





# WE ARE ARENA

Since 2012, ARENA has supported 543 projects with \$1.58 billion in grant funding, unlocking total investment of almost \$6.48 billion in Australia's renewable energy industry.

## THE AUSTRALIAN RENEWABLE ENERGY AGENCY

ARENA was established by the Australian Government to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia.

We are an Australian Government statutory agency within the Industry, Science, Energy and Resources portfolio, and enabled by the *Australian Renewable Energy Agency Act 2011* (ARENA Act).

## OUR PURPOSE

is to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy through innovation that benefits Australian consumers and businesses.

## 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. We also share knowledge, insights and data from our funded projects to help the renewable energy industry and other projects learn from experience.

# ARENA'S IMPACT SO FAR

ARENA has played an instrumental role in delivering significant improvements in the competitiveness of renewable energy technologies such as large-scale solar, grid-scale batteries, bioenergy and distributed energy technologies.

We have been directly responsible for many renewable energy success stories including:

- › world-leading solar photovoltaic (PV) research, principally through our funding of the Australian Centre for Advanced Photovoltaics (ACAP), and by helping to halve the cost of large-scale solar projects through our competitive auction process and \$92 million of financial assistance in our large-scale solar round
- › successful Demand Response and Virtual Power Plant pilots to help pave the way for a better understanding of consumer behaviour and identify opportunities to reduce consumer costs
- › demonstrating high penetration of renewables in off-grid sites including energy intensive mining operations
- › rapid commercialisation of bioenergy and energy-from-waste projects spanning electricity

and biogas production, biofuels, efficient feedstock harvesting technology and projects that aim to capture energy from a range of waste materials

- › supporting a number of Electric Vehicle (EV) projects including charging infrastructure, that will generate significant data on how EVs are driven, charged and impact the electricity system, helping to prepare the energy and transport sectors for the electrification of transport
- › demonstrating how large-scale batteries can provide different benefits to the electricity system, including improving grid stability and power quality, and how they can help integrate more variable renewable energy into the grid.



These activities, supported by our work with organisations like the CSIRO, CEFC, energy sector peak bodies, consumer groups, universities, major energy companies and startup businesses, continue to assist with the transition to cleaner and cheaper energy.



Gannawarra Energy Storage System located in north-west Victoria. Image credit: ARENA.

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Image credit: Genex Power.

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# ABOUT THIS REPORT

THIS ANNUAL REPORT PROVIDES INFORMATION ABOUT ARENA'S ACTIVITIES AND ACHIEVEMENTS IN 2019-20.

Results are reported against our objective and performance criteria, which are stated in the ARENA Act, our Corporate Plan and our Portfolio Budget Statements 2019-20. We also describe our governance, management and accountability practices, our workforce and financial performance, and provide our audited financial statements.

You can also read the Annual Report online at [arena.gov.au/about/publications](https://arena.gov.au/about/publications)



Solpod's prefabricated solar system being installed on the roof of Highpoint Shopping Centre. Image credit: Solpod.





Australian Government  
Australian Renewable  
Energy Agency

**ARENA**

**OFFICE OF THE CHAIR**

17 September 2020

**THE HON ANGUS TAYLOR MP**

Minister for Energy and Emissions Reduction  
PO Box 6022  
Parliament House CANBERRA ACT 2600

**DEAR MINISTER**

**ARENA ANNUAL REPORT 2019-20**

I am pleased to present to you the Australian Renewable Energy Agency (ARENA) Annual Report for the financial year 2019-20, 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 17 September 2020.

This report incorporates ARENA's Annual Performance Statement (APS) for 2019-20, 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

A handwritten signature in black ink that reads "Justin Punch".

**JUSTIN PUNCH**

Chair



Image credit: Stock.



Justin Punch, Chair

# CHAIR'S INTRODUCTION

On behalf of the Board, I am pleased to present the ARENA 2019-20 Annual Report.

As the report outlines, ARENA's activities continue to contribute to an increase in the supply and diversity of Australia's renewable energy resources and a decrease in the cost of renewable energy.

I would like to thank outgoing Chair, Martijn Wilder AM, and the previous Board members for their outstanding service in delivering the many projects and initiatives outlined in the Annual Report.

During Martijn's tenure, ARENA played an instrumental role in delivering significant improvements in the competitiveness of renewable energy technologies such as large-scale solar, grid-scale batteries, bioenergy, and distributed energy technologies.

On behalf of the Board I also wish to acknowledge the ongoing leadership of the Agency's CEO, Darren Miller, and his executive. Along with the rest of ARENA's dedicated team, they have continued to deliver important and ground-breaking projects over the past 12 months despite an uncertain and challenging COVID-19 dominated operating environment.

ARENA is a key delivery agent for the Australian Government in bringing to bear the most effective tools and technologies to support the changing energy landscape and help Australia reduce its emissions.

I am honoured to join ARENA as the new Chair and to help guide the Agency through the next important phase of its life.

A handwritten signature in black ink that reads "Justin Punch". The signature is written in a cursive, flowing style.

**JUSTIN PUNCH**  
Chair

# CEO'S REVIEW

Equipped with a suite of new investment priorities and faced with an increasingly complex and fast-paced energy transition, ARENA spent 2019-20 investing in projects at the forefront of renewable energy innovation.

ARENA's activities continue to contribute to an increase in the supply and diversity of Australia's renewable energy resources, a decrease in the cost of renewable energy and reduction in emissions.

## MAXIMISING OUR IMPACT

Each year we review our work to ensure ARENA's funding support is delivering maximum value to the Australian community.

The penetration of renewable energy in the electricity sector is increasing, but there are still challenges to overcome. These include managing the growth of distributed energy, transforming and modernising the grid to integrate renewables and balancing the variable supply of renewable energy.

ARENA's current investment priorities, launched in September 2019, are geared towards maximising our impact to help future proof our energy system and economy and unlock Australia's renewable resources.

Under these priorities, funding is being directed towards projects that support the integration of renewables in the electricity system, accelerate the development of Australia's hydrogen industry for domestic use and export and support industry to reduce emissions.

## OVERALL PERFORMANCE AND ACTIVITY

In 2019-20, we committed \$120.2 million to 49 new projects with a total value of \$982.8 million, and managed 285 active projects.

A major focus of our activity during the period, in line with our investment priorities and the National Hydrogen Strategy, was the launch of our \$70 million Hydrogen Deployment Funding Round. The funding round is expected to play a significant role in supporting commercial-scale deployments of renewable hydrogen in Australia. ARENA has already committed over \$55 million in funding to renewable hydrogen projects including research and development (R&D) activities, feasibility studies for large-scale projects such as ammonia production and power-to-gas and smaller-scale demonstrations in areas such as mobility and microgrids.

Another significant milestone during the year was ARENA's \$18 million in funding to help develop Australia's second large-scale energy-from-waste

plant in Western Australia. The East Rockingham Waste to Energy Facility is expected to process approximately 300,000 tonnes per year of residual waste from non-recyclable materials in the Perth metropolitan area to deliver 29 megawatts (MW) of baseload electricity capacity, enough to power more than 36,000 homes.

And in R&D the first payments under the \$19 million Australian Centre for Advanced Photovoltaics (ACAP) Infrastructure Project Funding Round were made this year. These funds will purchase research infrastructure to support Australia's world leading solar PV research program.

ARENA continued to work closely with the Clean Energy Finance Corporation (CEFC) on a range of initiatives including the \$200 million Innovation Fund, investing in new and exciting technologies and supporting early stage companies.

In April 2019, the Board agreed to a request from the Minister for Energy and Emissions Reduction, the Hon Angus Taylor MP, to invest in the development of a roadmap to identify the role that the bioenergy sector can play in Australia's energy transition and in helping Australia meet its emissions reduction commitments. Work commenced with an extensive consultation process and is expected to be finalised in late 2020. The Bioenergy Roadmap will help to inform the next series of investment and policy decisions in the bioenergy sector in Australia.

ARENA was subject to a performance audit during the year by the Australian National Audit Office (ANAO). The overall result of the audit was positive, particularly in terms of ARENA's governance

## CEO'S REVIEW

arrangements and management of grant funding agreements and programs. We have taken steps to improve ARENA's performance framework and evaluation process to more effectively measure the impact of our grant funding support.

The Showcase section of this report illustrates a selection of ARENA's projects that were funded during 2019-20.

### A COLLABORATIVE EFFORT

ARENA's impact is based on strong partnerships built with industry, regulators, investors and innovators, working collaboratively to maximise the benefits of renewable energy for Australian consumers and the economy. We thank the individuals and organisations that worked with us and supported ARENA's efforts in 2019-20. We also wish to recognise the important contributions of the ARENA team and our project proponents.

As always, ARENA's Board members have made an important contribution to ARENA's efforts and I thank them for their leadership and governance.

I welcome our new Chair Justin Punch and our new Board members who were appointed in July 2020. They bring skills and experience that will help ensure the Agency is in a strong position to support the continuation of Australia's energy transition and broader efforts to help reduce our emissions.

I'd like to thank Martijn Wilder AM, Meg McDonald, Samantha Hogg and Susan Jeanes for their service and wish them all the best in their future endeavours. During their tenure, ARENA has played an instrumental



Darren Miller, Chief Executive Officer

role in delivering significant improvements in the competitiveness of renewable energy technologies such as large-scale solar, grid-scale batteries, bioenergy and distributed energy technologies.

Thank you also to our Minister, the Hon Angus Taylor MP, for his support and ongoing interest in ARENA's work.

### ARENA'S FUTURE

2019-20 was an important year for ARENA and for the renewables sector, but as the energy transition gathers momentum it is clear there are many challenges and opportunities to manage as we head towards 2030. Of course, the

economy-wide impacts of COVID-19 are also still playing out.

However, with a new Board and a strong existing management team, I believe we are well positioned to respond to these challenges as well as the opportunities established through the Australian Government's Technology Investment Roadmap and the first Low Emissions Technology Statement.

A handwritten signature in black ink, appearing to read 'Darren Miller'. The signature is fluid and cursive.

**DARREN MILLER**  
Chief Executive Officer

# ABOUT ARENA

THIS SECTION EXPLAINS WHAT ARENA DOES, WHY IT WAS CREATED AND HOW IT INVESTS FUNDS TO BENEFIT THE NATION.

## OVERVIEW

The energy sector is undergoing a profound and complex transformation as the shift to renewable energy gathers momentum.

Transitioning the electricity system to deal with an increasing share of renewables and different ways

of operating is challenging, but it presents many opportunities to help businesses manage their energy costs, as well as capture new sources of growth.

Electricity is only one component of the energy transition. Other sectors such as transport, heavy industry and the built environment are crucial in the pursuit of lower emissions and in ensuring Australia meets its international commitments.

There are many pathways that the transition to a low emissions economy can take but technological development and innovation are part of almost every scenario.

ARENA's expertise, deep understanding of the clean energy sector and willingness to fund innovative and ground-breaking

projects mean we provide a pathway to commercialisation for many new technologies and businesses that would otherwise struggle to get off the ground or be potentially lost to overseas markets.

We also actively identify and troubleshoot issues arising from the energy transition – from technological and commercial issues to regulatory and market barriers, and provide funding for projects that help solve these issues.

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

## PURPOSE, OBJECTIVE AND OUTCOMES

ARENA's purpose is to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy through innovation that benefits Australian consumers and businesses.

Our objective, set out in the *Australian Renewable Energy Agency Act 2011* (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.

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

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.

## HISTORY

ARENA was established by the Australian Government on 1 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 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 help projects 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 people together from across the energy sector, government, startups and universities to collaborate and share their knowledge.

## PROJECTS FUNDED TO DATE

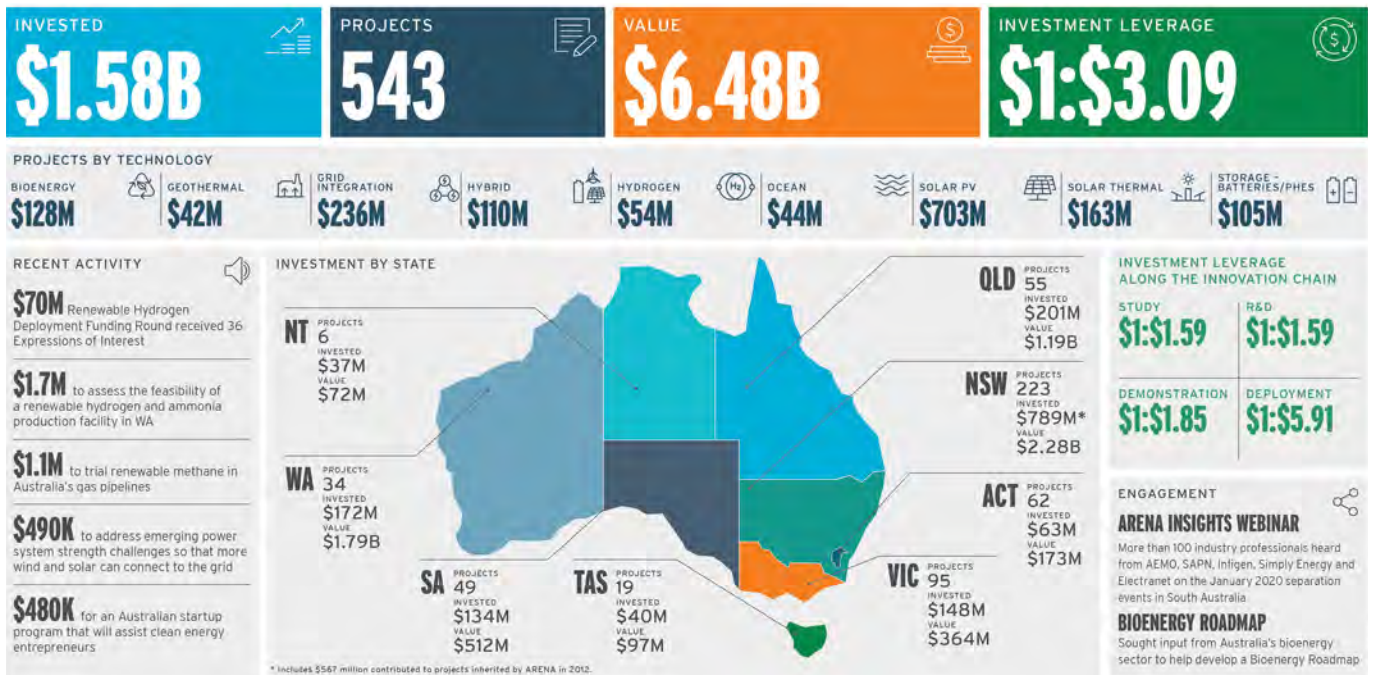
Since 2012, ARENA has committed approximately \$1.58 billion in grant funding to support 543 projects focused on delivering smarter, more efficient ways of producing and using renewable energy. The projects have a total value of \$6.48 billion (Figure 1).

ARENA's involvement has strengthened the confidence of other investors, leveraging almost \$5 billion in additional funding for the projects, as well as Australia's renewable energy industry.

ARENA's expertise, deep understanding of the clean energy sector, and willingness to fund innovative and ground-breaking projects means we provide a pathway to commercialisation for many new technologies and businesses that would otherwise struggle to get off the ground or be potentially lost to overseas markets.

**ABOUT ARENA**

FIGURE 1: ARENA AT A GLANCE - FUNDING COMMITMENTS TO PROJECTS 2012-2020



**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.

**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, Portfolio Budget Statements and business plans.

**GENERAL FUNDING STRATEGY AND INVESTMENT PLAN**

ARENA contributes funding to renewable energy activities in accordance with our General Funding Strategy (GFS) and Investment Plan (IP). Current editions of the GFS and IP are available on our website at [www.arena.gov.au](http://www.arena.gov.au).

The GFS reflects how ARENA intends to achieve its objective and takes account of the Government's priorities as reflected in the Minister's Statement of Expectations.

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.

The IP builds on the work, achievements and knowledge we have gained to date. Within each of the investment priorities, we define 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.

**CORPORATE PLAN**

Each year ARENA develops and publishes a Corporate Plan outlining the Agency's performance measures, capabilities and approach to managing risk in the context of our purpose and operating environment.

Successive Corporate Plans have built on ARENA's considerable experience and reflected priorities



**ABOUT ARENA**

that have evolved to anticipate and address the longer-term needs of the changing energy system.

Figure 2 demonstrates how we keep a line of sight from the ARENA Act through to the Annual Performance Statement in this Annual Report.

**GRANT FUNDING**

ARENA's financial assistance is provided through grants. To identify the projects that will make a

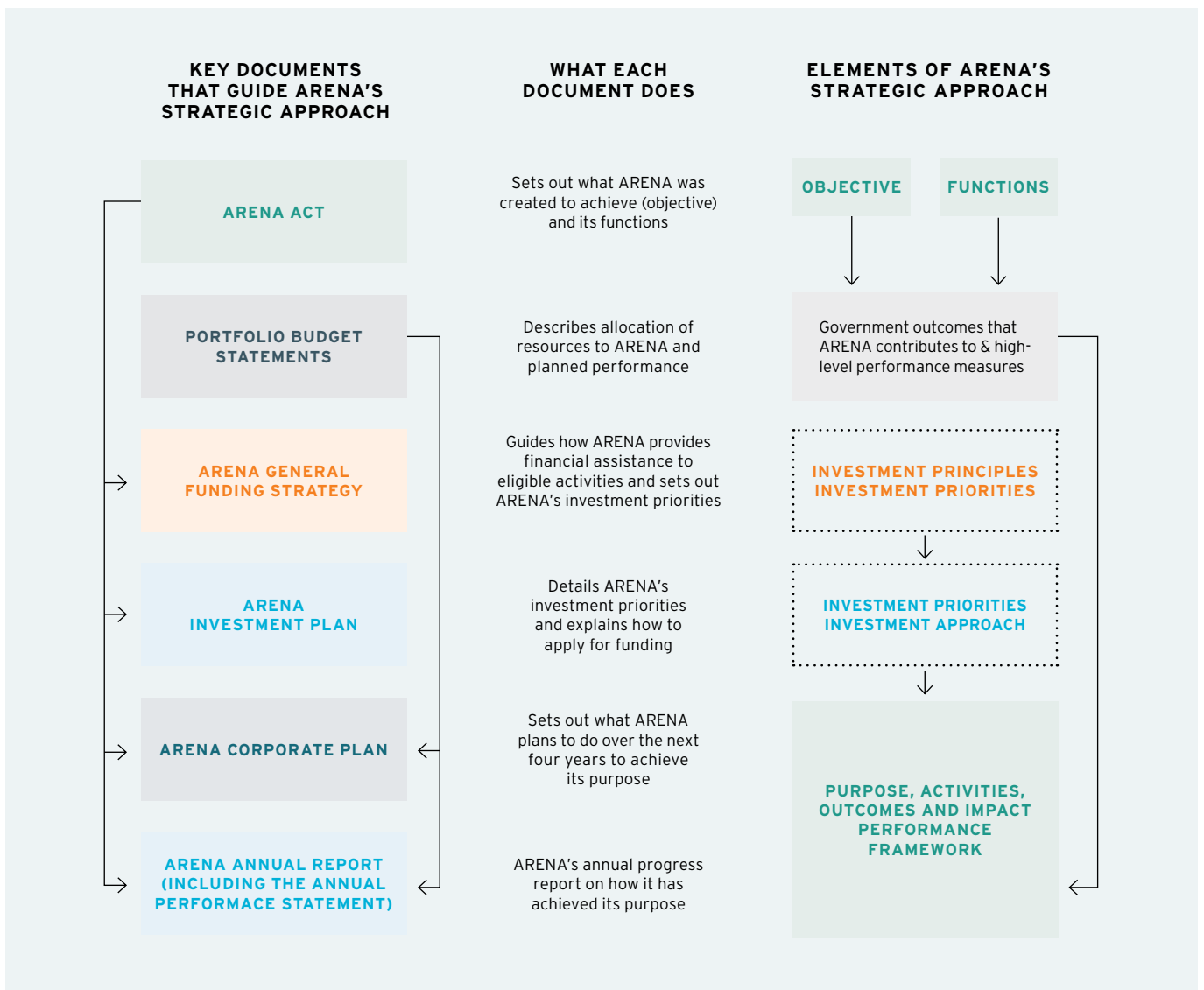
critical difference, ARENA assesses funding proposals for the best fit with our objectives and investment priorities – this forms part of the merit assessment for our funding programs.

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 taken into account when assessing funding proposals.

FIGURE 2: LINE OF SIGHT FROM ARENA ACT TO OTHER ELEMENTS OF ARENA'S STRATEGIC APPROACH



**ABOUT ARENA**

**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 3).

We collaborate with organisations such as the 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 Australian Government initiatives such as the Regional and Remote Communities Reliability Fund, Climate Solutions Fund and the Renewable Energy Target.



FIGURE 3: ARENA'S COMPLEMENTARY ROLE

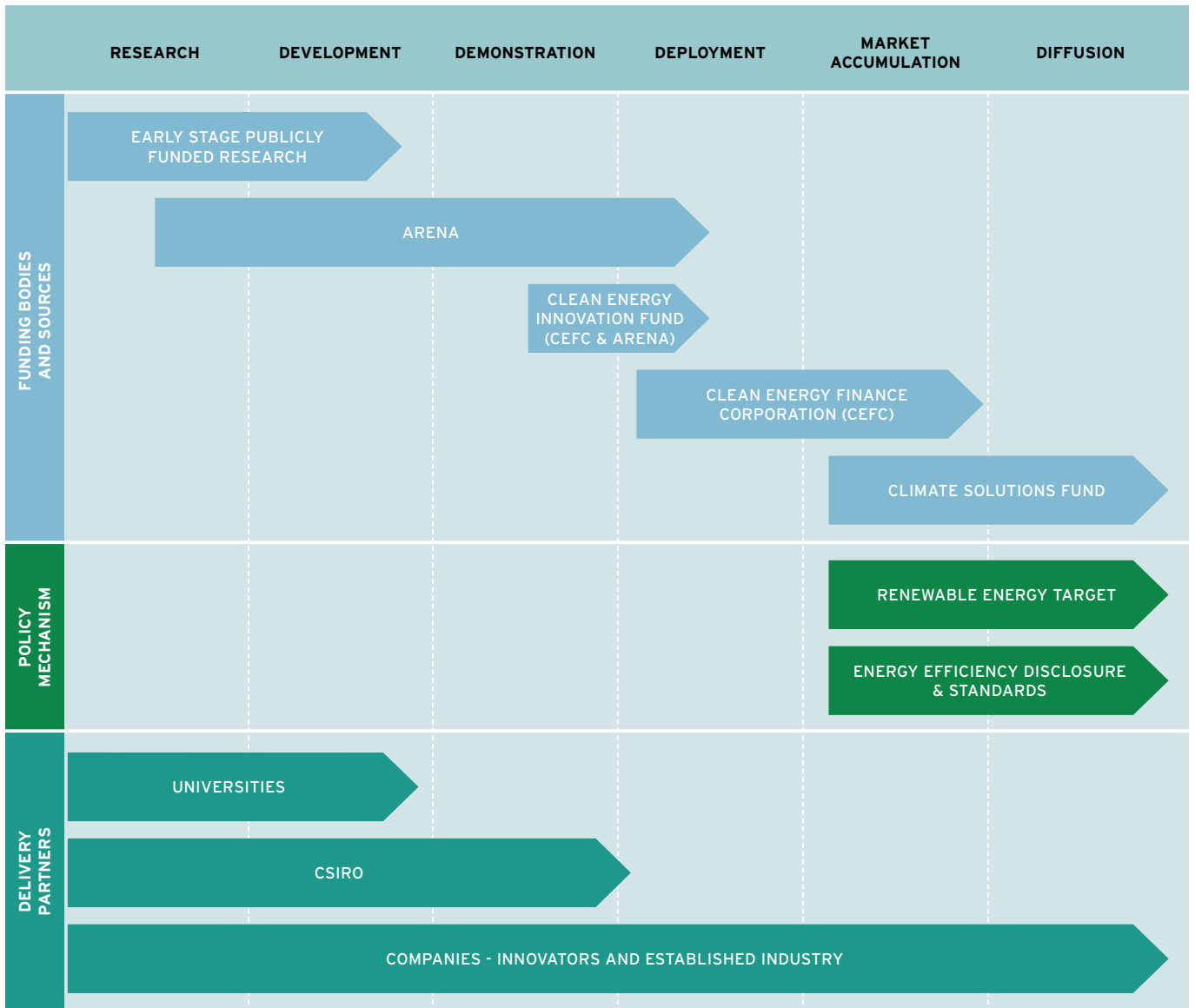




Image credit: Stock.

**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 for projects recommended by the Board, 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.

**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.

**MEMBERS**

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 2020, 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
- > Secretary of the Portfolio Department\* (Ex-officio).

\*The Secretary of the Portfolio Department during the reporting period was:

- > Mr Finn Pratt AO PSM, Secretary of the Department of Environment and Energy (from 1 July 2019 until his retirement on 11 October 2019)
- > Mr David Fredericks, Secretary of the Department of Environment and Energy (from 11 November 2019 to 30 January 2020) and then Secretary of the Department of Industry, Science, Energy and Resources (from 1 February 2020 to 30 June 2020).

Ms Jo Evans was the nominated delegate for Mr Finn Pratt AO PSM and then for Mr David Fredericks during the reporting period.

With the exception of the Secretary of the Portfolio Department and any nominated delegate, Board members were appointed by the

Portfolio Minister on 17 April 2018 for a two-year term. Board members' appointments were subsequently extended by the Portfolio Minister to 17 July 2020.

**BOARD CHANGES AFTER 30 JUNE 2020**

On 17 July 2020, the Portfolio Minister announced the appointment of Mr Justin Punch as ARENA Chair. On that date, the terms of all previously appointed Board members expired.

The Minister announced additional appointments to the ARENA Board on 24 July 2020. From this date, and at the time this report was approved, members of the ARENA Board were:

- > Mr Justin Punch (Chair)
- > Mr Justin Butcher
- > Mr John Hirjee
- > Ms Anna Matysek
- > Mr Dougal McOmish
- > Ms Stephanie Unwin
- > Secretary of the Portfolio Department (Ex-officio).

Profiles of Board Members from 1 July 2020 are available on the ARENA website at [www.arena.gov.au](http://www.arena.gov.au)

**MEETINGS**

The Board formally met eight times during 2019-20.

TABLE 1: BOARD AND COMMITTEE MEETING ATTENDANCE 2019-20

	BOARD MEETINGS (8)	RISK AND AUDIT COMMITTEE MEETINGS (5)	PEOPLE AND CULTURE COMMITTEE MEETINGS (3)
<b>BOARD MEMBERS</b>			
Mr Martijn Wilder AM (Chair)	7		
Ms Samantha Hogg	8	1/1 <sup>1</sup>	
Ms Susan Jeanes	8		2
Ms Meg McDonald	8	5	3
Ms Stephanie Unwin	8		3
Mr Dougal McOmish	7	3/4 <sup>1</sup>	
Ms Jo Evans (Ex-officio, nominated delegate for the Secretary of the Portfolio Department)	8		3
<b>INDEPENDENT COMMITTEE MEMBERS</b>			
Mrs Jenny Morison (RAC Chair)		5	
Ms Karen Hogan (RAC member)		5	

<sup>1</sup>Membership of the Risk and Audit Committee changed during the reporting period. See Board Committees below for more information.

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

BOARD MEMBER PROFILES



**MR MARTIJN WILDER AM**

Chair / Non-executive member  
Term: 18 April 2016 - 17 July 2020

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  
Term: 18 April 2018 - 17 July 2020

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  
Term: 18 April 2016 - 17 July 2020

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 the Hon 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.

## ABOUT ARENA



### MS MEG MCDONALD

Non-executive member  
Term: 18 April 2016 - 17 July 2020

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. 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.



### MR DOUGAL MCOMISH

Non-executive member  
Term: 18 April 2018 - 17 July 2021

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 \$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.



### MS STEPHANIE UNWIN

Non-executive member  
Term: 18 April 2018 - 17 July 2021

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

## ABOUT ARENA



Image credit: Southern Oil Refining.

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.



### MS JO EVANS

Ex-officio member  
(Delegate for Secretary of Portfolio Department)

Jo Evans is a Deputy Secretary at the Department of Industry, Science, Energy and Resources and delegate for the Secretary.

Jo has worked in a number of portfolios including the Department of Agriculture and Water Resources,

the Department of the Prime Minister and Cabinet and the Department of the Environment and Energy.

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.

## 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 Charter is available on the ARENA website at [www.arena.gov.au/charter](http://www.arena.gov.au/charter)

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 ANAO.

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.

Members of the RAC in 2019-20 were:

- › Mrs Jenny Morison (RAC Chair and Independent Member)
- › Ms Karen Hogan (Independent Member)
- › Ms Samantha Hogg (to 18 September 2019)
- › Ms Meg McDonald
- › Mr Dougal McOmish (from 18 September 2019)

Refer to Board Member Profiles and Board Committee Member Profiles for details of each RAC Member's experience and qualifications.

During the reporting period, the RAC formally met five times. Meeting attendance is provided in Table 1.

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

### 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.

Members of the PCC in 2019-20 were:

- › Ms Susan Jeanes
- › Ms Meg McDonald
- › Ms Stephanie Unwin
- › Ms Jo Evans (Ex-officio, delegate of the Secretary of the Portfolio Department).

Refer to Board Member Profiles for details of each PCC Member's experience and qualifications.

During the reporting period, the PCC formally met three times. Meeting attendance is provided in Table 1.

## BOARD COMMITTEE MEMBER PROFILES

### MRS JENNY MORISON

RAC CHAIR / INDEPENDENT COMMITTEE MEMBER

Jenny Morison FCA, BEc (Sydney University) has 38 years of broad experience in the accounting profession, commerce and government.

She was a National Board Member of the Chartered Accountants of Australia and New Zealand for four years, CFO of a public company and

has held senior positions in the major international accounting firms.

Jenny founded Morison Consulting Pty Limited in 1996, specialising in government financial reforms, governance and consulting. She was awarded a Centenary medal in 2000 for services to women and accounting.

Jenny brings a wealth of experience having held roles as an independent member and chair of Commonwealth audit and risk committees and financial statement sub-committees for large and small government entities for the last 17 years.

### MS KAREN HOGAN

RAC INDEPENDENT COMMITTEE MEMBER

Karen Hogan has over 30 years' experience in governance with expertise in Finance, Human Resources and Information and Communication Technology. Karen has held roles in a variety of sectors such as fast-moving consumer products, manufacturing, tourism, government regulation, agriculture and the cultural institutions.

Karen was the Chief Financial Officer at the Museum of Australian



**ABOUT ARENA**

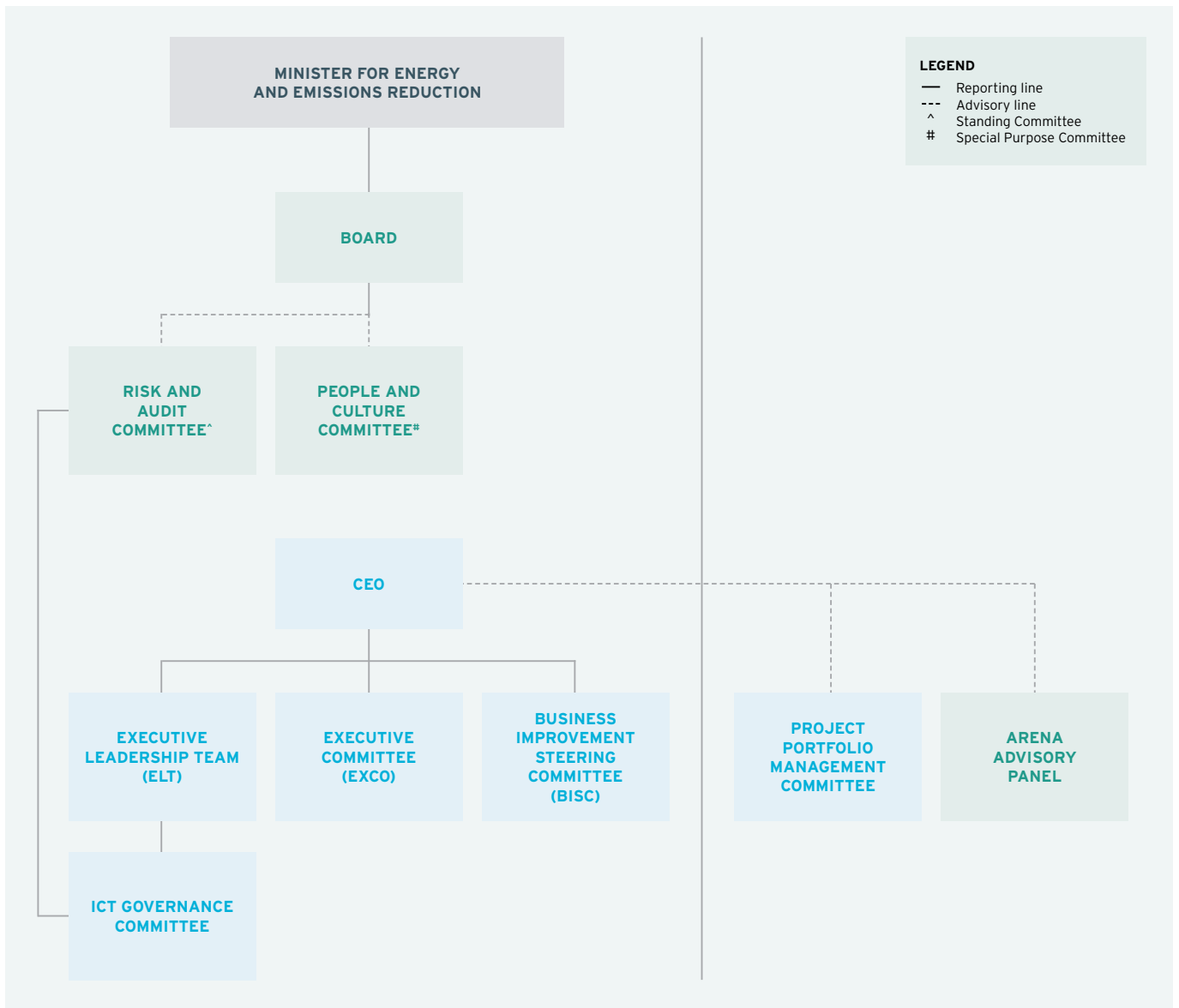
Democracy, Old Parliament House from 2009 until 2015. Karen is now a Director of EGA Insights and provides strategic consulting advice on governance, accounting, internal controls and business improvement opportunities.

In addition, Karen is an independent member of several public sector Audit and Risk Committees. The current Audit and Risk Committees

include as a member of the Australian Renewable Energy Agency (ARENA), the Deputy Chair of the Murray Darling Basin Authority (MDBA) and the Chair of the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS).

Karen has a Bachelor of Commerce (Accounting), is a Fellow of CPA Australia and a graduate of the Institute of Company Directors.

FIGURE 4: ARENA BOARD AND MANAGEMENT COMMITTEES 2019-20



## ABOUT ARENA

### SENIOR EXECUTIVE PROFILES

#### 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, CFO and then 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 positions as investment manager for Publishing and Broadcasting Limited (PBL) and Consolidated Press Holdings (CPH) and as an analyst with Ernst & Young.

Darren is a Graduate of the Australian Institute of Company Directors, and 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 27 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, 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.





APA Group will demonstrate renewable methane production at the Wallumbilla Gas Hub in Queensland.  
Image credit: APA Group.

# FINANCIAL PERFORMANCE

THIS SECTION PROVIDES AN OVERVIEW OF ARENA'S FINANCIAL PERFORMANCE. ARENA'S AUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE 2020 ARE PROVIDED IN THE FINANCIAL STATEMENTS SECTION.

ARENA reports an operating surplus of \$18.5 million for the year and a significantly higher level of grant spending of \$193.3 million compared to the previous year's \$138.7 million.

Grant expenditure was 40 per cent higher than the prior year but was less than the budget principally due to the deferral of two significant projects to 2020-21. The economic slowdown due to the COVID-19 pandemic has had a moderate impact on existing grant projects, resulting in some delays in completion of milestones, especially in the April-June quarter.

