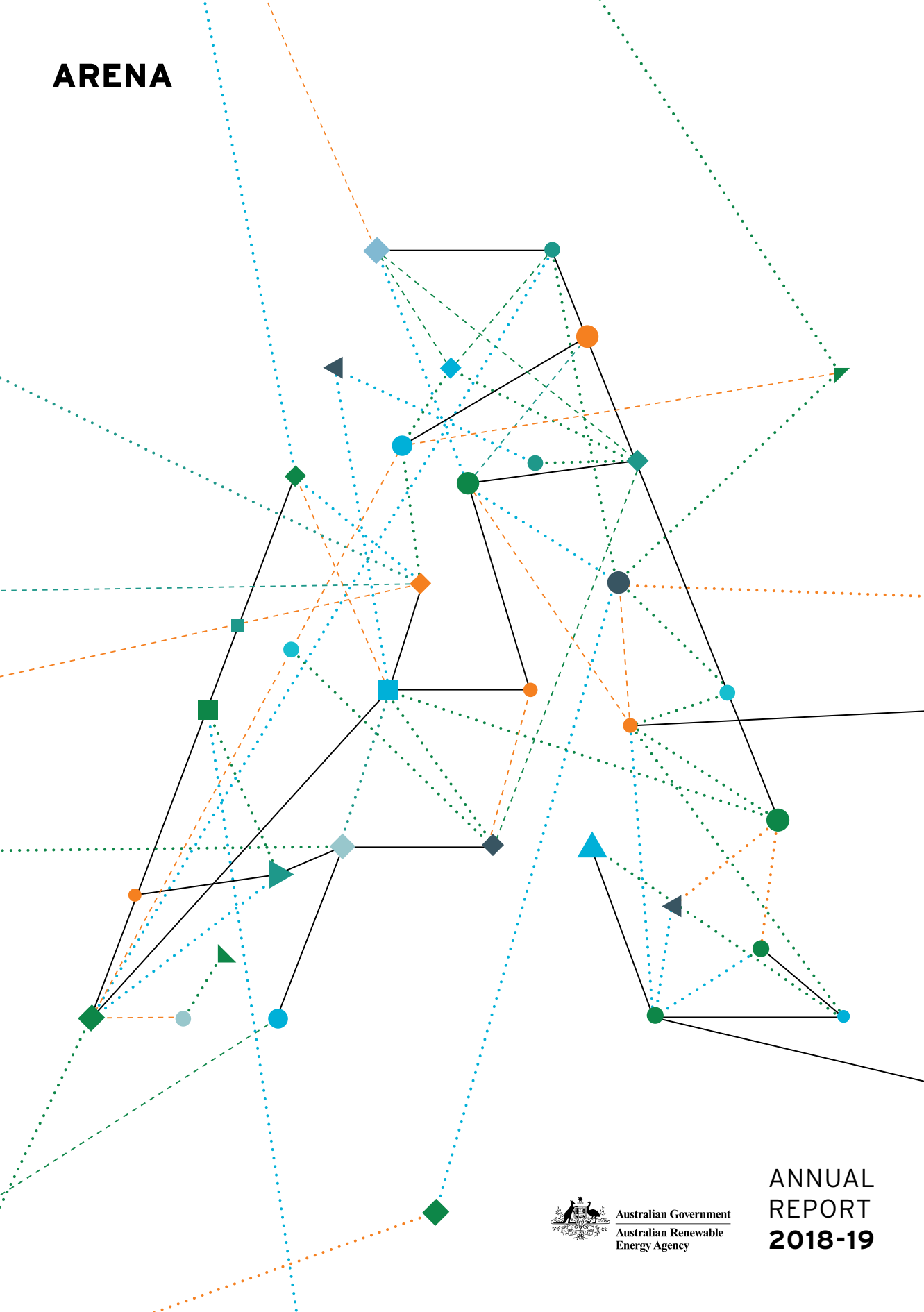
ARENA



Australian Government
Australian Renewable Energy Agency

ANNUAL REPORT 2018-19

ARENA

is the Australian Renewable Energy Agency, established by the Australian Government to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia.

OUR PURPOSE

is to accelerate Australia's shift to affordable and reliable renewable energy.

OUR VALUES

are to be impact-driven, stakeholder-focused, collaborative, accountable and respectful of people.

OUR WORK

is to support Australian renewable energy projects with financial assistance to maximise the benefits of the energy transition to the Australian economy.

Since 2012, ARENA has supported 478 projects with $1.44 billion in grant funding, unlocking total investment of almost $5.5 billion in Australia's renewable energy industry.

FIGURE 1: ARENA AT A GLANCE - FUNDING COMMITMENTS TO PROJECTS 2012-19*

INVESTED

$1.44B

PROJECTS

478

PROJECTS BY TECHNOLOGY

- BIOENERGY $100M
- STORAGE - BATTERIES/PHES $95M
- OCEAN $54M
- GEOTHERMAL $42M
- HYDROGEN $35M
- SOLAR PV $654M
- GRID INTEGRATION $205M
- SOLAR THERMAL $145M
- HYBRID $105M

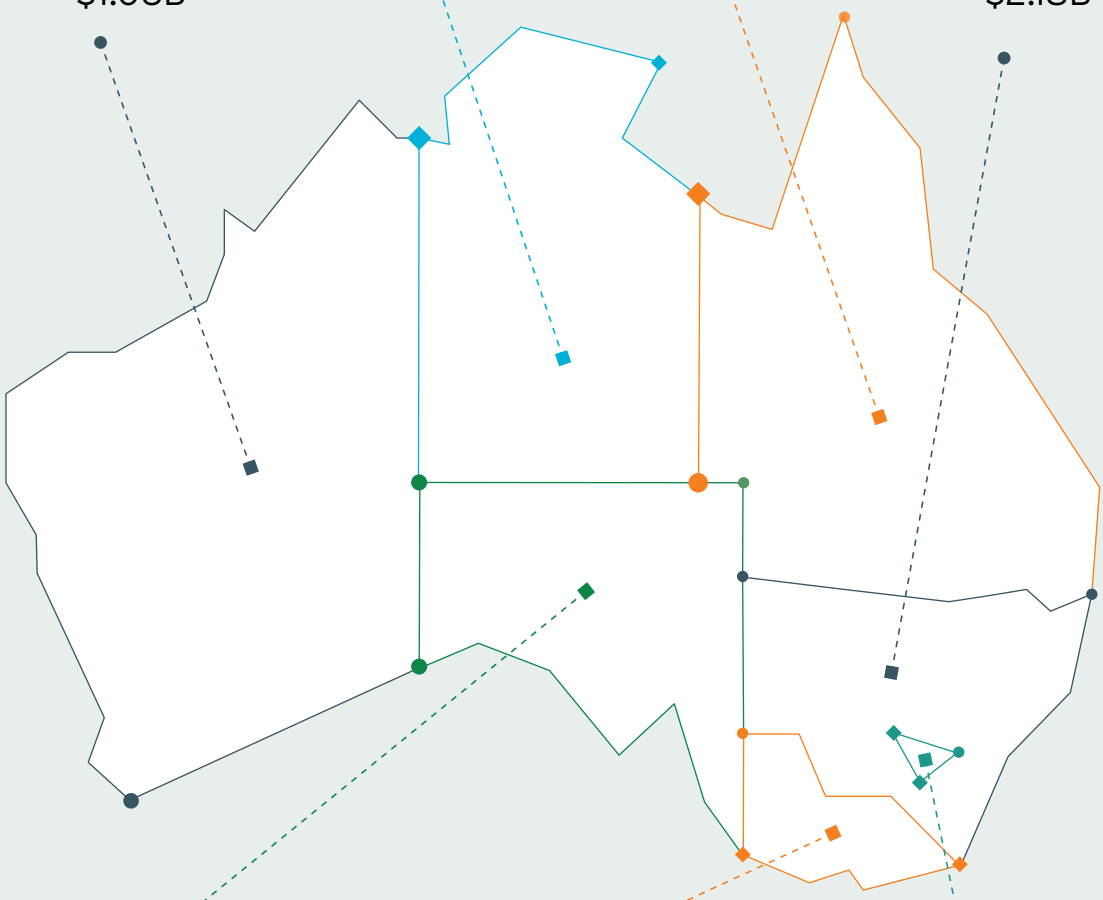
TOTAL PROJECT VALUE

$5.49B

INVESTMENT LEVERAGE

$1:$2.83

*At 30 June 2019



NT
PROJECTS 7
INVESTED $34M
VALUE $70M

QLD
PROJECTS 47
INVESTED $190M
VALUE $1.16B

WA
PROJECTS 28
INVESTED $124M
VALUE $1.06B

NSW
PROJECTS 198
INVESTED $731M
VALUE $2.18B

SA
PROJECTS 41
INVESTED $120M
VALUE $420M

VIC
PROJECTS 81
INVESTED $139M
VALUE $340M

TAS
PROJECTS 17
INVESTED $39M
VALUE $93M

ACT
PROJECTS 59
INVESTED $58M
VALUE $162M

ARENA NEW PROJECTS 2018-19

$188.1
MILLION

79
PROJECTS

During 2018-19 ARENA committed $188.1 million in grant funding to 79 new projects across four investment priorities.

INVESTMENT PRIORITIES

1. DELIVERING SECURE & RELIABLE ELECTRICITY

$86.9 MILLION

39 NEW PROJECTS

2. ACCELERATING SOLAR PV INNOVATION

$2.0* MILLION

3 NEW PROJECTS

3. IMPROVING ENERGY PRODUCTIVITY

$67.0 MILLION

13 NEW PROJECTS

4. EXPORTING RENEWABLE ENERGY

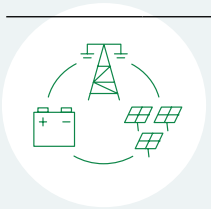
$18.7 MILLION

13 NEW PROJECTS

OTHER

$13.0 MILLION

11 NEW PROJECTS



Projects focused on delivering affordable low-emission electricity solutions that keep the lights on

Advanced weather forecasting technologies being developed to improve the reliability of wind and solar energy

Trial to show how to smoothly integrate electricity from Virtual Power Plants into the grid

Australian-first project to power a mine with a hybrid microgrid using wind, solar, battery and gas

Big battery paired with a wind farm to show their combined services can strengthen the grid

Next stage of development reached by online electricity marketplace for homes and businesses to trade the energy they produce

Identifying how to get the most benefit for homes and businesses from the energy they produce while keeping the grid strong

Projects focused on making solar PV more affordable through research and development

Trial of self-powering solar classrooms extended to more schools

*$38 million also committed to extend the Australian Centre for Advanced Photovoltaics to continue world-leading research in solar PV R&D

Projects focused on helping to reduce energy costs and emissions in the transport, building and industry sectors

Australian-first project to produce 36 MW of baseload power from household waste, diverting 25 per cent from landfill

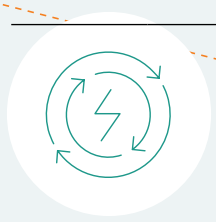
Help the rollout of ultra-rapid charging networks for electric vehicles

First off-grid project with the oil and gas industry, also involving an off-grid switch to 100 per cent renewables

Pioneering project established to turn biosolids from sewage into crude oil

Supported the transformation of a decommissioned car manufacturing plant into a renewable energy hub

First-of-a-kind project to test if renewables can be used reliably in metal production



Projects focused on helping to create new, scalable export value chains in renewable energy

16 new hydrogen R&D projects

Established projects to demonstrate how best to produce, store and use renewable hydrogen

ABOUT THIS REPORT

This Annual Report provides information about ARENA's activities and achievements in 2018-19.

Results are reported against our objective and performance criteria, which are stated in the ARENA Act, our Corporate Plan and our Portfolio Budget Statements 2018–19. We also describe our governance, management and accountability practices, our workforce and financial performance, and provide our audited financial statements.

CONTENTS

Image credit: Stock image

Australian Government
Australian Renewable Energy Agency

ARENA

OFFICE OF THE CHAIR

18 September 2019

THE HON ANGUS TAYLOR MP
Minister for Energy and Emissions Reduction
PO Box 6022
Parliament House
CANBERRA ACT 2600

DEAR MINISTER

ARENA ANNUAL REPORT 2018-19

I am pleased to present to you the Australian Renewable Energy Agency (ARENA) Annual Report for the financial year 2018-19, in accordance with the requirements of the *Australian Renewable Energy Agency Act 2011* (ARENA Act) and the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).

The ARENA Board is responsible for preparing the report and providing it to you in accordance with s46 of the PGPA Act. The report was approved by a resolution of ARENA's Board on 18 September 2019.

This report incorporates ARENA's Annual Performance Statement (APS) for 2018-19, as required by s39 of the PGPA Act. In the opinion of the Board, the APS accurately presents information about ARENA's performance for the reporting period and complies with s39(2) of the PGPA Act.

The report also includes ARENA's audited financial statements prepared according to s42 of the PGPA Act.

Yours sincerely

MARTIJN WILDER AM
Chair

CHAIR AND CEO REVIEW

Image: Mr Martijn Wilder AM (left) and Mr Darren Miller

Helping Australia's energy system manage an increasing share of renewables and different ways of operating has been an important focus for ARENA this year.

This economy-wide transformation is profound, complex and gathering pace as technology costs decline, new business opportunities emerge, and consumers, as well as businesses, increasingly demand more choice and more control over their energy source, use and cost.

ARENA is playing an instrumental role in funding and assisting this transition. We act as a connector, bringing stakeholders together and leading innovation and issue-solving across sectors, businesses, governments and industry organisations.

We have actively identified and are helping to troubleshoot issues arising from the changing energy system – from technological and commercial issues to regulatory and market barriers. We have also funded projects and research and provided advice throughout the course of this year that is helping to solve some of these economy-wide issues.

The energy transition increasingly involves sectors such as transport, heavy industry and the built environment, which are critical in the pursuit of lower emissions and ensuring Australia meets its international commitments. ARENA's investment priorities and activities have targeted these key sectors during 2018-19.

ARENA invests in projects spanning the innovation chain, from research to early-stage deployment, to help push first-of-a-kind energy technologies and business models towards commercial viability. Without our support, the pathway to commercialisation would be blocked for many of these new technologies and businesses.

ARENA is committed to achieving maximum impact and value from the projects we fund. We work closely with our project proponents to ensure we progress high-quality applications through our approval processes.

In 2018-19, we committed $188.1 million to 79 new projects with a total value of $1.3 billion, and managed 254 active projects.

Our investment is aimed at:

- improving energy system reliability through the development and commercialisation of solutions such as large-scale batteries, pumped hydro and hydrogen
- increasing system security and reliability such as using wind farms to provide grid support services
- empowering consumers through their distributed energy resources, including finding methods to coordinate and integrate rooftop PV, home battery storage and energy management systems.

We are pleased to showcase some of these projects in this Annual Report.

FOCUS ON DISPATCHABLE TECHNOLOGIES

As the National Electricity Market progresses towards higher shares of variable renewable generation, there is a growing need for more dispatchable technologies.

Pumped hydro provides a viable solution for medium to long-term energy storage, which will be critical in a power system with high shares of variable generation. ARENA funded a study to assess the feasibility of expanding the Shoalhaven Pumped Hydro Scheme in NSW, which could potentially double its capacity. Work also continued on Tasmania's Battery of the Nation initiative and other projects across a number of states.

Large-scale battery systems present a significant opportunity as they can provide short-term energy storage at increasingly competitive costs. They contribute to system reliability and provide essential system services and operational and network benefits.

Four 'big battery' projects (two in Victoria and two in South Australia) demonstrated innovative technologies and operating capabilities that progressed the status of large-scale battery systems in Australia. The capabilities that these projects have demonstrated, and their value in the renewable energy transition for delivering secure, reliable and affordable energy, are discussed in the Annual Performance Statement section.

EMPOWERING ENERGY CONSUMERS

Rooftop solar, batteries and other customer-related energy technologies are set to play a key role in shaping the future energy system. It is projected that up to half of all Australian households will have solar and/or batteries within the next few decades, up from around twenty per cent today. This is a huge change and will require continued innovation in software, hardware and thinking to achieve the best outcome for consumers.

This year, ARENA funded some of the leading experts in the energy sector to build network hosting capacity technology and further understand the impacts of Distributed Energy Resources (DER). Increasing network hosting capacity will allow more DER (such as rooftop solar) to be connected and operate while remaining within the technical limits of our electricity grid. This work is ongoing but we are excited to be exploring and hopefully solving some of these important consumer energy challenges.

MISSION INNOVATION

Australia made an international commitment to double its clean energy research and development investments by 2020-21 through the Mission Innovation initiative. ARENA plays an important role in meeting this pledge and we committed $29.7 million to 24 new Mission Innovation eligible projects this year and spent $39.1 million on existing eligible research and development projects.

ARENA's impact is demonstrated in how we are ensuring the private sector has the right tools, technology options and business models to deliver secure and reliable renewable energy

MAXIMISING BENEFITS TO THE ECONOMY

A key part of ARENA's work is to build knowledge that can be shared openly to help industry and government better navigate the energy transition. Information and 'lessons learned' also help to de-risk follow-on projects, accelerate deployment of safe and commercially viable technologies, increase public understanding and confidence in new technologies, and support capability development.

This year we conducted two major ARENA Insights Forums that attracted more than 300 participants. We also led workshops and industry events in which relevant industry players and state governments shared lessons learned from ARENA projects and solutions to the challenges and opportunities of integrating renewable energy technologies into the electricity grid. ARENA representatives also attended and spoke at many industry events and stakeholder meetings across the country.

ARENA's impact is demonstrated in how we are ensuring the private sector has the right tools, technology options and business models to deliver secure and reliable renewable energy. We are also working with key decision-makers in both government and industry, building the knowledge, data and skills to navigate the challenging energy system transition.

As a small organisation we have developed a highly effective team-based way of working that enables us to make best use of complementary skills and Agency resources and to maintain high efficiency in our business activities.

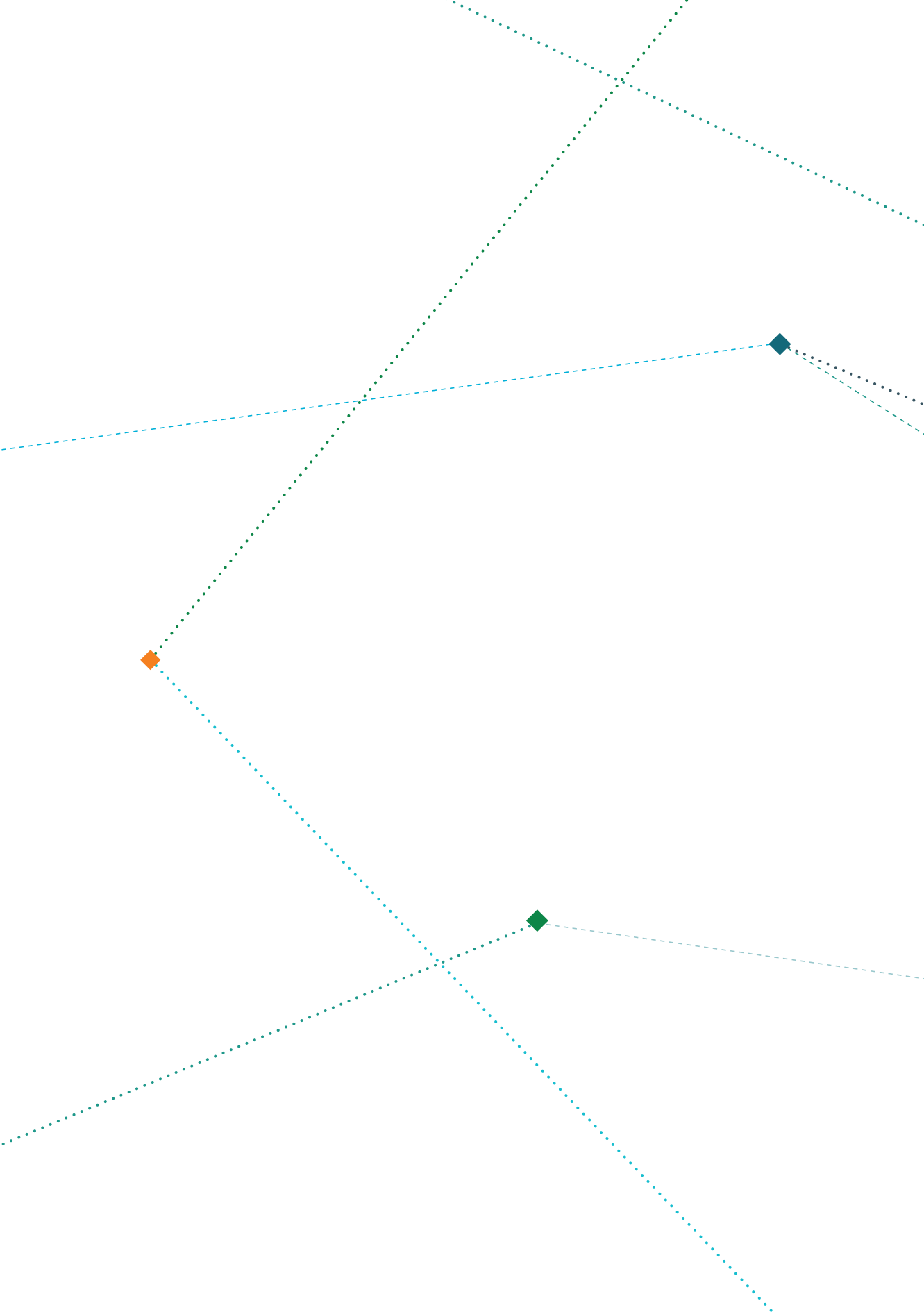
We would like to acknowledge the many people and organisations that have worked with ARENA and supported our efforts in 2018-19. ARENA's continuing contribution is made possible with the commitment and guidance provided by the Board; the hard work and commercial focus of the ARENA team; the vision, ingenuity and determination of our project proponents; and the support of the Australian community.

ARENA continues to deliver lasting benefits for the broader economy and our work is fully aligned with the Australian Government's priorities in the energy sector. We thank our Ministers during the reporting period, the Hon Josh Frydenberg MP and the Hon Angus Taylor MP, for their support and ongoing interest in ARENA's important work.

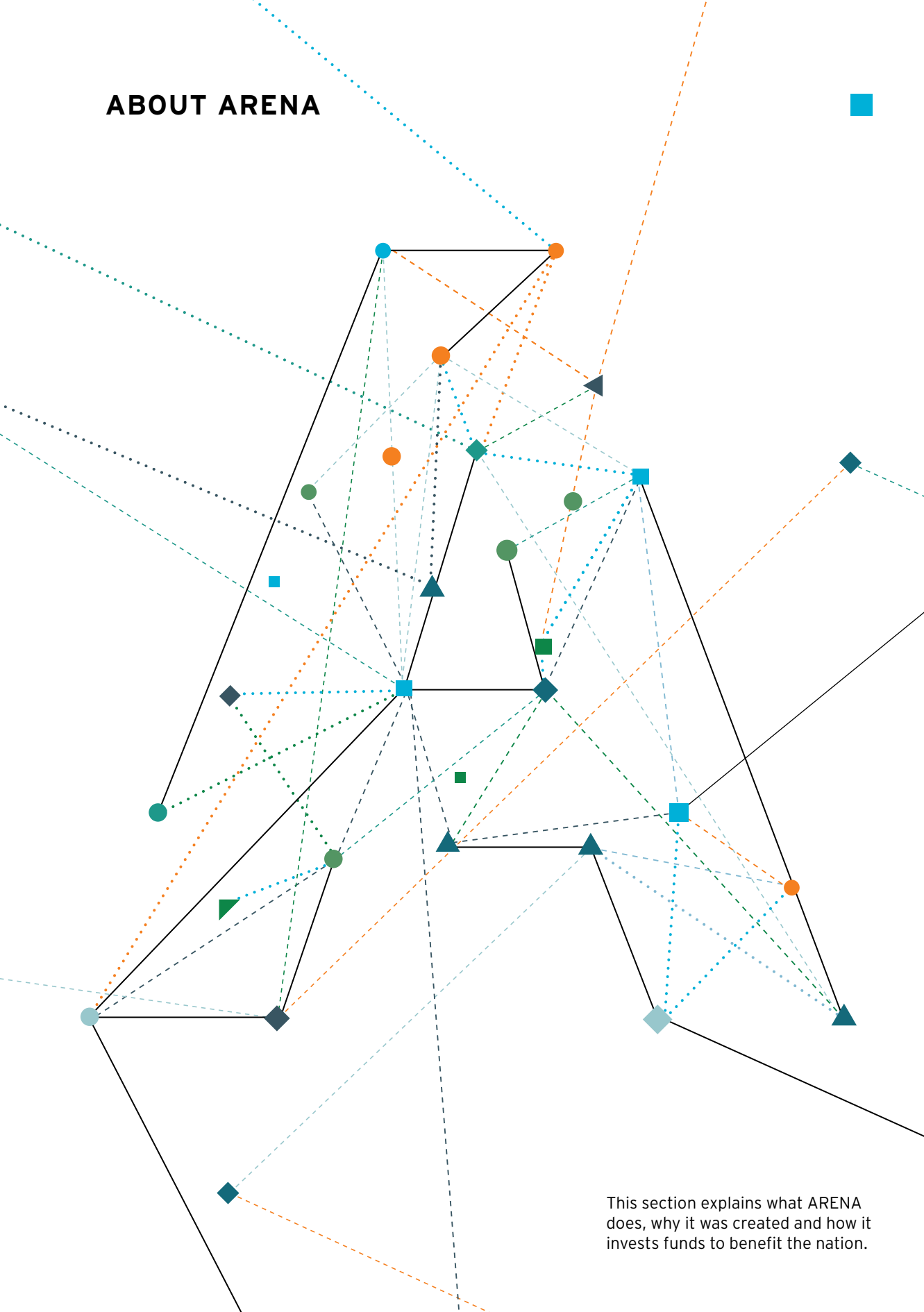
Martijn Wilder AM
ARENA Chair

Darren Miller
ARENA CEO

Image credit: ARENA



ABOUT ARENA



This section explains what ARENA does, why it was created and how it invests funds to benefit the nation.

KEY ELEMENTS

PURPOSE, OBJECTIVE AND OUTCOMES

ARENA's purpose is to accelerate Australia's shift to affordable and reliable renewable energy.

Our objective, which is set out in the ARENA Act, is to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia. This objective sits at the core of ARENA's performance framework, which can be found in the Annual Performance Statement section.

The Portfolio Budget Statements, published as part of the Federal Budget, describe the contribution that ARENA is expected to make to the Australian Government's outcomes.

Our purpose statement was developed by the ARENA Board to align to the ARENA Act objective and also incorporate the priorities of the Government.

HISTORY

The Agency was established by the Australian Government in July 2012.

At this time, a number of the Government's existing renewable energy programs and projects were also brought together under the ARENA umbrella, including those previously managed by the Australian Centre for Renewable Energy, the Solar Flagships Program and the Australian Solar Institute.

UNIQUE ROLE

ARENA has a unique role in the energy transition. Our job is to find and support the building blocks of Australia's future energy system, helping to ensure that the benefits of the energy transition to the Australian economy are maximised.

We invest in projects spanning the entire innovation chain, from research to deployment.

We focus on finding and demonstrating first-of-a-kind renewable energy technologies and business models that can reduce technical and commercial risks and grow Australia's renewable energy supply, knowledge and expertise.

We have the business acumen and industry knowledge to bridge the gap to commerciality. Without our support, the pathway to commercialisation would be blocked for many new technologies and businesses.

CORE ACTIVITIES

ARENA not only provides funding but actively identifies and troubleshoots issues arising from the energy transition, from technological and commercial issues to regulatory and market barriers.

We support research, inform policy decisions, and bring together people from across the energy sector, government, startups and universities to collaborate with one another, and share their knowledge.

PROJECTS FUNDED TO DATE

Since 2012, ARENA has committed approximately $1.44 billion in grant funding to support 478 projects focused on delivering smarter, more efficient ways of producing and using renewable energy.

The projects have a total value of $5.49 billion. ARENA's involvement has strengthened the confidence of other investors, leveraging more than $4 billion in additional funding for the projects, as well as Australia's renewable energy industry.

HOW WE WORK

ARENA's values empower our people to take an agile, commercially-oriented and outcome-driven approach to achieving our purpose. A strong culture of mutual support, teamwork and collaboration has been central to our success.

As a small organisation we have developed a highly effective team-based way of working that enables us to make best use of complementary skills and Agency resources and to maintain high efficiency in our business activities.

ARENA's team is skilled, productive and highly motivated, drawn from diverse backgrounds in the business, industry, finance, research and government sectors. We have expertise and experience in energy policy, Australia's electricity market, energy technology and project finance.

The Agency also blends public and private sector expertise, balancing innovation and accountability in the design and delivery of ARENA activities.

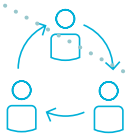
FIGURE 2: ARENA VALUES

1. IMPACT DRIVEN

We make a significant positive impact on Australia's energy sector, economy, environment and society. We take a bold, innovative approach to give us the best chance of achieving our goals.

2. STAKEHOLDER-FOCUSED

We deliver excellent service. Our approach is marked by responsiveness, clarity and flexibility.



3. COLLABORATE

We collaborate across teams and with our partners to achieve our goals.

4. ACCOUNTABLE

We are accountable to each other and, in following our processes, to the Minister, the Parliament and the Australian public. We work transparently to ensure public funds are spent in a responsible and efficient manner.

5. RESPECTFUL OF PEOPLE

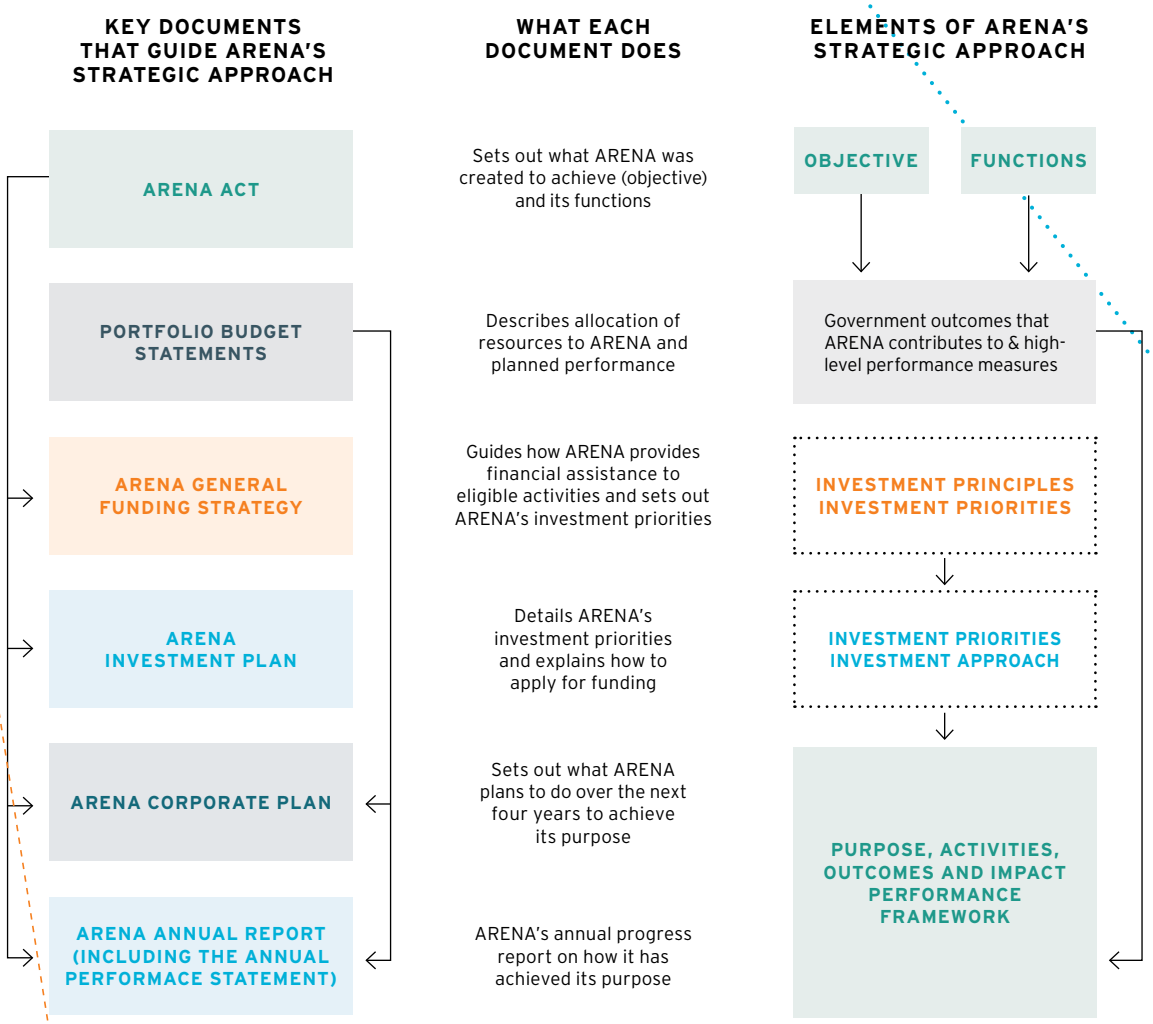
We support and respect each other. We cultivate a diverse team to access the best talent, broaden our thinking and foster a culture of innovation.

OUR STRATEGIC APPROACH

ARENA has the business acumen and industry knowledge to invest funds for the greatest impact. We apply commercial rigour to our funding decisions and ensure that each of ARENA's activities is focused on achieving the objective and performing the functions stated in our legislation and business plans.

Figure 3 demonstrates how we keep a line of sight from the ARENA Act through to the Annual Performance Statement in this Annual Report.

FIGURE 3: LINE OF SIGHT FROM ARENA ACT TO OTHER ELEMENTS OF ARENA'S STRATEGIC APPROACH



GETTING THE BEST VALUE FROM OUR PROJECTS

A TARGETED APPROACH

ARENA contributes funding to renewable energy activities in accordance with our *General Funding Strategy* (GFS) and *Investment Plan* (IP). We use the principles in the GFS to identify investment priorities, which are provided in the IP along with information on our funding programs and initiatives. Current editions of the GFS and IP are available on our website at arena.gov.au.

To identify the projects that will make a critical difference, ARENA assesses funding proposals for the best fit with the investment priorities. Within each of the investment priorities, we have defined focus areas to target investments to achieve specific outcomes.

Focus areas also inform our knowledge sharing strategies and the design of the performance measures that will enable our stakeholders to assess ARENA's impact.

ARENA's investment priorities have evolved as our operating environment has changed, our goals have been achieved, and we have learned from our current and planned activities (Figure 4).

GRANT FUNDING

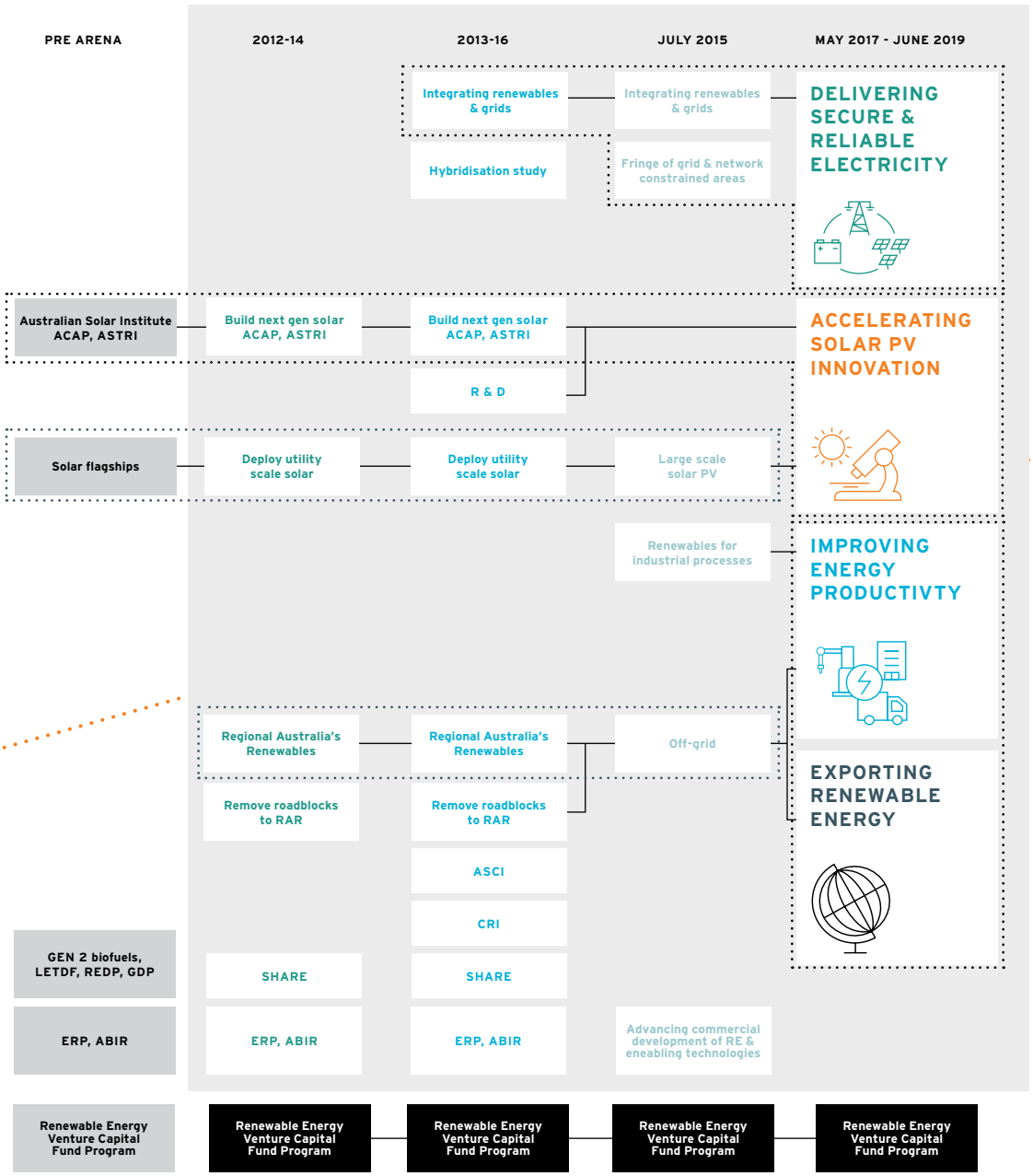
ARENA's financial assistance is provided through grants. We also provide funding to the Renewable Energy Venture Capital (REVC) Fund to make equity investments.

ARENA is committed to achieving maximum impact and value from the projects it funds, using minimal capital investment. For this reason we carefully assess how much ARENA investment is required to achieve each project's outcomes.

ELIGIBLE TECHNOLOGIES

Eligible technologies are indicated by ARENA's investment priorities, which are outlined in our IP and are taken into account when assessing project proposals. ARENA may also fund exceptional projects that fall outside the investment priorities. The number of projects funded according to each technology is provided in the Annual Performance Statement section.

FIGURE 4: HOW ARENA'S INVESTMENT PRIORITIES HAVE EVOLVED*



ABIR: Advanced Biofuels Investment Readiness Program ASCI: Australian Step Change Initiative CRI: Commercialisation Readiness Index ERP: Emerging Renewables Program GDP: Geothermal Drilling Program GEN 2 Biofuels: Second Generation Biofuels Program LETDF: Low Emissions Technology Demonstration Fund RAR: Regional Australia's Renewables RE: Renewable Energy REDP: Renewable Energy Development Program SHARE: Supporting high-value Renewable Energy Knowledge Initiative

* ARENA's investment priorities have changed since the end of the reporting period, refer to the GFS 2018-19 to 2020-21.

OUR COMPLEMENTARY ROLE

To ensure ARENA's activities have the greatest impact, we strive to complement other elements of the Australian Government's support for clean energy innovation (Figure 5).

We collaborate with organisations such as the Clean Energy Finance Corporation (CEFC), the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Australian Energy Market Operator (AEMO), the Australian Energy Market Commission (AEMC), the Australian Energy Regulator (AER) and the Energy Security Board (ESB) as well as innovators in industry.

We also work alongside Government initiatives such as the Regional and Remote Communities Reliability Fund, Climate Solutions Fund and the Renewable Energy Target.

FIGURE 5: ARENA'S COMPLEMENTARY ROLE

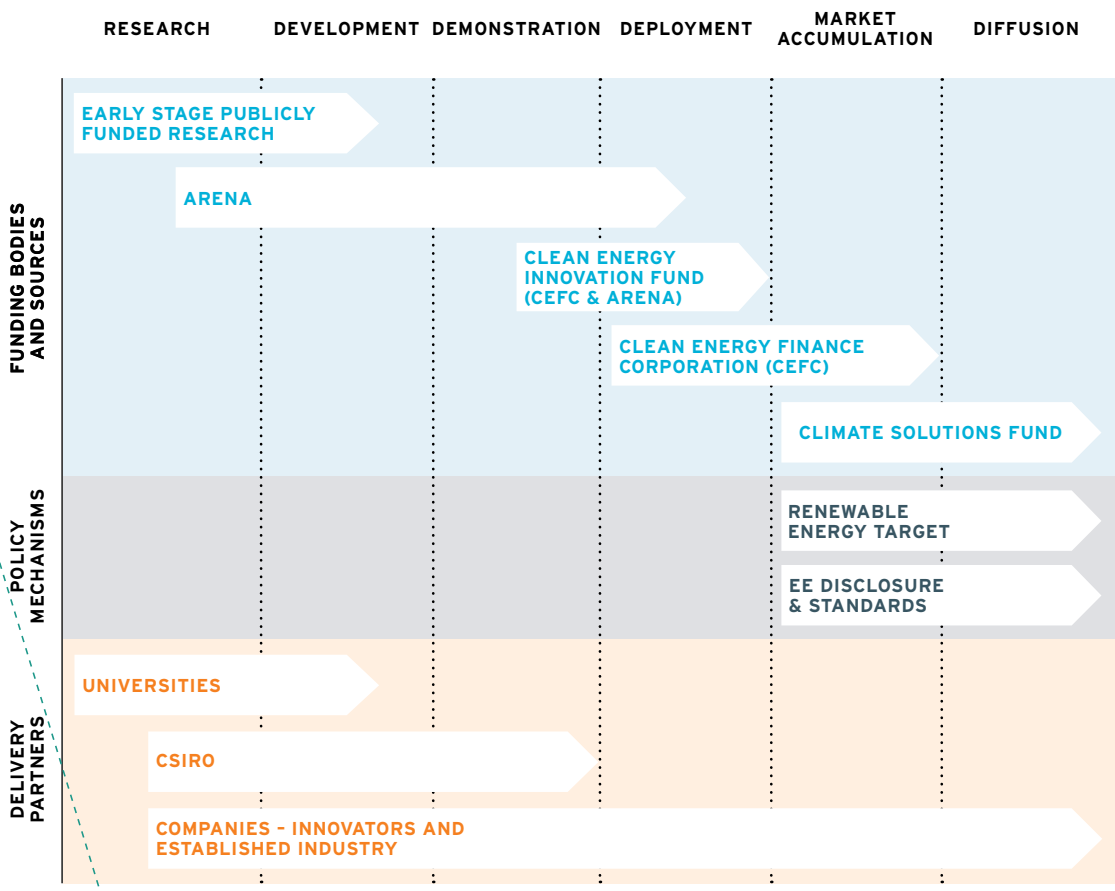


Image credit: Southern Oil

ARENA BOARD

RESPONSIBILITIES

The Board sets ARENA's investment strategies and priorities, oversees the running of the organisation, and approves funding for projects up to $50 million. ARENA's Portfolio Minister approves funding of more than $50 million, while the ARENA CEO has board-delegated authority to approve funding up to $1 million. The Board may also delegate to the CEO specific powers or functions, subject to any directions specified by the Board and any applicable ARENA policies and legislation.

The Board formally met eight times during 2018-19.

MEMBERSHIP

The Board consists of up to six appointed members as well as the Secretary of the Portfolio Department.

With the exception of the ex-officio member, Board members are appointed by the Minister for a term of up to two years, and may be reappointed for a total of up to six continuous years.

At 30 June 2019, members of the ARENA Board were:

- Mr Martijn Wilder AM (Chair)
- Ms Samantha Hogg
- Ms Susan Jeanes
- Ms Meg McDonald
- Mr Dougal McOmish
- Ms Stephanie Unwin
- Mr Finn Pratt AO PSM (ex-officio member as Secretary of the Department of the Environment and Energy). Ms Jo Evans is the nominated delegate for Mr Pratt.

With the exception of Mr Pratt and any nominated delegate, Board members were appointed by the Portfolio Minister on 17 April 2018 for a two-year term.

Members of the ARENA Board must have experience or knowledge in renewable energy technology, commercialisation, business investment or corporate governance

ARENA Board members (from left): Ms Stephanie Unwin, Ms Susan Jeanes, Ms Meg McDonald, Mr Martijn Wilder AM (Chair), Ms Jo Evans (delegate for Mr Finn Pratt AO PSM), Ms Samantha Hogg. Not present: Mr Dougal McOmish.

BOARD MEMBER PROFILES

MR MARTIJN WILDER AM
Chair / Non-executive member

Start date: April 2016, re-appointed April 2018
Board meeting attendance: 7/8 meetings.

Martijn Wilder is a Founding Partner of Pollination Capital Partners.

Prior to this he spent 20 years as head of Baker & McKenzie's Global Environmental Markets and Climate Change practice and was Chair of the Baker & McKenzie Law for Development Initiative.

