Important information

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About this report

We are pleased to share with you MIRA’s sustainability report for our infrastructure business. This sits alongside the sustainability report for our agriculture business published earlier this year. The report brings together MIRA’s approach to sustainability which has been embedded in our business for over a decade, but which we seek to continually evolve and improve as the needs and challenges of our world also change.

We are focused on progressing and integrating our sustainability strategy across MIRA’s global platform, including our infrastructure, agriculture, real estate, private credit and transportation finance businesses. As we build on our capabilities and achievements, our aim is to deliver a consolidated MIRA sustainability report across our full platform. We are excited by this progress and look forward to building and improving on our disclosures year on year.

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When we committed to publish our first Infrastructure Sustainability Report earlier this year, nobody could have predicted the situation the world is facing today. The unprecedented health, economic and social impact of the COVID-19 pandemic has had a profound effect on the lives of so many around the world – and is likely to persist for some time to come.

As one of the world’s largest managers of infrastructure and real assets, we have been acutely aware of the demands and responsibilities placed upon the providers of critical infrastructure during this period of crisis. In many cases, the companies in which we are invested have been on the front line and have played a significant role in ensuring that customers and communities around the world continue to have access to essential services. I would like to acknowledge the incredible work they have done, and continue to do, in the face of very difficult circumstances.

Of course, being prepared for events like these is part of our job. It is also the very reason why we have put sustainability at the heart of our business.

As investment managers we have an obligation to ensure that the companies we manage today are positioned to provide sustainable goods and services long into the future. Of course, we also have a fiduciary duty to ensure our clients’ capital is invested responsibly and sustainably. We firmly believe that sustainability and long-term value creation are fundamentally aligned, and it is for this reason that our ambition is to be the global leader in both.

Environmental, social and governance (ESG, or sustainability) has always been central to MIRA’s approach to investment and asset management. However, as our business has grown, as the challenges our world faces become more complex and as the role of private capital evolves, we must continue to intensify our commitment to sustainable investment.

During the past year we have taken meaningful steps towards our ambition to become the leader in sustainable real asset management. We have advanced our commitment to a low carbon future with the introduction of a coal policy and have launched a programme to understand and reduce the greenhouse gas (GHG) footprints of our portfolio companies. We are establishing measurable goals and outcomes that will enhance and capture value through sustainable practice and purpose. We have also invested in our internal expertise with the formation of a dedicated sustainability team.

Whether it is working with our assets to establish a pathway for decarbonisation, investing in clean energy, or developing innovative solutions through the use of technology for social benefit and risk protection, we see tremendous opportunity to create meaningful impact.

This inaugural report showcases the stories of small initiatives, as well as transformative changes happening across our portfolio. We also hope it demonstrates how our focus on sustainability can drive positive outcomes for the benefit of our portfolio companies, our investors and the communities in which our assets operate.

We acknowledge that we don’t yet have all the answers and that there is a lot more work to be done, but we are grateful for your partnership and we welcome your engagement and ideas as we seek to drive a more sustainable future for everyone.

Thank you for your continued support.

Martin Stanley
MIRA and sustainability

WHO WE ARE

MIRA is one of the world’s leading alternative asset managers.

For over 25 years, MIRA has partnered with clients, governments and communities to build and manage essential real assets that are used by over 100 million people every day. Our dedicated team of over 900 people focus on adding real and lasting value for our clients and the people our assets serve.

We partner with more than 650 pension funds, sovereign wealth funds and insurance companies worldwide to manage and invest the long-term savings of the millions of investors they represent.

MIRA’s portfolio by AUM

With capabilities across the following businesses:

- **INFRASTRUCTURE**
  - AGRICULTURE: 4.8m hectares of farmland
  - TRANSPORTATION FINANCE: 191 aircraft on lease
  - REAL ESTATE: ~500 properties

- **PRIVATE CREDIT**

- **REAL ESTATE**

- **MIRA’s portfolio by AUM**

MIRA is the world’s largest infrastructure manager1 with a team of over 300 infrastructure specialists managing equity investments in over 120 businesses globally across:

**TRANSPORTATION**
- Airports, roads and rail services, ports and shipping services, ferries

**UTILITIES**
- Gas and electricity generation and transmission, water

**RENEWABLE ENERGY**
- Onshore and offshore wind, solar, hydro, geothermal, bioenergy and waste-to-energy

**COMMUNICATIONS**
- Telecommunications infrastructure, data centres

**SOCIAL INFRASTRUCTURE**
- Healthcare, aged care, land title services

**WASTE MANAGEMENT**
- Treatment, recycling, disposal

**OUR INFRASTRUCTURE BUSINESS**

Infrastructure portfolio businesses managed by MIRA

1. As at 31 March 2020. MIRA defines AUM as proportionate enterprise values calculated as proportionate net debt and equity value. For jointly managed funds, the amount is representative of MIRA’s economic ownership of the joint venture manager. Adjustments are made when MIRA-managed funds invested in other MIRA-managed funds.

2. IPE Real Assets Infrastructure Manager Rankings 2020. 3. As at 31 March 2020. Represents portfolio businesses within Macquarie Infrastructure and Real Assets manages on behalf of investors with various direct percentage stakes held in each. List of countries is representative and not exhaustive. In some instances they represent the operations of a single business where it has operations across different countries.
OUR CORE BELIEFS

At the heart of our approach is a commitment to sustainability.

That’s why we invest in businesses that underpin communities and economies – aiming to add real and lasting value for our clients and the people our assets serve. We are in business to seek superior returns, but it is the way we do business that defines us.

As custodians of these vital businesses we have a responsibility and opportunity to create stronger, more sustainable investments and a legacy of which everyone can be proud.

Sustainable infrastructure and other real assets are fundamental to the global transition to a more sustainable economy. They bear the physical burden of climate change, yet they are also uniquely suited to drive new climate resilience solutions and preserve the integrity of crucial supply networks and communities.

We define sustainable asset management as seeking to proactively enhance shareholder value by improving the environmental, social and governance performance of the businesses in which we manage investments.

Sustainable, adaptable, resilient businesses are more valuable businesses: they perform better for longer and can attract higher multiples when divested.