Administration expenses in 2019-20 were 5 per cent lower than the

previous year, attributable to a reduction in business activity under the COVID-19 lockdown and some genuine savings from improved efficiency. Part of the administration expenses were 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'.

In February 2020 ARENA underwent a Machinery of Government transfer from the Environment and Energy Portfolio to the Industry, Science, Energy and Resources Portfolio. This change had no financial impact on ARENA.

The Renewable Energy Venture Capital (REVC) Fund drew down \$3.3 million from ARENA during the financial year. On 30 June 2020, the investment recorded a fair value loss of \$2.8 million, which is reported in the Other Comprehensive Income section of the financial statements. The carrying value of the investment at 30 June 2020 was \$29.8 million.

ARENA is retaining cash returned from project grants and investing the surplus cash 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 2: KEY FINANCIAL RESULTS

	2015-16	2016-17	2017-18	2018-19	2019-20
	\$M	\$M	\$M	\$M	\$M
Revenue from Government	114.6	192.1	209.1	174.0	231.4
Resources Received Free of Charge	8.9	7.3	6.7	5.5	4.9
Return of Grants	50.4	2.8	0	5.1	3.1
Interest and Other Income	0.3	1.2	1.5	1.6	1.6
<b>Grant Expenses</b>	<b>(113.0)</b>	<b>(160.7)</b>	<b>(176.3)</b>	<b>(138.7)</b>	<b>(193.3)</b>
Administration Expenses	(25.1)	(28.0)	(30.9)	(30.7)	(29.2)
<b>Operating Surplus</b>	<b>36.1</b>	<b>14.7</b>	<b>10.1</b>	<b>16.8</b>	<b>18.5</b>
Cash and Term Deposits	41.7	55.7	56.4	85.6	87.8
Investments	19.9	22.5	30.6	29.3	29.8
Total Equity	68.6	79.2	89.0	103.3	119.2



The double curvature arch dam on the Gordon River in South West Tasmania, Australia. Image credit: Stock.

# ARENA SHOWCASE

Each year we showcase a selection of ARENA's newest projects to demonstrate the Agency's critical role in improving the competitiveness of renewable energy technologies and increasing the supply of renewable energy through innovation that benefits Australian consumers and businesses.

Our funding commitments focus on finding and demonstrating first-of-a-kind renewable energy solutions that reduce technical and commercial risks and grow Australia's renewable energy knowledge and expertise.

By helping the most promising projects progress towards commercialisation, ARENA is maximising the opportunities for

renewable energy businesses to create jobs, establish new supply chains, and continue their important contribution to Australia's economic growth.

ARENA has a unique role in Australia, being able to help renewable energy technologies and solutions at almost every stage of the innovation process, from early stage R&D to demonstration projects and pre-commercial deployment.

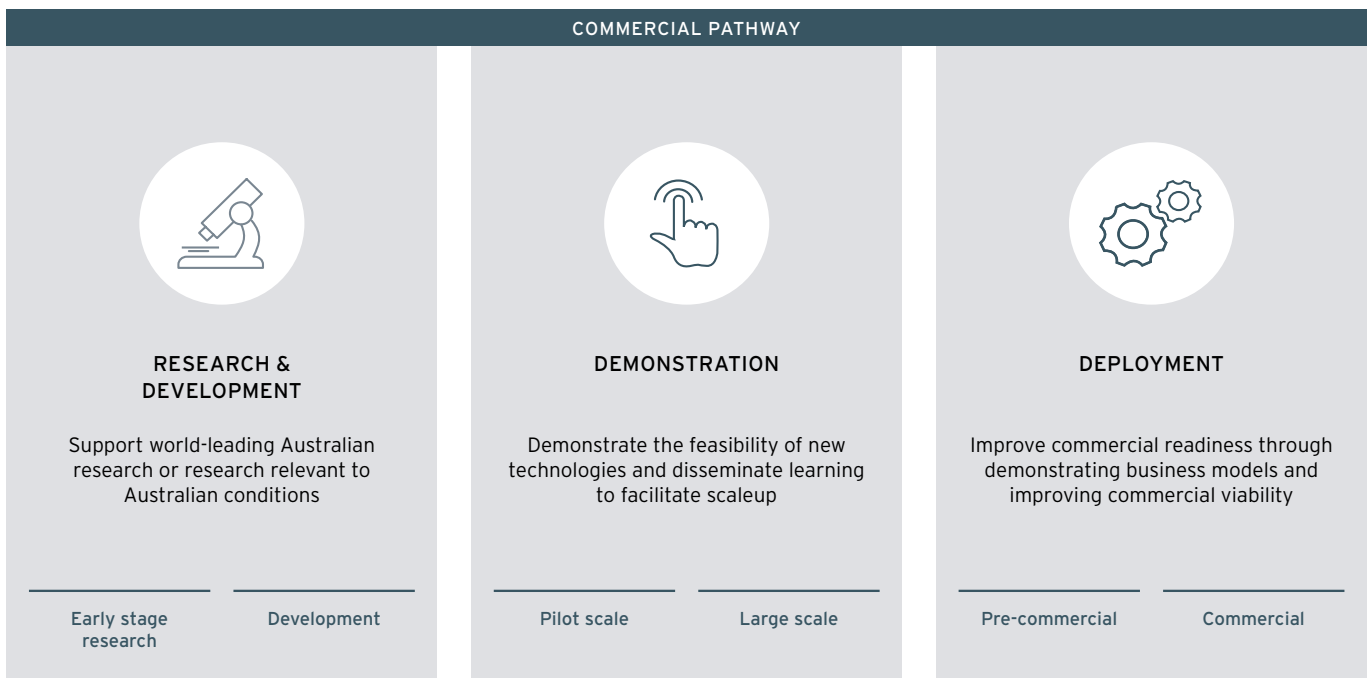
As demonstrated by a number of this year's case studies, ARENA can also uniquely provide grant funding support to successive projects as a technology progresses through the innovation process.

ARENA is therefore able to maximise the chances of high-potential technologies that would be unable to secure funding because they are untested or their timeframe for commercialisation is too long for private investors.

ARENA's investment scope also makes it possible to provide a pathway to commercialisation for new technologies and businesses that would otherwise be potentially lost to overseas markets.

FIGURE 5: ARENA'S ROLE\* IN THE INNOVATION PROCESS

\*Note: ARENA supports projects only up to (and including) the pre-commercial stage





Advanced Energy Resources' 3.5 MW wind and solar farm with battery storage at Port Gregory in Western Australia. Image credit: Advanced Energy Resources.

# 'SOLAR HYDRO' PLANT MOVES TO NEXT STAGE



RayGen's Solar Power Plant will use its PV Ultra technology, which generates electricity and heat from sunlight focused onto a tower-mounted photovoltaic receiver. Image credit: ARENA.

"ARENA has been with us since we were in the garage! We wouldn't have been able to make the commitments to technology innovation that are required to achieve this position without ARENA."

**WILL MOSLEY**  
HEAD OF BUSINESS DEVELOPMENT, RAYGEN



**CASE STUDY: 'SOLAR HYDRO' PLANT MOVES TO NEXT STAGE**

**PROJECT NAME:**  
Solar Power Plant Phase 1

**LEAD ORGANISATION:**  
RayGen Resources

**ARENA FUNDING:**  
\$3.0 million

**TOTAL PROJECT COST:**  
\$6.0 million

**LOCATION:**  
Victoria

**ARENA PRIORITY:**  
Integrating renewables into the electricity system

**TECHNOLOGY:**  
Solar thermal

**INNOVATION STAGE:**  
Study

ARENA's unique role in Australia is being able to help renewable energy technologies and solutions at almost any stage of the innovation process.

An exciting example of how this assistance can provide a pathway to commercialisation is RayGen's Solar Power Plant project, which received \$3 million in grant funding this year to undertake a technical and commercial feasibility study for a utility-scale 4 MW / 50 MWh 'solar hydro' power plant.

Using an innovative and low-cost combination of mirrors, heat and water to generate power and then store it for 12-15 hours, the Victorian solar plant will be able to supply electricity even when the sun isn't shining.

Over the past decade, funding from ARENA - and its predecessor the Australian Solar Institute - has supported RayGen to become a global leader in concentrated solar PV. With ARENA's support over successive projects, RayGen previously demonstrated its ground-breaking technology at the pilot stage, and in this project will be scoping out a full-size version of the power plant.

ARENA funding also supported RayGen to construct a 200 kW pilot project in 2016 that provided a stepping stone to larger demonstrations of the concentrated solar PV system. When RayGen scaled the project up and deployed their PV Ultra system in 2017, ARENA provided \$4.8 million towards the \$9.6 million capital funding raise.

In 2019-20 the Solar Power Plant Phase 1 project aims to develop the solar and storage technology at commercial scale in Australia.

From the three people that started RayGen in 2010, the company has grown to employ 32 people at their headquarters in Melbourne's eastern suburbs. In this time, they have steadily grown the scale of the projects while making their technology more commercially viable.

Following completion of this project, RayGen intends to proceed with Phase 2, which will involve construction and commissioning of the power plant in Australia. AGL and GHD are partnering on the first stage of the \$6 million project, which is expected to be shovel-ready by the end of 2020 and operating in 2021.

**HOW THIS PROJECT MAKES A DIFFERENCE**

If proven to be cost-competitive with batteries and pumped hydro, RayGen's 'solar hydro' solution will complement other more traditional forms of storage such as grid-scale batteries and pumped hydro. It can be deployed at a smaller scale and at a much lower absolute cost.



# WESTERN AUSTRALIAN ENERGY-FROM-WASTE PLANT GETS GREEN LIGHT

The East Rockingham Waste to Energy Project will process up to 300,000 tonnes of household, industrial and commercial rubbish each year. Image credit: East Rockingham Waste to Energy.

Since ARENA commenced operation in 2012, it has provided over \$128 million in funding towards bioenergy projects across Australia spanning energy-from-waste, biogas, biomass and biofuels.

<p><b>CASE STUDY: WESTERN AUSTRALIAN ENERGY-FROM-WASTE PLANT GETS GREEN LIGHT</b></p>	<p><b>PROJECT NAME:</b> East Rockingham Resource Recovery Facility Waste to Energy Project</p> <p><b>LEAD ORGANISATION:</b> East Rockingham RRF Project Co Pty Ltd</p> <p><b>ARENA FUNDING:</b> \$18.0 million (recoupable)</p> <p><b>CEFC DEBT FUNDING:</b> \$57.5 million (up to)</p> <p><b>TOTAL PROJECT COST:</b> \$511.0 million</p> <p><b>LOCATION:</b> Western Australia</p>	<p><b>ARENA PRIORITY:</b> Integrating renewables into the electricity system</p> <p><b>TECHNOLOGY:</b> Bioenergy and energy-from-waste</p> <p><b>INNOVATION STAGE:</b> Deployment</p>
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Australia disposes over 23 million tonnes of waste to landfill every year, with Western Australia having the highest waste generation rate per capita coupled with the lowest recovery rate.

With ARENA's \$18 million funding support, Australia's second large-scale energy-from-waste facility is being developed in Western Australia to produce electricity from non-recyclable waste that would otherwise be sent to landfill.

The \$511 million East Rockingham energy-from-waste project will use the moving grate combustion technology that has been installed in more than 500 projects worldwide, which meets the most stringent environmental requirements.

The project is expected to employ 300 workers during construction, and up to 50 operations staff on an ongoing basis when complete.

The facility will process up to 300,000 tonnes of household, industrial and commercial rubbish each year and recover energy to produce 28.9 MW of baseload power, enough to power more than 36,000 homes. This will deliver a reduction in greenhouse gases of 9.7 million tonnes over the 30 year lifetime of the facility.

Construction began in January 2020, with the facility expected to be operational in 2023. Developed by New Energy Corporation, Hitachi Zosen Inova Australia (HZI) and Tribe Infrastructure Group (Tribe), the facility is owned by a consortium of co-

investors including Masdar/Tribe, John Laing, HZI and Acciona Concesiones.

ARENA's grant funding for this project is recoupable, meaning that ARENA may recoup the entirety of its \$18 million in funding, either from mandatory repayments, refinancing payments, sale payments, capital expenditure underruns or a material event of default.

Since ARENA commenced operation in 2012, it has provided over \$128 million in funding towards bioenergy projects across Australia spanning energy-from-waste, biogas, biomass and biofuels. ARENA's investment to date encompasses electricity and biogas production, efficient feedstock harvesting technology and projects that aim to capture energy from a range of waste materials.

## HOW THIS PROJECT MAKES A DIFFERENCE

Energy-from-waste projects provide a significant opportunity to address two major challenges facing Australia - delivering sustainable and affordable solutions for both electricity generation, and waste management. As the second large-scale energy-from-waste facility in the country, the East Rockingham project represents a progression along the pathway towards commercialisation for the sector.

The recycling and waste-reduction efforts of local councils and other residual waste providers are supported by the 'waste-arising' contractual structure, which is a key commercial innovation of the project. Long-term waste supply agreements have been struck with local councils in the area, including the Eastern Metropolitan Regional Council and the City of Cockburn. French waste management company SUEZ has also signed a long-term deal to supply up to 65,000 tonnes per annum of commercial and industrial residual waste.

The project will be delivered by a consortium with global expertise, driving competition in the Australian market and demonstrating that large-scale metropolitan energy-from-waste plants are now a bankable asset class in Australia.



# NEW POWERS FOR WORLD'S BIGGEST BATTERY

The Hornsdale Power Reserve is a ground-breaking project that has proven what batteries can do for our electricity system.  
Image credit: Hornsdale Power Reserve.

“Talking about the grid of the future, I would like to acknowledge the great support of ARENA to demonstrate and bring forward the critical innovations and regulatory changes that the network requires to provide affordable renewable energy to Australian homes and businesses.”

**LOUIS DE SAMBUCY**  
MANAGING DIRECTOR, NEOEN AUSTRALIA

**CASE STUDY: NEW POWERS FOR WORLD'S BIGGEST BATTERY**

**PROJECT NAME:**  
Hornsedale Power Reserve Upgrade

**LEAD ORGANISATION:**  
Neoen Australia

**ARENA FUNDING:**  
\$8.0 million (recoupable)

**CEFC DEBT FUNDING:**  
\$50.0 million (up to)

**TOTAL PROJECT COST:**  
\$71.0 million

**LOCATION:**  
South Australia

**ARENA PRIORITY:**  
Integrating renewables into the electricity system

**TECHNOLOGY:**  
Battery storage

**INNOVATION STAGE:**  
Deployment

After playing a critical role in maintaining grid security over the past two years, the world's largest battery received funding support from ARENA this year for an important upgrade to the facility.

ARENA provided \$8 million to Neoen Australia's \$71 million expansion of the Tesla-built Hornsdale Power Reserve battery, which will see the current 100 MW / 129 MWh battery increased by half again (50 MW / 64.5 MWh).

Being able to deliver electricity to the network in seconds to balance the effects of variable renewables, grid-scale batteries such as Hornsdale are already playing a key role in ensuring the reliability of supply and support for power system security as Australia transitions to renewable energy.

The upgraded Hornsdale battery will further develop industry's knowledge of the technical services that batteries can provide to support Australia's electricity system such as inertia, Frequency Control Ancillary

Services (FCAS) and stability for state interconnectors.

Along with providing essential services to the South Australian grid, the project will help governments to modernise regulations to allow battery owners to sell these services just as power producers do, creating a market for other batteries to enter on a commercial basis.

Tesla, which built the original battery in less than nine months in 2017, will deliver the project on a full turn key construction basis.

The project will also receive \$15 million over five years from the South Australian Government's Grid Scale Storage Fund and be supported by the CEFC.

ARENA has now supported five grid-scale batteries including the ESCRI and Lake Bonney batteries in South Australia and two in Victoria at Ballarat and Gannawarra.

**HOW THIS PROJECT MAKES A DIFFERENCE**

The Hornsdale Power Reserve is a ground-breaking project that has proven what batteries can do for our electricity system - this expansion will now show that it is capable of much more by demonstrating inertia, expanded FCAS functionality and extended support for the Heywood interconnector.

Along with providing essential services to the South Australian grid, this will help to inform the regulatory changes required to value these services and create additional revenue markets for other batteries to enter the market on a commercial basis.



# WORLD-LEADING EV-TO-GRID TRIAL

The Realising Electric Vehicle-to-Grid Services project will install 51 bi-directional chargers and deploy a fleet of 51 V2G capable vehicles in the ACT. Image credit: Stock.

**CASE STUDY: WORLD-LEADING EV-TO-GRID TRIAL**

**PROJECT NAME:**  
Realising Electric Vehicle-to-Grid Services

**LEAD ORGANISATION:**  
ActewAGL Retail

**ARENA FUNDING:**  
\$2.4 million

**TOTAL PROJECT COST:**  
\$6.26 million

**LOCATION:**  
Australian Capital Territory

**ARENA PRIORITY:**  
Integrating renewables into the electricity system

**TECHNOLOGY:**  
Electric vehicles

**INNOVATION STAGE:**  
Deployment

ARENA is focused on commercialising technologies that can aid the integration of EVs into the electricity system.

This year we supported an Australian-first project that is testing a vehicle-to-grid (V2G) technology that allows EVs to discharge electricity back to the grid and even provide services to improve grid security.

Before this project, V2G technologies and services were largely non-existent in the Australian market, though the benefits were demonstrated in small trials internationally.

With ARENA's support, the Realising Electric Vehicle-to-Grid Services (REVS) project will install 51 bi-directional chargers and deploy a fleet of 51 V2G capable vehicles in the ACT. A system will monitor charger and vehicle availability, as well as a range of electrical parameters, to enable the delivery of market contingency FCAS at a fleet scale.

The REVS project will also include a major study of the economic, electrical and behavioural learnings of V2G arising from the trial. Using these outcomes, international learnings and new analysis, the Australian National University (project partner) will produce a V2G roadmap for Australia highlighting the potential of V2G and possible steps to get there.

This will lead to new V2G enabled service offerings for fleets and residential customers.

The project will also unite stakeholders from federal and state governments, along with the transport and electricity industries, in a working group to align and accelerate the development of V2G capable EVs, chargers and services across Australia.

**HOW THIS PROJECT MAKES A DIFFERENCE**

As EV uptake grows, this project will help to unlock a future where EVs are just as critical a piece of the electricity sector as the transport sector.

Given its potential to provide similar services as household batteries, V2G has the opportunity to transform a vehicle into a revenue generating device for consumers, through access to energy and network service markets and also to provide power solutions for the grid.

# DRIVING DOWN THE COST OF RENEWABLE HYDROGEN



The \$70 million Renewable Hydrogen Deployment Funding Round will help fast track the development of renewable hydrogen in Australia. Image credit: Stock.

## FUNDING ROUND: DRIVING DOWN THE COST OF RENEWABLE HYDROGEN

ARENA FUNDING:  
\$70.0 million

ARENA PRIORITY:  
Accelerating hydrogen

TECHNOLOGY:  
Hydrogen

INNOVATION STAGE:  
Deployment

Seven companies have been shortlisted and invited to submit a full application for the next stage of ARENA's \$70 million hydrogen funding round.

In April 2020, ARENA opened the \$70 million Renewable Hydrogen Deployment Funding Round to help fast track the development of renewable hydrogen in Australia. The funding round is expected to play a significant role in supporting commercial-scale deployments of renewable hydrogen in Australia.

The shortlisted applicants were:

- › APT Management Services Pty Limited (trading as APA Group)
- › ATCO Australia Pty Ltd

- › Australian Gas Networks Limited
- › BHP Billiton Nickel West Pty Ltd
- › Engie Renewables Australia Pty Ltd
- › Macquarie Corporate Holdings Pty Limited
- › Woodside Energy Ltd.

The total grant requested across all seven projects was over \$200 million, with a total project value of almost \$500 million.

All applicants had well developed projects that involve deploying 10 MW or larger electrolyzers, made up of various end uses including transport, gas injection, renewable ammonia production, power and industrial use. Among the shortlisted applicants





there were four projects based in Western Australia, and one each in Queensland, Tasmania and Victoria.

ARENA aims to support two or more of the shortlisted large-scale renewable hydrogen projects. These projects are expected to be among some of the largest electrolysers in the world. Each project will need to be powered by renewable electricity, either directly or through a contracting approach.

Applicants invited to the full application stage have until January 2021 to prepare their application. ARENA expects to select the preferred projects by mid 2021. Successful projects are expected to reach financial close by late 2021 and

commence construction in 2022.

The round invited funding applications from advanced hydrogen electrolysis projects that would produce renewable hydrogen at scale. To be eligible, applicants were required to deploy electrolysers powered by electricity from renewable sources, with a minimum capacity of 5 MW and preference for 10 MW or more.

During the initial application stage, ARENA received 36 expressions of interest (EOIs), totalling more than \$3 billion of renewable hydrogen projects. Collectively the 36 EOIs had more than 500 MW of electrolysis capacity. Projects ranged in size from 5 MW to approximately 80 MW

and sought to produce hydrogen for a wide range of end uses across a number of industries.

Applications were received from every Australian state and territory, with more than \$1 billion in ARENA funding requests and \$3 billion in combined project value, when accounting for private sector investment.

Following on from ARENA's critical role in helping to make large-scale solar commercially competitive, the Agency aims to help bring down the cost of producing renewable hydrogen, thereby building Australia's skills and capacity, creating jobs and activity in regional areas and helping Australia further reduce emissions.



# DATA MARKETPLACE TO INFORM AND EMPOWER ENERGY USERS

Wattwatchers will install its 'super smart' energy devices in 5000 homes and businesses, as well as 250 schools, to allow energy usage data to be monitored in real time. Image credit: Stock.

**CASE STUDY: DATA MARKETPLACE TO INFORM AND EMPOWER ENERGY USERS**

**PROJECT NAME:**  
My Energy Marketplace Deployment

**LEAD ORGANISATION:**  
Wattwatchers Digital Energy

**ARENA FUNDING:**  
\$2.7 million

**TOTAL PROJECT COST:**  
\$8.2 million

**LOCATION:**  
New South Wales

**ARENA PRIORITY:**  
Integrating renewables into the electricity system

**TECHNOLOGY:**  
Enabling

**INNOVATION STAGE:**  
Demonstration

To successfully integrate renewables into the electricity system, governments, network providers, energy producers and electricity users need improved information about power generation and use.

Whether it is rooftop solar, battery storage, energy efficiency, controlling electricity loads and appliances remotely, or the uptake of electric vehicles, better data is needed to effectively run the future grid consisting of more and more decentralised consumer energy assets.

This year ARENA provided \$2.7 million in grant funding to the Sydney startup Wattwatchers to help bridge this information gap by developing the My Energy Marketplace data hub.

The \$8.2 million, three-year project will offer a pathway towards the smart home of the future, bringing together energy usage information and data from smart appliances and other internet of things technologies to be shared through the cloud-based My Energy Marketplace platform.

My Energy Marketplace is a consumer-facing energy data platform designed to securely collect and process data and create products using the vast amounts of energy data. It will include a mobile app and opportunities for customers to share their information with relevant third parties.

Wattwatchers will install its 'super smart' energy devices in 5000 homes and businesses, as well as 250 schools, to allow energy usage data to be monitored in real time. Participants' data will be protected, with clear arrangements established around privacy, data sharing and cyber security.

The improved consumer energy data will benefit electricity users by helping them to save money by cutting energy waste and using power at the best times. Schools can use the data to drive energy engagement and literacy among students, while also assisting with reducing energy bills.

When given permission to use the data, third-party service providers

can use it to provide improved management of the Australian electricity grid and better integrate renewables.

**HOW THIS PROJECT MAKES A DIFFERENCE**

The project is designed to provide both the data and consumer participation needed to manage an increasingly decentralised electricity system.

It will demonstrate how an energy data platform can deliver value and savings to end users and ultimately become a sustainable business model. Additionally, by providing end users and services providers with valuable information about energy consumption and generation, it will increase the value of distributed energy resources and improve the integration of renewables into the grid.



# TRIALLING RENEWABLE METHANE IN AUSTRALIA'S GAS PIPELINES

Approximately 340 kg of hydrogen will be produced each year and converted into 35 gigajoules of methane to be injected into APA's 7500 kilometres of natural gas pipelines. Image credit: Stock.

**CASE STUDY: TRIALLING RENEWABLE METHANE IN AUSTRALIA'S GAS PIPELINES**

**PROJECT NAME:**  
APA Renewable Methane Demonstration

**LEAD ORGANISATION:**  
APT Facility Management

**ARENA FUNDING:**  
\$1.1 million

**TOTAL PROJECT COST:**  
\$2.3 million

**LOCATION:**  
Queensland

**ARENA PRIORITY:**  
Accelerating hydrogen

**TECHNOLOGY:**  
Hydrogen

**INNOVATION STAGE:**  
Demonstration

While the electricity sector has led the transition to renewables, natural gas makes up a larger share of Australia's total energy use. Finding ways to decarbonise the gas industry will be important in helping Australia further reduce emissions.

ARENA is providing funding to projects that could support these efforts, ranging from direct injection of hydrogen into gas grids, to use of renewable hydrogen for ammonia production and production of biogas from waste products.

This year ARENA committed \$1.1 million in funding for the gas operator APA Group to build a renewable methane demonstration plant in south-central Queensland.

Methane produced from renewable hydrogen may provide a replacement to natural gas for transmission and storage in existing pipelines, offering a way to transport renewable energy in the existing gas network or for potential export.

APA's 'power to gas' demonstration plant is testing an innovative way

of producing renewable hydrogen using an Anion Exchange Membrane electrolyser powered by solar PV. The system draws water from the atmosphere to produce hydrogen, which in turn is converted to methane through a reaction with carbon dioxide, also extracted from the air.

Approximately 340 kilograms of hydrogen will be produced each year and converted into 35 gigajoules of methane to be injected into APA's 7500 kilometres of natural gas pipelines that link Victoria, Queensland, New South Wales and South Australia.

While CO<sub>2</sub> will be emitted when the methane is used, the process is carbon neutral as the emissions will be balanced by carbon extracted from the atmosphere during production.

This proof of concept trial will take the innovative technology from the lab to a real world test environment. The project will generate cost and technical data to be used to assess the feasibility of a larger, commercial-

scale renewable methane concept system.

Over the lifetime of the project, knowledge will also be shared with a broad cross section of the renewables, energy and engineering community, with the intent that the project insights will contribute to an increase of skills, capacity and knowledge relevant to renewable hydrogen in Australia.

**HOW THIS PROJECT MAKES A DIFFERENCE**

The APA demonstration plant will provide a proof of concept that hydrogen can be produced from solar energy and water, and then converted to methane using CO<sub>2</sub> extracted from the air.

The project partners also aim to be the first to commercialise exportable renewable energy, and thereby accelerate a global trade in renewables.



# UNLOCKING ROOFTOP SOLAR FOR MULTI-TENANTED BUILDINGS

The project involves the installation of 487 kW of rooftop solar across 10 multi-unit properties that are either owned or tenanted by non-government organisations. Image credit: Allume Energy.

“Allume Energy is proud to deploy our world-first technology in this ARENA project to demonstrate how solar electricity can be shared to multiple tenants in the same building. This is core to our mission of making solar accessible to all.”

**CAMERON KNOX**  
CEO, ALLUME ENERGY

<p><b>CASE STUDY: UNLOCKING ROOFTOP SOLAR FOR MULTI- TENANTED BUILDINGS</b></p>	<p><b>PROJECT NAME:</b> Allume Rooftop Solar Salvation Army Pilot Demonstration</p>	<p><b>ARENA PRIORITY:</b> Integrating renewables into the electricity system</p>
	<p><b>LEAD ORGANISATION:</b> Allume Energy</p>	<p><b>TECHNOLOGY:</b> Solar PV</p>
	<p><b>ARENA FUNDING:</b> \$220,000</p>	<p><b>INNOVATION STAGE:</b> Demonstration</p>
	<p><b>TOTAL PROJECT COST:</b> \$1.04 million</p>	
	<p><b>LOCATION:</b> Tasmania</p>	

This year ARENA announced \$220,000 in funding to Australian startup Allume Energy to deliver their rooftop solar pilot project with the Salvation Army and Green Peak Energy.

The innovative new technology is set to revolutionise the way multi-tenanted buildings can access and benefit from rooftop solar.

Allume Energy's \$1.04 million pilot project involves the installation of 487 kilowatts of rooftop solar across 10 multi-unit properties that are either owned or tenanted by non-government organisations (NGOs). This allows the NGO to save on their power bills and also generate revenue by on-selling any excess solar power to other tenants.

The first site to be installed with the technology will be the Salvation Army's Glenorchy City Corps in Glenorchy, Tasmania.

Each system will use Allume Energy's SolShare technology that allows the energy produced by a single solar system to be distributed behind-the-meter to separately metered units, such as those in apartments,

commercial buildings and retail strips.

Traditional rooftop solar setups do not have this capability and cannot distribute the energy they produce to multiple, separately metered units.

The Salvation Army will enter into a Power Purchase Agreement with project financier Green Peak Energy, becoming the solar energy retailer of the building and leveraging the SolShare technology's ability to distribute, meter and bill individual tenants in conjunction with their own energy consumption.

The unique ability to distribute solar power to other units in the building will allow the Salvation Army to generate additional revenue by on-selling excess solar energy, essentially making them the solar retailer for the other tenants in the building. This on-sold solar energy will still be cheaper than grid supplied energy, allowing everyone in the building to benefit from cheaper, renewable power.

**HOW THIS PROJECT MAKES A DIFFERENCE**

If the pilot project is successful, Allume Energy aims to roll out deployments across the not-for-profit sector, resulting in more funds being freed up for their charitable purposes.

The SolShare technology could open up access to the benefits of rooftop solar no matter where or what type of housing people live in.

# GROWING AUSTRALIAN RENEWABLE ENERGY STARTUPS



EnergyLab's four programs are designed to accelerate the progress of entrepreneurs deploying renewable energy and complementary technologies.  
Image credit: Stock.

"ARENA's support will enable us to do even more to support Australia's leading clean energy entrepreneurs.

"In particular, this funding allows us to launch a Scale Up Program to provide the best late-stage energy startups with the support they need to reach their full potential."

**JAMES TILBURY**  
CEO, ENERGYLAB



<p><b>CASE STUDY: GROWING AUSTRALIAN RENEWABLE ENERGY STARTUPS</b></p>	<p><b>PROJECT NAME:</b> Clean Energy Startup Support Programs</p>	<p><b>ARENA PRIORITY:</b> Integrating renewables into the electricity system</p>
	<p><b>LEAD ORGANISATION:</b> EnergyLab Australia</p>	<p><b>TECHNOLOGY:</b> Enabling</p>
	<p><b>ARENA FUNDING:</b> \$480,000</p>	<p><b>INNOVATION STAGE:</b> Demonstration</p>
	<p><b>TOTAL PROJECT COST:</b> \$1.2 million</p>	
	<p><b>LOCATION:</b> New South Wales, Queensland, Victoria</p>	

This year ARENA provided \$480,000 in funding to help EnergyLab establish four programs designed to accelerate the progress of entrepreneurs deploying renewable energy and complementary technologies. These are:

- › **Women in Clean Energy Fellowship:** to equip women interested in energy entrepreneurship with the skills, knowledge and support they need to start a company
- › **Pre-Acceleration Program:** to assist entrepreneurs with an idea for an energy startup to test its commercial viability
- › **Acceleration Program:** to help the most promising energy startups refine their product/ service, increase revenues, and raise capital
- › **Scale Up Program:** to connect the best later-stage startups from around the world with potential utility partners, mentors who successfully scaled energy startups, and Australia's

most active energy-sector investors.

The programs will be available in Brisbane, Melbourne and Sydney. Through mentoring and supporting startups, the project is expected to:

- › increase the level of expertise, skills and capacity in the renewable energy technology sector
- › help identify pathways to commercialisation
- › bring together multiple value streams to help develop technologies, businesses and markets to reduce cost
- › increase renewable energy uptake.

Since its establishment in 2017, EnergyLab has supported over 80 Australian startups through its programs.

**HOW THIS PROJECT MAKES A DIFFERENCE**

Startups and entrepreneurs play an important role in accelerating the uptake of clean energy solutions. However, they also face challenges in reaching scale and may not be equipped to overcome hurdles such as high capital requirements, geographic constraints and revenue delay.

By providing mentoring and support to startups, EnergyLab's project will help to increase expertise, skills and capacity in the renewable energy sector. It will also identify pathways to commercialisation that will keep Australia at the forefront of renewable energy innovation.

# BATTERY OF THE NATION MOVES TO NEXT STAGE



The floor of the Trevallyn power station in Launceston. Image credit: Hydro Tasmania.

**CASE STUDY: BATTERY OF THE NATION MOVES TO NEXT STAGE**

**PROJECT NAME:**  
Battery of the Nation, Future State NEM analysis (Stage 2)

**LEAD ORGANISATION:**  
Hydro Tasmania

**ARENA FUNDING:**  
\$500,000

**TOTAL PROJECT COST:**  
\$2.0 million

**LOCATION:**  
Tasmania

**ARENA PRIORITY:**  
Integrating renewables into the electricity system

**TECHNOLOGY:**  
Hydropower and pumped hydro energy storage

**INNOVATION STAGE:**  
Feasibility study

Over the past three years ARENA has supported a succession of projects aimed at unlocking Tasmania’s vast renewable energy resources to benefit the mainland as well as the island state.

ARENA first provided funding to Hydro Tasmania in 2017, to examine whether Tasmania could become the Battery of the Nation by doubling the state’s hydro electricity generation and exporting dispatchable renewable energy to the mainland to help keep the grid stable as more variable renewables such as wind and solar come online.

Hydro Tasmania’s early modelling showed the Battery of the Nation project could deliver \$5 billion of investment and up to 3000 jobs over the next 10 to 15 years.

Following the study’s confirmation that the concept was feasible, ARENA supported additional related projects to flesh out how it could best be achieved.

The Battery of the Nation Future State NEM analysis (Stage 1) project confirmed the significant opportunity that exists for Tasmania to support a transforming National Electricity Market (NEM).

This year, ARENA committed \$500,000 to the \$2 million Future State NEM analysis (Stage 2) project, to investigate the technical and economic drivers that would enable Tasmania to play a greater role in the NEM. The analysis concluded that Tasmania has the potential to expand its role in the NEM and found that Tasmania as the Battery of the Nation was a viable and cost-effective option for supporting Australia’s future energy needs.

As part of the Stage 2 project, Hydro Tasmania undertook a series of detailed analyses into the market structure; modelling and forecasting frameworks; revenue and finance models for pumped hydro; how the energy market is changing and what that means for the industry; and an exploration of the system outcomes

from an expanded renewable energy capacity. This knowledge is being shared with the rest of the industry through a range of communication channels, principally through the provision of focussed discussion papers.

**HOW THIS PROJECT MAKES A DIFFERENCE**

The Battery of the Nation Future State NEM analysis (Stage 2) project is helping industry to develop a more detailed, refined and robust understanding of the role of pumped hydro storage in the transforming energy market.

By sharing learnings on the market mechanisms and reforms needed to unlock the Tasmanian opportunity, this project will provide pathways to an efficient and effective future NEM.

The analysis is also supporting and informing critical work on the NEM by the Energy Security Board and the Australian Energy Market Operator.



# SCOPING AUSTRALIA'S FIRST RENEWABLE ENERGY ZONE

The study will scope the ideal size for the new transmission line, the cost, and look at different financial and regulatory approaches for funding the project.  
Image credit: Stock.

<p><b>CASE STUDY: SCOPING AUSTRALIA'S FIRST RENEWABLE ENERGY ZONE</b></p>	<p><b>PROJECT NAME:</b> Central West NSW Renewable Energy Zone Detailed Scoping Study</p> <p><b>LEAD ORGANISATION:</b> TransGrid</p> <p><b>ARENA FUNDING:</b> \$5.0 million</p> <p><b>TOTAL PROJECT COST:</b> \$16.2 million</p> <p><b>LOCATION:</b> New South Wales</p>	<p><b>ARENA PRIORITY:</b> Integrating renewables into the electricity system</p> <p><b>TECHNOLOGY:</b> Enabling</p> <p><b>INNOVATION STAGE:</b> Feasibility study</p>
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As part of its work to improve the way renewable energy is integrated into the electricity network, ARENA is supporting a ground-breaking project that will plot a pathway for Australia's first renewable energy zone (REZ).