In addition to being Chair of ARENA, Martijn is President of WWF (Australia), a Director of the Climate Council and a Visiting Professor of Climate Change Law at the Australian National University. He also holds advisory roles as Chair of the NSW Climate Change Council and Governing Board Member of the Renewable Energy and Energy Efficiency Partnership, and is a member of the Wentworth Group of Concerned Scientists.

Martijn chaired the Independent Review Committee of the Victorian Climate Change Act, was formerly Chairman of Low Carbon Australia and for many years chaired TRAFFIC (Oceania).

In 2012, Martijn was awarded a Member of the Order of Australia in recognition of his "service to environmental law, particularly in the area of climate change through contributions to the development of law, global regulation, public policy and the promotion of public debate, and to the community".

Martijn holds a BEc (Hons) from the University of Sydney, LLB Honours from the Australian National University, LLM from the University of Cambridge and studied at the Hague Academy Centre for Studies and Research in International Law and International Relations. He is also a Graduate Member of the Australian Institute of Company Directors.

MS SAMANTHA HOGG

Non-executive member

Start date: April 2018
Board meeting attendance: 6/8 meetings

Samantha Hogg brings more than 25 years of experience in executive management across the resources and road infrastructure sectors as well as broad Australian and international experience in finance, marketing and strategic projects.

Her most recent executive role was as Chief Financial Officer of Transurban Limited during the period that the business grew to become a Top 20 ASX company.

Samantha holds positions on a number of boards, serving as Chair of Tasmanian Irrigation, Chair of TasRail, non-executive Director of Hydro Tasmania, non-executive Director of MaxiTRANS and non-executive Director of Infrastructure Australia.

She resides on a family farm outside of Launceston in Northern Tasmania and is a graduate of the Australian Institute of Company Directors.

MS SUSAN JEANES

Non-executive member

Start date: April 2016, re-appointed April 2018
Board meeting attendance: 8/8 meetings

Susan Jeanes is a consultant at Jeanes Holland and Associates, which assists companies that are developing and promoting the goals of sustainability, particularly in the emerging renewable energy sector.

She has worked closely with the Australian renewable energy and sustainability sectors for more than two decades, most recently in her role as the Chief Executive Officer of the Australian Geothermal Energy Association, the national body representing the Australian geothermal energy industry, and previously as the Chief Executive Officer of the Renewable Energy Generators Australia.

Susan is the Chair of the South Australian Centre for Geothermal Energy Research and the Centre for Energy Technology. Prior to 2002, she worked exclusively in the political area as Advisor to the former Federal Environment Minister Robert Hill on climate change, renewable energy and the urban environment, and serving the Federal Parliament as the Member for Kingston. Susan has tertiary qualifications in politics and environmental studies.

MS MEG MCDONALD

Non-executive member

Start date: April 2016, re-appointed April 2018
Board meeting attendance: 7/8 meetings

Meg McDonald has career experience at senior levels in business and government across the fields of energy and environment.

From 2013 to 2015 she served as Chief Operating Officer of the Clean Energy Finance Corporation. Previously, from 2010 to 2013, Meg was CEO of Low Carbon Australia Limited (LCAL), leading the organisation's development of innovative financial solutions for energy efficiency and investment partnerships for financing projects deploying low emissions technologies. Over three years, LCAL financed more than $80 million in projects valued at more than $270 million. LCAL merged with the CEFC in 2013.

From 2002 to 2010, Meg held roles with the global resources and manufacturing corporation, Alcoa, including as Director, Global Issues, Alcoa Inc. in New York and as Global President of Alcoa Foundation. The Foundation was one of the largest US corporate foundations, managing a fund with assets of more than US$500 million and which made annual grants up to US$50 million across 24 countries in environment, sustainability and social projects.

While in the Australian Public Service from 1978 to 2002, Meg had roles across a variety of portfolios. She served as a senior Australian diplomat, including in Geneva, as Assistant Secretary, Environment and Antarctic Branch, and in the Australian Embassy in Washington as Australia's Deputy Chief of Mission to the United States.

As Australia's Ambassador for the Environment from 1997 to 1998, Meg was Australia's lead negotiator for the Kyoto Protocol and played a key role in shaping those negotiations and other environment treaties.

Meg holds an Honours Degree in Applied Science from the University of NSW and has served on boards and a variety of advisory bodies in Australia and the United States. She is currently a member of the Foreign Investment Review Board.

MS STEPHANIE UNWIN
Non-executive member

Start date: April 2018
Board meeting attendance: 8/8 meetings

Stephanie Unwin is Chief Executive Officer of Horizon Power. She was previously General Manager Transformation and Technology of CBH Group, where she was responsible for information technology and overseeing the transformation of CBH to a low-cost, efficient supply chain from paddock to port. Prior to that she was Chief Executive Officer of Phylogica, a biotech and medical devices company in Western Australia.

Stephanie has significant executive and board-level experience across a variety of sectors, and is a former General Manager Commercial at energy generator and retailer Synergy. During her time at Synergy, Stephanie was responsible for strategy and innovation, modelling and analytics, corporate affairs and communication, policy and regulation, corporate development and continuous improvement.

Stephanie has considerable experience with renewable energy, including being a key negotiator at Synergy and then the General Manager with oversight for the construction and commissioning of the Greenough River Solar Farm and Mumbida Wind Farm. She also conceived of and developed a renewables infrastructure fund to initial commercial close, took the Alkimos Beach Community Battery Storage project through funding to commissioning and into delivery, and developed the company's forward strategy for innovation and renewables.

She was also the Chair and operational Board member for the joint venture companies supplying renewable energy from the solar and wind farms.

MR DOUGAL MCOMISH
Non-executive member

Start date: April 2018
Board meeting attendance: 6/8 meetings

Dougal McOmish has more than twelve years of experience in senior management across the agriculture and financial advisory sectors, as well as large-scale infrastructure project delivery and stakeholder management.

Dougal is a Director of Eco Advisory, a corporate and strategic advisor focused on the food and agribusiness sectors.

Prior to founding Eco Advisory, Dougal was Chief Operating Officer for Sundrop Farms. Sundrop Farms is a world-first A$200 million horticulture and energy infrastructure development, financed by the world's largest private equity investor KKR. As COO of Sundrop Farms Dougal was responsible for the establishment and execution of Sundrop's operational strategy and commercial targets. Prior to Sundrop Farms Dougal spent a decade working in the finance sector as an investment banker, predominantly with Macquarie Group in Australia and Asia.

Dougal's investment banking and project management experience stretches across the infrastructure, utilities, resources and oil and gas sectors, both in Australia and overseas.

He now lives in the Adelaide Hills, and is an economics graduate of the University of Adelaide.

MR FINN PRATT AO PSM

Ex-officio member

Commenced: September 2017
Board meeting attendance: 8/8 meetings
(attended by Mr Pratt or his nominated delegate)

Finn Pratt has a public service career spanning 35 years and during this time he has driven many government priorities. As Secretary of the Department of the Environment and Energy he is responsible for delivering energy market reform, environmental policy priorities such as biodiversity conservation and protecting the Great Barrier Reef.

Finn was appointed Secretary of the Department of the Environment and Energy in September 2017. Before this appointment, he held other senior positions including Secretary of the Department of Social Services (2013-2017), Secretary of the Department of Families, Housing, Community Services and Indigenous Affairs (2011-2013), Secretary of the Department of Human Services (2009-2011) and the Chief Executive Officer of Centrelink (2008-2009).

In these roles, he has been responsible for setting the strategic and corporate directions of each Department and its portfolio and providing senior policy advice to the portfolio Ministers and Assistant Ministers. He is a member of the Jawun Board and was Chair of the Australia and New Zealand School of Government (ANZSOG) from 2014 to 2017.

Finn was awarded a Public Service Medal in 2008 and in 2015 became an Officer of the Order of Australia for distinguished service in public administration, social policy development and service delivery reform, and improving support for people with disability, their families and carers. Finn has a Bachelor of Arts degree from the Australian National University.

MS JO EVANS

Ex-officio member
(Delegate for Mr Finn Pratt AO PSM)

Jo Evans is a Deputy Secretary at the Department of the Environment and Energy. Jo is responsible for Climate Change and Energy Innovation, which includes the Emissions Reduction Fund, international climate programs, ozone and air quality programs and clean energy innovation. Jo is proud to be the Department's Indigenous Champion.

Jo has worked in a number of portfolios including the Department of Agriculture and Water Resources and in the Department of the Prime Minister and Cabinet. Prior to joining the Australian Public Service in 2000, Jo worked for management consultants McKinsey & Company.

Jo has a Masters of Public Policy from the Woodrow Wilson School of Public and International Affairs, Princeton University; a Masters in Environmental Science from the University of Melbourne; and a combined bachelor degree in Asian Studies and Economics (Honours) from the Australian National University.

SENIOR EXECUTIVES

MR DARREN MILLER
Chief Executive Officer

Darren Miller commenced as ARENA's CEO on 27 August 2018. He has more than 25 years' experience across a range of sectors including renewable energy, electricity retail, technology, finance, media and entertainment.

Darren was co-founder and CEO of Mojo Power, an innovative electricity retailer, from 2015 until July 2018. He was previously the Director of Asset Finance at Sungevity Australia in 2014, and co-founder and CEO of Sumwise, a technology and services company from 2007 to 2013. Darren's other previous experience includes a position as investment manager for Publishing and Broadcasting Limited (PBL) and Consolidated Press Holdings (CPH) and roles at New Zealand Natural and Ernst & Young.

Darren is a Graduate of the Australian Institute of Company Directors, and is a Chartered Accountant with a Bachelor of Commerce (Hons) from the University of New South Wales.

MR IAN KAY
Chief Financial Officer

As Chief Financial Officer, Ian Kay leads ARENA's Business Development and Transactions and Finance teams. His focus is on optimising the use of ARENA's grant money to help proponents secure the sponsor equity, third party equity and project finance debt needed to bring projects to financial close.

Ian possesses 20 years' experience leading investment in infrastructure, development and commercialisation of renewable energy projects at Origin Energy and Macquarie Group.

He has particular skill in managing joint venture partnerships and a track record of designing innovative transaction structures. Ian brings a depth of experience to ARENA and has originated, developed and led projects totalling more than $12 billion in enterprise value and $3.7 billion total required equity commitment. He has experience of a broad range of renewable energy projects.

Ian holds a Master of Arts (Honours) in Economic Science from Aberdeen University and is a member of the Institute of Chartered Accountants (England and Wales).

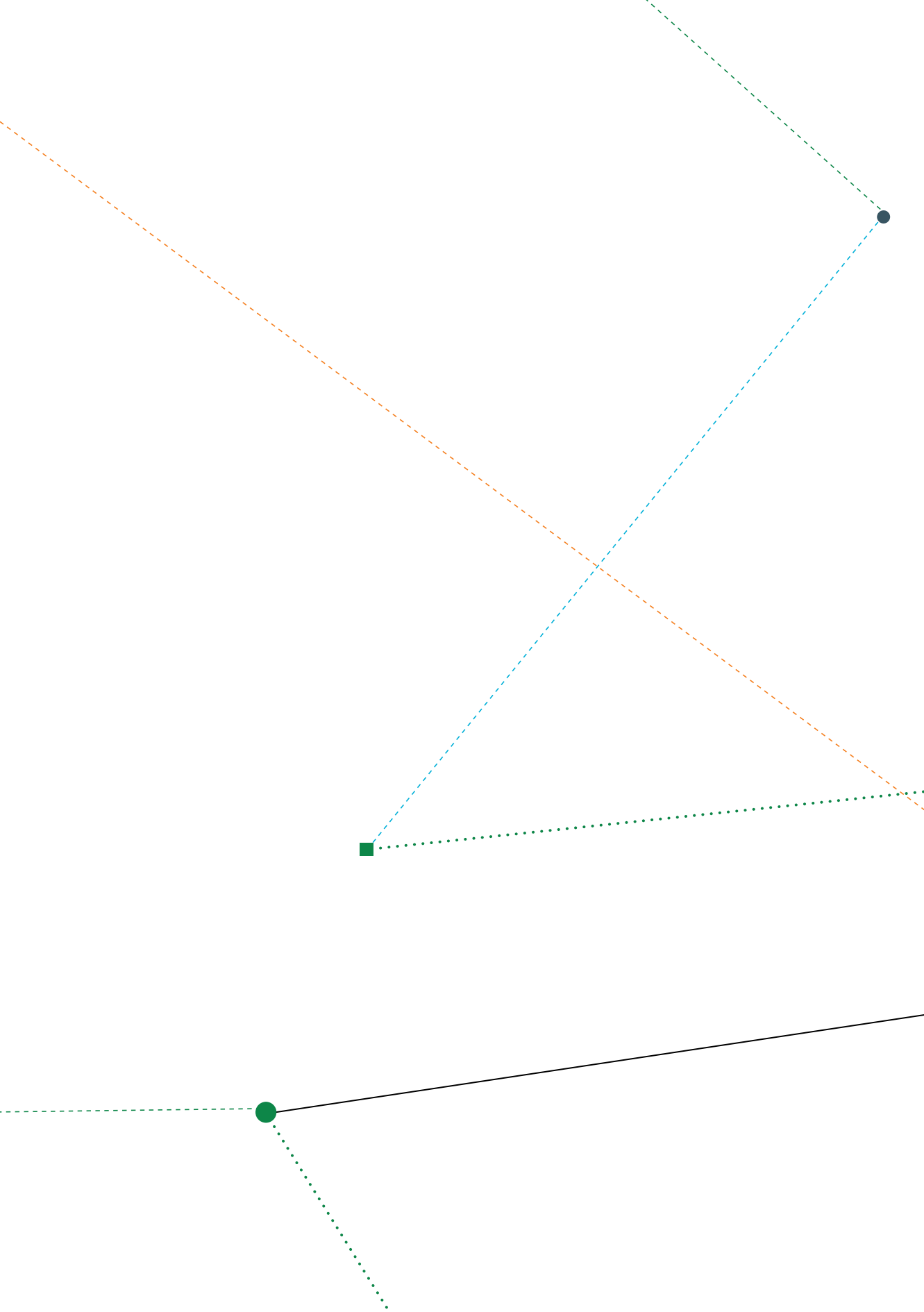
MS NICOLA MORRIS
Chief Operating Officer

Nicola Morris commenced as Chief Operating Officer for ARENA in July 2016. She provides oversight of the Strategy, Human Resources, Information Technology, Corporate Affairs, Legal and Project Delivery teams and leads ARENA's digital transformation agenda.

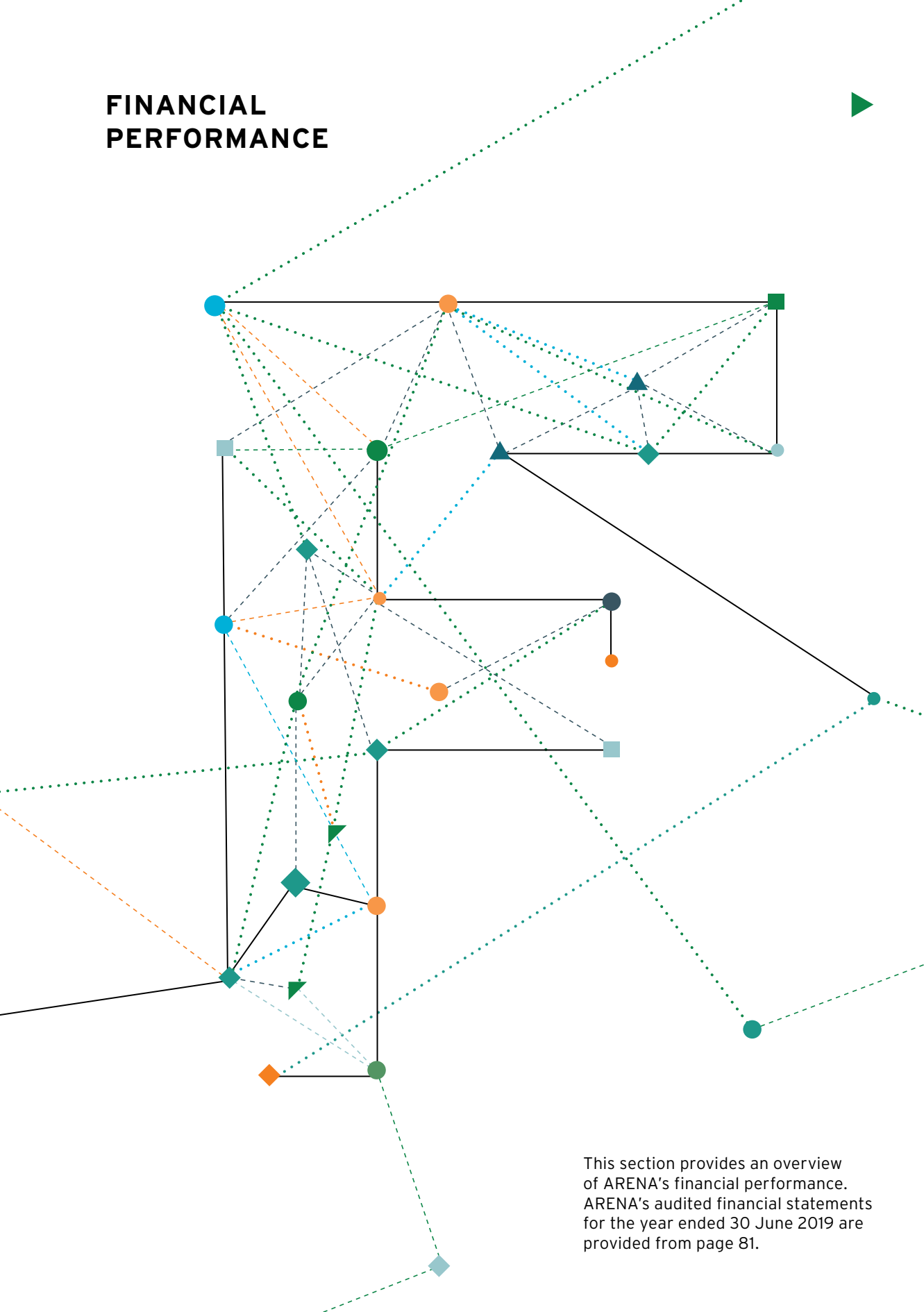
Nicola also worked at ARENA as General Manager and General Counsel until early 2014 and was responsible for the Big Solar team. She was also the head of the ARENA Establishment Team in the lead up to the commencement of ARENA in July 2012.

Nicola was previously Acting Head of Division of Innovation Programs Division – AusIndustry in the Department of Industry, Innovation and Science. She was also General Manager of the Business Management element of the Entrepreneurs' Program.

Previously Chief Lawyer for the Department of Resources, Energy and Tourism, and a lawyer in private practice, Nicola has transitioned to program management, with a particular interest in innovation programs, and the intersection between public sector programs and private sector expertise and delivery models.



FINANCIAL PERFORMANCE



This section provides an overview of ARENA's financial performance. ARENA's audited financial statements for the year ended 30 June 2019 are provided from page 81.

FINANCIAL PERFORMANCE

Operating surplus for the year was $16.8 million.

ARENA has had another busy year and exceeded its 2018-19 project approval target of $280 million. Several projects under negotiation or in the approval process during 2018-19 took longer than expected to reach financial close, which is reflected in the reduction in grant expenses in 2018-19 compared to budget and previous years.

Administration expenses in 2018-19 were in line with the previous year. Part of the administration expenses was funded by the Portfolio Department through the secondment of departmental staff to ARENA. This funding is included in the table below as 'Resources received free of charge'.

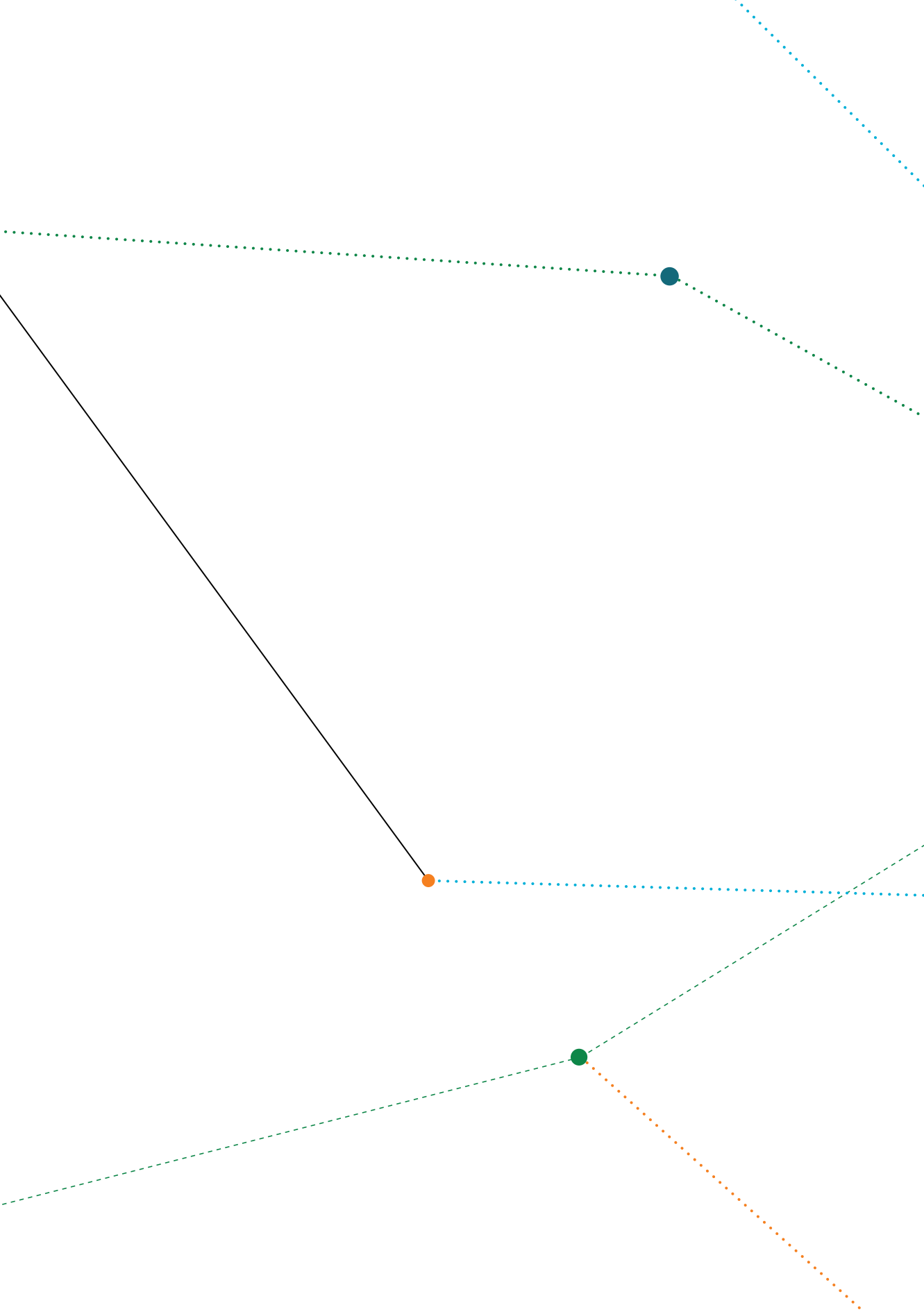
No new investments in the Renewable Energy Venture Capital Fund other than for management fees were made in the year. A loss of $2.4 million in fair value of the investments is reported in the Other Comprehensive Income section.

ARENA is retaining cash returned from grants and investing them in term deposits in accordance with the ARENA Act. The cash reserve is intended to be used to fund operating expenses after 2021-22 when legislated funding ceases.

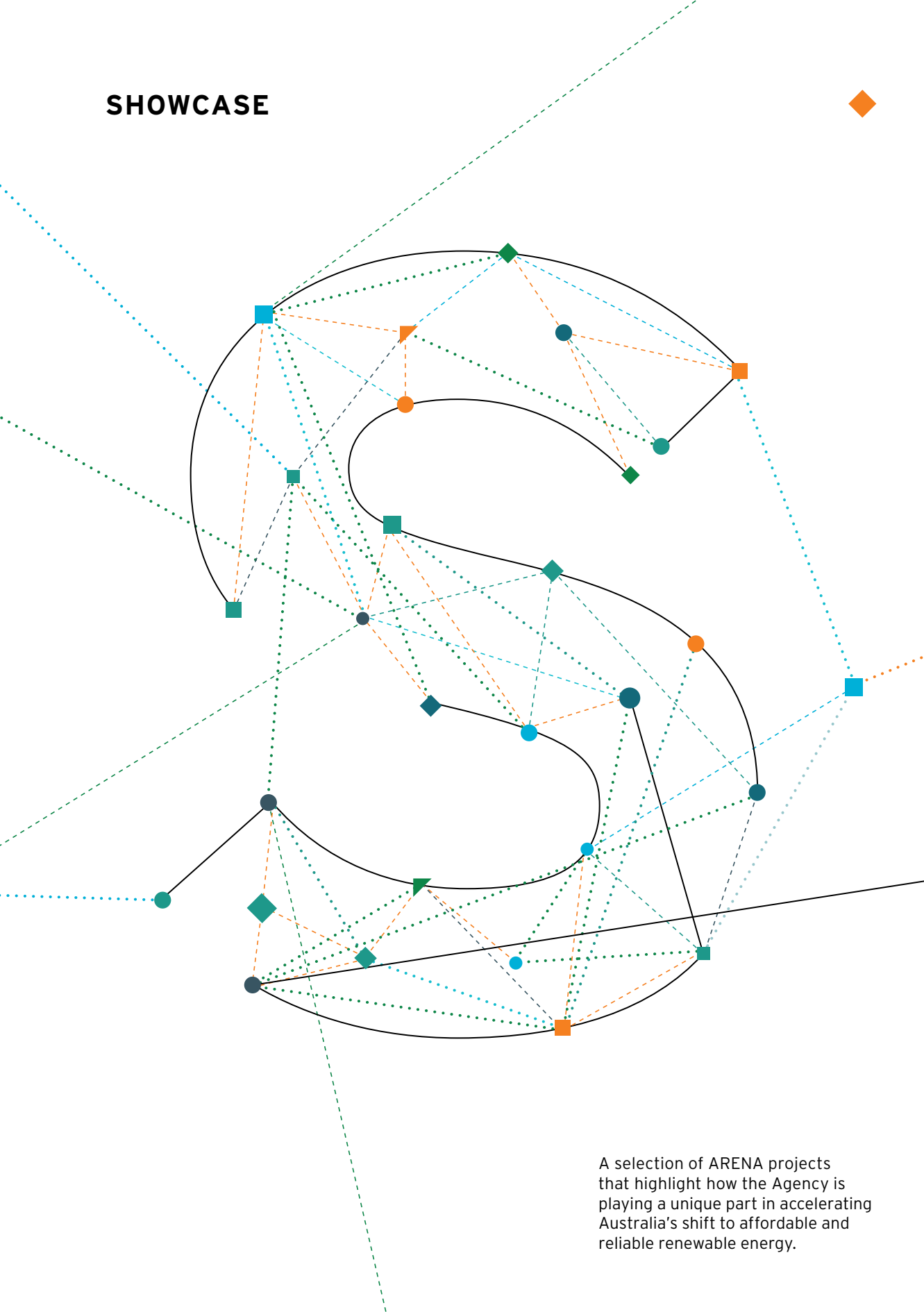
TABLE 1: KEY FINANCIAL RESULTS

	2014-15 $M	2015-16 $M	2016-17 $M	2017-18 $M	2018-19 $M
REVENUE FROM GOVERNMENT	244.4	114.6	192.1	209.1	174.0
RESOURCES RECEIVED FREE OF CHARGE	10.4	8.9	7.3	6.7	5.5
RETURN OF GRANTS	5.2	50.4	2.8	-	5.1
INTEREST AND OTHER INCOME	0.3	0.3	1.2	1.5	1.6
GRANT EXPENSES	**(216.2)**	**(113.0)**	**(160.7)**	**(176.3)**	**(138.7)**
ADMINISTRATION EXPENSES	(20.3)	(25.1)	(28.0)	(30.9)	(30.7)
OPERATING SURPLUS	**23.8**	**36.1**	**14.7**	**10.1**	**16.8**
CASH AND TERM DEPOSITS	0.5	41.7	55.7	56.4	85.6
INVESTMENTS	13.1	19.9	22.5	30.6	29.3
TOTAL EQUITY	34.8	68.6	79.2	89.0	103.3

Image credit: TasNetworks



SHOWCASE



A selection of ARENA projects that highlight how the Agency is playing a unique part in accelerating Australia's shift to affordable and reliable renewable energy.

BUSINESS RENEWABLES CENTRE

INVESTMENT PRIORITY
Improving energy productivity

LEAD ORGANISATION
Climate-KIC Australia

ARENA FUNDING
$500,000

TOTAL PROJECT COST
$1.7 million

LOCATION
NSW

The Business Renewables Centre in Australia (BRC-A) is Australia's first online resource centre and marketplace established to increase renewable energy use within Australian organisations, particularly commercial and industrial energy users.

The goal of the BRC-A project is to help Australian organisations buy 1 gigawatt (GW) of renewable energy by 2022 and 5 GW by 2030 (see Figure 6: How much electricity is a gigawatt?).

The BRC-A is working to streamline and accelerate corporate purchasing of large-scale wind and solar energy and storage by making it easier for businesses to enter the renewable energy market.

It provides energy buyers and developers with online resources, such as a Buyer's Roadmap, to guide them through the procurement process for renewable energy, as well as training and networking opportunities that share the hard-earned lessons of first movers to help new entrants negotiate and execute power purchase agreements (PPAs).

The Centre also offers members access to a new live marketplace for renewable energy, which already has more than 7000 megawatts (MW) of wind and solar listed across 67 separate projects, listed by 30 different renewable energy developers.

HOW THIS PROJECT MAKES A DIFFERENCE

By supporting this project, ARENA is assisting the growing number of Australian organisations that want to use more renewable energy but do not know how to achieve this.

More than 100 organisations have already joined the BRC-A, in addition to the Centre's 71 founding member organisations. The BRC-A focuses on helping such organisations overcome their lack of experience and knowledge of corporate renewable PPAs by providing online resources, training and information sharing.

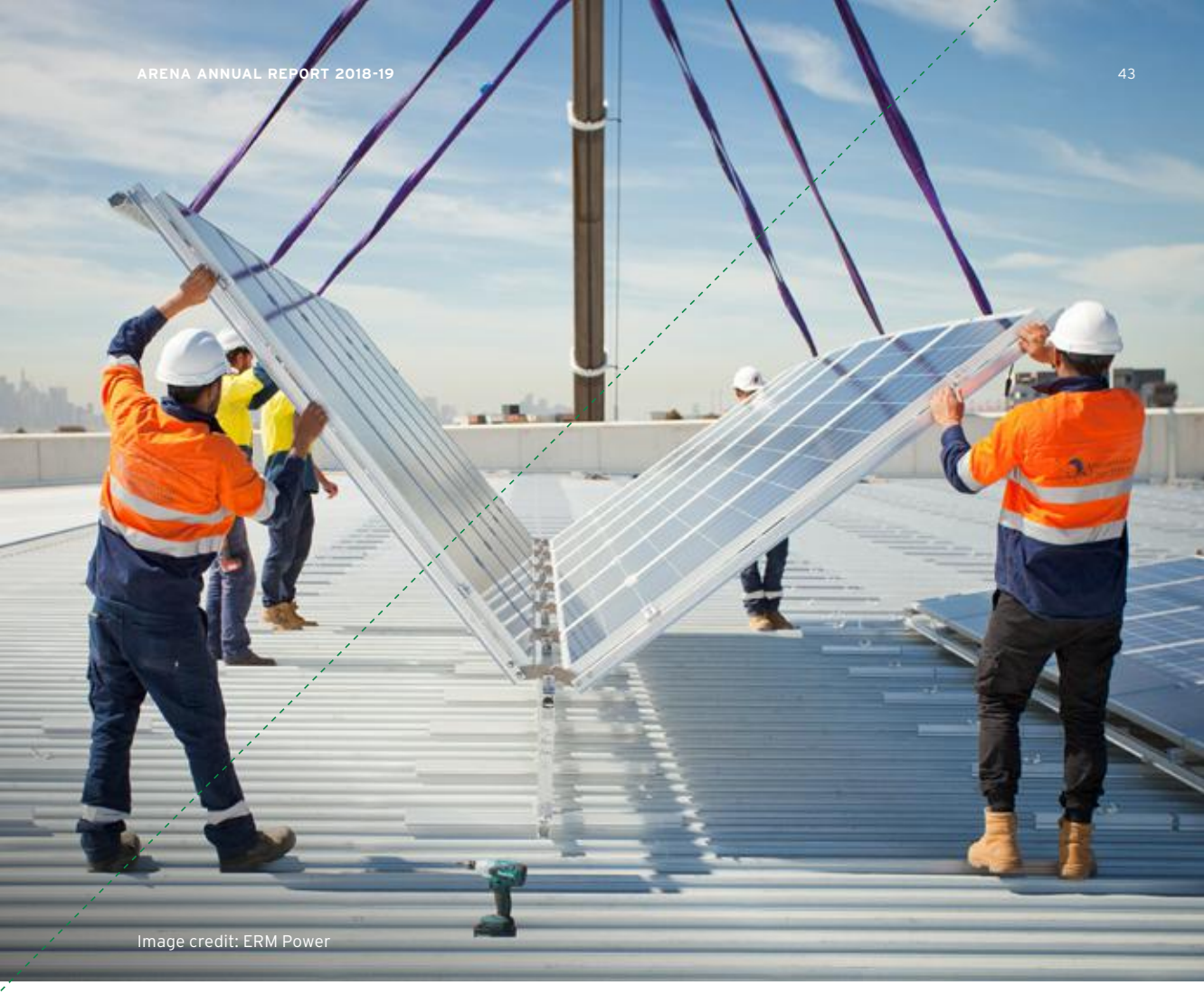


Image credit: ERM Power

FIGURE 6: HOW MUCH ELECTRICITY IS A GIGAWATT?

HOW ELECTRICITY IS MEASURED

WATT (W)	1 WATT	Often seen on packaging for small household products such as light bulbs		A 40 W light bulb uses 40 watts of electricity
KILOWATT (KW)	1000 watts (1 WATT X 1000)	The output of rooftop solar panels is often described in kilowatts		A typical residential solar panel system can produce 3.5 KW of electricity
MEGAWATT (MW)	1 MILLION WATTS (1 KILOWATT X 1000)	The output of a power station is described in megawatts		The Ballarat Energy Storage System can produce 30 MW of electricity
GIGAWATT (GW)	1000 MILLION WATTS (1 MEGAWATT X 1000)	Gigawatts are used to describe large amounts of electricity		Maximum demand for NSW in 2016-17 was 14.7 GW

A kilowatt-hour is the amount of electricity produced or consumed in an hour. A typical Australian home's daily usage is around 17 kWh.

Diagram credit: Australian Energy Market Operator

KWINANA ENERGY FROM WASTE PROJECT

INVESTMENT PRIORITY
Improving energy productivity

LEAD ORGANISATION
Macquarie Capital (Australia) Limited

ARENA FUNDING
$23.0 million

TOTAL PROJECT COST
$696.0 million

LOCATION
Kwinana, WA

Up to a quarter of Perth's post-recycling rubbish will be diverted from landfill to generate energy as a result of the Kwinana Energy from Waste Project, which is currently under construction.

The Kwinana plant will be the first thermal utility-scale energy from waste facility in Australia and is on track to be completed by the end of 2021. It will use non-recyclable materials from local councils in the Perth metropolitan area under long-term waste supply agreements, but also be able to process commercial, industrial, construction and demolition waste.

The moving grate technology used in the facility thermally treats (or heats) the waste and converts the recovered energy into steam to produce electricity. Metallic materials are recovered and recycled, while other byproducts can be reused as construction materials.

Co-developed by Macquarie Capital (Australia) Limited and Phoenix Energy Australia Pty Ltd, the facility will create more than 800 jobs during construction, and more than 60 full-time positions once operational.

HOW THIS PROJECT MAKES A DIFFERENCE

When complete, the Kwinana Energy from Waste facility will divert 400,000 tonnes of household, commercial and industrial waste from landfill each year to generate energy, recover and recycle metals, and re-purpose the remaining ash residue as construction materials.

The facility is expected to reduce carbon dioxide emissions by more than 400,000 tonnes per year, which is equivalent to taking 85,000 cars off the road. It will also export up to 36 MW of electricity to the local grid each year, sufficient to power more than 50,000 households.

Image credit: Macquarie Capital

GOLD FIELDS RENEWABLE HYBRID MICROGRID

INVESTMENT PRIORITY
Delivering secure and reliable electricity

LEAD ORGANISATION
Agnew Gold Mining Company
(part of the Gold Fields Group)

ARENA FUNDING
$13.5 million

TOTAL PROJECT COST
$111.6 million

LOCATION
Goldfields, WA

The Agnew Gold Mine will be the first mine in Australia to be powered by a microgrid using a combination of wind, solar, battery and gas.

The microgrid will consist of five wind turbines in an 18 MW wind farm, a 10,000 panel 4 MW solar farm and a 13 MW / 4 megawatt hour (MWh) Battery Energy Storage System (BESS). Its security and reliability will be reinforced with a 16 MW gas engine power station along with innovative operational practices including the use of predictive solar forecasting technology and dynamic demand-side load management.

Once complete, the microgrid is expected to provide 55 to 60 per cent of the mine's energy requirements, with the potential to meet almost all energy demand at certain times. It is forecast to reduce the mine's carbon emissions by some 40,000 tonnes each year, the equivalent of removing 8700 cars off the road.

Independent power producer EDL will design, construct, own and operate the microgrid to power the Agnew Gold Mine in two stages, under a 10-year agreement with Gold Fields. The first stage, involving a new off-grid power station incorporating gas, diesel generation and solar, is due to be completed by mid-2019. The second stage, including the wind, battery and microgrid system, started construction during 2019 and is due to be completed in 2020.

HOW THIS PROJECT MAKES A DIFFERENCE

This project marks a growing shift in thinking about powering mine sites and will provide a blueprint for other resources companies to deploy similar off-grid energy solutions.

It also helps ARENA continue to build a business case for renewables in mining, which has already been strengthened by other successful projects in the sector such as Rio Tinto's Weipa project and Sandfire Resources' DeGrussa Solar Project.

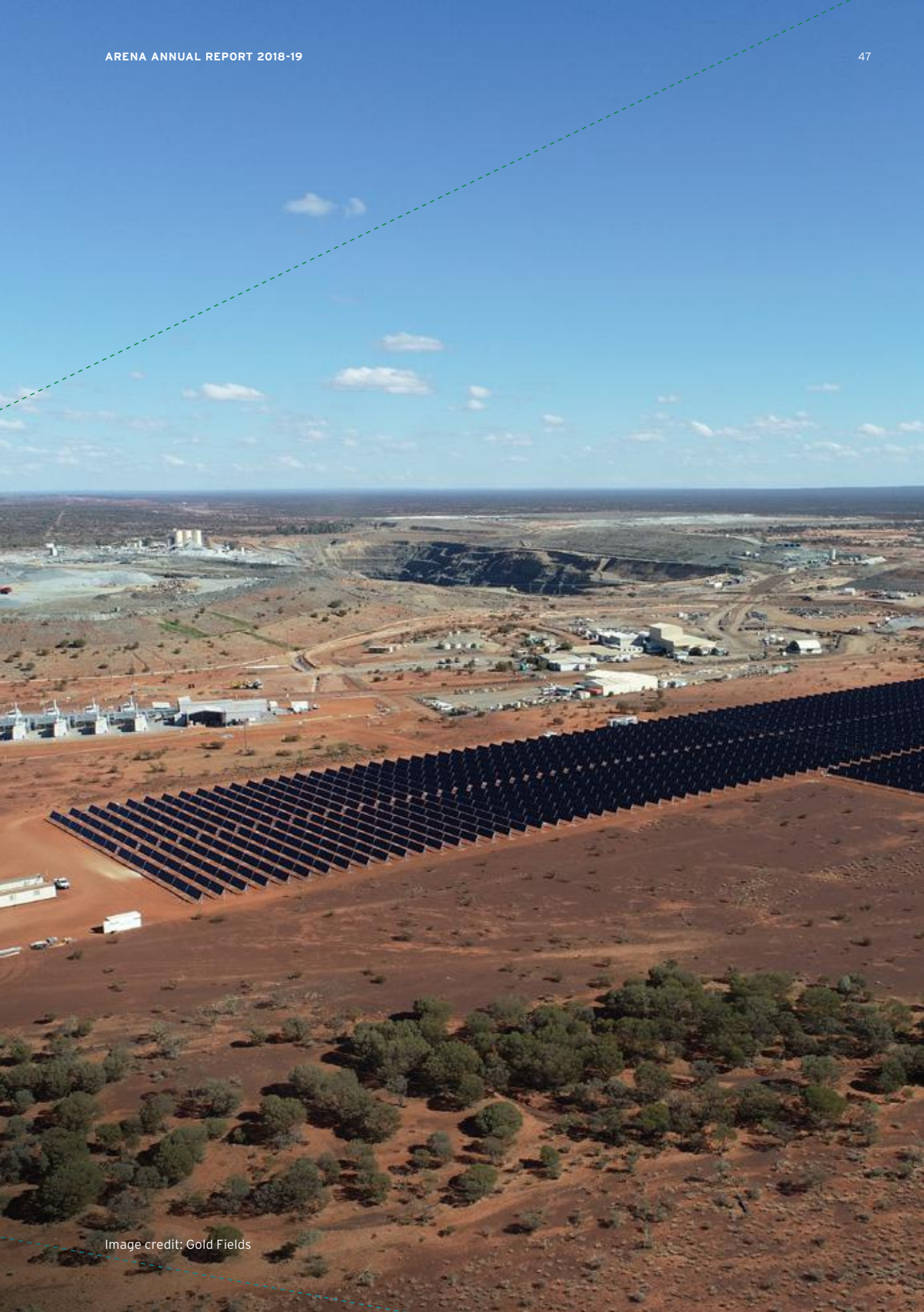


Image credit: Gold Fields

ATCO HYDROGEN MICROGRID

INVESTMENT PRIORITY
Delivering secure and reliable electricity

LEAD ORGANISATION
ATCO

ARENA FUNDING
$1.66 million

TOTAL PROJECT COST
$13.53 million

LOCATION
Jandakot, WA

Australia's first green hydrogen innovation hub has been established in Western Australia to assess the practicality of replacing natural gas with hydrogen at a city-wide scale. The project is testing the production, storage and supply of renewable hydrogen in a commercial-scale microgrid at ATCO's Jandakot facility.

Some of the technical challenges that will be tackled by the project include finding the best hydrogen storage solutions, blending hydrogen with natural gas and using hydrogen as a 'direct fuel' in household gas appliances.

The project includes approximately 1100 solar panels to generate up to 300 kilowatts (kW) of power, which is around 2.5 times the daily electricity requirements of the facility. Batteries store 400 kilowatt hours (kWh) of the solar energy produced, and the excess is used to create the green hydrogen.

The facility has been producing renewable hydrogen since March 2019, piping the gas into two lines for testing. In one line, the hydrogen is blended in low concentrations with natural gas to test how a cooktop, hot water boiler and space heater respond to different proportions of the renewable gas. The other will deliver 100 per cent hydrogen for dedicated hydrogen appliances that will be installed in the future.

In addition to tackling these engineering and technical challenges, the project will explore the economic barriers to hydrogen replacing natural gas in our homes.

HOW THIS PROJECT MAKES A DIFFERENCE

This project could lead to hydrogen being used to store variable renewable energy and becoming more accessible across Australia, providing carbon free energy to cities and towns while leveraging existing natural gas infrastructure.

Image credit: Stock image

JEMENA POWER-TO-GAS DEMONSTRATION

INVESTMENT PRIORITY
Other

LEAD ORGANISATION
Jemena

ARENA FUNDING
$7.5 million

TOTAL PROJECT COST
$11.42 million

LOCATION
Sydney, NSW

Australia's biggest Power-to-Gas (P2G) facility is being constructed in western Sydney for a project that will examine how green hydrogen can be both stored in the gas distribution network and used as a clean fuel for hydrogen fuel cell vehicles.

The P2G facility features a 500 kilowatt (kW) electrolyser that will convert excess solar and wind power into hydrogen. The majority of the hydrogen produced will be injected into the gas network, providing enough energy to meet the cooking, heating and hot-water requirements of approximately 250 homes. A portion of the hydrogen will be used in a gas engine generator to produce electricity that will be exported to the grid, with the remainder stored for use in an onsite Hydrogen Refuelling Station (HRS) for hydrogen fuel cell vehicles.

The five-year trial by Jemena will inject the green hydrogen into the company's large gas distribution network to demonstrate how existing gas pipeline infrastructure can be repurposed to store excess renewable energy.

It will also focus on addressing the technical, regulatory, environmental and economic barriers to the production and use of hydrogen in gas distribution and transmission networks.

HOW THIS PROJECT MAKES A DIFFERENCE

The project will help to support the decarbonisation of Australia's energy market by demonstrating a long-term storage solution for variable renewable energy within gas distribution networks and as a clean fuel for hydrogen vehicles. The successful demonstration of hydrogen storage in existing gas infrastructure is likely to support further investments in renewable energy.

Image credit: Jemena

EXPANSION OF SHOALHAVEN PUMPED HYDRO SCHEME

INVESTMENT PRIORITY
Delivering secure and reliable electricity

LEAD ORGANISATION
Origin Energy Eraring Pty Ltd

ARENA FUNDING
$2.0 million

TOTAL PROJECT COST
$6.8 million

LOCATION
Multiple sites, NSW

The focus of the Shoalhaven Pumped Hydro Expansion project is to increase the nation's sources of dispatchable energy generation, such as pumped hydro, to keep the grid strong and stable.

