MACQUARIE

Green Investment Group

Progress Report

Accelerating the transition to a greener global economy

October 2019

About this report

The purpose of this report is to provide an overview of GIG activity since its last progress report in October 2018. The report covers the period from September 2018 to the end of August 2019, unless otherwise stated. GIG provides real-time progress updates via its website and social media channels.

About the cover of this report

The photo on the cover of this report shows Korea's first floating LiDAR system. The LiDAR will collect wind resource data and its installation marks a critical step in the development of GIG's first floating offshore wind project in South Korea, located off the coast of Ulsan City. To find out more about this project and GIG's growing global development pipeline, see p.10-11.

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Green Investment Group

@GreenInvGroup

Progress Report

Who we are and what we do

Green Investment Group (GIG) is a specialist developer, sponsor and investor with a mission to accelerate the transition to a greener global economy. We support the growth of the global green economy by making new green infrastructure investments and developing new projects. Working across the full project lifecycle, including early-stage development, we offer our clients and partners expertise in principal investment, project and portfolio management, advisory services and access to flexible capital.

Our unique offer

Our track record of pioneering green infrastructure investment, deep technical expertise, responsiveness to dynamic markets and flexible partnership approach defines us.

Technical expertise

We provide our partners with deep technical knowledge across renewable energy technologies, project development, asset management and green impact measurement.

Flexible capital

Our strong balance sheet and breadth of experience enable us to invest flexibly across the full capital structure.

Partnership approach

We work with a range of partners to complement and leverage our expertise, access to capital and global reach.

New market models

We respond to the dynamic renewables market by investing in technologies and businesses that help energy consumers realise greater value from energy systems.

Development capital

We're building our in-house development capability, working with partners to engage early in the project lifecycle, and investing in development projects and platforms to build a sustainable investment pipeline.

Green leadership

Our market-leading approach to green impact assessment continues to be applied to all of our investments and is at the forefront of efforts to increase standardisation in green finance.

Our heritage

In 2012 the UK Green Investment Bank plc (GIB) was launched by the UK Government. It was the first institution of its type in the world – a publicly funded bank designed to mobilise private finance into the green energy sector. Between 2012 and 2017, GIB helped to finance more than £12bn of UK green infrastructure projects.

Founded in 1969 in Sydney, Australia, Macquarie Group Limited (Macquarie) is a diversified financial group with offices in 30 markets, employing over 15,700 people globally. Macquarie has been an active green investor since 2005. In 2017, GIB was acquired by Macquarie from the UK Government.

Now operating as the Green Investment Group, GIG brings together the GIB business with Macquarie Capital's renewables team to create one of the world's largest teams of specialist green investors.

Green Investment Group at a glance

£20+bn

of capital committed and arranged[1]

25+

markets with investments or operations

400+

people working on GIG activities[2]

Working across all green technologies

- Offshore wind
- Waste-to-energy
- Solar
- Onshore wind
- Storage
- Energy efficiency
- Hydro
- Biofuel

1. Combining historic activitiy where UK Green Investment Bank (GIB), Green Investment Group (GIG) or Macquarie Capital have contributed equity or debt
2. Includes operating platform employees
3. Forecast lifetime
4. For 25 years, calculation based on UK benchmark numbers

181,000 kt CO_2e

greenhouse gas emissions avoidance,[3] equivalent to removing 2.3m cars from the road[1,4]

493,000 GWh

renewable energy generation,[3] equivalent to the energy consumption of 5m homes[1,4]

20+ GW

global development pipeline

Building a global green investment platform

Dan Wong
Macquarie Capital Co-Head and Chair of Green Investment Group

This report marks the second anniversary of the formation of GIG. In that time, the business has grown from its UK base to become a global business, fully integrated within and leveraging the capabilities and ambition of Macquarie.

Macquarie has been proud to enable the rapid growth of GIG and to support the mission at the heart of the business. That mission has remained constant as GIG has grown: to accelerate the transition to a greener global economy. This is more than just a phrase; it is a clear green purpose that is hard-coded into the business. It is enshrined in our legal constitution through our five green purposes, backed up by our Green Investment Policy and Principles.

That mission, however, is only as good as the action we take and I'm pleased to report that GIG is investing and arranging large amounts of new capital. In the past two years we have invested or arranged almost £4bn in the UK and Europe alone. We are exceeding the commitments we made when we acquired GIB from the UK Government.

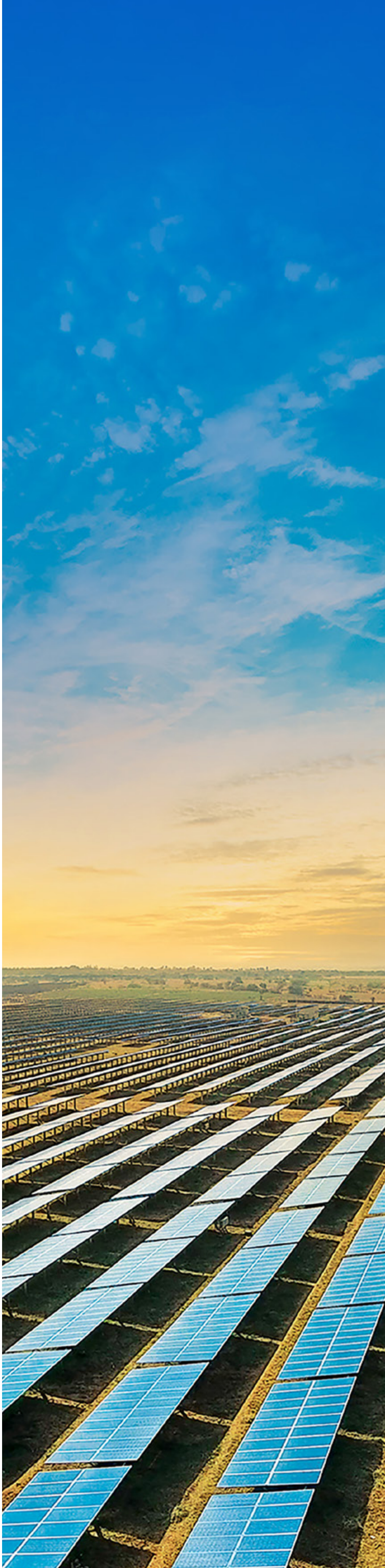
Our greatest contribution is not how much we invest, but when we invest it. We believe that one of the biggest challenges of the energy transition lies not in access to capital, but in building a pipeline of investible projects. This shift to invest earlier in the project lifecycle – into early-stage development – means that GIG is investing where the market needs us most. This significantly extends GIB's previous approach of investing during the construction and operational phases of projects.

We have invested significantly in the business to enable its move into project development, quadrupling the people working for GIG from 100 to over 400 and working with our partners to build a 20 GW global development pipeline. Our focus is now to deliver that pipeline into construction and to add to it.

This is good, purposeful business. The urgency of our mission is clear: climate change is upon us and the energy transition is one of the defining challenges of our lifetime. We are proud, at Macquarie and GIG, to be leading the charge in finding solutions to accelerate that green transition.

Dan

Dan Wong,
Macquarie Capital Co-Head and Chair of Green Investment Group



Right: CleanMax Solar Farm, Tumkur, India

Mark Dooley
Global Head of
Green Investment Group

In last year's report, I set out the strategic themes that would drive GIG's development: early engagement in the project lifecycle; expanding our reach to build a truly global business; the creation of development platforms; and the establishment of power purchase agreements (PPAs) as a viable source of revenue to anchor new projects. These themes continue to underpin our mission-led approach to investment in the green economy, transforming GIG into a unique global platform.

Following GIG's expansion from its home base in the UK across Europe, Asia and North America in 2017-18, 2019 saw GIG become active in Macquarie's home market of Australia and New Zealand. This means GIG is now a truly global platform, active in over 25 countries across six continents. By combining GIG's expertise originally developed in the UK, with the talent and know-how of our local teams we're driving the low-carbon transition across established and emerging economies.

Perhaps the most marked change in our activity is our commitment to development. We're now no longer only relying on others to kick-start projects. Instead, we're increasingly acting as the lead developer, identifying development opportunities and driving projects forward from dollar number one to electron number one.

This in-house development activity has been complemented by the growth of what we call our development platforms. Through these platforms, we partner with smaller local developers to create pipelines of scale which will, ultimately, attract more institutional capital into the sector. This partnership platform model, alongside our in-house activity, has created a global development pipeline of 20+ GW.

By bringing our financial expertise to projects from their very inception, we're able to develop high-quality investment opportunities that can operate successfully in even the most challenging of markets.

As a developer and sponsor in today's renewables markets, we need to meet the challenge of reducing subsidies. Our dedicated PPA team plays a huge role in this. With a growing number of markets operating on a low to no-subsidy basis, their skills in sourcing and structuring PPAs as an alternative revenue source are increasingly in demand – and not just from the power generators. Corporates increasingly expect their energy to come from low-cost and verifiably low-carbon sources, with the sustainable sourcing of energy becoming a key item on the agenda both for shareholders and in the boardroom. GIG's PPA team is at the forefront of this burgeoning sector, structuring new PPA models that will open up the market to even more generators and consumers of power.

As a complement to our core investment business, we are also growing our advisory capability, building on our pioneering work in areas such as Green Impact Advisory services and developing green banks. We also continue to take part in the wider global green investment movement, from supporting Macquarie CEO Shemara Wikramanayake in her roles on the Global Commission on Adaptation and the Climate Finance Leadership Initiative, through to engagement with policymakers in our home market of the UK.

These themes have been our focus for the past year, and will continue to shape the business in the years to come.

Across the world, 2019 may well be remembered as the year that the climate emergency truly entered the public consciousness. With record-breaking temperatures and growing numbers of climate-driven natural disasters, the realities of climate change are becoming increasingly tangible and inescapable. GIG's mission to accelerate the transition to a greener global economy has never been so urgent nor so critical. As the world's energy transition continues, we're determined to continue leading the charge.

Mark Dooley,
Global Head of Green Investment Group

Highlights of the year

"GIG has transformed its approach to development in Europe, establishing seven new solar energy partnerships with a collective pipeline of over 4 GW of capacity."

Edward Northam
Head of GIG, UK & Europe

"The acquisition of Savion added an additional 8 GW to GIG's US development pipeline, further advancing our vision of creating an industry leading, US wide, solar and energy storage development platform."