This year the Agency committed \$5 million in funding for TransGrid, in conjunction with the NSW Government, to undertake preliminary works for the Central West Orana renewable energy zone.

The \$16.2 million project will explore all aspects of developing the renewable energy zone and deliver a business case for the proposed Central West Orana zone, which if approved could be in place by the mid-2020s.

The project includes scoping the feasibility of a plan to construct a high voltage transmission network that would unlock 3000 MW of new electricity generation capacity, supplying electricity for 1.3 million homes and providing hosting capacity for new renewable energy projects.

New transmission will be required to connect regions with strong renewable resources to load centres

where the electricity demand is, and to reduce network congestion.

As well as assessing commercial viability, the business case will look at technical aspects of the REZ proposal and undertake consultation with local communities. The study will scope the ideal size for the new transmission line, the cost, and look at different financial and regulatory approaches for funding the project.

Research commissioned by ARENA found the lack of transmission infrastructure to be a major barrier to developing some of Australia's most promising areas for renewable generation.

In its Integrated System Plan, AEMO assessed 34 regions for their potential to deliver large amounts of renewable energy, at the times when it will be needed to meet demand. The plan emphasised the network is often weak where the renewable resources are strong, which is evident in the NSW Central West region where AEMO identified 3000 MW of solar and 1600 MW of wind potential.

The NSW Government has committed \$9 million towards the project and

will provide a further \$31.2 million including creating a new body to oversee the development and delivery of the REZ – one of three such zones that it is seeking to progress in the state.

Estimates predict the Central West Orana zone could create 450 jobs in the region and attract at least \$4.5 billion in private sector investment.

**HOW THIS PROJECT MAKES A DIFFERENCE**

The study is expected to provide a pathway to achieving Australia's first true REZ and provide a blueprint for how others can be created in the future, helping to unlock investment in renewable energy projects, secure new regional jobs and cheaper, emissions-free energy.

### UNDERSTANDING RENEWABLE ENERGY ZONES

A REZ is the modern-day equivalent of a power station, but instead of being one facility using generators that typically use only one type of fuel, a REZ can combine several types of renewable energy generation with storage in one 'zone' to deliver reliable and secure electricity to the system.

In order to deliver this increased capacity, existing electricity network infrastructure needs to be augmented. REZs therefore involve the coordinated development of new grid infrastructure in energy rich areas, efficiently connecting multiple generators in the same location.

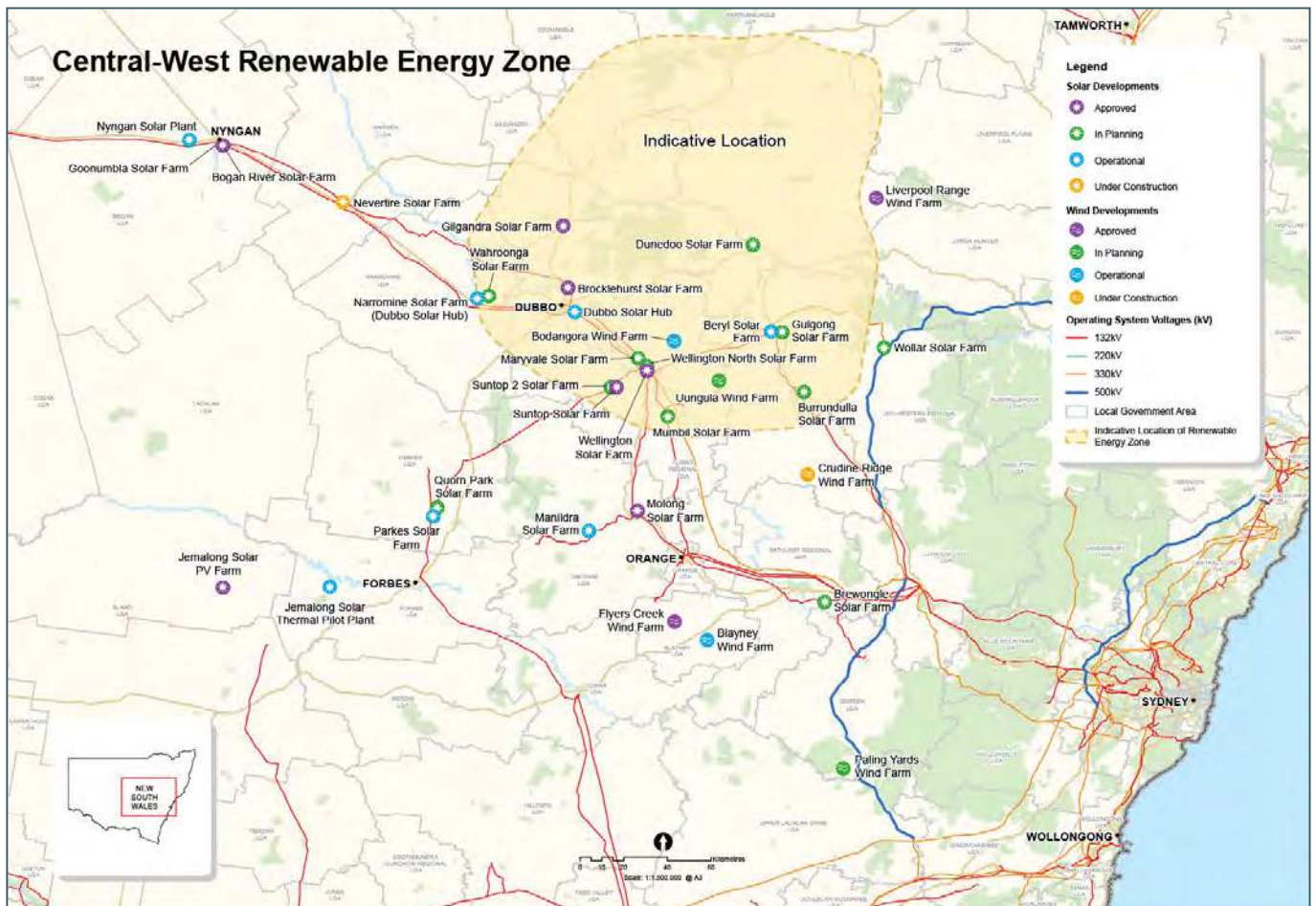


Image credit: NSW Government.



ARENA SHOWCASE





# R&D TO ADDRESS SOLAR PV END-OF-LIFE ISSUES



Research and development can help find innovative solutions to reduce the cost of sustainably managing solar panels at the end of their life. Image credit: Stock.

## FUNDING ROUND: R&D TO ADDRESS SOLAR PV END-OF-LIFE ISSUES

**ARENA FUNDING:**  
\$15.0 million

**ARENA PRIORITY:**  
Integrating renewables into the electricity system

**TECHNOLOGY:**  
Solar PV

**INNOVATION STAGE:**  
Research and development

The solar PV sector in Australia does not currently have a sustainable solution for managing panels at the end of their life. As the rate of solar PV deployment increases, innovations that can reduce the cost of sustainably managing panels at the end of their life will become more important.

R&D can help find innovative solutions to reduce this cost, enabling sustainable and cost effective management of solar panels at the end of their life.

Accordingly, ARENA established a \$15 million funding round in late 2019 to support research that addressed end-of-life issues for solar PV panels, increased their efficiency or lowered their cost.

The funding round sought projects that could improve the economics of managing solar panels at end of life such as better upfront design, increasing the value of recovered materials, or innovations that incorporated reused or recycled components in new panels.

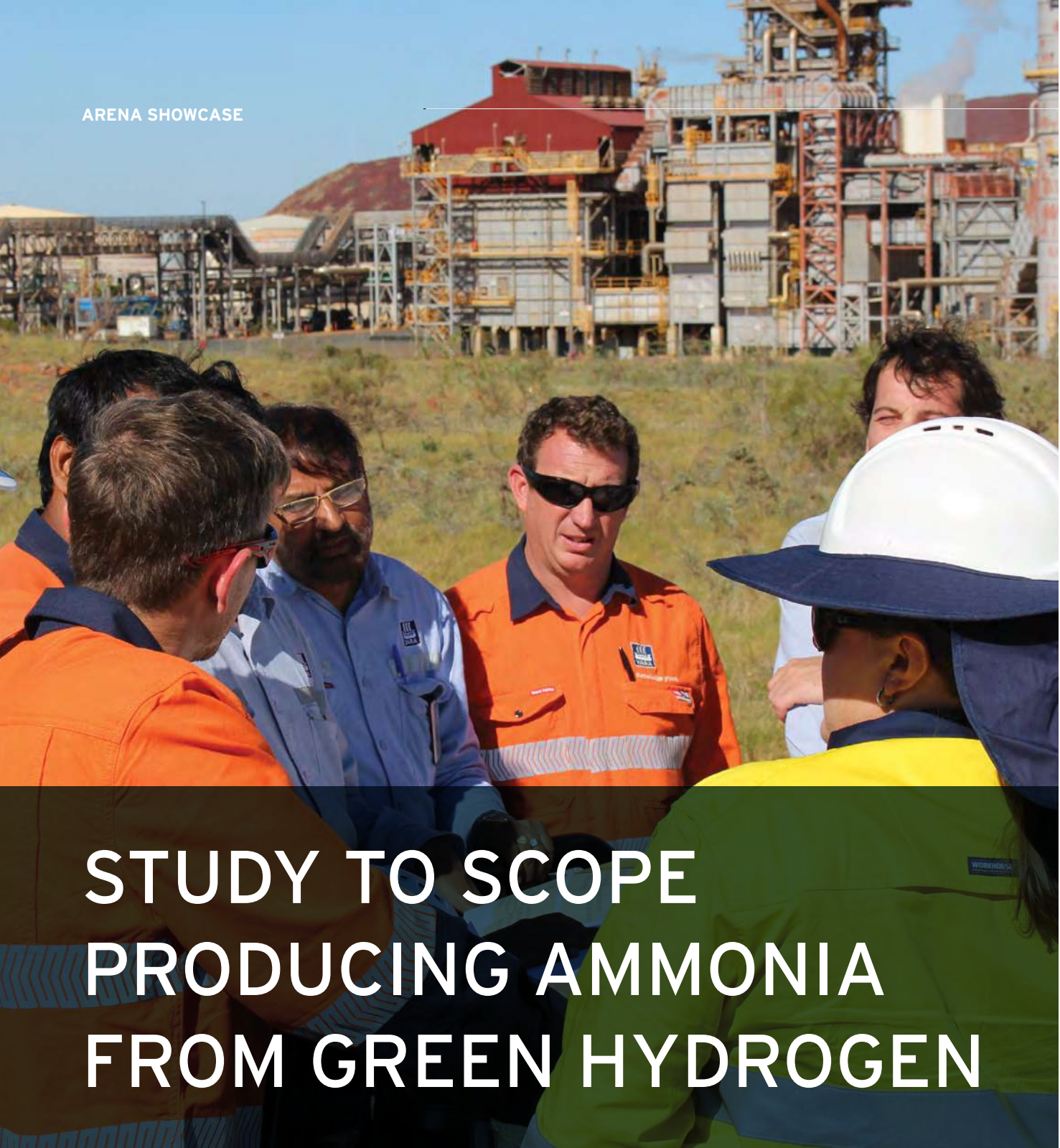
The funding round also aimed to build on Australia's excellence in solar PV R&D, increasing efficiencies and driving down costs even

further to help bring about the next generation in solar technology. More efficient and lower cost solar PV can underpin the growth of a renewable hydrogen industry, drive the electrification of transport and industrial processes, and reduce the costs of delivering secure and reliable renewable electricity.

This was ARENA's third funding round specifically in support of solar PV R&D.

Following an expression of interest process in late 2019 - early 2020, short-listed applicants were invited to submit full applications in April-June. Successful applicants will be announced in the second half of 2020.

ARENA has committed more than \$290 million to around 300 solar R&D projects since 2009, either through funding programs inherited by ARENA from the Australian Solar Institute, or run by ARENA since 2012. This support includes \$84 million for ACAP to continue its research operations until 2022.



# STUDY TO SCOPE PRODUCING AMMONIA FROM GREEN HYDROGEN

The Yara and Engie team investigate the potential production site. Image credit: Yara Pilbara Fertilisers.

“We appreciate that ARENA has recognised Yara and ENGIE’s complementary expertise and experience on this complex project via this commitment. ARENA’s support will assist in completing the feasibility study so that we can fully understand the opportunity for generating renewable hydrogen for use in our Pilbara facilities.”

**TOVE ANDERSEN**  
EXECUTIVE VICE PRESIDENT PRODUCTION, YARA INTERNATIONAL

<p><b>CASE STUDY: STUDY TO SCOPE PRODUCING AMMONIA FROM GREEN HYDROGEN</b></p>	<p><b>PROJECT NAME:</b> Yara Pilbara Renewable Ammonia Feasibility Study</p> <p><b>LEAD ORGANISATION:</b> Yara Pilbara Fertilisers</p> <p><b>ARENA FUNDING:</b> \$995,000</p> <p><b>TOTAL PROJECT COST:</b> \$3.7 million</p> <p><b>LOCATION:</b> Western Australia</p>	<p><b>ARENA PRIORITY:</b> Accelerating hydrogen</p> <p><b>TECHNOLOGY:</b> Hydrogen</p> <p><b>INNOVATION STAGE:</b> Feasibility study</p>
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With ARENA's support, one of the world's largest ammonia producers is now exploring the feasibility of making a switch to renewable hydrogen.

This year the Agency committed \$995,000 in funding to Yara Pilbara Fertilisers (Yara) to support a feasibility study for the production of renewable hydrogen and ammonia. The study will explore the potential to make green hydrogen work at industrial scale at Yara's existing ammonia production facility in Western Australia's Pilbara region.

Yara will investigate producing renewable hydrogen through electrolysis powered by onsite solar PV, and potentially using seawater for electrolysis. The renewable hydrogen produced would displace 30,000 tonnes a year of hydrogen that Yara currently derives from fossil fuels.

The blended hydrogen would be converted to ammonia with a lower carbon footprint and sold for use in agricultural fertilisers, to be shipped around Australia and the world from the nearby Port of Dampier.

In the long term, Yara aims to produce hydrogen and ammonia

entirely using renewable energy. The study will therefore be the first step on the path to achieving commercial-scale production of renewable hydrogen for export.

Yara currently produces and exports approximately five per cent of the world's ammonia production out of its existing facility in the Pilbara. The project will utilise Yara's established trade partnerships and market expertise to export renewable hydrogen as ammonia from WA.

Yara will collaborate with global energy company ENGIE to deliver the feasibility study. ENGIE has a dedicated hydrogen business unit focused on developing industrial-scale renewable-based hydrogen solutions in international markets.

The study will provide important insight into how Australia's current ammonia producers can transition away from the use of fossil fuels towards renewable alternatives for producing hydrogen while continuing to leverage the substantial export capabilities that those companies have already established.

**HOW THIS PROJECT MAKES A DIFFERENCE**

With Yara's Pilbara site alone accounting for five per cent of the world's ammonia production, the project offers a unique opportunity to demonstrate the potential of renewable hydrogen at an industrial scale.

# GOVERNANCE

THIS SECTION EXPLAINS ARENA'S GOVERNANCE ARRANGEMENTS.

## KEY GOVERNANCE EVENTS IN 2019-20

On 1 February 2020, new administrative arrangements took effect transferring portfolio responsibility for ARENA to the Department of Industry, Science, Energy and Resources. There was no change to the Portfolio Minister.

## RISK MANAGEMENT

ARENA embeds risk management into its culture to support well-informed decision-making. As a taxpayer-funded entity, we seek to maximise the value of the financial assistance we provide in the short and long term.

Value for ARENA is maximised when our strategies and objectives strike the optimal balance between risks and opportunities, and when we can effectively and efficiently deploy resources towards achieving our statutory objectives.

ARENA's Risk Management Framework, Principles and Processes are based on the International Standard for Risk Management and we apply five general principles to our risk management activities to create and protect value for all Australians.

Our principles test if risk management activities are:

1. proportionate to the level of risk faced by the organisation
2. aligned with other activities in the organisation

3. embedded within the organisation
4. comprehensive in order to be fully effective
5. dynamic and responsive to emerging and changing risks.

Risks are identified and assessed through a consistently applied and replicable methodology. This follows a structured approach that encompasses the context, identification, assessment, analysis and treatment of risks.

The framework also features effective communication and monitoring of the portfolio risk profile and risk management activities.

ARENA's Board has a duty to establish and maintain systems relating to risk and control. It is responsible for the appropriateness of ARENA's system of risk oversight and management, and systems of internal control.

The RAC, a committee of the Board, provides oversight of these systems of risk and control. The Board also has overall responsibility for the identification, analysis and evaluation of ARENA's strategic risks. Corporate risks are managed by the Executive Leadership Team, while operational risks are managed by line areas.

ARENA's strategic risk reporting addresses the highest level of risk that would impact us achieving our objectives. In line with ARENA's risk management practices, these risks are monitored through the year by the ARENA Board and RAC. ARENA's

risk appetite (the total impact of risk an organisation is prepared to accept in the pursuit of its strategic objectives) is reviewed annually.

## CONFLICT OF INTEREST

### CONFLICT OF INTEREST POLICY

In 2019-20, 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.

In addition, during the year the Board considered concerns that

can arise due to the small pool of Australian expertise in cutting edge technologies. Some members of the ARENA Advisory Panel are associated with universities that often put forward R&D projects for assessment. In the solar R&D round this was addressed by using predominantly overseas experts, with a smaller number of Australian experts to provide the context of the Australian research landscape. The Board was satisfied that this addressed any perceptions of conflict, and may consider this approach for similar rounds in the future.

### 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 2019-20, 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 \$136,904 (excluding GST).

### REMUNERATION

Details of the ARENA Board and Executive remuneration is provided in Note 3.2 of the Financial Statements and Tables 12-13 of Appendix 3.

# 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 functions.

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

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 2019-20, ARENA's Portfolio Minister was the Hon Angus Taylor MP, the Minister for Energy and Emissions Reduction.

## 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 of more than \$50 million are to be awarded.

During the reporting period the

Minister approved ARENA's GFS for 2019-20.

## 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 2019-20.

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 2019-20.

## 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. Information on the complaints and review process is available at [www.arena.gov.au/making-a-complaint](http://www.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 [www.arena.gov.au](http://www.arena.gov.au)

There were two requests for information related to ARENA under the FOI Act received in 2019-20.

Information on how to make a request under the FOI Act is available on the Department of Industry, Science, Energy and Resources' website at [www.industry.gov.au/about-us/what-we-do/freedom-of-information](http://www.industry.gov.au/about-us/what-we-do/freedom-of-information).

The Department can be contacted the following ways:

- > Email: [FOI@industry.gov.au](mailto:FOI@industry.gov.au)
- > Phone: +61 2 6102 8104
- > Write: FOI Coordinator, Legal Branch, GPO Box 2013, Canberra ACT 2601

**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 2019-20.

**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 reporting 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 3 provides this information.





TABLE 3: ARENA'S ENVIRONMENTAL PERFORMANCE

REPORTING CRITERIA	PERFORMANCE
<p>Accordance with and contribution to ecologically sustainable development (ESD), including the development and implementation of policies, plans, programs and legislation</p>	<p>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.</p> <p>ARENA's policies, plans and programs all accord with and contribute to the ESD principles by:</p> <ul style="list-style-type: none"> <li>› helping to foster the long-term sustainability of Australia's energy sector while promoting the reduction of energy-related greenhouse gas emissions</li> <li>› taking into account economic, environmental and social considerations when developing renewable energy measures.</li> </ul>
<p>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</p>	<p>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).</p> <p>For the duration of 2019-20, 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.</p> <p>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.</p>



School students being shown a wind turbine blade in Tasmania.  
Image credit: Hydro Tasmania.



Yara Pilbara's ammonia plant on the Burrup Peninsula in Western Australia. Image credit: Yara Pilbara.

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## JUDICIAL DECISIONS AND REVIEWS BY OUTSIDE BODIES

### ANAO PERFORMANCE AUDIT

The ANAO commenced a Performance Audit of ARENA in June 2019. The objective of the Audit was to assess the effectiveness of grant program management by ARENA.

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

- › does grant 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 conducted field work from June to December 2019, and its Audit report (Auditor-General Report No.35 2019-20 Report into Grant Program Management by the Australian Renewable Energy Agency) was tabled in the Parliament on 30 April 2020.

ARENA accepted all six of the report's recommendations and has taken action to implement them.

### OTHER REVIEWS

During 2019-20 ARENA was not subject to any judicial decisions or reviews by administrative tribunals, the Commonwealth Ombudsman or the Office of the Australian Information Commissioner.

### FINANCIAL AUDIT

ARENA received an unqualified audit report on its financial statements for 2019-20. The Auditor-General's independent report is presented in the Financial Statements section of this annual report.

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## LEGAL EXPENDITURE

Legal services are provided by a small team of lawyers provided from a law firm and sole practitioner firms. Legal services are generally only outsourced where transactions involve complex project finance arrangements, with the process managed by the General Counsel.

During 2019-20 ARENA incurred \$1,947,820 (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.

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## 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.

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## RELATED ENTITY TRANSACTIONS

Refer to Note 3.3 in the Financial Statements.

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## 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.

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## SUBSIDIARIES

ARENA did not have any subsidiaries during 2019-20.

FIGURE 6: ARENA VALUES



**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 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 2020, ARENA had two employees (CEO and CFO) and 25 departmental staff (20.4 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.

**ENGAGEMENT**

Engagement initiatives continued throughout the year with a significant focus on wellbeing and morale due to the catastrophic summer fires, followed by transitioning all workers to remote working in response to COVID-19. The 2020 People Pulse survey demonstrated that ARENA continued to maintain or increase its engagement score overall across many areas during a very difficult period, including for job satisfaction, communication and culture.

**LEGISLATIVE, GOVERNMENT AND OTHER INFORMATION**

**PLANNING**

ARENA's strategic workforce plan was updated to reflect the funding trajectory. Management has continued to consider the size and shape of the organisation in preparation for potential funding changes and different strategic opportunities, to ensure the organisation is ready to implement and deliver on legislative requirements.

**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.

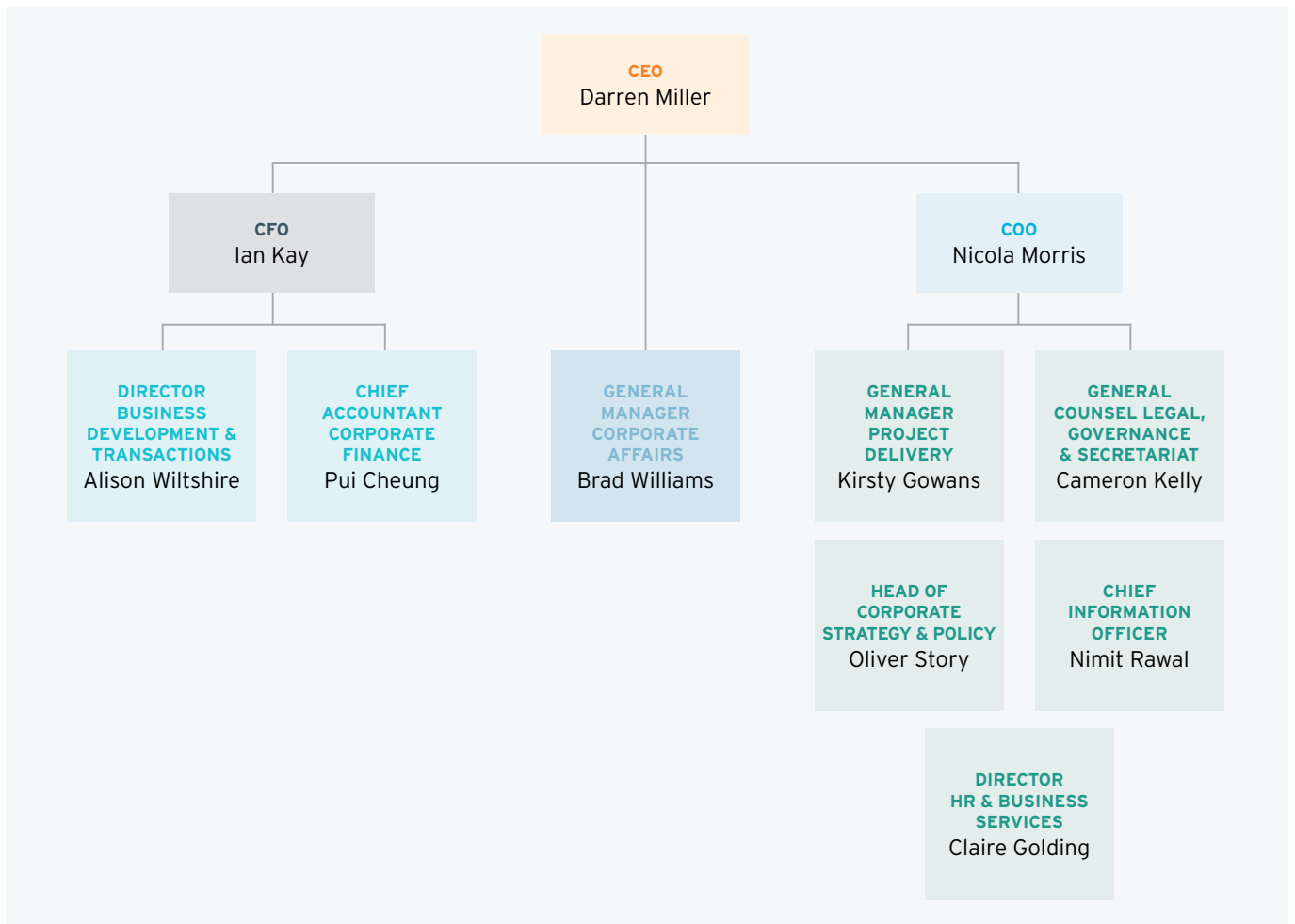
ARENA considers health and safety throughout the lifecycle of the funding process and its officials promote a positive safety culture at ARENA. The Board closely monitors health and safety in both the projects it supports and in ARENA workplaces.

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 WHS investigations were conducted and no notifiable WHS incidents were reported during 2019-20. Reporting in respect of Departmental staff made available to ARENA is covered in the Portfolio Department's annual report for 2019-20.

FIGURE 7: ARENA ORGANISATIONAL STRUCTURE AT 30 JUNE 2020



RayGen's PV Ultra uses low-cost mirrors to track and reflect the sun onto a solar PV receiver to generate low cost solar electricity and heat. Image credit: ARENA.



# FINANCIAL STATEMENTS

FOR THE YEAR ENDED 30 JUNE 2020

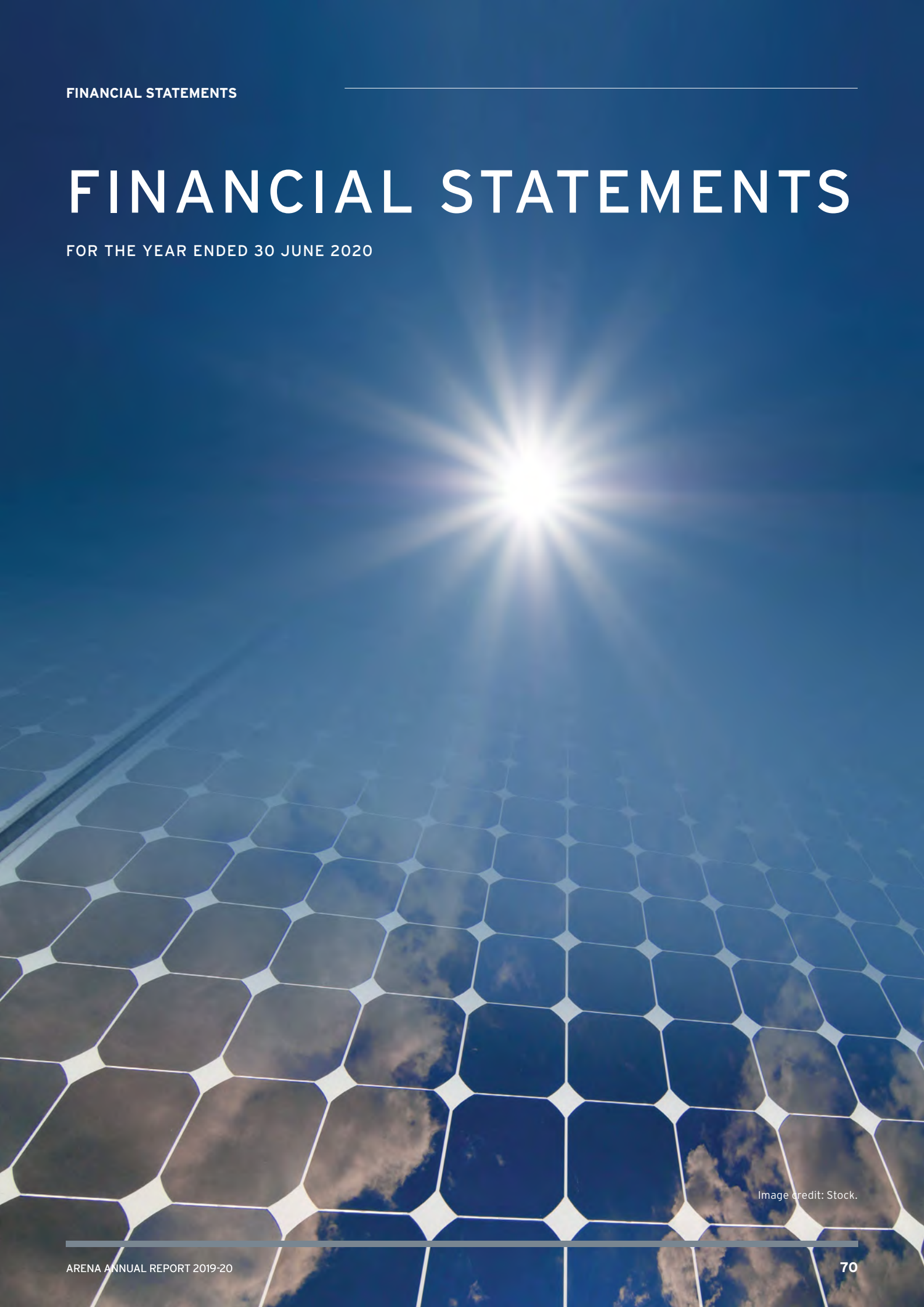


Image credit: Stock.



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**INDEPENDENT AUDITOR'S REPORT**

**To the Minister for Energy and Emissions Reduction**

**Opinion**

In my opinion, the financial statements of the Australian Renewable Energy Agency (the Entity) for the year ended 30 June 2020:

- (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 2020 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 as at 30 June 2020 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 (including Independence Standards)* (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.

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**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  
19 September 2020

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**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 2020 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.



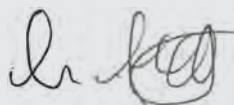
Justin Punch  
Chair of the Board

17 September 2020



Darren Miller  
Chief Executive Officer

17 September 2020



Ian Kay  
Chief Financial Officer

17 September 2020

**Statement of Comprehensive Income***for the period ended 30 June 2020*

		2020	2019	Original <sup>1</sup>
	Notes	\$'000	\$'000	Budget \$'000
<b>NET COST OF SERVICES</b>				
<b>Expenses</b>				
Employee benefits	1.1A	1,101	1,095	1,422
Suppliers	1.1B	26,266	28,984	33,204
Grants	1.1C	193,293	138,692	248,000
Depreciation and amortisation	2.2	1,830	601	470
Finance Costs		25	10	-
Losses from asset sales		1	-	-
<b>Total expenses</b>		<b>222,516</b>	<b>169,382</b>	<b>283,096</b>
<b>Own-source revenue</b>				
Interest	1.2A	1,425	1,621	1,550
Other revenue	1.2B	8,188	10,552	5,014
<b>Total own-source revenue</b>		<b>9,613</b>	<b>12,173</b>	<b>6,564</b>
<b>Net cost of services</b>		<b>(212,903)</b>	<b>(157,209)</b>	<b>(276,532)</b>
Revenue from Government	1.2C	231,368	173,963	281,961
<b>Surplus on continuing operations</b>		<b>18,465</b>	<b>16,754</b>	<b>5,429</b>
<b>OTHER COMPREHENSIVE INCOME</b>				
<b>Items not subject to subsequent reclassification to net cost of services</b>				
Decrease in the value of investment	2.1C	2,851	2,388	1,339
<b>Total other comprehensive income</b>		<b>2,851</b>	<b>2,388</b>	<b>1,339</b>
<b>Total comprehensive income</b>		<b>15,614</b>	<b>14,366</b>	<b>4,090</b>

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

<sup>1</sup> ARENA's budget as published in the 2019-20 Portfolio Budget Statements.

**Statement of Financial Position**
*as at 30 June 2020*

		2020	2019	Original <sup>1</sup>
	Notes	\$'000	\$'000	Budget \$'000
<b>ASSETS</b>				
<b>Financial assets</b>				
Cash and cash equivalents	2.1A	87,832	85,584	56,340
Trade and other receivables	2.1B	2,716	2,875	2,546
Investments	2.1C	29,813	29,349	47,655
<b>Total financial assets</b>		<b>120,361</b>	<b>117,808</b>	<b>106,541</b>
<b>Non-financial assets</b>				
Buildings - right of use assets	2.2	2,065	-	-
Leasehold improvements	2.2	896	1,586	866
Plant and equipment	2.2	160	278	-
Prepayments		130	288	405
<b>Total non-financial assets</b>		<b>3,251</b>	<b>2,152</b>	<b>1,271</b>
<b>Total assets</b>		<b>123,612</b>	<b>119,960</b>	<b>107,812</b>
<b>LIABILITIES</b>				
<b>Payables</b>				
Suppliers - trade creditors and accruals		1,373	1,855	1,465
Grants	2.3A	286	13,751	763
Other payables	2.3B	67	383	6
<b>Total payables</b>		<b>1,726</b>	<b>15,989</b>	<b>2,234</b>
<b>Interest bearing liabilities</b>				
Leases		2,035	-	-
<b>Total interest bearing liabilities</b>		<b>2,035</b>	<b>-</b>	<b>-</b>
<b>Provisions</b>				
Employee provisions	3.1	233	194	108
Other provisions	2.4	439	435	425
<b>Total provisions</b>		<b>672</b>	<b>629</b>	<b>533</b>
<b>Total liabilities</b>		<b>4,433</b>	<b>16,618</b>	<b>2,767</b>
<b>Net assets</b>		<b>119,179</b>	<b>103,342</b>	<b>105,045</b>
<b>EQUITY</b>				
Asset revaluation reserve		238	238	-
Retained surplus		118,941	103,104	105,045
<b>Total equity</b>		<b>119,179</b>	<b>103,342</b>	<b>105,045</b>

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

<sup>1</sup> ARENA's budget as published in the 2019-20 Portfolio Budget Statements.

**Statement of Changes in Equity**

for the period ended 30 June 2020

	Retained earnings			Asset revaluation surplus			Total equity		
	2020	2019	Original Budget <sup>1</sup>	2020	2019	Original Budget <sup>1</sup>	2020	2019	Original Budget <sup>1</sup>
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
<b>Opening balance</b>									
Balance carried forward from previous period	103,104	88,738	100,955	238	238	-	103,342	88,976	100,955
Adjustment on initial application of AASB 16	223	-	-	-	-	-	223	-	-
<b>Adjusted opening balance</b>	<b>103,327</b>	<b>88,738</b>	<b>100,955</b>	<b>238</b>	<b>238</b>	<b>-</b>	<b>103,565</b>	<b>88,976</b>	<b>100,955</b>
<b>Comprehensive income</b>									
Surplus for the period	18,465	16,754	4,090	-	-	-	18,465	16,754	4,090
Other comprehensive income	(2,851)	(2,388)	-	-	-	-	(2,851)	(2,388)	-
<b>Total comprehensive income</b>	<b>15,614</b>	<b>14,366</b>	<b>4,090</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>15,614</b>	<b>14,366</b>	<b>4,090</b>
<b>Closing balance as at 30 June</b>	<b>118,941</b>	<b>103,104</b>	<b>105,045</b>	<b>238</b>	<b>238</b>	<b>-</b>	<b>119,179</b>	<b>103,342</b>	<b>105,045</b>

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

<sup>1</sup> ARENA's budget as published in the 2019-20 Portfolio Budget Statements.