The Shoalhaven pumped hydro scheme has been delivering electricity since it was commissioned in 1977. It acts like a giant battery, pumping water up to the elevated reservoirs when energy demand and prices are low, to be later released to create electricity when it is most needed. It is able to feed electricity into the grid in as little as three minutes, to either increase supply, improve reliability or smooth out variable renewables in the system.

This project is assessing the technical and commercial feasibility of expanding the Shoalhaven scheme, doubling the support it could provide. Increasing the capacity of the pumped hydro facility from 240 megawatts (MW) to 475 MW would provide enough additional energy to power 80,000 homes.

One unique element of the proposal is that Shoalhaven already has much of the required infrastructure needed for the expansion. The scheme was 'future proofed' when it was originally constructed to allow for more capacity to be added later on, with dams, pipeline easements and transmission connections already in place. This would help the expansion to be developed with lower community and environmental impact and in a shorter timeframe than an entirely new project with the same amount of additional capacity. The full feasibility study is expected to be completed in 2020.

HOW THIS PROJECT MAKES A DIFFERENCE

The ability of pumped hydro to store energy and dispatch it in minutes makes the Shoalhaven scheme a vital part of Australia's transition to renewable energy. The findings from this project will lead the way for other pumped hydro developments to determine how they can best help to deliver secure and reliable electricity.

Image credit: Origin Energy

DISTRIBUTED ENERGY RESOURCES FUNDING ROUND

ARENA FUNDING
$9.6 million

PROJECTS
12

With two million grid-connected solar systems already installed on the roofs of Australian households, and other forms of distributed energy resources (DER) also set to play a key role in shaping the future energy system, ARENA launched a funding round in 2018 for projects that could identify solutions to the nation's DER challenges.

The 12 successful projects and studies will help to solve the challenges of integrating DER into Australia's electricity system.

DER includes behind-the-meter technologies such as rooftop solar, home batteries, inverters, controllable loads (both in homes and commercial / industrial facilities), electric vehicle charging points, smart appliances and systems (such as fridges, air conditioning systems, hot water heaters and pool pumps), as well as relevant enablers such as smart meters and data services.

The results of the funding round were announced in early 2019, with $7.21 million committed to five pilot projects that will trial new ways to maximise the amount of distributed energy that the network can accommodate, while maintaining the stability of the system. A further $2.38 million was allocated to seven studies that will investigate how to successfully integrate 'high penetration' or large amounts of distributed energy into the energy market and grid.

HOW THIS PROJECT MAKES A DIFFERENCE

The 12 projects and studies will help to empower energy consumers by maximising the potential benefits of DER technologies for the households and businesses that own them, while keeping the grid secure.

Image credit: Stock image

CHARGEFOX ELECTRIC VEHICLE CHARGING NETWORK

INVESTMENT PRIORITY
Improving energy productivity

LEAD ORGANISATION
Chargefox

ARENA FUNDING
$6.0 million

TOTAL PROJECT COST
$15.0 million

LOCATION
NSW, QLD, SA, TAS, VIC, WA

This project will develop and construct at least 21 ultra-rapid electric vehicle (EV) charging sites, powered by renewable energy. The sites will be approximately 200 kilometres apart, along major driving routes between Brisbane and Adelaide. Charging stations will also be provided in and around Perth in Western Australia, and in Campbell Town, Tasmania.

The Chargefox network will allow EV drivers to quickly charge their vehicle between major cities when traveling long distances along the east coast of Australia, using an ultra-rapid charging technology that allows an EV to add 200 to 400 kilometres of range in just 15 minutes. This is 15 times faster than typical domestic charging points.

Each of the network's sites will hold at least two DC charging stations and be able to charge all EV models currently available for sale in Australia. The energy to charge the vehicles will be 100 per cent renewable, generated by either onsite solar or contracted with large remotely located solar and wind farms.

The new network may help reduce range anxiety for prospective EV buyers, which, according to consumer studies, is seen as a key issue preventing greater EV adoption. As a result, it may help stimulate the uptake of EV sales in Australia, enabling the ongoing electrification of transport and the opportunity to power it with renewable energy.

HOW THIS PROJECT MAKES A DIFFERENCE

The project will help to put in place infrastructure that provides motorists with more choice in the type of vehicle they drive. The national network of ultra-rapid charging stations will enable EV drivers to confidently drive between Australia's major cities, removing one of the major barriers that limit the adoption of EVs in Australia.

Image credit: Chargefox

TOYOTA ECOPARK HYDROGEN DEMONSTRATION

INVESTMENT PRIORITY
Exporting renewable energy

LEAD ORGANISATION
Toyota Motor Corporation Australia Limited

ARENA FUNDING
$3.07 million

TOTAL PROJECT COST
$7.37 million

LOCATION
Altona, VIC

A decommissioned car manufacturing plant will get a second life as part of this project's green hydrogen transport hub in Melbourne. The Toyota Australia Hydrogen Centre aims to demonstrate that hydrogen is a viable fuel source for transport and for storing renewable energy.

Using solar PV and battery storage, more than 60 kilograms of hydrogen will be produced daily for use in Victoria's first commercial-scale hydrogen vehicle refuelling station infrastructure to fuel passenger vehicles, heavy vehicles and forklifts, and run hydrogen forklifts through warehousing operations.

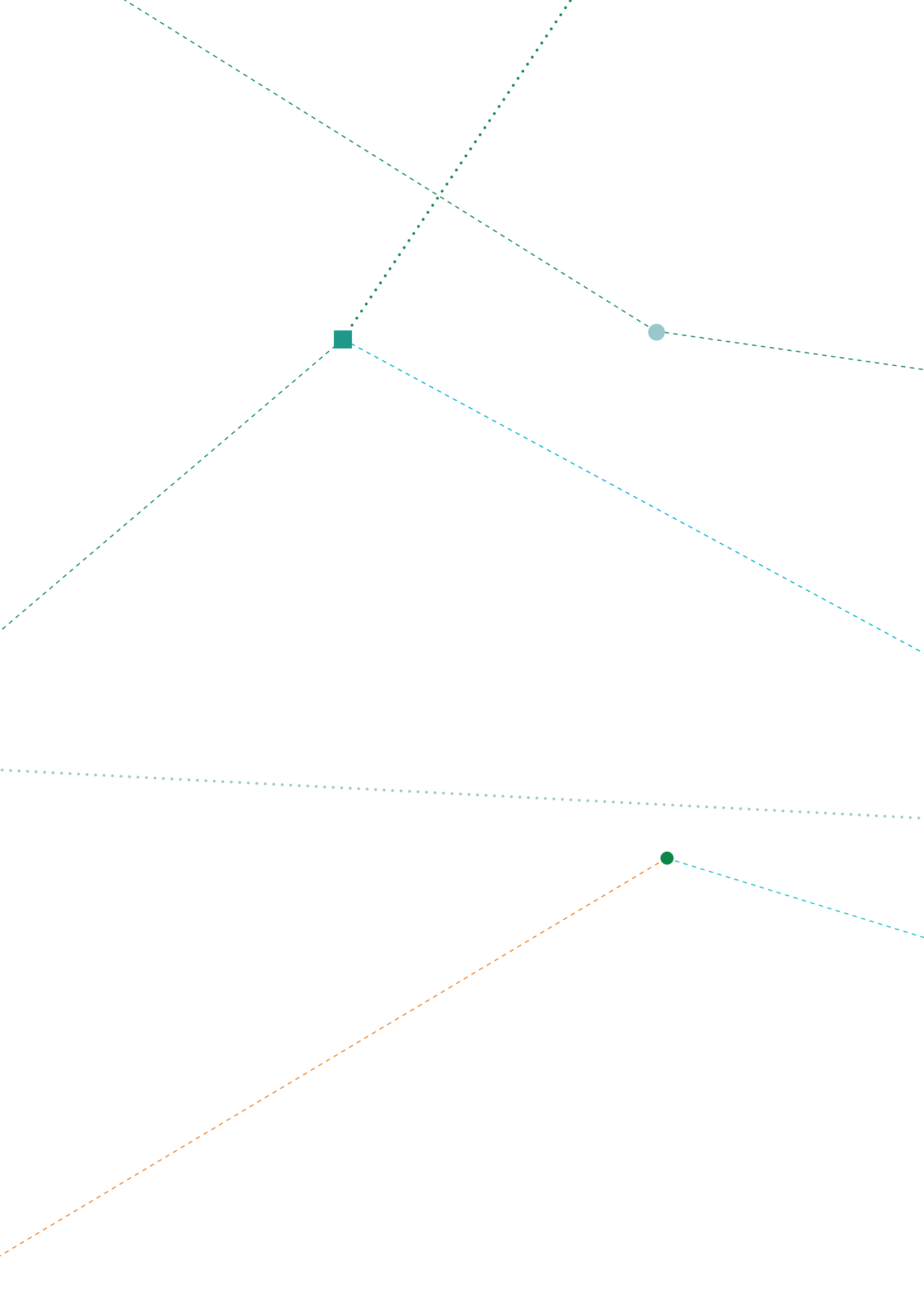
As well as being the first known project in Australia seeking to use renewable energy for hydrogen production and use on a single site, a key deliverable of the project will be the construction and operation of an education centre to promote hydrogen innovation and education.

The education centre will coordinate research activities that address technology development for the safe and cost-effective generation and use of hydrogen, and has been designed to support collaboration between government, technology developers and educators to progress the uptake of renewable hydrogen in Australia.

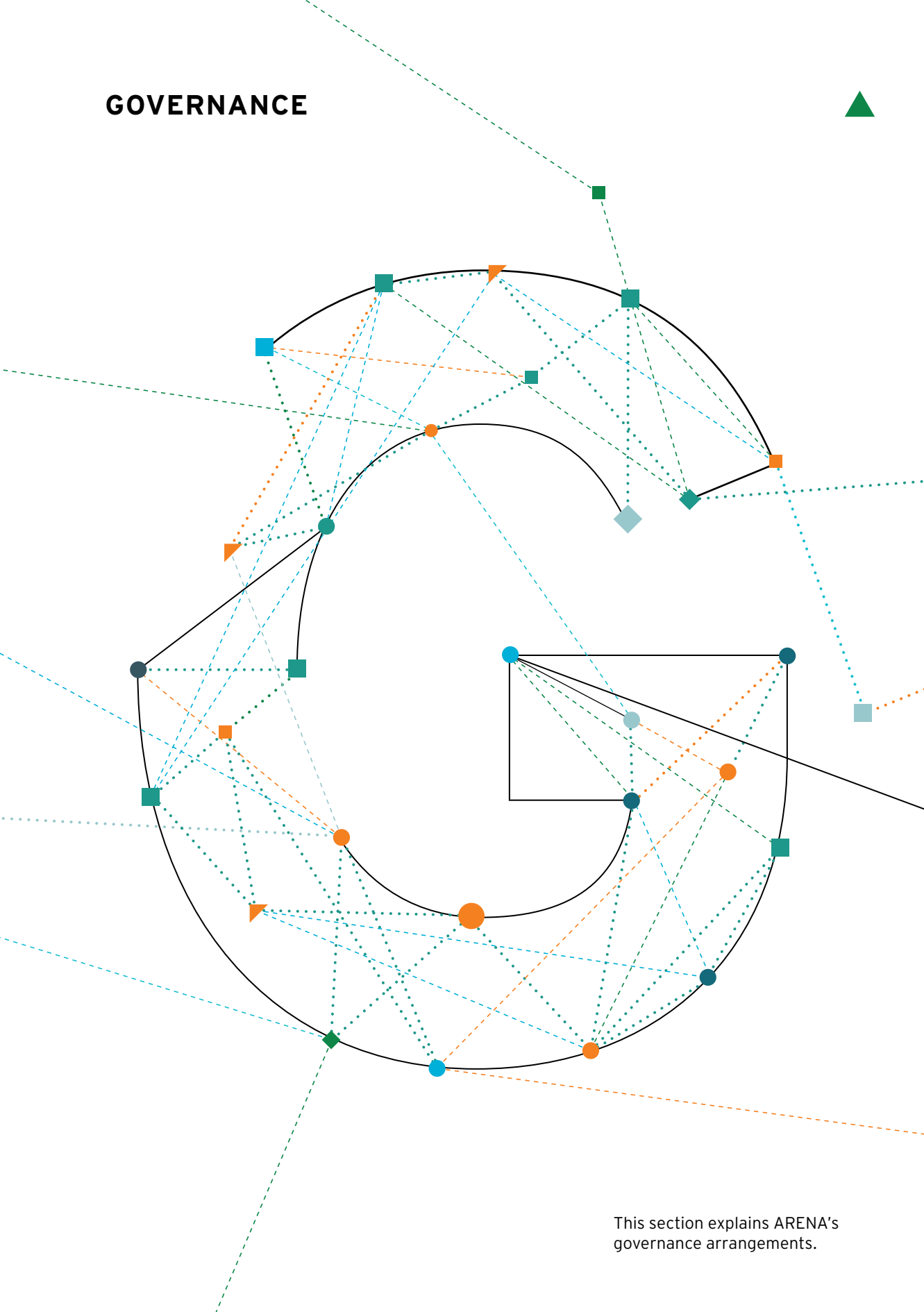
HOW THIS PROJECT MAKES A DIFFERENCE

This project will help to pave the way for more Australian vehicles to be powered by renewable energy by increasing hydrogen education and awareness in Australia, and demonstrating the feasibility of using multiple sources of renewable energy at a single site. The hydrogen refuelling station may also reduce the hurdles facing hydrogen infrastructure deployment.

Image credit: Toyota



GOVERNANCE



This section explains ARENA's governance arrangements.

BOARD GOVERNANCE

The Board's business and meetings were conducted during the reporting period in accordance with the requirements of applicable legislation and in line with best practice. Its members regularly review the Board's operation as part of their responsibility to continually improve the efficiency and effectiveness of governance processes.

There were no key governance events or other activities affecting ARENA during the reporting period.

BOARD COMMITTEES

RISK AND AUDIT COMMITTEE

The Board's Risk and Audit Committee (RAC) was established as a sub-committee of the Board in compliance with section 45 of the PGPA Act. The RAC formally met four times during 2018–19.

The RAC is responsible and accountable to the ARENA Board for the performance of its functions, which are to review and provide written advice as assurance to the Board about the appropriateness of ARENA's financial reporting, performance reporting, system of risk oversight and management, and system of internal control. It also provides a forum for communication between the Board and the internal auditor (Callida Consulting) as well as the external auditor (Australian National Audit Office).

The Board has authorised the RAC, within the scope of its responsibilities, to:

- seek any information that it requires from an ARENA official, consultant or external party (subject to any legal obligation to protect information)
- discuss any matters with the external auditor or other external parties (subject to confidentiality considerations)
- obtain legal or other independent professional advice, as considered necessary to meet its responsibilities, at ARENA's expense and in accordance with its Charter.

RAC members are expected to understand and observe the requirements of the PGPA Act and PGPA Rules.

TABLE 2: MEETING ATTENDANCE OF RAC MEMBERS

RAC MEMBERS 2018-19	ROLE	MEETINGS ATTENDED
Ms Meg McDonald	Board Member	4/4
Ms Samantha Hogg	Board Member	3/4
Ms Jenny Morison	RAC Chair and Independent Member	4/4
Ms Judith Smith	RAC Independent Member (Jul-Nov 2018)	2/2
Ms Karen Hogan	RAC Independent Member (Jan-Jun 2019)	2/2

PEOPLE AND CULTURE COMMITTEE

The People and Culture Committee (PCC) was created as a Board committee under section 48 of the ARENA Act to assist the Board by reviewing, reporting on and, if required, making recommendations to the Board or management on matters relating to human resources, culture and diversity, including the representation of women, compensation policy, and continuity and development of senior management for the Agency.

During the reporting period, the PCC formally met four times.

TABLE 3: MEETING ATTENDANCE OF PCC MEMBERS

PCC MEMBERS 2018-19	ROLE	MEETINGS ATTENDED
Ms Meg McDonald	Board Member and PCC Chair	4/4
Ms Susan Jeanes	Board Member	3/4
Ms Stephanie Unwin	Board Member	4/4
Ms Sonya Clancy	PCC Independent Member until Nov 2018	2/2
Mr Finn Pratt AO PSM	Board Ex-Officio Member or nominated Delegate	4/4

REVIEW IMPLEMENTATION OVERSIGHT COMMITTEE

The Review Implementation Oversight Committee (RIOC) was created as a Board committee under section 48 of the ARENA Act to assist the Board by providing oversight of the implementation of operational improvements following a review.

The RIOC formally met once during the reporting period. The Board dissolved the Committee on 1 November 2018 as it considered the RIOC had achieved its objective.

TABLE 4: MEETING ATTENDANCE OF RIOC MEMBERS

RIOC MEMBERS 2018-19	ROLE	MEETINGS ATTENDED
Mr Martijn Wilder AM	ARENA Chair and RIOC Chair	1/1
Ms Meg McDonald	Board Member	1/1
Ms Jo Evans	Nominated Delegate for Board Ex-Officio Member	1/1

FIGURE 7: ARENA BOARD AND MANAGEMENT COMMITTEES 2018-19

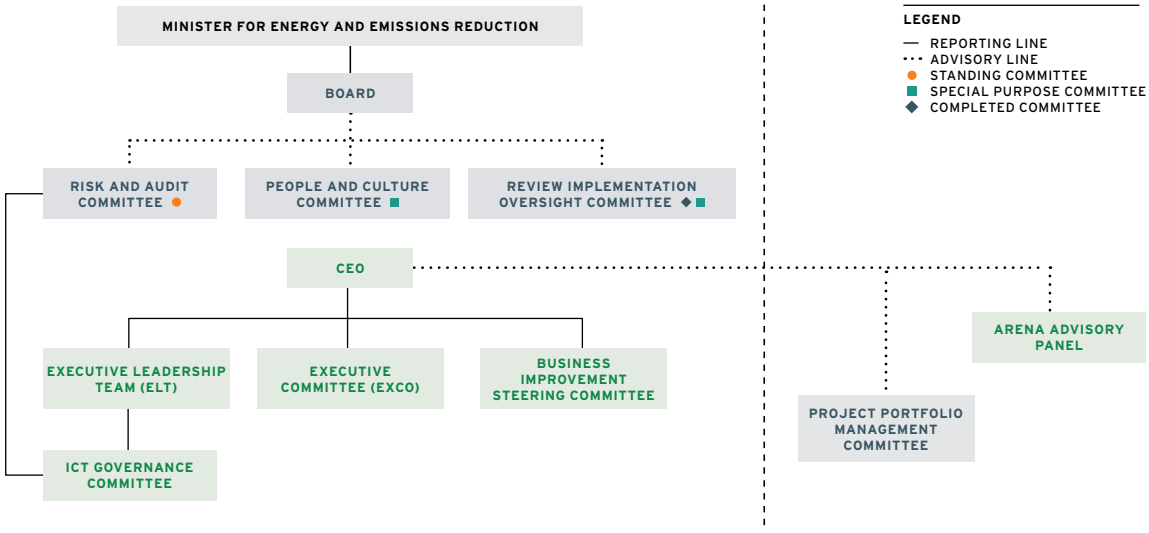


Image credit: ARENA

RISK MANAGEMENT

APPROACH TO RISK

The ARENA Board is ultimately responsible for the operation of ARENA and its management of risk. Effective risk management is an essential part of performance management. While the Board and ARENA executive are ultimately accountable for risk management, it is also the responsibility of all ARENA workers to manage risk.

In 2017, ARENA undertook a comprehensive review of its approach to risk, and adopted an enhanced risk management framework that embeds risk management practices and mitigation measures into all processes and operations.

ARENA's Risk Report, which includes a Risk Appetite Statement, Risk Dashboard and Risk Register, is reviewed regularly by management, the Board and the RAC.

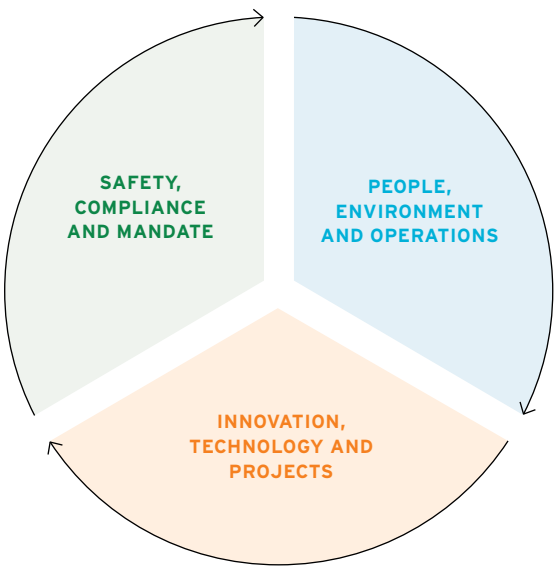
ARENA classifies its risks in three categories, as shown in Figure 8.

Overall ARENA has assessed 15 strategic risks, of which one remains outside the Board's risk appetite and for which additional treatments have been put in place to manage and reduce risk.

ARENA will consider climate risk in future annual reports based on Climate Compass, a climate risk management framework for Commonwealth agencies.

ARENA's RAC provides independent assurance and advice to the Board on ARENA's risk management.

FIGURE 8: ARENA RISK CATEGORIES



CONFLICT OF INTEREST

CONFLICT OF INTEREST POLICY

In 2018–19, the Board continued to manage any conflicts in accordance with its Conflict of Interest policy. The policy sets out:

- the duties in respect to the disclosure of actual or potential conflicts applying to:
  - all ARENA workers, including the Chief Executive Officer and the Chief Financial Officer, consultants, contractors, external service providers and employees of the Department who are made available to ARENA
  - the Board (including committee and advisory panel members)
- how individuals are to discharge their duties under the policy
- how conflict of interest declarations are made and material conflicts managed.

DECLARATION OF CONFLICT OF INTEREST

In accordance with the requirements of ARENA's Conflict of Interest policy, all Board, committee and panel members are required to complete a conflict of interest form upon appointment and on an annual basis. They are also required to provide updated declarations to the Board Secretariat in the event that new conflicts arise or the circumstances of their original notification changes.

PROCESS TO MANAGE CONFLICTS OF INTEREST

The declaration of conflicts is a standing item at all Board and Committee meetings. At least two days prior to the meeting date, the Secretariat circulates to members a list of all entities to be discussed in a material manner in the upcoming meeting. If the member notifies the Secretariat that he or she has a conflict of interest with one of the entities then the declaration is referred to the delegate (ARENA Chair) to determine materiality and, if so, how such a conflict will be managed.

Conflicts are typically managed by excluding the conflicted member from discussions and decisions relating to the paper dealing with the entity with which they have notified a conflict. The ARENA Chair determines the materiality of any conflicts of interests notified by Board members. Conflicts of interest notified by the ARENA Chair are referred to the Minister for determination.

If a conflict arises during the meeting, the matter will be similarly referred to the Chair in order that it can be managed. Probity advice is procured as required as part of this process.

CONFLICT OF INTEREST REGISTER

All conflict declarations, including any management action agreed, are recorded in a conflict of interest register maintained by ARENA's Legal, Governance and Secretariat team.

FRAUD CONTROL

The Agency's fraud control arrangements comply with section 10 of the PGPA Rule.

ARENA's Fraud Control Plan is regularly reviewed by the Board to ensure that ARENA has in place appropriate mechanisms for preventing, detecting incidents of, investigating and otherwise dealing with, and recording of fraud. ARENA has taken all reasonable measures to minimise the incidence of fraud. ARENA's ongoing adherence to the Plan encompasses annual fraud risk assessments. In addition, reporting on fraud is a standard item at all Board and RAC meetings.

Annual fraud awareness training is a mandatory requirement for all of ARENA's workers.

INDEMNITIES AND INSURANCE PREMIUMS OF OFFICERS

During 2018-19, ARENA was a member of the Comcover self-managed fund, which includes cover for directors and officers against liability claims. The premium paid for ARENA's insurance policy was $162,885 (excluding GST).

ARENA has entered into a Deed of Indemnity, Access and Insurance with each Board member (with the exception of the Secretary of the Department) and the CEO of ARENA. The purpose of this deed is to provide Board members with certain document access rights and additional indemnity and insurance coverage.

REMUNERATION

Under the ARENA Act and the *Remuneration Tribunal Act 1973*, remuneration and travel allowances for Board members are determined independently by the Australian Government Remuneration Tribunal.

Table 5 identifies the Remuneration Tribunal Determinations that were applicable during 2018-19, and Table 6 provides the remuneration rates for the reporting period.

TABLE 5: REMUNERATION TRIBUNAL DETERMINATIONS APPLICABLE IN 2018-19

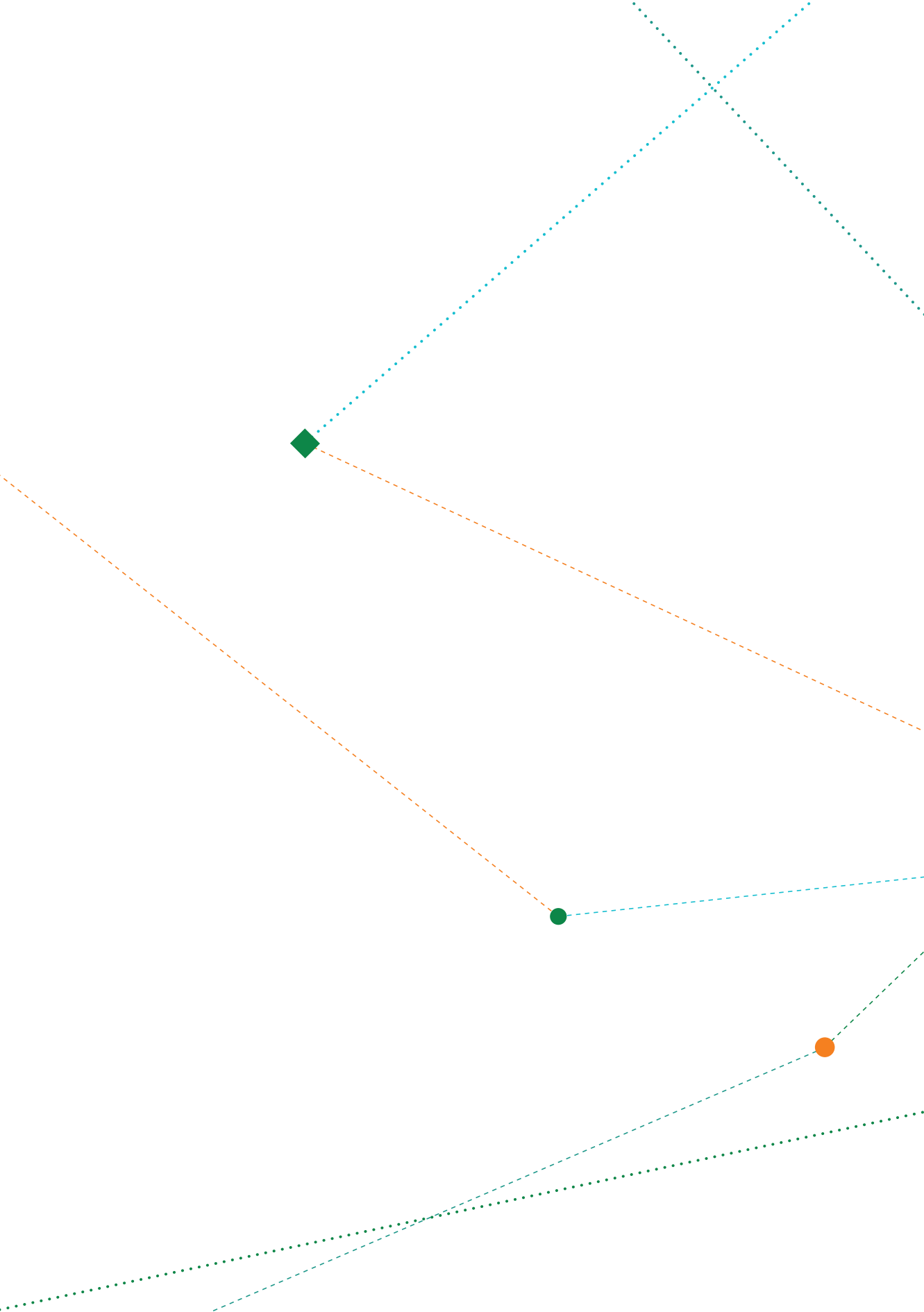
DETERMINATIONS: REMUNERATION AND ALLOWANCES	DATE OF EFFECT
Administration expenses	1 July 2018

DETERMINATIONS: OFFICIAL TRAVEL BY OFFICE HOLDERS	DATE OF EFFECT
Remuneration tribunal (official travel) determination 2018	26 August 2018

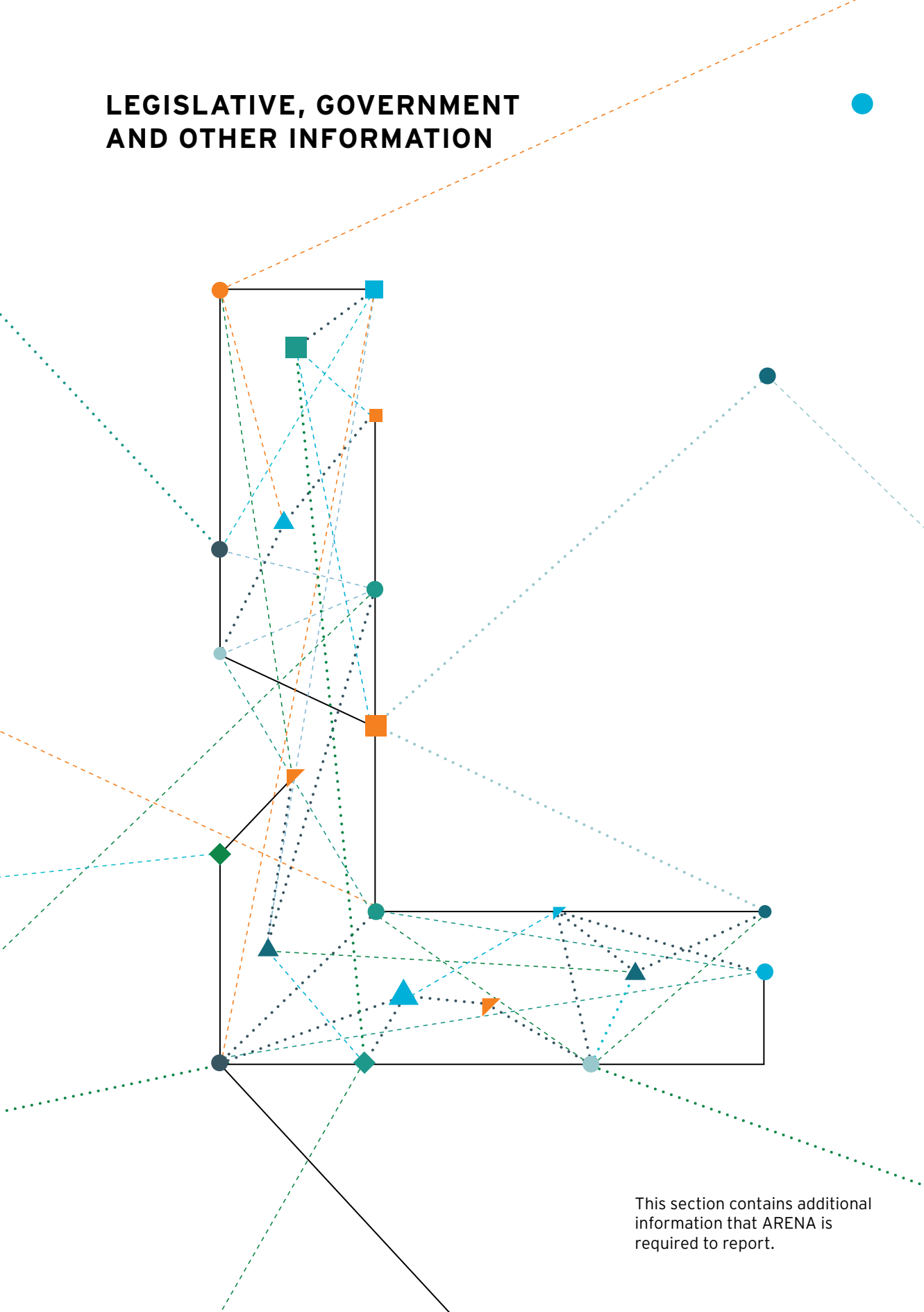
TABLE 6: RATES OF BOARD MEMBER REMUNERATION APPLICABLE IN 2018-19

OFFICE	DAILY RATE
Chair	$1306
Board member	$1045

In addition, superannuation is payable on these amounts at the rate of 9.5 per cent in accordance with the *Superannuation Guarantee Charge Act 1992*. Actual amounts paid to Board members during the reporting period are disclosed in Note 1.1A of the Financial Statements.



LEGISLATIVE, GOVERNMENT AND OTHER INFORMATION



This section contains additional information that ARENA is required to report.

ENABLING LEGISLATION

Our enabling legislation, the *Australian Renewable Energy Agency Act 2011* (ARENA Act), sets out ARENA's objective and function.

OBJECTIVE

The ARENA Act objective is to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia.

FUNCTION

ARENA's functions are to:

- provide financial assistance for:
  - research into renewable energy technologies
  - the development, demonstration, commercialisation or deployment of renewable energy technologies
  - the storing and sharing of information and knowledge about renewable energy technologies
- collect, analyse, interpret and disseminate information and knowledge on renewable energy technologies
- provide advice to the Portfolio Minister on renewable energy and related technologies including:
  - improving the competitiveness of renewable energy technologies
  - increasing the supply of renewable energy in Australia
  - improving the development of skills in the renewable energy technology sector
  - increasing the use of renewable energy technologies
- liaise with State and Territory governments and other authorities to facilitate ARENA renewable energy projects
- any other functions prescribed by regulations or contained in the ARENA Act or other Commonwealth law.

PORTFOLIO MINISTER ENGAGEMENT

During 2018-19, ARENA's Portfolio Ministers were the Hon Josh Frydenberg MP, Minister for the Environment and Energy until 27 August 2018, and the Hon Angus Taylor MP, who was appointed Minister for Energy on 28 August 2018 and subsequently appointed Minister for Energy and Emissions Reduction on 26 May 2019.

MINISTERIAL APPROVAL

The Australian Government included safeguards in the ARENA Act to ensure that ARENA is transparent and accountable in its funding decisions.

Accordingly, the Portfolio Minister must approve ARENA's GFS and any guidelines for programs that could grant funding in excess of $15 million for projects. The Minister must also approve individual projects where grants more than $50 million are to be awarded.

MINISTERIAL REQUESTS AND DIRECTIONS

The Minister made no requests of ARENA under section 11 of the ARENA Act and no directions under section 13 of the Act during 2018–19.

The Minister wrote to the Board in April 2019 requesting that it consider investing in a bioenergy roadmap that quantifies opportunities where Australia has a competitive advantage, and identifies impediments to future growth.

Under section 22 of the PGPA Act, the Finance Minister may make a government policy order that specifies a policy of the Government that is to apply to an agency. No such orders were made that apply to ARENA during 2018–19.

REPORTS TO THE MINISTER

ARENA kept the Minister informed about its operations during the year by providing updates on the Agency's progress towards meeting the objective of the ARENA Act.

It also provided the Minister with reports following each ARENA Board meeting, including key deliberations, meeting outcomes, any material conflicts and significant correspondence.

There were no significant issues reported to the Minister under paragraph 19(1)(e) of the PGPA Act, which includes compliance with Finance law.

ENGAGEMENT WITH OUR STAKEHOLDERS

ARENA SERVICE CHARTER

ARENA aims to provide a high standard of service to all its stakeholders, focusing on the achievement of honest and ethical working relationships that are underpinned by genuine consultation and feedback. As the Agency continues to help drive the development and deployment of renewable energy in Australia, it anticipates an increase in the volume of contact with stakeholders. ARENA aims to continue to deliver professional and timely services to an expanded customer base.

COMPLAINTS HANDLING

ARENA has an established internal complaints and review process. Its complaints policy is published on the ARENA website, and provides for reviews of ARENA decisions and complaints about service quality to be resolved fairly. ARENA's complaint-handling policy was recently reviewed and updated. Information on the complaints and review process is available at arena.gov.au/making-a-complaint.

FREEDOM OF INFORMATION

Australian Government entities that are subject to the *Freedom of Information Act 1982* (FOI Act) are required to publicly publish information as part of the Information Publication Scheme. All ARENA publications covered by the scheme are accessible from the ARENA website at arena.gov.au.

There were five requests for information related to ARENA under the FOI Act received in 2018-19. Information on how to make a request under the FOI Act is available on the Department of the Environment and Energy's website at environment.gov.au/about-us/freedom-information.

Contact details are:
FOI Contact Officer
Department of the Environment and Energy
GPO Box 787 CANBERRA ACT 2601
Email: foi@environment.gov.au
Phone: 02 6274 2098

PUBLIC INTEREST DISCLOSURE

ARENA has a Public Interest Disclosure Procedure to address disclosures under the *Public Interest Disclosure Act 2013*. No disclosures were made in 2018–19.

ENVIRONMENTAL PERFORMANCE

Section 516A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires Commonwealth entities and Commonwealth companies such as ARENA to report on:

- how the activities of, and the administration (if any) of legislation by, ARENA during the period accorded with the principles of ecologically sustainable development (ESD)
- how the outcomes (if any) specified for ARENA in an Appropriations Act relating to the reporting period contribute to ESD
- the effect of ARENA's activities on the environment
- any measures ARENA is taking to minimise the impact of its activities on the environment
- the mechanisms, if any, for reviewing and increasing the effectiveness of those measures.

Table 7 provides this information.

TABLE 7: ARENA'S ENVIRONMENTAL PERFORMANCE

REPORTING CRITERIA	PERFORMANCE
Accordance with and contribution to ecologically sustainable development (ESD), including the development and implementation of policies, plans, programs and legislation	ARENA is specifically tasked with facilitating research, development, demonstration and deployment of renewable energy technologies with a view to driving the commercialisation and reducing the cost of renewable energy. ARENA's policies, plans and programs all accord with and contribute to the ESD principles by: • helping to foster the long-term sustainability of Australia's energy sector while promoting the reduction of energy-related greenhouse gas emissions • taking into account economic, environmental and social considerations when developing renewable energy measures.
Environmental performance, including the impact of the agency's activities on the natural environment, how any impacts are mitigated and how they will be managed	ARENA's accommodation and facilities arrangements are supported by the Portfolio Department. The Department operates under the Energy Efficiency in Government Operations policy, which aims to reduce the energy consumption of government operations, with particular emphasis on the energy efficiency of buildings. The Department's Property and Security section works closely with the ARENA corporate team to provide supporting information on ARENA's intended and/or ongoing property and security arrangements. This has ensured ARENA meets its property and security obligations within government (i.e. whole-of-government property changes from the Department of Finance) or through regulatory processes (e.g. changes to the Building Code 2016). For the duration of 2018–19, ARENA's Canberra offices were located in the NewActon Nishi Building. The offices in the Nishi Building have a six-star Green Star Design rating and NewActon Nishi is considered to be Canberra's most sustainable mixed use building complex. Some renewable energy projects may have environmental impacts. ARENA takes a risk-based approach to identifying and managing potential environmental impacts from the projects it funds.

JUDICIAL DECISIONS AND REVIEWS BY OUTSIDE BODIES

ARENA was advised by the Australian National Audit Office that it would be the subject of a Performance Audit, which commenced in June 2019. The objective of the Audit is to assess the effectiveness of grant program management by ARENA.

To form a conclusion against this objective the following criteria will be applied:

- does grant project selection support the achievement of ARENA's objectives
- are grant funding agreements managed effectively
- does evaluation of grant programs indicate that ARENA is achieving its outcomes.

The ANAO will conduct field work from June to December 2019 with the Audit report expected to be presented for tabling in the August 2020 session of the Parliament. At the time of preparation of this Annual Report the Audit was underway and progressing to schedule.

During 2018–19 ARENA was not subject to any judicial decisions or reviews by administrative tribunals, the Commonwealth Ombudsman or the Office of the Australian Information Commissioner.

ARENA received an unqualified audit report on its financial statements for 2018–19. The Auditor-General's independent report is presented in the Financial Statements section of this annual report.

LEGAL EXPENDITURE

Legal services are provided by a small team of lawyers comprised of junior lawyers provided from a law firm, with more senior level services provided by sole practitioner firms. Legal services are generally only outsourced where transactions involve complex project finance arrangements and this process is managed by the General Counsel. During 2018–19 ARENA incurred $1,907,132 (excluding GST) in external legal services expenditure. ARENA will report the expenditure to the Office of Legal Services Coordination in accordance with the Legal Services Directions 2017.

MATERIAL MATTERS

ARENA did not have any 'material' matters disclosed in the financial statements as defined in paragraph 7 of the Public Governance, Performance and Accountability (Financial Reporting) Rule 2015.

RELATED ENTITY TRANSACTIONS

Refer to Note 3.3 in the Financial Statements section.

SERVICE LEVEL AGREEMENT

The Portfolio Department provides corporate support for ARENA's day-to-day operations, with a service level agreement setting out the services to be provided by the Department to ARENA along with the applicable services standard. The service level agreement is subject to annual review.

SUBSIDIARIES

ARENA did not have any subsidiaries during 2018-19.

WORKFORCE

ARENA is a dynamic and outcomes-oriented agency, with a highly qualified and experienced workforce. Our aim is to be agile, with the ability to respond quickly to any changes in our operating environment.

VALUES

The Agency has a strong commitment to modelling its values (see page 20) and significant efforts have been made in the reporting period to embed them into ARENA's organisational culture. This has been accomplished through a variety of initiatives such as values-based recognition awards and through regular ARENA-wide communication.

EMPLOYEES AND OTHER STAFF

ARENA has two employees, as stipulated by the ARENA Act. These are the Chief Executive Officer (CEO) and Chief Financial Officer (CFO).

Other ARENA staff are employed by the Portfolio Department under the *Public Service Act 1999* and made available to ARENA by the Secretary of the Department. The Agency also engages specialist consultants, contractors and service providers as necessary.

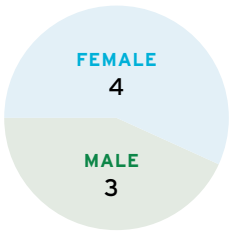
At 30 June 2019, ARENA had two employees (CEO and CFO) and 28 departmental staff (26.4 FTE) including staff in non-ongoing positions.

DIVERSITY

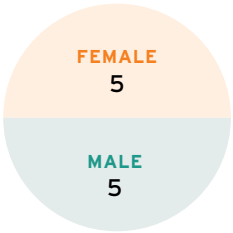
For the reporting period, the gender ratio for the ARENA Board and senior personnel within ARENA was:

- of the seven Board members, four were female (this number increased to five when the nominated delegate for the Secretary of the Department attended Board meetings on his behalf)
- of the ten personnel in ARENA's Executive Leadership Team (excluding the CEO), five were female.

BOARD MEMBERS



EXECUTIVE LEADERSHIP TEAM



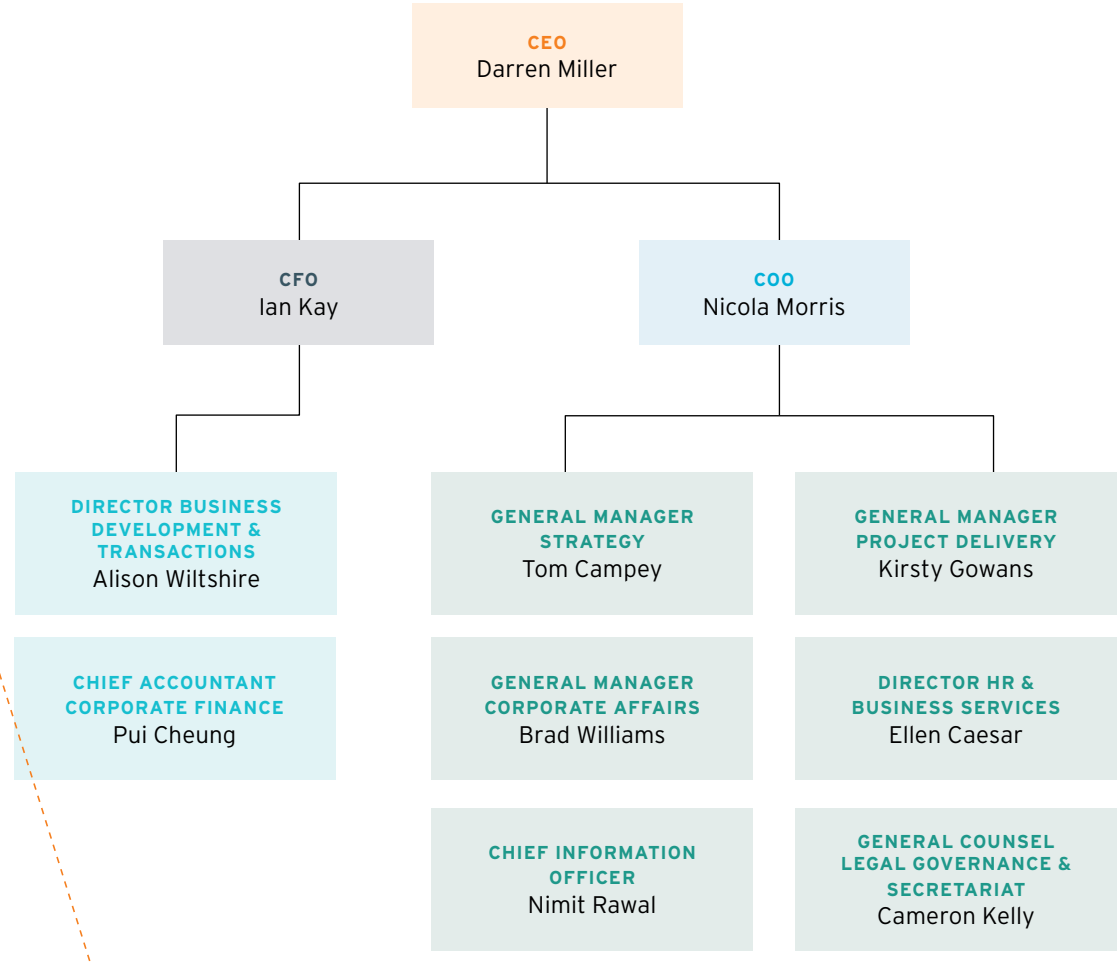
ENGAGEMENT

The 2019 ARENA People Pulse survey received a high response rate with 99 per cent of the workforce responding to the survey (an increase from 95 per cent the year before). Over the past 12 months, ARENA has increased management focus on its people and launched initiatives focused on career development and progression, engagement and leadership, resulting in a consistently high engagement score.