Our ambition is to be the global leader in sustainable real asset management.

Because the best kind of investment is where everyone gains.

OUR CULTURE

Sustainability is the responsibility of everyone within MIRA and is embedded into everything we do.

At Macquarie, our purpose is to empower people to innovate and invest for a better future. We apply the same principles to sustainability – harnessing real knowledge and skill to encourage innovation.

To be successful we must integrate sustainability awareness and expertise across all our teams. Our MIRA executives work with portfolio company management teams and investment teams to build highly valued, long-term sustainable businesses.

This is consistent with the Macquarie Group principles of accountability, opportunity and integrity which underpin a culture of ownership to deliver the best outcomes for our stakeholders.

Our people are passionate about this journey. Our asset management teams from around the globe were asked to come up with sustainable value-add initiatives that would be achievable at an asset they managed. A significant number of ideas were generated. Many of these ideas have since been workshopped, refined and implemented – we look forward to reporting on the success of these initiatives over time.

We continue to step up training, awareness and commitment to sustainable practices. The variety of sectors, in different regions, with unique market dynamics, require creativity across our business to identify and unlock the right sustainability opportunities. In addition to keeping our internal teams equipped and connected, we take advantage of external resources to make sure we have the best ideas.

To support our people on this journey, MIRA has formed a global sustainability team comprising specialists solely dedicated to ensuring we promote and improve the sustainability of our business. These experts assist our people across product development, investment and acquisitions, asset management and reporting – integrating a sustainable mindset into all that we do.

During 2019, MIRA conducted a series of sustainability-focused Human Centred Design interviews with staff and portfolio companies. Here are some insights:

“Having a sustainable outlook is putting our portfolio assets in a position so they can operate and profit into the future.”

“The next generation is becoming more educated in being sustainable and is putting more value on it.”

“Business culture has changed. It’s no longer about the bottom line being all that matters – employee, social, environment and community responsibilities are becoming more and more paramount.”
OUR SUSTAINABILITY APPROACH

The assessment and management of sustainability risks and opportunities are formally embedded within MIRA’s investment decision-making approach and asset management frameworks.

MIRA’s ESG framework incorporates a suite of policies which require the identification and management of sustainability issues throughout the investment lifecycle.

Our approach is materiality-based. Given the diversity of the portfolio of investments managed by MIRA, there isn’t one standardised set of sustainability considerations applicable across all investments.

Rather, we place emphasis on those sustainability issues that are considered most important and meaningful to each business and its community given the industry and type of asset, its physical location, legal jurisdiction, stage in the asset cycle, as well as the specific outcomes of our rigorous due diligence process.

For more detail, our publication Environmental, Social and Governance (ESG) – Our Approach is available to clients on request.
A changing world

RESPONDING TO GLOBAL THEMATICS

We believe sustainability in the infrastructure sector will be shaped by the convergence of trends that shape infrastructure demand, and themes that influence the journey to sustainable economies.

The following trends have consistently been part of MIRA’s thinking as we contemplate the future of the asset class.

We see four demand trends that may shape the infrastructure landscape

- Ageing infrastructure: We see a persistent need to replace ageing infrastructure around the world. The backlog is enormous and growing. The physical reality of our infrastructure constrained is sorely evident in congestion, service delivery, pollution and so on. There are individual and economic costs to this.

  - Addressing this backlog is estimated to require between $US5 trillion and $US7.5 trillion over the next 15 to 20 years. There is no shortage of demand if stakeholders can solve for how to structure and finance the need.

- Urbanisation: A related trend is the concentration of this infrastructure in growing urban centres with evolving needs. More than half the world’s population now lives in urban areas and 1.5 million people are added to that urban population each week. A step up to 80% of this growth takes place in Asia and Africa, but it’s not just about demographics. The pace, nature, and complexity of urban infrastructure is evolving too. Governments need modern transportation solutions, low carbon energy, circular economy waste management and a flexible mix of communication technologies and infrastructure to support increasing appetite for data, among other infrastructure solutions. In short, there are more people, and they want different, better infrastructure.

- Digitalisation: Technology and digitisation has created the need for a whole new class of infrastructure in the form of data centres, fibre networks, and communication channels. It has also transformed how traditional infrastructure is designed, built and managed.

  - Management teams can design ‘digital twins’ to explore operating efficiencies, deploy remote sensors, and drive new innovation and operations. We pay close attention to a wider systemic integration of the physical world – heat, drought, floods, storms – and the virtual world – climate, financial, political, cyber, social – that affects the commercial reality of how infrastructure is managed and integrated. We look for investors to design-in resilience to protect basic functionality. Both the physical and virtual need to be integrated to protect basic functionality.

- Globalisation: The systemic integration and interdependencies of infrastructure assets have become important factors for investment selection, risk management and governance. The report COVID-19 has demonstrated how interconnected and interdependent the global economy has become, but also how resilience and integration is essential to protect basic functionality. Both the physical changes – heat, drought, floods, storms – and the virtual world – climate, financial, political, cyber, social – affect the commercial reality of how infrastructure is designed.

We track four sustainability themes to identify and capture opportunities

- Adaptation and decarbonisation: The rise of climate risks – both physical risks and transition risks – is as persistent as it is protracted. Munich Re estimated that there have been $US5 billion of natural disaster losses since 1980, about the time the scientific consensus confirmed the global warming trend. 50% of this loss was uninsured. Transition risk is less dramatic, but equally consequential. Transition risk includes the awareness that structural assets become unattractive to investors, operators, communities and regulators choose low carbon alternatives over traditional high-emitting products. Physical and transition risk now translates to an extended decision time over time. Navigating this context creates challenges as well as opportunities.

- Social licence: The rise of private capital to address social and sustainability challenges has contributed to new drivers by a combination of factors. Most importantly, it appears that investment returns are correlated with good ESG governance. There is also a growing body of asset owners that are allocating capital to companies that can help deliver the world they want to live in. Another factor is that the largest asset owners, such as public pension and insurance companies, are aligning the idea that they can shape the long-term health of markets through sustainability engagement. More than $US8.5 trillion of capital owned by investors now subscribes to the Principles for Responsible Investment (PRI) and their expectations continue to grow.