**Cash Flow Statement**
*for the period ended 30 June 2020*

	Notes	2020 \$'000	2019 \$'000	Original <sup>1</sup> Budget \$'000
<b>OPERATING ACTIVITIES</b>				
<b>Cash received</b>				
Receipts from Government		231,368	173,963	281,961
Interest		1,466	1,844	1,550
Net GST received		17,035	15,409	-
Return of grant funds from prior years		3,370	5,056	-
Other		226	15	-
<b>Total cash received</b>		<b>253,465</b>	<b>196,287</b>	<b>283,511</b>
<b>Cash used</b>				
Employees		(1,378)	(732)	(1,422)
Suppliers		(22,521)	(24,717)	(28,190)
Grants		(223,009)	(139,944)	(248,000)
Interest paid		(20)	-	-
<b>Total cash used</b>		<b>(246,928)</b>	<b>(165,393)</b>	<b>(277,612)</b>
<b>Net cash from operating activities</b>		<b>6,537</b>	<b>30,894</b>	<b>5,899</b>
<b>INVESTING ACTIVITIES</b>				
<b>Cash received</b>				
Proceeds from sales of assets		10	-	-
<b>Total cash received</b>		<b>10</b>	<b>-</b>	<b>-</b>
<b>Cash used</b>				
Purchase of property, plant and equipment		-	(603)	-
Investments		(3,315)	(1,096)	(6,746)
<b>Total cash used</b>		<b>(3,315)</b>	<b>(1,699)</b>	<b>(6,746)</b>
<b>Net cash used by investing activities</b>		<b>(3,305)</b>	<b>(1,699)</b>	<b>(6,746)</b>
<b>FINANCING ACTIVITIES</b>				
<b>Cash used</b>				
Principal payments of lease liabilities		(984)	-	-
<b>Total cash used</b>		<b>(984)</b>	<b>-</b>	<b>-</b>
<b>Net cash used by financing activities</b>		<b>(984)</b>	<b>-</b>	<b>-</b>
<b>Net increase in cash held</b>		<b>2,248</b>	<b>29,195</b>	<b>(847)</b>
Cash and cash equivalents at the beginning of the reporting period		85,584	56,389	57,187
<b>Cash and cash equivalents at the end of the reporting period</b>	2.1A	<b>87,832</b>	<b>85,584</b>	<b>56,340</b>

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

<sup>1</sup> ARENA's budget as published in the 2019-20 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 objectives of ARENA are to improve the competitiveness of renewable energy technologies and increase the supply of renewable energy in Australia.

In December 2019 an Administrative Arrangements Order was issued to reduce Australian Government departments from 18 to 14 and reallocate the principal matters the departments are responsible for and the legislation administered by each portfolio. Consequently, ARENA was transferred on 1 February 2020 from the portfolio of the former Department of the Environment and Energy to the portfolio of the restructured Department of Industry, Science, Energy and Resources.

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.

ARENA has assessed the impact of COVID-19 on its economic activity. There has been little impact on the 2019-20 financial statements. Operationally, there has been a reduction in travel and event related expenditure. Some projects funded by ARENA grants have reported moderate delays in milestones completion due to COVID-19 but these delays are not expected to impact project completion dates.

### New Australian Accounting Standards

Except for AASB 16 *Leases*, all new and/or 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.

#### *Application of AASB 16 Leases*

AASB 16 became effective on 1 July 2019. This new standard has replaced AASB 117 *Leases*, Interpretation 4 *Determining whether an Arrangement contains a Lease*, Interpretation 115 *Operating Leases—Incentives* and Interpretation 127 *Evaluating the Substance of Transactions Involving the Legal Form of a Lease*.

AASB 16 provides a single lessee accounting model, requiring the recognition of assets and liabilities for all leases, together with options to exclude leases where the lease term is 12 months or less, or where the underlying asset is of low value. AASB 16 substantially carries forward the lessor accounting in AASB 117, with the distinction between operating leases and finance leases being retained.

ARENA adopted AASB 16 Leases using the modified retrospective approach, under which the cumulative effect of initial application is recognised in retained earnings at 1 July 2019. Accordingly, the comparative information presented for 2019 is not restated, that is, it is presented as previously reported under AASB 117 and related interpretations.

ARENA elected to apply the practical expedient to not reassess whether a contract is, or contains, a lease at the date of initial application. Contracts entered into before the transition date that were not identified as leases under AASB 117 were not reassessed. The definition of a lease under AASB 16 was applied only to contracts entered into or changed on or after 1 July 2019.

AASB 16 provides for certain optional practical expedients, including those related to the initial adoption of the standard. ARENA applied the following practical expedients when applying AASB 16 to leases previously classified as operating leases under AASB 117:

- Apply a single discount rate to a portfolio of leases with reasonably similar characteristics;
- Exclude initial direct costs from the measurement of right-of-use assets at the date of initial application for leases where the right-of-use asset was determined as if AASB 16 had been applied since the commencement date;
- Reliance on previous assessments on whether leases are onerous as opposed to preparing an impairment review under AASB 136 Impairment of assets as at the date of initial application; and
- Applied the exemption not to recognise right-of-use assets and liabilities for leases with less than 12 months of lease term remaining as of the date of initial application.

As a lessee, ARENA previously classified leases as operating or finance leases based on its assessment of whether the lease transferred substantially all of the risks and rewards of ownership. On adoption of AASB 16, ARENA recognised right-of-use assets and lease liabilities in relation to leases of office space which had previously been classified as operating leases. At the reporting date, ARENA did not have any other leases that would require the recognition of right-of-use assets and lease liabilities under AASB 16.

The lease liabilities were measured at the present value of the remaining lease payments, discounted using ARENA's incremental borrowing rate as at 1 July 2019. ARENA's incremental borrowing rate is the rate at which a similar borrowing could be obtained from an independent creditor under comparable terms and conditions. The weighted-average rate applied was 0.98%.

The right-of-use assets were measured as follows:

- a) Office space: measured at an amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments.
- b) All other leases: the carrying value that would have resulted from AASB 16 being applied from the commencement date of the leases, subject to the practical expedients noted above.

**Impact on transition**

On transition to AASB 16, ARENA recognised additional right-of-use assets and additional lease liabilities, recognising the difference in retained earnings. The impact on transition is summarised below:

<b>Assets and liabilities recognised at 1 July 2019</b>	<b>\$'000</b>
Buildings - right-of-use assets	3,098
Lease liabilities	3,017
Retained earnings	223

The following table reconciles the minimum lease commitments disclosed in ARENA's 30 June 2019 annual financial statements to the amount of lease liabilities recognised on 1 July 2019:

	<b>\$'000</b>
Minimum operating lease commitment (undiscounted) at 30 June 2019	3,053
Less: effect of discounting using the incremental borrowing rate as at the date of initial application	<u>(36)</u>
<b>Lease liabilities recognised at 1 July 2019</b>	<b><u>3,017</u></b>

**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 ARENA for the year ended 2019.

**1.1 Expenses**

	2020	2019
	\$'000	\$'000
<b>1.1A: Employee Benefits</b>		
Board remuneration fees	175	228
Salaries and wages	833	723
Superannuation - defined contribution plans	55	56
Leave and other entitlements	38	88
<b>Total employee benefits</b>	<b>1,101</b>	<b>1,095</b>

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

**1.1B: Suppliers**

**Goods and services supplied or rendered**

Audit fees	89	89
Consultants	16,821	17,944
Department support costs (resources received free of charge) <sup>1</sup>	4,898	5,481
IT services	1,098	985
Legal fees	1,830	1,907
Travel	376	526
Other	1,151	1,088
<b>Total goods and services supplied or rendered</b>	<b>26,263</b>	<b>28,020</b>

**Other suppliers**

Operating lease rentals <sup>2</sup>	-	960
Workers compensation expenses	3	4
<b>Total other suppliers</b>	<b>3</b>	<b>964</b>
<b>Total suppliers</b>	<b>26,266</b>	<b>28,984</b>

<sup>1</sup> 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).

<sup>2</sup> The Entity has applied AASB 16 using the modified retrospective approach and therefore the comparative information has not been restated and continues to be reported under AASB 117.

1.1 Expenses (contd.)		
	2020	2019
	\$'000	\$'000
<b>1.1.C: Grants</b>		
<b>Public sector</b>		
Australian Government entities	9,416	6,168
<b>Private sector</b>		
Australian companies	132,859	99,169
Australian not-for-profit entities	15,529	1,881
Other entities <sup>1</sup>	35,489	31,474
<b>Total grants</b>	<b>193,293</b>	<b>138,692</b>

<sup>1</sup> This includes grants to Australian universities and the Australian Government's contributions 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 have 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 is dependent on the realisation of specified future events and/or other commercial indicators, and in some cases Ministerial approval.

The probability of recoupment from grants is assessed at the end of each financial year. Where recoupment is probable in the next 12 months the relevant details are disclosed in Note 4.1 Contingent Assets and Liabilities.

**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.

<b>1.2 Own-Source Revenue and Gains</b>		
	<b>2020</b>	2019
	<b>\$'000</b>	\$'000

**Own-Source Revenue**

**1.2A: Interest**

Bank deposits	1,425	1,621
<b>Total interest</b>	<b>1,425</b>	<b>1,621</b>

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

**1.2B: Other Revenue**

Resources received free of charge - former Department of the Environment and Energy	2,765	5,481
Resources received free of charge - Department of Industry, Science, Energy and Resources	2,133	-
Return of grants from prior years	3,064	5,056
Other	226	15
<b>Total other revenue</b>	<b>8,188</b>	<b>10,552</b>

**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 - former Department of the Environment and Energy	148,868	173,963
Payments from Portfolio Department - Department of Industry, Science, Energy and Resources	82,500	-
<b>Total revenue from Government</b>	<b>231,368</b>	<b>173,963</b>

**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 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**

	2020	2019
	\$'000	\$'000

**2.1A: Cash and Cash Equivalents**

Cash at bank	8,641	23,595
Cash on deposit	79,191	61,989
<b>Total cash and cash equivalents</b>	<b>87,832</b>	<b>85,584</b>

**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	2,042	2,367
Interest receivable	398	438
Other	276	70
<b>Total other receivables</b>	<b>2,716</b>	<b>2,875</b>
<b>Total trade and other receivables</b>	<b>2,716</b>	<b>2,875</b>

There is no impairment allowance for receivables as at 30 June 2020 (2019: 0).

**2.1C: Investments**

Opening balance	29,349	30,641
Net payment into the investment fund, including management fees	3,315	1,096
Decrease in value of investment at 30 June	(2,851)	(2,388)
<b>Total investments - REVC Fund Commonwealth Participation Trust</b>	<b>29,813</b>	<b>29,349</b>

**Accounting Policy**

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

At 30 June 2020 ARENA held 47,505,505 (2019: 44,190,937) 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 2020 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

	Buildings (ROU assets) \$'000	Leasehold Improvements \$'000	Plant and Equipment \$'000	Total \$'000
<b>As at 1 July 2019</b>				
Gross book value	-	2,097	368	2,465
Accumulated depreciation, amortisation and impairment	-	(511)	(90)	(601)
<b>Total as at 1 July 2019</b>	-	1,586	278	1,864
Recognition of right of use asset on initial application of AASB 16	3,098	-	-	3,098
<b>Total as at 1 July 2019</b>	3,098	1,586	278	4,962
Write back of asset purchase value on disposal of assets	-	-	(60)	(60)
Write back of depreciation and amortisation on disposal of assets	-	-	49	49
Depreciation and amortisation	(1,033)	(690)	(107)	(1,830)
<b>Total as at 30 June 2020</b>	2,065	896	160	3,121
<b>Total as at 30 June 2020 represented by</b>				
Gross book value	3,098	2,097	308	5,503
Accumulated depreciation, amortisation and impairment	(1,033)	(1,201)	(148)	(2,382)
<b>Total as at 30 June 2020</b>	2,065	896	160	3,121

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

<p><b>Accounting Policy</b></p> <p><u>Acquisition of Assets</u> 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.</p> <p><u>Buildings - Right-of-Use (ROU) Assets</u> Leased ROU assets are capitalised at the commencement date of the lease and comprise the initial lease liability amount, initial direct costs incurred when entering into the lease, less any lease incentives received. These assets are accounted for by Commonwealth lessees as separate asset classes to corresponding assets owned outright, but included in the same column as where the corresponding underlying assets would be presented if they were owned.</p> <p>On initial adoption of AASB 16, ARENA did not identify any onerous leases and no adjustment to the ROU assets was required. Following initial application, an impairment review is undertaken for any right of use lease asset that shows indicators of impairment and an impairment loss is recognised against any right of use lease asset that is impaired. Lease ROU assets continue to be measured at cost after initial recognition in Commonwealth agency, GGS and Whole of Government financial statements.</p> <p><u>Leasehold Improvements</u> Leasehold improvements are carried at fair value.</p> <p><u>Plant and Equipment</u> Plant and equipment are valued at cost in accordance with the FRR.</p> <p><u>Impairment</u> 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.</p> <p><u>Revaluations</u> 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</p>	<p>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.</p> <p>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.</p> <p><u>Depreciation</u> The depreciation rates for ROU assets are based on the commencement date to the earlier of the end of the useful life of the ROU asset or the end of the lease term.</p> <p>Leasehold improvements are depreciated over the lease term.</p> <p>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.</p> <p>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.</p>
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<b>2.3 Payables</b>		
	2020	2019
	\$'000	\$'000

**2.3A: Grants****Private sector**

Australian companies	-	9,731
Other entities	286	4,020
<b>Total grants</b>	<b>286</b>	<b>13,751</b>

**2.3B: Other payables**

Accrued salaries and income tax withheld	67	383
<b>Total other payables</b>	<b>67</b>	<b>383</b>

**2.4 Other Provisions****2.4 Other provisions**

	<b>Provision for restoration</b>
	<b>\$'000</b>
<b>Opening balance as at 1 July 2019</b>	<b>435</b>
<b>Additional provisions made</b>	
Unwinding of discount or change in discount rate	4
<b>Total as at 30 June 2020</b>	<b>439</b>

ARENA currently has three (2019: three) 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

	2020	2019
	\$'000	\$'000
<b>Employee provisions</b>		
Leave	233	194
<b>Total employee provisions</b>	<b>233</b>	<b>194</b>

#### 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 to provide services to ARENA free of charge. The figures in the table below exclude salary cost associated with the position of the Chief Operating Officer.

	2020	2019
	\$	\$
Short-term employee benefits	1,046,054	981,431
Post-employment benefits	69,166	80,826
Other long-term employee benefits *	(14,374)	33,354
<b>Total KMP remuneration expenses</b>	<b>1,100,846</b>	<b>1,095,611</b>

The total number of KMP that are included in the above table are 9 individuals (2019: 9) and includes 6 ARENA Directors (2019: 6).

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.

\* Other long-term employee benefits represent the net movement in long service leave liabilities. An overstatement of the liabilities in 2019 was corrected in 2020, resulting in a net credit in long service leave expense for the current financial year.

**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.

Related party transactions are managed in accordance with ARENA's conflict of interest policy with regular use of independent probity advice services during major grant and procurement processes.

Giving consideration to relationships with related entities, and transactions entered into, it has been determined that ARENA entered into six (2019: three) transactions with 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 the Acting Chief Investment Officer for 5 Pillars Capital. During the reporting period ARENA conducted the following transactions, with which 5 Pillars Capital has a financial relationship. ARENA committed to these transactions prior to the ARENA Board Member commencing the role with 5 Pillars Capital.

Grant payments totalling \$4,929,920 were made to Greensync Pty Ltd for the purpose of developing a decentralised energy exchange program. Total approved funding for the this program is \$11,000,000 with a remaining balance of \$3,923,900 at 30 June 2020.

Grant payments totalling \$511,644 were made to Nectar Farms Management Limited for the purpose of developing high efficiency off grid glasshouse. Total approved ARENA funding for this project is \$1,100,000 with a remaining balance of \$203,677 at 30 June 2020.

Grant payments totalling \$290,663 were made to Energy Saving Networks Group Pty Ltd for the purpose of developing 'My Energy Marketplace' (MEM) platform to securely accept consumer energy data from multiple energy meter devices. The total ARENA funding for this project is \$2,970,000 with a remaining balance of \$2,679,337 at 30 June 2020.

Grant payments totalling \$550,000 were made to The Trustee for Sustainable Australia Fund for the purpose of developing a new finance product; Environmental Upgrade Agreements. Total approved ARENA funding for this project is \$693,000 with a remaining balance of \$143,000 at 30 June 2020.

An ARENA Board Member is the CEO of Horizon Power. During the reporting period ARENA conducted the following transactions:

Grant payments totalling \$574,540 were made to Horizon Power for the purpose of a pilot project to develop decentralised high penetration renewables to towns across regional Australia. Total approved ARENA funding for this project is \$2,112,000 with a remaining balance of \$441,017 at 30 June 2020.

An ARENA Board Member is a former non-executive Board Member of Hydro-Electric Corporation. They held this position for part of the reporting period. During the reporting period ARENA conducted the following transactions:

Grant payments totalling \$1,320,000 were made to Hydro-Electric Corporation for the purpose of several projects including Tasmanian pumped-hydro energy storage and the Tarraleah hydropower scheme feasibility study. Total approved ARENA funding for these projects is \$4,378,000 with a remaining balance of \$1,185,800 at 30 June 2020.



## Managing Uncertainties

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

### 4.1 Contingent Assets and Liabilities

	Grant recoupment \$'000	Total \$'000
<b>Contingent assets</b>		
Balance at 30 June 2019	-	-
New contingent assets recognised	9,500	9,500
<b>Total contingent assets at 30 June 2020</b>	<b>9,500</b>	<b>9,500</b>

ARENA did not have any contingent liabilities at 30 June 2020 (2019: nil).

#### Quantifiable Contingencies

The contingent assets are in respect of recoupment of grants from ARENA funded projects. Certain ARENA funded projects have funding agreements that include the potential for ARENA to recoup all, or part, of its funding provided to the grant recipient. Recoupment is generally tied to the success of a project and determined by formulas agreed as part of the terms and conditions of the funding agreement. ARENA is expecting that one project will meet the recoupment conditions in 2020-21 (2019: nil). The estimate of the recoupable amount is based on an assessment of the recoupment conditions of each relevant project and the probability of a recoupment occurring within the next financial year.

#### Accounting Policy

Contingent assets and contingent liabilities are not recognised in the statement of financial position but are reported in the notes. They may arise from uncertainty as to the existence of an asset or liability or represent an asset or liability in respect of which the amount cannot be reliably measured. Contingent assets are disclosed when settlement is probable but not virtually certain and contingent liabilities are disclosed when settlement is greater than remote.

#### Grant Recoupment

ARENA assesses the likelihood of recoupment on a project by project basis and estimates the amount recoupable within the next 12 months. The estimate is based on interpretation of the relevant market conditions and the probability of the recoupment trigger occurring under the circumstances.

### 4.2 Financial Instruments

	2020 \$'000	2019 \$'000
<b>4.1A: Categories of Financial Instruments</b>		
<b>Financial Assets</b>		
<b>Financial assets at amortised cost</b>		
Cash and cash equivalents	87,832	85,584
Trade and other receivables	674	508
<b>Total financial assets at amortised cost</b>	<b>88,506</b>	<b>86,092</b>
<b>Financial assets at fair value through other comprehensive income</b>		
Investments	29,813	29,349
<b>Total available-for-sale financial assets</b>	<b>29,813</b>	<b>29,349</b>
<b>Total financial assets</b>	<b>118,319</b>	<b>115,441</b>
<b>Financial liabilities</b>		
<b>Financial liabilities measured at amortised cost</b>		
Trade creditors	1,373	1,855
Grant payables	286	13,751
<b>Total financial liabilities measured at amortised cost</b>	<b>1,659</b>	<b>15,606</b>
<b>Total financial liabilities</b>	<b>1,659</b>	<b>15,606</b>

<p><b>Accounting Policy</b></p> <p><b>Financial Assets</b></p> <p>ARENA classifies its financial assets in the following categories:</p> <p>a) financial assets at fair value through other comprehensive income; and</p> <p>b) financial assets measured at amortised cost.</p> <p>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.</p> <p><b>Financial Assets at Amortised Cost</b></p> <p>Financial assets included in this category need to meet two criteria:</p> <p>1. the financial asset is held in order to collect the contractual cash flows; and</p> <p>2. the cash flows are solely payments of principal and interest (SPPI) on the principal outstanding amount.</p> <p>Amortised cost is determined using the effective interest rate.</p> <p><b>Effective Interest Method</b></p> <p>Income is recognised on an effective interest rate basis for financial assets that are recognised at amortised cost.</p> <p><b>Financial Assets at Fair Value Through Other Comprehensive Income (FVOCI)</b></p> <p>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.</p> <p>Any gains or losses as a result of fair value measurement or the</p>	<p>recognition of an impairment loss allowance is recognised in other comprehensive income.</p> <p><b>Impairment of Financial Assets</b></p> <p>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.</p> <p>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.</p> <p>A write-off constitutes a derecognition event where the write-off directly reduces the gross carrying amount of the financial asset.</p> <p><b>Financial liabilities</b></p> <p>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.</p> <p><b>Financial liabilities at Amortised Cost</b></p> <p>Trade creditors and other payables are recognised at amortised cost. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).</p>
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<b>4.2 Financial Instruments (contd.)</b>		
	2020	2019
	\$'000	\$'000
<b>4.2B Net Gains or Losses on Financial Assets</b>		
<b>Financial assets at amortised cost</b>		
Interest revenue	1,425	1,621
<b>Net gains on financial assets at amortised cost</b>	<b>1,425</b>	<b>1,621</b>
<b>Financial assets at fair value through other comprehensive income</b>		
Fair value changes	(2,851)	(2,388)
<b>Net losses on available-for-sale financial assets</b>	<b>(2,851)</b>	<b>(2,388)</b>
<b>Net gains/(losses) on financial assets</b>	<b>(1,426)</b>	<b>(767)</b>

**Other Information**

**5.1 Aggregate Assets and Liabilities**

	2020 \$'000	2019 \$'000
<b>Assets expected to be recovered in:</b>		
No more than 12 months	90,581	88,687
More than 12 months	33,031	31,273
<b>Total assets</b>	<b>123,612</b>	<b>119,960</b>
<b>Liabilities expected to be settled in:</b>		
No more than 12 months	(2,924)	(16,086)
More than 12 months	(1,509)	(532)
<b>Total liabilities</b>	<b>(4,433)</b>	<b>(16,618)</b>

**5.2 Assets Held in Trust**

	2,020 \$'000	2,019 \$'000
<b>Cash held in Locked Boxes</b>		
<b>Balance as at 1 July</b>	1,490	24,934
Receipts <sup>1</sup>	73,136	25,383
Payments <sup>2</sup>	(57,628)	(48,827)
<b>Balance as at 30 June</b>	<b>16,998</b>	<b>1,490</b>
<b>Total monetary assets held in trust</b>	<b>16,998</b>	<b>1,490</b>

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.

<sup>1</sup> Receipts are the amounts paid into Locked Boxes by ARENA. These amounts include interest received from the balances of the Locked Boxes.

<sup>2</sup> Payments are those amounts which have been withdrawn by the projects in accordance with agreed milestones.

<b>Note 5.3: Budget Variance Commentary</b>	
<p>ARENA's financial performance is measured against its original budget as published in the 2019-20 Portfolio Budget Statements.</p> <p>Variances are considered to be 'major' if they are core to ARENA's activities and based on the following criteria:</p> <ul style="list-style-type: none"> <li>• the variance between budget and actual is greater than +/- 10% of the original budget for a line item; and</li> <li>• the variance between budget and actual is greater than \$1,000,000; or</li> <li>• 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 ARENA's performance.</li> </ul>	
<b>Budget Variance Commentary</b>	<b>Affected statements and line items</b>
<p>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.</p> <p>Variance in grants expenditure to budget is largely due to the deferment of two major projects to 2020-21, with a total forecast grant amount of \$80 million.</p> <p>The supplier variance is impacted by lower grant expenditure as the costs associated with administering grants decreases.</p> <p>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.</p> <p>Cash and cash equivalents include cash held in operating bank accounts 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 increase in cash reserve due to a higher than expected amount of money returning to ARENA.</p>	<p><b>Statement of Comprehensive Income:</b></p> <ul style="list-style-type: none"> <li>- Suppliers</li> <li>- Grants</li> <li>- Revenue from Government</li> </ul> <p><b>Statement of Financial Position:</b></p> <ul style="list-style-type: none"> <li>- Cash and cash equivalents</li> </ul> <p><b>Cash Flow Statement:</b></p> <ul style="list-style-type: none"> <li>- Receipts from Government</li> <li>- Grants cash used</li> </ul>
<p>ARENA adopted the AASB 16 Leases from 1 July 2019. Consequently, ARENA recognised right-of-use assets in buildings for office accommodation of \$3 million and corresponding lease liabilities of an equivalent amount. Expenses in the renting of property are now accounted for as depreciation.</p> <p>At the time of budget, the impact of AASB 16 at a whole-of-Government level was still being assessed. The budget was prepared, in line with the Government's directive at the time, on the basis of the previous accounting standard AASB 117.</p>	<p><b>Statement of Comprehensive Income:</b></p> <ul style="list-style-type: none"> <li>- Depreciation and amortisation</li> </ul> <p><b>Statement of Financial Position:</b></p> <ul style="list-style-type: none"> <li>- Right of Use Assets</li> <li>- Lease Liabilities</li> </ul>
<p>During 2019-20 ARENA received recoupment/refund of grants totalling \$3.084 million, which had not been anticipated at the time of budgeting.</p>	<p><b>Statement of Comprehensive Income:</b></p> <ul style="list-style-type: none"> <li>- Other revenue</li> </ul>
<p>ARENA invested an additional \$3.3 million into the Renewable Energy Venture Capital Fund during the financial year. The principal activity of the Fund is to invest in the early stage renewable energy technology companies. Movement in fair value of the investment is driven by market and is not budgeted. A loss of \$2.8 million in the fair value of the investment at 30 June 2020.</p> <p>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.</p>	<p><b>Statement of Comprehensive Income:</b></p> <ul style="list-style-type: none"> <li>- Decrease in the value of investment</li> </ul> <p><b>Statement of Financial Position:</b></p> <ul style="list-style-type: none"> <li>- Other investments</li> </ul>
<p>Net GST received was not separated out from cash used for Suppliers and Grants at the time of budget.</p>	<p><b>Cash Flow Statement:</b></p> <ul style="list-style-type: none"> <li>- Net GST received</li> </ul>

Wilmot hydro-electric power station in north west Tasmania. Image credit: ARENA.





# ANNUAL PERFORMANCE STATEMENT 2019-20

THIS SECTION DESCRIBES HOW ARENA'S ACTIVITIES IN 2019-20 MET THE PERFORMANCE MEASURES IDENTIFIED IN OUR CORPORATE PLAN AND PORTFOLIO BUDGET STATEMENTS.



Image credit: Bundaberg Regional Irrigators Group.

# INTRODUCTION

## STATEMENT OF PREPARATION

The Board, as the accountable authority of the Australian Renewable Energy Agency (ARENA), presents the Annual Performance Statement of the Agency covering the 2019-20 financial year as required under paragraph 39(1)(a) of the *Public Governance, Performance and Accountability Act 2013* (PGPA Act).

In our 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 PURPOSE

ARENA was established by the *Australian Renewable Energy Agency 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 improve the competitiveness of renewable energy technologies and increase the supply of renewable energy through innovation that benefits Australian consumers and businesses.

## PERFORMANCE FRAMEWORK

ARENA's performance is assessed against the measures published in the Portfolio Budget Statements and Corporate Plan (Figure 8). This Annual Performance Statement provides performance results for each measure and an analysis of what these results indicate about ARENA's performance in achieving its purpose.

## ANNUAL PERFORMANCE STATEMENT

This Annual Performance Statement is presented in three sections. The first section presents ARENA's performance against the performance measures set out in the

2019-20 performance framework. These comprise measures of output, effectiveness and efficiency.

The second section presents the findings of the evaluations that were scheduled to be conducted in 2019-20. The findings report the results achieved on a program or project portfolio basis.

The third section analyses the performance data and explains how significant events during the year affected ARENA's operations, funded projects and results.

Figure 9 shows how the results presented in this Annual Performance Statement enable a clear read between the ARENA Act, 2019-20 Portfolio Budget Statements and 2019-20 Corporate Plan. The results presented below use baselines to provide a clear read across time. Reporting performance using technology and commercial readiness indicators aims to enable a clear read across entities that contribute to renewable energy technology development.



FIGURE 8: ARENA CORPORATE PLAN 2019-20

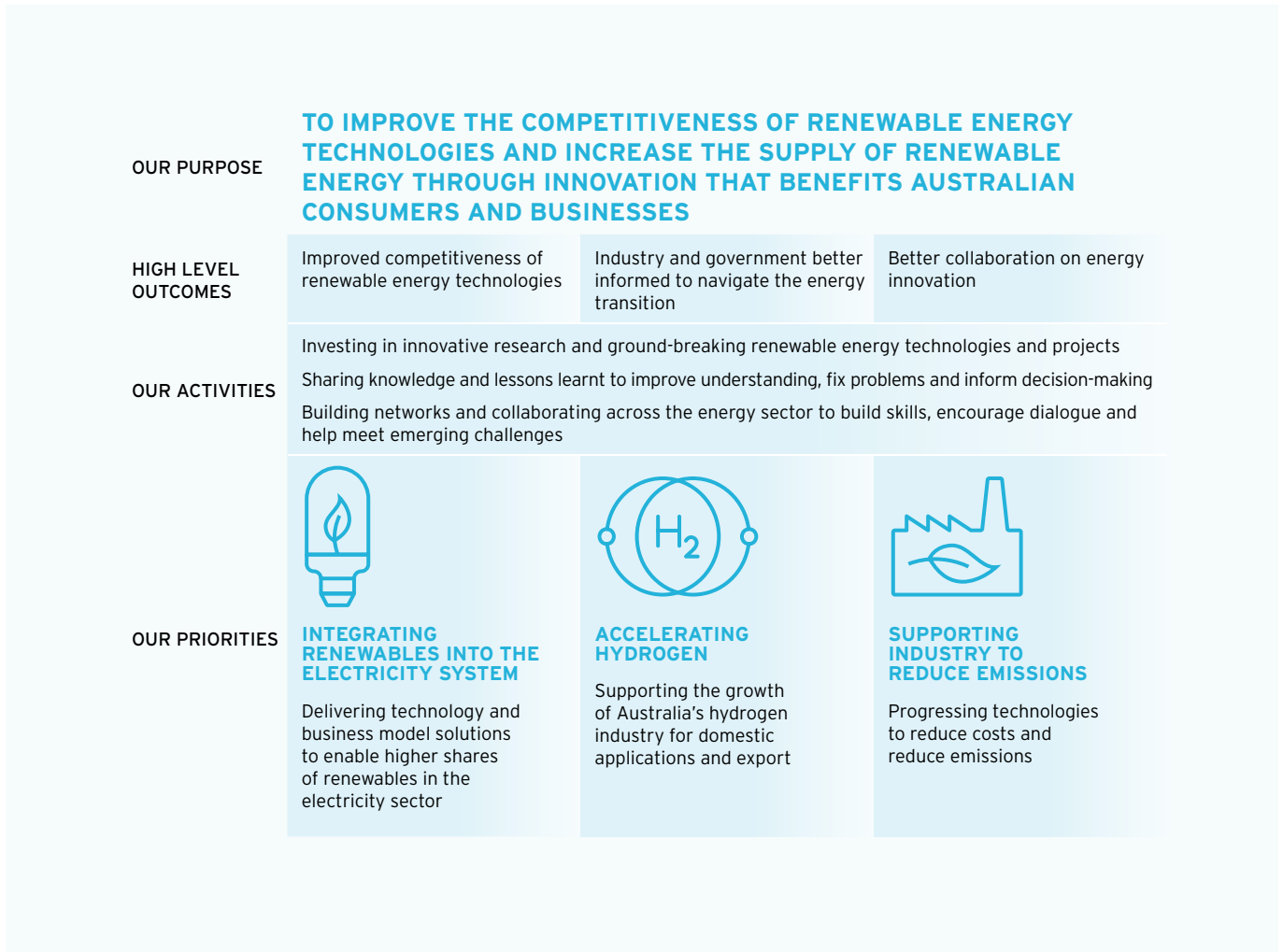
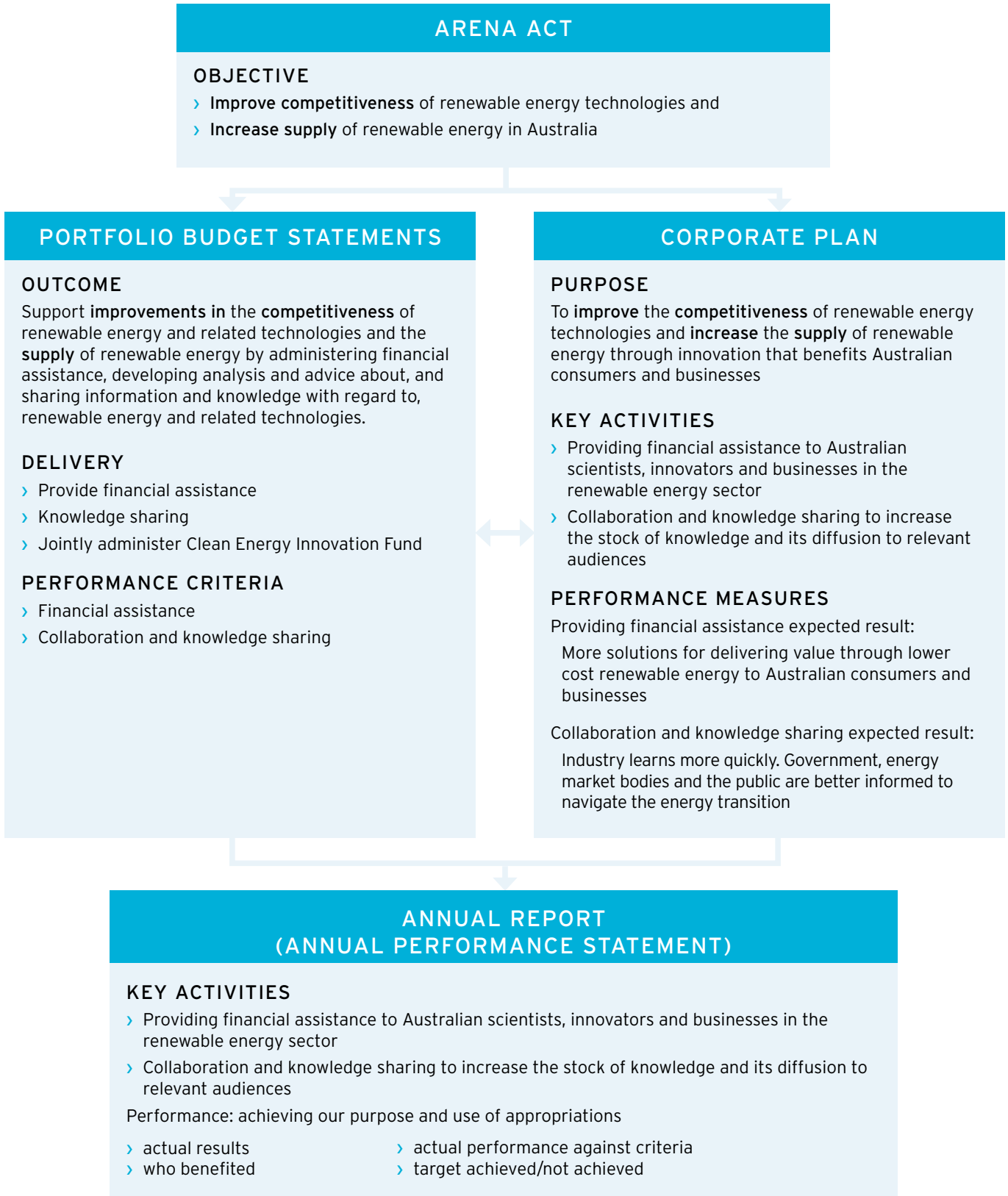


Image credit: Stock.