PLANNING

Significant work has occurred over the past 12 months implementing a strategic workforce plan, which has enabled ARENA to more effectively manage its workforce. The strategic workforce plan has informed the way recruitment is managed and facilitated a more active approach to positioning ARENA's workforce for future changes. Engagement with management and the broader workforce has allowed for greater awareness of the size and shape of the workforce required to deliver ARENA's business objectives.

FIGURE 9: ARENA ORGANISATIONAL STRUCTURE AT 30 JUNE 2019



WORK HEALTH AND SAFETY

In accordance with the *Work Health and Safety Act 2011* (WHS Act), ARENA aims to ensure - so far as reasonably practicable - the health and safety of the workforce (who are engaged by us or whose work is influenced or directed by us) and other persons who may be put at risk by work carried out as part of the conduct of ARENA's business or undertaking.

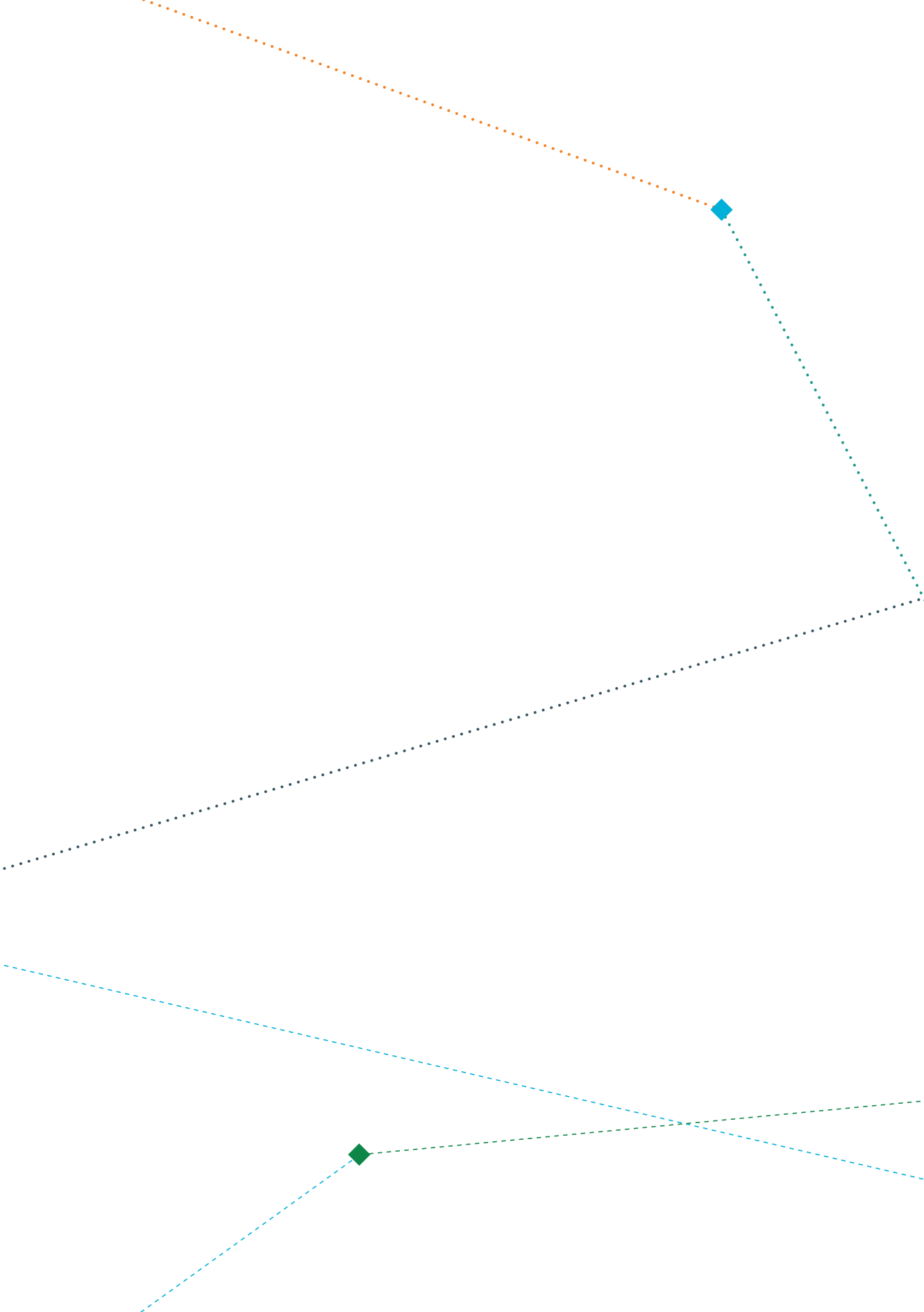
ARENA considers health and safety throughout the lifecycle of the funding process and its officials promote a positive safety culture at ARENA. The Board closely monitors health and safety in both the projects it supports and in ARENA workplaces.

With respect to funded projects, ARENA's standard agreement provides that recipients are to comply with and actively manage WHS risks; it further contains reporting and notification obligations with respect to WHS incidents.

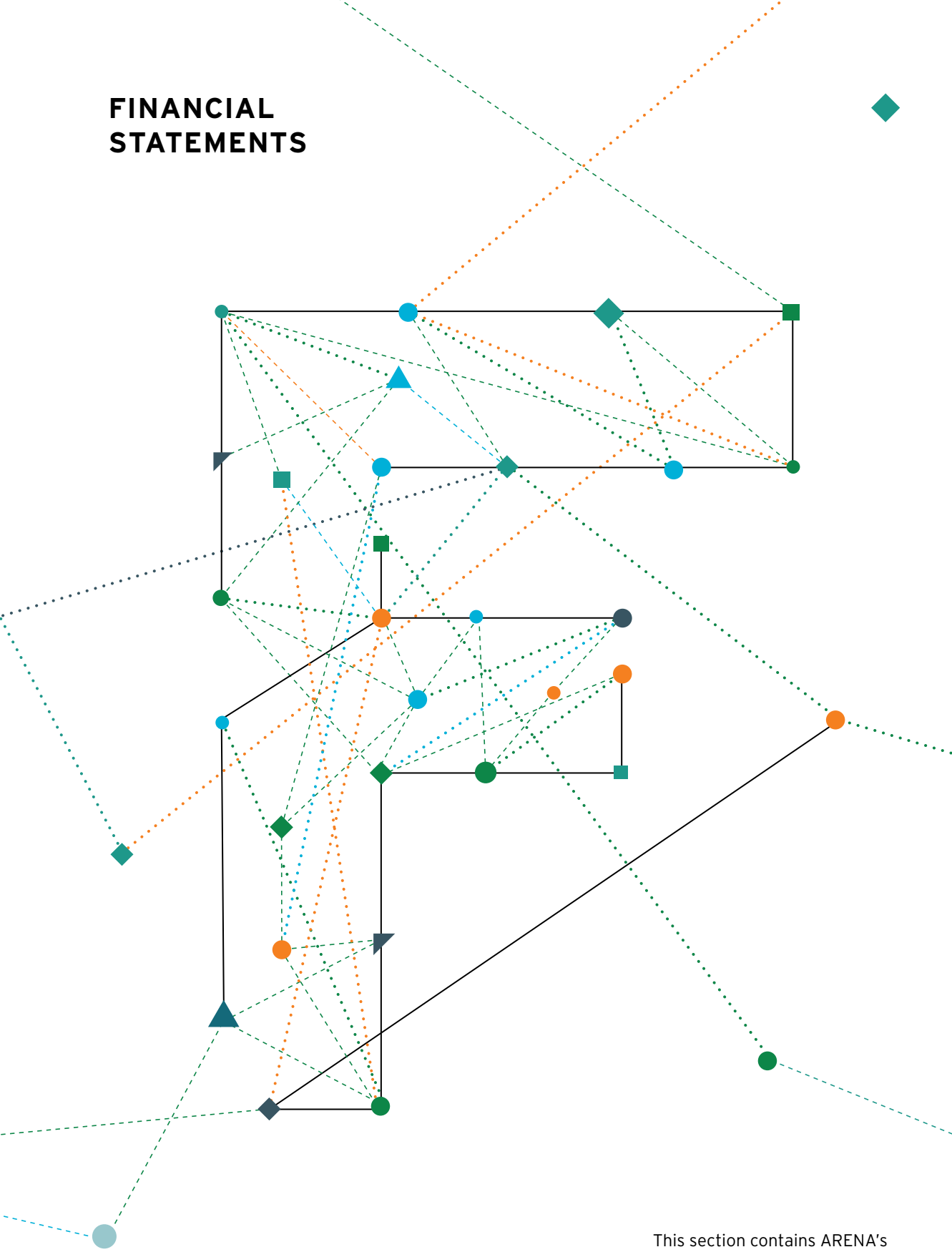
The health and safety of ARENA's workforce during day-to-day operations is safeguarded through ARENA's Work Health and Safety Management System, while also supported by the Portfolio Department.

In respect of ARENA workers, no investigations were conducted and no notifiable incidents were reported during 2018–19. Reporting in respect of Departmental staff made available to ARENA is covered in the Department of the Environment and Energy's Annual Report 2018–19.

Image credit: ARENA



FINANCIAL STATEMENTS



This section contains ARENA's audited financial statements for the year ended 30 June 2019.

Australian National Audit Office

INDEPENDENT AUDITOR'S REPORT

To the Minister for Energy and Emissions Reduction

Opinion

In my opinion, the financial statements of Australian Renewable Energy Agency ('the Entity') for the year ended 30 June 2019:

(a) comply with Australian Accounting Standards – Reduced Disclosure Requirements and the *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015*; and

(b) present fairly the financial position of the Entity as at 30 June 2019 and its financial performance and cash flows for the year then ended.

The financial statements of the Entity, which I have audited, comprise the following statements as at 30 June 2019 and for the year then ended:

- Statement by the Board, Chief Executive and Chief Financial Officer;
- Statement of Comprehensive Income;
- Statement of Financial Position;
- Statement of Changes in Equity;
- Cash Flow Statement; and
- Notes to the financial statements, comprising a Summary of Significant Accounting Policies and other explanatory information.

Basis for opinion

I conducted my audit in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards. My responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of my report. I am independent of the Entity in accordance with the relevant ethical requirements for financial statement audits conducted by the Auditor-General and his delegates. These include the relevant independence requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* (the Code) to the extent that they are not in conflict with the *Auditor-General Act 1997*. I have also fulfilled my other responsibilities in accordance with the Code. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Accountable Authority's responsibility for the financial statements

As the Accountable Authority of the Entity, the Board of Directors is responsible under the *Public Governance, Performance and Accountability Act 2013* (the Act) for the preparation and fair presentation of annual financial statements that comply with Australian Accounting Standards – Reduced Disclosure Requirements and the rules made under the Act. The Board is also responsible for such internal control as the Board determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board is responsible for assessing the ability of the Entity to continue as a going concern, taking into account whether the Entity's operations will cease as a result of an administrative restructure or for any other reason. The Board is also responsible for disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the assessment indicates that it is not appropriate.

GPO Box 707 CANBERRA ACT 2601
19 National Circuit BARTON ACT
Phone (02) 6203 7300 Fax (02) 6203 7777

Auditor's responsibilities for the audit of the financial statements

My objective is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the Australian National Audit Office Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with the Australian National Audit Office Auditing Standards, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

- identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Entity's internal control;
- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Accountable Authority;
- conclude on the appropriateness of the Accountable Authority's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Entity's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Entity to cease to continue as a going concern; and
- evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with the Accountable Authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

Australian National Audit Office

Peter Kerr

Executive Director

Delegate of the Auditor-General

Canberra

18 September 2019

CONTENTS

Australian Renewable Energy Agency

STATEMENT BY THE BOARD, CHIEF EXECUTIVE AND CHIEF FINANCIAL OFFICER

In our opinion, the attached financial statements for the year ended 30 June 2019 comply with subsection 42(2) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act), and are based on properly maintained financial records as per subsection 41(2) of the PGPA Act.

In our opinion, at the date of this statement, there are reasonable grounds to believe that the Australian Renewable Energy Agency will be able to pay its debts as and when they fall due.

This statement is made in accordance with a resolution of the directors.

Martijn Wilder AM	Darren Miller	Ian Kay
Chair of the Board	Chief Executive Officer	Chief Financial Officer
18 September 2019	18 September 2019	18 September 2019

Statement of Comprehensive Income

for the period ended 30 June 2019

	Notes	2019 $'000	2018 $'000	Original[1] Budget $'000
NET COST OF SERVICES				
Expenses				
Employee benefits	1.1A	**1,095**	1,068	1,400
Suppliers	1.1B	**28,984**	28,965	34,706
Grants	1.1C	**138,692**	176,327	279,177
Depreciation and amortisation	2.2	**601**	537	998
Finance Costs		**10**	-	-
Write-down and impairment of assets		**-**	293	-
Total expenses		**169,382**	207,190	316,281
Own-source revenue				
Interest	1.2A	**1,621**	1,476	2,200
Other revenue	1.2B	**10,552**	6,737	5,976
Total own-source revenue		**12,173**	8,213	8,176
Net cost of services		**(157,209)**	(198,977)	(308,105)
Revenue from Government	1.2C	**173,963**	209,073	313,406
Surplus on continuing operations		**16,754**	10,096	5,301
OTHER COMPREHENSIVE INCOME				
Items not subject to subsequent reclassification to net cost of services				
Increase in asset revaluation reserve		**-**	(238)	-
Decrease in the value of investment	2.1C	**2,388**	584	-
Total other comprehensive income		**2,388**	346	-
Total comprehensive income		**14,366**	9,750	5,301

The above statement should be read in conjunction with the accompanying notes.

[1] ARENA's budget as published in the 2018-19 Portfolio Budget Statements.

Statement of Financial Position

as at 30 June 2019

	Notes	2019 $'000	2018 $'000	Original[1] Budget $'000
ASSETS				
Financial assets				
Cash and cash equivalents	2.1A	**85,584**	56,389	61,603
Trade and other receivables	2.1B	**2,875**	2,546	2,586
Investments	2.1C	**29,349**	30,641	34,318
Total financial assets		**117,808**	89,576	98,507
Non-financial assets				
Leasehold improvements	2.2	**1,586**	1,734	-
Plant and equipment	2.2	**278**	128	867
Computer software	2.2	**-**	-	2,420
Prepayments		**288**	405	317
Total non-financial assets		**2,152**	2,267	3,604
Total assets		**119,960**	91,843	102,111
LIABILITIES				
Payables				
Suppliers - trade creditors and accruals		**1,855**	1,465	1,479
Grants	2.3A	**13,751**	763	1,815
Other payables	2.3B	**383**	6	12
Total payables		**15,989**	2,234	3,306
Provisions				
Employee provisions	3.1	**194**	208	205
Other provisions	2.4	**435**	425	347
Total provisions		**629**	633	552
Total liabilities		**16,618**	2,867	3,858
Net assets		**103,342**	88,976	98,253
EQUITY				
Asset revaluation reserve		**238**	238	-
Retained surplus		**103,104**	88,738	98,253
Total equity		**103,342**	88,976	98,253

The above statement should be read in conjunction with the accompanying notes.

[1] ARENA's budget as published in the 2018-19 Portfolio Budget Statements.

Statement of Changes in Equity

for the period ended 30 June 2019

	Retained earnings			Asset revaluation surplus			Total equity		
	2019	2018	Original Budget[1]	**2019**	2018	Original Budget[1]	**2019**	2018	Original Budget[1]
	$'000	$'000	$'000	**$'000**	$'000	$'000	**$'000**	$'000	$'000
Opening balance									
Balance carried forward from previous period	**88,738**	79,226	92,952	**238**	-	-	**88,976**	79,226	92,952
Comprehensive income									
Surplus for the period	**16,754**	10,096	5,301	-	-	-	**16,754**	10,096	5,301
Other comprehensive income	**(2,388)**	(584)	-	-	238	-	**(2,388)**	(346)	-
Total comprehensive income	**14,366**	9,512	5,301	**-**	238	-	**14,366**	9,750	5,301
Closing balance as at 30 June	**103,104**	88,738	98,253	**238**	238	-	**103,342**	88,976	98,253

The above statement should be read in conjunction with the accompanying notes.

[1] ARENA's budget as published in the 2018-19 Portfolio Budget Statements.

Cash Flow Statement

for the period ended 30 June 2019

	Notes	2019 $'000	2018 $'000	Original[1] Budget $'000
OPERATING ACTIVITIES				
Cash received				
Receipts from Government		**173,963**	209,073	313,406
Interest		**1,844**	1,472	2,200
Net GST received		**15,409**	17,815	-
Return of grant funds from prior years		**5,056**	-	-
Other		**15**	38	-
Total cash received		**196,287**	228,398	315,606
Cash used				
Employees		**(732)**	(1,071)	(1,400)
Suppliers		**(24,717)**	(24,294)	(27,730)
Grants		**(139,944)**	(193,224)	(279,177)
Total cash used		**(165,393)**	(218,589)	(308,307)
Net cash from operating activities		**30,894**	9,809	7,299
INVESTING ACTIVITIES				
Cash used				
Purchase of property, plant and equipment		**(603)**	(435)	(628)
Investments		**(1,096)**	(8,723)	(5,873)
Total cash used		**(1,699)**	(9,158)	(6,501)
Net cash used by investing activities		**(1,699)**	(9,158)	(6,501)
Net increase in cash held		**29,195**	651	798
Cash and cash equivalents at the beginning of the reporting period		**56,389**	55,738	60,805
Cash and cash equivalents at the end of the reporting period	2.1A	**85,584**	56,389	61,603

The above statement should be read in conjunction with the accompanying notes.

[1] ARENA's budget as published in the 2018-19 Portfolio Budget Statements.

Overview

Objectives of the Australian Renewable Energy Agency

The Australian Renewable Energy Agency (ARENA) is an Australian Government controlled entity under the *Public Governance, Performance and Accountability Act 2013* (PGPA Act). It is a not-for-profit entity. The objective of ARENA is to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia.

ARENA is structured to meet the following outcome:

Outcome 1: To support improvements in the competitiveness of renewable energy and related technologies and the supply of renewable energy by administering financial assistance, developing analysis and advice about and sharing information and knowledge with regard to renewable energy and related technologies.

ARENA operates under the following legislation:

- *Australian Renewable Energy Agency Act 2011 (as amended);*
- *Australian Renewable Energy Agency (Consequential Amendments and Transitional Provisions) Act 2011;*
- *Australian Renewable Energy Agency (Consequential Amendments and Transitional Provisions) Act 2012;*
- *Australian Renewable Energy Agency Determination No 1 of 2013; and*
- *Australian Renewable Energy Agency Regulation 2016 .*

ARENA is governed by an independent, decision-making Board. The members of the Board draw together skills in renewable energy technology, commercialisation, business investment and corporate governance to provide expert administration of ARENA funds.

Basis of preparation

The financial statements are general purpose financial statements and are required by section 42 of the PGPA Act.

The financial statements have been prepared in accordance with:

a) *Public Governance, Performance and Accountability (Financial Reporting) Rule 2015* (FRR) ; and

b) Australian Accounting Standards and Interpretations - Reduced Disclosure Requirements issued by the Australian Accounting Standards Board that apply for the reporting period.

The financial statements have been prepared on an accrual basis and in accordance with the historical cost convention, except for certain assets and liabilities at fair value. Except where stated, no allowance is made for the effect of changing prices on the results or the financial position. The financial statements are presented in Australian dollars and values are rounded to the nearest thousand dollars unless otherwise specified.

New Australian Accounting Standards

All new and revised standards and interpretations that were issued prior to the sign-off date and are applicable to the current reporting period did not have a material effect, and are not expected to have a material effect, on ARENA's financial statements for the current and future reporting periods.

Taxation

ARENA is exempt from all forms of taxation except Fringe Benefits Tax (FBT) and the Goods and Services Tax (GST).

Events after the reporting period

ARENA is not aware of any subsequent events that have a potential to significantly affect its ongoing structure or financial activities.

Financial Performance

This section analyses the financial performance of the ARENA for the year ended 2019.

1.1 Expenses

	2019 $'000	2018 $'000
1.1A: Employee Benefits		
Board remuneration fees	**228**	232
Salaries and wages	**723**	680
Superannuation - defined contribution plans	**56**	71
Leave and other entitlements	**88**	85
Total employee benefits	**1,095**	1,068

Accounting Policy
Accounting policies for employee related expenses is contained in the People and Relationships section.

1.1B: Suppliers		
Goods and services supplied or rendered		
Audit fees	**89**	99
Consultants	**17,944**	16,094
Department support costs (resources received free of charge)[1]	**5,481**	6,699
IT services	**985**	996
Legal fees	**1,907**	2,275
Travel	**526**	437
Other	**1,088**	1,547
Total goods and services supplied or rendered	**28,020**	28,147
Other suppliers		
Operating lease rentals	**960**	813
Workers compensation expenses	**4**	5
Total other suppliers	**964**	818
Total suppliers	**28,984**	28,965

[1] Department support costs represent the cost of staff and associated costs made available by the Secretary of the Portfolio Department (also refer to resources received free of charge in note 1.2B).

Leasing commitments
Canberra ACT - Commencing on 1 July 2017 a 5 year lease was initiated in respect of the Canberra office. Lease payments are subject to a fixed annual increase of 3.75% on review date (1 July each year).
Sydney NSW - Commencing on 1 July 2018 a 4 year lease was initiated in respect of the Sydney office. Lease payments are subject to a fixed annual increase of 4.00% on review date. (1 July each year).
Melbourne VIC - Commencing on 1 July 2017 a 5 year lease was initiated in respect of the Melbourne office. Lease payments are subject to a fixed annual increase of 4.00% on review date. (1 July each year).

Commitments for minimum lease payments in relation to non-cancellable operating leases are payable as follows:		
Within 1 year	**974**	643
Between 1 to 5 years	**2,079**	2,059
Total operating lease commitments	**3,053**	2,703

Accounting Policy
Operating Leases
Operating lease payments are expensed on a straight-line basis which is representative of the pattern of benefits derived from the leased assets. The lessor effectively retains substantially all such risks and benefits of ownership.

1.1 Expenses (contd.)

	2019 $'000	2018 $'000
1.1C: Grants		
Public sector		
Australian Government entities	**6,168**	8,261
Private sector		
Australian companies	**99,169**	141,487
Australian not-for-profit companies	**1,881**	1,818
Other entities[1]	**31,474**	24,761
Total grants	**138,692**	176,327

[1] This includes the Australian Government's contribution to the Clean Energy Solutions Centre and the International Renewable Energy Agency.

Accounting Policy

Grants are recognised to the extent that services required to be performed by the grantee have been performed or the grant eligibility criteria has been satisfied. A commitment is recorded when ARENA has a binding agreement to make these grants but services have not been performed or criteria satisfied. Where grant monies are paid in advance of performance or eligibility, a prepayment is recognised. Grants payable are settled within twelve months of recognition.

Certain grants provided by ARENA include the potential for ARENA to recoup all, or part, of its grant expenditure. The amount of any future recoupment may in some instances even exceed that of the initial grant expense depending on the realisation of specified future events and/or other commercial indicators.

Recoverability will in certain instances be predicated on formulas that have been agreed as part of the terms and conditions of the relevant grant funding agreement.

ARENA has no quantifiable contingent assets at reporting date as the amount and likelihood cannot be measured reliably.

Locked Box Arrangements

ARENA's Locked Box funding arrangements relate to grant funding agreements whereby ARENA deposits the total amount of the grant into a prescribed bank account, in the recipient's name, after the execution of a legally binding funding agreement. ARENA retains sole control of the Locked Box until withdrawal conditions precedent (WCPs) have been satisfied.

At the time of payment by ARENA into the prescribed bank account, the transaction is recorded as a Prepayment in the Statement of Financial Position. After all WCPs have been met, ARENA relinquishes sole control over the Locked Box and the recipient is able to withdraw money from the Locked Box in accordance with the funding agreement. At this point, the Prepayment is expensed as a Grant in the Statement of Comprehensive Income.

Withdrawals from Locked Boxes require joint signatures from the recipient and ARENA. ARENA can only refuse the release of funds if there is a breach of conditions in the funding agreement. ARENA continues to be responsible and accountable for ensuring that the funds are only released from the Locked Boxes when conditions specified in the grant funding agreement have been met. Accordingly, the value of Locked Boxes at balance date is deemed to be held by ARENA in trust and is disclosed under Note 5.2: Assets Held in Trust.

1.2 Own-Source Revenue and Gains

	2019 $'000	2018 $'000
Own-Source Revenue		
1.2A: Interest		
Deposits	**1,621**	1,476
Total interest	**1,621**	1,476

Accounting Policy
Interest revenue is recognised using the effective interest method.

1.2B: Other Revenue		
Resources received free of charge - Department of the Environment and Energy	**5,481**	6,699
Return of grants	**5,056**	-
Other	**15**	38
Total other revenue	**10,552**	6,737

Accounting Policy
Resources Received Free of Charge
Resources received free of charge are recognised as revenue when, and only when, a fair value can be reliably determined and the services would have been purchased if they had not been donated. Use of those resources is recognised as an expense (see Note 1.1B: Suppliers). Resources received free of charge are recorded as either revenue or gains depending on their nature.

Return of Grants
Return of grant is reported as other revenue if the grant was fully expensed in previous financial year(s).

1.2C: Revenue from Government		
Payments from Portfolio Department	**173,963**	209,073
Total revenue from Government	**173,963**	209,073

Accounting Policy
Amounts appropriated to ARENA are recognised as Revenue from Government when ARENA receives the cash from the Portfolio Department.

Financial Position

This section analyses the ARENA's assets used to conduct its operations and the operating liabilities incurred as a result. Employee related information is disclosed in the People and Relationships section.

2.1 Financial Assets

	2019 $'000	2018 $'000
2.1A: Cash and Cash Equivalents		
Cash at bank	**23,595**	387
Cash on deposit	**61,989**	56,002
Total cash and cash equivalents	**85,584**	56,389

Accounting Policy
Cash is recognised at its nominal amount. Cash and cash equivalents include:
a) cash on hand; and
b) demand deposits in bank accounts with an original maturity of 12 months or less that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value.

2.1B: Trade and Other Receivables		
GST receivable from the Australian Taxation Office	**2,367**	2,259
Interest receivable	**438**	215
Other	**70**	72
Total trade and other receivables	**2,875**	2,546

There is no impairment allowance for receivables as at 30 June 2019 (2018: 0).

2.1C: Investments		
Opening balance	**30,641**	22,502
Net payment into the investment fund, including management fees	**1,096**	8,723
Decrease in value of investment at 30 June	**(2,388)**	(584)
Total investments - REVC Fund Commonwealth Participation Trust	**29,349**	30,641

Accounting Policy
Investments are expected to be recovered in more than 12 months.

At 30 June 2019 ARENA held 44,190,937 (2018: 43,094,784) fully paid "A" class units in the Renewable Energy Venture Capital (REVC) Fund Commonwealth Participation Trust (Trust).

The Trust is an investor pursuant to the REVC Co-Investment Arrangement. The principal activity of the REVC Co-Investment Arrangement, which is independently managed, is investing in early stage technology companies consistent with governing documents, including the Co-Investment Deed signed in 2011.

The investments of the REVC Co-Investment Arrangement comprise traded debt, equity and unlisted equity investments; these are valued in accordance with the guidelines published by the Australian and Venture Capital Association Limited (AVCAL).

The valuation is assessed to be materially consistent with AASB 13 Fair Value Measurement as the AVCAL methodology adopts market-based and observable inputs to the maximum extent possible in arriving at the values for the investments shown.

The REVC Co-Investment Arrangement recognises investments on the date it becomes party to the underlying contractual agreement and recognises any changes in value from this date. The value of ARENA's investment at 30 June 2019 is based on annual audited financial statements of the REVC Co-Investment Arrangement at that reporting date.

2.2 Non-Financial Assets

2.2: Reconciliation of the Opening and Closing Balances of Property, Plant and Equipment and Intangibles

	Leasehold Improvements $'000	Plant and Equipment $'000	Total $'000
As at 1 July 2018			
Gross book value	**1,734**	**128**	**1,862**
Accumulated depreciation, amortisation and impairment	**-**	**-**	**-**
Total as at 1 July 2018	**1,734**	**128**	**1,862**
Additions:			
Purchase	**363**	**240**	**603**
Depreciation and amortisation	**(511)**	**(90)**	**(601)**
Total as at 30 June 2019	**1,586**	**278**	**1,864**
Total as at 30 June 2019 represented by			
Gross book value	**2,097**	**368**	**2,465**
Accumulated depreciation, amortisation and impairment	**(511)**	**(90)**	**(601)**
Total as at 30 June 2019 represented by	**1,586**	**278**	**1,864**

No indicators of impairment were found for property, plant and equipment.

Accounting Policy

Acquisition of Assets

Assets are recorded at cost on acquisition except as stated below. The cost of acquisition includes the fair value of assets transferred in exchange and liabilities undertaken. Financial assets are initially measured at their fair value plus transaction costs where appropriate.

Leasehold Improvements

Leasehold improvements are carried at fair value.

Plant and Equipment

Plant and equipment are valued at cost in accordance with the FRR.

Intangibles

ARENA's intangibles comprise internally developed software for internal use. These assets are carried at cost less accumulated amortisation and accumulated impairment losses. Software is amortised on a straight-line basis over its anticipated useful life. The useful lives of ARENA's software is 3-10 years (2018: 3-10 years).

Impairment

All assets are assessed for impairment at the end of each reporting period. When indications of impairment exist, the asset's recoverable amount is estimated and an impairment adjustment made if the asset's recoverable amount is less than its carrying amount.

Revaluations

Following initial recognition at cost, all asset classes except for Intangibles are carried at fair value less subsequent accumulated depreciation and accumulated impairment losses. Valuations are conducted with sufficient frequency to ensure that the carrying amounts of assets did not differ materially from the assets' fair values as at the reporting date. The regularity of independent valuations depended upon the volatility of movements in market values for the relevant assets.

Revaluation adjustments are made on a class basis. Any revaluation increment is credited to equity under the heading of Asset Revaluation Reserve except to the extent that it reversed a previous revaluation decrement of the same asset class that was previously recognised in the surplus/deficit. Revaluation decrements for a class of assets are recognised directly in the surplus/deficit except to the extent that they reversed a previous revaluation increment for that class. Any accumulated depreciation as at the revaluation date is eliminated against the gross carrying amount of the asset and the asset restated to revalued amount.

Depreciation

Depreciable plant and equipment assets are written off to their estimated residual values over the estimated useful lives to ARENA, using, in all cases, the straight-line method of depreciation.

Leasehold improvements are depreciated over the lease term.

Depreciation rates (useful lives), residual values and methods are reviewed at each reporting date and necessary adjustments are recognised in the current, or current and future reporting periods, as appropriate.

2.3 Payables

	2019 $'000	2018 $'000
2.3A: Grants		
Private sector		
Australian companies	**9,731**	763
Other entities	**4,020**	-
Total grants	**13,751**	763

A high number of milestones in relation to various grant projects were approved close to 30 June 2019. Consequently grants payable increased significantly from the previous year. All accrued milestone amounts were subsequently paid in July 2019.

2.3B: Other payables		
Accrued salaries and income tax withheld	**383**	6
Total other payables	**383**	6

ARENA outsourced its payroll function in July 2018 and has experienced technical issues with the Australian Taxation Office in submitting and paying income tax withheld throughout the year, giving rise to a significant payable at the end of the financial year.

2.4 Other Provisions

2.4 Other provisions

	Provision for restoration $'000
Opening balance as at 1 July 2018	**425**
Additional provisions made	
Unwinding of discount or change in discount rate	**10**
Total as at 30 June 2019	**435**

ARENA currently has three (2018: four) agreements for the leasing of premises which have provisions requiring ARENA to restore the premises to their original condition at the conclusion of the lease. ARENA has made a provision to reflect the present value of these obligations.

People and Relationships

This section describes a range of employment and post employment benefits provided to our people.

3.1 Employee Provisions

	2019 $'000	2018 $'000
Employee provisions		
Leave	**194**	208
Total employee provisions	**194**	208

Accounting policy

Employee related expenses are recognised in the period that employee services are received.
Liabilities for short-term employee benefits and termination benefits expected within twelve months of the end of the reporting period are measured at their nominal amounts. Other long-term employee benefits are measured as net total of the present value of the defined benefit obligation at the end of the reporting period.

Leave

The liability for employee benefits includes provision for annual leave and long service leave. Changes in the measurement of the liability are recognised in the Statement of Comprehensive Income.
The leave liabilities are calculated on the basis of employees' remuneration at the estimated salary rates that will be applied at the time the leave is taken, including the entity's employer superannuation contribution rates to the extent that the leave is likely to be taken during service rather than paid out on termination.

The liability for long service leave has been determined by reference to the 'short hand method' as per the FRR. The estimate of the present value of the liability takes into account attrition rates and pay increases through promotion and inflation.

3.2 Key Management Personnel Remuneration

Key management personnel (KMP) are those persons having authority and responsibility for planning, directing and controlling the activities of an entity, directly or indirectly, including any director (whether executive or otherwise) of that entity. ARENA has determined the KMP to be the Directors, the Chief Executive Officer, Chief Financial Officer and the Chief Operating Officer. The Chief Operating Officer is seconded from the Portfolio Department free of charge and is not included in the KMP remuneration table below.

	2019 $	2018 $
Short-term employee benefits	**981,431**	969,499
Post-employment benefits	**80,826**	59,030
Other long-term employee benefits	**33,354**	39,285
Total KMP remuneration expenses	**1,095,611**	1,067,814

The total number of KMP that are included in the above table are 9 individuals (2018:12) and includes 6 ARENA Directors (2018:9). ARENA's new Chief Executive Officer commenced on 27 August 2018.

The above KMP remuneration excludes the remuneration and other benefits of the Portfolio Minister. The Portfolio Minister's remuneration and other benefits are set by the Remuneration Tribunal and are not paid by ARENA.

3.3 Related Party Disclosures

Related party relationships:
ARENA is an Australian Government controlled entity. Related parties of ARENA include:

i) Key Management Personnel (See Note 3.2: KMP)
ii) Portfolio and Cabinet Ministers;
iii) Close family members of the persons identified in (i) and (ii) above; and
iv) An entity which is controlled or jointly controlled by a member of the KMP.

Transactions with related parties:

Given the breadth of Government activities, related parties may transact with the Government sector in the same capacity as ordinary citizens. Such transactions include payment of taxes, use of public infrastructure and public services that are available to all citizens. These transactions have not been separately disclosed in this note.

Giving consideration to relationships with related entities, and transactions entered into, it has been determined that ARENA transacted with three (2018: four) related parties during the reporting period. It should be noted that in all transactions the KMP affected by a relationship excluded themselves from all decision processes and/or management of the contract or arrangement. All transactions were on normal business terms and conditions.

An ARENA Board Member is a non-executive Board Member of Right Angle Business Services Pty Ltd. During the reporting period ARENA conducted the following transactions:

Grant payments totalling $138,651 were made to Right Angle Business Services Pty Ltd for the purpose of developing a Concentrating Solar Thermal roadmap.

A partner of a KMP is a Director of Planet Innovation Pty Ltd. During the reporting period ARENA conducted the following transactions:

Grant payments totalling $221,373 were made to Planet Innovation Pty Ltd for the ZenHQ Virtual Power Plant project.

An ARENA Board Member is a non-executive Board Member of Hydro-Electric Corporation. During the reporting period ARENA conducted the following transactions:

Grant payments totalling $2,518,450 were provided to Hydro-Electric Corporation during the reporting period. The transactions were for several projects including Flinders Island Hybrid Energy Hub and the Tarraleah hydropower scheme feasibility study.

Managing Uncertainties

This section analyses how the ARENA manages financial risks within its operating environment.

4.1 Financial Instruments

	2019 $'000	2018 $'000
4.1A: Categories of Financial Instruments		
Financial Assets under AASB 139		
Loans and receivables		
Cash and cash equivalents		56,389
Trade and other receivables		287
Total loans and receivables		56,676
Available-for-sale financial assets		
Investments		30,641
Total available-for-sale financial assets		30,641
Total financial assets		87,317
Financial Assets under AASB 9		
Financial assets at amortised cost		
Cash and cash equivalents	**85,584**	
Trade and other receivables	**508**	
Total financial assets at amortised cost	**86,092**	
Financial assets at fair value through other comprehensive income		
Investments	**29,349**	
Total available-for-sale financial assets	**29,349**	
Total financial assets	**115,441**	
Financial liabilities		
Financial liabilities measured at amortised cost		
Trade creditors	**1,855**	1,465
Grant payables	**13,751**	763
Total financial liabilities measured at amortised cost	**15,606**	2,228
Total financial liabilities	**15,606**	2,228

Classification of financial assets on the date of initial application of AASB 9.

Financial assets class	Note	AASB 139 original classification	AASB 9 new classification	AASB 139 carrying amount at 1 July 2018 $'000	AASB 9 carrying amount at 1 July 2018 $'000
Cash and cash Equivalents	2.1A	Loans and receivables	Amortised Cost	56,389	56,389
Trade and other receivables	2.1B	Loans and receivables	Amortised Cost	287	287
Investments	2.1C	Available-for-sale equity instruments	FVOCI Equity instruments	30,641	30,641
Total financial assets				87,317	87,317

4.1 Financial Instruments (contd.)

Reconciliation of carrying amounts of financial assets on the date of initial application of AASB 9.

	AASB 139 carrying amount at 30 June 2018 $'000	AASB 9 carrying amount at 1 July 2018 $'000
Financial assets at amortised cost		
Loans and receivables		
Cash and cash Equivalents	56,389	56,389
Trade and other receivables	287	287
Total amortised cost	56,676	56,676
Financial assets at fair value through other comprehensive income		
Available-for-sale financial assets		
Investments	30,641	30,641
Total fair value through other comprehensive income	30,641	30,641

There was no change in the classification and measurement of financial assets under AASB 9 *Financial Instruments* .

Accounting Policy

Financial Assets

With the implementation of AASB 9 *Financial Instruments* for the first time in 2019, ARENA classifies its financial assets in the following categories:

a) financial assets at fair value through other comprehensive income; and
b) financial assets measured at amortised cost.

The classification depends on the nature and purpose of the financial assets and is determined at the time of initial recognition. Financial assets are recognised and derecognised upon trade date.

Comparatives have not been restated on initial application.

Financial Assets at Amortised Cost

Financial assets included in this category need to meet two criteria:
1. the financial asset is held in order to collect the contractual cash flows; and
2. the cash flows are solely payments of principal and interest (SPPI) on the principal outstanding amount.

Amortised cost is determined using the effective interest rate.

Effective Interest Method

The effective interest method is a method of calculating the amortised cost of a financial asset and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts through the expected life of the financial asset, or, where appropriate, a shorter period.

Financial Assets at Fair Value Through Other Comprehensive Income (FVOCI)

Financial assets measured at fair value through other comprehensive income are held with the objective of both collecting contractual cash flows and selling the financial assets and the cash flows meet the SPPI test.

Any gains or losses as a result of fair value measurement or the recognition of an impairment loss allowance is recognised in other comprehensive income.

Impairment of Financial Assets

Financial assets are assessed for impairment at the end of each reporting period based on Expected Credit Losses, using the general approach which measures the loss allowance based on an amount equal to lifetime expected credit losses where risk has significantly increased, or an amount equal to 12-month expected credit losses if risk has not increased.

The simplified approach for trade, contract and lease receivables is used. This approach always measures the loss allowance as the amount equal to the lifetime expected credit losses.

A write-off constitutes a derecognition event where the write-off directly reduces the gross carrying amount of the financial asset.

Financial liabilities

Financial liabilities are classified as either financial liabilities 'at fair value through profit or loss' or other financial liabilities. Financial liabilities are recognised and derecognised upon 'trade date'.

Financial liabilities at Amortised Cost

Trade creditors and other payables are recognised at amortised cost using the effective interest method, with interest expense recognised on an effective interest basis. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced). Trade creditors and other payables are derecognised on payment.

4.1 Financial Instruments (contd.)

	2019 $'000	2018 $'000
4.1B Net Gains or Losses on Financial Assets		
Financial assets at amortised cost		
Interest revenue	**1,621**	1,476
Net gains on financial assets at amortised cost	**1,621**	1,476
Financial assets at fair value through other comprehensive income		
Fair value changes	**(2,388)**	(584)
Net losses on available-for-sale financial assets	**(2,388)**	(584)
Net gains/(losses) on financial assets	**(767)**	892

Other Information

5.1 Aggregate Assets and Liabilities

	2019 $'000	2018 $'000
Assets expected to be recovered in:		
No more than 12 months	**88,687**	**59,197**
More than 12 months	**31,273**	**32,646**
Total assets	**119,960**	**91,843**
Liabilities expected to be settled in:		
No more than 12 months	**(16,086)**	**(2,378)**
More than 12 months	**(532)**	**(489)**
Total liabilities	**(16,618)**	**(2,867)**

5.2 Assets Held in Trust

	2019 $'000	2018 $'000
Cash held in Locked Boxes		
Balance as at 1 July	**24,934**	42,273
Receipts[1]	**25,383**	36,698
Payments[2]	**(48,827)**	(54,037)
Balance as at 30 June	**1,490**	24,934
Total monetary assets held in trust[3]	**1,490**	24,934

This note should be read in conjunction with Note 1.1C : Grants. The transaction values mentioned above are not linked to any other Statement or Note within these documents.

This note has been added to the Financial Statements for information purposes only. It provides the reader with an indication of Locked Box funding levels where ARENA continues to be responsible and accountable for ensuring that the funds are only released when conditions specified in the grant funding agreement have been met.

[1] Receipts are the amounts paid into Locked Boxes by ARENA. These amounts include interest received from the balances of the Locked Boxes.

[2] Payments are those amounts which have been withdrawn by the projects in accordance with agreed milestones.

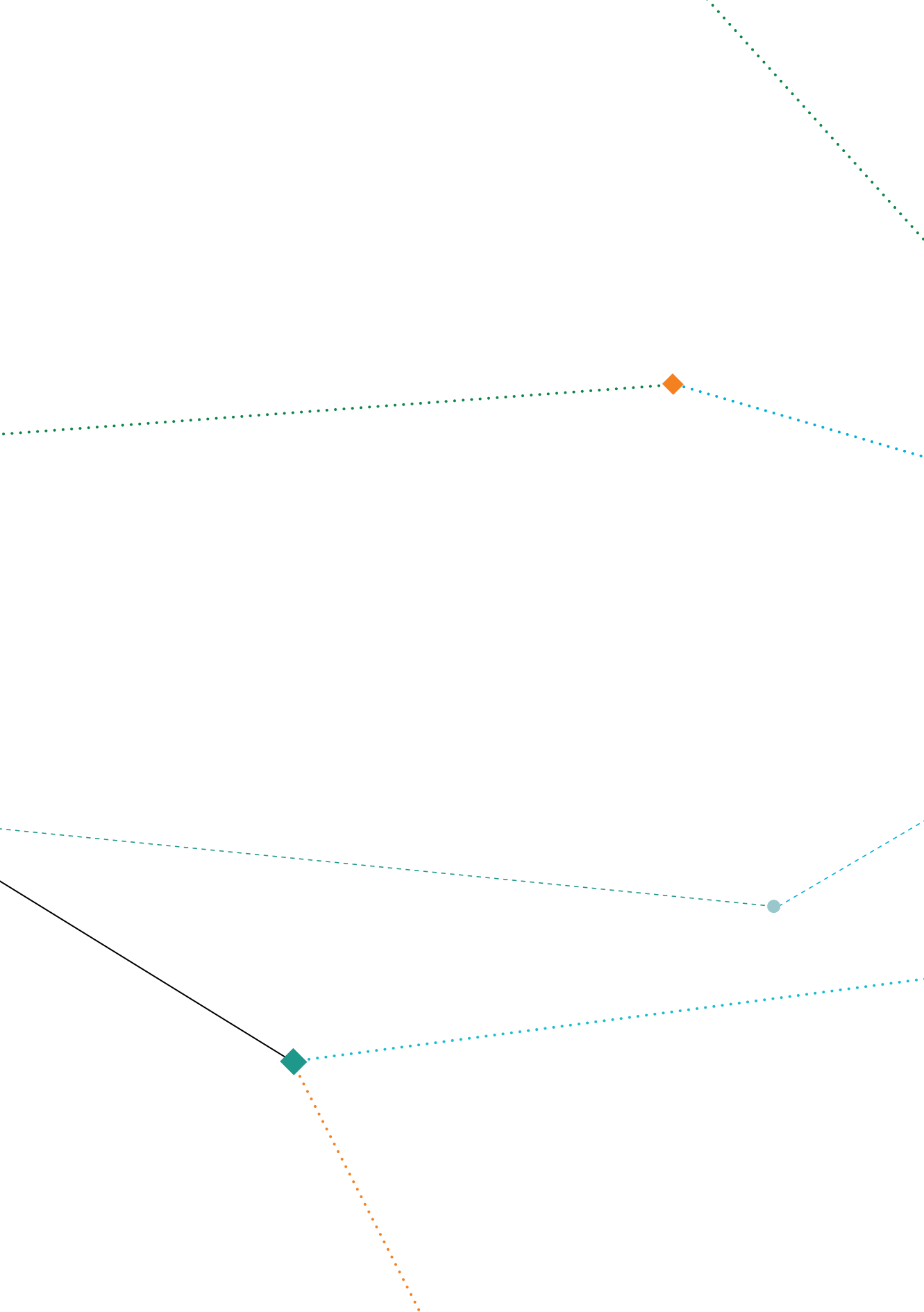
[3] There is a restatement of prior year amounts as one of the project's USD balance was incorrectly reported as AUD in the 2017-18 financial statements. The total balance of monetary assets held in trust reported in the 2017-18 financial statements was $20.5 million instead of $24.9 million.