- Value creation: There is increasing appetite to generate and measure sustainable value creation from infrastructure, real estate, and other investments. MIRA’s experience validates the thesis that sustainability practices can reduce operating costs, drive new revenue streams, improve the quality of earnings, attract better talent, and contribute to higher risk-adjusted returns. There is a plethora of frameworks and methodologies designed to help investors assess and value how their capital is performing and compare financial and non-financial value creation, including the UN SDGs, SASB, TCFD and GRESB. It’s an essential part of any diversified investment portfolio to contribute to the long-term performance of their infrastructure assets.

- Diversity and capability: Sustainability is shaping the talent pool. Diversity and inclusion are more important than ever before, key to unlocking greater innovation and outcomes. Businesses need diversity of thinking and capability in order to solve for today and tomorrow’s issues with ingenuity, the sustainability agenda. Young people enter a wider force facing fewer risk than previous generations. They are looking to align their own values with those of the businesses they work for. We believe that companies with sustainability solutions will attract the most dynamic, diverse and dedicated talent.

The convergence of these themes will provide opportunity for the future.


In our continually evolving world, change is a key constant. Much has changed for the infrastructure asset class since Macquarie played a role in catalysing the sector over 25 years ago. MIRA's inaugural infrastructure sustainability report signals another inflection point – the essential integration of sustainability principles into infrastructure asset management.

Sustainability considerations have existed for decades, given the longevity of infrastructure investments. This remains the case, but today's environmental circumstances require us to go further. Technology, urbanisation, decarbonisation, demographics and dozens of other factors have created challenges, risks and disruptions for the asset class and for society at large. And with them, opportunity.

In aggregate these changes force new perspectives. We must look at infrastructure in the new context of how each investment can turn these challenges into opportunities, to thrive through these changes and contribute to sustainable solutions.

MIRA, its clients and partners face this opportunity together. We are individual community members with local needs affected by global consequences. We are fiduciary stewards, intent on protecting and growing value.

We have entered the most consequential decade in human history, where science affirms unprecedented action on climate change is necessary. We can either see this as a moment to despair, or as our calling to be the generation that writes the story of the future.

The Paris Agreement, signed by 195 countries five years ago, was in fact forged by the determined optimism of national leaders with sovereign and shared interest at heart – and inspired by the deep commitment and momentum of visionary leader groups, corporate leaders and the persistence of civil society.

Five years later we are all called upon to actualise the promise of the Paris Agreement – to halve global emissions in the next decade, eventually reaching net zero by 2050 or earlier. In the crucible of economic recovery, we must recognise that although time is short, we have the tools, technologies, knowledge and resources to re-frame the economy and build a thriving future. What remains is leadership across all sectors, coming together to do what science says is necessary.

We can't deliver the promise of the Paris Agreement without a transformation in infrastructure – adapting some legacy assets, replacing others with cleaner solutions, and meeting rising demand with greenfield projects designed to allow humans, nature and economies to thrive sustainably.

It is promising to see Macquarie leverage its global scale, or earlier. In the crucible of economic recovery, we must recognise that although time is short, we have the tools, technologies, knowledge and resources to re-frame the economy and build a thriving future. What remains is leadership across all sectors, coming together to do what science says is necessary.

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04

Our progress

We see sustainability as a journey – one that MIRA embarked upon more than a decade ago when consideration of ESG risks became a formal part of our investment process.

Risk brings opportunity and our focus shifted to also harnessing the opportunities sustainability brings – opportunities to create more value for our clients, to meet client needs through specialised products, to better tell our story, and much more.

We recognise that there is more to achieve on our journey – and indeed that as the world, our business and our clients evolve our destination will not be an ever-fixed mark.

A key component of our approach to sustainability is our philosophy of continuous improvement.

Value creation via sustainable initiatives

A major focus over the past year has been harnessing the value that sustainability can bring.

- We encouraged our portfolio assets to identify sustainability initiatives that improve the value of their businesses, and supported them in implementation.
- Our assets embraced this opportunity and worked with us to identify:
  - ‘Quick wins’: for example switching light bulbs to LEDs (saving energy and improving EBITDA).
  - Larger initiatives: for example installation of onsite solar power generation (reducing purchased energy and improving resilience).
  - Longer term strategic initiatives: for example transitioning from fossil fuel generation to cleaner sources.

Many are already implemented. Some are already improving earnings, others will improve the asset’s value on divestment. Some are showcased as case studies in Section 5 of this report.

Restricting fossil fuels exposure

Climate change has been an important consideration in MIRA’s investment decision making process for some time.

- In early 2019 we formalised a policy restricting investments in businesses with exposure to coal:
  - No further investments will be made in standalone coal-fired generation, or in any asset for which more than 25% revenue is dependent on coal.
  - For businesses with a smaller exposure to coal, the investment case must incorporate a transition away from that dependency.

- MIRA is actively encouraging and supporting assets to decarbonise, as described on page 18, with a number of examples, both completed and planned, of transitioning energy from traditional sources to renewable or other cleaner sources.

- MIRA considers exposure to all fossil fuels when assessing climate risk in relation to potential acquisitions and in the current portfolio (for example as part of its TCFD analysis).

Sustainable product development

MIRA is developing sustainable solutions for its clients in both our existing funds and through the creation of new “green” products.

- We now ask portfolio assets to incorporate sustainability considerations in their five-year business plans.
- Recent new products include two renewables funds dedicated solely to investment in clean renewable energy.
Decarbonising our existing portfolio
We aim to reduce the greenhouse gas (GHG) emissions intensities of our existing infrastructure portfolio over time.

- In 2019, we launched a global programme to collect quarterly emissions and energy data from our infrastructure portfolio assets. This data will be used by:
  - Compare performance within industries to identify challenges, solutions and opportunities
  - Set targets
  - Track progress over time.
- Some portfolio assets have already engaged experts to assist with determining baseline emissions, setting emission reduction targets and identifying strategic initiatives to achieve these.
- Over the coming year we will seek to significantly increase the number of assets with decarbonisation pathways in place.

Listening to our investor needs
Clients are at the centre of our business. An important part of our continued development is engaging with our investors to understand their perspectives and needs.