Chris Archer
Head of GIG, Americas

A year of global GIG activity

OCT 18 – **Inaugural Macquarie GIG Conference**
London

DEC 18 – **Earls Gate**
Grangemouth, UK
See p.11

JAN 19 – **Revego (UKCI)**
Africa
See p.19

JAN 19 – **GIG offshore wind event**
Seoul, Korea

MAR 19 – **Rookery South**
Bedfordshire, UK
See p.13

MAR 19 – **Electrodes Holdings**
California, USA
Debt financing of an innovative battery storage project.

MAR 19 – **Savion**
USA
Acquisition of the solar and storage unit of Tradewind Energy.

APR 19 – **CleanMax (UKCI)**
India
See p.19

11
new green transactions supported globally[1]

£2.4[+]bn
of capital committed or arranged[1]

13,000 kt CO_2e
greenhouse gas emissions avoidance,[2] equivalent to removing 165,000 cars from the road[1,3]

43,000 GWh
renewable energy generation,[2] equivalent to the energy consumption of 440,000 homes[1,3]

1. In the reporting period
2. Additional forecast lifetime
3. For 25 years, calculation based on UK benchmark numbers

"GIG is at the forefront of Asia's burgeoning offshore wind industry. In June we launched Korea's first floating LiDAR system, marking a critical step in the development of our first floating offshore wind project."

Neil Arora
Head of GIG, Asia

"We're excited to now be utilising GIG's expertise across Australia, Macquarie's home market. The GIG platform forms part of our ambitious plans to further grow our green investment business."

Ivan Varughese
Head of GIG, ANZ

JUN 19 – Hornamossen
Jönköping, Sweden
See p.13

JUN 19 – LiDAR installation
Korea
See p.11

JUL 19 – GIG stakeholder event
Sydney, Australia

AUG 19 – East Anglia ONE
Suffolk, UK
See below

AUG 19 – H1 Holdings (UKCI)
South Africa
See p.19

AUG 19 – Kisielice
Poland
Acquisition of a 42 MW onshore wind project, GIG's first in Poland.

AUG 19 – Tysvær
Norway
See p.11

In August 2019, GIG entered into an agreement to acquire a 40 per cent stake in Iberdrola's ScottishPower Renewables' 714 MW East Anglia ONE offshore wind farm.

This new partnership brings the total capacity of UK offshore wind supported by GIG to over 5.7 GW across 14 projects – equivalent to almost 50 per cent of the total UK offshore wind capacity in operation or construction.

Building a sustainable development pipeline

Risk perceptions are changing among renewable energy investors. In most markets, green energy is now a mature asset class, and more and more capital is being directed towards renewable energy projects. A recent survey of 100 large investors found that allocations to renewables are set to almost double over the next five years, with these investors alone expected to direct $US210bn towards the sector.[1]

“Our partnership with GIG has ushered in an era of unprecedented opportunity and growth for Covanta. For a company whose core mission is ‘Protecting Tomorrow,’ we are energised by the opportunities before us to deliver reliable sustainable waste management infrastructure for citizens and communities across the UK, which promotes landfill avoidance and reduces greenhouse gases.”

Stephen J. Jones, President and CEO, Covanta

Left: Covanta waste-to-energy plant, Dublin, Ireland

Despite these achievements, investment levels are still falling far short of what is required to deliver the transition to a low-carbon economy – why? One challenge is that there are simply not enough projects of scale, in which this capital can be invested. GIG is responding to this challenge by dedicating a growing proportion of its resources to early-stage project development, creating a pipeline of investment opportunities to help bridge this gap and accelerate the global energy transition.

GIG's global development pipeline now sits at over 20 GW. That pipeline is made up of projects developed ‘in-house’ by GIG and through a growing number of development platforms.

Global strategic partnerships

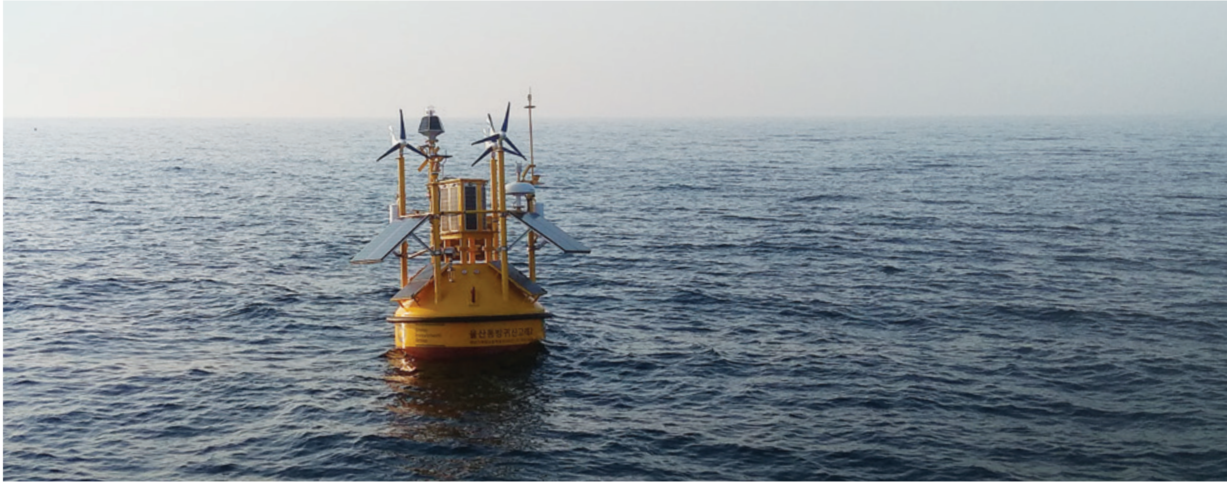
Institutional investors face a fragmented landscape of smaller developers who lack the capital to create a sufficient volume of assets to meet the demands of large institutions. GIG is therefore partnering with local developers to create development platforms, combining complementary skill sets to deliver successful, scalable, development outcomes.

These platforms offer a means of accessing local knowledge and de-risking the development process without the need for considerable investment in human resources. Local development partners focus on finding and acquiring the rights to sites, ensuring grid connections and securing the required permits – areas where few economies of scale exist – while GIG adds value in procurement, financing, the negotiation of PPAs, and in centralising oversight of construction and operation.

As of mid-2019, GIG had created 12 such platforms globally. In mainland Europe, GIG has created seven solar energy development platforms to date, working with developers in countries including Italy, Spain and the Netherlands. These platforms collectively boast a development pipeline of over 4 GW of solar capacity. The first projects from these platforms are expected to come into operation during 2020.

In the US, GIG acquired the solar development and energy storage unit of Tradewind Energy, Savion. Alongside its investments in Alira and

1. Source: Octopus Group, *The green investor: why institutional investing holds the key to a renewable energy future.* February 2019



Right: Korea's first floating LiDAR system

Candela Renewables, this transaction further advances GIG's vision to create a leading solar and energy storage development platform in the US. Through these companies, GIG is currently developing over 100 solar projects across 26 different states with a total capacity of over 12 GW.

But it's not just smaller developers that GIG partners with. One of GIG's first strategic partnerships was with Covanta, a New Jersey-based waste-to-energy developer. Forged in late 2017, that partnership closed two projects in the UK throughout 2018-19. In December 2018, GIG financed a 25 per cent stake in Earls Gate Energy Centre, a 21.5 MWe waste-to-energy project in Grangemouth, Scotland. The project will divert over 200,000 tonnes of household and commercial waste from landfill, instead using it to generate 79 GWh of green electricity and 81 GWh of heat. Earls Gate – which is believed to be the first waste-to-energy project in Scotland to supply industrial heat – will create 500 jobs in construction and 30 long-term posts.

GIG originally identified Earls Gate as a promising project in 2016, entering into a development agreement with developer Brockwell Energy in June the following year. GIG brought its own technical and commercial capability to the project team, structuring the project to increase its attractiveness to investors through appropriate risk allocation and robust contractual and commercial protection. A particular focus for the team has been the establishment of engineering, procurement and construction contracts with reliable and proven contractors, and the signing of an innovative Energy Supply Agreement.

In-house development expertise

In addition to these strategic partnerships, GIG is undertaking an increasing amount of in-house development work, particularly in Asia, where the group has the largest offshore wind team in the region. The predominantly local teams have extensive knowledge of domestic development processes. GIG's team in Taiwan – numbering more than 50 – has been a leading participant in Taiwan's offshore wind roll-out, delivering the country's first offshore wind farm, the 128 MW Formosa 1 project, with domestic developer Swancor as well as Orsted and JERA, and is also developing the 376 MW Formosa 2 project alongside Swancor.

In Korea, GIG is active at the very inception of the country's offshore wind sector, deploying the country's first floating LiDAR system in June 2019. It will collect data to enable what is set to be one of Korea's first floating offshore wind installations, the 1.4 GW Ulsan project, the first phase of which is targeted for completion in 2022.