Note 5.3: Budget Variance Commentary

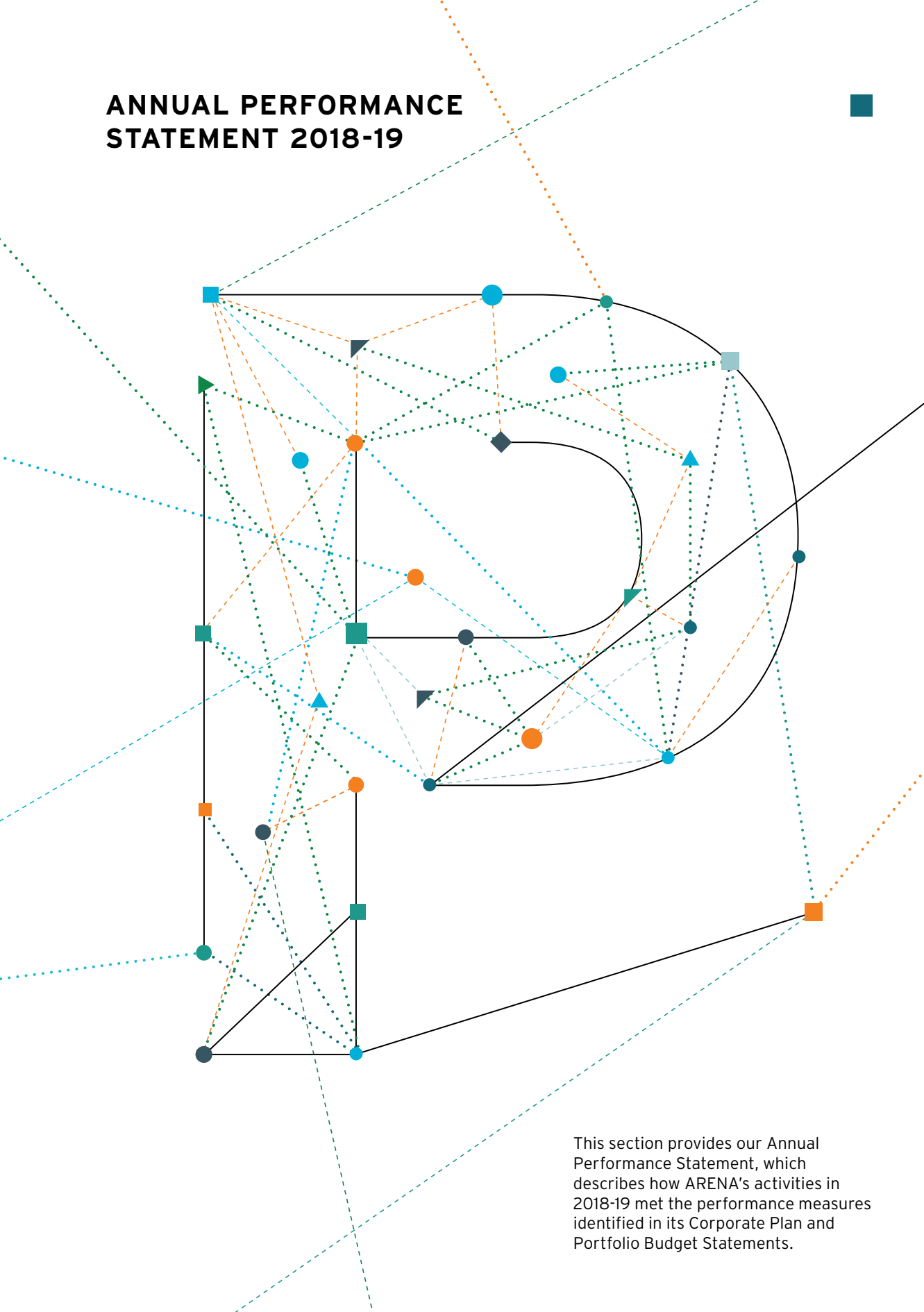
ARENA's financial performance is measured against its original budget as published in the 2018-19 Portfolio Budget Statements.

Variances are considered to be 'major' if they are core to ARENA's activities and based on the following criteria:
• the variance between budget and actual is greater than +/- 10% of the original budget for a line item; and
• the variance between budget and actual is greater than $1,000,000; or
• an item is below this threshold but is considered important for the reader's understanding or is relevant to an assessment of the discharge of accountability and to an analysis of the ARENA's performance.

Budget Variance Commentary	Affected statements and line items
Due to the complex nature of ARENA's projects, which deal with emerging and developing technologies, there are regular project variations. These variations are difficult to predict and therefore material variances to original budget are possible. Cash and cash equivalents include cash held in operating bank account and surplus cash placed, in accordance with s59 of the PGPA Act, in demand deposits in Australian bank accounts. The significant increase in cash balance against budget was due to a large drawdown of funds from Government at the end of June to meet significant grant payments due in early July. Additional variances to budget are due to the termination of $16.8 million worth of funding agreements and $11.6 million of project slippages. There were also a number of projects included in the budget at $47.3 million in total that were unable to progress. The supplier variance is impacted by lower grant expenditure as the costs associated with administering grants decreases. Revenue from Government is accounted for on a cash basis and is drawn down as required. A reduction in expenditure and cash paid results in a corresponding reduction in receipts from Government. Grants payable were higher than anticipated at the time of budget due to an unusually high number of project milestones approved close to the end of financial year.	**Statement of Comprehensive Income:** - Suppliers - Grants - Revenue from Government **Statement of Financial Position:** - Cash and cash equivalents - Grant payable **Cash Flow Statement:** - Receipts from Government - Grants cash used
Due to the write-off of the Grants Management System (GMS) last financial year and the transition of GMS to software as a service (SaaS) distribution model, amortisation is significantly lower than budgeted.	**Statement of Comprehensive Income:** - Depreciation and amortisation
Interest received is lower than expected due to a decrease in the cash interest rate during the year. ARENA saw a decline in the interest rates offered by banks for the demand deposits that are currently being held. The decline is offset by an increase in Other revenue. During 2018-19 ARENA received refunds of grants totalling $5.056 million.	**Statement of Comprehensive Income:** - Interest - Other revenue
No investments in the Renewable Energy Venture Capital Fund other than for management fees were made during the year. The principal activity of the Fund is to invest in the commercialisation of renewable energy companies. Movement in fair value of the investment is driven by market and is not budgeted. All investment decisions are to be made by the Fund Manager within an agreed timeframe ending in 2024. Actual investments made from year to year may vary from budget.	**Statement of Comprehensive Income:** - Decrease in the value of investment **Statement of Financial Position:** - Other investments
ARENA owns leasehold improvement assets in its three offices. The zero value in the budget was due to a reporting error categorising leasehold improvement assets as part of computer software. At the time of budget ARENA carried the historical cost of its major IT system as intangible asset and there were plans for upgrade and enhancements. The budget for computer software reflected the accounting approach at the time. ARENA has since decided to write off the remaining value of the intangible asset and expense costs of subsequent work on the system in accordance with relevant accounting standards.	**Statement of Financial Position:** - Leasehold improvements - Computer software
Net GST received was not separated out from cash used for Suppliers and Grants at the time of budget. Cash used for employee costs were much less than budget due to an overestimation of board fees for the year and the build-up of a large payable of income tax withheld due to technical issues with the ATO payment system.	**Cash Flow Statement:** - Net GST received - Employees cash used



ANNUAL PERFORMANCE STATEMENT 2018-19



This section provides our Annual Performance Statement, which describes how ARENA's activities in 2018-19 met the performance measures identified in its Corporate Plan and Portfolio Budget Statements.

STATEMENT OF PREPARATION

I, Martijn Wilder AM, on behalf of the Board, and in my capacity as the accountable authority of the Australian Renewable Energy Agency, present the Annual Performance Statement of the Agency covering the 2018–19 financial year as required under paragraph 39(1)(a) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act). In my opinion, the Annual Performance Statement is based on properly maintained records, accurately reflects the performance of the entity, and complies with subsection 39(2) of the PGPA Act.

ARENA'S PURPOSE

ARENA was established by the *Australian Renewable Energy Act 2011* (ARENA Act) to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia.

Our purpose is to accelerate Australia's shift to affordable and reliable renewable energy.

PERFORMANCE FRAMEWORK

ARENA's performance is assessed against the measures published in the Portfolio Budget Statements and Corporate Plan. The following text, tables and performance case studies provide performance results for each measure and an analysis of what these results indicate about ARENA's performance in achieving its purpose.

ABOUT THIS ANNUAL PERFORMANCE STATEMENT

This Annual Performance Statement has been structured to reflect the fact that the contributions particular activities or projects make to ARENA achieving its purpose occur over different timeframes. These timeframes reflect the earlier investment decisions and the multi-year nature of ARENA-funded projects and activities.

SECTION 1:
CONTEXT

Sets the context for assessing our performance in 2018-19 and explains why this Annual Performance Statement focuses on ARENA's contribution to improving the security and reliability of the electricity system.

SECTION 2:
PERFORMANCE CASE STUDIES

Presents an assessment of the outcomes and impact that ARENA achieved in 2018-19 through performance case studies that draw on qualitative performance information to show how ARENA achieved its purpose.

The case studies cover three different approaches to improving security and reliability in the grid. Each case study describes the need for action, ARENA's activities and the benefits generated by ARENA's activities and ARENA-funded projects.

SECTION 3:
CORE ACTIVITY AREAS

Presents the results achieved in three core activity areas: funding, knowledge sharing and collaboration. The section presents results for both activities and outcomes.

FIGURE 10: ARENA'S OBJECT, OUTCOME AND PURPOSE

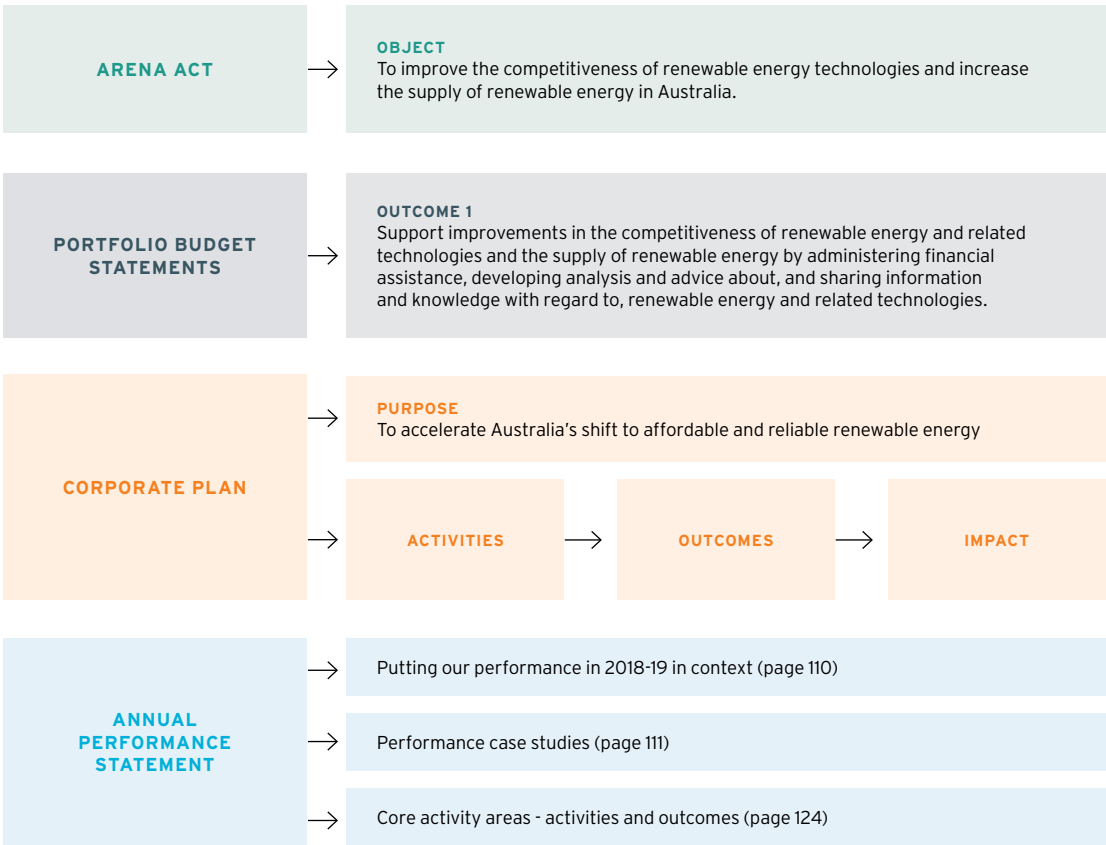


TABLE 8: ARENA'S 2018-19 PERFORMANCE FRAMEWORK

ACTIVITIES What we do to achieve our purpose and how efficiently we do it *All timeframes FY18-19 to FY21-22 except where stated*	OUTCOMES The direct results that our activities will produce *All timeframes from FY18-19 to FY21-22*	IMPACT The enduring, positive change that we will contribute to *Timeframes as stated*[1]
Provide financial assistance and leverage private investment[2] • $m ARENA funds approved [$281 million total in 2018-19][3] • Investment leverage[4] by innovation stage[5] • Total third party funds invested • Number of projects approved • Commitments to contribute to Australia's Mission Innovation target [ARENA 2020-21 R&D expenditure at least doubled from 2015-16]	More solutions for delivering secure, reliable and affordable energy and increasing the value provided by renewable energy • Number of completed proofs of concept, pilots and demonstrations • Improvements in technological readiness of R&D Improved competitiveness of renewable energy technologies • Cost and/or revenue improvements for renewable energy technologies	Increase in supply of renewable energy From 2018 Ongoing improvements in the competitiveness of renewable energy technologies From 2018 Secure, reliable and affordable electricity system with a significantly higher share of renewable energy From 2018 Increase in employment in renewable energy activities From 2018 Improvements in energy productivity enabling achievement or exceeding of targets in the National Energy Productivity Plan From 2022 Commercial-scale export value chains in renewable energy established By 2030
Administer financial assistance • Number of projects managed • Number of projects closed[6] • $m payments made		
Jointly manage Clean Energy Innovation Fund with the Clean Energy Finance Corporation • Number of projects funded by Clean Energy Innovation Fund; number originating from ARENA • $ value of projects funded • Investment leverage[7]		
Provide information, advice and knowledge to advance renewable energy • Number of knowledge sharing products, by type (includes reports, presentations, blog posts, videos, policy submissions etc) • Number of knowledge sharing events delivered (includes virtual events e.g. webinars) • Number of ministerial and departmental briefs prepared	Industry and government better informed to navigate the energy transition • Third party recognition of value of ARENA knowledge sharing (e.g. citations of ARENA-provided information and supported projects in publications by relevant bodies (e.g. AEMO, AEMC), inclusion of ARENA in relevant working groups) • Number of users of knowledge sharing products (includes data on downloads, requests for products, reach of knowledge sharing events etc) • Proponent and other stakeholder feedback on value of ARENA knowledge sharing (via annual survey, and feedback from specific knowledge sharing events)	
Collaborate with, and facilitate collaboration between, other persons, organisations and governments (including international collaborations) • Number of joint activities/arrangements undertaken or supported by ARENA including A-Lab activities • Number and type of meetings with governments	Increased collaboration on energy innovation • Number and quality of new partnership arrangements in the energy sector (including collaborations entered into by participants in ARENA-funded projects)	

Note:
Activities and outcomes to be reported by investment priority, focus area, technology, location, sector, innovation stage, proponent type (where relevant)

1 Specified timeframes indicate when we would expect to see impacts occurring. Includes impacts from ARENA activities and outcomes prior to 2018-19
2 Black text describes an activity, outcome or impact
3 Blue text describes a performance measure; [Square brackets] describe targets
4 Ratio of ARENA funds committed to third party funds invested
5 Innovation stage denotes studies, R&D, demonstration, deployment
6 Reported as projects completed or terminated
7 Ratio of CEFC funds invested to third party funds invested

SECTION 1:

CONTEXT

Australia's energy system is shifting to one that is much more decentralised, increasingly consumer-centric and in which new forms of energy production are rapidly entering the mix. This shift is most advanced in the electricity sector, with other sectors just at the start of their transitions.

The Energy Security Board's second *Health of the National Electricity Market* report[1] states that "the fundamentally different characteristics of variable distributed energy resources to traditional generation mean that changes to the way the National Electricity Market operates must be made".

One of the main requirements to enable an increasing share of renewable electricity is to have a suite of enabling technologies available to support an overall reliable, secure and affordable electricity system. ARENA recognised this early on and, from 2015, began to develop and implement funding initiatives and support activities focused on integrating renewables and grids.

System security is becoming increasingly important as the generation mix changes. The machinery that generates electricity in a coal-fired, gas-fired or hydro-electric plant has the in-built capability to manage frequency and voltage fluctuations. Solar PV and wind power technologies do not possess the same inherent capability. As the proportion of electricity generated by solar PV and wind increase, system services such as inertia, frequency control and system strength will need to be explicitly provided for, or alternative techniques for maintaining stable power system operation will need to be developed.

Another important area of change is flexible capacity: resources that can balance variable renewable energy supply with variable demand for electricity. This includes storage technologies like batteries and pumped hydro, as well as technologies and mechanisms that not only reduce demand (lower electricity consumption at times of high stress on the grid) but shift demand for electricity to periods of high renewable energy supply. These new technologies are projected to provide 31 GW of flexible capacity by 2050.[2]

As the needs of the National Electricity Market (NEM) have evolved, ARENA has devoted significant resources to finding and funding projects and activities that would deliver secure and reliable electricity. ARENA's 2017 *Investment Plan* identified new flexible capacity and grid stability technologies (and associated business models) that could balance the electricity system with higher shares of renewable energy, ensuring electricity is available where and when it is needed, as an area of particular interest.

The largest share of ARENA's funding commitments to date has been in the electricity sector and this is reflected in the outcomes and impact seen in 2018-19. It is in this context that our Annual Performance Statement for 2018-19 focuses primarily on the electricity system and ARENA's activities aimed at addressing electricity system security and reliability needs. In reporting our results we use a combination of quantitative and qualitative performance measures.

[1] *The Health of the National Electricity Market*, 2018 Annual Report, Energy Security Board

[2] *New Energy Outlook 2018*, Bloomberg New Energy Finance

SECTION 2:

PERFORMANCE CASE STUDIES

The outcomes of ARENA's activities are the changes that we expect to see occurring above and beyond the outputs produced by our activities and the projects that we fund. Our impact is the enduring, positive change that results in the longer term.

Outcomes and impact rarely arise from just one project, so each of the performance case studies in this section draw together the contribution from a portfolio of complementary projects.

ARENA's activities are delivered in a complex, rapidly changing environment. ARENA's limited control over external factors can make it challenging to link the results of a particular activity with changes observed in the broader environment.

For this reason, when reporting our performance in achieving our outcomes and impact we rely on qualitative evidence that shows how our activities are contributing to broader changes in the Australian energy sector. In particular, we rely on qualitative information to assess our contribution to improving the competitiveness of renewable energy technologies.

ARENA takes into account a number of factors in assessing competitiveness:

- cost and revenue are the major indicators of competitiveness of renewable energy technologies. ARENA supports activities that can reduce the cost and/or increase the value (and thereby the revenue) of renewable energy technologies
- improved technical performance, more solutions demonstrated and greater availability of technical performance data
- increased industry and supply chain skills, capability and capacity
- demonstration of innovative business models.

Competitiveness is assessed relative to other technologies (incumbent and emerging) and depends on the context in which those technologies are deployed.

While the participants directly involved in delivering ARENA-funded projects are the immediate beneficiaries of ARENA funding, the projects that we support are assessed for their potential to catalyse broader change within Australia's energy sector. This broader change is expected to benefit a wider group of individuals and organisations and, ultimately, the Australian economy.

CASE STUDY:

LARGE-SCALE BATTERIES: SUPPORTING A MORE SECURE AND RELIABLE GRID

THE NEED

ARENA's work to actively identify and troubleshoot issues arising from the energy transition includes a major focus on delivering the reliability and security benefits offered by large-scale batteries.

'Big batteries' are capable of playing a key role in safeguarding the reliability of supply and security of the electricity system. They can provide short-term energy storage and deliver rapid-response dispatchable power that is needed to keep the grid secure and reliable. Their role is expected to increase as the share of variable renewables in Australia's power system continues to grow.

For large-scale batteries to participate in the market on a commercial basis there will need to be further reductions in cost, greater opportunities for battery operators to earn revenue, new business models that incorporate generation and storage, and updates to energy market regulations.

ARENA ACTIVITIES

ARENA has committed $42 million to four demonstration projects focused on accelerating the development and commercialisation of large-scale batteries in Australia. Supported projects are required to share knowledge, experience and lessons with the broader industry and other interested entities so that benefits from ARENA's support are spread widely.

Project information distributed through knowledge sharing activities this year included ARENA's large-scale battery storage knowledge sharing workshop (attended by more than 60 participants from state and territory governments, market and regulatory bodies, developers, financiers, networks, consultants, technology developers and retailers); two public reports from the Electranet ESCRI project; and the ARENA Insights newsletter, which provided an update on the Lake Bonney battery as well as insights into the drivers, challenges and services that utility-scale storage offers.

Image credit: ARENA

ARENA'S 'BIG BATTERY' PROJECTS

BALLARAT ENERGY STORAGE SYSTEM (BESS)

VIC
Stand alone at substation
ARENA funding: $2.3 million
30 MW / 30 MWh

GANNAWARRA ENERGY STORAGE SYSTEM (GESS)

VIC
Co-located with 50 MW solar farm
ARENA funding: $22.7 million
25 MW / 50 MWh

ELECTRANET ESCRI BATTERY

SA
Standalone and grid-connected
Can operate as microgrid with 90 MW wind farm
ARENA funding: $12.0 million
30 MW / 8 MWh

INFIGEN LAKE BONNEY BATTERY

SA
Co-located with 279 MW wind farm
ARENA funding: $5.0 million
25 MW / 52 MWh

OUTCOME - WHAT HAS ARENA'S SUPPORT DELIVERED SO FAR?

OUTCOME

More solutions for delivering secure, reliable and affordable energy and increasing the value provided by renewable energy

Collectively, the Ballarat, Gannawarra, ESCRI and Lake Bonney batteries have demonstrated innovative technologies and operating capabilities that have progressed the large-scale battery sector in Australia. These include:

- helping power system reliability by participating in the wholesale energy market and discharging to the grid when supply is otherwise scarce
- providing Frequency Control Ancillary Services (FCAS), which help to stabilise the grid by either injecting or absorbing power to compensate for excessive drops or rises in frequency
- providing backup power supply to local customers following planned or unplanned outages on the transmission network
- delivering a System Integrity Protection Scheme, or SIPS, by providing fast-acting power response from the batteries to help maintain power system security.

During its first three months of operation, the Ballarat Energy Storage System was dispatched to provide FCAS more than 1400 times.

The Gannawarra project, Australia's largest battery to be integrated with a solar farm, also involves the first existing solar farm to be retrofitted with battery storage. Being the first to achieve these configurations, the project has gained significant learnings, which it has shared with the energy sector.

The ESCRI battery is one of the first large-scale, grid-connected batteries to be designed, built and operated in Australia. This year it continued to demonstrate the ability of big batteries to improve the reliability of electricity supply at fringe-of-grid locations, and protect grid security by providing fast-response power and other services.

The Lake Bonney Energy Storage System examined ways that big batteries can earn revenue by trading power and providing FCAS. It was also the first project in Australia to demonstrate the ability of grid-scale batteries to reduce the costs associated with wind farms delivering variable power into the grid.

OUTCOME

Improved competitiveness of renewable energy technologies

Collectively, these projects have identified and demonstrated ways that large-scale batteries can earn revenue from providing services. This will help potential investors to identify greater value in large-scale battery systems.

OUTCOME

Industry and government better informed to navigate the energy transition

Sharing knowledge from ARENA's large-scale battery projects has helped energy market organisations to adapt existing market rules and processes to the technology. Cost and performance data from ARENA's projects are also being used by industry, financiers and electricity system modellers to inform decision-making and guide resource allocation.

OUTCOME

Increased collaboration on energy innovation

A number of ARENA's large-scale battery projects had complex contracting arrangements, with up to 15 different parties involved. Strong collaboration with AEMO during the grid connection process streamlined elements of the process, and ensured that any issues arising (particularly in non-standard developments such as standalone, unmanned systems) were approached with pragmatism.

IMPACT - HOW IS ARENA MAKING A DIFFERENCE?

IMPACT

Secure, reliable and affordable electricity system with a significantly higher share of renewable energy

Through first-of-a-kind demonstrations and sharing insights with industry, investors and regulators, ARENA's big battery projects are helping to pave the way for the technology to commercially deliver reliability and security benefits to the grid.

IMPACT

Increase in employment in renewable energy activities

The projects directly supported employment in the renewables enablement sector, and facilitated a future pipeline that will support further employment. Barriers that have been identified and overcome in the projects are expected to make further investment in large-scale battery systems more attractive and viable. The Gannawarra project has also led to a pipeline of similar initiatives with planning permits in place for eight large-scale solar farms.

CASE STUDY:

SHORT-TERM FORECASTING: IMPROVING PREDICTABILITY OF RENEWABLES

THE NEED

In the search for approaches that enable higher shares of variable renewable energy sources in the grid, ARENA has established an initiative to improve the accuracy of forecasts for the energy generated by large-scale renewables.

Accurate short-term forecasts of cloud movements and wind changes allow the Australian Electricity Market Operator (AEMO) to better balance electricity supply and demand, which keeps the grid stable. They also assist AEMO in maximising the use of the lowest-cost generators, helping keep electricity prices down.

Improved forecasting approaches also benefit solar and wind farms operators, who rely on accurate forecasts to calculate how much electricity they can produce. This reduces their exposure to the costs of balancing the system when their output is less than AEMO expected.

ARENA ACTIVITIES

Presently, AEMO is responsible for forecasting how much electricity will be generated by wind and solar farms. In early 2018 ARENA and AEMO established the Short-Term Forecasting initiative to trial wind and solar farms submitting their own 'five-minute ahead' forecasts to AEMO. The market operator can then integrate this information with its own data to improve overall accuracy.

In March 2019 ARENA awarded $9.4 million to 11 projects to implement the trial, establishing short-term forecasting at large-scale wind and solar farms across Australia. The trial comprises 35 per cent of the NEM's registered large-scale wind and solar capacity, and collectively includes a total of 3.0 GW of renewable electricity generation.

The projects were selected to ensure diversity of forecasting technologies and generator sizes, hardware types and climate regions, including multiple solar and wind and one hybrid generator across NSW, SA and VIC.

As the trials continue there will be ongoing knowledge sharing reports and forums to communicate the learnings to the broader industry.

Image credit: Fulcrum3D

SHORT-TERM FORECASTING INITIATIVE

11 PROJECTS

$9.4 million
ARENA funding

$21.1 million
Total project value

Solar 1.5 GW
Wind 1.5 GW

OUTCOME - WHAT HAS ARENA'S SUPPORT DELIVERED SO FAR?

The objectives of ARENA's Short-term Forecasting initiative are to:

- demonstrate the ability for semi-scheduled generators[3] to submit five-minute self-forecasts via AEMO's web-based Application Programming Interface (API)
- demonstrate the ability for self-forecasting to be more accurate than the equivalent forecast produced by the Australian Wind Energy Forecasting System or Australian Solar Energy Forecasting System (the systems currently used by AEMO)
- explore the potential commercial benefits for semi-scheduled generators of investing in forecasting approaches
- examine factors that affect the accuracy of the forecasting approaches trialed (e.g. in different weather, operational conditions or geographies)
- improve the commercial and technical readiness of forecasting providers and technologies
- contribute to industry knowledge sharing.

As at July 2019, the initiative is five months into the two-year trial. However, considerable outcomes have already been achieved, as described below.

OUTCOME

More solutions for delivering secure, reliable and affordable energy and increasing the value provided by renewable energy

With 11 different forecasting approaches being trialled, the initiative will help solar and wind farms understand which technologies are likely to work best given their local situation.

Another key outcome to date is the development, testing and implementation of a new API. As part of this process, AEMO has changed its systems and procedures to give all generators participating in the NEM the option to submit their own forecasts for use in the dispatch process. This is a fundamental change for renewables, as it provides them an avenue to participate more fully in the market bidding and dispatch process.

As at 30 June 2019, 23 generators had registered to participate in the self-forecasting process and cleared the first API milestone, including 16 generators from ARENA's short-term forecasting trial. The number of participants is expected to grow through 2019 to encompass at least the 28 generators that are involved in ARENA-supported projects.

Self-forecasting could also lead to further innovations, including more sophisticated approaches to operating renewable generators and storage. Renewable energy developers that have more visibility and control of their generation plant through short-term forecasts will have greater ability to create custom, site-specific generation entities such as solar co-located with storage plants, or to guarantee renewables firming across a portfolio of generation entities.

OUTCOME

Increased collaboration on energy innovation

This trial is a prime example of how ARENA's fostering of collaboration can give rise to innovation. The initiative was conceived and developed through ARENA's A-Lab program in 2017, with key input from ARENA, AEMO and Clean Energy Finance Corporation (CEFC) representatives. There was subsequently broad stakeholder input through a series of workshops reaching more than 60 people, and input from AEMO's relevant industry reference group.

IMPACT - HOW IS ARENA MAKING A DIFFERENCE?

IMPACT

Increase in employment in renewable energy activities

One impact already realised through the trial is the creation of a new market for the provision of short-term forecasting capability to renewable generators, in both the wind and solar sectors. Demand for self-forecasting services is expected to increase with generator appetite to connect to the API. This market will be underpinned by the growth of industry experience and capability in self-forecasting approaches.

Self-forecasting will also make it possible for greater forecast certainty to translate directly to cost and revenue improvements for semi-scheduled plants.

IMPACT

Secure, reliable and affordable electricity system with a significantly higher share of renewable energy

Improved accuracy in short-term forecasts will allow the electricity system to operate with a higher share of renewable energy and lower costs incurred due to forecasting errors.

[3] The NEM generator category typically applied for generators with variable output (such as large-scale wind and solar) that are 30 MW or more.

CASE STUDY:

VIRTUAL POWER PLANTS: EMPOWERING ELECTRICITY CONSUMERS

THE NEED

Australia is at the start of a distributed energy revolution that could see half the nation's electricity generating capacity provided by rooftop solar within 20 years. A third of all residences could also have installed an energy storage system by then. This is due to consumers increasingly demanding more choice and control over their energy source, use and cost.

This change presents huge opportunities as well as challenges. To make energy more affordable and future-proof the electricity grid there is a need to better coordinate rooftop solar, batteries and other devices owned by consumers.

Virtual Power Plants, or VPPs, are being developed with support from ARENA to meet this need. VPPs coordinate and control thousands of residential solar PV systems, batteries and other smart energy devices so they behave like a traditional power plant. This makes it possible for VPPs to help keep the grid stable, manage peaks in electricity demand and allow participating homes and businesses to be paid for providing these services.

ARENA ACTIVITIES

ARENA has been helping to develop VPPs since 2014, committing $25.2 million to projects that have increased in scale and sophistication over time. These include pilot projects that demonstrate VPPs in action as well as research projects that develop technologies and business models to help VPPs operate and earn revenue for participants.

ARENA's VPP projects include:

- AEMO VPP demonstration program: delivering operational data from VPPs to AEMO, and providing an evidence base to inform changes to regulatory settings or AEMO operational processes
- AGL's VPP: network of 1000 cloud-controlled residential premises that operates as a 5 MW VPP
- Alkimos Beach: developing, deploying and testing a new energy retail model for community-scale battery storage
- CONSORT: Australian National University's project on Bruny Island that uses battery systems and Network-Aware Coordination software to support a constrained electricity network (that experiences low-quality electricity supply)
- CSIRO's Virtual Power Station 2: advanced VPP that coordinates load, generation and energy storage, building on previous CSIRO research
- GreenSync's deX platform: a prototype online platform that helps electricity networks to trade with distributed energy resource owners

Image credit: ARENA

- Ergon Retail's VPPx pilot: demonstrated a commercial and operational model for providing grid-connected solar PV and battery storage systems for 33 systems in three Queensland towns
- Horizon Power's Project Highgarden: exploring the most economically efficient ways to design and manage a future grid to maximise solar energy contributions
- Reposit Power's GridCredit trials: allowed stored energy to be sold back into the grid when there is a high value in the market
- Simply Energy's VPPx: 6 MW of residential energy storage, with ten commercial businesses networked to deliver a further 2 MW of demand response capacity.

VPPs and other ways of coordinating DER were also a significant focus of ARENA's knowledge sharing activities during 2018-19, and of our new collaborative forum, the Distributed Energy Integration Program (DEIP). ARENA brought together more than 60 stakeholders from state and territory governments, market bodies and industry organisations for a workshop in March 2019 to share knowledge on energy storage systems and VPPs.

OUTCOME - WHAT HAS ARENA'S SUPPORT DELIVERED SO FAR?

An independent evaluation of ARENA's support for DER, including VPPs, conducted in 2019 found that there was a clear progression in the scale and complexity of VPP projects funded by ARENA. The evaluation outlined clear progress towards VPPs being a viable contributor to secure, reliable and affordable electricity in the context of a high renewable electricity system.

OUTCOME

More solutions for delivering secure, reliable and affordable energy and increasing the value provided by renewable energy

The evaluation found that ARENA's early VPP projects, such as Reposit's GridCredits and Ergon Retail's demonstration of solar PV and batteries, made a significant contribution by demonstrating how VPPs could combine and coordinate services from numerous distributed energy resources. In the case of GreenSync's deX, the evaluation found ARENA's early funding support was vital in propelling the project from an innovative idea to a commercial product.

OUTCOME

Improved competitiveness of renewable energy technologies

The evaluation found ARENA's support for Reposit's GridCredits system and Simply Energy's VPPx helped these technologies reach a commercial stage.

OUTCOME

Industry and government better informed to navigate the energy transition

The evaluation concluded the Alkimos Beach project is contributing to current reliability needs; however VPPs of this kind must be on a larger scale to affect system reliability.

The project increased industry understanding of regulatory issues that will impact VPP deployments as they scale into the future.

Project Highgarden contributed knowledge about how to coordinate rooftop solar PV and battery systems to support network power quality in a microgrid setting.

OUTCOME

Improved collaboration on energy innovation

ARENA-supported projects are focusing on how established technologies can be best integrated into the electricity network. Several ARENA VPP projects involve significant collaborations, reflecting the importance of establishing commercial and technical models that work in the context of the roles and responsibilities of electricity network companies, retail companies, the market operator and other participants. For example, GreenSync's deX project resulted in the formation of an industry-wide collaboration that in 2018 included 68 partner organisations.

A second evaluation, which assessed ARENA's reliability projects, found ARENA's DER projects aligned well with key issues the sector needs to address in order to transition to higher penetrations of renewables. The evaluation also found ARENA's coordination and knowledge sharing activities are especially helpful in relation to the development of new commercial models and addressing regulatory barriers.

IMPACT - HOW IS ARENA MAKING A DIFFERENCE?

IMPACT

Secure, reliable and affordable electricity system with a significantly higher share of renewable energy

ARENA-supported VPP projects are contributing to improved reliability in three areas:

- addressing regulatory barriers
- developing new commercial models
- increasing community engagement with distributed energy resources.

The reliability evaluation estimated that projects focussed on better coordination of DER could deliver benefits worth around $140 million, which would increase if there is a larger take up of DER.

SECTION 3:

CORE ACTIVITY AREAS

*Results against this measure are presented in the Performance Case Studies Section.

Image credit: Hydro Tasmania

FUNDING

ARENA has robust processes for working with proponents as project proposals are being developed, to ensure that the Government funding the Agency is responsible for administering is used as effectively as possible.

When making funding decisions, we ask:

- Is the project innovative or novel?
- Is there a pathway to commercialisation?
- Will the project help unlock future investment?

In addition to ARENA's in-house expertise, the Agency draws on the technical expertise of the ARENA Advisory Panel. The Panel's expert members provide advice to support the development and selection of projects and initiatives for funding by ARENA.

ACTIVITY PERFORMANCE MEASURES

Provide financial assistance and leverage private investment

PERFORMANCE MEASURE

Provide financial assistance to new projects in accordance with the principles and priorities outlined in the Agency's *General Funding Strategy* and *Investment Plan*

Target: Provide financial assistance to one or more new projects in each of the Agency's priority areas.

SOURCE
Portfolio Budget Statements

RATIONALE FOR MEASURE

ARENA's ability to provide financial assistance and fully utilise its appropriation is seen by key stakeholders including the Parliament, Minister and Department as a key indicator of effectiveness.

RESULT

Achieved - ARENA provided funding to a total of 79 new projects in 2018-19. Funding was provided to one or more new projects in each of ARENA's investment priority areas.

Provision of funding is reported on the basis of the number of projects for which a contract was executed in 2018-19.

FIGURE 11: LOCATION OF NEW PROJECTS FUNDED IN 2018-19*

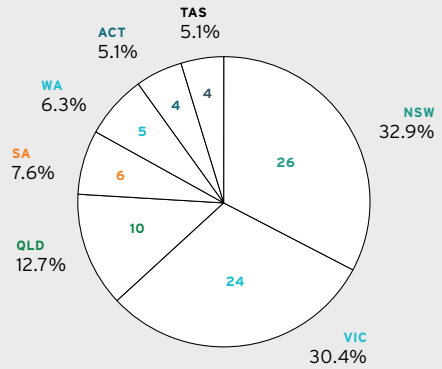


FIGURE 12: DISTRIBUTION OF NEW PROJECTS FUNDED IN 2018-19 BY INVESTMENT PRIORITY*

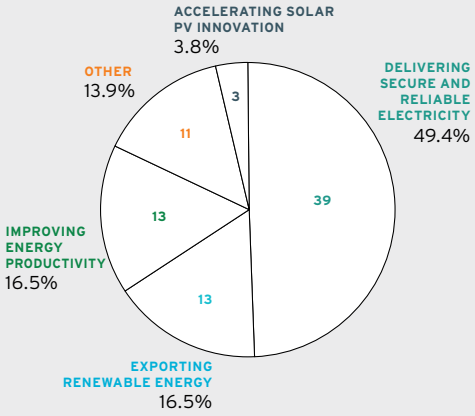


FIGURE 13: DISTRIBUTION OF NEW PROJECTS FUNDED IN 2018-19 BY INNOVATION STAGE*

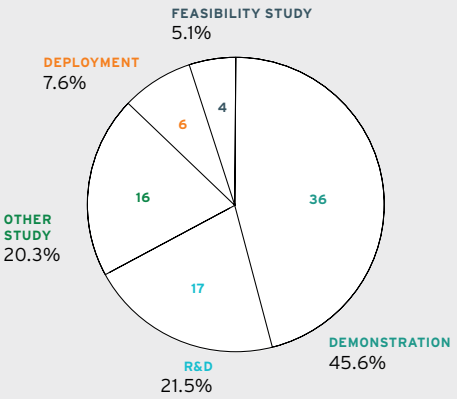
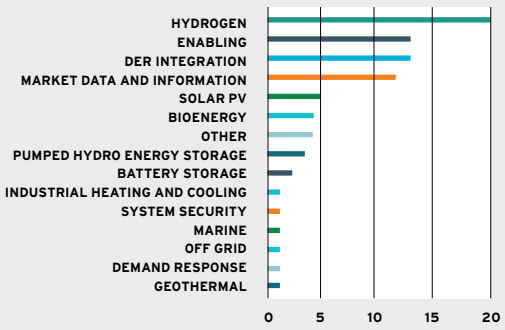


FIGURE 14: DISTRIBUTION OF NEW PROJECTS FUNDED IN 2018-19 BY PRIMARY TECHNOLOGY



*Totals may exceed 100% due to rounding

PERFORMANCE MEASURE

$m ARENA funds approved*
Target: $281 million in 2018-19

SOURCE
Corporate Plan 2018-19 p14-15

*The value of ARENA funds that the Board or CEO has approved to be offered to an applicant subject to successful negotiation of a contract, or subject to a final assessment process.

RATIONALE FOR MEASURE

Approval of a request for funding represents an important milestone in ARENA's rigorous business development, application and assessment process. The amount of funding approved is an indicator of the strength of ARENA's project pipeline and of ARENA's effectiveness in progressing applications.

RESULT

In 2018-19 ARENA approved a total of more than $292.6 million, exceeding its target by more than $11 million. This figure includes funds that were approved to be offered to an applicant subject to negotiation of a contract, approval of variations greater than $1 million, as well as those that were approved to be made available to projects subject to a final assessment process. Adoption of more innovative ways of selecting projects has resulted in incorporation of a small number of projects that were approved subject to a final assessment process. This updated methodology is intended to more completely reflect progress towards funds being contractually committed and then spent.

A wide range of companies and innovators bring proposals to ARENA, which employs a highly-skilled team of business specialists to help proponents bring the best ideas to life. The Business Development and Transactions team works with proponents from the concept stage to a fully developed proposal, with the best projects receiving a commitment of funding from ARENA. We undertake robust financial and technical due diligence. The ARENA Advisory Panel (AAP) provides independent merit assessment. This year, the AAP considered 52 expressions of interest (EOIs) and 90 full applications.

Consistent with ARENA's risk-based approach, our due diligence activities were commensurate with the value, size and complexity of each proposal. Due diligence activities may include the commissioning of independent research, feasibility assessment, analysis and modelling to support ARENA's assessment and facilitate consultation with our stakeholders. Table 9 sets out the number of proposals considered by ARENA during the reporting period, from EOI, consideration by the AAP, through to full application and funding approval.

Proposals may pass through a two-stage process (EOI and full application), or single-stage process (full application only), depending on a number of factors. Single-stage applications include feasibility studies, projects where the ARENA grant funding sought is less than $500,000, or where ARENA has waived the requirement to submit an EOI (for instance, in the case of well-developed projects).

TABLE 9: PROJECT PIPELINE DATA FOR 2018-19

	EOIS SUBMITTED	EOIS CONSIDERED BY AAP	FULL APPLICATIONS SUBMITTED	FULL APPLICATIONS CONSIDERED BY AAP
NUMBER	60	52	94	90

PERFORMANCE MEASURE

Number of projects approved*

SOURCE
Corporate Plan 2018-19 p14-15

*Projects that the Board or CEO has approved to be offered ARENA funds subject to successful negotiation of a contract.

RATIONALE FOR MEASURE

ARENA's ability to provide financial assistance and fully utilise its appropriation is seen by key stakeholders including the Parliament (via PBS), Minister and Department as a key indicator of effectiveness.

RESULT

In 2018-19 ARENA approved funding for a total of 68 new projects. The majority of these led to contractual commitments in 2018-19. Twenty-two were still subject to commercial negotiations on 30 June 2019, and are likely to lead to contractual commitments in 2019-20.

PERFORMANCE MEASURE

Investment leverage by innovation stage

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

ARENA's investment approach is to provide the minimum viable grant to enable high quality projects to proceed.

The ratio of ARENA to third party funding is an indicator of how well we select projects and negotiate funding arrangements.

RESULTS

Across all projects contractually committed in 2018-19, $5.89 of third party funding is expected to be provided for every ARENA dollar.

This overall result is significantly driven by a small number of projects at the deployment stage, where commercial funders are underwriting more than 90 per cent of the total project cost. The investment leverage by innovation stage is shown in Table 10.

TABLE 10: INVESTMENT LEVERAGE BY INNOVATION STAGE

INNOVATION STAGE	NUMBER OF PROJECTS	ARENA FUNDING ($M)	TOTAL PROJECT COST ($M)	INVESTMENT LEVERAGE
R&D PROJECTS	17	22.4	59.8	1.67
DEMONSTRATION PROJECTS	36	95.3	316.3	2.32
DEPLOYMENT PROJECTS	6	48.5	864.6	16.84
FEASIBILITY STUDIES	4	3.0	7.2	1.41
OTHER STUDIES	16	19.0	48.5	1.55
ALL PROJECTS	**79**	**188.1***	**1296.4**	**5.89**

*Totals may vary slightly due to rounding

PERFORMANCE MEASURE

Total third party funds invested

SOURCE

Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

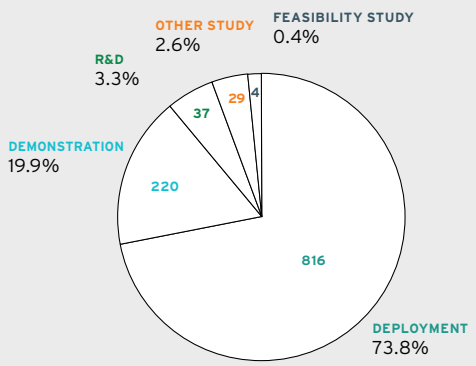
An important part of ARENA's role is to unlock third party funding and increase total investment in renewable energy innovation.