- Investor initiatives during 2019 included:
  - A significant increase in sustainability-specific client meetings, including as part of dedicated roadshows
  - MIRA’s first sustainability-focused global investor survey.

MIRA 2019 ESG Survey

With 150 real asset investors participating
from across the globe, this survey provided valuable insights into our investors’ thoughts, needs and concerns relating to sustainable investing which we have taken on board to improve our engagement and promote industry leadership. The survey report is available on MIRA’s website.

Thought leadership
We have published or contributed to a number of reports and articles in the field of sustainable investing during 2019.

- MIRA Pathways reports: covering topics such as the link between ESG and value creation in infrastructure, and the expected impact of electric and autonomous vehicles.
- MIRA Technical reports: covering topics such as the feasibility of hydrogen as an alternative energy source, digital twins, immersive technology, industrial drones and stationary energy storage.
- MIRA contributed to the creation of two United Nations flagship reports on climate change published by the Global Commission on Adaptation and the Climate Finance Leadership Initiative. These reports are available on request. Please contact us at mirafunds@macquarie.com.

Transparency and disclosure
MIRA has improved its investor communications on sustainability initiatives and progress during 2019.

- Launching a MIRA Infrastructure Sustainability Report.
- Improving our website MIRAFunds.com and creating a hub of asset-related case studies.
- Providing more detailed fund quarterly disclosures, “newsbites” communications and annual reporting on sustainability developments. We plan to further improve our investor reporting in the coming year, including in relation to TCFD.
- Increasing our fund and asset participation in GRESB assessments. More detail on our progress is provided in Section 6 of this report.

We are proud of the progress we have made over the past year, and of the important initiatives to which our portfolio companies have committed.

In 2020 and beyond, we look forward to embedding further improvements as we continue our journey towards leadership in sustainable real asset management.
Our commitment to a sustainable future

Sustainable asset management seeks to proactively enhance shareholder value by improving the environmental and social performance of the business.

Improving investment outcomes for our clients has been an anchoring principle of our business since MIRA’s inception. Sustainability provides a valuable approach that our investment teams leverage to increase operating efficiency, improve earnings quality, reduce costs and enhance an asset’s value.

In addition to these financial benefits from sustainable asset management, we must seek to continuously improve the delivery, measurement and disclosure of non-financial improvements, namely the environmental and social performance of each business for the customers and the communities in which we operate.

We are long-term asset managers. Sustainability is at the centre of our mindset and our commitment to our clients. In this report we have identified six key themes that encapsulate this commitment across our infrastructure platform to a more sustainable future.

The following pages describe how we will seek to drive positive change at the infrastructure assets we manage across six key themes.

Decarbonisation
MIRA aims to reduce the GHG emissions intensities of its portfolio assets. In some cases we have great scope 1 opportunities, in others, the focus is scope 2. Some assets have the capacity to help address scope 3 emissions and even generate carbon offsets. What empowers us is the confidence to buy businesses that we can improve and transition.

Resilience and adaptation
Investors have always expected infrastructure to be long-lasting, stable and resilient, but the operating environment is changing. MIRA teams around the world invested in operating procedure changes, physical enhancements, and even new specialised resiliency features that allowed us to capture new revenue sources, higher terminal value and higher reliability for essential services in the face of climate change.

Operating efficiency
This usually starts with the simplicity of switching to energy efficient lighting and water-efficient appliances, but our teams went much further. The examples that follow show how teams embraced circular economy solutions, reduced costly inputs, and switched in electric drive motors to replace diesel alternatives, among other ideas.

Renewable energy
Infrastructure must play a role in meeting the Paris Agreement 2050 target, especially by helping to replace traditional energy sources with cleaner ones. Macquarie has a long tradition of pioneering this space, and MIRA has been an important part of this story – including managing the world’s largest dedicated offshore wind fund.

People and communities
We recognise that we must earn our licence to operate every day – through COVID-19 crises, through bushfires and floods, and more. If we are not creating positive impact for the people that work at and use our assets, we are not meeting our own expectations, let alone others.

Technology and innovation
The digital age brings untold opportunity to improve the efficiency and the performance of our assets, as well as to reduce risks through improved detection, protection and monitoring. MIRA assets create value by deploying technology and innovative initiatives for social benefit and risk protection.

1 Scope 1 GHG emissions are direct emissions produced by sources owned or controlled by a company (eg combusted fuels, process emissions). Scope 2 GHG emissions are indirect emissions associated with the off-site generation of energy purchased by a company (eg residual mix grid electricity, purchased steam). Scope 3 emissions are consequences of the activities of a company, but cannot be sources owned or controlled by the company. For further information refer to the Greenhouse Gas Protocol: https://ghgprotocol.org/corporate-standard.
Decarbonisation

AUSTRALIAN DECARBONISATION PROJECT

In October 2019, the Australian Government’s Clean Energy Finance Corporation (CEFC) committed $A100 million towards MIRA’s Australian infrastructure platform with the objective of reducing carbon emissions and improving the energy efficiency of infrastructure assets across sectors including airports, electricity, port, rail and water.

In order to achieve this objective, MIRA and CEFC subsequently established an emissions committee and launched MIRA’s Australian decarbonisation project. The first step was to facilitate a decarbonisation workshop with representatives from across MIRA’s Australian infrastructure portfolio businesses. The workshop provided information and tools to help portfolio businesses to recognise the importance of reducing their GHG emissions, the process of developing Science Based Targets (SBTs) and case studies outlining feasible and tested industry-relevant emission abatement opportunities.

With the help of an external sustainability consultant, several portfolio companies have since measured their baseline GHG emissions footprint and identified initiatives to achieve sustained emissions reductions over time. Work completed includes development of:

- scope 1, 2 and 3 GHG emissions inventories defined by the Greenhouse Gas Protocol
- business as usual projections for scopes 1 and 2 GHG emissions
- one or more aspirational science-based GHG emissions reduction pathways, based on the framework of the Science Based Target Initiative
- abatement opportunities that could enable each asset to significantly reduce its scope 1 and scope 2 GHG emissions.

We welcome this exciting emissions reduction focus from a substantial long-term investment manager such as MIRA and look forward to seeing these landmark Australian assets further developed to become an essential part of our sustainable future.”