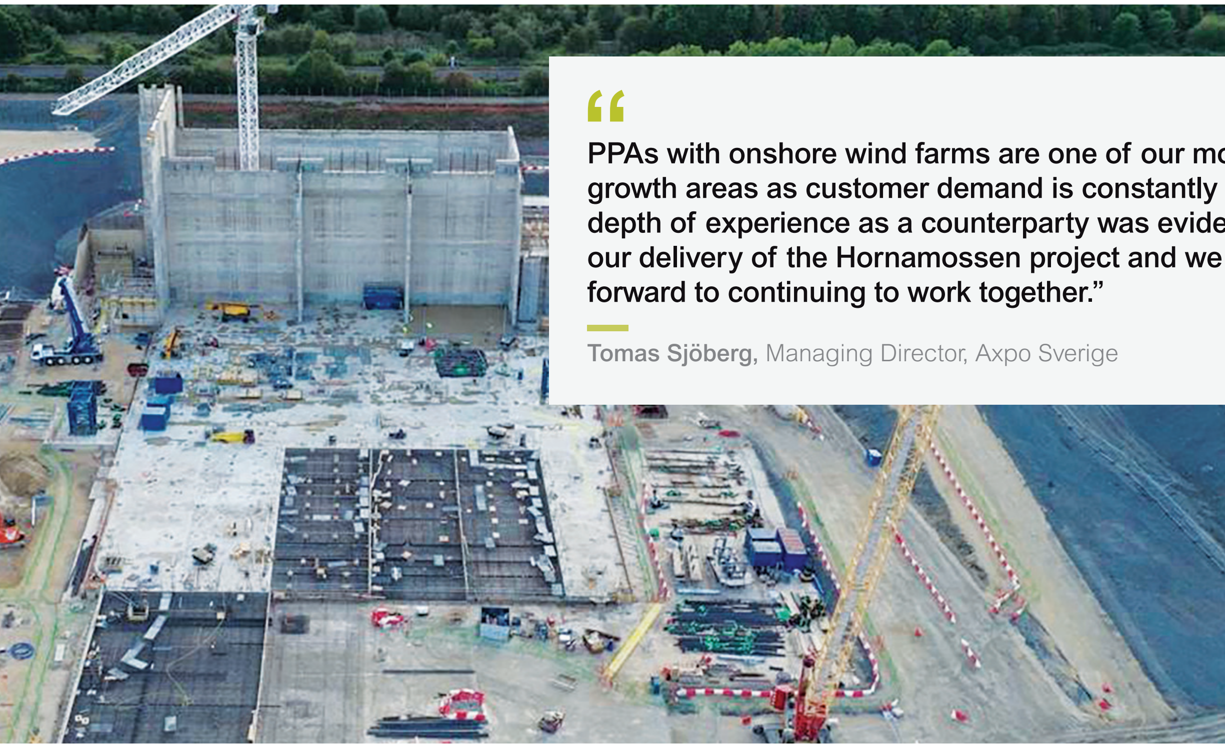
European onshore wind has also been a focus of GIG's development activity. Building on its success in Sweden with the Markbygden and Överturingen wind farms, GIG continued its Nordic onshore wind expansion throughout 2018-19 with the acquisition of its first project in Norway – Tysvær Wind Farm. The 47 MW project is being developed directly by GIG and is expected to start construction in early 2020.

For GIG, the next few years will involve the further evolution of its development platform strategy, alongside a deepening of its in-house expertise. In Europe, further development platforms are expected to be established to broaden GIG's geographic coverage, and to expand its activities into early-stage onshore wind. In Asia, a combination of growing demand for green energy, and GIG's development focus, suggests significant expansion in GIG's activity across the region. And in North America, strong solar resource coupled with an abundance of land and competitive costs, set a strong backdrop for the continued growth of GIG's solar activity.

Through this development activity, GIG's goal is to increase the volume and scale of green energy transactions, creating a pipeline of opportunity which will unlock the investment needed to accelerate the global energy transition.

Delivering projects in a post-subsidy world

The renewable energy sector has successfully created the conditions to enable deployment at a scale and pace few thought possible. Costs are falling rapidly, enabling these new sources of energy to compete directly with conventional sources in many markets – and win. Solar energy has delivered some of the most dramatic cost reductions, with solar photovoltaic module prices falling 80 per cent over the last decade.[1] This dramatic fall in costs enabled the installation of over 100 GW of solar globally in 2018.[2] But with this success come new challenges.



> “PPAs with onshore wind farms are one of our most important growth areas as customer demand is constantly growing. GIG's depth of experience as a counterparty was evident throughout our delivery of the Hornamossen project and we are looking forward to continuing to work together.”
>
> **Tomas Sjöberg,** Managing Director, Axpo Sverige

Left: Construction of Covanta's Rookery South waste-to-energy plant, UK

The mainstreaming and maturing of renewable technologies has prompted governments around the world to review and, in many instances, remove the various publicly funded support schemes brought in to stimulate the market. This low- or no-subsidy world requires developers to find alternative sources of revenue to anchor the low-cost, long-term financing needed for projects to be economically viable. Developers are increasingly looking to the growing number of corporations that are seeking to access green power through power purchase agreements (PPAs) – usually long-term agreements for the delivery of renewable energy from a specific source, entered into between energy producers and energy consumers – to provide that alternative revenue certainty.

The rise of the PPA

In a growing number of markets in which GIG operates, the underlying business case for renewable energy projects is supported by this increased appetite among businesses and consumers to buy renewable power through PPAs. For reasons of cost, long-term predictability, or simply to play their part in driving the transition to a sustainable global economy, consumers of power are increasingly attracted to PPAs. Last year, companies entered into PPAs with 13.4 GW of projects, according to data from Bloomberg – more than double the total in 2017.[3]

While PPAs are becoming more popular in markets such as Spain and Poland, the PPA strongholds of North America and the Nordics continue to lead the way. The US is home to the most developed and liquid market for renewable energy offtake in the world. Within GIG's US based development platforms, PPA experts with significant experience of contracting solar energy projects work with both corporate and utility offtakers to structure the PPAs which will underpin their development pipeline. In Sweden, GIG has been instrumental in some of the largest and longest-term PPAs ever structured. In June 2019, GIG acquired the 43 MW Hornamossen onshore wind farm in northern

1. Source: The International Renewable Energy Agency
2. Source: Bloomberg New Energy Finance, *Clean Energy Investment Exceeded $300 Billion Once Again in 2018*, blog post, 16 January 2019
3. Source: Bloomberg New Energy Finance, *Corporate Clean Energy Buying Surged to New Record in 2018*, blog post, 28 January 2019

Right: Craigellachie combined heat and power plant, Speyside, Scotland

Sweden, sourcing and structuring a long-term PPA with the Nordic arm of Swiss energy utility Axpo. Axpo will sell the electricity from Hornamossen on to its industrial customers as part of its renewables portfolio, helping to further decarbonise Swedish industry. GIG has now sourced and structured PPAs for almost 1 GW of wind energy in Sweden – equivalent to 10 per cent of the country's total onshore wind capacity.

GIG's first Norwegian onshore wind project, the Tysvær Wind Farm, will also look to secure a long-term PPA with a large industrial off-taker which will use the competitively priced energy to power Norwegian industry.

This growing demand from corporate buyers for PPAs is illustrated by the success of RE100, a global corporate leadership initiative bringing together businesses committed to 100 per cent renewable electricity. Macquarie announced in September 2019 that it will become a member of RE100 and will source all of the energy supplying its premises and data centres from renewable sources by 2025.

The power of aggregation

In many markets, demand from off-takers is outpacing the supply available from new projects coming on stream. Finding the right projects for off-takers can be a significant challenge, but one that GIG has been able to overcome by opening the PPA market to more buyers through multi-buyer or clubbed PPAs. Aggregating volumes – pooling smaller companies together to buy energy from a larger project – not only gives corporates access to a broader set of projects, but it also provides projects with the ability to match their production volumes with an appropriate group of customers.

For example, Macquarie's Murra Warra development – a 429 MW onshore wind farm in Australia – is underpinned by the largest corporate PPA in Australia and is a leading example of a multi-buyer PPA, struck with five corporate off-takers: Telstra, ANZ, Coca-Cola Amatil, Melbourne University and Monash University.

Going merchant

PPAs, however, typically only form part of a project's expected revenues, with the remainder earned from trading 'merchant', in wholesale power markets. A growing number of projects have been financed on an almost-merchant basis, while some existing projects that have come to the end of their guaranteed tariff period are being refinanced on that basis.

GIG expects to develop a growing number of fully merchant projects, which require neither government subsidy nor long-term PPAs to raise funding. For example, the Rookery South waste-to-energy project in the UK will sell its power on a fully merchant basis, using the revenues earned to supplement income from waste-processing contracts with local authorities and commercial customers. GIG reached financial close on Rookery South, alongside partners Covanta and Veolia, in March 2019. Currently in construction, the facility will become a critical part of the UK's waste infrastructure, diverting over 500,000 tonnes of waste per year from landfill and transforming it into enough electricity to meet the needs of the equivalent of over 112,500 homes.

The renewable energy landscape is becoming more varied, more complex, and more challenging for investors to effectively navigate. However, the underlying demand for low-cost, low-carbon power is only moving in one direction. The power of the consumer is, once again, fundamentally changing the marketplace. Increasingly, corporate managers, customers and investors expect green power supply simply to come as standard. GIG stands ready to make sure that demand can be met.

Delivering green advisory services

The impact investing market – where investors seek measurable social and/or environmental impact – is now worth more than $US500bn, according to the Global Impact Investing Network, twice its 2018 estimate.[1] As the low-carbon transition takes hold, we've also seen enormous growth in the green bond market, which has quadrupled in size since 2014, with $US100bn in issuance in the first half of 2019.[2] These bonds require the use of their proceeds to be tracked and their impact reported. But measuring and reporting impact requires specific expertise.

> "Through engaging GIG's Green Impact Advisory service, we were able to perform 'materiality mapping' to identify key environmental and social metrics against which we want to measure our performance, and define a roadmap towards our aspirational goals. This has allowed us to demonstrate to our shareholders the real impact our investments are having."
>
> **Giulia Guidi,** ESG Senior Advisor, NextEnergy Capital Group

Left: Sheringham Shoal offshore wind farm, UK

Green Impact Advisory

During its initial years as the world's first green investment bank, GIG developed an industry-leading green impact assessment methodology, providing a template for best-practice green impact disclosure. While GIG continues to apply these assessments to all of its investments to ensure they support GIG's green purposes, the growing demand for green advisory services has led to GIG also securing mandates with third-party clients seeking to measure and report their own contribution to a greener economy. In addition to impact reporting, GIG also provides a more flexible Green Impact Advisory service that is adapted to the evolving needs of its clients and the market.

This year, GIG worked with NextEnergy Capital to help the UK-based renewable energy fund manager understand how its activities are contributing to meeting the UN Sustainable Development Goals (SDGs) – an issue of growing interest to current and prospective investors. GIG helped the company develop a new strategy to incorporate SDGs into project assessment, monitoring and reporting.[3] That advice drove change in its processes and brought renewed focus to the organisation's aspirational goals.

GIG also advised on the green assessment and reporting for parent Macquarie Group's inaugural green loan, a £500m facility to support renewable energy projects globally – the first such loan to be issued under the Green Loan Principles. While GIG has produced green impact reports on projects and assets, this marked the first time those methodologies have been used to influence the design of a green loan instrument. Given that most investors typically invest through such products, rather than directly into the underlying asset, the design of this type of instrument with integrated impact reporting could significantly extend the reach of such reporting.

While a growing number of investors are looking to understand the sustainability credentials of their investments, concerns are rising about 'greenwashing', whether intended or inadvertent. Investor uncertainty over greenwashing is acting as a brake on the market. However, the use of robust and transparent green performance data, coupled with easily understood ratings as provided by GIG's Green Impact Advisory team, can offer reassurance and confidence to investors.