FIGURE 9: HOW THE ANNUAL PERFORMANCE STATEMENT ENABLES A CLEAR READ BETWEEN THE ARENA ACT, 2019-20 PORTFOLIO BUDGET STATEMENTS AND 2019-20 CORPORATE PLAN



The Ballarat Battery Energy Storage System is a utility-scale battery energy storage project located at the Ballarat Terminal Station. Image credit: AusNet Services.



# RESULTS ACHIEVED

THIS SECTION PRESENTS ARENA'S PERFORMANCE AGAINST THE MEASURES SET OUT IN THE 2019-20 PERFORMANCE FRAMEWORK. THESE COMPRISE MEASURES OF OUTPUT, EFFECTIVENESS AND EFFICIENCY.

## 1. ACTIVITY: PROVIDING FINANCIAL ASSISTANCE TO AUSTRALIAN SCIENTISTS, INNOVATORS AND BUSINESSES IN THE RENEWABLE ENERGY SECTOR.

### EXPECTED RESULTS:

More solutions for delivering value through lower cost renewable energy to Australian consumers and businesses.

### WHO BENEFITS:

Direct beneficiaries are grant recipients such as scientists, researchers, technology developers, businesses and innovators.

In the long term, Australian consumers and businesses will benefit from cost-effective options to meet their future energy needs. Australians will also benefit through more options to reduce emissions and grow the economy in a low emissions global context.

### 1.1 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 projects across the Agency's priority areas.

#### SOURCE

ARENA Portfolio Budget Statements 2019-20

#### RATIONALE FOR MEASURE

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

## RESULT

**Achieved.** ARENA provided funding of \$120 million to a total of 49 new projects in 2019-20. 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, and value of funds committed, for which a contract was executed in 2019-20. A breakdown of funding by investment priority is provided under performance measure 1.2.

Data source: Grants Management System



Image credit: ARENA.

FIGURE 10: NUMBER OF NEW PROJECTS COMMITTED BY PRIORITY AREAS IN 2019-20

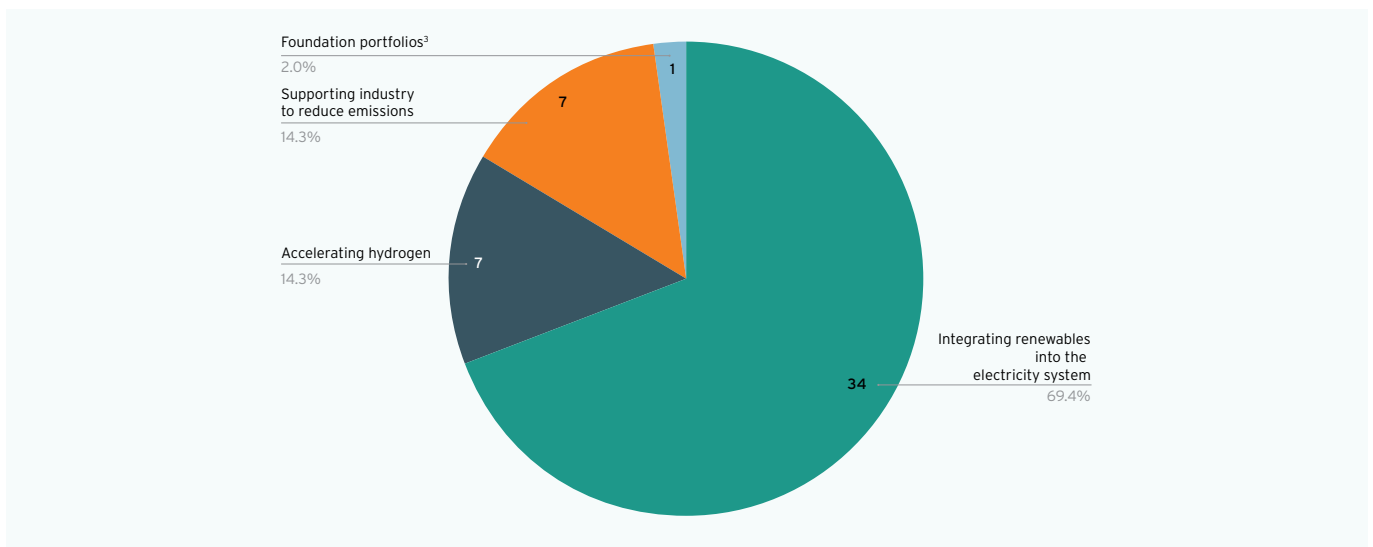
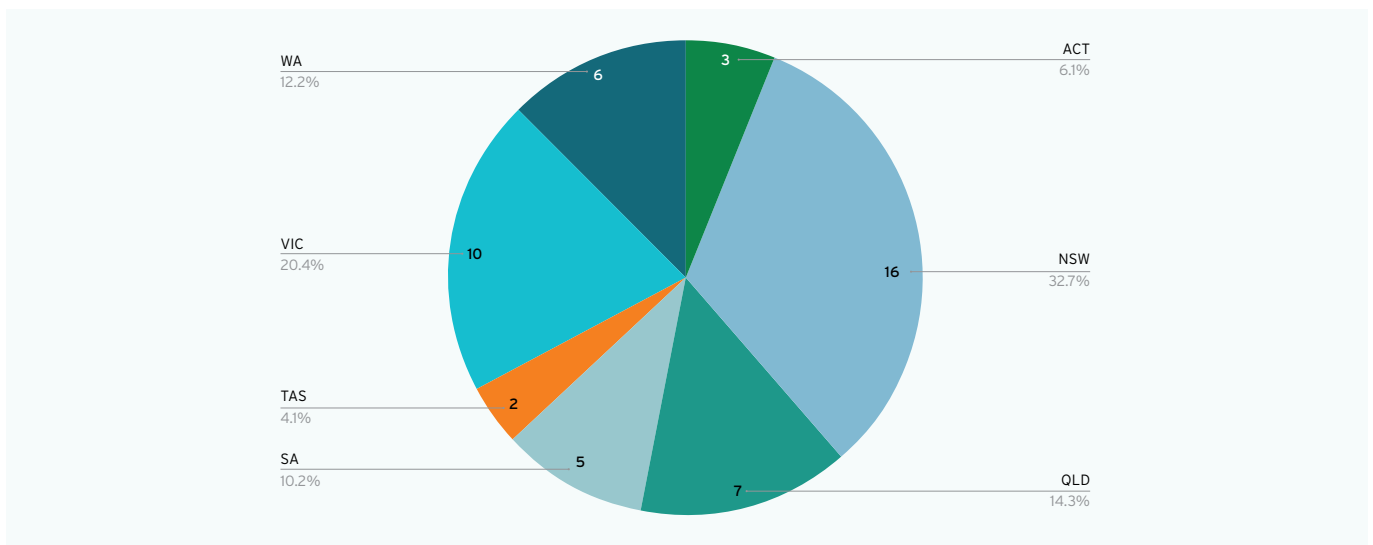
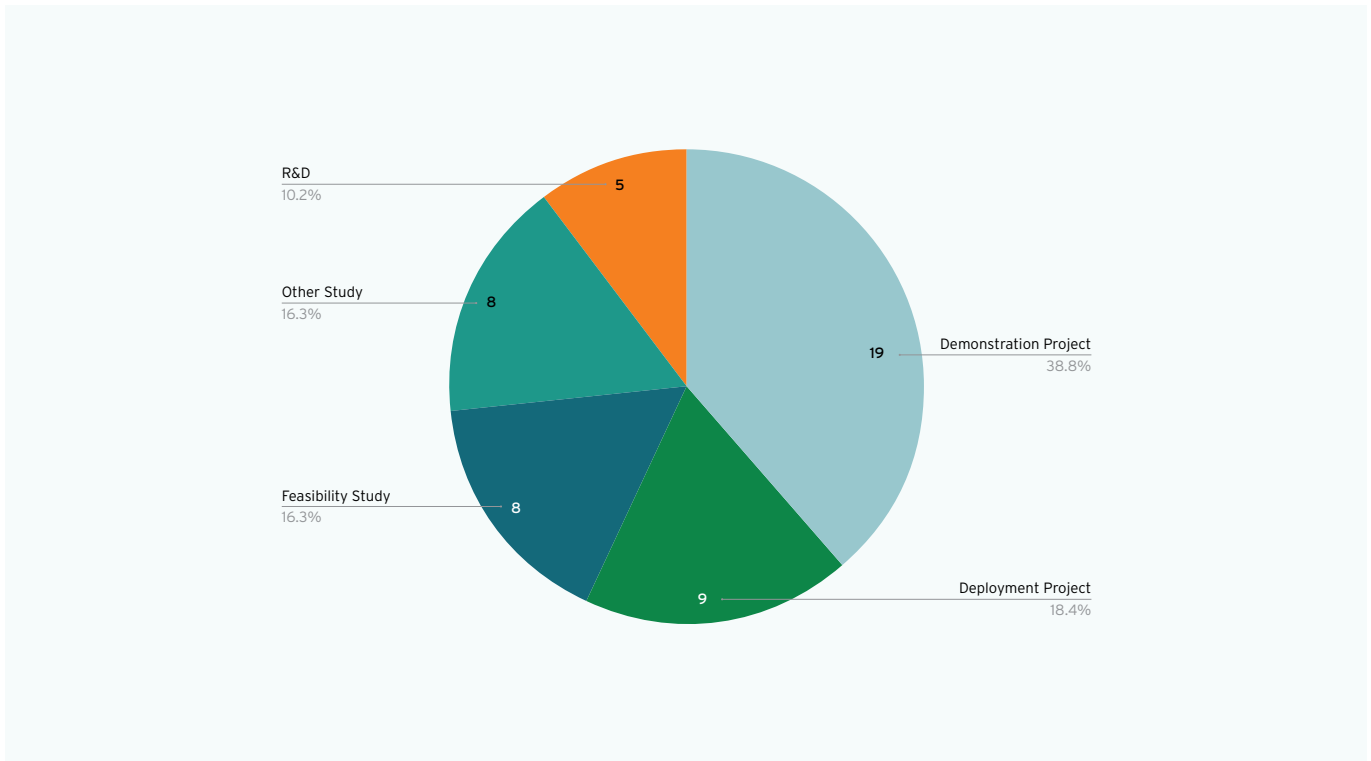


FIGURE 11: NEW PROJECTS COMMITTED BY LOCATION (STATE/TERRITORY) IN 2019-20

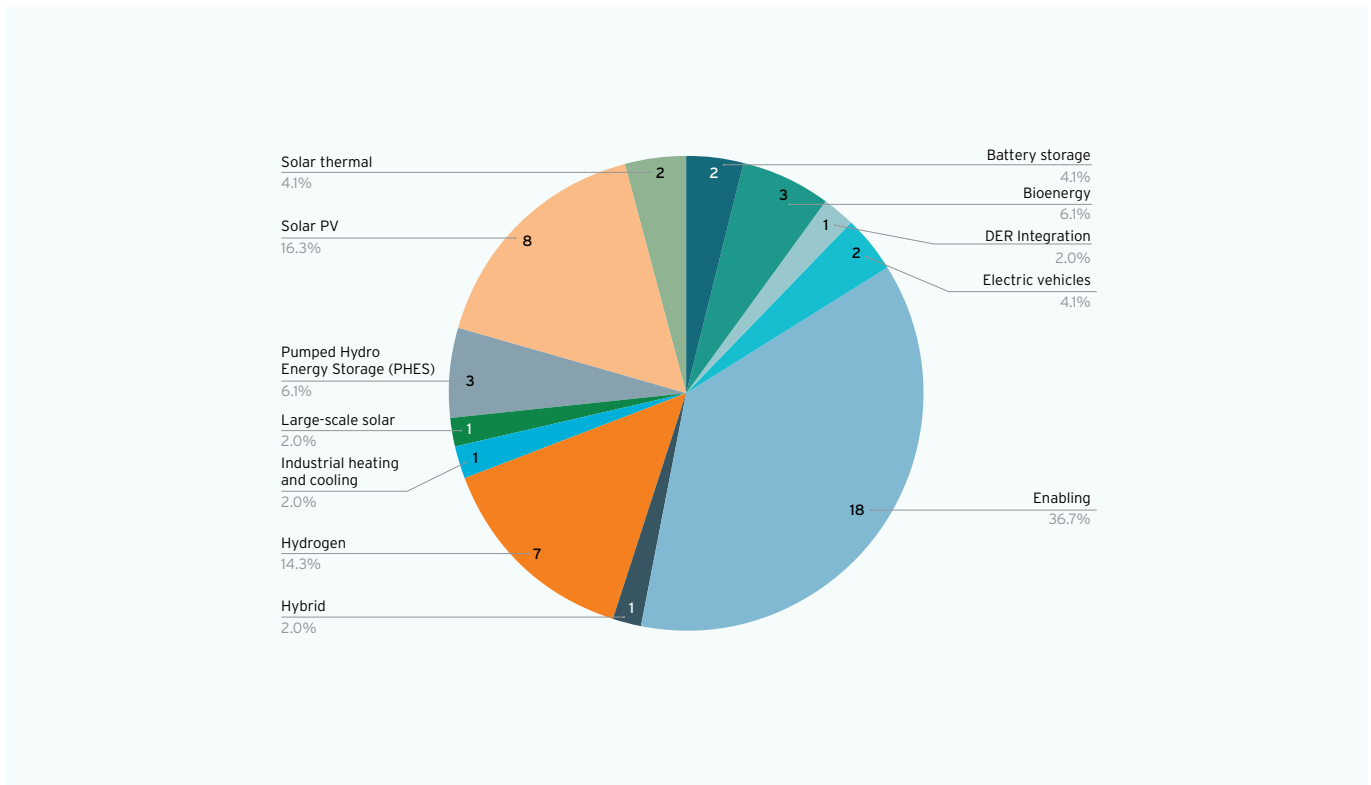


<sup>3</sup>ARENA's foundation portfolios include bioenergy projects, which can contribute to one or more of our priority areas making it a cross-cutting area of focus, as well as projects awarded funding under previous priorities where there remains benefit to be gained for the sector as lessons are learned in coming years.

**FIGURE 12: NEW PROJECTS COMMITTED BY INNOVATION STAGE IN 2019-20**



**FIGURE 13: NEW PROJECTS COMMITTED BY PRIMARY TECHNOLOGY IN 2019-20**



## 1.2 PERFORMANCE MEASURE

ARENA provides financial assistance to support renewable energy technologies across the Agency's priority areas.

\$m ARENA funds approved\*

TARGET: \$111.5 million in 2019-20

\$m ARENA funds committed

TARGET: \$140 million in 2019-20

\*ARENA's original 2019-20 Corporate Plan was published on 30 August 2019. As part of implementing the recommendations of the ANAO Performance Audit, ARENA revised its purpose statement and performance framework, and published them in an updated 2019-20 Corporate Plan. The target for funds approved for the year was amended to reflect a decision by the ARENA Board to allocate \$70 million to a Hydrogen Deployment Round, under which projects will be approved in 2020-21.

### SOURCE

ARENA Corporate Plan  
2019-20 – 2022-23 p8

### RATIONALE FOR MEASURE

This is a short-term indicator of the level of financial assistance. A breakdown by investment priority shows that grant funds are going towards the investment priorities approved by the Minister. It aligns with the Portfolio Budget Statements performance measure to 'provide assistance to new projects across the Agency's approved priority areas'.

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## RESULT

Funds approved<sup>1</sup>

**Achieved.** In 2019-20 ARENA approved a total of \$132.3 million, exceeding its target by 19 per cent.

Funds committed<sup>2</sup>

**Not achieved.** In 2019-20 ARENA committed a total of \$120.2 million, underperforming its target by 14 per cent.

During the second half of 2019-20 the reduction in actual and forecast wholesale electricity prices, along with uncertain economic conditions and the impacts of COVID-19, made finalising funding difficult. This flowed through to a lower than forecast level of contractual commitments for the year.

Data sources: Grants Management System and Funding Availability Report

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<sup>1</sup>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.

<sup>2</sup>The value of funds in executed funding contracts.

FIGURE 14: FUNDS APPROVED BY PRIORITY AREA IN 2019-20

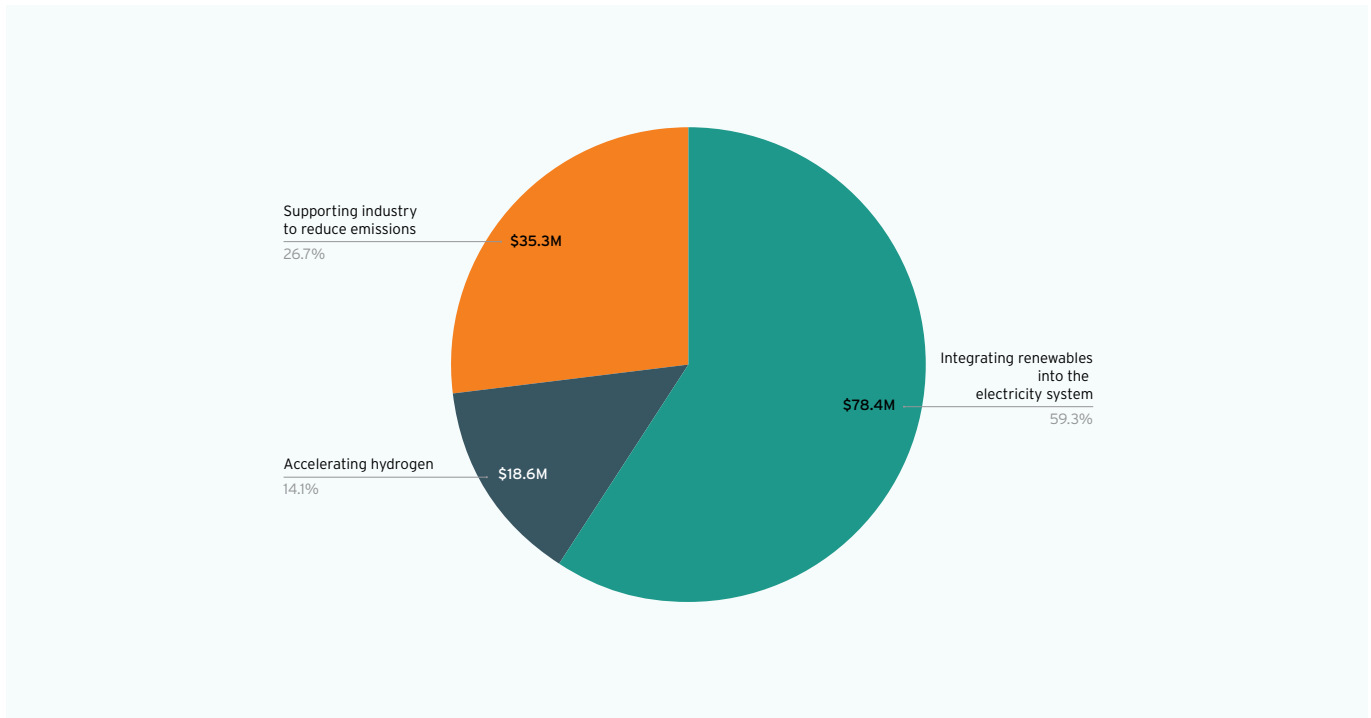


FIGURE 15: FUNDS COMMITTED BY PRIORITY AREA IN 2019-20

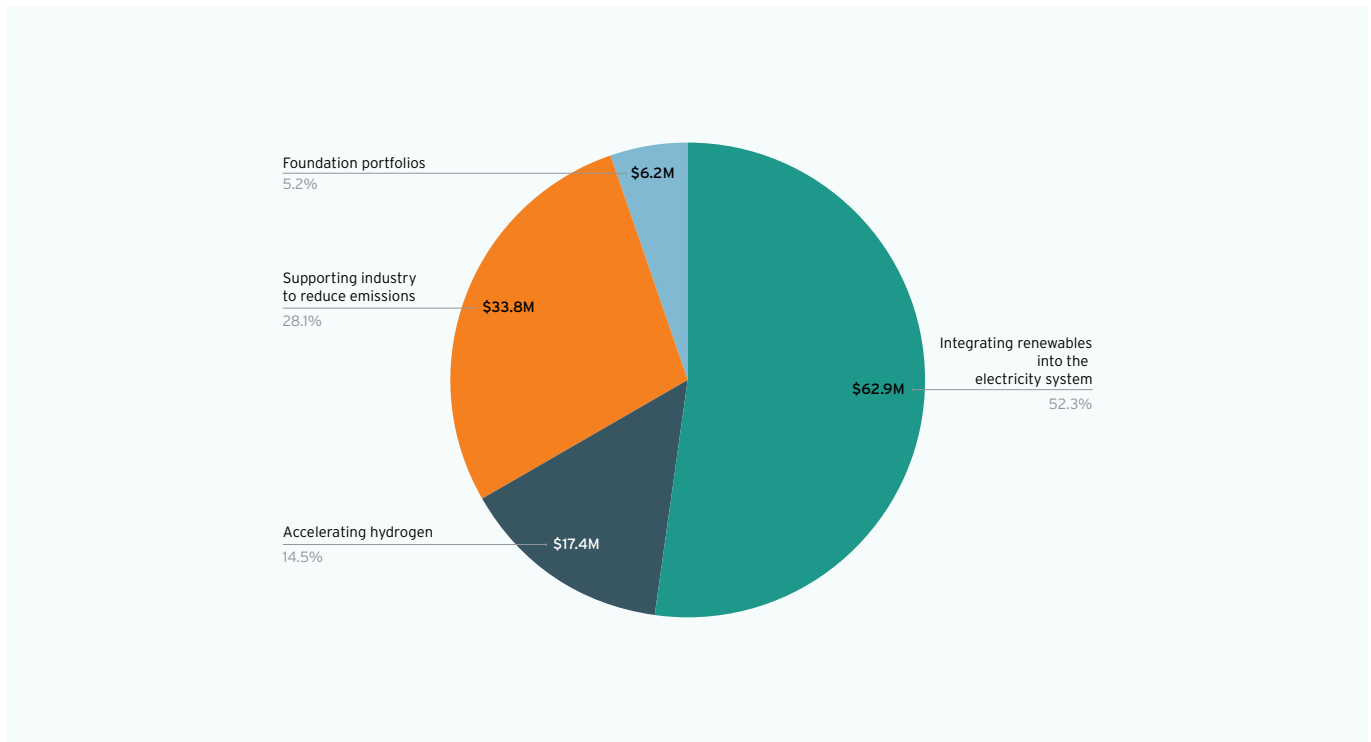




FIGURE 16: FUNDS COMMITTED BY LOCATION (STATE/TERRITORY) IN 2019-20

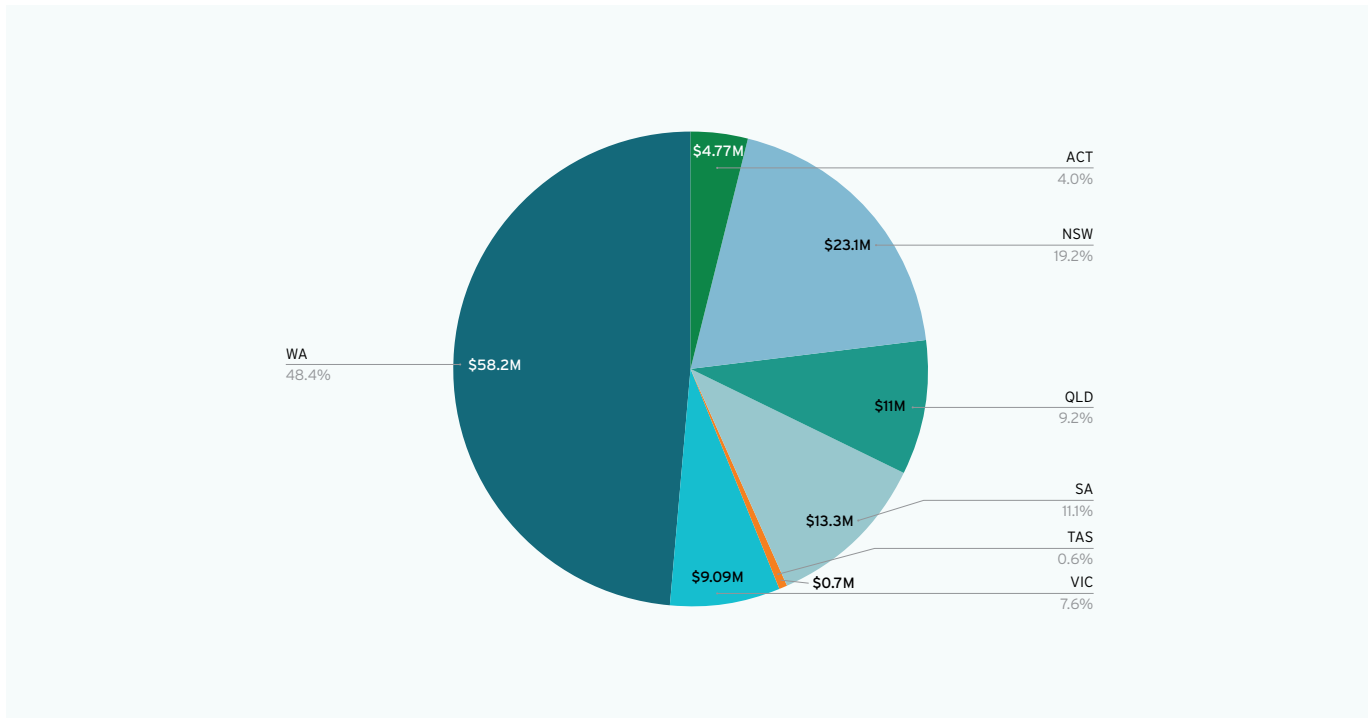


FIGURE 17: FUNDS COMMITTED BY INNOVATION STAGE IN 2019-20

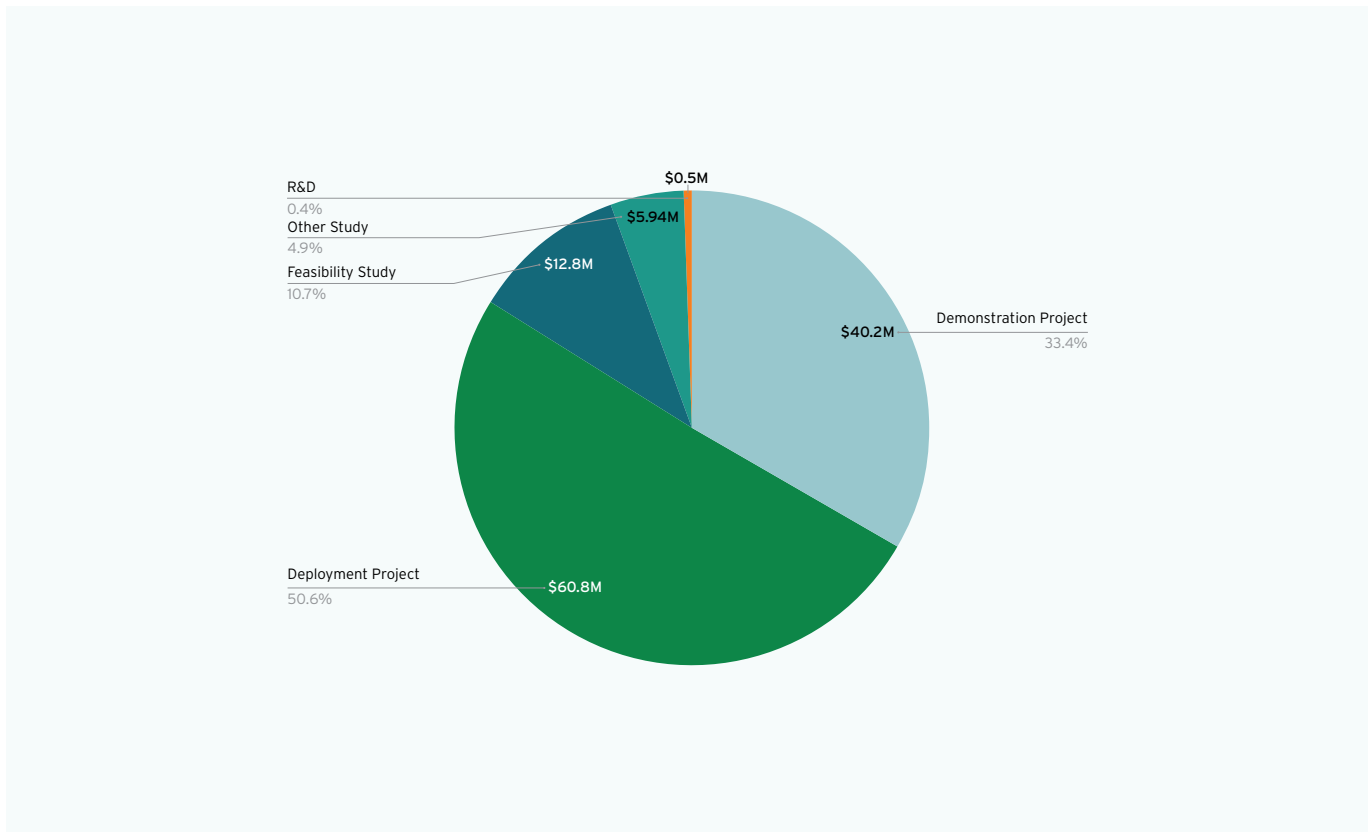


FIGURE 18: FUNDS COMMITTED BY PRIMARY TECHNOLOGY IN 2019-20

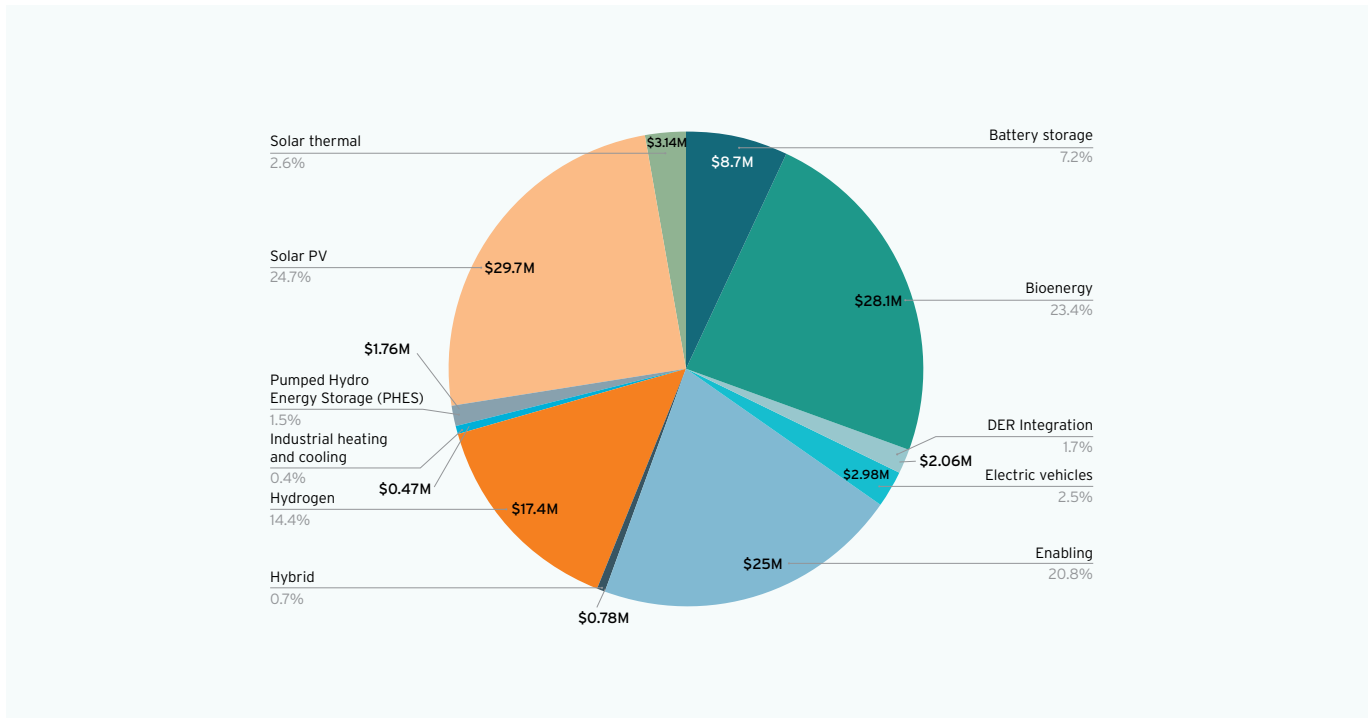


Image credit: ARENA.

**1.3 PERFORMANCE MEASURE**

Private sector capital makes taxpayers' dollars go further and achieve greater impact.

TARGET: Leverage falls between 1:2 and 1:3 across the portfolio.

**SOURCE**

ARENA Corporate Plan  
2019-20 – 2022-23 p8

**RATIONALE FOR MEASURE**

Private sector capital contributes to ARENA's purpose, and indicates genuine interest in commercialising technologies in the longer term.

The expected leverage ratio varies by innovation stage, so leverage is reported for each innovation stage and as an average across active projects in any one year.

**RESULT**

**Achieved.** In 2019-20 ARENA's overall investment leverage was 1:7.20. That is, for every dollar of ARENA funding provided to new projects, third parties contributed \$7.20.

The overall investment leverage of \$7.20 of third-party funds for every dollar of ARENA funds achieved in 2019-20 was significantly higher than ARENA's historical leverage to the end of 2018-19 of \$2.83 for every dollar of ARENA funds.

The overall investment leverage is driven by the two largest deployment projects, where commercial funders are underwriting the majority of the total project cost<sup>4</sup>. The leverage ratio excluding these two projects was 1:2.66.

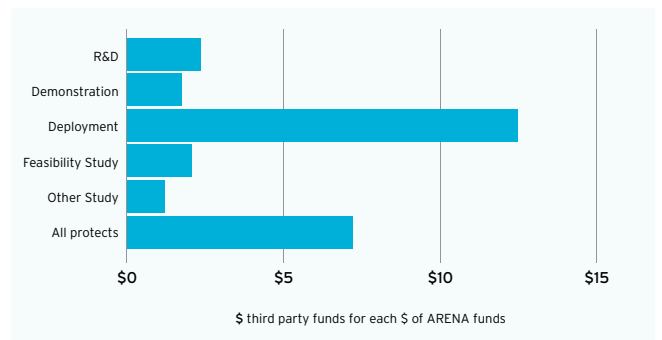
Table 4 shows investment leverage in 2019-20 by innovation stage. Figure 19 shows how leverage ratios vary by innovation stage.

Data source: Grants Management System

TABLE 4: INVESTMENT LEVERAGE BY INNOVATION STAGE

INNOVATION STAGE	INVESTMENT LEVERAGE
R&D projects	2.34
Demonstration projects	1.75
Deployment projects	12.46
Feasibility Studies	2.07
Other Studies	1.19
All projects	7.20

FIGURE 19: LEVERAGE RATIO BY INNOVATION STAGE



<sup>4</sup>East Rockingham Waste to Energy: ARENA grant \$18 million, third party funds \$493 million. Alinta Fortescue Solar Gas Hybrid Project: ARENA grant \$24.2 million, third party funds \$184.1 million.

#### 1.4 PERFORMANCE MEASURE

ARENA-funded projects advance renewable energy technology, enabling technology and energy business models.

TARGET: 80 per cent of completed projects achieve advance in Technology Readiness Level or Commercial Readiness Index indicators over the life of the project

##### SOURCE

ARENA Corporate Plan  
2019-20 – 2022-23 p8

##### RATIONALE FOR MEASURE

This medium-term measure indicates progress along the innovation pathway towards improved competitiveness.

The Technology Readiness Level (TRL) tracks progress from blue sky research to technical maturity. It applies to research, development and demonstration projects.

The Commercial Readiness Index (CRI) measures progress towards commercial viability. It assesses the commercial maturity of a technology or business models on the basis of eight indicators.