Ian Learmonth, CEFC CEO

13. The Science Based Target setting process enables companies to set emissions reduction targets that are consistent with the objectives of achieving net zero greenhouse gas emissions by 2050 and finding global warming well below 2°C by 2100 relative to pre-industrial temperatures. 14. In accordance with the SBT setting manual published by the Science Based Target Initiative, a screening approach was employed at some assets to determine whether their scope 3 emissions were significant. For assets at which scope 3 emissions did not comprise >40% of combined scope 1, scope 2 and scope 3 emissions, a detailed scope 3 inventory method may not have been applied.

15. Tabulated assets are those assets in which MIRA had an ownership stake during calendar year 2019 and for which GHG emissions data was available at the time of reporting. The table excludes the following assets for which MIRA managed an interest during 2019: Celsius, NSW Land Registry Services, Land Services WA and Sydney Desalination Plant.

MIRA AUSTRALIAN INFRASTRUCTURE GREENHOUSE GAS EMISSIONS FOOTPRINT

Total annual scope 1 and scope 2 GHG emissions associated with MIRA’s Australian infrastructure portfolio are estimated to be 184,764 tonnes of carbon dioxide equivalent (tCO2e) as outlined by Table 1, which provides a breakdown of scope 1 and scope 2 GHG emissions by sector.

Table 1 Greenhouse gas emissions of Australian infrastructure assets by sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Baseline Year</th>
<th>Scope 1 emissions (tCO2e)</th>
<th>Scope 1 emissions</th>
<th>Scope 2 emissions</th>
<th>Scope 2 emissions</th>
<th>Scope 1 and 2 emissions</th>
<th>MIRA portfolio emissions (tCO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities</td>
<td>FY18</td>
<td>22,234</td>
<td>831,336</td>
<td>853,569</td>
<td>121,366</td>
<td>176,870</td>
<td>1,047,578</td>
</tr>
<tr>
<td>Rail</td>
<td>FY18</td>
<td>141,482</td>
<td>237,204</td>
<td>143,532</td>
<td>105,840</td>
<td>289,014</td>
<td>1,424,290</td>
</tr>
<tr>
<td>Ports</td>
<td>FY18</td>
<td>778,879</td>
<td>33,794</td>
<td>246,066</td>
<td>279,958</td>
<td>533,514</td>
<td>1,978,708</td>
</tr>
<tr>
<td>Digital infrastructure</td>
<td>FY19</td>
<td>27</td>
<td>714</td>
<td>741</td>
<td>317</td>
<td>1,047,578</td>
<td>1,047,578</td>
</tr>
<tr>
<td>Digital Infrastructure</td>
<td>Total</td>
<td>875,709</td>
<td>238,809</td>
<td>1,047,578</td>
<td>1,978,708</td>
<td>1,978,708</td>
<td>1,978,708</td>
</tr>
</tbody>
</table>

Of total scope 1 and 2 GHG emissions, the utilities sector contributes approximately 82% and largely comprises electricity transmission and distribution portfolio companies. For these networks, scope 2 emissions (direct emissions) comprise the majority of their GHG emissions footprint, which are mainly due to line losses arising from the transmission of electricity over long distances through the network. The resistance in the metal network wires causes heat loss resulting in a portion of energy being lost in transit. As Australia transitions to a greater mix of clean energy generation, this will naturally decarbonise the energy supply transported through the grid and reduce GHG emissions associated with line losses over time. Recent adoption of innovative technology by Endeavour Energy (an electricity distribution network service provider in New South Wales) has illustrated that, based on the findings of a small-scale trial, the rollout of low-voltage regulators across its network could potentially accelerate the decarbonisation of its scope 2 emissions footprint. Please refer to the EcoVAR case study on page 25 for more information.

The rail sector is the second highest emissions-intensive sector, contributing almost 13% of total scope 1 and 2 emissions that are largely attributable to the use of diesel locomotives. The remaining emissions footprint between airports, ports and digital infrastructure together make up less than 5% of total emissions.

16. Financial years correspond to year ended 30 June. 17. Calculated based on the proportionate share of the emissions profile which reflects the combined interest held by MIRA, its managed funds, its advised clients and its debt funds and its clients as at 30 June 2019.
AUSTRALIAN DECARBONISATION PROJECT RESULTS

Five Australian infrastructure assets outlined in Table 2 have completed baseline emissions inventories and associated science-based emissions reduction targets based on the framework of the Science Based Targets initiative (SBTi). Together, their scope 1 and scope 2 emissions represent over 80% of the total scope 1 and 2 emissions of MIRA’s Australian infrastructure assets under management. Of those four assets, are committing to emission reduction targets that together represent scope 1 and scope 2 emissions totalling 282,177 tCO2e. An overview of the results of the Australian decarbonisation project is provided in Table 2.

<table>
<thead>
<tr>
<th>Asset</th>
<th>Baseline emissions (tCO2e)</th>
<th>Emissions reduction target (%)</th>
<th>Emissions reduction target (tCO2e)</th>
<th>Emissions reduction projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endeavour Energy</td>
<td>FY19: 468,780</td>
<td>40%</td>
<td>187,649</td>
<td>• Power factor correction • Off-peak power injection • Hot water efficiency upgrade</td>
</tr>
<tr>
<td>One Rail Australia</td>
<td>FY19: 143,532</td>
<td>30%</td>
<td>42,351</td>
<td>• locomotive efficiency improvement • Reduced locomotive idling • Increase train lengths • Reduce aerodynamic losses</td>
</tr>
<tr>
<td>Perth Airport</td>
<td>FY18: 24,080</td>
<td>50%</td>
<td>12,040</td>
<td>• Renewable power purchase agreements • Building energy efficiency optimisation • Canteen renewables power generation • Electric vehicle terminal forecourt</td>
</tr>
<tr>
<td>Port of Newcastle</td>
<td>CY18: 3,878</td>
<td>30%</td>
<td>1,164</td>
<td>• Renewable power purchase agreements • Electric vehicle corporate fleet • Onsite electric vehicle charging infrastructure • Onsite solar installation</td>
</tr>
<tr>
<td>Land Services SA</td>
<td>FY19: 101</td>
<td>46%</td>
<td>46</td>
<td>• Building energy efficiency optimisation • Electric vehicle corporate fleet</td>
</tr>
<tr>
<td>Total</td>
<td>840,371</td>
<td></td>
<td>282,177</td>
<td></td>
</tr>
</tbody>
</table>