1. Source: Global Impact Investing Network, *Sizing the Impact Investing Market*, 2019
2. Source: Climate Bonds Initiative
3. See www.nextenergycapital.com/un-sustainable-development-goals

Right: Siemens turbine blades at Gwynt y Môr offshore wind farm, UK

Setting the standard

GIG's Green Impact Advisory team is contributing to industry-wide initiatives, building some of the market infrastructure upon which future green finance will rest. As a member of the British Standards Institute (BSI) Sustainable Finance Strategic Advisory Group, GIG continues to provide advice to BSI on future priorities for green and sustainable finance standardisation. The team is currently working with BSI on two initiatives: leading the development of an international standard on sustainable finance; and contributing to an international certification standard for green bonds and loans, which will enable issuers to demonstrate that a green debt instrument is funding genuinely green projects.

This work is not only aligned with GIG's mission to accelerate the transition to a greener global economy, but it also ensures GIG's Green Impact Advisory clients have access to global best practice guidance as they seek alignment with, or certification to, these standards.

Green Bank Advisory

GIG is also providing advice to governments and international financial institutions on how they might repeat the success the UK Government had in creating the world's first green bank. This year's Green Bank Design Summit saw representatives of 22 emerging markets convene to explore how they could establish their own green banks. Eleven of these markets plan to have a green bank operational within two years. With first-hand experience, from inception through to privatisation, GIG is uniquely positioned to give practical guidance to other jurisdictions planning to set up green banks.

Among other ongoing commissions, GIG is working with the Mongolian government regarding the creation of the Mongolian Green Finance Corporation, an institution being set up with support of the UN Green Climate Fund. GIG's advice draws on its unique heritage to provide advice on governance and target investment areas.

The GIG team has extensive experience working at the intersection of public policy and private investment, both as GIB and now as part of Macquarie Group.

The development of GIG's advisory business has seen the group take its unique origins and adapt techniques initially applied to its own purpose to meet the needs of a growing green finance sector. By combining its experience as a major investor in infrastructure with the technical in-house capability to advise on green measurement, investment and reporting, GIG is able to meet growing market demand for support at the intersection of finance and sustainability.

Supporting the global green community

The global green transition requires a team effort across the public and private sectors, and the broader environmental community. As part of its mission, GIG supports a diverse range of networks, events, initiatives and policy activity, all intended to help accelerate the green transition by sharing experience and insight.

“Macquarie Green Investment Group are driving the energy transition through their commitment to support wind and wider renewable energy projects. Their investments, experience and expertise are directly impacting the growth of wind energy and we’re delighted to have them as a member of the WindEurope Board.”

Giles Dickson, CEO Wind Europe

Left: Gwynt y Môr offshore wind farm, UK

Taking part in industry initiatives

The GIG team has supported Macquarie chief executive Shemara Wikramanayake in her role on two global climate initiatives: the Climate Finance Leadership Initiative and the Global Commission on Adaptation.

The Climate Finance Leadership Initiative (CFLI) was established in January 2019 by Michael Bloomberg, the UN Secretary General’s Special Envoy for Climate Action. It brings together the chief executives of Allianz, Axa, Enel, HSBC, Goldman Sachs and Macquarie and the chief investment officer of the Japanese Government pension fund GPIF, to consider how to accelerate the mobilisation of private climate finance. CFLI members contributed to an interim report delivered to the G7 summit in July and made a series of group commitments, including a collective commitment of $US20bn of increased green investment in emerging markets and a new partnership to work more closely with publicly funded development finance institutions.

The Global Commission on Adaptation (GCA) was established by Ban Ki-moon, 8th Secretary-General of the United Nations, Microsoft founder Bill Gates and World Bank CEO Kristalina Georgieva, and is guided by 28 commissioners from OECD and non-OECD governments and the private sector, including Macquarie CEO Shemara Wikramanayake. Its focus is on helping investors, government officials and other stakeholders gain a better understanding of current and future resilience challenges and on spurring climate adaptation action in areas such as infrastructure, agriculture and supply chains.

Both initiatives published reports in the lead up to the UN’s Climate Week in September 2019.[1,2]

In addition, GIG’s team has been involved in ongoing work to develop international standards for sustainable finance and green bonds, as described in more detail on p.15.

In GIG’s home market of the UK, Mark Dooley, Global Head of GIG, has been appointed to the UK Government’s Infrastructure Finance Review panel. GIG continues to play an active role in the City of London’s Green Finance Initiative, as well as working with government and City of London officials supporting the set-up of the new Green Finance Institute.

1. https://cdn.gca.org/assets/2019-09/GlobalCommission_Report_FINAL.pdf
2. https://data.bloomberglp.com/company/sites/55/2019/09/Financing-the-Low-Carbon-Future_CFLI-FullReport_September2019.pdf

Right: Rhyl Flats offshore wind farm, UK

Supporting industry groups and conferences

Across its key markets, GIG aims to play an active role in industry groups and trade associations. In the UK, these include: the Association for Decentralised Energy, RenewableUK, Environmental Services Association, Scottish Renewables, Solar Trade Association, Renewable Energy Association, Aldersgate Group, A Word About Wind, Scottish Council for Development & Industry, Making Energy Understandable for Customers and, through Macquarie, the Confederation of British Industry. Elsewhere, GIG was elected to the board of Wind Europe, and is involved with Solar Power Europe, the International Solid Waste Association and NORWEA in Norway, the American Council of Renewable Energy, the US Alliance for Sustainable Finance and, through Macquarie, the Japan Wind Power Association and Japan Association of Asset Management for Offshore Wind.

In addition, GIG has attended, spoken at, hosted or sponsored more than 130 industry events during the reporting period.

For example, GIG took part in the UK Government's first ever Green GB Week in October 2018, hosting an event in Edinburgh with senior officials from the Department for Business, Energy & Industrial Strategy at which the Offshore Wind Green Impact Report was launched.

Beyond the UK, GIG began engaging this year with the UK's Foreign Office and the Government of the Philippines on the development of a green finance strategy for the country. In March 2019, GIG participated in the inaugural Green Bank Design Summit, providing training and expert insight to governments of 25 countries interested in setting up their own green finance Institutions.

GIG also provided financial sponsorship to industry events in the UK and overseas. These included: RE-Source Europe 2018, hosted by WindEurope and Solar Power Europe, and RE-SourceUK 2019, hosted by RenewableUK and the Solar Trade Association; WindEurope 2019 in Bilbao; GWEC's Offshore Wind Conference; RWM2019, the UK's largest recycling and waste management conference; the Scottish Green Energy Awards; RenewableUK's Global Offshore Wind Conference; and the City of London's flagship Green Finance Summit, part of London Climate Action Week in July 2019, at which the UK's Green Finance Strategy was launched. Through Macquarie, GIG also sponsored the Energy Taiwan event in Taipei, the Global Offshore Wind Summit in Taipei, and the launch of the Taiwan Offshore Wind Industry Association.

Sharing our expertise

Each year, GIG hosts stakeholder events in London and Edinburgh to provide an update on activity over the past year and to look ahead to the next.

In October 2018, the first Macquarie GIG Green Energy Conference was held. The event combined GIG's Annual Review with Macquarie's Alternative Energy Conference and was attended by 450 stakeholders, including clients, members of the renewable energy industry and community, journalists and staff. The event was followed up with thought-leadership videos shared on GIG's website and social media channels.

At the conference, GIG published its first Progress Report, marking the anniversary of the creation of GIG, following the acquisition of GIB by Macquarie.

In November, GIG hosted 50 stakeholders to provide an update on its Scottish activity and hear from a panel of industry experts on the future of Scotland's renewable energy industry.

Elsewhere, GIG held two events in Seoul, Korea in 2018 and 2019 with a focus on green investment and the Korean offshore wind industry. The events were attended by over 200 members of Korea's green community. In March 2019, GIG also convened over 130 industry, government and regulatory leaders in a closed forum to discuss the opportunities and challenges of the green energy transition in America.

Throughout the reporting period, GIG has continued to share details of its activities and expertise through the GIG website and LinkedIn and Twitter accounts. Each new GIG transaction is announced on the website, often accompanied by a film providing further background on the transaction and any market-leading elements.

Funds under management

As well as investing its own capital, GIG manages capital on behalf of long-term institutional investors – acting as a general partner in a dedicated renewable energy fund and managing a joint venture, UK Climate Investments, with the UK Government.

"A significant opportunity exists to accelerate the low-carbon transition – connecting the world's long-term savings pools with investment opportunities in green infrastructure. By better leveraging this institutional capital, we can finance the build-out of vital clean energy projects around the world whilst creating more sustainable economies."

David Tilstone, Managing Director, GIG

Left: Rhyl Flats offshore wind farm, UK

Macquarie GIG Renewable Energy Fund 1

In 2016, GIB reached final close on the world's first offshore wind fund. This fund, now named Macquarie GIG Renewable Energy Fund 1 (MGREF1), currently manages investments in a portfolio of six operational offshore wind farms around the UK; Gwynt y Môr (576 MW), Inner Dowsing (97.2 MW), Lincs (270 MW), Lynn (97.2 MW), Rhyl Flats (90 MW) and Sheringham Shoal (316.8 MW).

With a total combined capacity of more than 1,400 MW, the wind farms represent approximately 18 per cent of the UK's total operational offshore wind generation capacity.[1]

Enhancing operational performance

Positioned miles off the coast in areas of high wind resource, offshore wind farms require ongoing maintenance to optimise their performance and extend their service lives. To ensure capital investment is appropriately prioritised, GIG works closely with operations teams to progress key asset management initiatives across the MGREF1 portfolio.

During the reporting period, maintenance work was undertaken across all projects to repair turbine blades damaged by erosion. The turbines, which often face harsh weather conditions, require ongoing monitoring and repairs to mitigate the impact of rain, salt spray, ice and other debris. Works to prevent the corrosion of turbine foundations by seawater were also progressed across key sites, as was the upgrade of lightning protection systems to prevent damage during electrical storms.

These upgrades aimed at improving the performance and longevity of wind turbines in the portfolio were complemented with the installation of new software. The software upgrades, which seek to optimise how wind turbines perform in different weather conditions, are helping to ensure the capacity of each project is fully utilised.