RESULT

In 2018-19 a total of $1.1 billion of third party funds were invested in new projects funded by ARENA.

Figure 15 shows the amount of third party funds invested by innovation stage.

FIGURE 15: TOTAL THIRD PARTY INVESTMENT ($M) BY INNOVATION STAGE



PERFORMANCE MEASURE

Commitments to contribute to Australia's Mission Innovation target

Target: ARENA 2020-21 R&D expenditure at least doubled from 2015-16

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Australia has pledged to double government clean energy research and development expenditure by 2020-21. ARENA's expenditure on R&D in 2015-16 was $26.6 million and our target is to achieve expenditure of at least $53.1 million in 2020-21. This performance measure tracks annual funds spent by ARENA on R&D and the trajectory to the target amount in 2020-21, which is the year that the Mission Innovation commitment relates to.

RESULT

In 2018-19 ARENA committed $29.7 million to 24 new Mission Innovation eligible projects.

ARENA expenditure in 2018-19 (milestones paid) for Mission Innovation R&D projects was $39.1 million.

ARENA is on track to meet the target for doubling R&D expenditure in 2020-21 subject to funding initiatives proposed for 2019-20 proceeding.

Administer financial assistance

ARENA maximises the impact of its portfolio of renewable energy projects through contract and risk management, performance monitoring, stakeholder engagement and knowledge sharing. ARENA takes a flexible, agile approach to respond to contingency events so that innovation projects can meet their objectives within a fast paced technological and market environment.

ARENA seeks to ensure that all projects deliver value for money.

PERFORMANCE MEASURE

Effectively manage projects in accordance with agreement terms to deliver intended outcomes, learn and improve

Target: Significant project outcomes and lessons learned disseminated

SOURCE
Portfolio Budget Statements

RATIONALE FOR MEASURE

The dissemination of significant project outcomes and lessons learned is an indicator of the success of ARENA's contract management processes and capabilities. It shows that projects have been managed so that they can succeed, generate and share knowledge.

RESULT

Achieved. Significant project outcomes and lessons learned were disseminated through a large number of knowledge sharing activities undertaken by funding recipients and ARENA.

Evidence that ARENA has achieved results against this criterion is presented in the Performance case studies and in the reporting for Knowledge sharing and Collaboration sections.

PERFORMANCE MEASURE

Number of projects managed

SOURCE
Corporate Plan 2018-19 p14-15

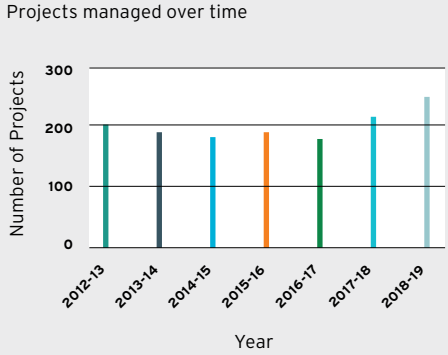
RATIONALE FOR MEASURE

This measure is an indicator of the strength of ARENA's project portfolio. The number of projects managed is a key workforce driver for the agency.

RESULT

During 2018-19, 254 active projects were managed by ARENA, which is greater than the forecast number and the largest number of active projects managed over the course of a financial year to date.

FIGURE 16: ACTIVE PROJECTS MANAGED BY ARENA OVER THE COURSE OF FINANCIAL YEARS 2012-2019



PERFORMANCE MEASURE

Number of projects closed

SOURCE

Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

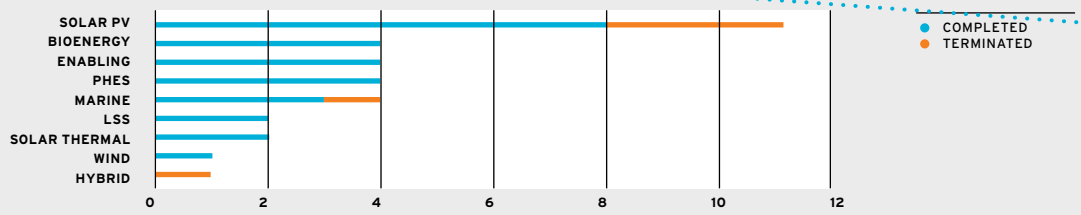
This measure is an indicator of ARENA's ability to successfully manage projects to completion.

RESULT

Twenty-eight ARENA-funded projects reached completion in 2018-19. ARENA seeks to ensure that all projects deliver value for money. Five projects were terminated during 2018-19.

The decision to terminate projects reflects a judgment that a project is not meeting, or is unlikely to meet, its intended outcomes, or has achieved its objectives prior to completion of all milestones for the project. Unspent funds from terminated projects were returned to ARENA or released for other commitments.

FIGURE 17: NUMBER OF PROJECTS COMPLETED AND TERMINATED IN 2018-19 BY PRIMARY TECHNOLOGY



PERFORMANCE MEASURE

$m payments made

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Payments made to funding recipients based on full or partial completion of a milestone under the terms of a funding contract is an indicator of the effectiveness of ARENA's contract management.

RESULT

The Agency paid $127.8 million* to 155 projects for the achievement of milestones according to funding agreements.

While ARENA did not set a specific target as part of its performance framework, this result is below ARENA's budget forecast for the year.

A number of large projects under negotiation or in the approval process during 2018-19 experienced delays in reaching financial close due to commercial and market issues. The impact of the delays is reflected in the reduction in grant expenses in 2018-19 compared to budget and previous years.

*Excluding GST and accruals

Jointly manage Clean Energy Innovation Fund with the Clean Energy Finance Corporation

During 2018-19, ARENA and the CEFC worked collaboratively on the Clean Energy Innovation Fund. The ARENA CEO and CFO were members of the Fund's Joint Investment Committee (JIC), which made recommendations on investment decisions to the CEFC Board.

ARENA assisted with developing investment proposals and advising on the technical and commercial feasibility of technologies, including by making available members of the ARENA Advisory Panel to assist the Fund on technical assessments of investment opportunities.

PERFORMANCE MEASURE

1. Number of projects funded by Clean Energy Innovation Fund, number originating from ARENA
2. $ value of projects funded
3. Investment leverage

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

These measures provides an indicator of the value of ARENA's contribution to the operation of the Clean Energy Innovation Fund.

RESULT

1. In 2018-19 the Fund made two new investments and five follow-on investments. One follow-on investment originated from ARENA
2. The Fund invested $11.6 million
3. The $11.6 million Fund investment was matched by $106.3 million from co-investors. For each dollar of Clean Energy Investment Fund investment, third parties invested $9.20

2018-19 saw the largest number of investments, the highest amount of co-investment and the highest leverage ratio since the Fund was established in 2016-17.

Further information is reported by the CEFC in its annual report.

TABLE 11: PROJECTS FUNDED BY CLEAN ENERGY INNOVATION FUND AND ORIGINATING FROM ARENA

	2018-19	2017-18	2016-17
Number of investments made by Fund, number originating from ARENA	2 new investments 5 follow-on investments, 1 originating from ARENA	6	4
$ value of investments made by Fund in 2018-19	$11.6 m	$26.2 m	$30 m
Total investment leverage ($m from co-investors)	$106.3 m	$23.6 m	$64.8 m
$ of co-investment for every dollar of Fund investment	$9.20	$0.90	$2.16

OUTCOME PERFORMANCE MEASURES

More solutions for delivering secure, reliable and affordable energy and increasing the value provided by renewable energy

Research and development creates new knowledge that provides the foundation for new products and services. The demonstration stage of the innovation chain, including studies, pilots and proof-of-concept projects, is where innovators validate or refute the viability of a product, service, market design or other potential solution.

A successful demonstration results in a new solution ready for commercialisation and adoption at scale. With more solutions available, Australia will be better placed to adopt the right mix of technologies and approaches to deliver secure, reliable and affordable energy, realising more value from our renewable energy resources.

PERFORMANCE MEASURE

Number of completed proofs of concept, pilots and demonstrations

SOURCE

Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Completed proofs of concept, pilots and demonstrations provide a means of validating or refuting the viability of an idea, technology, business model, market design or other proposed solution. The demonstration effect and lessons learned from such projects support innovation and the eventual adoption of viable solutions.

RESULT

Seven demonstration projects (which include proofs of concept and pilots) were completed in 2018-19.

These comprised three solar PV projects, one large-scale solar, one marine, one wind and one enabling project.

CASE STUDY: NSW SCHOOLS ENERGY PRODUCTIVITY PROGRAM

The NSW Schools Energy Productivity Program (SEPP) produced tangible benefits in terms of reduced costs and greenhouse gas emissions and increased energy literacy.

The SEPP program ran from April 2018 to June 2019 and demonstrated the benefits of integrating energy productivity improvements and renewable energy across NSW schools. When the project began, Schools Infrastructure NSW's (SINSW) resource efficiency program was limited to procuring and installing LED lighting and large-scale solar PV systems.

SINSW and ERM Power agreed the pilot achieved the following tangible outcomes:

- estimated $651,700 (60 per cent) reduction in annual electricity spend
  - solar accounted for 29 per cent
  - lighting consumption savings accounted for 50 per cent
  - lighting demand savings accounted for 21 per cent
- additional $64,750 in maintenance savings due to LED lighting
- estimated 3.55 GWh (61 per cent) reduction in annual electricity consumption
  - solar accounted for 38 per cent or 1.35 GWh
  - lighting consumption savings accounted for 62 per cent or 2.20 GWh
- estimated reduction in greenhouse gas emissions by 3475 metric tonnes of CO2.

A pre-engagement and post-engagement survey measured a strong increase in energy literacy among students and staff. Respondents' understanding of bill charges increased threefold and their understanding of the concept of demand doubled.

PERFORMANCE MEASURE

Improvements in technological readiness of R&D

SOURCE
Corporate Plan 2018-19 p14-15

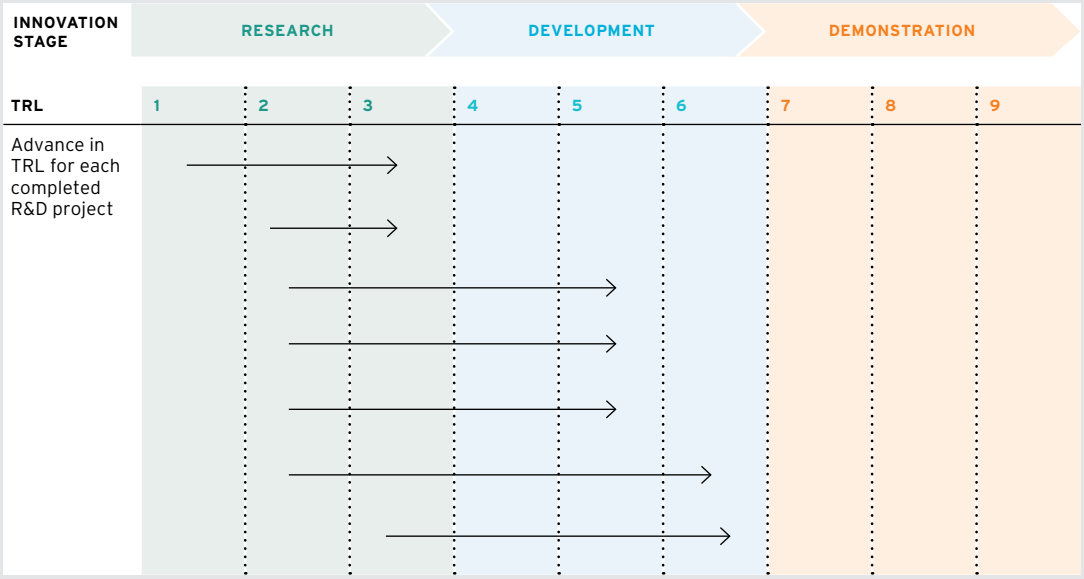
RATIONALE FOR MEASURE

This measure provides an indicator of how ARENA-supported R&D is enabling ideas to advance along the innovation pathway. The TRL index is a globally accepted benchmarking tool for tracking progress and supporting the development of a specific technology through the early stages of the innovation chain, from blue sky research (TRL 1) to actual system demonstration over the full range of expected conditions (TRL 9).

RESULT

FIGURE 18: ADVANCES IN TRL ACHIEVED BY R&D PROJECTS

Arrows show starting and ending TRL for the seven R&D projects where final reports were available in 2018-19



GUIDE TO TRLS

1 Transition from scientific research to applied research
2 Applied research
3 Proof of concept validation
4 Standalone prototyping implementation and test
5 Thorough testing of prototyping in representative environment
6 Prototyping implementations on full-scale realistic problems
7 System prototyping demonstration in operational environment
8 End of system development
9 Actual system has been thoroughly demonstrated and tested in its operational environment

Seven research and development projects were substantially completed in 2018-19, with final reports available. The Network Aware Coordination software (NAC) technology was successfully used in the CONSORT Bruny Island battery trial, which won the 2018 Energy Networks Industry Innovation Award. The technology is now ready for wider implementation.

The other projects covered: advanced imaging and materials science to improve solar PV cell efficiency and durability; a novel receiver for concentrating solar thermal; rooftop solar with storage; and novel battery chemistry. Two projects moved the technology from the research stage to the stage where they are ready for demonstration in an operational environment, representing significant progress along the innovation pathway.

Improved competitiveness of renewable energy technologies

This performance measure is reported against in the Performance Case Studies section.

Image credit: UNSW

KNOWLEDGE SHARING

The results for knowledge sharing provide additional information about industry-wide learning for the PBS performance measure 'Effectively manage projects in accordance with agreement terms to deliver intended outcomes, learn and improve'.

ARENA invested significant effort to ensure that its projects delivered the maximum benefit by sharing knowledge and lessons learned to improve understanding, build networks and inform decision-making.

Every newly-contracted project during 2018-19 included a Knowledge Sharing (KS) Plan as part of the funding agreement between ARENA and the funding recipient.

The KS Plan sets out what information and knowledge generated during the activity will be provided, and how, when and with whom it will be shared.

The KS deliverables are relevant to the specific project outcomes and also aim to provide industry with knowledge that can help de-risk follow-on projects, accelerate deployment of safe and commercially viable technologies, increase public understanding and confidence in new technologies, support capability development, and inform future policy-making.

In addition to project KS deliverables, this reporting period has seen an increase in ARENA-led activities to maximise the impact of ARENA project knowledge. This involved a significant program of work, which included convening two major ARENA Insights Forums to share lessons from projects that cut across technologies and inform the broader industry.

Feedback from the Forums indicated that ARENA KS is highly valued by industry and opportunities to collaborate and share knowledge directly in forums and workshops is viewed as important to the establishment and expansion of networks. In the June forum, 95 per cent of respondents reported making new connections at the event.

International engagement helps inform industry and government to better navigate the energy transition. Inviting international speakers to share expertise, knowledge and experience is an important part of this. The Knowledge Sharing ARENA Insights Forums provide an opportunity to share international lessons that inform ARENA projects and the broader industry.

The keynote speaker at the second ARENA Insights Forum, Ms Lorraine Akiba, former Commissioner at the Hawaiian Utilities Commission, provided lessons and challenges from a high renewables grid and Hawaii's transition to 100 per cent clean energy by 2045. ARENA arranged a schedule of meetings for Ms Akiba to speak to key players in the Australian energy transition.

ARENA also led seven workshops and webinars in which industry players and state governments shared lessons learned from ARENA projects and discussed the challenges and opportunities of renewable energy technologies.

In addition, this reporting period saw the development of the ARENA Insights newsletter to share reports, lessons and insights from ARENA's projects directly to industry audiences. Eight editions were delivered to approximately 2000 subscribers.

ACTIVITY PERFORMANCE MEASURES

Provide information, advice and knowledge to advance renewable energy

PERFORMANCE MEASURE

Number of knowledge sharing products by type (includes reports, presentations, blog posts, videos, policy submissions etc.)

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Synthesising knowledge and lessons learned and making them widely available in the form of reports and written submissions is an indicator of the extent to which ARENA is contributing to building the publicly available knowledge base for renewable energy technologies.

RESULT

TABLE 12: KNOWLEDGE SHARING PRODUCTS PRODUCED AND NUMBER OF USERS IN 2018-19*

PRODUCT	NUMBER PRODUCED	USERS
Insights Newsletter	8	1,927 readers with an average of 23% click through rate or average of 635 clicks (engagement) per edition
Public reports uploaded to Knowledge Bank	70	Accessed by 3,508 readers with 94% of users who visit the Knowledge Bank downloading a report 8,619 total unique visits to the Knowledge Bank 8,076 total unique report downloads 24 average daily visits to Knowledge Bank
Public presentations uploaded to Knowledge Bank	20	Accessed by 535 users
Public reports commissioned and/or prepared by ARENA and uploaded to the ARENA Knowledge Bank	19	Accessed by 2,545 users
Policy submissions	11	Accessed by 24 users via the ARENA website (submissions are also available from the relevant policy agency website)
Blog posts	84	71,613 unique views
Videos	15	194,249 unique views on Facebook
Infographics	7	129,440 unique views on Facebook

*Also shows results for outcome performance measure: Number of users of knowledge sharing products

PERFORMANCE MEASURE

Number of knowledge sharing events delivered (includes virtual events e.g. webinars)

SOURCE

Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Bringing people together is an effective way of facilitating the exchange of knowledge. This measure is an indicator of the extent to which ARENA facilitates in person knowledge sharing.

RESULT

TABLE 13: KNOWLEDGE SHARING EVENTS DELIVERED IN 2018-19*

EVENT	NUMBER	ATTENDEES
Insights Forums	2 forums	Total of over 300 attendees
Workshops and events facilitated by ARENA's Knowledge Sharing team	7 events	Total of 295 attendees

*Also shows results for outcome performance measure: Number of users of knowledge sharing products

The first ARENA Insights Forum was held in Sydney in November 2018 and was split into two streams: large-scale projects and distributed energy resources. This forum had 13 presenters, 33 panelists and 135 attendees.

The second Insights Forum was held in June 2019 in Sydney and featured an international speaker, Lorraine Akiba, a former Commissioner of the Hawaiian Public Utilities Commission. This forum had 12 presenters, 35 panelists and 195 attendees.

The workshops and events involved bringing together industry, and covered a range of topics including virtual power plants, demand response, short-term forecasting and large-scale battery storage. We also ran a webinar about SunSHIFT's Redeployable Solar Project. There was a total of 295 attendees at the ARENA-run workshops and webinars.

PERFORMANCE MEASURE

Number of ministerial and departmental briefs prepared

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

This performance measure provides an indicator of how ARENA fulfilled its function to provide advice on renewable energy technologies to the Minister.

RESULT

In 2018-19 ARENA prepared 15 Ministerial briefs on the following topics: seeking approval (4), providing information (9), ministerial correspondence (1) and other (1).

Image credit: ARENA

OUTCOME PERFORMANCE MEASURES

Industry and government better informed to navigate the energy transition

PERFORMANCE MEASURE

Third party recognition of value of ARENA knowledge sharing (e.g. citations of ARENA-provided information and supported projects in publications by relevant bodies (e.g. AEMO, AEMC)); inclusion of ARENA in relevant working groups

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Information or data from ARENA-funded projects or activities being cited by authoritative sources is evidence of the visibility, relevance and quality of ARENA's activities and that they are positively influencing developments in the Australian energy sector. ARENA workers being invited to participate in significant bodies or initiatives within the energy sector is an indicator of stakeholder assessments of the skills and expertise of ARENA workers.

RESULT

ARENA-funded projects and ARENA activities were cited in a range of influential publications and also earned recognition by winning an industry innovation award.

TABLE 14: SIGNIFICANT INSTANCES OF ARENA ACTIVITIES OR FUNDED PROJECTS BEING CITED IN 2018-19

NATURE OF CITATION	SOURCE	DATE
Report on Multi-criteria scoring for identification of renewable energy zones	DNV GL	July 2018
Report on Retail electricity pricing	ACCC	July 2018
Web article	Energy Networks Australia	September 2018
Report on Australian Government Funding Arrangements for non-NHMRC Research	House of Representatives Standing Committee on Employment, Education and Training	October 2018
NEM Virtual Power Plant (VPP) Demonstrations Program Consultation paper	AEMO	November 2018
South Australian Electricity Report	AEMO	November 2018
2018-19 Summer Readiness Plan	AEMO	November 2018

(CONTINUED)

NATURE OF CITATION	SOURCE	DATE
Energy Network Industry Innovation Award	Energy Networks Australia	November 2018
2019 Planning and Forecasting Consultation Paper	AEMO	February 2019
Report on Innovation in the Electricity Network Sector	Energy Networks Australia	March 2019
Annual Market Performance Review 2018	AEMC	April 2019
Report on Improving DER capabilities to benefit consumers and the power system	AEMO	April 2019
Technical Integration of Distributed Energy Resources Report and Consultation paper	AEMO	April 2019
Australian renewable energy investment trends and outlook	MinterEllison	June 2019
WEM Electricity Statement of Opportunities	AEMO	June 2019
Distributed Energy Resources and Electric Vehicle Forecasts report	Energeia	June 2019
Forward looking work program (Transitioning to a lower emissions power system)	AEMC	June 2019

TABLE 15: WORKING GROUPS THAT ARENA PARTICIPATED IN DURING 2018-19

WORKING GROUP	CHAIR
Wholesale demand response working group	AEMC
Coordination of generation and transmission investment (CoGaTI) technical working group	AEMC
Advanced Systems Integration Group	AEMO
Post 2025 Market Design Working Group	Energy Security Board
Regulatory Sandbox Working Group	AEMC
GenCost Working Group	CSIRO
Network Tariff Reform Roundtable	Australian Energy Regulator
Hydrogen Stakeholder Advisory Panel	Chief Scientist
Wave Energy Research Centre Steering Committee	University of Western Australia
WA Renewable Hydrogen Working Group	Western Australian Department of Regional Development
Emissions Projections Technical Working Group	Commonwealth Department of the Environment and Energy
HiTeMP Forum Steering Committee	Centre for Energy Technology, University of Adelaide
Hydrogen RD&D Roadmap Steering Committee	CSIRO
Hydrogen Inter-departmental Committee	Commonwealth Department of Industry, Innovation and Science
Hydrogen Working Group	COAG Energy Council
WA Renewable Hydrogen Council	Western Australian Department of Regional Development
Innovation Steering Group (EV stream)	Energy Networks Australia

PERFORMANCE MEASURE

Number of users of knowledge sharing products (includes data on downloads, request for products, reach of knowledge sharing events etc.)

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Indicator of the visibility, relevance and usefulness of ARENA knowledge sharing.

RESULT

See Tables 12 and 13 for users of knowledge sharing products and attendance at knowledge sharing events.

TABLE 16: MEDIA AND SOCIAL MEDIA REACH

PLATFORM	METRIC	NUMBER
Facebook	reach	1,401,749
Twitter	impressions	948,400
LinkedIn	impressions	743,326
ARENA website	visitors	766,608
Re-Wired	downloads	8,885
ARENAWIRE (ARENA'S BLOG)		
Number of direct ARENAWIRE subscribers as at 30 June		8,207
Number of recorded unique page views (UPVs)		150,773
The top five blogs for the year (as measured by UPVs) were:		
Distributed energy resources		10,882
Hydrogen: future Australian renewables		5,466
Relectrify: bringing new life to old lithium-ion batteries		4,888
ARENA's role in commercialising big batteries		3,608
Hydrogen to become Australia's next big export		2,614

ARENA's media reach continued to climb with 37 project-related media releases reaching a collective 37 million people based on media monitoring data.

PERFORMANCE MEASURE

Proponent and other stakeholder feedback on value of ARENA knowledge sharing (via annual survey and feedback from specific knowledge sharing events)

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

The effectiveness of knowledge sharing depends on its relevance, timeliness and ease of access to those who are most likely to use it. Direct feedback from target audiences is a way of assessing effectiveness.

RESULT

Feedback from ARENA's quarterly knowledge sharing survey (66 respondents each representing one unique project):

- 75 per cent find ARENA's knowledge sharing activities to be valuable to their work and feel ARENA is useful as a knowledge sharing resource
- 71 per cent reported that they have either formed new relationships or strengthened existing relationships as a result of knowledge sharing activities
- only 17 per cent reported that they have not been contacted to share knowledge about their project. Of these, the main reason was that the project was in its early stages.

Feedback from participants in ARENA's Insights Forums (73 respondents):

- participants provided an overall satisfaction rating of 8.6/10 for the event
- participants provided a rating of 8.8/10 for the value of ARENA knowledge sharing to their organisation
- 95 per cent of respondents reported making new connections at the event.

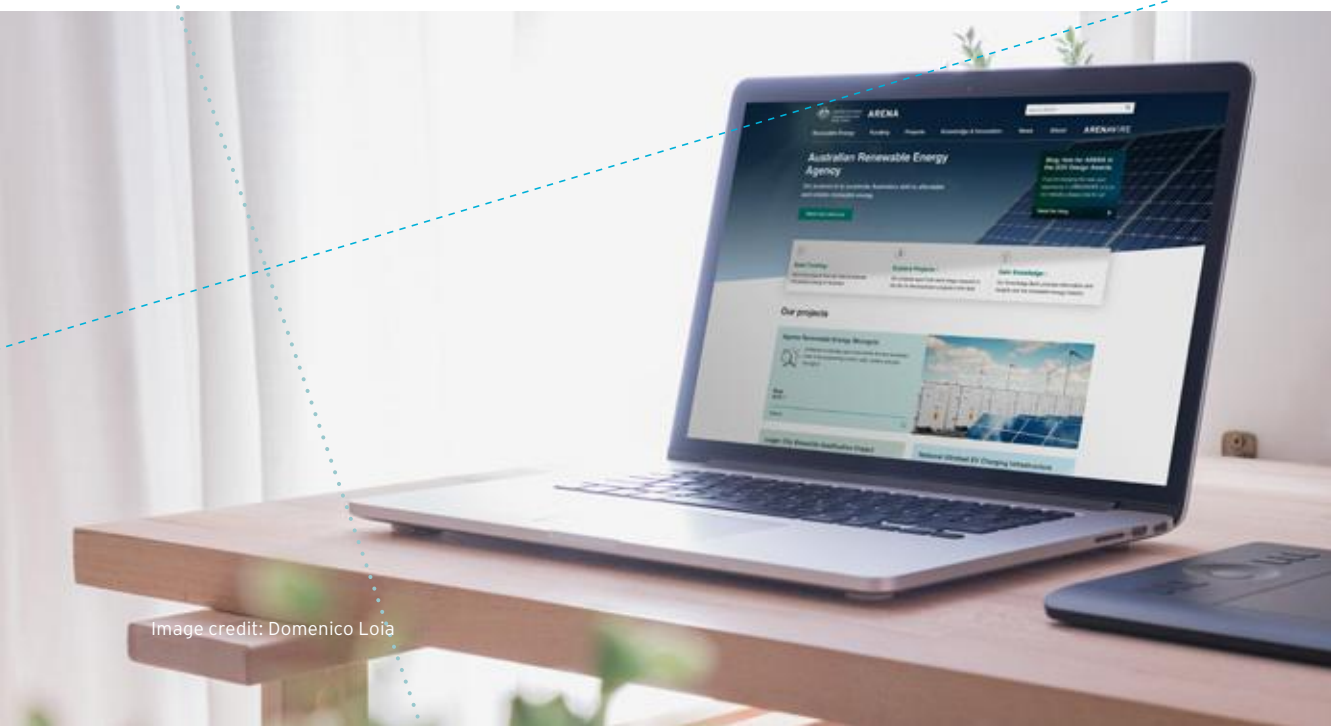


Image credit: Domenico Loia

COLLABORATION

ACTIVITY PERFORMANCE MEASURES

Collaborate with, and facilitate collaboration between, other persons, organisations and governments (including international collaborations)

Building networks and collaborating across the energy sector to build skills, encourage dialogue and help meet emerging challenges is a core activity for ARENA. Energy sector transformation benefits from coordination between many different players across government, industry and the research sector.

ARENA's innovation lab, A-Lab, contributed to increased coordination and collaboration by creating cross-sector partnerships and world-first projects to transition Australia to clean energy. A-Lab brought together a diverse network of people with the expertise and passion to drive systemic change in the electricity sector.

Image credit: ARENA

PERFORMANCE MEASURE

Number of joint activities/arrangements undertaken or supported by ARENA including A-Lab activities

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

The activities reported under this performance measure are an indicator of ARENA's contribution to improving collaboration within the energy sector.

RESULT

ARENA established or maintained seven memorandums of understanding during 2018-19 covering joint or coordinated activities between ARENA and parties including AEMO, the AEMC, CEFC, the South Australian Government and New South Wales Government.

A-LAB ACTIVITIES

ARENA organised two significant A-Lab events during the year, helping to develop and test ideas to further renewable energy in Australia.

Incubate 2018 (Melbourne)
This was A-Lab's first ever project incubate program using a three-day competitive format. Its aims were to refine renewable energy project ideas and develop detailed business plans for testing with industry.

ARENA invited the public to submit their best ideas to help accelerate Australia to transition to renewable energy. The ten teams invited to participate generated ten project ideas of which six applied for ARENA funding and one was successful in receiving funding.

Ideate (Alice Springs)
This event was the first regional A-Lab event. Its aim was to generate ideas and projects to tackle some of the significant challenges facing the Alice Springs power system.

The event drew together more than 50 people from 29 organisations, with more than half of those organisations coming from outside the NT.

This event generated more than 200 new ideas, translated them into 19 project concepts, and finally pitched nine project ideas to the A-Lab 'Dolphin Tank' which included the NT Minister for Renewable Energy and Essential Services, the Hon Dale Wakefield.

To deliver this session the A-Lab team partnered with the Intyalheme Centre for New Energy in Alice Springs.

Since the event, the Intyalheme team has continued to work with A-Lab participants to further develop their ideas and concepts. This has resulted in the development of the Alice Springs Future Grid Project, an amalgamation of several of the ideas created at A-Lab and the continued collaboration of the participants.

The A-Lab events brought together participants from 15 different sectors of the energy system representing: industry associations, consulting firms, customers, distributed energy resources sector, developers, electric vehicle sector, finance sector, generators, government, market bodies, metering companies, network service providers, research sector, retailers and technology providers. Participants represented all states and territories.

PERFORMANCE MEASURE

Number and type of meetings with governments

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

Information provided under this performance measure is an indicator of ARENA's contribution to joined up government and reflects ARENA's efforts to share information and collaborate with other Commonwealth and State and Territory government agencies.

RESULT

The ARENA Executive Leadership Team collectively had more than 150 meetings with governments. This included meetings with Members of Parliament, Commonwealth Government departments and agencies, state and territory government departments and agencies and foreign government officials and agencies. ARENA's General Manager of Strategy met with Japanese Government officials and agencies, Belgian officials and German officials. ARENA's CEO met with a Singaporean delegation.

The types of meetings included cross-agency coordination, information exchanges, development of joint activities, negotiation of MOUs, consultation and ARENA acting in an advisory capacity.

ARENA's Business Development and Transactions team held meetings with officials from all states and territories to explore and pursue collaborative initiatives relating to renewable energy. These included:

- meeting on a regular basis with NSW officials regarding NSW's Emerging Energy Fund
- discussions with Queensland officials on ARENA's dispatchability and concentrating solar thermal studies; renewable hydrogen initiatives and energy from waste funding opportunities
- discussions with Victorian officials regarding collaboration in hydrogen and microgrids
- discussions with South Australian officials ahead of agreeing an MOU on the SA Grid Scale Storage Fund (GSSF)
- discussions with Western Australian officials regarding potential joint initiatives in hydrogen deployment and VPP opportunities
- a series of meetings with Northern Territory officials regarding hydrogen opportunities
- regular meetings with Hydro Tasmania and TasNetworks.

OUTCOME PERFORMANCE MEASURE

Increased collaboration on energy innovation

Collaboration improves the sharing of knowledge and the pace of innovation. As a Commonwealth agency, ARENA is committed to supporting a whole of sector approach to the energy transition.

The benefits of increased collaboration include:

- early identification of opportunities
- generation of ideas
- more efficient and effective use of resources, reducing costs
- improved decision-making.

PERFORMANCE MEASURE

Number and quality of new partnership arrangements in the energy sector (including collaborations entered into by participants in ARENA-funded projects)

SOURCE
Corporate Plan 2018-19 p14-15

RATIONALE FOR MEASURE

The ARENA Act requires ARENA, if appropriate, to collaborate with other parties in performing its functions. This measure relates to the extent to which ARENA is doing this. Evidence that ARENA is enabling more diverse partnerships is a strong indicator of our effectiveness in this role.

RESULT

NEW PARTNERSHIP ARRANGEMENTS IN THE ENERGY SECTOR

The Distributed Energy Integration Program (DEIP) is a collaboration of 13 organisations including government agencies, energy peak bodies, market authorities, industry and consumers associations.

The aim of the collaboration is to maximise the value of customers' distributed resources for all energy users.

The premise is that a forum for information exchange and collaboration on DER issues will enable a more efficient identification of knowledge gaps and priorities and thereby accelerate market reform in the interest of customers.

ARENA played a key role in establishing DEIP and provides ongoing support as a member of the secretariat, along with AEMO and AEMC.

ARENA has a number of strategic collaborations, and in 2018-19 the following delivered notable outcomes:

AEMO SHARED WORK PROGRAM

Under the MOU in place since May 2017, the shared work program has delivered several collaborative initiatives. These include the Demand Response RERT trial, ARENA's Short-Term Forecasting initiative, and innovative proof-of-concept projects such as the Hornsdale Wind Farm Stage 2 (HWF2) FCAS Trial.

GENCOST 2018

ARENA was a member of the reference group and contributor to this report which provides updated projections of electricity generation technology costs. GenCost 2018 is a collaboration between CSIRO and AEMO, supported by ARENA, the Department of the Environment and Energy and industry stakeholders, established to produce annual cost estimates to guide strategic decision making, given technology costs change significantly each year. GenCost 2018 informed AEMO's assumptions for its 2019 planning and forecasting publications.

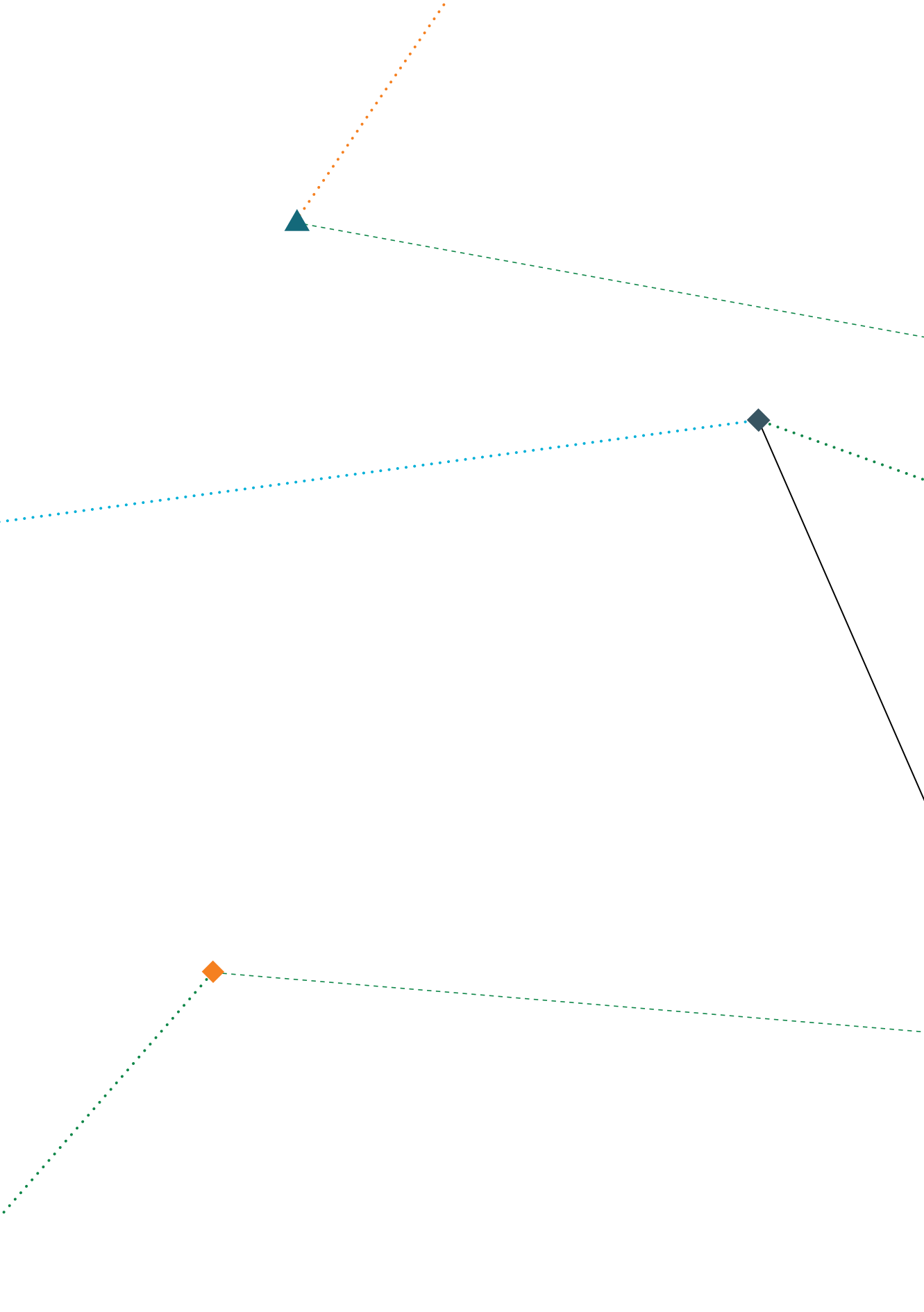
NATIONAL HYDROGEN STRATEGY

ARENA was a key contributor to the Chief Scientist's Hydrogen Strategy Group and Taskforce, which delivered the briefing paper 'Hydrogen for Australia's Future' to the COAG Energy Council in August 2018, which led to the Energy Council's request for the development of a National Hydrogen Strategy. ARENA is contributing to the National Hydrogen Strategy through provision of subject matter expertise, including through representation on the Stakeholder Advisory Panel.

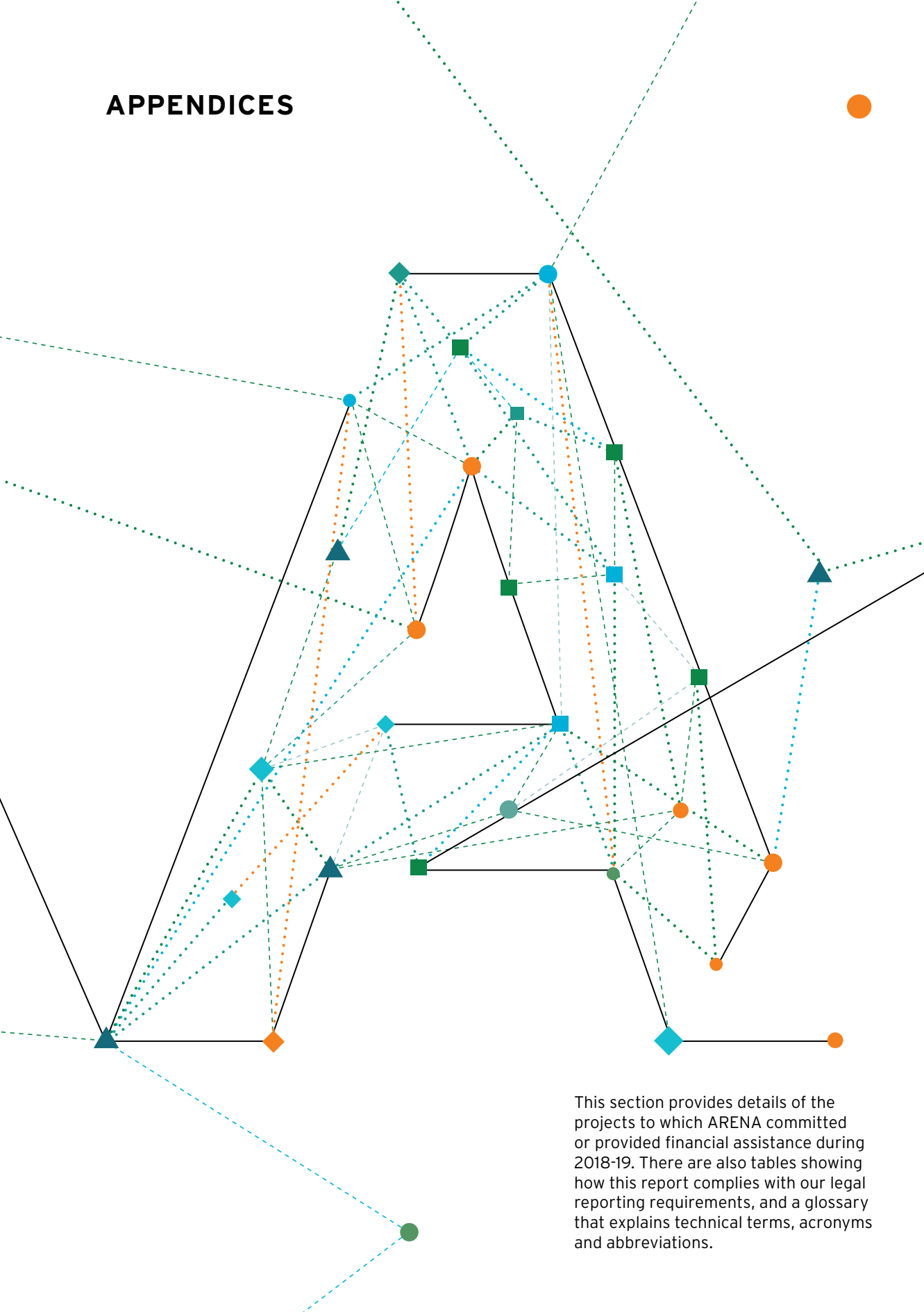
PARTNERSHIP ARRANGEMENTS ENTERED INTO BY PARTICIPANTS IN ARENA-FUNDED PROJECTS

ARENA facilitated the formation of new and diverse partnerships through the projects that it funded. Seventy per cent of new projects funded involved two or more organisations, and half of new projects involved three or more organisations. More than one quarter of projects involved international partners contributing to knowledge and skills transfer. The new projects funded in 2018-19 involved more than 200 organisations spanning the corporate, industrial, professional services, government, research and not-for-profit sectors.

Image credit: BOC



APPENDICES



This section provides details of the projects to which ARENA committed or provided financial assistance during 2018-19. There are also tables showing how this report complies with our legal reporting requirements, and a glossary that explains technical terms, acronyms and abbreviations.

APPENDIX 1: FINANCIAL ASSISTANCE AGREEMENTS AND PROGRESS

ARENA is required under the ARENA Act to publish details of financial assistance agreements and an assessment of the extent to which these agreements have progressed, or are expected to progress, the principal objectives and priorities as stated in the general funding strategy in force for the year.

The Australian Renewable Energy Agency (Consequential Amendments and Transitional Provisions) Act 2011 also requires ARENA to report details of people to whom financial assistance is provided under a transferred Australian Government funding agreement or Australian Solar Institute agreement.

During the reporting period, 254 active projects were managed by ARENA. Of those projects, 28 were completed in 2018-19 and another five were terminated during the course of the year, two of which received no funding prior to the closure of the projects.

ARENA contractually committed funds to 79 new projects in 2018-19 (Table 17). As with previous years, some of the projects contractually committed during 2018-19 were approved by the Board in the previous financial year, while other projects approved by the Board during 2018-19 will be contractually committed in 2019-20. This is reflective of ARENA's approval processes.

Details of all ongoing projects (including new commitments) during 2018-19 are provided in Table 18. One project that was completed in 2017-18 received a final payment during 2018-19 (Table 19).