18. The results of the Australian decarbonisation project represent external sustainability consultant targets and recommendations. Participating portfolio companies reserve the right to adjust these recommended targets or targets developed internally. The Australian decarbonisation project represents the majority of the Australian decarbonisation project assets. The results are based on the Science Based Targets initiative (SBTi) framework. The emissions reduction targets were set on a 2°C temperature scenario except for those of Land Services SA, which is aligned with a 1.5°C temperature scenario, and One Rail Australia, which is a scope 1 emissions intensity reduction target. 19. Tabulated likelihood of emissions reduction opportunities remains uncertain due to COVID-19 and these opportunities will require further assessment. All tabulated emissions reduction targets are consistent with a “well-below 2°C” temperature scenario except for those of Land Services SA, which is aligned with a “1.5°C” temperature scenario, and One Rail Australia, which is a scope 1 emissions intensity reduction target. 20. Tabulated likelihood of emissions reduction opportunities remains uncertain due to COVID-19 and these opportunities will require further assessment. All tabulated emissions reduction targets are consistent with a “well-below 2°C” temperature scenario except for those of Land Services SA, which is aligned with a “1.5°C” temperature scenario, and One Rail Australia, which is a scope 1 emissions intensity reduction target. 21. One Rail Australia’s emissions reduction target applies only to their scope 1 emissions intensity targets.

CASE STUDY
ENDEAVOUR ENERGY ROLLOUT OF ECOVAR INSTALLATION

As part of the Australian decarbonisation project, Endeavour Energy has been working closely with an external sustainability consultant to review and determine its business as usual emissions, potential emission reduction pathways and the impact of identified abatement opportunities in achieving emission reduction targets.

In connection with this work, the business has identified an initiative with the potential to reduce a significant portion of its scope 2 emissions which are largely due to line losses. The initiative would involve the installation of EcoJoule Energy’s EcoVAR units that would help regulate voltage swings on the network, thereby lowering line losses and its carbon emissions footprint. The technology would operate autonomously on the network through an algorithm to adjust the current to reduce high voltages and increase low network voltage. The ability to reduce the range of voltage variation on the network could potentially drop total voltage on the network by ~5% and reduce energy consumption by ~3.5%.

Endeavour Energy has already implemented a small-scale trial of the EcoVAR technology across four sites, which has successfully demonstrated the capability to minimise voltage variations. However, the Australian regulatory regime does not currently provide sufficient financial incentives to support a broader rollout of EcoVAR units across the National Electricity Market. Endeavour Energy is therefore considering the deployment of a larger trial across its network, subject to finding external sources of co-funding, with the intent to pursue a rule change application that would allow the EcoVAR investment to roll into the regulatory asset base.

If EcoVAR is rolled out across the National Electricity Market, the annual benefits are estimated to be:

- Carbon emission savings of 2.6 million tCO2e across the National Electricity Market
- Electricity bill savings of $A35 per customer
- Improved appliance lifetime of $A3-12 per solar customer
- Avoided curtailment of solar hosting $A3-12 per solar customer
- Reduced peak electricity demand lowering the market cost of energy
Puget is a vertically integrated electric and natural gas utility located in Washington state, USA that was divested by MIRA in 2019.

PUGET SOUND ENERGY
10 YEARS OF OWNERSHIP

During the ten years while a MIRA fund was Puget Sound Energy’s (Puget) largest shareholder, Puget committed to a substantial reduction in its carbon footprint by committing to close two coal-fired power stations and replacing that capacity with wind, solar, hydro, and gas generation plants, including:

- constructing onshore wind, hydro and solar generation assets across Washington state with a combined installed capacity of 400MW during the ownership period
- constructing a natural gas liquefaction, vaporisation and storage facility in Tacoma to improve Puget’s ability to meet peak customer gas demand and provide cleaner transport fuel to the marine trade between Puget Sound and Alaska
- leading community negotiations that resulted in the closure of two coal-fired power stations in Montana by 2020, including a plan to mitigate the economic effects of the closure
- creating approximately 300 new company jobs and a substantial 45% decrease in the company worker lost time injury frequency rate (LTIFR) during period 2009-2018.

The value of Puget at exit was significantly enhanced by its diversified mix of renewable energy and low-emissions power generation technologies. The financial performance showcased the benefits of integrating sustainability and resilience principles into the business strategy, generating value for communities, the environment and investors.
ENERGY DEVELOPMENT CORPORATION (EDC)

Energy Development Corporation (EDC) is the world’s largest vertically integrated geothermal company with a combined installed capacity of 1.4GW – across geothermal, solar, hydro and wind assets. It represents approximately 20% of total installed renewable energy capacity in the Philippines. In December 2017, damage resulting from Typhoon Urduja temporarily reduced the generation capacity of EDC’s Malitbog geothermal power plant by 50%. Over the following months, MIRA and its co-investors supported significant infrastructure upgrades and business improvements to enhance EDC’s resilience against natural disasters and ensure continuity of supply to communities.

Resilience improvements include the installation of geohazard early warning systems to provide EDC employees with alerts of forthcoming seismic disruptions, providing advanced notice to minimise harm to workers and enabling rapid execution of business continuity plans to minimise power supply disruption. Robust modeling of potential slope failure and landslide risks has also been implemented, with pipes rerouted for added protection and cooling towers re-engineered to withstand typhoons with greater than 300kph winds.

These improvements not only significantly minimised the risks of worker harm, asset damage and forced outages, but also contributed to an estimated 3% increase in generation output and an estimated 14% increase in EBITDA for 2019.

FINLAND

Finland’s average temperatures are rising faster than the global average. In recent years, this has combined with more frequent and severe weather events to cause serious damage to electricity distribution networks.