Supporting the UK's energy transition

The six wind farms in the MGREF1 portfolio continue to make a significant contribution to the UK's decarbonisation agenda.

Since inception, the portfolio has generated more than 15.7 TWh of renewable energy – equivalent to avoiding more than 6.1 Mt CO_2e. The MGREF1 portfolio is set to generate enough clean electricity to power 1.1m homes each year.

GIG's asset management team continues to work closely with stakeholders to identify and advance further initiatives that support the ongoing contribution of the portfolio to the UK's energy transition. This includes working closely with the Crown Estate to progress potential lease extensions at Gwynt y Môr and Sheringham Shoal. In August 2019, the Crown Estate confirmed that both projects could progress to an award of development rights after undertaking a plan-level Habitats Regulations Assessment, to assess the possible impact of the proposed wind farm extensions on relevant nature conservation sites of European importance.

1. Based on total UK operational offshore wind capacity of 7.9 GW, *Offshore Wind Operational Report* January-December 2018, The Crown Estate

Right: KIOCL 2, CleanMax Solar rooftop solar plant, KIOCL Limited, Mangalore, India

UK Climate Investments

UK Climate Investments (UKCI) is a joint venture between GIG and the UK Government. Forming part of the UK's International Climate Finance commitment, it targets transformational green energy investments where UKCI capital can mobilise additional private sector capital on a sustainable basis to promote cleaner, greener growth in developing economies.

Last year, following a successful transition onto the Macquarie platform, UKCI made two landmark investments in India's renewables sector – supporting the development of a 50 MW solar farm in Maharashtra, and seeding the country's first offshore unlisted renewables yieldco with an investment in a 185 MW solar portfolio.

UKCI built on this momentum during the reporting period with three new commitments across a range of greenfield renewable energy projects and green finance capital market innovations. The UK Government also extended UKCI's investment period by 12 months to November 2019 to allow UKCI to realise an increasingly attractive pipeline of transformational opportunities.

Green finance market development

In December 2018, UKCI made a ~£30m cornerstone commitment to Revego Energy, a first-of-a-kind listed renewables yieldco in sub-Saharan Africa. This green finance vehicle will accelerate the deployment of renewable energy in the region by recycling development capital and providing institutional investors with access to long-term operational cashflows generated by a portfolio of renewables projects. The vehicle intends to seek a listing on the Johannesburg Stock Exchange and will be managed by Revego Fund Managers, a Black Economic Empowerment (BEE) accredited fund manager. In this way, the investment is both helping to support a key social and economic agenda whilst enabling the expansion of renewable energy across sub-Saharan Africa.

Funding innovative new renewable energy projects

In April 2019, UKCI made a £30m commitment in one of India's leading providers of renewable energy for commercial and industrial (C&I) clients, CleanMax Solar. Partnering with C&I customers across India's largest cities to build new rooftop and ground-mounted solar generation projects, CleanMax Solar enables businesses to access clean, cheaper-than-grid electricity by removing the need for significant upfront capital investment. UKCI's commitment will assist CleanMax Solar as it looks to scale its operations, providing it with the capital needed to expand its network of solar farms across the country. In approaching this investment, UKCI was able to draw on the extensive expertise across GIG to better understand how innovative private offtake PPAs work in markets around the world.

In August 2019, UKCI announced a ~£14m agreement with H1 Holdings to support the development of 254 MW of renewables projects across South Africa. The agreement will see UKCI provide critical financing for two onshore wind farms and one small-scale hydro project via an innovative financing mechanism developed by UKCI to support BEE entities.

Climate adaptation

Following a successful pilot, UKCI and co-shareholders in its India Sun investment approved a £1.2m investment to install robotic waterless cleaning technology on its Bhadla solar farm. The technology will prepare the plant, which is located in a water-stressed region, for the expected future impacts of climate change – ensuring it continues to operate efficiently, whilst increasing the availability of scarce water for use by local farmers and communities.

Macquarie: Sustainability and green investment

Macquarie Group, GIG's parent company, has a substantial and longstanding commitment to supporting the transition to a low-carbon economy. Together with its managed funds, Macquarie is one of the world's largest investors in green energy, with more than 15 years of renewables expertise, and green energy and investment specialists across all regions.

In 2018-19, Macquarie invested or arranged more than £4bn (~$A8bn) in green energy projects and, as of 31 March 2019, had 13.5 GW of renewable energy assets in operation or under management.[1]

Macquarie services clients across various renewable energy technologies, including solar, wind, waste-to-energy, bioenergy and energy efficiency, and has consistently grown its commitment and broadened its focus.

Macquarie works across the renewable energy and clean technology markets as a fund and project manager, adviser, financier and participant in environmental markets. Its activities span the investment cycle, from research into alternative energy to tailored capital solutions for the development and construction of renewable assets.

Global leadership

Macquarie Group's CEO, Shemara Wikramanayake, has taken on two key global leadership roles in supporting the transition to a greener, lower-carbon economy across the world. Further details of these are provided on p.16.

Recent green investment developments from across Macquarie Group

Macquarie Group capital raising in August 2019

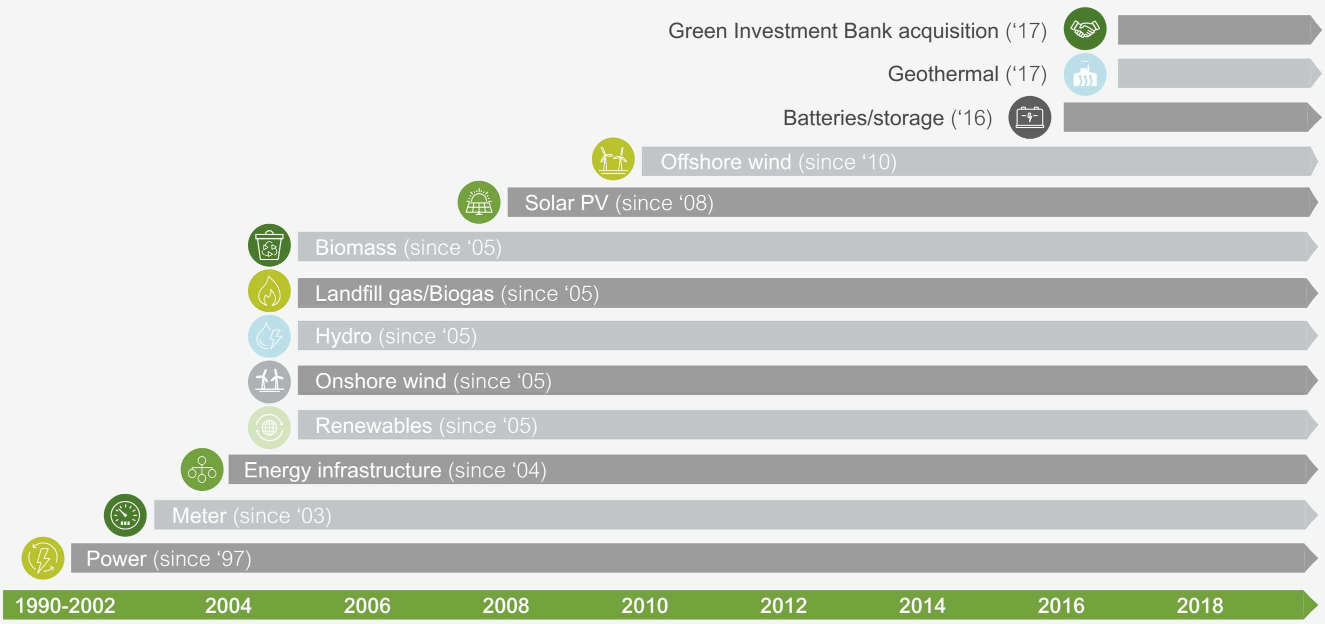
Macquarie successfully raised $A1bn of share capital for investment through an institutional placement in August 2019, a significant proportion of which was earmarked for renewables projects.

Green impact reporting on Macquarie's first green loan

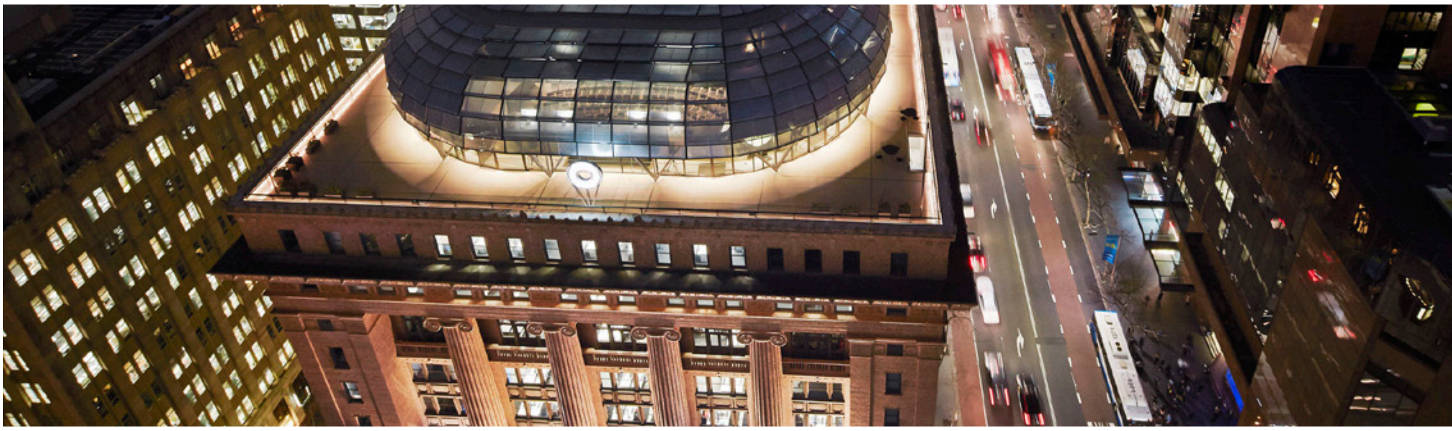
On 26 July 2019, Macquarie published the first green finance impact report for its £500m green financing facility, issued in June 2018. Macquarie was the first financial institution globally to issue a green loan under the Green Loan Principles. The portfolio developed under these loan tranches is forecast to produce almost 7,000 GWh per year and avoid approximately 3,500 kt CO_2e per year.