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#### RESULT

**Achieved.** In 2019-20, 100 per cent of the 29 completed<sup>5</sup> projects that were independently assessed achieved an advance in TRL or CRI indicators over the life of the project. This exceeded the target by 20 percentage points.

- › 87 per cent of projects that set out to improve technological readiness succeeded in improving Technology Readiness by one or more levels.
- › 68 per cent of projects improved technological readiness by two or more levels.
- › 70 per cent of projects were able to achieve system prototyping in an operational environment.
- › Two thirds of projects advanced the CRI summary status level. In more than half the projects each indicator was advanced.

Data source: Independent external project outcomes assessments

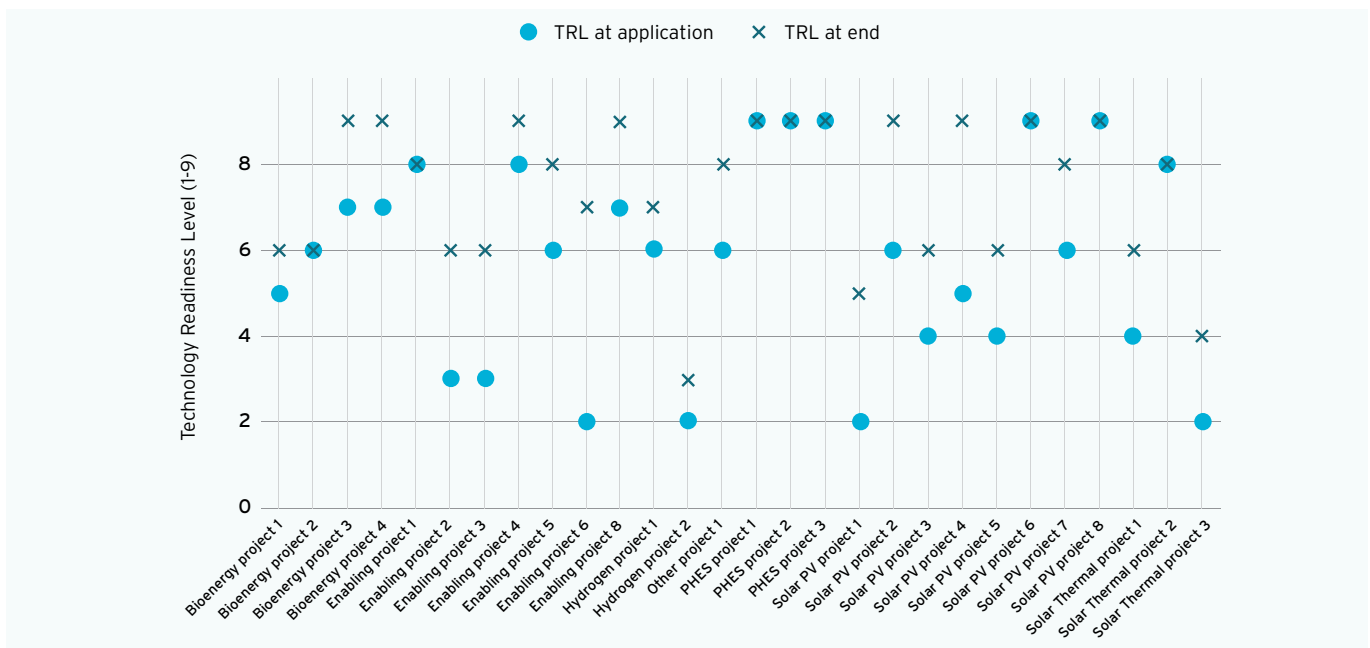
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<sup>5</sup>15 of the 50 projects completed in 2019-20 were small travel grants to attend workshops as part of ARENA's Commercialisation of Research and Development pilot initiative and these were excluded from the assessment process. Not all of the remaining projects were able to be assessed because of the lead time required. Results for the projects not assessed will be reported in the 2020-21 Annual Performance Statement.

**UNDERSTANDING TECHNOLOGY/COMMERCIAL READINESS LEVELS**

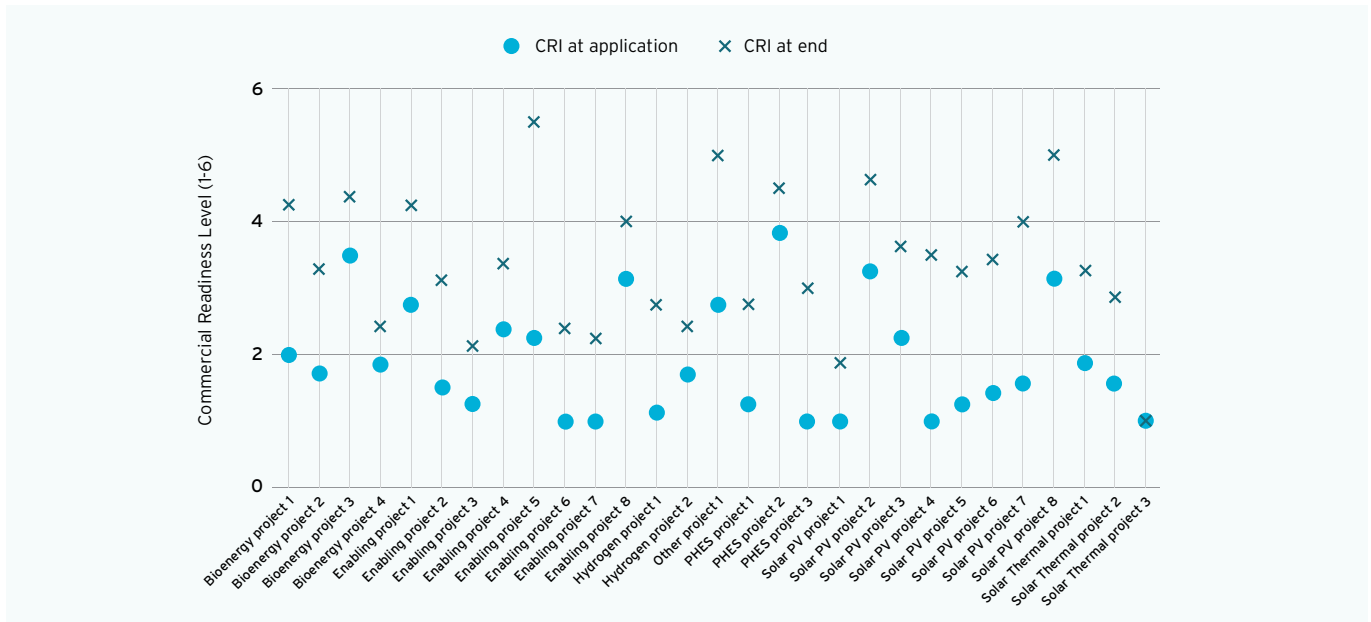
TECHNOLOGY READINESS LEVELS	LEVELS OF THE COMMERCIAL READINESS INDEX
1. Transition from scientific research to applied research	1. Hypothetical commercial proposition
2. Applied research	2. Commercial trial
3. Proof of concept validation	3. Commercial scale up
4. Standalone prototyping implementation and test	4. Multiple commercial applications
5. Thorough testing of prototyping in representative environment	5. Market competition driving widespread deployment
6. Prototyping implementations on full-scale realistic problems	6. (Most mature) Bankable asset class
7. System prototyping demonstration in operational environment	The commercial readiness index is a composite of eight indicators, which are:
8. End of system development	<ul style="list-style-type: none"> <li>&gt; Regulatory environment</li> <li>&gt; Stakeholder acceptance</li> <li>&gt; Technical performance</li> <li>&gt; Financial performance (costs)</li> <li>&gt; Financial performance (revenue)</li> <li>&gt; Industry supply chain and skills</li> <li>&gt; Market opportunities</li> <li>&gt; Company maturity</li> </ul>
9. Actual system has been thoroughly demonstrated and tested in its operational environment	

**FIGURE 20: IMPROVEMENT IN TECHNOLOGY READINESS LEVEL OF INDIVIDUAL PROJECTS**



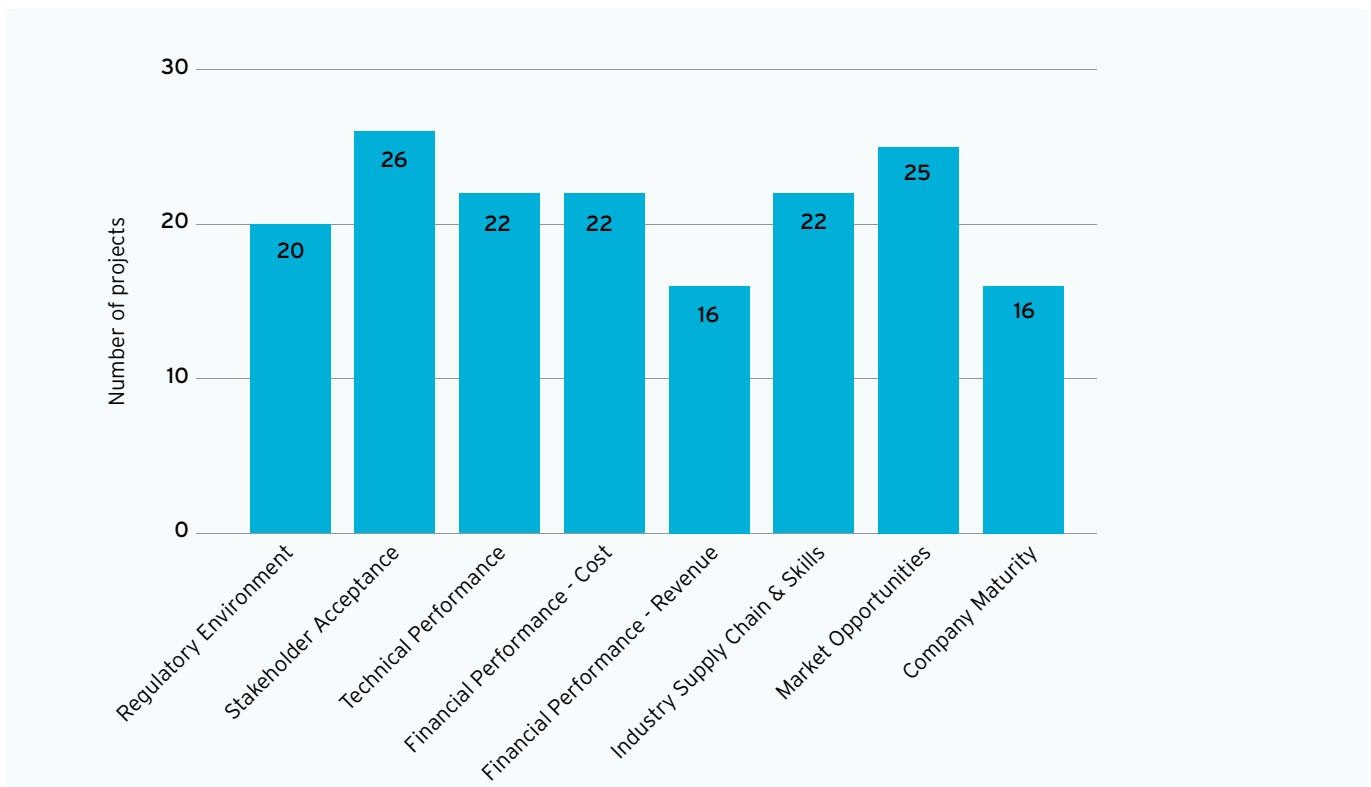
Each individual project is shown along the horizontal axis. The TRL levels are shown on the vertical axis. For each project the change in TRL is shown by a circle (TRL at start of application) and a cross (TRL at the end of the project). Of the 29 assessed projects one is not shown because TRL is not a relevant measure. Five projects were already at the maximum level of TRL 9 at the start of the project; these and the other three projects that did not progress TRL all improved at least one indicator of commercial readiness.

**FIGURE 21: IMPROVEMENT IN OVERALL COMMERCIAL READINESS LEVEL OF INDIVIDUAL PROJECTS**



Each individual project is shown along the horizontal axis. The commercial readiness level is shown on the vertical axis. For each project the change in CRI is shown by a circle (CRI at application) and a cross (CRI at the end of the project)

**FIGURE 22: NUMBER OF PROJECTS IMPROVING COMMERCIAL READINESS INDICATORS**



Each bar represents one indicator of commercial readiness, and shows how many projects (of the 29 assessed in 2019-20) contributed to improving that indicator. Most projects contribute to improving more than one indicator. The average across all indicators determines the overall level of the commercial readiness index for a particular technology.

**VAST SOLAR ADVANCES COMMERCIAL READINESS OF INNOVATIVE AUSTRALIAN TECHNOLOGY**

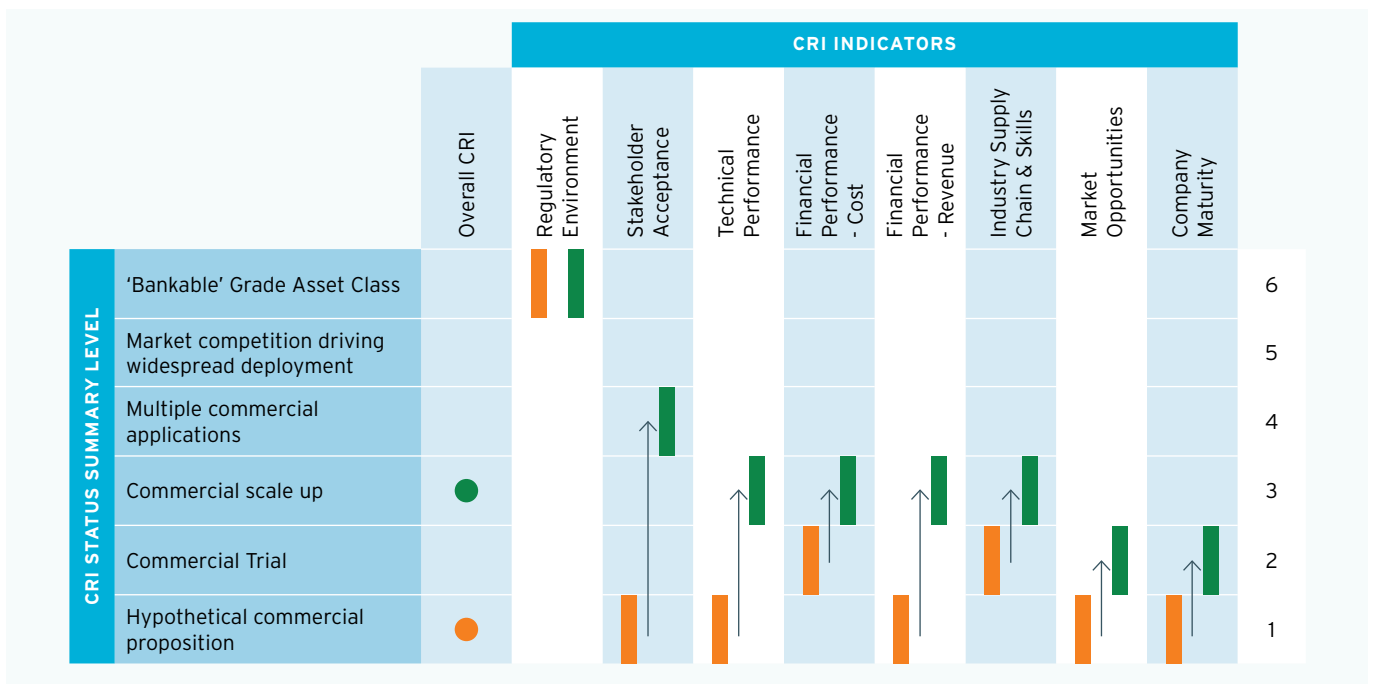
This award winning (SolarPACES 2019 Technology Innovation Award) \$20 million project successfully demonstrated the full Vast Solar modular CSP technology, from heat capture to electricity generation into the grid. The project will provide data to validate system cost/efficiency performance and progress towards the sent out energy cost target of \$100 / MWh.



Image credit: VAST Solar.

The following diagram shows how VAST Solar advanced its technology from a 'Hypothetical commercial proposition' to 'Commercial scale up'. The project succeeded in advancing the level of commercial readiness for 7 out of 8 indicators.

**FIGURE 23: VAST MODULAR CSP TECHNOLOGY COMMERCIAL READINESS CHART**



### 1.5 PERFORMANCE MEASURE

ARENA-funded projects bring forward supply of renewable energy in emerging areas.

Target: Total electricity generation from ARENA-funded demonstration and deployment projects matches the output intended at time of commitment.

#### SOURCE

ARENA Corporate Plan  
2019-20 – 2022-23 p8

#### RATIONALE FOR MEASURE

ARENA-funded demonstration and deployment projects build renewable energy capacity as a means to foster industry learning in emerging technology areas. Because the primary objective of demonstration and deployment-stage projects is to build industry experience, leading to increases in supply through follow-on projects, ARENA does not provide an overall target in advance of project commitments.

### RESULT

**Achieved.** Overall, nominal annual electricity generation at 30 June 2020 was tracking slightly above that expected at the time of commitment.

Note: The methodology for 2019-20 is based on nominal annual electricity production with key variables being plant start date, capacity, and an assumed capacity factor. The scope reported includes only the 42 projects that directly produce electricity. ARENA intends to expand the types of projects counted under this performance measure in future years.

Data source: Grants Management System and ARENA analysis



Image credit: Jemena.



**EDL COOBER PEDY HYBRID RENEWABLE ENERGY PROJECT WINS NATIONAL AND INTERNATIONAL RECOGNITION**

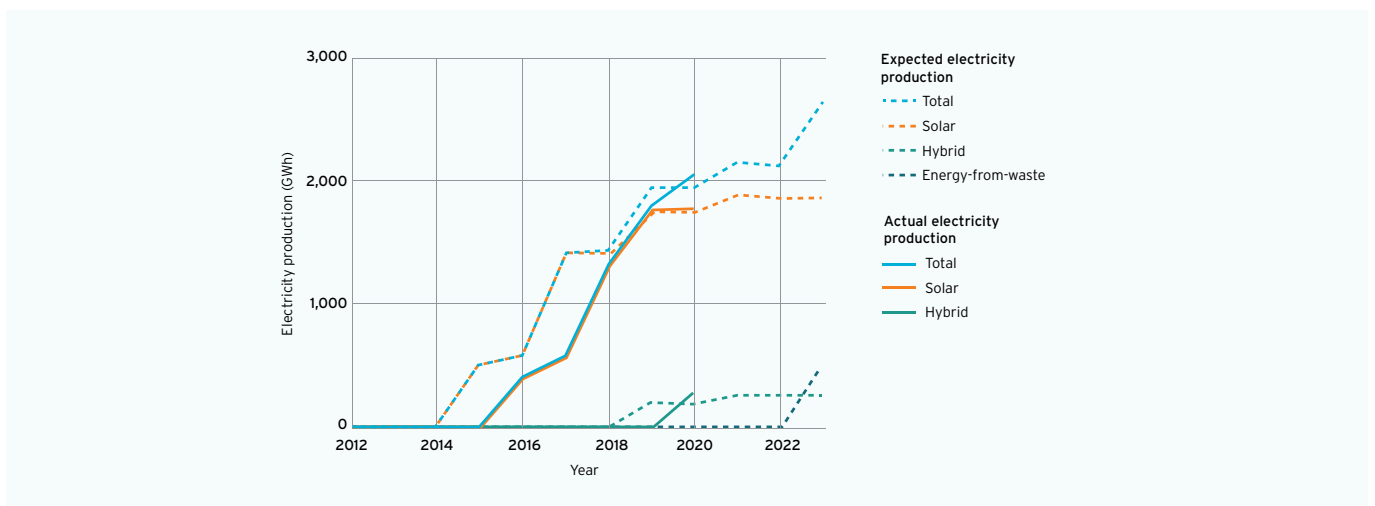
EDL's Coober Pedy Hybrid Renewable Project has followed up winning the 2018 South Australian Premier's Award with the Environmental Upgrade of the Year award at the 2019 Asia Power Awards.

Since the upgrade to hybrid renewable technology in July 2017, almost 75 per cent of the town's power has been renewable, and it has operated on 100 per cent renewable power more than 50 per cent of the time. Better still, the power station has been operating more reliably than the original diesel-only configuration, winning the strong support of the Coober Pedy Council.



Image credit: EDL Energy.

**FIGURE 24: NOMINAL ENERGY PRODUCTION - EXPECTED VS ACTUAL**



## ANALYSIS

Overall, nominal annual electricity generation at 30 June 2020 was tracking slightly above that expected at the time of commitment. Electricity production capacity of over 2,000 GWh per year is enough to supply more than 300,000 households. This is because:

- › All large-scale solar PV projects are now operating, after delays in connection to the grid or commissioning for many of them. One solar farm (Darling Downs) has upgraded its nominal capacity from a planned 110 MW to 131 MW.
- › The largest ARENA-funded hybrid project, Kennedy Energy Park, is now online after delays in connection to the grid.
- › Two remote area hybrid projects started electricity production in 2019-20, slightly ahead of expected start dates in 2020-21. These projects generally combine solar PV, wind energy, and enabling technologies such as batteries and advanced control systems.

The Vast Concentrated Solar Thermal 1.1MWe pilot plant continued operating in 2019-20 to collect operational data, having successfully demonstrated sustained output in 2018-19. This was behind its initial planned schedule, which is not unusual for a project demonstrating an emerging technology.

Vast Solar is now pursuing a commercial-scale project using this technology.

ARENA has committed funds to two energy-from-waste facilities, at East Rockingham and Kwinana. These plants are expected to begin production in 2022-23<sup>6</sup>.

One active wave energy project (the Wave Swell 200 kW pilot) is expected to begin operation in 2021. Earlier wave energy projects not included in this analysis include Carnegie Clean Energy's Perth Wave Energy Project, which was operational for a period of 13 months in 2014 and 2015 for a cumulative 14,000 operating hours,

and BioPower Systems 250 kW BioWAVE device that was deployed in 2016 but never commissioned.

Historically, the major factors affecting electricity generation from demonstration and deployment projects have been projects not proceeding to plan, or connection and commissioning delays. This is not unusual for projects that, by their nature, are demonstrating and deploying new technologies, where there is an inherent risk some will fail.

ARENA plans to reduce its target for future years to reflect this inherent failure risk. The reasons for failure inform future strategy - either identifying new challenges to solve, or in some cases highlighting inherent risks that might mean refocusing effort on other technologies.

---

## OTHER RELEVANT FACTORS

Significant factors not accounted for in this analysis include the effects of the 2019-20 bushfires, actual weather conditions or plant performance compared to forecast (which affects energy output at the point of connection), changes to marginal loss factors (which affects output delivered to end customers), and curtailment. It is likely that these issues affected energy production from ARENA-funded projects, reducing actual output compared to that reported here.

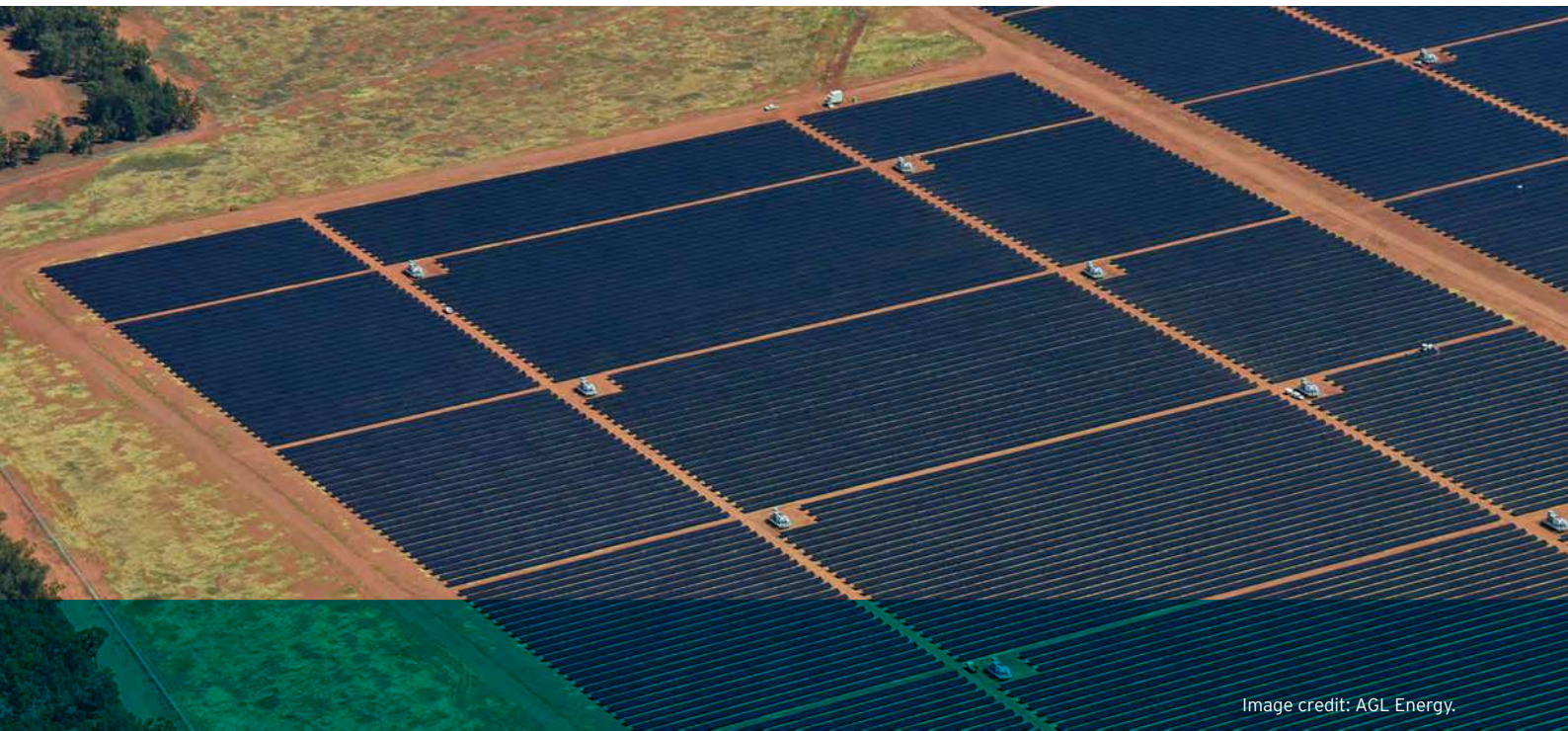
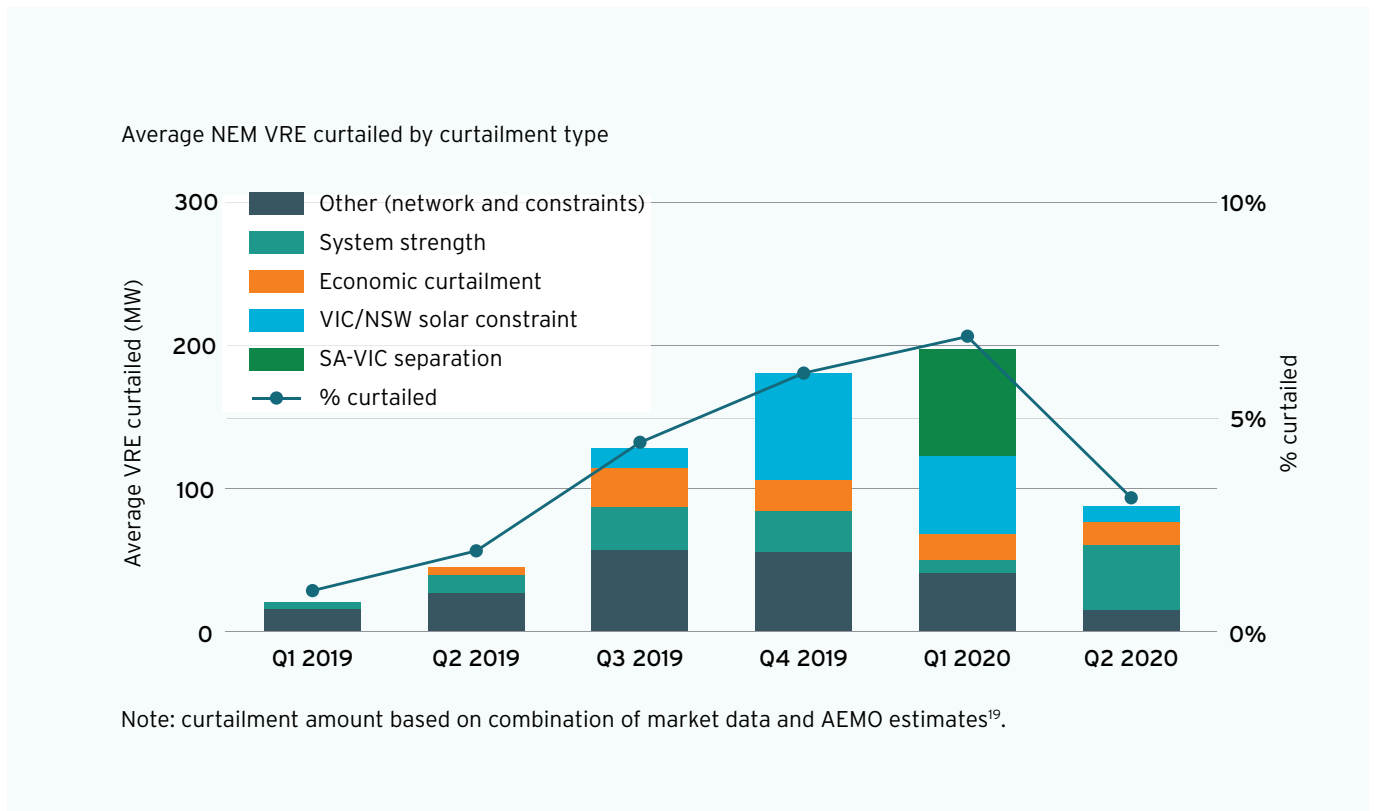
AEMO analysis in its Quarterly Energy Dynamics report for Q2 2020 shows the potential significance of

curtailment. For variable renewable energy facilities across the entire market, curtailment was around 3.2 per cent (down from 6.9 per cent in Q1 2020). Some sources of curtailment can be addressed through improved techniques for managing the electricity system, while others (such as economic curtailment) are to be expected in a high renewables electricity system. Addressing issues such as system strength is a focus for several ARENA-funded power system security projects.

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<sup>6</sup>The energy output from these facilities is a combination of renewable energy (from biomass in the waste stream) and non-renewable energy. The proportion will vary depending on the composition of the waste stream. 48.5 per cent renewable energy content was assumed for the Kwinana project life-cycle assessment.

FIGURE 25: AVERAGE NEM VRE CURTAILED BY CURTAILMENT TYPE<sup>7</sup>



<sup>7</sup>AEMO Quarterly Energy Dynamics, Q2 2020, <https://aemo.com.au/-/media/files/major-publications/qed/2020/qed-q2-2020.pdf?la=en&hash=D1A82334D16E915F-CB1B628640A05223>



Image credit: ARENA.

## 2. ACTIVITY: COLLABORATION AND KNOWLEDGE SHARING TO INCREASE THE STOCK OF KNOWLEDGE AND ITS DIFFUSION TO RELEVANT AUDIENCES

### EXPECTED RESULTS:

Industry learns more quickly. Government, energy market bodies and the public are better informed to navigate the energy transition.

### WHO BENEFITS:

Industry, energy market bodies, policy makers, consumers and businesses benefit through a faster, smoother and less expensive energy transition.

### 2.1 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

ARENA Portfolio Budget  
Statements 2019-20

#### 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 results for the two following performance measures:

- › ARENA funds or produces, and makes available, new knowledge products
- › ARENA shares knowledge to enhance the competitiveness of renewable energy technologies.

## 2.2 PERFORMANCE MEASURE

ARENA funds or produces, and makes available, new knowledge products.

Target: Total of 400 knowledge sharing deliverables completed and knowledge sharing products produced.

### SOURCE

ARENA Corporate Plan  
2019-20 – 2022-23 p.9

### RATIONALE FOR MEASURE

This short-term measure indicates the level of knowledge sharing activity. Grant recipients share knowledge by producing knowledge sharing deliverables that help others learn from their experience. ARENA produces a range of knowledge sharing products that complement the knowledge sharing activities undertaken as part of every ARENA-funded project.

## RESULT

**Achieved.** A total of 1170 knowledge sharing deliverables were completed and knowledge sharing products were produced.

- › A total of 369 knowledge sharing deliverables were produced in 2019-20.
- › A total of 801 knowledge sharing products were produced in 2019-20.

Table 5 provides a breakdown of knowledge sharing products.

COVID-19 caused project delays, which were reflected in a lag in milestone submissions in April, May and June. As a result the number of knowledge sharing deliverables was lower than expected.

Data source: Grants Management System, Corporate Affairs dashboard, Knowledge Bank uploads

TABLE 5: KNOWLEDGE SHARING PRODUCTS BY CATEGORY

PRODUCT <sup>a</sup>	NUMBER
ARENAWIRE newsletter editions	11
Insights newsletters	10
Public reports uploaded to Knowledge Bank	168
Public presentations uploaded to Knowledge Bank	22
Public reports commissioned or prepared by ARENA Knowledge Sharing team and uploaded to the ARENA Knowledge Bank	13
Blog posts	72
Videos	18
Infographics	2
Project pages	38
Podcasts	6
Policy submissions	5
Media releases	47
Social media posts (LinkedIn - 103; Facebook - 122; Twitter - 164 posts)	389
<b>TOTAL</b>	<b>801</b>

<sup>a</sup>The categories of knowledge sharing products have changed compared to those reported in the 2018-19 Annual Performance Statement. This year we have included five additional products: ARENAWIRE newsletter editions, project pages, podcasts, social media posts and media releases. This change has been made to provide a more complete account of ARENA's knowledge sharing activities. For the purposes of ensuring a clear read across reporting years, the results based on the 2018-19 categories would be a total of 310 knowledge sharing products resulting in a total of 679 knowledge sharing deliverables completed and knowledge sharing products produced.

**2.3 PERFORMANCE MEASURE**

ARENA shares knowledge to enhance the competitiveness of renewable energy technologies.

Target: At least 75 per cent of stakeholders surveyed report that knowledge shared by ARENA has informed part of their decision making processes.

**SOURCE**

ARENA Corporate Plan  
2019-20 – 2022-23 p.9

**RATIONALE FOR MEASURE**

Sharing knowledge about renewable energy technologies should help industry learn more quickly and can inform regulatory change. This measure provides evidence that knowledge is being shared with people who can (and do) use it.

**RESULT**

**Achieved.** 79 per cent of respondents to ARENA's 2019 Stakeholder Survey reported having used ARENA resources and information to support decision making within their organisation. This includes responses of "yes", "yes, occasionally" and "yes, rarely".

Data source: Australian Renewable Energy Agency stakeholder research consolidated report, November 2019

**METHODOLOGY**

The results were gathered using a mix of qualitative (23 in-depth interviews) and quantitative research (173 12-minute surveys). Data was gathered between June and August 2019.

All results were subject to statistical significance testing carried out at a 95 per cent confidence level (p=0.05). The total sample size for the survey was 173.

**2.4 PERFORMANCE MEASURE**

The public is better informed about renewable energy technologies and the role they can play in Australia's energy transition.

Target: 10 per cent increase in visitor traffic (unique page views) to ARENA website.

**SOURCE**

ARENA Corporate Plan  
2019-20 – 2022-23 p.9

**RATIONALE FOR MEASURE**

Australian consumers and businesses are the long-term beneficiaries of a smooth transition to a low-carbon energy system. Their choices also influence the take-up of renewable energy. ARENA uses several communication methods to inform the public and drive deeper engagement via our website. Visitor traffic is a measurable indicator of the overall level of engagement.

**RESULT**

**Achieved.** There was a 43 per cent increase in visitor traffic (unique page views) to the ARENA website. A range of indicators demonstrate that ARENA achieved strong results in better informing the public about renewable energy technologies and the role that they can play in Australia's energy transition. The table below provides evidence of ARENA's performance.