In December 2011, Cyclone Tapani hit Finland with wind speeds of up to 113 kilometres per hour, causing some of the worst damage to Finland infrastructure in over 15 years – impacting overhead power lines and causing extensive power outages. The episode drew attention to the growing implications of storms, snow and tree fall on the resilience of Finland’s electricity network. In response, regulation was introduced requiring network operators to exceed certain availability targets by 2028.

MIRA acquired Elenia Oy (Elenia) in 2018 and is supporting the company to become more resilient to weather events through its goal to bury ~26,000 km of new and existing sections of its power line network by 2030. The ‘undergrounding’ of the network is considered the most effective way to protect it from extreme weather events – minimising the risk of power supply disruption for Elenia’s 430,000 customers.

The resilience of Elenia’s network is further enhanced by the company’s incorporation of smart technology, permitting real-time 24/7 monitoring, control and fault location as well as automatic isolation of faults to minimise the network area impacted by outages.
WCA is a vertically-integrated waste management company based in Houston, Texas, that provides solid waste collection, transfer, disposal and recycling services to more than 700,000 customers in the Southeast and Midwest United States. The company is supported by approximately 1,700 employees and more than 1,000 collection vehicles and currently operates 21 landfills, 27 transfer stations, two municipal recycling facilities and 36 collection operations across eleven states.

WCA continues to add Compressed Natural Gas (CNG) fuelled collection trucks to its operations, which have approximately 30% lower emissions than their diesel counterparts. By the end of 2019, 162 of route vehicles, or 16% of WCA’s total fleet, had been converted to CNG. WCA estimates that the current CNG fleet will reduce fuel costs by approximately $US3.2 million annually.

Given the combined commercial and sustainability benefits, the board of WCA are committed to expanding the CNG fleet to 200 vehicles, or 20% of its current total fleet, by 2023. It is estimated this will result annual fuel costs savings of $US4.0 million.

WCA has also adopted route optimisation plans that utilise technology to help drivers identify the most efficient route to travel whilst collecting waste from customers. Route optimisation has further reduced WCA’s impact on the environment, whilst also minimising costs related to wear and maintenance across its fleet.

Enfi Environmental (Enfi) owns and operates a high-quality portfolio of seven water and wastewater treatment projects in China, together representing combined water treatment capacity of 1,000,000 metric tonnes of wastewater influent per day.

In late 2019, Enfi acquired a sludge recycling facility to treat residual sludge generated by their nearby wastewater treatment plant and other nearby plants. The new facility treats 120 tonnes of sludge per day, reducing Enfi’s sludge treatment costs by $US2 million while also generating additional EBITDA of $US1 million from treatment of residual sludge produced by other wastewater companies. The residual products from Enfi’s sludge recycling facility is donated to the local community as an environmentally-safe intermediary organic fertiliser suitable for agricultural, gardening or landscaping applications after further processing.

The facility represents an innovative circular economy initiative that sustainably improves operating efficiency and commercial outcomes.
Approximately 64% of India’s electricity relies on fossil fuel-based sources of generation\(^{26}\). With national energy demand set to grow rapidly over coming decades\(^{27}\), India is seeking new ways to power its economic development. The amount of renewable energy is expected to grow significantly\(^{28}\).

In 2017, UK Climate Investments (UKCI) – a MIRA-managed vehicle which forms part of the UK’s International Climate Finance – partnered with Lightsource bp, a major global solar developer, to install green infrastructure across India.

UKCI and Lightsource bp commenced with the development of a 60MW solar farm in the western Indian state of Maharashtra. In less than six months, more than 200,000 ground-mounted solar photovoltaic panels were successfully installed over 240 acres of non-arable land.

Connected to the local distribution grid, the solar farm is displacing electricity generated from non-renewable sources to meet the needs of approximately 75,000 homes each year\(^{29}\). In doing so, the project helps avoid over 80,000 tCO\(_2\)e annually as well as harmful air pollutants including nitrous oxide, sulphur oxide and particulate matter emissions\(^{30}\).

The project is helping to contribute to cleaner air in a country where more than 1.2 million people each year die prematurely as a result of air pollution\(^{31}\). In addition to causing serious respiratory and cardiovascular diseases, it is estimated that poor air quality costs the Indian economy the equivalent of 8.5% of GDP annually\(^{32}\).

In August 2017, a Macquarie-led consortium acquired the UK Green Investment Bank, today known as the Green Investment Group (GIG). GIG is one of the world’s largest teams of specialist green investors with expertise in project finance and development, construction, investment and asset management of green energy infrastructure.

In its original configuration, GIG accelerated the development of the UK wind sector by backing a portfolio of six offshore wind farm assets with a consortium of public and private investors. The success of these assets has further enhanced GIG’s track record and enabled expansion into additional renewable energy investment opportunities abroad.

The nine offshore wind assets, which are currently managed by MIRA, comprise combined capacity of 2.4GW, or up to 3% of the UK’s energy needs\(^{33}\), and supply near-zero emissions electricity to communities and businesses across the UK.

If this same amount of electricity were generated by the UK’s residual energy mix, it would result in approximately 2.4 million tCO\(_2\)e annually\(^{34}\). Together, these nine offshore wind farms represent 5% of all renewable capacity in the UK\(^{35}\).

Renewable energy technologies can generate significant value for investors and communities while also minimising adverse environmental impacts and supporting the global transition to a low-carbon economy.
One of Germany’s major challenges during recent years has been the influx of asylum seekers displaced by political conflict from surrounding regions. Nearly 1.4 million registered asylum seekers have entered Germany since 2015.36. Open Grid Europe (OGE) owns and operates the longest regulated supra-regional gas transmission network in Germany. OGE has taken proactive steps to address this social challenge by focusing on the recruitment and education of young refugee workers. To promote the integration, support and training of asylum seekers, OGE aims to ensure that approximately 15% of their industrial mechanism apprenticeship program intake comprises individuals with refugee status. OGE offers preparatory courses in mathematics, ongoing German language lessons and intercultural training for its new apprentices.

GOETHALS BRIDGE

In 2013, NYNJ Link – a consortium comprising MIRA and Kiewit Development Corporation – was awarded a 35-year concession to finance, design, build and operate a new bridge to replace an existing road link between New York City and New Jersey. As a critical transport connector for two states and two cities, the project had to account for the current and future needs of numerous stakeholders. This required extensive consultation with numerous government authorities, commuters and other stakeholders to optimise the public benefit of a new Goethals Bridge.