The proceeds from the green tranches have been committed to solar, offshore wind and onshore wind projects across the globe – many of which were GIG-led. Going forward, Macquarie may extend the use of the loan proceeds to support further renewable energy, energy efficiency, waste management, green buildings and clean transportation projects.

Diversification of Macquarie's investment focus



1. MW of renewable energy assets in operation or under management reflect 100 per cent generating capacity of each asset, not the proportion owned/managed by Macquarie



Bringing institutional capital into the green energy sector

In addition to overseeing investment and asset management activities for UKCI and MGREF1 *(see p.18-19)*, Macquarie Infrastructure and Real Assets (MIRA) is supporting the growth of green energy by bringing additional long-term institutional capital into the sector via its managed funds. During the reporting period, MIRA made a series of additional investments in the sector and progressed initiatives to improve data capture and reporting across its portfolio.

In September 2018, a MIRA-managed fund acquired Wheelabrator Technologies, a leading waste-to-energy platform in the US. In August 2019, MIRA also announced that it will acquire the 400 MW BARD Offshore 1 project, Germany's first utility-scale offshore wind farm. In September 2019, Macquarie Infrastructure Debt Investment Solutions (MIDIS), on behalf of its European and Asian insurance company clients, announced a new €38m debt investment in a portfolio of Spanish solar farms.

Green Climate Fund accreditation

Macquarie Alternative Assets Management Limited was accredited to the Green Climate Fund (GCF) in February 2019. The GCF is a United Nations fund which partners with accredited organisations, like Macquarie, to provide concessional, risk-mitigating capital for climate change mitigation and adaptation projects in emerging markets. Macquarie is continuing to engage with the GCF on potential projects or programmes to drive a paradigm shift in green energy and/or other sectors in key markets.

ESG at Macquarie

Macquarie's Board and Management recognise the importance of sound environmental, social and governance (ESG) practices as part of their responsibility to its clients, shareholders, communities, people and the environment in which Macquarie operates.

Macquarie's ESG approach is structured around focus areas considered to be material to the business. Building on Macquarie's principles of opportunity, accountability and integrity, these focus areas reflect the risks and opportunities identified by the business and the issues of interest to its stakeholders.

Clear dialogue with stakeholders is important in building strong relationships, understanding external dynamics, earning and maintaining trust, enhancing business performance and evolving the ESG approach. Macquarie regularly engages with a broad range of stakeholders, including clients, shareholders, investors, analysts, governments, regulators, staff, suppliers and the wider community.

Macquarie's ESG focus areas include:

- business conduct and ethics
- ESG risk management
- investments, markets and products
- sustainability in direct operations
- people and workplace.

More information regarding Macquarie's ESG approach can be found at www.macquarie.com/ESG.

Task Force on Climate-related Financial Disclosures

Macquarie supports the important work of the Task Force on Climate-related Financial Disclosures (TCFD) and is actively implementing the TCFD recommendations.

In the 2018-19 financial year, Macquarie sought to use scenario analysis to assess potential risks and impacts to its business from climate-related risks. The results of this analysis are outlined in the ESG section of the Macquarie Group Annual Report 2019.

RE100

Macquarie also announced that it will become a member of RE100, a global corporate leadership initiative bringing together businesses committed to 100 per cent renewable electricity and will source all of the energy supplying its premises and data centres from renewable sources by 2025. Consistent with the dedicated PPAs it has created for clients, Macquarie will seek to develop projects to supply the green energy for its new Sydney headquarters and Melbourne office..

Carbon neutrality at Macquarie

Since 2010, Macquarie has maintained a carbon-neutral commitment by working to reduce and offset emissions. To meet this commitment in 2018-19, Macquarie purchased and retired a portfolio of voluntary carbon offsets, focusing on project quality and verifiable emissions reductions. Carbon credits that met the Verified Carbon Standard and the Climate, Community and Biodiversity Standards were purchased from projects in Peru and Zimbabwe. These projects, supported by the sale of carbon credits on international markets, reduce carbon emissions in the countries and communities in which they operate.

Our green impact

GIG has developed a market-leading suite of principles, policies and processes which inform all its investment decisions. Through its commitment to transparent disclosure, GIG continues to demonstrate application of best practice in green impact performance reporting.

Green governance framework

GIG's green governance framework is applicable to all its investment activity globally. This framework includes:

- Compliance with GIG's Green Investment Policy and its seven Green Investment Principles
- Contribution to one or more of GIG's five Green Purposes
- Independently assured green impact data *(see p.27)*
- Adherence to Macquarie's Environment and Social Risk Policy
- Signatory to the Principles for Responsible Investment (PRI)
- Adoption of the Equator Principles

GIG achieved an A+ rating for both its PRI assessment categories, putting its performance in the top 20 per cent of PRI signatories.

Reporting green impact

With GIG now investing in the early development stage of projects, the method of reporting the green impact of its investments has been updated. GIG continues to report five key green impact metrics:

- Greenhouse gas emissions avoided (kt CO_2e)
- Renewable energy generated (GWh)
- Energy demand reduced (GWh)
- Materials recycled (kt)
- Waste to landfill avoided (kt).

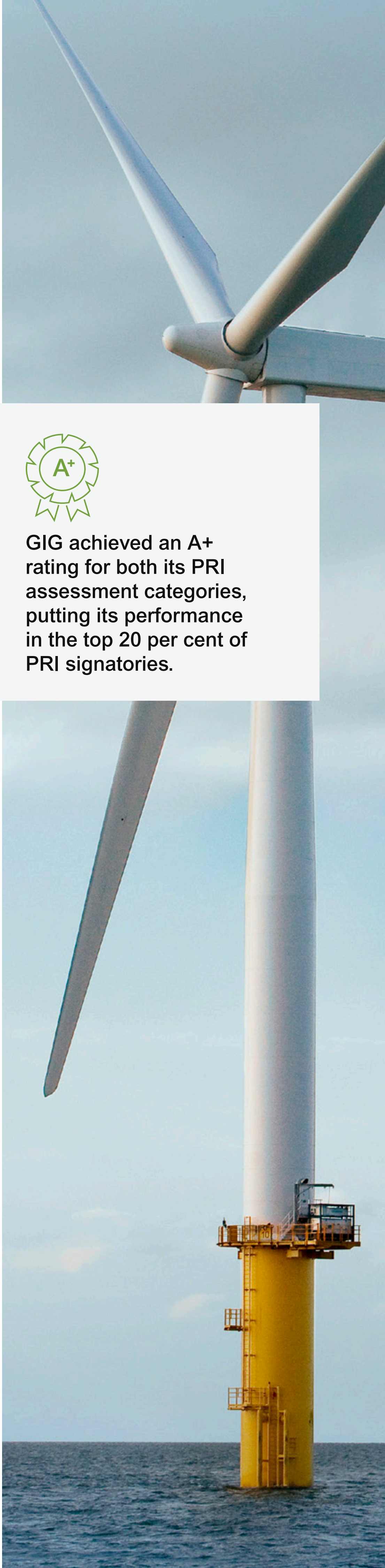
The same data is collected for all projects but the way this impact is presented has been updated.

In previous years, where operational assets were held for prolonged periods, actual and forecast green impact from the projects held at the end of each financial year was reported. Reporting now reflects the lifetime green impact of all investments to date, highlighting the expected green impact of investments made in the past year. This new approach provides greater clarity on the increasing green impact that GIG is catalysing through its investment activity.

Green impact for new investments made within the year is reported, as well as green impact of all GIG investments to date. This includes projects from previous years that continue to be held as they progress through to operations, and projects no longer held where GIG's investment catalysed their delivery. It is noted that under this approach, green impact reported by GIG in relation to projects catalysed but no longer held may also be reported by other investors. For projects no longer held, an estimate is made of their remaining lifetime green impact at the point of exit.

Although GIG is increasingly focussed on the early-stage development of green projects, its Green Impact Statements only report on projects when they have moved to the 'ready-to-build' stage or beyond; early-stage development projects may not always progress, so this approach avoids the risk of overstating green impact.

By investing in early-stage development projects and development partnerships, GIG is catalysing more investment into green projects, laying the foundation for greater future green impact.



Right: Rhyl Flats offshore wind farm, UK

Our five green purposes

01
Reduce greenhouse gas emissions

02
Increase natural resource efficiency

03
Protect the natural environment

04
Protect biodiversity

05
Promote environmental sustainability

The reduction of greenhouse gas emissions

All projects that GIG invested in during the 2018-19 reporting period are expected to contribute to greenhouse gas emissions reduction. Of the investments that have reached final investment decision, the greatest contribution is made by GIG's investment into the Canadian Breaks onshore wind farm, which GIG progressed through construction and is due to commence operations in the second half of 2019.

The advancement of efficiency in the use of natural resources

The contribution to this green purpose is measured by the metrics below on renewable energy generated, energy demand reduction and materials recycled. All of the projects invested in during the reporting period are expected to contribute to this green purpose.

The protection or enhancement of the natural environment

The two waste-to-energy projects in which GIG invested during the reporting period are both anticipated to contribute to this green purpose by diverting waste from landfill. The quantified contribution is summarised in the landfill diversion metric below. As well as evaluating the quantitative contribution to this green purpose, the qualitative contribution of all investments is also assessed with reference to project Environmental Impact Assessments (EIAs). All the projects in which we invested during the reporting period were evaluated through the EIA process as having minor or no significant effects following mitigation. GIG applies contractual safeguards to projects to ensure that required environmental mitigation is delivered.

The protection or enhancement of biodiversity

None of the projects in which GIG invested during the reporting period are expected to make a direct contribution to the protection or enhancement of biodiversity.
The evaluation of potential adverse impacts, also based on project EIAs, determined that none of the projects would have greater than minor adverse impacts on biodiversity. With the international expansion of GIG there is a greater opportunity to contribute to this green purpose, for example by investing in waste management projects in countries where current waste management practices threaten biodiverse ecosystems. GIG is actively pursuing investment opportunities in these areas.

The promotion of environmental sustainability

All of the projects invested in during the reporting period are expected to contribute to the promotion of environmental sustainability. Contribution to this green purpose is assessed against a range of qualitative criteria. Projects are scored more positively where financial innovation is demonstrated, such as through the use of PPAs, or through financing the development of assets that will contribute to the transition to a low-carbon economy.