Data source: Google Analytics

**ANNUAL PERFORMANCE  
STATEMENT 2019-20**

TABLE 6: ARENA'S PERFORMANCE IN BETTER INFORMING THE PUBLIC

PERFORMANCE INDICATOR	PERCENTAGE CHANGE 2018-19 TO 2019-20
Unique page views	43% increase
Unique document downloads The number of times a visitor downloads an ARENA website document once	89% increase
ARENAWIRE subscribers The number of emails subscribed to the ARENAWIRE monthly e-newsletter	31% increase
Video views The number of times an ARENA video has been watched	24% increase

The percentage change is calculated using the number of views, downloads and subscribers in 2018-19 compared to the number in 2019-20.



The Renewable Hydrogen Deployment Funding Round information and consultation session in Melbourne. Image credit: ARENA.

## **2.5 PERFORMANCE MEASURE**

Collaboration partners value collaboration with ARENA.

Target: 85 per cent of survey respondents rate ARENA's performance as "good" or better.

### **SOURCE**

ARENA Corporate Plan  
2019-20 – 2022-23 p.9

### **RATIONALE FOR MEASURE**

Positive feedback and tangible outcomes demonstrate that collaboration is relevant and useful and that it is facilitated effectively.

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## **RESULT**

**Achieved.** 86 per cent of participants in the 2019 ARENA Stakeholder Survey rated ARENA's overall performance in accelerating Australia's shift to affordable and reliable renewable energy as "good" or better.

ARENA's overall performance is supported by its funding, knowledge sharing and collaboration activities. ARENA engages with a diverse range of stakeholders, hailing from various sectors including all levels of government, industry associations, finance providers, university researchers, media, think tanks, funding recipients and service providers, workshop attendees and online subscribers.

Stakeholders' rating of ARENA's effectiveness as a catalyst for collaboration averaged a rating of 7.6 out of 10<sup>9</sup>. Stakeholders value the way in which ARENA's regular innovation labs and industry events bring different stakeholders in the industry together. In an industry where funding is tight, collaboration is seen to be necessary in order to increase the collective advancement of the industry as a whole.

ARENA's collaborative style on projects is the most valued aspect of ARENA's engagement process.

ARENA's knowledge sharing activities are thought to fulfil an important role in fostering collaboration within the industry.

Data source: Australian Renewable Energy Agency stakeholder research consolidated report, November 2019

## **METHODOLOGY**

The results were gathered using a mix of qualitative (23 in-depth interviews) and quantitative research (173 12-minute surveys). Data gathering was undertaken between June and August 2019.

All results were subject to statistical significance testing carried out at a 95 per cent confidence level (p=0.05). The total sample size for the survey was 173.

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<sup>9</sup>ARENA set a target in its August 2019-20 Corporate Plan that 85 per cent of survey respondents rate ARENA's performance as "good" or better, drawing on stakeholder perceptions of ARENA's overall performance in fulfilling its purpose.

Survey data specifically relating to collaboration included interview responses, but was collected on a numerical rating scale rather than "good", "very good", "extremely good".





Thinfilm solar cell technology. Image credit: ARENA.

**NETWORKS RENEWED PROJECT WINS 5TH INNOVATION AWARD**

The University of Technology Sydney Networks Renewed project won the 2019 Clean Energy Innovation Award for demonstrating that residential solar and batteries can support network voltage and provide a realistic alternative to traditional network side solutions.

The overall value of the project was in bringing Distributed Network Service Provider partners one step closer to being comfortable with replacing traditional network-side solutions with distributed energy options.



Image credit: Stock.

**2.6 PERFORMANCE MEASURE**

ARENA operates efficiently in the administration of public funds.

Target: Operating costs do not exceed 12 per cent of total expenditure over a rolling five year period.

**SOURCE**

ARENA Corporate Plan  
2019-20 – 2022-23 p.9

**RATIONALE FOR MEASURE**

This efficiency measure demonstrates efficient use of taxpayer resources. A trailing five-year average will even out project delivery variance.

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**RESULT**

**Not achieved.** ARENA's operating costs over the five-year period to 2019-20 were 14.8 per cent of total expenditure.

ARENA managed an average of 232 projects over the year. Despite the impacts of bushfires and COVID-19, ARENA made more than \$193 million in milestone payments (including the accruals for 2019-20). This expenditure was within 3 per cent of our \$200 million target.

Data source: Financial Management Information System

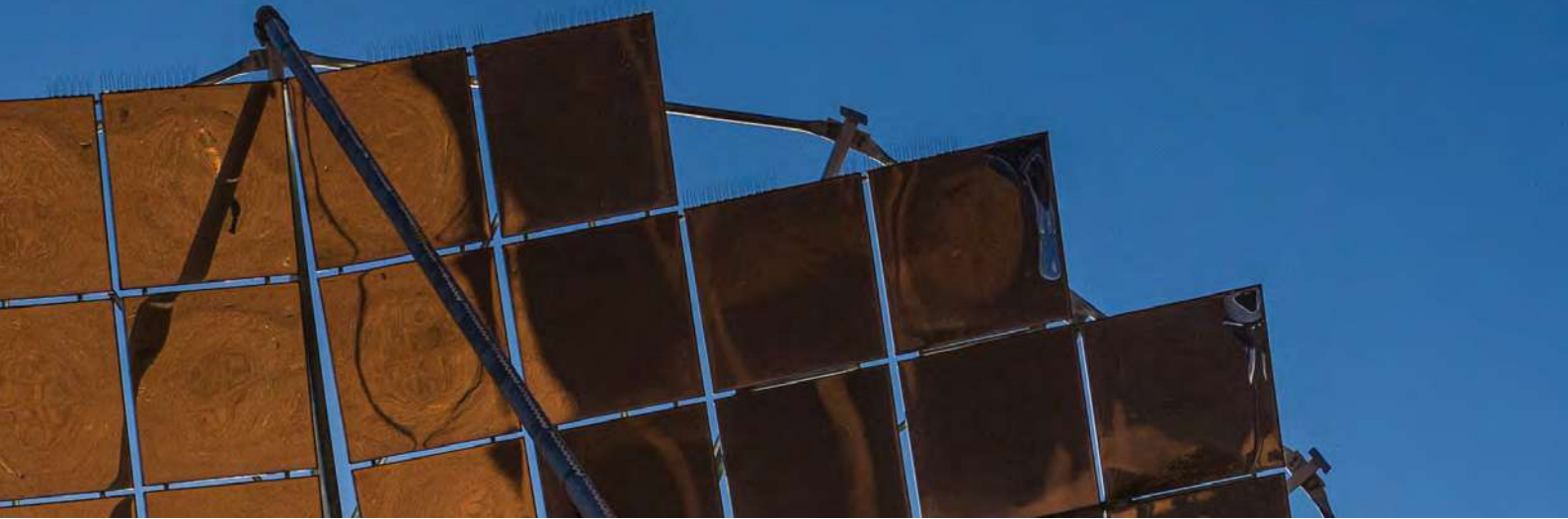
**METHODOLOGY**

The measure is calculated as a trailing average of the preceding five years. Performance in 2019-20 is significantly influenced by the preceding four years which range from 16.03 per cent to 17.82 per cent.

By 2021-22, performance should converge to 12 per cent.

# FINDINGS OF EVALUATIONS

IN 2019-20, ARENA CONDUCTED OR COMMISSIONED EVALUATIONS ON THE FOUR TOPICS IDENTIFIED IN THE 2019-20 CORPORATE PLAN.



The first was an evaluation of ARENA's impact and effectiveness - an assessment of all the programs and activities undertaken by the Agency since its inception. The other three evaluations assessed specific programs or initiatives: ARENA's International Engagement Program, the Commercialisation of R&D pilot funding initiative and the Renewable Energy Venture Capital Fund Program. Below are the evaluation findings as they relate to ARENA's purpose. The objective of these evaluations was to assess

whether, and to what extent, ARENA as a whole and the specific programs, have contributed to improvements in the competitiveness of renewable energy technologies and an increase in the supply of renewable energy across our priority areas and other major focus areas from previous years.

## EVALUATION OF ARENA'S IMPACT AND EFFECTIVENESS

### CONDUCTED BY ERNST & YOUNG

Report available on ARENA's website [www.arena.gov.au](http://www.arena.gov.au)

### FINDINGS

The evaluation found that ARENA's activities contributed to the achievement of its legislated purpose. Ernst & Young reported that, "Through ongoing support of R&D, demonstration and deployment projects, ARENA has contributed to a more competitive renewables sector, reducing costs and advancing new technologies and will enable further improvements into the future."

It also noted that "A strong commitment to knowledge sharing embedded across ARENA's programs keeps industry and government better informed by sharing information to improve future project delivery and industry capability."

Additionally, it was determined that ARENA contributed to each of the following impacts:

- › building and enhancing technology pathways and fostering innovation
- › development of industry capacity and capability building
- › creating new supply chains
- › an electricity system with more renewable energy, reducing costs and emissions
- › changes to market rules and frameworks
- › direct and indirect economic impacts
- › other social benefits and impacts such as those associated with avoided greenhouse gas emissions.

**MID-TERM EVALUATION OF ARENA'S INTERNATIONAL ENGAGEMENT PROGRAM**

**CONDUCTED BY CLEAR HORIZON**

Report available on ARENA's website [www.arena.gov.au](http://www.arena.gov.au)

**ABOUT THE PROGRAM**

The International Engagement Program (IEP) is designed to support greater Australian participation in international renewable energy collaborations.

ARENA launched the IEP in 2017. Under the IEP, ARENA administers \$5 million in grant funding to 12 projects to participate in the International Energy Agency (IEA) Technology Collaboration Programmes (TCPs) and Mission Innovation Challenges (MI Challenges). The projects cover 12 technology R&D areas and a range of recipient organisations. ARENA also delivers knowledge sharing activities to help spread ideas accessed through international engagement.

Figure 26 shows the program logic.

**FIGURE 26: INTERNATIONAL ENGAGEMENT PROGRAM LOGIC**



**FINDINGS**

The evaluation found that, overall, the IEP is appropriately designed and has been effective at achieving the intended outcomes of the program. The IEP's current mix of 12 projects was found to be appropriately aligned to ARENA's strategic direction. While it is too early to assess the IEP's impact against ARENA's legislative objectives, based on evidence of IEP's effectiveness so far it was determined that the IEP will likely contribute to these objectives in the longer term.

**EVALUATION OF THE COMMERCIALISATION OF R&D PILOT**

**CONDUCTED BY ARENA**

Report available on ARENA's website [www.arena.gov.au](http://www.arena.gov.au)

**ABOUT THE PROGRAM**

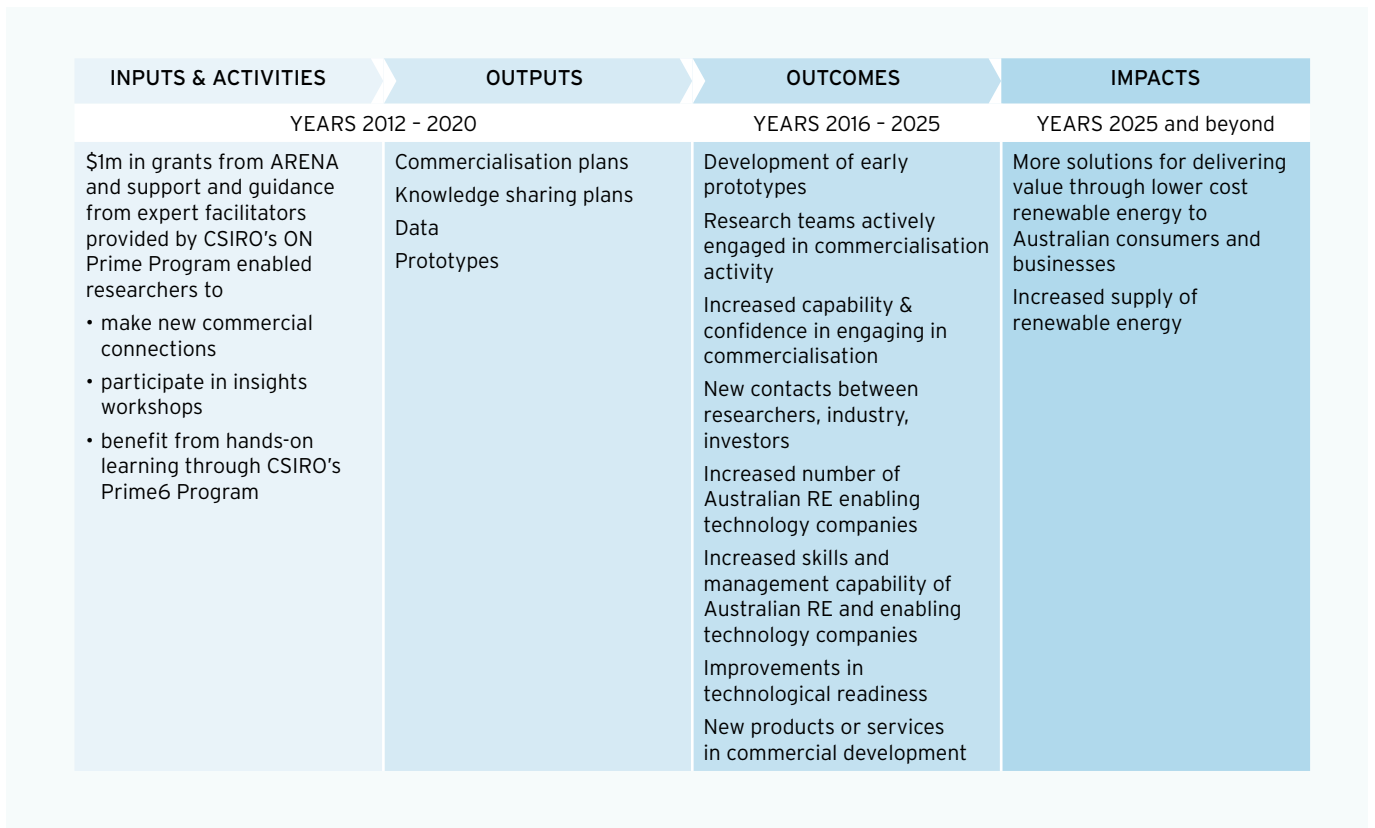
The Commercialisation of R&D pilot funding initiative was run in early 2019 to support the translation of renewable energy technology R&D into commercial outcomes, leading to a greater number of solutions for delivering secure, reliable and affordable energy within the next 5 to 10 years.

Impact can be challenging to deliver at this stage of development, and it was a gap in ARENA's existing grant funding programs.

The initiative was delivered in conjunction with the CSIRO's ON Prime program. Up to \$1 million was available for grants of \$100,000 each, for projects of up to one year duration.

Figure 27 shows the program logic.

FIGURE 27: COMMERCIALISATION OF R&D PROGRAM LOGIC



**FINDINGS**

The evaluation found the design of the initiative was appropriate to 'filling the gap'. While it is too early to assess the medium and long-term outcomes, the evaluation found that the initiative was very effective in delivering its short-term outcomes and is therefore on track to achieving its longer-term outcomes and impacts.

**MID-TERM EVALUATION OF THE RENEWABLE ENERGY VENTURE CAPITAL FUND PROGRAM**

**CONDUCTED BY UNIVERSITY OF  
TECHNOLOGY SYDNEY**

Report available on ARENA's website [www.arena.gov.au](http://www.arena.gov.au)

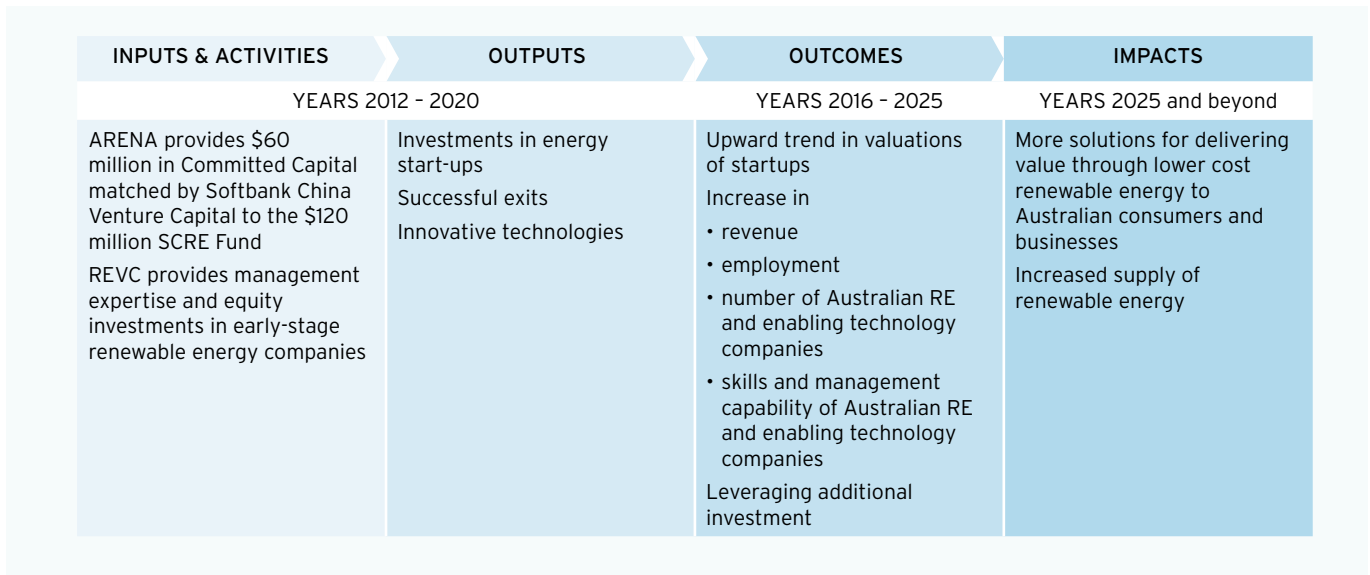
**ABOUT THE FUND**

The Renewable Energy Venture Capital (REVC) Fund Program provides management expertise and makes equity investments in early-stage renewable energy companies to help them overcome capital constraints, develop technologies, increase skills and forge international connections.

The Southern Cross Renewable Energy (SCRE) Fund was established under the REVC Fund Program. The SCRE Fund is managed by Southern Cross Venture Partners with co-investment from Softbank China Venture Capital and ARENA. The committed capital for the SCRE Fund was confirmed at \$120 million at the end of its investment period 31 December 2019, half of which is provided by ARENA.

Figure 28 shows the program logic.

**FIGURE 28: RENEWABLE ENERGY VENTURE CAPITAL FUND PROGRAM LOGIC**



**FINDINGS**

The evaluation found that the SCRE Fund has filled, and continues to fill, a market gap in early-stage renewable energy funding in Australia, and that it contributes to the achievement of ARENA's objectives and complements other funding mechanisms.

The fund has contributed to an increase in the number of Australian renewable energy and enabling technology companies in Australia. At least some of the companies in the portfolio would either not have been established in Australia, or would have struggled to find alternative sources of finance in the absence of the SCRE Fund's support.

The success of these companies to date is mixed. Three companies are showing early success, some demonstrating potential, and others are unlikely to progress further. This picture of mixed success is consistent with venture capital patterns in other sectors and in renewable energy in other countries, and is a reflection of the higher risk associated with early-stage investments.

# ANALYSIS

THIS SECTION OUTLINES HOW SIGNIFICANT EVENTS DURING THE YEAR AFFECTED ARENA'S OPERATIONS, FUNDED PROJECTS AND RESULTS.

## ARENA'S PURPOSE AND PERFORMANCE FRAMEWORK

The ANAO conducted a performance audit of ARENA (Auditor-General Report No.35 2019-20, Grant Program Management by the Australian Renewable Energy Agency) to provide the Parliament with assurance over the effectiveness of ARENA's grants management.

As part of implementing the recommendations of the ANAO performance audit, ARENA revised its purpose statement and performance framework and published them in an updated 2019-20 Corporate Plan on 30 April 2020.

## KEY DEVELOPMENTS AFFECTING PROGRAM IMPLEMENTATION AND PROJECT DELIVERY

The 2019-20 summer bushfires and COVID-19 affected ARENA's program implementation and the delivery of ARENA-funded projects.

The effect of the bushfires and COVID-19 resulted in:

- › a lower than expected rate of new applications
- › reduced electricity prices and market outlook for electricity generation, which in turn affected the ability of some projects to achieve financial close
- › project delivery delays affecting the achievement of milestones.

In March 2020 ARENA surveyed all its funded projects to ascertain the impacts of COVID-19 on project delivery. The survey showed:

- › 29 per cent of active projects reported being impacted by COVID-19
- › 44 requests for variations were made mainly to adjust milestone dates
- › the number of projects reporting impacts peaked in early April 2020
- › the main impacts reported were:
  - COVID response taking priority
  - travel restrictions and
  - supply chain issues

- › the impacts mainly affected demonstration and deployment projects with a large number estimating 17-24 weeks delay in implementation
- › the estimated delays as of April 2020 were forecast to result in approximately \$13million less than expected expenditure in both 2019-20 and 2020-21.

Despite the work-from-home and lockdown arrangements, ARENA:

- › assessed these requests for variations while delivering normal business
- › reduced average processing time for grant payment requests
- › continued to successfully promote its work and share knowledge across the sector.

ARENA was able to mitigate bushfire and COVID-19 impacts through sound program implementation and project delivery. These practices were reflected in ANAO audit findings that ARENA's:

- › project risk management is robust and effective
- › management of grants programs is largely effective
- › management of grant funding agreements is largely effective.

# APPENDICES

## 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, 285 active projects were managed by ARENA. Of those projects, 50 were completed in 2019-20 and another four were terminated during the course of the year.

ARENA contractually committed funds to 49 new projects in 2019-20 (Table 7). As with previous years, some of the projects contractually committed during 2019-20 were approved by the Board in the previous financial year, while other projects approved by the Board during 2019-20 will be contractually committed in 2020-21. This is reflective of ARENA's approval processes.

Details of all ongoing projects (including new commitments) during 2019-20 are provided in Table 8.

TABLE 7: ARENA FUNDS CONTRACTUALLY COMMITTED TO NEW PROJECTS IN 2019-20

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Alinta Energy Pilbara Finance Pty Ltd	Active	Alinta Solar Gas Hybrid Project	\$24,200,000	WA	Supporting industry to reduce emissions	Solar PV	Deployment
Allume Energy	Active	Allume Rooftop Solar Salvation Army Pilot Demonstration Project	\$220,000	TAS	Integrating renewables into the electricity system	Solar PV	Demonstration
Applied Electric Vehicles Pty Ltd	Active	Energy Freedom Solar Electric Vehicle Pilot Project	\$2,000,000	VIC	Integrating renewables into the electricity system	Electric vehicles	Demonstration
APT Facility Management Pty Limited	Active	APA Renewable Methane Demonstration Project	\$1,100,000	QLD	Accelerating hydrogen	Hydrogen	Demonstration



## APPENDICES

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Australand Residential Edmondson Park Pty Limited	Active	Frasers Property Australia Net Zero Energy Homes	\$708,910	NSW	Integrating renewables into the electricity system	Solar PV	Deployment
Australian Alliance for Energy Productivity Limited	Active	A2EP & Climate-KIC renewable energy for process heat opportunity study (phase 2)	\$473,200	NSW	Supporting industry to reduce emissions	Industrial heating and cooling	Feasibility Study
Australian Gas Networks Limited	Active	Blending Hydrogen into Victorian and South Australian Gas Infrastructure - Feasibility studies	\$1,280,000	SA	Accelerating hydrogen	Hydrogen	Feasibility Study
Australian Institute of Refrigeration Airconditioning and Heating	Active	Affordable Heating and Cooling Innovation Hub (i-Hub)	\$6,480,870	VIC	Supporting industry to reduce emissions	Enabling	Deployment
Australian National University	Active	Short Term Off-River Energy Storage Stage 2 (STORES 2) Study	\$308,736	ACT	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
BP Australia Pty Ltd	Active	Project GERI Feasibility Study	\$1,710,000	WA	Accelerating hydrogen	Hydrogen	Feasibility Study
BT Imaging Pty Ltd	Active	BT Imaging LIS-M1 Solar Module Inspection System Project	\$999,999	NSW	Integrating renewables into the electricity system	Solar PV	Deployment
BTPS 1 Pty Ltd	Active	Transforming Industrial Rooftops with the Bright Thinkers Power Station (BTPS)	\$496,857	NSW	Integrating renewables into the electricity system	Solar PV	Demonstration
East Rockingham Rrf Project Co Pty Ltd	Active	East Rockingham Waste to Energy Project	\$18,000,000	WA	Integrating renewables into the electricity system	Bioenergy	Deployment
Echuca Regional Health	Active	Rooftop Concentrated Solar Thermal for Hospital Heating/Cooling Demonstration Project	\$136,000	VIC	Integrating renewables into the electricity system	Solar thermal	Demonstration

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
EnergyLab Australia Pty Limited	Active	Clean Energy Startup Support Programs Project	\$480,000	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Enova Energy Pty Ltd	Active	Community Battery Storage and Peer to Peer Trading Platform	\$700,000	NSW	Integrating renewables into the electricity system	Battery storage	Demonstration
ERM Power	Active	ERM Power advancing renewables in the manufacturing sector project	\$250,000	QLD	Supporting industry to reduce emissions	Enabling	Other Study
Evoenergy	Active	DER integration and automation project	\$2,056,292	ACT	Integrating renewables into the electricity system	DER integration	Demonstration
Glaciem Cooling Technologies Pty Ltd	Active	Advancing Renewables with PCM Thermal Energy Storage Project	\$1,962,037	SA	Supporting industry to reduce emissions	Enabling	Demonstration
Hazer Group Limited	Active	Hazer Process Demonstration Plant	\$9,410,000	WA	Accelerating hydrogen	Hydrogen	Demonstration
Hydro Tasmania	Closed	Battery of the Nation, Future State NEM analysis (phase 2)	\$500,000	TAS	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Feasibility Study
Icon Retail Investments Limited and AGL Act Retail Investments Pty Ltd	Active	Realising Electric Vehicle-to-Grid Services Project	\$2,403,005	ACT	Integrating renewables into the electricity system	Enabling	Demonstration
Jolt Charge Pty Ltd	Active	Metro Advertising Revenue Funded Electric Vehicle Charging Trial Project	\$983,776	NSW	Integrating renewables into the electricity system	Electric vehicles	Demonstration
Logan City Council	Active	Loganholme Wastewater Treatment Plant Gasification Facility Demonstration Project	\$6,220,898	QLD	Foundation portfolios	Bioenergy	Demonstration

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Mirvac	Active	Net Zero Energy Homes	\$784,000	VIC	Integrating renewables into the electricity system	Hybrid	Deployment
Monash University	Active	ClimateWorks Australia Industry ETI Establishment Phase Project	\$300,000	VIC	Supporting industry to reduce emissions	Enabling	Other Study
Monash University	Active	Stability-Enhancing Measures for Weak Grids Study	\$495,680	VIC	Integrating renewables into the electricity system	Enabling	Other Study
Neoen Australia	Active	Hornsedale Power Reserve Upgrade Project	\$8,000,000	SA	Integrating renewables into the electricity system	Battery storage	Deployment
OMPS Pty Ltd	Active	OMPS New England PHES Benefits Study	\$951,000	NSW	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
OMPS Pty Ltd	Active	My Energy Marketplace Deployment Project	\$2,703,133	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Powerlink Queensland	Active	Powerlink Cost-effective system strength in North Queensland study	\$491,629	QLD	Integrating renewables into the electricity system	Enabling	Other Study
Queensland Nitrates Pty Ltd (QNP)	Closed	Queensland Nitrates Feasibility Study for a Green Hydrogen and Ammonia Project	\$1,620,000	QLD	Accelerating hydrogen	Hydrogen	Feasibility Study
RayGen Resources Pty Ltd	Active	Solar Power Plant, Phase 1	\$3,000,000	VIC	Integrating renewables into the electricity system	Solar thermal	Other Study
Reactive Technologies Limited	Active	System Inertia Measurement Demonstration	\$1,430,000	VIC	Integrating renewables into the electricity system	Enabling	Demonstration

## APPENDICES

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Renergi Pty Ltd	Active	Waste to Energy through Pyrolysis	\$3,900,000	WA	Integrating renewables into the electricity system	Bioenergy	Demonstration
Renewable Energy Hub Pty Ltd	Active	Wholesale Renewable Energy Firming Marketplace Demonstration Project	\$845,552	VIC	Integrating renewables into the electricity system	Enabling	Deployment
Rheem Australia Pty Ltd	Active	Bringing South Australia's Hot Water Load Under Active Control	\$1,981,000	SA	Integrating renewables into the electricity system	Solar PV	Demonstration
Royal Melbourne Institute of Technology	Active	Building Integrated Photovoltaics (BIPV) Enabler	\$100,614	VIC	Integrating renewables into the electricity system	Enabling	R&D
Solar and Storage Modelling Pty Ltd	Active	Gridded Renewables Nowcasting Demonstration over South Australia	\$994,685	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Stanwell Corporation Limited	Active	Stanwell Hydrogen Mid/ Large Scale Electrolysis Deployment Feasibility Study	\$1,250,000	QLD	Accelerating hydrogen	Hydrogen	Feasibility Study
Sustainable Melbourne Fund	Active	Scaling up Environmental Upgrade Agreements across Australia	\$755,000	NSW	Integrating renewables into the electricity system	Enabling	Deployment
Transgrid	Active	New England Renewable Energy Zone - Pilot for commercial development of transmission structure	\$995,000	NSW	Integrating renewables into the electricity system	Solar PV	Demonstration
Transgrid	Active	Central West NSW Energy Zone Detailed Scoping Study	\$5,000,000	NSW	Integrating renewables into the electricity system	Enabling	Feasibility Study
University of New South Wales	Active	Prototyping a Photoluminescence Imaging Tool for Testing of Fielded Solar Modules	\$100,000	NSW	Integrating renewables into the electricity system	Solar PV	R&D

## APPENDICES

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
University of New South Wales	Active	Launch of a photothermal absorption spectrometer for cost reduction in PV materials	\$100,000	NSW	Integrating renewables into the electricity system	Enabling	R&D
University of Queensland	Active	Pilot project to trial Solar F2D2 at University of Queensland's Gatton Solar Farm	\$95,912	QLD	Integrating renewables into the electricity system	Large-scale solar	R&D
University of South Australia	Active	Displacement of Gas by Thermal Energy Storage	\$103,500	SA	Supporting industry to reduce emissions	Enabling	R&D
University of Wollongong	Active	Investigation of the Impact and Management of Harmonic Distortion for Large Renewable Generators	\$146,400	NSW	Integrating renewables into the electricity system	Enabling	Other Study
Yara Pilbara Fertilisers Pty Ltd	Active	Renewable Ammonia Feasibility Study	\$995,000	WA	Accelerating hydrogen	Hydrogen	Feasibility Study
<b>TOTAL</b>		<b>49</b>	<b>\$120,218,685</b>				

## APPENDICES

TABLE 8: ALL ACTIVE PROJECTS MANAGED BY ARENA IN 2019-20 (INCLUDING NEW PROJECTS LISTED IN TABLE 7)

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Advisian Pty Ltd	Active	Advisian Wind and Solar Forecasting for the NEM Project	\$499,722	\$248,482	QLD	Integrating renewables into the electricity system	Market data and information	Demonstration
Aeolius Wind Systems Pty Ltd	Active	Aeolius Wind Systems Wind Forecasting Demonstration Project	\$1,899,000	\$886,050	VIC	Integrating renewables into the electricity system	Market data and information	Demonstration
AGL Energy Services Pty Limited	Active	5MW Virtual Power Plant in South Australia (VPP-SA) Project	\$5,300,000	\$300,000	SA	Integrating renewables into the electricity system	Enabling	Deployment
AGL Energy Services Pty Limited	Active	AGL Energy Application for Demand Response in NSW	\$2,624,019	\$612,271	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
AGL PV Solar Holdings Pty Limited	Active	AGL Solar PV project	\$166,700,000	\$1,000,000	NSW	Integrating renewables into the electricity system	Large-scale solar	Deployment
Alinta Energy Pilbara Finance Pty Ltd	Active	Alinta Solar Gas Hybrid Project	\$24,200,000	\$24,200,000	WA	Supporting industry to reduce emissions	Solar PV	Deployment
Allen Taylor And Co	Closed	Hardwood Residue Bio-refinery Feasibility Study	\$500,000	\$215,000	NSW	Foundation portfolios	Bioenergy	Other Study
Allume Energy	Active	Allume Rooftop Solar Salvation Army Pilot Demonstration Project	\$220,000	\$0	TAS	Integrating renewables into the electricity system	Solar PV	Demonstration
APA Group	Active	Emu Downs Solar Farm Project	\$5,500,000	\$0	WA	Integrating renewables into the electricity system	Large-scale solar	Deployment
APA Group	Active	Darling Downs Solar Farm	\$20,000,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Deployment

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Apace Research Ltd	Active	Ethtec Cellulosic Ethanol Pilot Plant	\$11,960,000	\$0	NSW	Foundation portfolios	Bioenergy	Demonstration
Applied Electric Vehicles Pty Ltd	Active	Energy Freedom Solar Electric Vehicle Pilot Project	\$2,000,000	\$411,867	VIC	Integrating renewables into the electricity system	Electric vehicles	Demonstration
APT Facility Management Pty Limited	Active	APA Renewable Methane Demonstration Project	\$1,100,000	\$228,800	QLD	Accelerating hydrogen	Hydrogen	Demonstration
ATCO Gas Australia Pty Ltd	Closed	Jandakot Commercial Hybrid Energy H2 Microgrid (ATCO H2 Microgrid)	\$1,790,313	\$659,503	WA	Accelerating hydrogen	Hydrogen	Demonstration
Ausgrid	Active	Demand Management for Replacement Needs	\$1,000,000	\$0	NSW	Integrating renewables into the electricity system	Demand response	Demonstration
Australand Residential Edmondson Park Pty Limited	Active	Frasers Property Australia Net Zero Energy Homes	\$708,910	\$0	NSW	Integrating renewables into the electricity system	Solar PV	Deployment
Australian Alliance for Energy Productivity Limited	Active	A2EP Renewable energy for process heat, Australia-wide, Replacing non-renewable systems	\$428,956	\$274,116	NSW	Supporting industry to reduce emissions	Industrial heating and cooling	Other Study
Australian Alliance for Energy Productivity Limited	Active	A2EP & Climate-KIC renewable energy for process heat opportunity study (phase 2)	\$473,200	\$124,250	NSW	Supporting industry to reduce emissions	Industrial heating and cooling	Feasibility Study
Australian Association for Hydrogen Energy	Active	Promoting hydrogen implementation and utilization in Australia through International collaboration	\$494,000	\$0	WA	Accelerating hydrogen	Hydrogen	Other Study
Australian Energy Market Operator Limited	Active	AEMO Virtual Power Plant Demonstrations	\$2,815,140	\$2,385,000	VIC	Integrating renewables into the electricity system	Enabling	Demonstration

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Australian Energy Market Operator Limited	Active	National Energy Simulator Feasibility Study	\$500,000	\$250,000	VIC	Integrating renewables into the electricity system	Enabling	Other Study
Australian Gas Networks Limited	Active	Blending Hydrogen into Victorian and South Australian Gas Infrastructure - Feasibility studies	\$1,280,000	\$37,745	SA	Accelerating hydrogen	Hydrogen	Feasibility Study
Australian Institute of Refrigeration Airconditioning And Heating	Active	Affordable Heating and Cooling Innovation Hub (i-Hub)	\$6,480,870	\$6,480,870	VIC	Supporting industry to reduce emissions	Enabling	Deployment
Australian National University	Active	A Robotic Vision System for Automatic Inspection and Evaluation of Solar Plant Infrastructure	\$444,016	\$0	ACT	Integrating renewables into the electricity system	Solar PV	R&D
Australian National University	Active	Next Generation Industrial Bifacial Silicon Solar Cells	\$1,977,845	\$593,354	ACT	Integrating renewables into the electricity system	Solar PV	R&D
Australian National University	Active	Advanced Silicon Solar Cells by DESIJN (Deposited Silicon Junctions)	\$1,116,142	\$0	ACT	Integrating renewables into the electricity system	Solar PV	R&D
Australian National University	Active	Driving Increased Efficiency and Reliability in Silicon Photovoltaics - from ingots to modules	\$2,399,392	\$814,721	ACT	Integrating renewables into the electricity system	Solar PV	R&D
Australian National University	Active	Monolithic perovskite - silicon Tandem Cells: Towards Commercial Reality	\$672,841	\$201,852	ACT	Integrating renewables into the electricity system	Solar PV	R&D
Australian National University	Active	Development of Stable Electrodes for Perovskite Solar Cells	\$936,732	\$281,020	ACT	Integrating renewables into the electricity system	Solar PV	R&D
Australian National University	Active	Tandem PV Micro Concentrator	\$839,515	\$236,555	ACT	Integrating renewables into the electricity system	Solar PV	R&D