TABLE 17: ARENA FUNDS CONTRACTUALLY COMMITTED TO NEW PROJECTS IN 2018-19

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED 2018-19 (EX GST)	LOCATION (STATE)	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Advisian Pty Ltd	Active	Wind and Solar Forecasting for the NEM Project	$499,723	QLD	Delivering secure and reliable electricity	Market data and information	Demonstration
Aeolius Wind Systems Pty Ltd	Active	Wind Forecasting Demonstration Project	$1,899,000	VIC	Delivering secure and reliable electricity	Market data and information	Demonstration
Apace Research Ltd	Active	Ethtec Cellulosic Ethanol Pilot Plant	$11,960,000	NSW	Improving energy productivity	Bioenergy	Demonstration
Apricus Energy	Terminated	Intelligent energy storage for thermal comfort in solar powered homes	$496,313	VIC	Improving energy productivity	Solar PV	Demonstration
Ausgrid	Active	Demand Management for Replacement Needs	$1,000,000	NSW	Delivering secure and reliable electricity	Demand Response	Demonstration
Australian Alliance for Energy Productivity (A2EP)	Active	Renewable energy for process heat	$447,000	NSW	Improving energy productivity	Industrial heating and cooling	Study
AEMO	Active	National Energy Simulator Feasibility Study	$500,000	VIC	Delivering secure and reliable electricity	Enabling	Study
AEMO	Active	Virtual Power Plant Demonstrations	$2,465,140	VIC	Delivering secure and reliable electricity	Enabling	Demonstration
ANU	Active	Direct Water Electrolysis R&D Project	$1,235,407	ACT	Other	Hydrogen	R&D
ANU	Active	Solar Hydrogen Generation R&D Project	$1,637,303	ACT	Exporting renewable energy	Hydrogen	R&D
ANU	Active	Hydrogen Generation by Electro-Catalytic Systems R&D Project	$615,682	ACT	Other	Hydrogen	R&D
BOC	Active	Renewable Hydrogen Production and Refuelling Project	$950,000	QLD	Exporting renewable energy	Hydrogen	Demonstration
Chargefox	Active	Electric Vehicle Charging Network Project	$6,000,000	VIC	Improving energy productivity	Enabling	Demonstration
Climate Council of Australia	Active	Climate Council Cities Power Partnership	$493,150	VIC	Other	Other	Study
Climate KIC Australia	Active	Business Renewables Centre Australia	$500,000	NSW	Improving energy productivity	Market data and information	Study

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED 2018-19 (EX GST)	LOCATION (STATE)	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Climate KIC Australia	Active	Residential heat pump study	$500,000	NSW	Other	Geothermal	Study
CSIRO	Active	Solar Thermochemical Hydrogen R&D Project	$2,007,676	NSW	Exporting renewable energy	Hydrogen	R&D
CSIRO	Active	Liquid Fuel Carrier R&D Project	$1,010,081	VIC	Other	Hydrogen	R&D
CSIRO	Active	Hydrogen to Ammonia R&D Project	$1,175,000	VIC	Other	Hydrogen	R&D
CSIRO	Active	Methane Fuel Carrier R&D Project	$1,085,553	NSW	Exporting renewable energy	Hydrogen	R&D
CSIRO	Active	National Low-Voltage Feeder Taxonomy Study	$485,025	NSW	Delivering secure and reliable electricity	DER integration	Study
DNV GL	Active	Multi-Model and Machine Learning Wind Forecast Project	$270,941	VIC	Delivering secure and reliable electricity	Market data and information	Demonstration
Dynamic Limits	Active	DER Feasibility Study	$292,213	NSW	Delivering secure and reliable electricity	DER integration	Study
Dyno Nobel Moranbah Pty Ltd	Active	Expansion of Moranbah - Feasibility of Renewable Hydrogen	$980,000	QLD	Exporting renewable energy	Hydrogen	Study
Element 25 Limited	Active	Pilot studies for Intermittent Dynamic Electrowinning using renewable energy	$490,000	WA	Exporting renewable energy	Enabling	Study
Evenergi Pty Ltd	Active	Charge Together Australia - Phase 2	$469,380	NSW	Improving energy productivity	Enabling	Deployment
Fast Cities	Active	Creating a National Ultrafast EV Charging Infrastructure Network	$15,000,000	QLD	Improving energy productivity	Enabling	Demonstration
Fulcrum3D Pty Ltd	Active	CloudCAM Solar Forecasting for the NEM	$490,800	QLD	Delivering secure and reliable electricity	Other	Deployment
Fulcrum3D Pty Ltd	Active	Wind Forecasting for the NEM at Pacific Hydro's Clements Gap, Crowlands and Taralga Wind Farms	$493,242	NSW	Delivering secure and reliable electricity	Market data and information	Demonstration
Goldwind Australia Pty Ltd	Active	Field Study of Virtual Synchronous Generator at Gullen Range Wind Farm	$400,000	NSW	Delivering secure and reliable electricity	System security	Demonstration
Goldwind Australia Pty Ltd	Active	Demonstration of a high penetration renewable microgrid on an operating mine in WA	$13,500,000	WA	Delivering secure and reliable electricity	Off grid	Deployment

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED 2018-19 (EX GST)	LOCATION (STATE)	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
GreenSync	Active	Decentralised Energy Exchange (deX) Program: scaling common platform requirements for decentralised energy exchanges across Australia	$10,000,000	VIC	Delivering secure and reliable electricity	Enabling	Deployment
Hydro Tasmania	Active	Tasmanian Pumped Hydro Energy Storage Opportunities Stage 2	$700,000	TAS	Delivering secure and reliable electricity	PHES	Study
Hydrostor Australia Pty Ltd	Active	Advanced Compressed Air Energy Storage South Australia Project	$6,000,000	SA	Delivering secure and reliable electricity	Other	Demonstration
Indra Australia	Active	Indra Monash Smart Microgrid Project	$2,974,162	VIC	Delivering secure and reliable electricity	DER integration	Demonstration
Industrial Monitoring & Control (IMC)	Active	Skycam and Multi-Model Solar Forecasting Project	$1,247,841	NSW	Delivering secure and reliable electricity	Market data and information	Demonstration
Jemena Limited	Active	Demonstration projects of innovative grid-based power electronics technology applications	$1,124,985	VIC	Delivering secure and reliable electricity	DER integration	Demonstration
Jemena Limited	Active	Power to Gas Demonstration	$5,710,000	NSW	Other	Hydrogen	Demonstration
Lake Bonney BESS Pty Limited	Active	Lake Bonney BESS	$5,000,000	SA	Delivering secure and reliable electricity	Battery storage	Demonstration
Macquarie Capital (Australia) Limited	Active	Kwinana Waste to Energy	$23,000,000	WA	Improving energy productivity	Bioenergy	Deployment
Macquarie University	Active	Biological Hydrogen Production R&D Project	$1,148,455	NSW	Other	Hydrogen	R&D
Meridian Energy Australia	Active	Wind Forecasting Demonstration Project	$2,180,155	VIC	Delivering secure and reliable electricity	Market data and information	Demonstration
Monash Energy Materials and System Institute (MEMSI)	Active	Ammonia production from renewables R&D Project	$913,848	VIC	Exporting renewable energy	Hydrogen	R&D
Monash Energy Materials and System Institute (MEMSI)	Active	Water splitting electrodes R&D Project	$1,054,209	VIC	Exporting renewable energy	Hydrogen	R&D

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED 2018-19 (EX GST)	LOCATION (STATE)	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Nectar Farms Management Pty Ltd	Active	High Efficiency Off-Grid Glasshouse Project	$1,000,000	VIC	Improving energy productivity	Enabling	Study
Oakley Greenwood Pty Ltd	Active	Pricing and Integration of Distributed Energy Resources Study	$207,000	QLD	Delivering secure and reliable electricity	DER integration	Study
OneSteel Manufacturing Pty Limited	Active	Middleback Ranges Pumped Hydro Energy Storage Project Pre-feasibility Study	$500,000	SA	Delivering secure and reliable electricity	PHES	Study
Origin Energy Eraring Pty Limited	Active	Shoalhaven Pumped Hydro Expansion Opportunity Feasibility Study	$2,000,000	NSW	Delivering secure and reliable electricity	PHES	Study
PGWF Pty Ltd atf PGWF Unit Trust	Active	Fringe of Grid Battery Microgrid for Port Gregory (WA) Wind & Solar Farm	$3,000,000	WA	Delivering secure and reliable electricity	Battery storage	Demonstration
Powercor Australia Pty Ltd	Active	DER Hosting Capacity Study	$164,402	VIC	Delivering secure and reliable electricity	DER integration	Study
Proa Analytics Pty Ltd	Active	Solar Forecasts Project	$728,072	QLD	Delivering secure and reliable electricity	Market data and information	Demonstration
Queensland University of Technology	Active	Hydrogen process R&D Project	$3,350,000	QLD	Exporting renewable energy	Hydrogen	R&D
RACV	Active	Smart Hot Water System	$272,998	VIC	Other	DER integration	Demonstration
RE.Group	Active	Mt Piper Energy Recovery Project, Financial Investment Decision Study	$1,000,000	NSW	Improving energy productivity	Bioenergy	Study
Relectrify Pty Ltd	Active	BMS-Inverter Hybrid Project	$338,000	VIC	Other	Enabling	Demonstration
RMIT University	Active	Melbourne Hydrogen Storage and Transport R&D Project	$805,026	VIC	Exporting renewable energy	Hydrogen	R&D
Santos Limited	Active	Conversion of remote crude oil beam pumps to solar & battery project	$4,200,000	SA	Delivering secure and reliable electricity	Solar PV	Demonstration
SAPN	Active	Advanced VPP grid integration	$1,032,000	SA	Delivering secure and reliable electricity	DER integration	Demonstration
Solar Analytics	Active	Enhanced Reliability through Short Time Resolution Data around Voltage Disturbances	$491,725	NSW	Other	DER integration	Demonstration
Solar Analytics	Active	Accelerating the growth development of energy monitoring for solar households and small businesses.	$1,000,000	NSW	Delivering secure and reliable electricity	Enabling	Deployment

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED 2018-19 (EX GST)	LOCATION (STATE)	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Solar and Storage Modelling Pty Ltd	Active	Solcast nowcasting solutions for solar farms and the Australian energy sector	$781,740	NSW	Delivering secure and reliable electricity	Market data and information	Demonstration
Solpod	Active	Solar PV Demonstration Project	$975,000	NSW	Accelerating solar PV innovation	Solar PV	Demonstration
Southern Oil Refining	Active	Commercialisation of renewable crude oil production from wastewater treatment plant waste	$4,000,000	QLD	Improving energy productivity	Bioenergy	Demonstration
TasNetworks	Active	Tasmanian and Victorian Second Bass Strait Interconnector Feasibility Study	$10,000,000	TAS	Delivering secure and reliable electricity	Other	Study
The Trustee for Lastek Unit Trust	Active	Measurement guidelines for multi-junction solar cells with perovskite layers, CSIRO PV Performance Laboratory	$732,038	NSW	Accelerating solar PV innovation	Solar PV	Demonstration
Toyota Motor Corporation Australia LTD	Active	Toyota Ecopark Hydrogen Demonstration	$3,076,000	VIC	Exporting renewable energy	Hydrogen	Demonstration
United Energy Distribution Pty Ltd	Active	Voltage-Controlled Frequency Regulation System	$900,000	VIC	Delivering secure and reliable electricity	Enabling	Demonstration
University of Melbourne	Active	Hydrogen Fuelled Reciprocating Engines R&D Project	$2,594,747	VIC	Improving energy productivity	Hydrogen	R&D
University of Melbourne	Active	Advanced Planning of PV-Rich Distribution Networks Study	$203,867	VIC	Delivering secure and reliable electricity	DER integration	Study
UNSW	Active	Addressing barriers to efficient renewable integration	$982,000	NSW	Delivering secure and reliable electricity	Enabling	Study
UNSW	Active	Module Design for Lower Field Operating Temperature and Improved Yield	$285,816	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Waste Biomass to Renewable Hydrogen R&D Project	$1,045,770	NSW	Improving energy productivity	Hydrogen	R&D
UNSW	Active	Photovoltaic Electrolysis to Generate Hydrogen R&D Project	$1,319,105	NSW	Exporting renewable energy	Hydrogen	R&D
University of Tasmania	Active	Optimal DER Scheduling for Frequency Stability Study	$527,582	TAS	Delivering secure and reliable electricity	DER integration	Study
University of Western Australia	Active	Methanol from Syngas R&D Project	$1,079,875	WA	Exporting renewable energy	Hydrogen	R&D

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED 2018-19 (EX GST)	LOCATION (STATE)	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Vestas Wind Systems A/S	Active	Wind Forecasting for the NEM Project	$405,754	SA	Delivering secure and reliable electricity	Market data and information	Demonstration
Wave Swell Energy Limited	Active	UniWave200 King Island Project	$4,035,628	TAS	Delivering secure and reliable electricity	Marine	Demonstration
Windlab Limited	Active	LIDAR for Wind Forecast Projects	$393,107	QLD	Delivering secure and reliable electricity	Market data and information	Demonstration
Zeppelin Bend Pty Ltd	Active	Publishing operating envelopes to the node to support the integration, orchestration and coordination of high-penetration DER in electricity distribution networks	$4,292,632	ACT	Delivering secure and reliable electricity	DER integration	Demonstration
TOTAL: 79			$188,122,168				

TABLE 18: ALL ACTIVE PROJECTS MANAGED BY ARENA IN 2018-19 (INCLUDING NEW PROJECTS LISTED IN TABLE 17)

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Adelaide University	Active	Establishing the Australian Energy Storage Knowledge Bank	$1,441,811	$127,192	SA	Other	Enabling	Study
Adelaide University	Active	Participation in Mission Innovation - Converting Sunlight Innovation Challenge	$494,000	$321,450	SA	Exporting renewable energy	Solar Thermal	Study
Adelaide University	Active	Integrating Concentrating Solar Thermal Energy into the Bayer Alumina Process	$4,490,752	$1,453,790	SA	Delivering secure and reliable electricity	Solar Thermal	R&D
Advisian Pty Ltd	Active	Wind and Solar Forecasting for the NEM Project	$499,723	$0	QLD	Delivering secure and reliable electricity	Market data and information	Demonstration
Aeolius Wind Systems Pty Ltd	Active	Wind Forecasting Demonstration Project	$1,899,000	$0	VIC	Delivering secure and reliable electricity	Market data and information	Demonstration
AGL Energy Ltd	Active	AGL Energy Application for Demand Response in NSW	$2,624,019	$586,491	NSW	Delivering secure and reliable electricity	Enabling	Demonstration
AGL Energy Ltd	Active	5MW Virtual Power Plant in South Australia (VPP-SA) Project	$5,000,000	$1,000,000	SA	Delivering secure and reliable electricity	Enabling	Deployment
AGL PV Solar Holdings Pty Limited	Active	AGL Solar PV project	$166,700,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
Allen Taylor and Co	Active	Hardwood Residue Bio-refinery Feasibility Study	$500,000	$285,000	NSW	Improving energy productivity	Bioenergy	Study
ANU	Active	Community Models for Deploying and Operating Distributed Energy Resources Study	$498,650	$149,595	ACT	Delivering secure and reliable electricity	DER Integration	Study

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
ANU	Active	CONSORT: Consumer Energy Systems Providing Cost-Effective Grid Support	$2,895,951	$823,501	TAS	Delivering secure and reliable electricity	Enabling	R&D
ANU	Active	Monolithic perovskite–silicon Tandem Cells: Towards Commercial Reality	$672,841	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Active	Development of Stable Electrodes for Perovskite Solar Cells	$936,732	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Active	Tandem PV Micro Concentrator	$788,515	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Active	High-temperature solar thermal energy storage via manganese-oxide based redox cycling	$1,193,534	$440,991	ACT	Delivering secure and reliable electricity	Solar Thermal	R&D
ANU	Active	Bladed Receivers with Active Airflow Control	$1,408,327	$0	ACT	Delivering secure and reliable electricity	Solar Thermal	R&D
ANU	Completed	An Atlas of Pumped Hydro Energy Storage	$609,000	$506,500	ACT	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
ANU	Completed	Katherine Booker: Metal-assisted chemical etching of Sliver solar cells	$356,749	$20,749	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Completed	PV Modules for The Australian Environment (PV-MATE)	$502,977	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Completed	Eliminating material quality barriers to low cost, very high efficiency silicon solar cells and modules	$2,023,407	$306,990	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Active	Hydrogen Generation by Electro-Catalytic Systems R&D Project	$615,682	$307,841	ACT	Other	Hydrogen	R&D
ANU	Active	Solar Hydrogen Generation R&D Project	$1,637,303	$818,652	ACT	Exporting renewable energy	Hydrogen	R&D
ANU	Active	Direct Water Electrolysis R&D Project	$1,235,407	$1,042,703	ACT	Other	Hydrogen	R&D

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
ANU	Active	A Robotic Vision System for Automatic Inspection and Evaluation of Solar Plant Infrastructure	$596,183	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Active	Real-time Operational Distributed PV Simulations for Distribution Network Service Providers	$1,198,359	$514,316	ACT	Delivering secure and reliable electricity	Solar PV	R&D
ANU	Active	Next Generation Industrial Bifacial Silicon Solar Cells	$1,977,845	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Active	Advanced Silicon Solar Cells by DESIJN (Deposited Silicon Junctions)	$1,116,142	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
ANU	Active	Driving Increased Efficiency and Reliability in Silicon Photovoltaics	$2,399,392	$0	ACT	Accelerating solar PV innovation	Solar PV	R&D
Apace Research Ltd	Active	Ethtec Cellulosic Ethanol Pilot Plant	$11,960,000	$0	NSW	Improving energy productivity	Bioenergy	Demonstration
Apricus Energy	Terminated	Intelligent energy storage for thermal comfort in solar powered homes	$496,313	$0	VIC	Improving energy productivity	Solar PV	Demonstration
APT Pipelines Limited	Active	Emu Downs Solar Farm Project	$5,500,000	$0	WA	Delivering secure and reliable electricity	Large-scale solar	Deployment
APT Pipelines Limited	Active	Darling Downs Solar Farm	$20,000,000	$0	QLD	Accelerating solar PV innovation	Large-scale solar	Deployment
ATCO Gas Australia Pty Ltd	Active	Jandakot Commercial Hybrid Energy H2 Microgrid (ATCO H2 Microgrid)	$1,661,000	$1,130,810	WA	Delivering secure and reliable electricity	Hydrogen	Demonstration
Ausgrid	Active	Demand Management for Replacement Needs	$1,000,000	$88,387	NSW	Delivering secure and reliable electricity	Demand Response (DR)	Demonstration
Australian Alliance for Energy Productivity (A2EP)	Active	Renewable energy for process heat, Australia-wide, Replacing non-renewable systems	$447,000	$154,840	NSW	Improving energy productivity	Industrial heating and cooling	Study

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Australian Association for Hydrogen Energy	Active	IEA Hydrogen Technology Collaboration Program, Promoting hydrogen implementation and utilisation in Australia through International collaboration	$494,000	$227,600	QLD	Exporting renewable energy	Hydrogen	Study
Australian Energy Market Operator Limited	Active	Virtual Power Plant Demonstrations	$2,465,140	$0	VIC	Delivering secure and reliable electricity	Enabling	Demonstration
Australian Energy Market Operator Limited	Active	National Energy Simulator Feasibility Study	$500,000	$250,000	VIC	Delivering secure and reliable electricity	Enabling	Study
Australian PV Institute	Active	Australian involvement in the IEA PV Power Systems, and solar heating and cooling implementing agreements	$440,500	$0	NSW	Other	Solar PV	Study
Australian PV Institute	Active	IEA Technology Collaboration Program, PV Power Systems	$668,000	$162,000	NSW	Accelerating solar PV innovation	Solar PV	Study
Australian PV Institute	Active	IEA Technology Collaboration Program, Solar Heating and Cooling	$383,500	$93,700	NSW	Improving energy productivity	Solar Thermal	Study
Barcaldine Remote Community Solar Farm Pty Ltd	Active	Barcaldine 25 MW Remote Community Solar Project	$22,800,000	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Demonstration
Bioenergy Australia	Active	Bioenergy Australia participation in the IEA Technology Collaboration Program on Bioenergy	$885,733	$265,711	NSW	Exporting renewable energy	Bioenergy	Study
Bioenergy Australia	Completed	Enhanced Australian Participation in IEA Bioenergy Tasks and Activities	$707,667	$68,649	NSW	Improving energy productivity	Bioenergy	Study
BioPower Systems Pty Ltd	Terminated	bioWAVE Ocean Pilot at Port Fairy	$11,541,864	$0	VIC	Other	Marine	Demonstration
BOC	Active	Renewable Hydrogen Production and Refuelling Project	$950,000	$0	QLD	Exporting renewable energy	Hydrogen	Demonstration

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Bundaberg Regional Irrigators Group Ltd	Active	Adapting Renewable Energy Concepts to Irrigated Sugarcane Production at Bundaberg	$446,011	$101,200	QLD	Improving energy productivity	Enabling	Demonstration
Canadian Solar	Active	Longreach Solar Farm	$1,300,000	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Deployment
Canadian Solar	Active	Oakey Solar Farm	$2,162,000	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Deployment
Carnegie Wave Energy Limited	Active	The Albany Wave Energy Project	$13,000,000	$0	WA	Other	Marine	Demonstration
Carnegie Wave Energy Limited	Active	Garden Island Microgrid Project	$2,500,000	$0	WA	Delivering secure and reliable electricity	Marine	Demonstration
Carnegie Wave Energy Limited	Completed	The Perth Wave Energy Project (PWEP)	$13,095,381	$0	WA	Other	Marine	Demonstration
Chargefox	Active	Electric Vehicle Charging Network Project	$6,000,000	$2,000,000	VIC	Improving energy productivity	Enabling	Demonstration
Climate Council of Australia	Active	Climate Council Cities Power Partnership	$493,150	$200,000	VIC	Other	Other	Study
Climate KIC Australia	Active	Residential heat pump study	$500,000	$150,000	NSW	Other	Geothermal	Study
Climate KIC Australia	Active	Business Renewables Centre Australia	$500,000	$75,000	NSW	Improving energy productivity	Market data and information	Study
CSIRO	Active	IEA SolarPACES Technology Collaboration Program	$394,000	$120,200	NSW	Delivering secure and reliable electricity	Solar Thermal	Study
CSIRO	Active	Feasibility study into dispatchable, cost effective power from forest and mill waste using the direct injection carbon engine (bioDICE)	$432,000	$0	NSW	Improving energy productivity	Bioenergy	Study
CSIRO	Active	National Low-Voltage Feeder Taxonomy Study	$485,025	$145,508	NSW	Delivering secure and reliable electricity	DER Integration	Study
CSIRO	Active	Australian Renewable Energy Mapping Infrastructure (AREMI)	$2,197,150	$200,000	NSW	Other	Enabling	Study
CSIRO	Active	Missions Innovation Challenge - Smart Grids	$113,750	$94,500	NSW	Delivering secure and reliable electricity	Enabling	Study

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CSIRO	Active	Missions Innovation Challenge - Affordable Heating and Cooling	$37,000	$27,200	NSW	Improving energy productivity	Enabling	Study
CSIRO	Active	Methane Fuel Carrier R&D Project	$1,085,553	$542,776	NSW	Exporting renewable energy	Hydrogen	R&D
CSIRO	Active	Hydrogen to Ammonia R&D Project	$1,175,000	$587,500	VIC	Other	Hydrogen	R&D
CSIRO	Active	Liquid Fuel Carrier R&D Project	$1,010,081	$505,011	VIC	Other	Hydrogen	R&D
CSIRO	Active	Solar Thermochemical Hydrogen R&D Project	$2,007,676	$1,003,838	NSW	Exporting renewable energy	Hydrogen	R&D
CSIRO	Active	IEA Ocean Energy Systems Technology Collaboration Program	$283,500	$0	TAS	Other	Marine	Study
CSIRO	Active	Specifying Guidelines for Assessing Perovskite Solar Cells	$932,000	$312,000	NSW	Accelerating solar PV innovation	Solar PV	Study
CSIRO	Active	Manufacturing of Printed Perovskite PV Modules	$3,310,248	$0	VIC	Accelerating solar PV innovation	Solar PV	R&D
CSIRO	Active	AIRAH PUSCH Australia - Promoting the Use of Solar Cooling and Heating in Australia	$399,436	$69,436	NSW	Improving energy productivity	Solar Thermal	Study
CSIRO	Active	Australian Solar Thermal Research Initiative (ASTRI)	$35,208,747	$3,000,000	NSW	Delivering secure and reliable electricity	Solar Thermal	R&D
Curtin University	Active	White Gum Valley: Increasing the uptake of solar PV, using energy storage, monitoring and grid-connected micro-grids within strata	$900,375	$97,000	WA	Delivering secure and reliable electricity	Enabling	R&D
DCP Company Pty Ltd	Completed	EJ004 Solar Rooftop Electricity Retailer	$775,000	$75,000	VIC	Other	Solar PV	Demonstration
Degrussa Solar Project Pty Ltd	Active	DeGrussa Solar PV & Storage Project	$20,900,000	$0	WA	Improving energy productivity	Solar PV	Demonstration

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DNV GL	Active	Development of a Proposed Performance Standard for a Battery Storage System connected to a Domestic/ Small Commercial Solar PV System	$1,400,000	$700,000	VIC	Delivering secure and reliable electricity	Battery Storage	Study
DNV GL	Active	Multi-Model and Machine Learning Wind Forecast Project	$270,941	$0	VIC	Delivering secure and reliable electricity	Market data and information	Demonstration
Dynamic Limits	Active	DER Feasibility Study	$292,213	$116,885	NSW	Delivering secure and reliable electricity	DER Integration	Study
Dyno Nobel Moranbah Pty Ltd	Active	Expansion of Moranbah - Feasibility of Renewable Hydrogen	$980,000	$0	QLD	Exporting renewable energy	Hydrogen	Study
EDL Group Operations Pty Ltd	Active	Coober Pedy Renewable Diesel Hybrid	$18,410,879	$549,234	SA	Delivering secure and reliable electricity	Hybrid	Demonstration
ElectraNet Pty Limited	Active	ElectraNet Energy Storage for Commercial Renewable Integration (ESCRI) Phase 2 (South Australia) - Deployment and Testing	$12,000,000	$5,700,000	SA	Delivering secure and reliable electricity	Battery Storage	Deployment
Electricity Generation and Retail Corporation	Active	Alkimos Beach Energy Storage Project	$3,310,000	$100,000	WA	Delivering secure and reliable electricity	Enabling	Demonstration
Element 25 Limited	Active	Pilot studies for Intermittent Dynamic Electrowinning using renewable energy to produce high purity EMM and MnSO4	$490,000	$0	WA	Exporting renewable energy	Enabling	Study
EnergyAustralia	Completed	South Australian Pumped Hydro Energy Storage Feasibility Study	$453,000	$0	SA	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
EnergyAustralia	Active	EnergyAustralia Demand Response NSW	$1,435,500	$167,475	NSW	Delivering secure and reliable electricity	Enabling	Demonstration
EnergyAustralia	Active	EnergyAustralia Demand Response VIC and SA	$6,929,000	$3,695,467	VIC	Delivering secure and reliable electricity	Enabling	Demonstration

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EnergyAustralia	Active	Phase 2 of EnergyAustralia South Australian Pumped Hydro Energy Storage Project	$500,000	$0	SA	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
EnerNOC Pty Ltd	Active	EnerNOC Demand Response NSW	$1,800,000	$210,000	NSW	Delivering secure and reliable electricity	Enabling	Demonstration
EnerNOC Pty Ltd	Active	EnerNOC Demand Response VIC	$5,400,000	$630,000	VIC	Delivering secure and reliable electricity	Enabling	Demonstration
EPC Technologies	Active	G.James Glass and Aluminium - a demonstration of medium-scale solar on industrial roof-tops can be effectively integrated into the distribution network	$225,000	$150,000	QLD	Delivering secure and reliable electricity	Solar PV	Study
ERM Power	Completed	NSW Schools Energy Productivity Program (SEPP)	$500,000	$500,000	NSW	Improving energy productivity	Solar PV	Demonstration
Evenergi Pty Ltd	Active	Charge Together Australia - Phase 2	$469,380	$117,345	NSW	Improving energy productivity	Enabling	Deployment
Evenergi Pty Ltd	Completed	South Australian Regional Electric Vehicle Adoption Program	$172,215	$68,885	SA	Improving energy productivity	Enabling	Demonstration
Fast Cities	Active	Creating a National Ultrafast EV Charging Infrastructure Network	$15,000,000	$0	QLD	Improving energy productivity	Enabling	Demonstration
Flow Power	Active	Flow Power Demand Response NSW	$1,318,250	$153,796	NSW	Delivering secure and reliable electricity	Enabling	Demonstration
Frontier Carbon Pty Ltd	Completed	Toolkit for Renewable Energy Financing	$467,717	$173,880	VIC	Other	Enabling	Study
Fulcrum3D Pty Ltd	Active	CloudCAM Solar Forecasting for the NEM	$490,800	$251,970	QLD	Delivering secure and reliable electricity	Other	Deployment
Fulcrum3D Pty Ltd	Active	Wind Forecasting for the NEM at Pacific Hydro's Clements Gap, Crowlands and Taralga Wind Farms	$493,242	$177,129	NSW	Delivering secure and reliable electricity	Market data and information	Demonstration
Genex	Active	Kidston Solar Project	$8,850,000	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Deployment

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Genex	Active	Kidston Stage 2 Project	$5,000,000	$2,476,805	QLD	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
Genex	Completed	Feasibility study to validate the construction of a large-scale pumped storage hydroelectric energy storage facility at a remote disused mine site in Northern Queensland	$3,996,211	$471,312	QLD	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
Gess Devco Pty Ltd	Active	Gannawarra Energy Storage System (GESS)	$22,735,000	$0	VIC	Delivering secure and reliable electricity	Battery Storage	Demonstration
Goldwind Australia Pty Ltd	Active	White Rock Solar Farm, co-located with White Rock Wind Farm	$5,400,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
Goldwind Australia Pty Ltd	Active	Field Study of Virtual Synchronous Generator at Gullen Range Wind Farm	$400,000	$0	NSW	Delivering secure and reliable electricity	System Security	Demonstration
Goldwind Australia Pty Ltd	Active	Demonstration of a high penetration renewable microgrid on an operating mine in WA	$13,500,000	$0	WA	Delivering secure and reliable electricity	Off grid	Deployment
Greatcell Solar Limited	Terminated	Perovskite Solar Cell Technology - Large Area Module Development	$6,000,000	$425,000	NSW	Accelerating solar PV innovation	Solar PV	Demonstration
GreenSync	Active	Decentralised Energy Exchange (deX) Program: scaling common platform requirements for decentralised energy exchanges across Australia	$10,000,000	$1,951,073	VIC	Delivering secure and reliable electricity	Enabling	Deployment
Gullen Solar Pty Ltd	Active	Gullen Range Solar Farm - co-located with Gullen Range Wind Farm	$9,900,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
Hivve	Active	HIVVE – Sustainable Modular Classrooms	$334,650	$48,919	NSW	Improving energy productivity	Enabling	Demonstration

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Horizon Power	Active	Horizon Power Business Model Pilot Project - Phase 1 (Highgarden)	$1,920,000	$660,815	WA	Delivering secure and reliable electricity	Enabling	Deployment
HWF 2 Pty Ltd	Completed	Hornsdale Wind Farm Stage 2 (HWF2) FCAS Trial	$271,709	$271,709	SA	Delivering secure and reliable electricity	Wind	Demonstration
Hydro Tasmania	Active	Participation in IEA Hydropower Technology Collaboration Program	$280,000	$139,500	TAS	Delivering secure and reliable electricity	Enabling	Study
Hydro Tasmania	Active	Flinders Island Hybrid Energy Hub Project	$5,500,000	$700,000	TAS	Delivering secure and reliable electricity	Hybrid	Demonstration
Hydro Tasmania	Active	Rottnest Island Renewable Energy Water Nexus Project	$3,758,010	$0	WA	Delivering secure and reliable electricity	Hybrid	Demonstration
Hydro Tasmania	Active	Tasmanian Pumped-Hydro Energy Storage Opportunities Stage 2	$700,000	$0	TAS	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
Hydro Tasmania	Active	Hydro Tasmania: Repurposing the Tarraleah hydropower scheme for the future electricity market - Feasibility Study	$2,500,000	$1,450,000	TAS	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
Hydrostor Australia Pty Ltd	Active	Advanced Compressed Air Energy Storage South Australia Project	$6,000,000	$0	SA	Delivering secure and reliable electricity	Other	Demonstration
Indigenous Essential Services Pty Ltd	Active	Northern Territory Solar Energy Transformation Program (SETuP)	$31,500,000	$9,000,000	NT	Delivering secure and reliable electricity	Hybrid	Demonstration
Indra Australia	Active	Indra Monash Smart Microgrid Project	$2,974,162	$0	VIC	Delivering secure and reliable electricity	DER Integration	Demonstration
Industrial Monitoring & Control (IMC)	Active	Skycam and Multi-Model Solar Forecasting Project	$1,247,841	$0	NSW	Delivering secure and reliable electricity	Market data and information	Demonstration
Intercast & Forge Pty Ltd	Active	Intercast&-Forge Demand Response SA	$323,654	$37,760	SA	Delivering secure and reliable electricity	Enabling	Demonstration
IT Power (Australia) Pty Limited	Active	Testing the performance of lithium-ion batteries	$1,290,000	$44,500	ACT	Delivering secure and reliable electricity	Battery Storage	R&D

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IT Power (Australia) Pty Limited	Active	Open Source Grid Integration Model for the National Electricity Market	$624,940	$325,354	ACT	Delivering secure and reliable electricity	Enabling	Study
Jeanes Holland and Associates	Completed	A Roadmap for Concentrated Solar Thermal (CST) Power Generation in Australia	$419,324	$126,046	TAS	Delivering secure and reliable electricity	Solar Thermal	Study
Jemalong JSS Project No 1 Pty Limited	Active	30 MW Concentrating Solar Thermal power plant with thermal energy storage	$39,500,000	$1,240,000	NSW	Delivering secure and reliable electricity	Solar Thermal	Demonstration
Jemena Limited	Active	Demonstration projects of innovative grid-based power electronics technology applications to increase network DER hosting capacity and improve the quality of customer electricity supplies	$1,124,985	$0	VIC	Delivering secure and reliable electricity	DER Integration	Demonstration
Jemena Limited	Active	Power to Gas Demonstration	$5,710,000	$0	NSW	Other	Hydrogen	Demonstration
Karratha Solar Power No 1 Pty Ltd	Completed	Karratha Airport Solar Project	$2,300,000	$0	WA	Delivering secure and reliable electricity	Large-scale solar	Demonstration
Kennedy Energy Park Pty Ltd	Active	Kennedy Energy Park (KEP)	$18,000,000	$0	QLD	Delivering secure and reliable electricity	Hybrid	Demonstration
Laing O'Rourke Australia Pty Ltd	Active	SunSHIFT Pre-Commercial Deployment	$2,100,396	$93,783	QLD	Other	Solar PV	Deployment
Lake Bonney BESS Pty Limited	Active	Lake Bonney BESS	$5,000,000	$3,400,000	SA	Delivering secure and reliable electricity	Battery Storage	Demonstration
Lakeland Solar & Storage Pty Limited	Active	Lakeland Solar & Storage Project	$17,419,000	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Demonstration
LMS Energy Pty Ltd	Active	Pilot Landfill Solar PV Project	$100,000	$0	VIC	Accelerating solar PV innovation	Solar PV	Study
LO3 Energy Pty Ltd	Active	Latrobe Valley Microgrid - Feasibility Assessment	$370,000	$370,000	VIC	Delivering secure and reliable electricity	Enabling	Study
Lord Howe Island Board	Active	Lord Howe Island Hybrid Renewable Project	$4,500,000	$68,172	NSW	Delivering secure and reliable electricity	Hybrid	Demonstration

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Macquarie Capital (Australia) Limited	Active	Kwinana Waste to Energy	$23,000,000	$23,000,000	WA	Improving energy productivity	Bioenergy	Deployment
Macquarie University	Active	Biological Hydrogen Production R&D Project	$1,148,455	$574,228	NSW	Other	Hydrogen	R&D
Manildra Solar Farm Pty Ltd	Active	Manildra Solar Farm	$9,810,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
Meridian Energy Australia	Active	Wind Forecasting Demonstration Project	$2,180,155	$0	VIC	Delivering secure and reliable electricity	Market data and information	Demonstration
Microbiogen Pty Ltd	Active	Microbiogen Biocatalyst Optimisation & Deployment Project for efficient production of biofuels	$4,029,467	$1,425,725	NSW	Improving energy productivity	Bioenergy	Demonstration
Monash Energy Materials and System Institute (MEMSI)	Active	Participation in IEA Technology Collaboration Program for Demand Side Management	$500,500	$147,150	VIC	Delivering secure and reliable electricity	Enabling	Study
Monash Energy Materials and System Institute (MEMSI)	Active	Water splitting electrodes R&D Project	$1,054,209	$527,104	VIC	Exporting renewable energy	Hydrogen	R&D
Monash Energy Materials and System Institute (MEMSI)	Active	Ammonia production from renewables R&D Project	$913,848	$457,924	VIC	Exporting renewable energy	Hydrogen	R&D
Monash Energy Materials and System Institute (MEMSI)	Active	Developing a New Type of High Efficiency Building Integrated PV Cell R&D Project	$744,661	$0	VIC	Accelerating solar PV innovation	Solar PV	R&D
Monash Energy Materials and System Institute (MEMSI)	Active	Bringing All-Polymer Solar Cells Closer to Commercialisation	$840,000	$0	VIC	Accelerating solar PV innovation	Solar PV	R&D

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Monash Energy Materials and System Institute (MEMSI)	Completed	From Plan to Action: Communicating pathways to deep decarbonisation through electric vehicles and renewable energy technologies	$390,000	$0	VIC	Other	Enabling	Study
Moree Solar Farm Pty Ltd	Completed	Moree Solar Farm - Design, construction and build 56 MWAC PV	$101,700,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
Mount Alexander Bioenergy Pty Ltd	Completed	Mt Alexander Waste to Energy Feasibility Study	$146,468	$0	VIC	Improving energy productivity	Bioenergy	Study
MSM Milling	Active	MSM Milling Biomass Fuel Switch Project	$2,000,000	$1,000,000	NSW	Improving energy productivity	Bioenergy	Deployment
Musselroe Wind Farm	Active	Musselroe Wind Farm FCAS Trial	$499,120	$228,820	TAS	Delivering secure and reliable electricity	Wind	Study
Nectar Farms Management Pty Ltd	Active	High Efficiency Off-Grid Glasshouse Project	$1,000,000	$349,708	VIC	Improving energy productivity	Enabling	Study
Neoen Australia Pty Ltd	Active	Griffith Solar Farm	$4,500,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
Neoen Australia Pty Ltd	Active	Dubbo Solar Hub	$4,950,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
Neoen Australia Pty Ltd	Active	Parkes Solar Farm	$6,750,000	$0	NSW	Delivering secure and reliable electricity	Large-scale solar	Deployment
NEV Power Pty Ltd	Active	Narara Ecovillage smart grid	$1,158,660	$0	NSW	Delivering secure and reliable electricity	Hybrid	Deployment
NOJA Power Switchgear Pty Ltd	Active	NOJA Power Intelligent Switchgear Project	$5,000,000	$1,768,908	QLD	Other	Enabling	Demonstration
Northern SEQ Distributor - Retailer Authority	Active	A feasibility study to undertake an assessment of the commercial viability of a waste to energy project at Unity Water's sewerage treatment plant	$695,197	$111,239	QLD	Improving energy productivity	Bioenergy	Study

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Oakley Greenwood Pty Ltd	Active	Pricing and Integration of Distributed Energy Resources Study	$207,000	$82,800	QLD	Delivering secure and reliable electricity	DER Integration	Study
OneSteel Manufacturing Pty Limited	Active	Middleback Ranges Pumped Hydro Energy Storage Project Pre-feasibility Study	$500,000	$500,000	SA	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
Origin Energy Eraring Pty Limited	Active	Shoalhaven Pumped Hydro Expansion Opportunity Feasibility Study	$2,000,000	$1,000,000	NSW	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
PGWF Pty Ltd atf PGWF Unit Trust	Active	Fringe of Grid Battery Microgrid for Port Gregory Wind & Solar Farm	$3,000,000	$0	WA	Delivering secure and reliable electricity	Battery Storage	Demonstration
Planet Innovation Pty Ltd	Active	ZenHQ Virtual Power Plant – delivering rapid distributed demand response and accelerating renewables integration through automated HVAC control	$1,878,404	$201,248	VIC	Delivering secure and reliable electricity	Enabling	Demonstration
Plumbing Industry Climate Action Centre (PICAC)	Active	PICAC Narre Warren - Net Zero Energy Facility	$500,000	$475,000	VIC	Improving energy productivity	Geothermal	Demonstration
Pooled Energy Pty Ltd	Active	Pooled Energy Demand Management and Modulation	$2,500,000	$300,000	NSW	Delivering secure and reliable electricity	Enabling	Demonstration
Powercor Australia Pty Ltd	Active	DER Hosting Capacity Study	$164,402	$65,761	VIC	Delivering secure and reliable electricity	DER Integration	Study
Powershop Australia	Active	Powershop DR Program	$1,113,269	$350,254	VIC	Delivering secure and reliable electricity	Enabling	Demonstration
Proa Analytics Pty Ltd	Active	Solar Forecasts Project	$728,072	$238,122	QLD	Delivering secure and reliable electricity	Market data and information	Demonstration
Queensland University of Technology	Active	Hydrogen process R&D Project	$3,350,000	$1,675,000	QLD	Exporting renewable energy	Hydrogen	R&D

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Queensland University of Technology	Active	Integration of biogas from sugarcane residues in sugarcane transport and milling to reduce fossil fuel usage	$2,239,100	$0	QLD	Improving energy productivity	Bioenergy	R&D
RACV	Active	Smart Hot Water System	$272,998	$0	VIC	Other	DER Integration	Demonstration
RATCH - Australia Corporation Limited	Active	Collinsville Solar PV Power Station Stage 1	$9,500,000	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Deployment
RayGen	Active	RayGen PV Ultra Series B Equity Investment Opportunity	$5,750,000	$850,000	VIC	Accelerating solar PV innovation	Solar PV	Deployment
Re.Group Pty Ltd	Active	Mt Piper Energy Recovery Project, Financial Investment Decision Study	$1,000,000	$300,000	NSW	Improving energy productivity	Bioenergy	Study
Re.Group Pty Ltd	Completed	Feasibility Study into Mt Piper Hybrid W2E Project	$400,000	$0	NSW	Improving energy productivity	Bioenergy	Study
Relectrify Pty Ltd	Active	BMS-Inverter Hybrid Project	$338,000	$0	VIC	Other	Enabling	Demonstration
Renergi Pty Ltd	Active	A Low Emission Biofuel Technology	$5,473,000	$773,000	WA	Improving energy productivity	Bioenergy	Demonstration
Renewable Developments Australia Pty Ltd	Active	Investment Case for the Pentland Integrated Biofuels Project	$3,000,000	$0	QLD	Improving energy productivity	Bioenergy	Study
Restech Pty Limited	Active	The Enerverter (Project Aztec)	$700,000	$100,000	NSW	Delivering secure and reliable electricity	Enabling	Demonstration
RMIT University	Active	Melbourne Hydrogen Storage and Transport R&D Project	$805,026	$402,513	VIC	Exporting renewable energy	Hydrogen	R&D
RMIT University	Completed	RMIT University: Micro-urban solar integrated concentrators (MUSIC)	$4,921,191	$150,000	VIC	Other	Solar Thermal	R&D
Rural Industries Research & Development Corporation	Active	Australian Biomass for Bioenergy Assessment	$3,160,669	$457,567	ACT	Improving energy productivity	Bioenergy	Study
Santos Limited	Active	Conversion of remote crude oil beam pumps to solar & battery project	$4,200,000	$0	SA	Delivering secure and reliable electricity	Solar PV	Demonstration

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
SAPN	Active	Advanced VPP grid integration	$1,032,000	$179,542	SA	Delivering secure and reliable electricity	DER Integration	Demonstration
Scouller Energy Pty Ltd	Active	Normanton Solar Farm	$8,380,000	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Demonstration
Sea Box International Pty Ltd	Completed	Sea Box Container Roll Out Warehousing System - Photovoltaic (CROWS-PV)	$289,725	$0	ACT	Accelerating solar PV innovation	Solar PV	Demonstration
Simply Energy Solutions	Active	Simply Energy Virtual Power Plant (VPPX) Project	$7,700,000	$1,939,355	SA	Delivering secure and reliable electricity	Solar PV	Deployment
SM Project Company Pty Ltd	Completed	Goulburn Bioenergy Project	$2,100,000	$20,000	NSW	Improving energy productivity	Bioenergy	Deployment
Smart Storage (Ecoult)	Active	Project Fulfil	$4,100,000	$512,500	NSW	Delivering secure and reliable electricity	Enabling	R&D
Snowy Hydro Limited	Completed	Snowy Hydro Limited's Project 2.0 Feasibility Study	$8,000,000	$0	NSW	Delivering secure and reliable electricity	Pumped Hydro Energy Storage (PHES)	Study
Solar Analytics	Active	Enhanced Reliability through Short Time Resolution Data around Voltage Disturbances	$491,725	$190,000	NSW	Other	DER Integration	Demonstration
Solar Analytics	Active	Accelerating the growth development of energy monitoring for solar households and small businesses.	$1,000,000	$1,000,000	NSW	Delivering secure and reliable electricity	Enabling	Deployment
Solar Analytics	Active	Solar Monitoring for Better Energy Outcomes for Residential Solar PV	$2,144,000	$200,000	NSW	Accelerating solar PV innovation	Solar PV	Deployment
Solar and Storage Modelling Pty Ltd	Active	Solcast nowcasting solutions for solar farms and the Australian energy sector	$781,740	$154,769	NSW	Delivering secure and reliable electricity	Market data and information	Demonstration
Solpod	Active	Solar PV Demonstration Project	$975,000	$0	NSW	Accelerating solar PV innovation	Solar PV	Demonstration
South Australian Govt DMITRE	Terminated	Solar Storage Diesel Hybrid System at Marree	$3,180,000	$0	SA	Delivering secure and reliable electricity	Hybrid	Demonstration