Lifetime green impact metrics

	Additional lifetime green impact from investments made in 2018-19	Lifetime green impact from all investments to date
Greenhouse gas emissions avoided (kt CO_2e)	12,842	180,973
Renewable energy generated (GWh)	43,374	492,667
Energy demand reduced (GWh)	-	3,959
Materials recycled (kt)	2,228	34,782
Waste to landfill avoided (kt)	8,944	104,413

The above metrics give an overview of the environmental benefits arising from GIG's portfolio of investments. To ensure reporting is comparable with previous years, the green impact is reported for the year April 2018 to March 2019. Full green impact statements can be found from p.27, along with notes on reporting methodology.

More details of GIG's green governance framework, green impact performance and reporting methodology can be found in the GIG Green Investment Handbook and on the GIG website.

Governance over our green mission

On 17 August 2017, the UK Green Investment Bank Limited became part of the group of companies of which Macquarie Group Limited (Macquarie) is the ultimate holding company. At this time, Macquarie announced that, "in order to pursue the Green Investment Bank's vision to invest in green infrastructure internationally and positively contribute to the globalisation of the renewables industry, the Green Investment Bank will now operate under the name Green Investment Group."

A consistent mission

New investments made under the name Green Investment Group in the UK and Europe continue to be made by UK Green Investment Bank Limited entities. Investments made elsewhere may be made by other Macquarie Group entities using the Green Investment Group name and brand for trading and marketing purposes. However, other entities are only permitted to do this in return for a contractual undertaking that any activities will be compliant with the UK Green Investment Bank Limited's Green Purposes, its Green Investment Principles and its Green Investment Policy.

As such, all activity undertaken under the Green Investment Group name and brand align to the Green Objective enshrined in the articles of association of the UK Green Investment Bank Limited, by contributing to its five Green Purposes.

The Green Purposes Company and special share

The Green Purposes can only be altered with the consent of the Green Purposes Company (GPC), the holders of a special share in the UK Green Investment Bank Limited, issued on 17 August 2017. No proposal has been made to change the Green Purposes.

The GPC is a company limited by guarantee, owned and operated by trustees independent of GIG and Macquarie Group. The primary role of those trustees is to approve or reject any changes proposed to GIG's Green Purposes as they apply in the UK and Europe.

The trustees were appointed on 31 October 2016 for an initial term of five years and are not remunerated. The trustees are:

- James Curran, former CEO of the Scottish Environment Protection Agency;
- Trevor Hutchings, previously a senior civil servant at the then Department of Energy and Climate Change, and currently Director of Strategy and Communications at Gemserv;
- Tushita Ranchan, an experienced green infrastructure investor and former CEO of a renewable energy company;
- Robin Teverson, Chair of the House of Lords EU Energy and Environment Sub-Committee; and
- Peter Young, environmentalist and former Chair of the Aldersgate Group.

In performing its role, the GPC is committed to public accountability, transparency and competency, and to contributing positively to the future development of GIG.

Over the course of the past year, GIG has continued to build on its strong and constructive relationship with the GPC trustees, meeting them at least on a quarterly basis and providing them with a wide variety of information on GIG's transactions, their green impact and its wider business strategy.

The trustees addressed the Macquarie Green Investment Group Green Energy Conference on GIG performance in 2017 and 2018, and are invited to address the same event in 2019. The trustees also have the opportunity to provide a letter in the GIG Progress Report and Annual Report, which they did in 2018 and 2019 (*see p.25*).

Letter from the trustees of the Green Purposes Company

This letter, also to be included in the relevant GIG annual report, sets out GPC's assessment of how GIG has performed against the five green purposes. It covers investments in the UK and Europe for the financial year 2018-19. The GPC has reached its views informed by regular meetings with GIG's senior management, reviewing substantive information provided by GIG, individual work by the Trustees, and specialist consultancy research and support. Our areas of particular interest are set out below.

Green assessments

The principal assessment of GIG's investment performance against the five green purposes is made with reference to the information provided to us by GIG and this Progress Report, including GIG's Green Impact Statements.

We commend the published commitments behind GIG's assessment methodologies as set out in their Green Investment Policy, Green Investment Principles and Green Impact Reporting Criteria. The positive attributes of this approach as highlighted in our letter last year endure, and we have no doubt that the GIG assessment methodology remains one of the most comprehensive available in the market.

Our attention this year is whether the outputs meet reasonable expectations from GIG's comprehensive approach and allow GPC to fulfil its role in confirming investments made are consistent with the green purposes. Three areas give us cause for concern and we look forward to encouraging GIG to find ways of addressing these:

Transparency

GIG state under their principle of transparency in their Green Investment Policy "We expect specific exclusions or inclusions of information to be clearly identified and assumptions explained, and appropriate references to be provided for both data and assumptions".

We would like the same transparency objectives to be applied to their own reporting, including by utilising independent assurance to ensure that green impacts claimed are robust and deserve the confidence of the market. Published green impact reporting on all investments at the time they are announced would also be welcomed.

Using the latest available data

Last year GPC highlighted the opportunity to use more refined forecasting of estimates of carbon savings where data permit. GPC recognises the balance between GIG's principles of consistency and accuracy, but the divergence between GIG's adopted data set and the latest UK and European country data for calculating carbon savings is widening. GPC believes the continued use of these criteria risks over-estimating the actual green impacts. If not addressed in the future this has the potential to make investments in some technologies (such as electricity only waste-to-energy plants) become incompatible with GIG's own green investment policy and principles.

Reporting against all five Green Purposes

GIG's published green impact reporting, including in this report, focuses only on the first two purposes, greenhouse gas emissions and natural resource efficiency. The statements made regarding the remaining three purposes are limited and opaque. We welcome GIG's active interest in future investment to deliver all five green purposes, but believe now is the time to review the methods to address all five purposes in readiness of a broader investment portfolio in the future. There is also an opportunity to remove the risk of perceived double counting with the current set of metrics.

External green assurance

This report contains the statement from GIB's independent Green Assurers who have verified that the assessment of green impacts from GIG's investments have been made consistent with GIG's published approach, based on good quality data. However as noted above, where confidentiality constraints prevent publishing explanation of the sources and assumptions in the data, GPC feels that independent assurance processes should seek to plug that gap.

Investment strategy

GPC has welcomed public statements in this report and elsewhere of GIG's new emphasis on development and helping create investible projects. This could also help broaden the types of green investment made. Whilst major capital investments reflecting this approach are in the future, GPC believes GIG's commitment to development is substantial, sustained and across a range of technology types.

Thought-leadership

We commend the GIG for remaining committed to thought-leadership through its input to several public activities, to the investment community, and a wider influence through its parent Macquarie; supporting Shemara Wikramanayake's new roles on the Global Commission on Adaptation and the Climate Finance Leadership Initiative being an example.

Letter from the trustees of the Green Purposes Company (continued)

Innovation

In terms of technology innovation, GIG's UK and European portfolio remained disappointingly narrow, consisting of onshore wind and waste-to-energy. Globally, including through UK Climate Investments, a wider range of technologies have been involved such as solar and battery storage. GPC hopes that the development focus will see a similar broadening of opportunities, ideally across all five green purposes.

In terms of financial innovation the expansion of power purchase agreements to leverage new developments and to purchase and revitalise ailing investments is demonstrating market leadership. We would encourage GIG to consider how it can further support earlier stage and innovative projects which might not otherwise attract investment from more traditional providers.

Investment record

We are pleased that GIG has published its assessment method to measure against the £3bn commitment made in April 2017. Using this methodology GIG has invested in UK and Europe, during its first full financial year (to 31 March 2019), just under £1bn (over 50 per cent in the UK, nearly 25 per cent in the rest of Europe and the balance in the rest of the world, including UK Climate Investments). It is clear that the £3bn commitment equates more with the former disclosure of investment + co-investments (by GIB) and includes both direct and arranged investment by GIG.

Divestments

GPC is interested in the treatment of divestments in green impact reporting. We welcome the clarity on how these are dealt with in this report and GIG's Green Impact Reporting Criteria. GIG recognises the precedent set in allowing lifetime claiming of green impacts from sold assets risks double counting, if others adopt the same methodology. GPC wishes to see greater clarity between contributions from investments when held and after sale in the aggregated figures presented here and elsewhere. GPC also have concerns that current lifetime impact calculations discussed under 'Green assessments' overleaf on p.25 could lead to permanent and material over-estimates remaining in the green impact reports, if green impact estimates for recent projects were not re-evaluated. We look forward to working with GIG in their development of these emerging reporting methods further. Our aim would be to achieve the same surety as for financial statements, noting that retention of value on the company balance sheet is not allowed after sale of assets.

Forward look

We have indicated areas of focus for GPC going forward. We hope the new advisory services being operated by GIG in the UK and Europe and the broadening of technology types will become more evident, and that GIG's commitment to green impact reporting will allow continued improvement. Further enhancement of green impact reporting will build investor and market confidence in the value of such reporting, and in ensuring green investments deliver on all their promises.

Peter J Young
Chair, for and on behalf of the Trustees
Green Purposes Company
25 September 2019

Green impact statements

Image: Rhyl Flats offshore wind farm, UK

Green impact statements

Reduction of greenhouse gas emissions

Understanding the green impact statements

The green impact statements below and overleaf indicate the principal environmental benefits arising from GIG's investments. Green impact metrics are reported in terms of estimated lifetime green impact from 2018-19 investments and all investments to date, where the project has reached final investment decision. The reporting period for the green impact statements is April 2018 to March 2019.

The green impact statements should be read in conjunction with GIG's methodology for calculating green impact, the details of which are set out in GIG's Green Impact Reporting Criteria 2018-19, a copy of which is published on GIG's website.

Selected totals for data in the green impact statements in respect of the financial year 2018-19 have been independently assured by Deloitte in accordance with the Independent Assurance Report set out on p.34-35.

The approach to reporting green impact has been updated in this year's green impact statements. Please refer to p.22 for more details.