Over the five-year period, the construction of the project recorded over three million hours in local union craft service37, with a lost time injury frequency rate of 1.2 (well below industry averages) and injected over $US870 million of economic activity into the local area38. The innovative bridge design gave the structure a service life of 150 years, allowing it to meet the evolving needs of the region such as future mass transit expansion.

The Goethals Bridge Replacement Project has been recognised for its innovation, collaboration and safety record. It was chosen unanimously by judges of the Engineering News Record Awards to be New York’s ‘Project of the Year’ for 2018. It was also named New York’s ‘Best Project’ in the highway/bridge category and also received the ‘Excellence in Safety’ award39.

STRIDE CLIMATE INVESTMENTS

Stride Climate Investments (Stride) operates renewable solar facilities in India with combined power capacity of 414MW which is supplied to residents, businesses and infrastructure via the local grid. Innovative use of drone technology with thermal imaging capability has allowed Stride to improve business efficiency, reduce GHG emissions and mitigate employee safety risks. The use of drones allows Stride to more efficiently monitor its solar arrays, which span 2,630 acres, ten times faster than handheld methods. More frequent, rapid and accurate monitoring allows Stride to respond faster to issues impacting solar array performance in order to maximise power generation productivity during sunshine hours. The technology has also resulted in reduced fleet vehicle fuel consumption, fleet vehicle GHG emissions and personnel safety risks associated with alternative handheld monitoring methods, including heat exhaustion and dehydration.

Stride has also used innovation to solve for local issues. At Stride’s Punjab site, neighbouring farmers would regularly burn their leftover crop residue seasonally. This not only resulted in a fire hazard, but also diminished local air quality and Stride’s power generation due to reduced sunlight penetration and accumulation of ash on its solar modules. Stride negotiated an agreement with locals to collect and donate 2,700 metric tonnes of unwanted crop residue to a nearby biogas generator for use as feedstock biomass, avoiding 4,716 tCO2e, and improving local air quality, community relations and Stride’s solar power generation output.

TECHEM

Techem provides sustainable heat supply and energy efficiency services along the entire energy value chain in real estate. Over the past decade, Techem has been transformed into a leading global energy efficiency provider active in more than 20 countries. The real estate sector represents around 40% of the world’s energy consumption and contributes up to 30% of global emissions. While new design and construction methods continue to create more sustainable buildings, significant investment is required to enhance the energy efficiency of established properties to help meet global emissions reduction targets.

Techem has been a leader in the development of quality technologies in the areas of energy and water measurement, billing and management since the early 1950s. Since taking full ownership in 2009, MIRA has partnered with management to invest more than €1 billion in developing a suite of highly efficient and cost-effective products to enable apartment buildings and commercial properties to further reduce their overall energy consumption. Over this period, Techem added sustainable heat supply solutions, enhanced fire protection monitoring and products to improve drinking water quality to its extensive service offering.

Memberships

INDUSTRY RECOGNITION AND ENGAGEMENT

MIRA’s commitment is demonstrated through our membership of and alignment with a number of industry bodies and suitability-focused global organisations.

GRESB’s mission is to enhance and protect shareholder value by assessing and empowering sustainability practices in the real asset sector. MIRA has been a member of GRESB Infrastructure since it was launched in 2016 and is represented on GRESB’s Infrastructure Benchmarking Committee. MIRA is also a member of GRESB Real Estate. GRESB assessments provide us with valuable insights as we develop sustainability strategies for our assets and opportunities for best practices within our portfolio and across industry sectors.

2019 GRESB results

We are proud that a number of MIRA assets and funds were peer group leaders and/or top quintile performers (receiving a prestigious five-star GRESB rating) in the 2019 assessment.

Of note from our asset portfolio, Viesgo was ranked one of the most sustainable in the 2019 assessment.

Macquarie Asset Management (MAM) has been a signatory to the Principles for Responsible Investment (PRI) since 2015 and is represented on PRI’s Infrastructure Advisory Committee. MAM’s most recent PRI Transparency Report has been made publicly available online at www.unpri.org. In 2020, MAM received above median scores of A and A+ across all relevant categories, including an A+ in ‘Direct – Infrastructure’ which relates wholly to MIRA’s infrastructure business.

Macquarie affiliations

Under the leadership of Macquarie Group Managing Director and CEO Shemara Wikramanayake, Macquarie is also participating in several new climate initiatives that build on our long-standing commitment to maintaining carbon neutrality and ongoing climate disclosure through the CDP:

- Global Commission on Adaptation
- Climate Finance Leadership Initiative
- US Alliance for Sustainable Finance
- Task Force on Climate-related Financial Disclosures
- RE100 by The Climate Group.

In December 2018, Macquarie CEO, Shemara Wikramanayake, was appointed to the Global Commission on Adaptation by co-chairman Ban Ki-moon and Bill Gates. The UN Commission was formed to help drive insight and attention to the current and future adaptation and resilience needs of society given the climate changes that are already manifesting. MIRA contributed thought leadership to the Infrastructure Chapter of the report. We continue to engage with stakeholders to originate projects that help showcase the principles and opportunity of resilience infra described in the report.

In January 2019, Shemara Wikramanayake accepted an appointment by UN Special Envoy on Climate Change Michael Bloomberg to become a member of the Climate Finance Leadership Initiative (CFLI). CFLI was formed to help identify the barriers and opportunities to increase capital formation for climate change mitigation globally, especially in emerging economies. MIRA provided thought leadership to a seminal report on mitigation finance including a section on investment readiness suggestions for growing economies.

Both the GCA and CFLI reports were released in conjunction with UN Climate Week in 2019 and garnered significant media coverage.

Shemara Wikramanayake is the only executive who serves on both bodies which for Macquarie, underlines the importance of elevating the consideration of infrastructure as a solution for some of society’s most material sustainability challenges – Mitigation, Adaptation and Resilience. We have a unique set of experiences which we will continue to bring to bear for our sector to help advance the thinking and smart deployment of capital.