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Southern Cross REVC Trusco Pty Ltd	Active	Southern Cross Renewable Energy Fund	$60,000,000	$1,096,153	NSW	Other	Enabling	Demonstration
Southern Oil Refining	Active	Commercialisation of renewable crude oil production from wastewater treatment plant waste	$4,000,000	$250,000	QLD	Improving energy productivity	Bioenergy	Demonstration
Southern Oil Refining	Active	Project Rudolf - Australian Biofuels from Australian Resources	$3,188,630	$1,010,050	QLD	Improving energy productivity	Bioenergy	Study
Spotless Sustainability Services	Active	Ballarat Terminal Station Battery Energy Storage System (BESS)	$2,265,000	$0	VIC	Delivering secure and reliable electricity	Battery Storage	Demonstration
Sustainable Melbourne Fund	Active	Expansion of the Environmental Upgrade Agreement (EUA) market in Victoria	$821,369	$272,180	VIC	Improving energy productivity	Solar PV	Study
Swinburne University of Technology	Completed	Towards an Australian capability in arrays of ocean wave-power machines	$770,728	$0	VIC	Other	Marine	Study
TasNetworks	Active	Tasmanian and Victorian Second Bass Strait Interconnector Feasibility Study	$10,000,000	$4,000,000	TAS	Delivering secure and reliable electricity	Other	Study
The Trustee for Lastek Unit Trust	Active	Measurement guidelines for multi-junction solar cells with perovskite layers, CSIRO PV Performance Laboratory	$732,038	$150,000	NSW	Accelerating solar PV innovation	Solar PV	Demonstration
Toyota Motor Corporation Australia Ltd	Active	Toyota Ecopark Hydrogen Demonstration	$3,076,000	$0	VIC	Exporting renewable energy	Hydrogen	Demonstration
United Energy Distribution Pty Ltd	Active	Peak Demand Reduction using Solar and Storage	$450,000	$0	VIC	Delivering secure and reliable electricity	Battery Storage	Demonstration
United Energy Distribution Pty Ltd	Active	United Energy Dynamic Voltage Management Demand Response (Product 2)	$5,762,000	$1,613,360	VIC	Delivering secure and reliable electricity	Enabling	Demonstration

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
United Energy Distribution Pty Ltd	Active	Voltage-Controlled Frequency Regulation System	$900,000	$0	VIC	Delivering secure and reliable electricity	Enabling	Demonstration
University of Melbourne	Active	Advanced Planning of PV-Rich Distribution Networks Study	$203,867	$61,160	VIC	Delivering secure and reliable electricity	DER Integration	Study
University of Melbourne	Active	Hydrogen Fuelled Reciprocating Engines R&D Project	$2,594,747	$1,297,374	VIC	Improving energy productivity	Hydrogen	R&D
University of Queensland	Active	PV Penetration Project	$1,190,000	$400,000	QLD	Delivering secure and reliable electricity	Enabling	Study
University of South Australia	Active	Maximising solar PV with phase change thermal energy storage	$995,290	$379,765	SA	Improving energy productivity	Enabling	R&D
University of Tasmania	Active	Optimal DER Scheduling for Frequency Stability Study	$527,582	$158,275	TAS	Delivering secure and reliable electricity	DER Integration	Study
University of Tasmania	Active	Tidal Energy in Australia – Assessing Resource and Feasibility to Australia's Future Energy Mix	$2,494,860	$615,885	TAS	Delivering secure and reliable electricity	Marine	Study
University of Technology Sydney	Active	Develop lithium-sulfur batteries for large-scale electrical energy storage	$830,000	$180,000	NSW	Delivering secure and reliable electricity	Battery Storage	R&D
University of Technology Sydney	Active	Networks Renewed: Using innovative inverter and battery storage technologies to improve network power quality, reduce costs and support solar PV	$1,599,340	$472,185	NSW	Delivering secure and reliable electricity	Enabling	Demonstration
University of Technology Sydney	Completed	UTS ISF Renewable Energy and Load Management (REALM) Stage 1 - Study	$293,578	$293,578	NSW	Improving energy productivity	Enabling	Study
University of Technology Sydney	Completed	Social Access Solar Gardens	$239,930	$189,930	NSW	Accelerating solar PV innovation	Solar PV	Study

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
University of the Sunshine Coast	Active	Control and manage the moisture content of woody biomass to create certainty in the quality and supply for bioenergy	$300,000	$240,000	QLD	Improving energy productivity	Bioenergy	Study
University of Western Australia	Active	Methanol from Syngas R&D Project	$1,079,875	$539,938	WA	Exporting renewable energy	Hydrogen	R&D
University of Western Australia	Active	From single to multiple wave energy converters: Cost reduction through location and configuration optimisation	$994,198	$170,000	WA	Other	Marine	R&D
University of Wollongong	Active	The Smart Sodium Storage System for Renewable Energy Storage	$2,678,307	$734,562	NSW	Delivering secure and reliable electricity	Battery Storage	R&D
UNSW	Active	Addressing barriers to efficient renewable integration	$982,000	$163,600	NSW	Delivering secure and reliable electricity	Enabling	Study
UNSW	Active	Mission Innovation Challenge - Off-Grid Access to Electricity	$228,000	$0	NSW	Delivering secure and reliable electricity	Enabling	Study
UNSW	Active	Photovoltaic Electrolysis to Generate Hydrogen R&D Project	$1,319,105	$659,552	NSW	Exporting renewable energy	Hydrogen	R&D
UNSW	Active	Waste Biomass to Renewable Hydrogen R&D Project	$1,045,770	$522,885	NSW	Improving energy productivity	Hydrogen	R&D
UNSW	Active	Development and Commercialisation of High Efficiency Silicon Solar Cell Technology	$6,472,980	$509,000	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Multi-Junction c-Si Solar Cells Based on Virtual Ge Substrates	$1,455,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	40% Efficient Photovoltaic "Power Cube" Power Tower Receiver	$1,400,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Australia-US Institute for Advanced Photovoltaics (AUSIAPV)	$64,999,005	$9,221,997	NSW	Accelerating solar PV innovation	Solar PV	R&D

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
UNSW	Active	Low-cost, high-efficiency Copper-Zinc-Tin-Sulphide (CZTS) on silicon multi-junction solar cells	$2,612,358	$561,683	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Towards Ultimate Performance Commercial Silicon Solar Cells	$2,970,702	$720,000	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	High-Efficiency Silicon/ Perovskite Tandem Cells and Modules: Demonstration and Commercial Evaluation	$3,599,459	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Accelerating industrial solar cells efficiency by development of plasma-enhanced chemical vapour deposition (PECVD) - based metal oxides	$503,389	$150,000	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Metallised Encapsulant for Silicon PV Modules: A Path to Reduced LCOE for PV	$1,160,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Improving World-Record Commercial High-Efficiency n-type Solar Cells through Recombination Analysis and Innovative Passivation	$1,785,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Hydrogenated bifacial PERL Silicon PV Cells with laser doping and plated contacts R&D Project	$1,100,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Hydrogenated and Hybrid Heterojunction p-type Silicon PV Cells R&&D Project	$1,735,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
UNSW	Active	Development of Beyond 20% Efficiency Kesterite (CZTSSe) Solar Cells: win the PV race with sustainable low-cost, low-toxic and stable materials	$1,331,098	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Advanced high-efficiency silicon solar cells employing innovative atomic scale engineered surface and contact passivation layers	$2,019,456	$605,837	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Next Generation Silicon sub-cells for high efficiency III-V/Si multi-junction solar cells	$1,144,628	$228,926	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Integrating industrial black silicon with high efficiency multicrystallne solar cells	$500,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Development of novel hydrogen trapping techniques for breakthrough Si casting and wafering technologies	$1,968,000	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Efficient Adamantine Thin-Film on Silicon Tandem Cells: The Next Step in Commercial Cell Evolution	$3,184,166	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Active	Module Design for Lower Field Operating Temperature and Improved Yield	$285,816	$0	NSW	Accelerating solar PV innovation	Solar PV	R&D
UNSW	Completed	Adrian Shi: Copper-Zinc-Tin-Sulfide (CTZS) thin-film solar cell on stell for BIPV application	$51,041	$4,148	NSW	Accelerating solar PV innovation	Solar PV	R&D

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Vast Solar Pty Ltd	Active	Vast Solar 6 MWth grid connected CSP research, development and demonstration facility with thermal energy storage	$9,896,960	$0	NSW	Delivering secure and reliable electricity	Solar Thermal	Demonstration
Vestas Wind Systems A/S	Active	Wind Forecasting for the NEM Project	$405,754	$89,658	SA	Delivering secure and reliable electricity	Market data and information	Demonstration
Voyages Indigenous Tourism	Active	Yulara 1.8 MW Dispersed Solar PV Project	$447,525	$97,525	NT	Delivering secure and reliable electricity	Solar PV	Demonstration
Wave Swell Energy Limited	Active	UniWave200 King Island Project	$4,035,628	$0	TAS	Delivering secure and reliable electricity	Marine	Demonstration
Weipa Solar Farm Pty Ltd	Terminated	Weipa Solar PV Project	$3,500,000	$0	QLD	Improving energy productivity	Solar PV	Demonstration
Whitsunday Solar Farm Pty Ltd	Active	Whitsunday Solar Farm	$5,359,706	$0	QLD	Delivering secure and reliable electricity	Large-scale solar	Deployment
Windlab Limited	Active	LIDAR for Wind Forecast Projects	$393,107	$340,607	QLD	Delivering secure and reliable electricity	Market data and information	Demonstration
Worley-Parsons	Completed	Tidal Turbine Reef Feasibility Study	$280,000	$0	WA	Other	Marine	Study
Zeppelin Bend Pty Ltd	Active	Publishing operating envelopes to the node to support the integration, orchestration and coordination of high-penetration DER in electricity distribution networks.	$4,292,632	$380,000	ACT	Delivering secure and reliable electricity	DER Integration	Demonstration
Zero Mass Water (Australia) Pty Ltd	Active	SOURCE Hydropanel Demonstration Project	$420,000	$230,000	SA	Accelerating solar PV innovation	Solar PV	Demonstration
TOTAL: 254			$1,226,970,805	$127,534,491				

TABLE 19: PAYMENTS MADE TO PROJECTS NOT ACTIVE IN 2018-19

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2018-19 (EX GST)	LOCATION (STATE)	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Ergon Energy Queensland Pty Ltd	Completed	Pilot a commercial and operational model for integrating solar and storage to provide energy services to residential customers	$400,000	$300,000	QLD	Delivering secure and reliable electricity	Enabling	Demonstration

APPENDIX 2: INDEX OF COMPLIANCE WITH ANNUAL REPORT REQUIREMENTS

The following table lists the information ARENA is required to provide in this Annual Report, and where the information is located.

TABLE 20: INDEX OF COMPLIANCE WITH ANNUAL REPORT REQUIREMENTS

RELEVANT ACT OR RULE	REFERENCE	REQUIREMENT	WHERE
Australian Renewable Energy Agency Act 2011	Section 70	**Funding provided under ARENA Act** Provide particulars of each person to whom financial assistance was provided or committed during the year: • name of the person • nature and amount of the financial assistance • renewable energy technology or technologies to which the assistance relates	P156-185
		Provide an assessment of the extent to which agreements for the provision of financial assistance entered into during the year has progressed, or are expected to progress, the principal objectives and priorities as stated in the general funding strategy in force for the year	P106-152
Australian Renewable Energy Agency (Consequential Amendments and Transitional Provisions) Act 2011	Schedule 2, Part 2, Section 28	**Funding provided under a transferred agreement** Provide particulars of each person to whom financial assistance has been provided during the year under a transferred Commonwealth funding agreement, or a transferred ASI Limited funding agreement: • name of the person • nature and amount of the financial assistance • renewable energy technology or technologies to which the assistance relates	P163-184
Australian Renewable Energy Agency Act 2011	Section 11 Section 70 (a)	**Ministerial requests** Particulars of each request given to ARENA during the financial year by the Minister under Section 11 asking ARENA to consider providing financial assistance for a specified project	P72
	Section 13 Section 70 (b)	**Ministerial directions** Particulars of each direction given to ARENA during the financial year by the Minister under Section 13 requiring ARENA to provide advice	P72
Public Governance, Performance and Accountability Act 2013	Section 46	**Annual report presented to Minister** ARENA Board must prepare and provide the annual report to the Minister by 15 October each year	Yes

RELEVANT ACT OR RULE	REFERENCE	REQUIREMENT	WHERE
Public Governance, Performance and Accountability Act 2013, Public Governance, Performance and Accountability Rule 2014	PGPA Act, Section 46 PGPA Rule, Section 17BB	**Approval of annual report by accountable authority (ARENA Board)** • be approved by the ARENA Board • be signed by the Board, or a member of the Board • include details of how and when approval of the annual report was given • state that the Board is responsible for preparing and giving the annual report to ARENA's responsible minister in accordance with Section 46 of the Act	P11
	PGPA Act, Section 46 PGPA Rule, Section 17BC	**Parliamentary standards of presentation** Comply with the guidelines for presenting documents to the Parliament	Yes
	PGPA Act, Section 46 PGPA Rule, Section 17BD	**Plain English and clear design** Must be prepared having regard to the interests of the Parliament and any other persons who are interested in the annual report and must be relevant, reliable, concise, understandable and balanced, including, where, practicable: • following standards of presentation, language and design • defining acronyms and technical terms • using tables, graphs, diagrams and charts • including any additional matters as appropriate	Yes
	PGPA Act, Section 46 PGPA Rule, Section 17BE	**Contents of Annual Report**	See below
	PGPA Rule, Section 17BE(a)	Details of the legislation that established ARENA	P72
	PGPA Rule, Section 17BE(b)(i)	Summary of ARENA's objectives and functions as set out in the legislation	P72
	PGPA Rule, Section 17BE(b)(ii)	ARENA's purpose as set out in the corporate plan for the period	P2, 18, 21, 106, 108, 109
	PGPA Rule, Section 17BE(c)	Names of the persons holding the position of responsible Minister or responsible Ministers during the reporting period, and the titles of those responsible Ministers	P72
	PGPA Rule, Section 17BE(d)	Any ministerial directions given under an Act or instrument during the reporting period	P72
	PGPA Rule, Section 17BE(e)	Any government policy order that applied to ARENA during the reporting period under s22 of the PGPA Act	P73
	PGPA Rule, Section 17BE(f)	Particulars of any non-compliance with a direction given by the Minister or a government policy order that applied during the reporting period	N/A
	PGPA Rule, Section 17BE(g)	Annual performance statement for ARENA for the period in accordance with paragraph 39(1)(b) of the PGPA Act and s16F of the Rule	P106-152
	PGPA Rule, Section 17BE(h), PGPA Rule, Section 17BE(i) PGPA Rule, Section 17BE(j)	Statement of any significant issues reported to the responsible Minister under paragraph 19(1)(e) of the Act that relates to non-compliance with finance law in relation to ARENA A statement of the action taken to remedy that non-compliance Information on each member of the ARENA Board: • name, qualification and experience • number of meetings attended • whether executive or non-executive	P73 P26-33, 189-90
	PGPA Rule, Section 17BE(k)	Outline of ARENA's organisational structure	P77

RELEVANT ACT OR RULE	REFERENCE	REQUIREMENT	WHERE
	PGPA Rule, Section 17BE(k)	Statistics on ARENA's employees on an ongoing and non-ongoing basis, including the following: • statistics on full-time employees • statistics on part-time employees • statistics on gender • statistics on staff location	P191
	PGPA Rule, Section 17BE(l)	Outline of location (whether or not in Australia) of major activities or facilities	Back cover
	PGPA Rule, Section 17BE(m)	Main corporate governance practices used by ARENA during the period: • Board committees and their main responsibilities • education and performance review processes for members of the Board • ethics and risk management policies	P62-68
	PGPA Rule, Section 17BE(n), PGPA Rule, Section 17BE(o)	Related entity transactions	P97
	PGPA Rule, Section 17BE(p)	Any significant activities and changes that affected ARENA's operations or structure during the period	P62
	PGPA Rule, Section 17BE(q)	Particulars of judicial decisions or decisions of administrative tribunals made during the period that have, or may have, a significant effect on the operations of ARENA	P75
	PGPA Rule, Section 17BE(r)	Particulars of any report on ARENA given during the period by: • the Auditor-General (other than a report under Section 43 of the PGPA Act) • a Parliamentary Committee • the Commonwealth Ombudsman • the Office of the Australian Information Commissioner	P75
	PGPA Rule, Section 17BE(s)	An explanation of any information not obtained from a subsidiary of ARENA and the effect of not having the information in the annual report	P76
	PGPA Rule, Section 17BE(t)	Details of any indemnity that applied during the period to the Board, any member of the Board or officer of ARENA against a liability (including premiums paid, or agreed to be paid, for insurance against the Board, Board member or officer's liability for legal costs)	P68
	PGPA Rule, Section 17BE(ta)	Information about executive remuneration	P96, 192
	PGPA Rule, Section 17BE(u)	An index identifying where the requirements of this section and s17BF (if applicable) are to be found in the annual report	P186-188
Public Governance, Performance and Accountability Act 2013, Public Governance, Performance and Accountability (Financial Reporting) Rule 2015	PGPA Act, Section 42 PGPA (Financial Reporting) Rule	**Financial statements** Financial statements are prepared as soon as practicable after the end of the reporting period, and then provided to the Auditor-General as soon as practicable Statements comply with the accounting standards and any other requirements prescribed by the rules, and fairly present ARENA's financial position, financial performance and cash flows Written confirmation from the Board that statements meet these requirements	P82-102
Environment Protection and Biodiversity Conservation Act 1999	Section 516A	**Environmental performance** Information on: • accord between ARENA's activities and ecologically sustainable development (ESD) principles • ARENA's contribution of outcomes to ESD • effects of these activities on the environment • measures to review and minimise effects on the environment	P74
Freedom of Information Act 1982 (Part II)		**Information Publication Scheme** Actions taken to comply	P73

APPENDIX 3: MANDATORY INFORMATION FOR TRANSPARENCY PORTAL

These mandatory tables have been prepared for use in the Australian Government's new Transparency Portal, which can be found at transparency.gov.au.

TABLE 21: DETAILS OF ARENA BOARD 2018-19

NAME	QUALIFICATIONS OF BOARD MEMBERS	EXPERIENCE OF BOARD MEMBERS	POSITION TITLE / POSITION HELD EXECUTIVE / NON-EXECUTIVE	PERIOD AS BOARD MEMBER DATE OF COMMENCEMENT	PERIOD AS BOARD MEMBER DATE OF CESSATION	NUMBER OF BOARD MEETINGS
Mr Martijn Wilder AM	BEc (Hons), LLB Honours, LLM, GAICD	Founding Partner of Pollination Capital Partners Formerly 20 years as Head, Global Environmental Markets and Climate Change, Baker & McKenzie Former Board Member, Clean Energy Finance Corporation Visiting Professor of Climate Change Law, ANU President, WWF (Australia) Director, Climate Council Chair, NSW Climate Change Council Governing Board Member, Renewable Energy and Energy Efficiency Partnership Member, Wentworth Group of Concerned Scientists Deputy Chair, Private Sector Roundtable of the Asia Pacific Rainforest Recovery Plan	Chair Non-executive member	17 April 2018	-	7/8
Ms Samantha Hogg	GAICD	Chief Financial Officer, Transurban Limited Chair, Tasmanian Irrigation Chair, TasRail Director, Hydro Tasmania Director, MaxiTRANS	Non-executive member	17 April 2018	-	6/8

NAME	QUALIFICATIONS OF BOARD MEMBERS	EXPERIENCE OF BOARD MEMBERS	POSITION TITLE / POSITION HELD EXECUTIVE / NON-EXECUTIVE	PERIOD AS BOARD MEMBER DATE OF COMMENCEMENT	 DATE OF CESSATION	 NUMBER OF BOARD MEETINGS
Ms Susan Jeanes	Tertiary qualifications in politics and environmental studies	Consultant, Jeanes Holland and Associates Former Chief Executive Officer, Australian Geothermal Energy Association Former Chief Executive Officer, Renewable Energy Generators Australia Chair, South Australian Centre for Geothermal Energy Research and Centre for Energy Technology	Non-executive member	17 April 2018	-	8/8
Ms Meg McDonald	Honours degree in Applied Science	Member, Foreign Investment Review Board Former Chief Operating Officer, Clean Energy Finance Corporation Former Chief Executive Officer, Low Carbon Australia Limited Former Director, Global Issues, Alcoa Inc Former Global President, Alcoa Foundation Former Deputy Chief of Mission, Australian Embassy in Washington Former Australian Ambassador for the Environment	Non-executive member	17 April 2018	-	7/8
Mr Dougal McOmish	Tertiary qualifications in economics	Director, Eco Advisory, Former Chief Operating Officer, Sundrop Farms	Non-executive member	17 April 2018	-	6/8
Ms Stephanie Unwin		Chief Executive Officer, Horizon Power Former General Manager Transformation and Technology, CBH Group Former Chief Executive Officer, Phylogica Former General Manager Commercial, Synergy	Non-executive member	17 April 2018	-	8/8
Mr Finn Pratt AO PSM	-	Secretary of the Department of the Environment and Energy	Ex-officio member	N/A	-	8/8 (attended by Mr Pratt or his nominated delegate)

TABLE 22: ALL ONGOING EMPLOYEES CURRENT REPORTING PERIOD (2018-19)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULL TIME	PART TIME	*TOTAL MALE*	FULL TIME	PART TIME	*TOTAL FEMALE*	FULL TIME	PART TIME	*TOTAL INDETER-MINATE*	
NSW	2									2
TOTAL	2									2

TABLE 23: ALL NON-ONGOING EMPLOYEES CURRENT REPORTING PERIOD (2018-19)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULL TIME	PART TIME	*TOTAL MALE*	FULL TIME	PART TIME	*TOTAL FEMALE*	FULL TIME	PART TIME	*TOTAL INDETER-MINATE*	
TOTAL	0									0

TABLE 24: ALL ONGOING EMPLOYEES PREVIOUS REPORTING PERIOD (2017-18)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULL TIME	PART TIME	*TOTAL MALE*	FULL TIME	PART TIME	*TOTAL FEMALE*	FULL TIME	PART TIME	*TOTAL INDETER-MINATE*	
NSW	2									2
TOTAL	2									2

TABLE 25: ALL NON-ONGOING EMPLOYEES PREVIOUS REPORTING PERIOD (2017-18)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULL TIME	PART TIME	*TOTAL MALE*	FULL TIME	PART TIME	*TOTAL FEMALE*	FULL TIME	PART TIME	*TOTAL INDETER-MINATE*	
TOTAL	0									0

TABLE 26: EXECUTIVE REMUNERATION

		SHORT-TERM BENEFITS	POST-EMPLOYMENT BENEFITS	OTHER LONG-TERM BENEFITS	TOTAL REMUNERATION
NAME	POSITION	BASE SALARY	SUPERANNUATION CONTRIBUTIONS	LONG SERVICE LEAVE	
Darren Miller	CEO*	$319,452	$17,683	$6,313	$343,448
Ian Kay	CFO	$406,467	$25,647	$27,041	$459,155
Ivor Frischknecht	ex-CEO*	$51,577	$12,980	-	$64,557
Martijn Wilder	Chair	$69,535	$7,506	-	$77,041
Samantha Hogg	Board Member	$24,557	$3,384	-	$27,941
Susan Jeanes	Board Member	$31,350	$3,367	-	$34,717
Meg McDonald	Board Member	$35,030	$4,028	-	$39,058
Dougal McOmish	Board Member	$14,504	$2,429	-	$16,933
Stephanie Unwin	Board Member	$28,959	$3,802	-	$32,761
TOTAL		$981,431	$80,826	$33,354	$1,095,611

*Part-year remuneration

TABLE 27: INFORMATION ABOUT REMUNERATION FOR SENIOR EXECUTIVES

		SHORT-TERM BENEFITS			POST-EMPLOYMENT BENEFITS	OTHER LONG-TERM BENEFITS		TERMINATION BENEFITS	TOTAL REMUNERATION
TOTAL REMUNERATION BANDS	NUMBER OF SENIOR EXECUTIVES	AVERAGE BASE SALARY	AVERAGE BONUSES	AVERAGE OTHER BENEFITS AND ALLOWANCES	AVERAGE SUPERANNUATION CONTRIBUTIONS	AVERAGE LONG SERVICE LEAVE	AVERAGE OTHER LONG-TERM BENEFITS	AVERAGE TERMINATION BENEFITS	AVERAGE TOTAL REMUNERATION
	0								

TABLE 28: INFORMATION ABOUT REMUNERATION FOR OTHER HIGHLY-PAID STAFF

		SHORT-TERM BENEFITS			POST-EMPLOYMENT BENEFITS	OTHER LONG-TERM BENEFITS		TERMINATION BENEFITS	TOTAL REMUNERATION
TOTAL REMUNERATION BANDS	NUMBER OF OTHER HIGHLY-PAID STAFF	AVERAGE BASE SALARY	AVERAGE BONUSES	AVERAGE OTHER BENEFITS AND ALLOWANCES	AVERAGE SUPERANNUATION CONTRIBUTIONS	AVERAGE LONG SERVICE LEAVE	AVERAGE OTHER LONG-TERM BENEFITS	AVERAGE TERMINATION BENEFITS	AVERAGE TOTAL REMUNERATION
	0								

APPENDIX 4: LIST OF FIGURES AND TABLES

The following table lists the figures/diagrams and tables provided in this report, as well as their location.

FIGURES

TABLES

APPENDIX 5: GLOSSARY

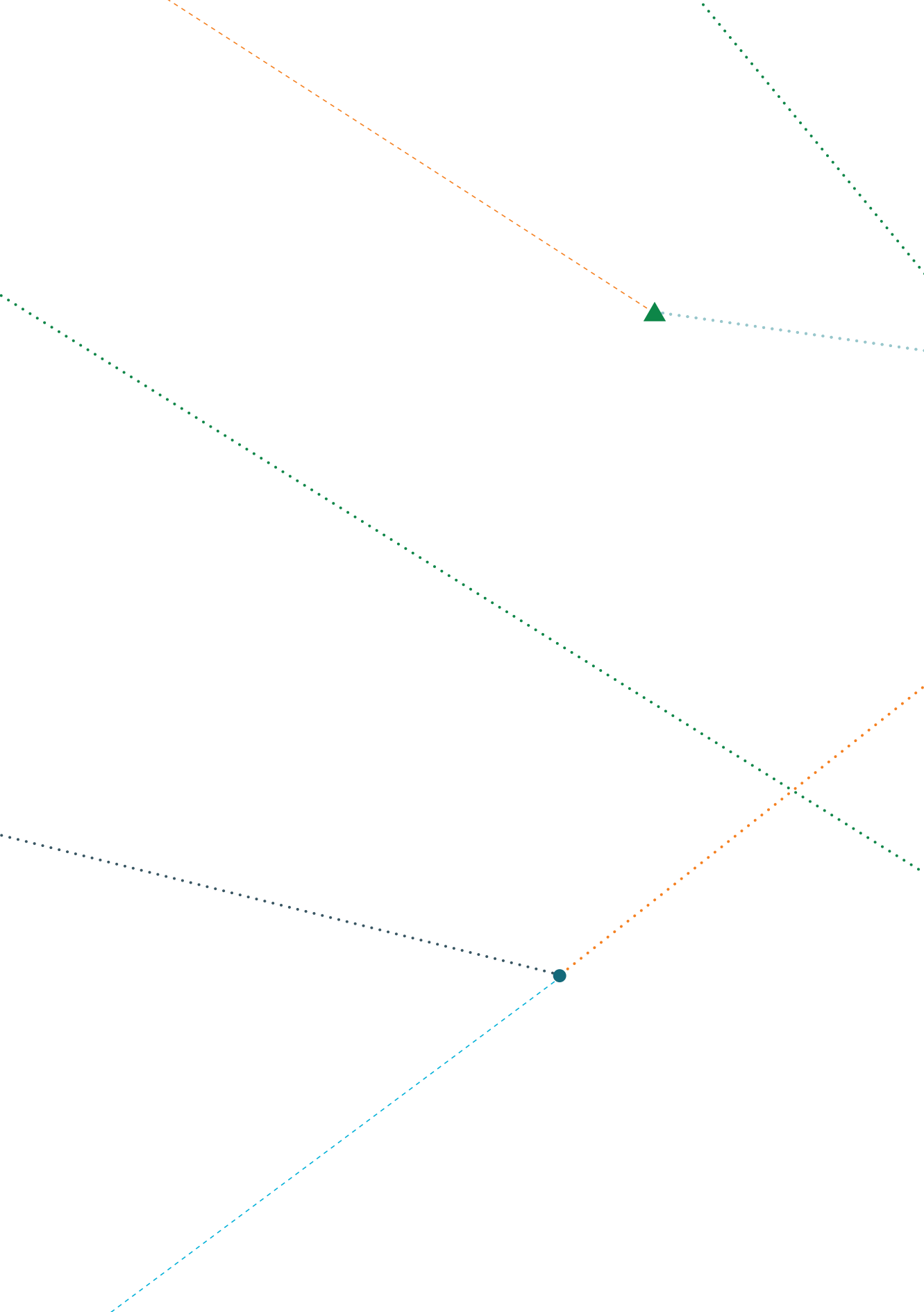
This is an alphabetical index that explains the acronyms, abbreviations and technical terms used in this Annual Report.

AAP	ARENA Advisory Panel
ACAP	Australian Centre for Advanced Photovoltaics
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
ACRE	Australian Centre for Renewable Energy
AEMO	Australian Energy Market Operator
AM	Member of the Order of Australia
AO	Officer of the Order of Australia
ANAO	Australian National Audit Office
approved funds	The amount that ARENA's Board or CEO has approved to be offered to a funding applicant (subject to successful negotiation of a contract, or subject to a final assessment process)
approved projects	Projects that the Board or CEO has approved to be offered ARENA funds subject to successful negotiation of a contract
APS	Annual Performance Statement, Australian Public Service
ARENA	Australian Renewable Energy Agency
ARENA Act	*Australian Renewable Energy Agency Act 2011*
ASI	Australian Solar Institute
ASTRI	Australian Solar Thermal Research Initiative
BESS	Battery energy storage system
CEFC	Clean Energy Finance Corporation
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COAG	Council of Australian Governments
committed funds	The value of executed funding contracts
CSP/CST	Concentrating solar power / concentrating solar thermal
DER	Distributed energy resources: renewable energy units or systems commonly located at houses or businesses Includes rooftop solar, home batteries, inverters, electric vehicle charging points, smart appliances and systems, and relevant enablers such as smart meters and data services
de-risk	Make an innovation less risky, or an investment less likely to involve a financial loss
dispatchable energy	Energy that can be made available - or dispatched - by a power generator or energy system whenever it is needed, or switched off when it is not needed
EE	Energy efficiency
energy efficiency	Using less energy to achieve the same outcome - includes energy conservation and demand management technologies
energy productivity	Output or value created per unit of energy used
EOI	Expression of interest
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESB	Energy Security Board
ESD	Ecologically sustainable development
EV	Electric vehicle
FCAS	Frequency Control Ancillary Services: services that help to stabilise the grid by either injecting or absorbing power to compensate for excessive drops or rises in frequency

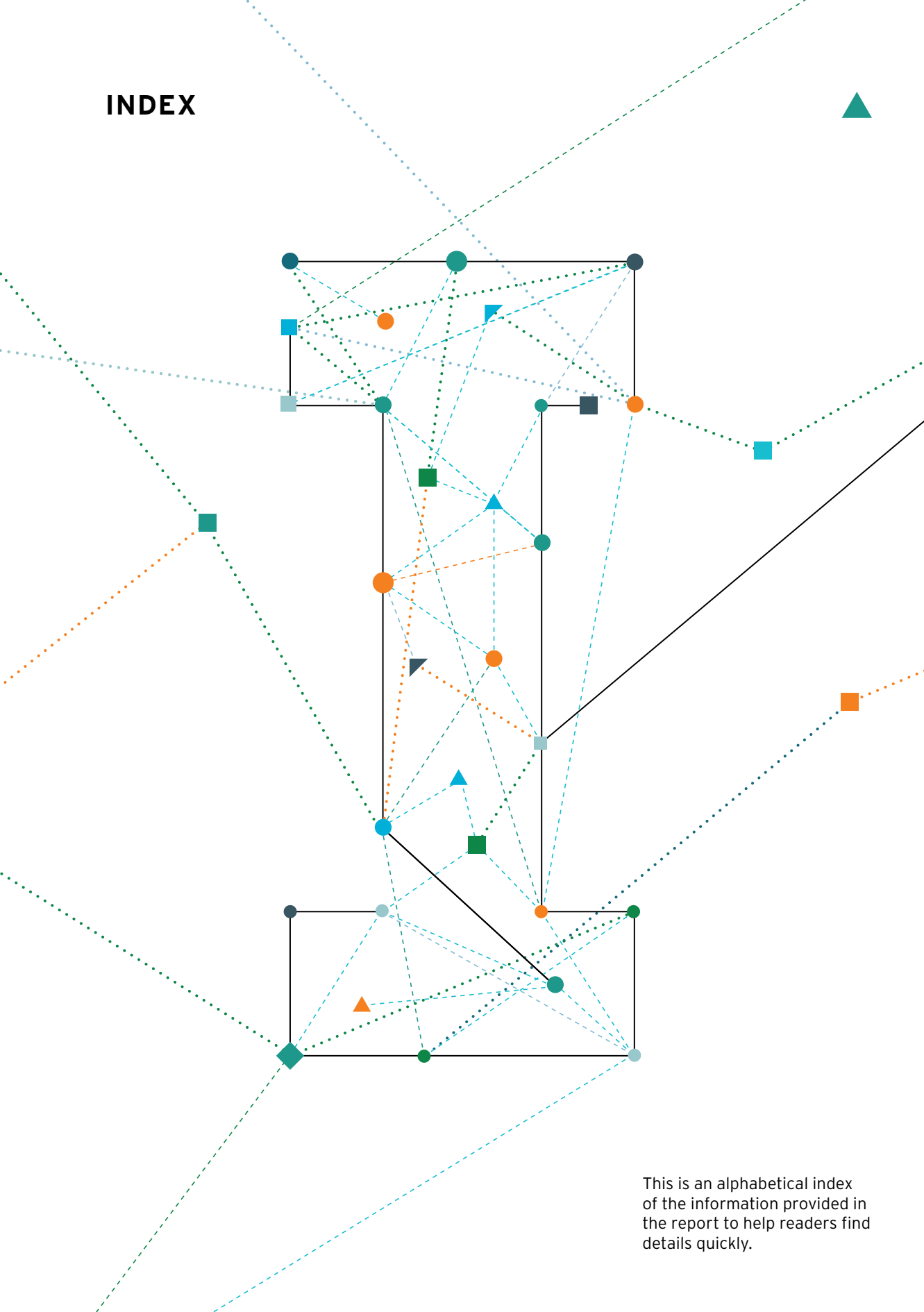
flexible capacity	Energy storage, demand response, and generation that can be quickly drawn upon to help balance energy supply and demand
FOI Act	*Freedom of Information Act 1982*
fringe-of-grid	Areas at the edges of an electricity grid
FTE	Full-time equivalent
GFS	*General Funding Strategy*
GST	Goods and services tax
GW	Gigawatt: 1000 million watts (a 40 W light globe uses 40 watts of electricity)
H2	Hydrogen
Hydrogen (green, renewable)	Hydrogen produced using renewable energy
Innovation chain	A framework for describing the stages involved in bringing an idea to the market (R&D, study, demonstration and deployment)
Innovation stage	A position along the innovation chain (i.e. R&D, study, demonstration or deployment)
Investment leverage	Ratio of ARENA funds committed to third party funds invested
IP	*Investment Plan*
investment priority	An area that ARENA wishes to focus its funding and activities on. Investment priorities are described in ARENA's *Investment Plan* and help guide funding assessments
KS	Knowledge Sharing
knowledge sharing	Information shared by ARENA or funding recipients to impart knowledge and lessons learned
LSBS	Large-scale battery storage
LSS	Large-scale solar
microgrid	A stand-alone power system that combines energy resources such as solar, diesel, wind and batteries A microgrid may be able to connect and disconnect from the larger grid, operating in either grid-connected or island mode
Mission Innovation	A global initiative of 24 countries and the European Commission (on behalf of the European Union) working to reinvigorate and accelerate global clean energy innovation with the objective to make clean energy widely affordable Australia has pledged to double government clean energy research and development expenditure by 2020-21
MW	Megawatt: 1 million watts (a 40 W light globe uses 40 watts of electricity)
network hosting capacity	The amount of DER that can connect to (or operate on) a distribution network without affecting the quality of supply to other customers (such as voltage levels), or the stability and security of the network
NEM	National Electricity Market
off-grid	Not connected to the electricity grid, such as in remote areas
P2G	Power-to-gas: the conversion of electricity to a fuel such as hydrogen
PGPA Act	*Public Governance, Performance and Accountability Act 2013*
PBS	Portfolio Budget Statements
PCC	People and Culture Committee
PHES	Pumped hydro energy storage
PPA	Power purchase agreement: an offtake agreement where a purchaser agrees to purchase and a supplier agrees to supply future generated electricity, usually at a specified price for a defined period
PSM	Public Service Medal
PV	Photovoltaic: a type of technology that converts energy from the sun into electricity
R&D	Research and development
RAC	Risk and Audit Committee
reliable (grid or power system)	A reliable power system has enough generation, demand response and network capacity to supply customers with the energy that they demand with a very high degree of confidence
REVC	Renewable Energy Venture Capital
RIOC	Review Implementation Oversight Committee
secure (grid or power system)	The ability of the power system to continue operating even in an event of an unexpected disruption

semi-scheduled (generators, plant)	A generating system with variable output (such as a wind or solar farm). An aggregate nameplate capacity of 30 MW or more is usually classified as semi-scheduled unless AEMO approves its classification as a scheduled or non-scheduled generating unit A semi-scheduled generating unit is only required to limit its output (or follow 'dispatch instructions' from AEMO) at times when there is a limitation on network capacity
variable (energy, generation)	Types of energy generation with output that varies based on the weather
VPP	Virtual power plant: a collection of batteries or other distributed energy resources, managed individually or in unison to support the local or regional electricity grid
WHS	Work health and safety
WHS Act	*Work Health and Safety Act 2011*

Image credit: ARENA



INDEX



This is an alphabetical index of the information provided in the report to help readers find details quickly.

INDEX

D

E

F

G

H

I

J

K

L

M

N

O

P

Image credit: TasNetworks

AUSTRALIAN RENEWABLE ENERGY AGENCY

NewActon Nishi
2 Phillip Law Street
CANBERRA ACT 2601
GPO Box 643
Phone: 1800 804 838

CONTACT PERSON FOR THIS REPORT: General Manager, Corporate Affairs
CONTENT: Australian Renewable Energy Agency
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EMAIL: arena@arena.gov.au
WEBSITE: arena.gov.au
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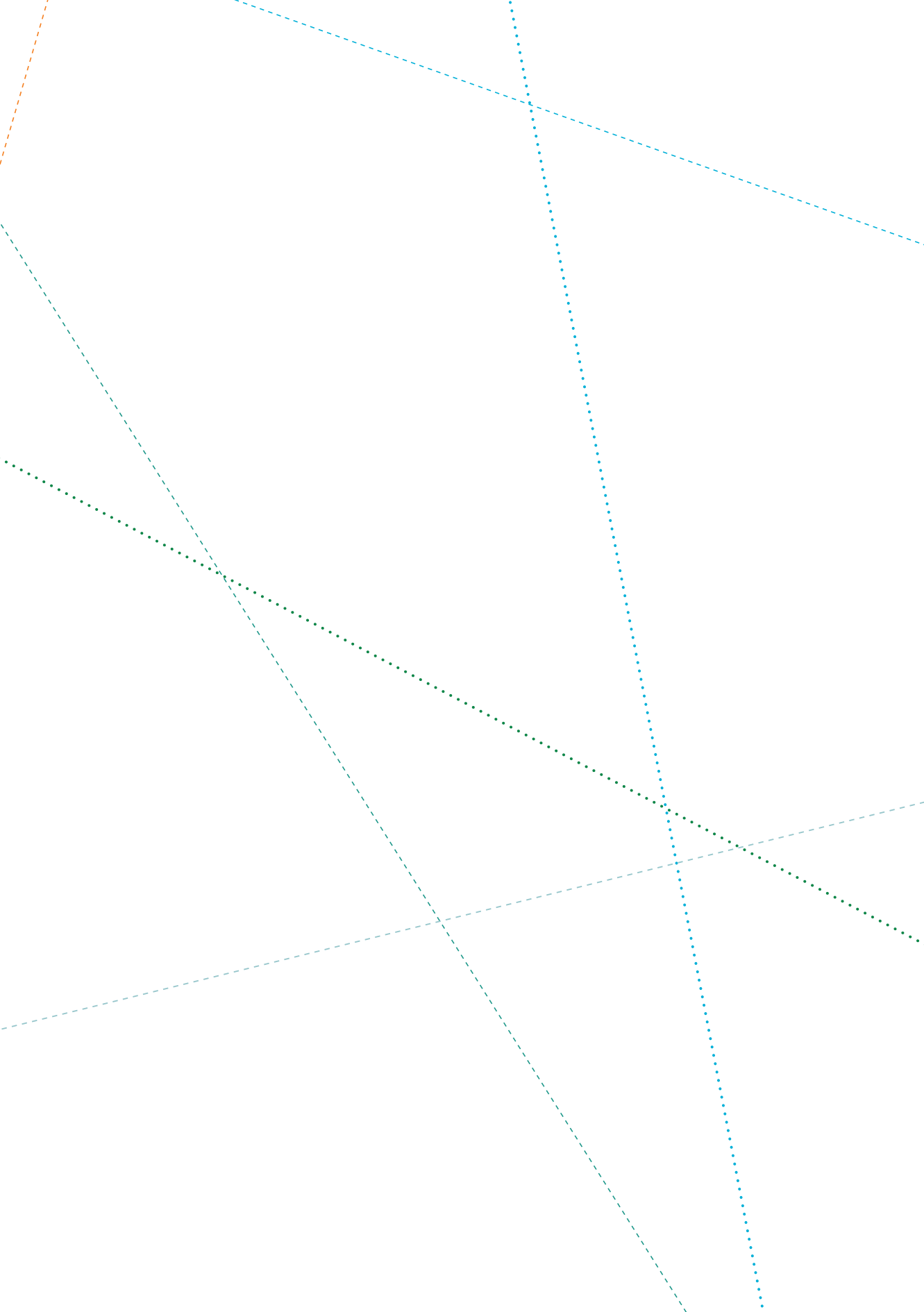

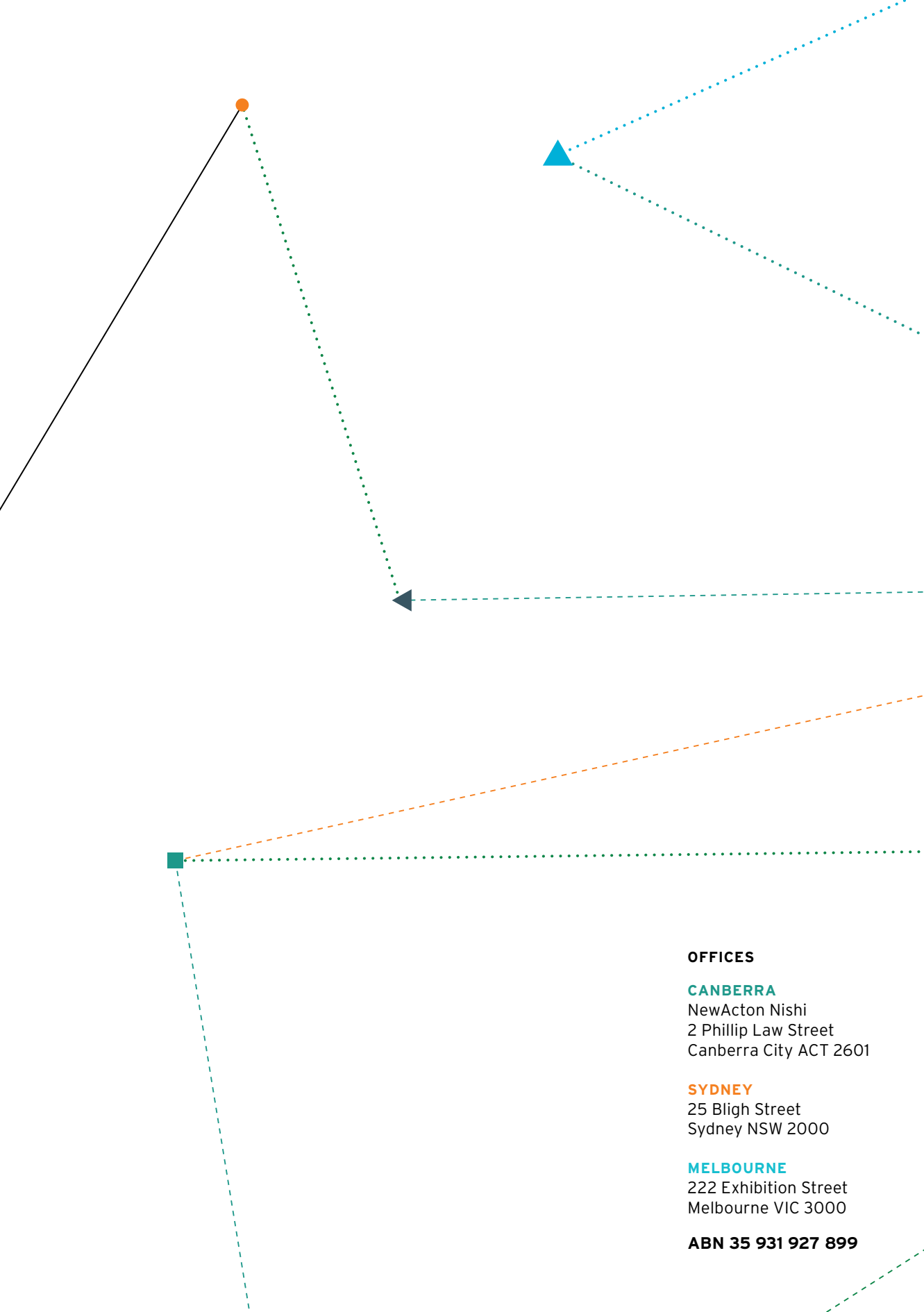

OFFICES

CANBERRA
NewActon Nishi
2 Phillip Law Street
Canberra City ACT 2601

SYDNEY
25 Bligh Street
Sydney NSW 2000

MELBOURNE
222 Exhibition Street
Melbourne VIC 3000

ABN 35 931 927 899