Estimated lifetime greenhouse gas emissions reduction of new GIG investments in the reporting period

	Year ended 31.03.19 kilotonnes CO_2e	Year ended 31.03.18 kilotonnes CO_2e
Offshore wind	0	0
Waste	3,501	4,381
Energy efficiency	0	0
Bioenergy	0	10,692
Onshore renewables	9,341	2,117
Total	**12,842**	**17,190**

Estimated lifetime greenhouse gas emissions reduction of all GIG investments to date

	Year ended 31.03.19 kilotonnes CO_2e	Year ended 31.03.18 kilotonnes CO_2e
Offshore wind	53,339	52,821
Waste	39,397	36,755
Energy efficiency	2,277	2,282
Bioenergy	72,817	72,932
Onshore renewables	13,143	3,802
Total	**180,973**	**168,592**

Green impact statements

Generation of renewable energy

Estimated lifetime renewable energy generated by new GIG investments in the reporting period

	Year ended 31.03.19 GWh	Year ended 31.03.18 GWh
Offshore wind	0	0
Waste	9,499	7,499
Energy efficiency	0	0
Bioenergy	0	33,337
Onshore renewables	33,875	44,104
Total	**43,374**	**84,940**

Estimated lifetime renewable energy generated by all GIG investments to date

	Year ended 31.03.19 GWh	Year ended 31.03.18 GWh
Offshore wind	123,934	122,741
Waste	63,234	53,853
Energy efficiency	1,265	1,265
Bioenergy	222,359	222,727
Onshore renewables	81,875	47,999
Total	**492,667**	**448,585**

Green impact statements

Energy demand reduction

Estimated lifetime energy demand reduced by new GIG investments in the reporting period

	Year ended 31.03.19 MWh	Year ended 31.03.18 MWh
Electricity	0	0
Heating fuels	0	0
Total	**0**	**0**

Estimated lifetime energy demand reduced by all GIG investments to date

	Year ended 31.03.19 MWh	Year ended 31.03.18 MWh
Electricity	1,800,459	1,817,481
Heating fuels	2,158,799	2,159,255
Total	**3,959,258**	**3,976,736**

Green impact statements

Recycling of materials

Estimated lifetime materials consumption avoided through materials recycling by new GIG investments in the reporting period

	Year ended 31.03.19 tonnes	Year ended 31.03.18 tonnes
Compost	0	0
Digestate (PAS 110)	0	0
Compost-like output	0	0
Plastics - mixed	0	0
Ferrous metals	132,750	102,857
Non-ferrous metals	80,845	93,669
Paper/card	0	0
Glass	0	0
Mineral aggregates	2,014,065	3,443,239
Waste electrical and electronic equipment (WEEE)	0	0
Other	0	0
Total	**2,227,660**	**3,639,765**

Estimated lifetime materials consumption avoided through materials recycling by all GIG investments to date

	Year ended 31.03.19 tonnes	Year ended 31.03.18 tonnes
Compost	987,642	987,642
Digestate (PAS 110)	7,053,177	7,038,440
Compost-like output	1,128,809	1,128,809
Plastics - mixed	704,051	704,051
Ferrous metals	1,203,478	1,064,879
Non-ferrous metals	381,068	293,117
Paper/card	654,299	654,299
Glass	9,424	9,424
Mineral aggregates	16,479,384	14,755,646
Waste electrical and electronic equipment (WEEE)	34,328	34,328
Other	6,146,348	6,146,348
Total	**34,782,008**	**32,816,983**

Green impact statements

Avoidance of waste to landfill

Estimated lifetime waste to landfill avoided by new GIG investments in the reporting period

	Year ended 31.03.19 tonnes	Year ended 31.03.18 tonnes
Biodegradable waste	6,669,380	11,281,419
Non-biodegradable waste	2,274,540	4,370,448
Total	**8,943,920**	**15,651,867**

Estimated lifetime waste to landfill avoided by all GIG investments to date

	Year ended 31.03.19 tonnes	Year ended 31.03.18 tonnes
Biodegradable waste	67,872,301	61,921,009
Non-biodegradable waste	36,540,983	33,524,366
Total	**104,413,284**	**95,445,375**

Notes to the green impact statements

Year-on-year changes to estimated lifetime green impact

The table below shows how the lifetime green impact at the end of 2018-19 compares to that at the end of 2017-18, and provides a breakdown of the year-on-year changes. The changes in lifetime green impact were caused by:

- Removal of estimated remaining lifetime of exited assets that were acquired as operational – as noted on p.22, GIG's approach to green impact reporting now focuses on the green impact catalysed by GIG's investment. Consequently, when GIG acquired assets that were already operational, the remaining lifetime green impact of these is removed upon divestment. Green impact from such assets divested prior to, during, and since the reporting period has therefore been removed.
- New investments made in the period – GIG invested in four new projects in the reporting period; all of these are expected to contribute to increased forecast green impact.
- Projects cancelled in the period – there were no cancellations of projects in the reporting period. The project agreement for the Derby waste-to-energy plant was terminated by Derby City and Derbyshire County Councils on 2 August 2019, ending senior lenders' involvement with the project. The estimated lifetime green impact arising from the project is nonetheless expected to be delivered (albeit delayed), and therefore continues to be included in the green impact statements.
- Existing projects' variation of performance/reforecasts from last year's forecast – for some of the projects that were in GIG's portfolio at the end of 2017-18, green impact produced in the reporting period differed from the previous year's forecast, leading to reforecasting of the green impact. The Dublin waste-to-energy plant received materially different input feedstock in 2018 to that expected at the point of investment. The higher-than-expected non-biogenic content in the project's input feedstock is expected to have been influenced by the ban on plastic waste exports to China and had a material effect on the green impact in 2018. Due to the potential effect on the remaining lifetime green impact of the project, the forecast green impact has been more conservatively re-estimated.

Equator Principles

In the reporting period, GIG did not make any investments to which the Equator Principles apply. The Equator Principles are not applicable to equity investments.

Estimated lifetime green impact of all GIG investments to date – year-on-year changes

	Greenhouse gas emissions reduction kilotonnes CO_2e	Renewable energy generated GWh	Energy demand reduced MWh	Materials recycled tonnes	Waste to landfill avoided tonnes
Year ended 31.03.18	**173,855**	**460,629**	**3,976,736**	**32,977,454**	**100,947,902**
Removal of estimated remaining lifetime of exited assets that were acquired as operational	(5,263)	(12,044)	0	(160,470)	(5,502,527)
Revised 31.03.18 following operational asset exits	**168,592**	**448,585**	**3,976,736**	**32,816,984**	**95,445,375**
New investments made in the period	12,842	43,374	0	2,227,660	8,943,920
Projects cancelled in the period	0	0	0	0	0
Variation of forecast remaining lifetime and actuals from last year's forecast	(461)	708	(17,478)	(262,636)	23,989
Year ended 31.03.19	**180,973**	**492,667**	**3,959,258**	**34,782,008**	**104,413,284**

Independent assurance report

Independent assurance report to the UK Green Investment Bank Limited on Green Impact Data and the application of Equator Principles within the Progress Report.

We have been engaged by the Directors of the UK Green Investment Bank Limited ("GIB") to conduct a limited assurance engagement relating to the Assured Disclosures concerning Green Investment Group ("GIG")'s performance-related Green Impact Data ("Green Impact Data") and the application of Equator Principles within the GIG Progress Report for the year ended 31 March 2019.

Our unqualified conclusion

Based on our work as described in this report, nothing has come to our attention that causes us to believe that the Assured Disclosures, which have been prepared in accordance with the GIG Green Impact Reporting Criteria and Equator Principles Reporting Criteria (the "Reporting Criteria"), materially misstate the Green Impact Data for the year ended 31 March 2019. The data have been prepared on the basis of the methodology set out in the respective GIG Reporting Criteria which can be seen on the GIG website.

Responsibilities of the Directors

The Directors of GIB are responsible for preparing the GIG progress report, including the following Assured Disclosures:

Green Impact Data	
Estimated lifetime performance for new GIG investments in the reporting period and all GIG investments to date as at financial year end – *see p.27-33.*	
Greenhouse gas emissions reduction	(kilotonnes CO_2e)
Renewable energy generated	(GWh)
Energy demand reduced	(MWh)
Materials consumption avoided through materials recycling	(tonnes)
Waste to landfill avoided (Annual Actual, Lifetime and Average Annual)	(tonnes)
Equator Principles *(see p.33)*	
Total number of Project Finance transactions and Project-Related Corporate Loans that reached financial close within the reporting period, to which the Equator Principles apply (absolute).	

Independent assurance report

Responsibilities of the assurance provider

Our responsibility is to express a conclusion on the Assured Disclosures based on our procedures. We conducted our engagement in accordance with International Standard on Assurance Engagements (ISAE3000 revised) *Assurance Engagements Other than Audits or Reviews of Historical Financial Information*, issued by the International Auditing and Assurance Standards Board, in order to state whether anything had come to our attention that causes us to believe that the Assured Data have not been prepared, in all material respects, in accordance with the applicable criteria.

Our engagement provides limited assurance as defined in ISAE3000 (Revised). The evidence gathering procedures for a limited assurance engagement are more limited than for a reasonable assurance engagement, and therefore less assurance is obtained than in a reasonable assurance engagement.

Our procedures consisted primarily of:

- interviewing managers at GIB's offices, including those with operational responsibility for the preparation of the Assured Disclosures and application of Equator Principles;
- evaluating the processes and controls for managing, measuring, collating and reporting the Assured Disclosures, including the application of the methodology within the Reporting Criteria to underlying assumptions; and
- testing a representative sample of Green Impact Data and Equator Principles applicable deals, selected on the basis of their inherent risk and materiality to the Green Impact Data. The focus of our testing is the work undertaken by GIB to prepare the Assured Disclosures based on information supplied by GIG's clients, projects or fund managers or collected within GIG. We have not carried out any work to verify that information, nor have we conducted site visits.

Our report is made solely to GIB, in accordance with ISAE 3000. Our work has been undertaken so that we might state to GIB those matters we are required to state in this report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than GIB for our work, this report, or for the conclusions we have formed.

Inherent limitations

Since the Estimated Lifetime Green Impact Data are based on assumptions about the future which cannot be predicted with certainty, as with any predictions about the future, the actual future Green Impact Data may be more or less than the stated Estimated Lifetime Data.

GIB does not receive project data or conduct further estimations following GIG's exit date from an investment.

With respect to disposals, GIB processes do not require reconciliation between: the operating assumptions on which Estimated Lifetime Green Impact Data is based; and asset actual or expected performance data (if any) stated in investment disposal documentation. Consequently we rely on written management representations to confirm that Estimated Lifetime Green Impact Data with respect to disposed of investments is based on the best information available to GIB management at the point of disposal.

Independence

We performed the engagement in accordance with Deloitte's independence policies, which cover all of the requirements of the International Federation of Accountants' Code of Ethics and in some areas are more restrictive. The firm applies the International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

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