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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Australian National University	Active	Community Models for Deploying and Operating Distributed Energy Resources Study	\$498,650	\$149,595	ACT	Integrating renewables into the electricity system	DER integration	Other Study
Australian National University	Active	Hydrogen Generation by Electro-Catalytic Systems R&D Project	\$615,682	\$0	ACT	Accelerating hydrogen	Hydrogen	R&D
Australian National University	Active	Solar Hydrogen Generation R&D Project	\$1,712,303	\$0	ACT	Accelerating hydrogen	Hydrogen	R&D
Australian National University	Active	Direct Water Electrolysis R&D Project	\$1,310,407	\$0	ACT	Accelerating hydrogen	Hydrogen	R&D
Australian National University	Active	Short Term Off-River Energy Storage Stage 2 (STORES 2) Study	\$308,736	\$9,333	ACT	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
Australian National University	Closed	High-temperature solar thermal energy storage via manganese-oxide based redox cycling	\$1,193,534	\$0	ACT	Integrating renewables into the electricity system	Solar thermal	R&D
Australian National University	Closed	Bladed Receivers with Active Airflow Control	\$1,408,327	\$0	ACT	Integrating renewables into the electricity system	Solar thermal	R&D
Australian National University	Closed	Real-time Operational Distributed PV Simulations for Distribution Network Service Providers	\$1,198,359	\$84,864	ACT	Integrating renewables into the electricity system	Solar PV	R&D
Australian National University	Closed	CONSORT: Consumer Energy Systems Providing Cost-Effective Grid Support	\$2,895,951	\$0	TAS	Integrating renewables into the electricity system	Enabling	R&D
Australian PV Institute	Active	IEA Technology Collaboration Programme (TCP) - Solar Heating and Cooling	\$383,500	\$83,700	NSW	Supporting industry to reduce emissions	Solar thermal	Other Study

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Australian PV Institute	Active	IEA Technology Collaboration Programme - PV Power Systems	\$668,000	\$145,000	NSW	Integrating renewables into the electricity system	Solar PV	Other Study
Australian PV Institute	Closed	Australian involvement in the IEA PV Power Systems, and solar heating and cooling implementing agreements	\$440,500	\$5,000	NSW	Integrating renewables into the electricity system	Solar PV	Other Study
Barcaldine Remote Community Solar Farm Pty Ltd	Active	Barcaldine 25 MW (DC) Remote Community Solar Project	\$22,800,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Demonstration
Bioenergy Australia	Active	Bioenergy Australia participation in the IEA Technology Collaboration Programme (TCP) on Bioenergy	\$885,733	\$265,711	ACT	Foundation portfolios	Bioenergy	Other Study
BOC	Active	Renewable Hydrogen Production and Refuelling Project	\$950,000	\$0	QLD	Accelerating hydrogen	Hydrogen	Demonstration
BP Australia Pty Ltd	Active	Project GERI Feasibility Study	\$1,710,000	\$0	WA	Accelerating hydrogen	Hydrogen	Feasibility Study
BT Imaging Pty Ltd	Active	BT Imaging LIS-M1 Solar Module Inspection System Project	\$999,999	\$100,000	NSW	Integrating renewables into the electricity system	Solar PV	Deployment
BTPS 1 Pty Ltd	Active	Transforming Industrial Rooftops with the Bright Thinkers Power Station (BTPS)	\$496,857	\$447,170	NSW	Integrating renewables into the electricity system	Solar PV	Demonstration
Bundaberg Regional Irrigators Group Ltd	Active	Adapting Renewal Energy Concepts to Irrigated Sugarcane Production at Bundaberg	\$446,011	\$150,211	QLD	Integrating renewables into the electricity system	Enabling	Demonstration
Canadian Solar	Active	Longreach Solar Farm	\$1,300,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Deployment

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Canadian Solar	Active	Oakey Solar Farm	\$2,162,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Deployment
Carnegie Wave Energy Limited	Active	Garden Island Microgrid Project	\$2,500,000	\$200,000	WA	Integrating renewables into the electricity system	Marine	Demonstration
Carnegie Wave Energy Limited	Terminated	Albany Wave Energy Project	\$2,184,745	\$865,493	WA	Foundation portfolios	Marine	Demonstration
Chargefox Pty Ltd	Active	Chargefox Electric Vehicle Charging Network Project	\$6,000,000	\$3,500,000	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
CKI Utilities Development Ltd & PAI Utilities Development Ltd & 3 OTHS	Active	SA Power Networks, Advanced VPP grid integration	\$1,032,000	\$539,859	SA	Integrating renewables into the electricity system	DER integration	Demonstration
Climate Council of Australia	Active	Climate Council Cities Power Partnership	\$493,150	\$180,000	VIC	Integrating renewables into the electricity system	Other	Other Study
Climate-KIC Australia Ltd	Active	Residential heat pump study	\$500,000	\$160,000	NSW	Integrating renewables into the electricity system	Geothermal	Other Study
Climate-KIC Australia Ltd	Active	Business Renewables Centre Australia	\$500,000	\$250,000	NSW	Foundation portfolios	Market data and information	Other Study
CSIRO	Active	Australian Solar Thermal Research Institute (ASTRI)	\$49,958,747	\$8,000,000	NSW	Integrating renewables into the electricity system	Solar thermal	R&D
CSIRO	Active	Australian Renewable Energy Mapping Infrastructure (AREMI)	\$2,341,800	\$174,650	NSW	Integrating renewables into the electricity system	Enabling	Other Study

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
CSIRO	Active	Feasibility study into dispatchable, cost effective power from forest and mill waste using the direct injection carbon engine (bioDICE)	\$432,000	\$211,578	NSW	Foundation portfolios	Bioenergy	Other Study
CSIRO	Active	Manufacturing of Printed Perovskite PV Modules	\$3,310,248	\$993,074	VIC	Integrating renewables into the electricity system	Solar PV	R&D
CSIRO	Active	National Low-Voltage Feeder Taxonomy Study	\$485,025	\$145,508	NSW	Integrating renewables into the electricity system	DER integration	Other Study
CSIRO	Active	IEA - SolarPACES (Solar Power and Chemical Energy Systems) Technology Collaboration Program (TCP)	\$394,000	\$0	NSW	Integrating renewables into the electricity system	Solar thermal	Other Study
CSIRO	Active	IEA -Ocean Energy Systems -Technology Collaboration Program (TCP)	\$283,500	\$90,500	TAS	Foundation portfolios	Marine	Other Study
CSIRO	Active	Missions Innovation Challenge - Smart Grids	\$113,750	\$70,375	NSW	Integrating renewables into the electricity system	Enabling	Other Study
CSIRO	Active	Missions Innovation Challenge - Affordable Heating and Cooling	\$37,000	\$9,800	NSW	Integrating renewables into the electricity system	Enabling	Other Study
CSIRO	Active	Methane Fuel Carrier R&D Project	\$1,085,553	\$0	NSW	Accelerating hydrogen	Hydrogen	R&D
CSIRO	Active	Hydrogen to Ammonia R&D Project	\$1,175,000	\$0	VIC	Accelerating hydrogen	Hydrogen	R&D
CSIRO	Active	Liquid Fuel Carrier R&D Project	\$1,010,081	\$0	VIC	Accelerating hydrogen	Hydrogen	R&D

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
CSIRO	Active	Solar Thermochemical Hydrogen R&D Project	\$2,007,676	\$0	NSW	Accelerating hydrogen	Hydrogen	R&D
CSIRO	Closed	AIRAH PUSCH Australia - Promoting the Use of Solar Cooling and Heating in Australia	\$399,436	\$0	NSW	Supporting industry to reduce emissions	Solar thermal	Other Study
CSIRO	Closed	Specifying Guidelines for Assessing Perovskite Solar Cells	\$932,000	\$40,000	NSW	Integrating renewables into the electricity system	Solar PV	Other Study
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	\$25,375	WA	Integrating renewables into the electricity system	Enabling	R&D
Degrussa Solar Project Pty Ltd	Closed	DeGrussa Solar PV & Storage Project	\$20,900,000	\$0	WA	Supporting industry to reduce emissions	Solar PV	Demonstration
DNV GL	Active	Development of a Proposed Performance Standard for a Battery Storage System connected to a Domestic/Small Commercial Solar PV System	\$1,440,000	\$450,000	VIC	Integrating renewables into the electricity system	Battery storage	Other Study
DNV GL	Active	Multi-Model and Machine Learning Wind Forecast Project	\$270,941	\$220,982	VIC	Integrating renewables into the electricity system	Market data and information	Demonstration
Dynamic Limits	Active	DER Feasibility Study	\$292,213	\$175,328	NSW	Integrating renewables into the electricity system	DER integration	Feasibility Study
Dyno Nobel Moranbah Pty Ltd	Active	Expansion of Moranbah - Feasibility of Renewable ('Green') Hydrogen	\$980,000	\$550,000	QLD	Accelerating hydrogen	Hydrogen	Feasibility Study
East Rockingham Rrf Project Co Pty Ltd	Active	East Rockingham Waste to Energy Project	\$18,000,000	\$18,000,000	WA	Integrating renewables into the electricity system	Bioenergy	Deployment

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Echuca Regional Health	Active	Rooftop Concentrated Solar Thermal for Hospital Heating/Cooling Demonstration Project	\$136,000	\$100,000	VIC	Integrating renewables into the electricity system	Solar thermal	Demonstration
EDL Group Operations Pty Ltd	Active	Cooper Pedy Renewable Diesel Hybrid	\$18,410,879	\$411,442	SA	Integrating renewables into the electricity system	Hybrid	Demonstration
Electranet Pty Limited	Active	Energy Storage for Commercial Renewable Integration (ESCR!) Phase 2 (South Australia) - Deployment and Testing	\$12,000,000	\$0	SA	Integrating renewables into the electricity system	Battery storage	Deployment
Electricity Generation and Retail Corporation	Active	Alkimos Beach Energy Storage Project	\$3,310,000	\$100,000	WA	Integrating renewables into the electricity system	Enabling	Demonstration
Element 25 Limited	Active	Pilot studies for Intermittent Dynamic Electrowinning using renewable energy for The Butcherbird Project to produce high purity EMM and MnSO4	\$490,000	\$141,540	WA	Supporting industry to reduce emissions	Enabling	Other Study
EnergyAustralia	Active	Demand Response NSW	\$1,435,500	\$334,950	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
EnergyAustralia	Active	Demand Response VIC and SA	\$6,929,000	\$1,616,767	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
EnergyAustralia	Active	Phase 2 of EnergyAustralia South Australian Pumped Hydro Energy Storage Project	\$500,000	\$0	SA	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
EnergyLab Australia Pty Limited	Active	Clean Energy Startup Support Programs Project	\$480,000	\$120,000	NSW	Integrating renewables into the electricity system	Enabling	Demonstration

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EnerNOC Pty Ltd	Active	Demand Response NSW	\$1,800,000	\$420,000	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
EnerNOC Pty Ltd	Active	Demand Response VIC	\$5,400,000	\$1,260,000	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
Enova Energy Pty Ltd	Active	Community Battery Storage and Peer to Peer Trading Platform	\$700,000	\$0	NSW	Integrating renewables into the electricity system	Battery storage	Demonstration
EPC Technologies	Closed	Demonstration of medium-scale solar on industrial roof-tops can be effectively integrated into the distribution network	\$225,000	\$0	QLD	Integrating renewables into the electricity system	Solar PV	Other Study
ERM Power	Active	Advancing renewables in the manufacturing sector project	\$250,000	\$20,000	QLD	Supporting industry to reduce emissions	Enabling	Other Study
Everengi Pty Ltd	Active	Charge Together Australia - Phase 2	\$469,380	\$352,035	NSW	Integrating renewables into the electricity system	Enabling	Deployment
Evoenergy	Active	DER integration and automation project	\$2,056,292	\$983,485	ACT	Integrating renewables into the electricity system	DER integration	Demonstration
Fast Cities	Active	Creating a National Ultrafast EV Charging Infrastructure Network	\$15,000,000	\$1,000,000	QLD	Integrating renewables into the electricity system	Enabling	Demonstration
Flow Power	Active	Demand Response NSW	\$1,318,250	\$338,351	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Fulcrum3D Pty Ltd	Active	CloudCAM Solar Forecasting for the NEM	\$490,800	\$137,508	QLD	Integrating renewables into the electricity system	Other	Deployment

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Fulcrum3D Pty Ltd	Active	Wind Forecasting for the NEM at Pacific Hydro's Clements Gap, Crowlands and Taralga Wind Farms	\$493,242	\$207,253	NSW	Integrating renewables into the electricity system	Market data and information	Demonstration
Genex	Active	Kidston Solar Project	\$8,850,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Deployment
Genex	Active	Kidston Stage 2 Project	\$5,000,000	\$1,058,383	QLD	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
Gess Devco Pty Ltd	Active	Gannawarra Energy Storage System (GESS)	\$22,735,000	\$0	VIC	Integrating renewables into the electricity system	Battery storage	Demonstration
Glaciem Cooling Technologies Pty Ltd	Active	Advancing Renewables with PCM Thermal Energy Storage Project	\$1,962,037	\$698,645	SA	Supporting industry to reduce emissions	Enabling	Demonstration
Goldwind Australia Pty Ltd	Active	White Rock Solar Farm, co-located with White Rock Wind Farm	\$5,400,000	\$0	NSW	Integrating renewables into the electricity system	Large-scale solar	Deployment
Goldwind Australia Pty Ltd	Active	Gold Fields Demonstration of a high penetration renewable microgrid on an operating mine in WA	\$13,500,000	\$13,500,000	WA	Foundation portfolios	Off grid	Deployment
Goldwind Australia Pty Ltd	Active	Field Study of Virtual Synchronous Generator at Gullen Range Wind Farm	\$271,450	\$162,870	NSW	Integrating renewables into the electricity system	System security	Demonstration
Greensync	Active	Decentralised Energy Exchange (deX) Program: scaling common platform requirements for decentralised energy exchanges across Australia	\$10,000,000	\$3,180,915	VIC	Integrating renewables into the electricity system	Enabling	Deployment
Gullen Solar Pty Ltd	Active	Gullen Range Solar Farm - co-located with Gullen Range Wind Farm	\$9,900,000	\$0	NSW	Integrating renewables into the electricity system	Large-scale solar	Deployment



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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Hazer Group Limited	Active	Hazer Process Demonstration Plant	\$9,410,000	\$0	WA	Accelerating hydrogen	Hydrogen	Demonstration
Hiveve	Active	Sustainable Modular Classrooms	\$334,650	\$0	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Hydro Tasmania	Active	Flinders Island Hybrid Energy Hub Project	\$5,500,000	\$0	TAS	Integrating renewables into the electricity system	Hybrid	Demonstration
Hydro Tasmania	Active	Rottneest Island Renewable Energy Water Nexus Project	\$3,758,010	\$0	WA	Integrating renewables into the electricity system	Hybrid	Demonstration
Hydro Tasmania	Active	Repurposing the Tarraleah hydropower scheme for the future electricity market - Feasibility Study	\$2,500,000	\$0	TAS	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
Hydro Tasmania	Active	Participation in IEA Hydropower Technology Collaboration Program	\$280,000	\$0	TAS	Foundation portfolios	Enabling	Other Study
Hydro Tasmania	Closed	Tasmanian Pumped-Hydro Energy Storage Opportunities Stage 2	\$700,000	\$700,000	TAS	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Feasibility Study
Hydro Tasmania	Closed	Battery of the Nation, Future State NEM analysis (phase 2)	\$500,000	\$500,000	TAS	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Feasibility Study
Hydrostor Australia Pty Ltd	Active	Advanced Compressed Air Energy Storage South Australia Project	\$6,000,000	\$0	SA	Integrating renewables into the electricity system	Other	Demonstration
Icon Retail Investments Limited And AGL ACT Retail Investments Pty Ltd	Active	Realising Electric Vehicle-to-grid Services Project	\$2,403,005	\$76,500	ACT	Integrating renewables into the electricity system	Enabling	Demonstration

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Indigenous Essential Services Pty Ltd	Active	Northern Territory Solar Energy Transformation Program (SETuP)	\$35,000,000	\$425,000	NT	Integrating renewables into the electricity system	Hybrid	Demonstration
Indra Australia	Active	Indra Monash Smart Microgrid Project	\$2,974,162	\$1,134,189	VIC	Integrating renewables into the electricity system	DER integration	Demonstration
Industrial Monitoring & Control (IMC)	Active	Skycam and Multi-Model Solar Forecasting Project	\$1,247,841	\$1,138,953	NSW	Integrating renewables into the electricity system	Market data and information	Demonstration
Intercast & Forge Pty Ltd	Active	Demand Response SA	\$316,102	\$75,520	SA	Integrating renewables into the electricity system	Enabling	Demonstration
IT Power (Australia) Pty Limited	Active	Testing the performance of lithium-ion batteries	\$1,290,000	\$304,451	ACT	Integrating renewables into the electricity system	Battery storage	R&D
IT Power (Australia) Pty Limited	Active	Open Source Grid Integration Model for the National Electricity Market	\$624,940	\$113,048	ACT	Integrating renewables into the electricity system	Enabling	Other Study
Jemalong JSS Project No 1 Pty Limited	Active	30 MW Concentrating Solar Thermal power plant with thermal energy storage, Jemalong NSW	\$39,500,000	\$7,000,000	NSW	Integrating renewables into the electricity system	Solar thermal	Demonstration
Jemena Limited	Active	Power to Gas Demonstration	\$7,500,000	\$0	NSW	Accelerating hydrogen	Hydrogen	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	\$691,493	VIC	Integrating renewables into the electricity system	DER integration	Demonstration

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Jolt Charge Pty Ltd	Active	Metro Advertising Revenue Funded Electric Vehicle Charging Trial Project	\$983,776	\$0	NSW	Integrating renewables into the electricity system	Electric vehicles	Demonstration
Kennedy Energy Park Pty Ltd	Active	Kennedy Energy Park (KEP)	\$18,000,000	\$0	QLD	Integrating renewables into the electricity system	Hybrid	Demonstration
Laing O'Rourke Australia Pty Ltd	Active	SunSHIFT Pre-Commercial Deployment	\$2,100,396	\$0	QLD	Integrating renewables into the electricity system	Solar PV	Deployment
Lake Bonney BESS Pty Limited	Active	Lake Bonney BESS	\$5,000,000	\$1,400,000	SA	Integrating renewables into the electricity system	Battery storage	Demonstration
Lakeland Solar & Storage Pty Limited	Active	Lakeland Solar & Storage Project	\$17,419,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Demonstration
LMS Energy Pty Ltd	Closed	Pilot Landfill Solar PV Project	\$100,000	\$5,000	VIC	Integrating renewables into the electricity system	Solar PV	Other Study
LO3 Energy Pty Ltd	Closed	Latrobe Valley Microgrid - Feasibility Assessment	\$370,000	\$0	VIC	Integrating renewables into the electricity system	Enabling	Other Study
Logan City Council	Active	Loganholme Wastewater Treatment Plant Gasification Facility Demonstration Project	\$6,220,898	\$1,304,783	QLD	Foundation portfolios	Bioenergy	Demonstration
Lord Howe Island Board	Active	Lord Howe Island Hybrid Renewable Project	\$4,500,000	\$2,196,391	NSW	Integrating renewables into the electricity system	Hybrid	Demonstration
Macquarie Capital (Australia) Limited	Active	Kwinana Waste to Energy	\$23,000,000	\$0	WA	Foundation portfolios	Bioenergy	Deployment

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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Macquarie University	Active	Macquarie University Biological Hydrogen Production R&D Project	\$1,148,455	\$0	NSW	Accelerating hydrogen	Hydrogen	R&D
Macquarie University	Closed	Researcher travel grant*	\$0	\$0	NSW	Accelerating hydrogen	Hydrogen	R&D
Macquarie University	Closed	Researcher travel grant*	\$0	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
Manildra Solar Farm Pty Ltd	Active	Manildra Solar Farm	\$9,810,000	\$0	NSW	Integrating renewables into the electricity system	Large-scale solar	Deployment
Meridian Energy Australia	Active	Wind Forecasting Demonstration Project	\$2,180,155	\$1,500,000	VIC	Integrating renewables into the electricity system	Market data and information	Demonstration
Microbiogen Pty Ltd	Active	Microbiogen Biocatalyst Project	\$4,029,467	\$730,791	NSW	Foundation portfolios	Bioenergy	Demonstration
Mirvac	Active	Net Zero Energy Homes	\$784,000	\$0	VIC	Integrating renewables into the electricity system	Hybrid	Deployment
Monash University	Active	Developing a New Type of High Efficiency Building Integrated PV Cell R&D Project	\$744,661	\$223,398	VIC	Integrating renewables into the electricity system	Solar PV	R&D
Monash University	Active	Bringing All-Polymer Solar Cells Closer to Commercialization	\$840,000	\$252,000	VIC	Integrating renewables into the electricity system	Solar PV	R&D
Monash University	Active	Participation in IEA Technology Collaboration Program (TCP) for Demand Side Management	\$500,500	\$146,600	VIC	Integrating renewables into the electricity system	Enabling	Other Study

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Monash University	Active	Water splitting electrodes R&D Project	\$1,054,209	\$0	VIC	Accelerating hydrogen	Hydrogen	R&D
Monash University	Active	Ammonia production from renewables R&D Project	\$913,848	\$0	VIC	Accelerating hydrogen	Hydrogen	R&D
Monash University	Active	ClimateWorks Australia - Industry ETI Establishment Phase Project	\$300,000	\$0	VIC	Supporting industry to reduce emissions	Enabling	Other Study
Monash University	Active	Stability-Enhancing Measures for Weak Grids Study	\$495,680	\$0	VIC	Integrating renewables into the electricity system	Enabling	Other Study
MSM Milling	Closed	Biomass Fuel Switch Project	\$2,000,000	\$600,000	NSW	Foundation portfolios	Bioenergy	Deployment
Musselroe Wind Farm	Active	Musselroe Wind Farm FCAS Trial	\$514,120	\$15,000	TAS	Integrating renewables into the electricity system	Wind	Other Study
Nectar Farms Management Pty Ltd	Active	Nectar Farms High Efficiency Off Grid Glasshouse Project	\$814,839	\$465,131	VIC	Supporting industry to reduce emissions	Enabling	Feasibility Study
Neoen Australia	Active	Griffith Solar Farm	\$4,500,000	\$0	NSW	Integrating renewables into the electricity system	Large-scale solar	Deployment
Neoen Australia	Active	Dubbo Solar Hub	\$4,950,000	\$0	NSW	Integrating renewables into the electricity system	Large-scale solar	Deployment
Neoen Australia	Active	Parkes Solar Farm	\$6,750,000	\$0	NSW	Integrating renewables into the electricity system	Large-scale solar	Deployment

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Neoen Australia	Active	Hornsedale Power Reserve Upgrade Project	\$8,000,000	\$8,000,000	SA	Integrating renewables into the electricity system	Battery storage	Deployment
NEV Power Pty Ltd	Active	Narara Ecovillage smart grid	\$1,158,660	\$0	NSW	Integrating renewables into the electricity system	Hybrid	Deployment
NOJA Power Switchgear Pty Ltd	Active	Intelligent Switchgear Project	\$5,000,000	\$1,131,899	QLD	Integrating renewables into the electricity system	Enabling	Demonstration
Normanton Solar Farm SPV	Active	Normanton Solar Farm	\$8,380,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Demonstration
Northern SEQ Distributor - Retailer Authority	Terminated	A feasibility study to undertake an assessment of the commercial viability of a waste to energy project at Unity Water's sewerage treatment plant	\$426,302	\$0	QLD	Supporting industry to reduce emissions	Bioenergy	Other Study
Oakley Greenwood Pty Ltd	Active	Pricing and Integration of Distributed Energy Resources Study	\$207,000	\$124,200	QLD	Integrating renewables into the electricity system	DER integration	Other Study
OMPS Pty Ltd	Active	New England PHES Benefits Study	\$951,000	\$242,000	NSW	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
Onesteel Manufacturing Pty Limited	Closed	Middleback Ranges Pumped Hydro Energy Storage Project Pre-feasibility Study	\$500,000	\$0	SA	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
Origin Energy Eraring Pty Limited	Active	Shoalhaven Pumped Hydro Expansion Opportunity Feasibility Study	\$2,000,000	\$100,000	NSW	Integrating renewables into the electricity system	Pumped Hydro Energy Storage (PHES)	Other Study
PGWF Pty Ltd ATF PGWF Unit Trust	Active	Fringe of Grid Battery Microgrid for Port Gregory (WA) Wind & Solar Farm	\$3,000,000	\$1,000,000	WA	Integrating renewables into the electricity system	Battery storage	Demonstration

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Planet Innovation Pty Ltd	Terminated	ZenHQ Virtual Power Plant - delivering rapid distributed demand response and accelerating renewables integration through automated HVAC control	\$847,928	\$57,630	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
Plumbing Industry Climate Action Centre (PICAC)	Active	Net Zero Energy Facility	\$500,000	\$25,000	VIC	Integrating renewables into the electricity system	Geothermal	Demonstration
Pooled Energy	Active	Demand Management and Modulation	\$2,500,000	\$100,000	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Powercor Australia Pty Ltd	Active	DER Hosting Capacity Study	\$164,402	\$0	VIC	Integrating renewables into the electricity system	DER integration	Other Study
Powerlink Queensland	Active	Cost-effective system strength in North Queensland study	\$491,629	\$177,829	QLD	Integrating renewables into the electricity system	Enabling	Other Study
Powershop Australia	Active	DR Program	\$1,113,269	\$232,222	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
Proa Analytics Pty Ltd	Active	Solar Forecasts Project	\$728,072	\$0	QLD	Integrating renewables into the electricity system	Market data and information	Demonstration
Queensland Nitrates Pty Ltd (QNP)	Closed	Feasibility Study for a Green Hydrogen and Ammonia Project	\$1,620,000	\$1,620,000	QLD	Accelerating hydrogen	Hydrogen	Feasibility Study
Queensland University of Technology	Active	Integration of biogas from sugarcane residues in sugarcane transport and milling to reduce fossil fuel usage	\$2,239,100	\$348,300	QLD	Supporting industry to reduce emissions	Bioenergy	R&D
Queensland University of Technology	Active	Hydrogen process R&D Project	\$3,350,000	\$0	QLD	Accelerating hydrogen	Hydrogen	R&D

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RACV	Terminated	Smart Hot Water System	\$40,000	\$40,000	VIC	Integrating renewables into the electricity system	DER integration	Demonstration
RATCH - Australia Corporation Limited	Active	Collinsville Solar PV Power Station Stage 1	\$9,500,000	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Deployment
RayGen Resources Pty Ltd	Active	Solar Power Plant; Phase 1	\$3,000,000	\$1,000,000	VIC	Integrating renewables into the electricity system	Solar thermal	Other Study
RayGen Resources Pty Ltd	Closed	RayGen PV Ultra Series B Equity Investment Opportunity	\$5,750,000	\$450,000	VIC	Integrating renewables into the electricity system	Solar PV	Deployment
RE Group	Active	Mt Piper Energy Recovery Project, Financial Investment Decision Study	\$1,000,000	\$500,000	NSW	Foundation portfolios	Bioenergy	Other Study
Reactive Technologies Limited	Active	System Inertia Measurement Demonstration	\$1,430,000	\$0	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
Regional Power Corporation	Active	Horizon Power Business Model Pilot Project - Phase 1 (Highgarden)	\$1,920,000	\$522,309	WA	Integrating renewables into the electricity system	Enabling	Deployment
Relectrify Pty Ltd	Closed	BMS-Inverter Hybrid Project	\$338,000	\$249,613	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
Renegi Pty Ltd	Active	Waste to Energy through Pyrolysis	\$3,900,000	\$0	WA	Integrating renewables into the electricity system	Bioenergy	Demonstration
Renegi Pty Ltd	Closed	Low Emission Biofuel Technology	\$5,473,000	\$0	WA	Foundation portfolios	Bioenergy	Demonstration



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Renewable Developments Australia Pty Ltd	Active	Investment Case for the Pentland Integrated Biofuels Project	\$3,000,000	\$0	QLD	Foundation portfolios	Bioenergy	Other Study
Renewable Energy Hub Pty Ltd	Active	A Wholesale Renewable Energy Firming Marketplace Demonstration Project	\$845,552	\$103,858	VIC	Integrating renewables into the electricity system	Enabling	Deployment
Restech Pty Limited	Active	The Enerverter (Project Aztec)	\$700,000	\$93,783	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Rheem Australia Pty Ltd	Active	Bringing South Australia's Hot Water Load Under Active Control	\$1,981,000	\$0	SA	Integrating renewables into the electricity system	Solar PV	Demonstration
Royal Melbourne Institute of Technology	Active	Hydrogen Storage and Transport R&D Project	\$805,026	\$0	VIC	Accelerating hydrogen	Hydrogen	R&D
Royal Melbourne Institute of Technology	Active	Building Integrated Photovoltaics (BIPV) Enabler	\$100,614	\$50,307	VIC	Integrating renewables into the electricity system	Enabling	R&D
Royal Melbourne Institute of Technology	Closed	Researcher travel grant	\$4,251	\$3,864	VIC	Integrating renewables into the electricity system	Solar PV	R&D
Royal Melbourne Institute of Technology	Closed	Researcher travel grant	\$3,169	\$2,881	VIC	Integrating renewables into the electricity system	Solar thermal	R&D
Royal Melbourne Institute of Technology	Closed	Researcher travel grant*	\$0	\$0	VIC	Accelerating hydrogen	Hydrogen	R&D
Rural Industries Research & Development Corporation	Active	Australian Biomass for Bioenergy Assessment (ABBA)	\$3,160,669	\$332,592	ACT	Supporting industry to reduce emissions	Bioenergy	Other Study

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Santos Limited	Active	Conversion of remote crude oil beam pumps to solar & battery project	\$4,200,000	\$1,650,000	SA	Foundation portfolios	Solar PV	Demonstration
Simply Energy Solutions	Active	Virtual Power Plant (VPPX) Project	\$7,700,000	\$2,131,833	SA	Integrating renewables into the electricity system	Solar PV	Deployment
Smart Storage (Ecoult)	Active	Project Fulfil	\$4,510,000	\$512,500	NSW	Integrating renewables into the electricity system	Enabling	R&D
Solar Analytics	Active	Solar Monitoring for Better Energy Outcomes for Residential Solar PV	\$2,144,000	\$250,000	NSW	Integrating renewables into the electricity system	Solar PV	Deployment
Solar Analytics	Active	Accelerating the growth development of energy monitoring for solar households and small businesses	\$1,160,000	\$100,000	NSW	Integrating renewables into the electricity system	Enabling	Deployment
Solar Analytics	Active	Enhanced Reliability through Short Time Resolution Data around Voltage Disturbances	\$491,725	\$189,725	NSW	Integrating renewables into the electricity system	DER integration	Demonstration
Solar And Storage Modelling Pty Ltd	Active	Solcast nowcasting solutions for solar farms and the Australian energy sector	\$781,740	\$548,797	NSW	Integrating renewables into the electricity system	Market data and information	Demonstration
Solar And Storage Modelling Pty Ltd	Active	Gridded Renewables Nowcasting Demonstration over South Australia	\$994,685	\$0	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Solpod	Active	Solar PV Demonstration Project	\$975,000	\$200,000	VIC	Integrating renewables into the electricity system	Solar PV	Demonstration
Southern Cross REVC Trusco Pty Ltd	Active	Southern Cross Renewable Energy Fund	\$60,000,000	\$0	NSW	Foundation portfolios	Enabling	Demonstration

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Southern Oil Refining	Active	Commercialisation of renewable crude oil production from wastewater treatment plant waste	\$4,000,000	\$375,000	QLD	Foundation portfolios	Bioenergy	Demonstration
Southern Oil Refining	Closed	Project Rudolf - Australian Biofuels from Australian Resources	\$3,188,630	\$0	QLD	Foundation portfolios	Bioenergy	Other Study
Spotless Sustainability Services	Active	Ballarat Terminal Station Battery Energy Storage System (BESS)	\$2,265,000	\$2,265,000	VIC	Integrating renewables into the electricity system	Battery storage	Demonstration
Stanwell Corporation Limited	Active	Stanwell Hydrogen Mid/Large Scale Electrolysis Deployment Feasibility Study	\$1,250,000	\$0	QLD	Accelerating hydrogen	Hydrogen	Feasibility Study
Sustainable Melbourne Fund	Active	Scaling up Environmental Upgrade Agreements across Australia	\$755,000	\$500,000	NSW	Integrating renewables into the electricity system	Enabling	Deployment
Sustainable Melbourne Fund	Closed	Expansion of the Environmental Upgrade Agreement (EUA) market in Victoria	\$821,369	\$0	VIC	Integrating renewables into the electricity system	Solar PV	Other Study
TasNetworks	Closed	Tasmanian and Victorian Second Bass Strait Interconnector Feasibility Study	\$10,000,000	\$3,500,000	TAS	Integrating renewables into the electricity system	Other	Other Study
Toyota Motor Corporation Australia Ltd	Active	Toyota Ecopark Hydrogen Demonstration	\$3,076,000	\$1,000,000	VIC	Accelerating hydrogen	Hydrogen	Demonstration
TransGrid	Active	New England Renewable Energy Zone - Pilot for commercial development of transmission structure	\$995,000	\$0	NSW	Integrating renewables into the electricity system	Solar PV	Demonstration
TransGrid	Active	Central West NSW Energy Zone Detailed Scoping Study	\$5,000,000	\$0	NSW	Integrating renewables into the electricity system	Enabling	Feasibility Study

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Trustee For Lastek Unit Trust	Active	Measurement guidelines for multi-junction solar cells with perovskite layers, CSIRO PV Performance Laboratory	\$732,038	\$216,019	SA	Integrating renewables into the electricity system	Solar PV	Demonstration
United Energy Distribution Pty Ltd	Active	Dynamic Voltage Management Demand Response (Product 2)	\$5,762,000	\$806,680	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
United Energy Distribution Pty Ltd	Active	Voltage-Controlled Frequency Regulation System	\$900,000	\$765,000	VIC	Integrating renewables into the electricity system	Enabling	Demonstration
United Energy Distribution Pty Ltd	Closed	Peak Demand Reduction using Solar and Storage	\$450,000	\$25,000	VIC	Integrating renewables into the electricity system	Battery storage	Demonstration
University of Adelaide	Active	Integrating Concentrating Solar Thermal Energy into the Bayer Alumina Process	\$4,490,752	\$796,898	SA	Supporting industry to reduce emissions	Solar thermal	R&D
University of Adelaide	Active	Participation in Mission Innovation - Converting Sunlight Innovation Challenge	\$494,000	\$0	SA	Foundation portfolios	Solar thermal	Other Study
University of Adelaide	Closed	Establishing the Australian Energy Storage Knowledge Bank	\$1,441,811	\$42,954	SA	Integrating renewables into the electricity system	Enabling	Other Study
University of Melbourne	Active	Advanced Planning of PV-Rich Distribution Networks Study	\$203,867	\$61,160	VIC	Integrating renewables into the electricity system	DER integration	Other Study
University of Melbourne	Active	Hydrogen Fuelled Reciprocating Engines R&D Project	\$2,594,747	\$0	VIC	Accelerating hydrogen	Hydrogen	R&D
University of Melbourne	Closed	Researcher travel grant	\$1,776	\$1,776	VIC	Integrating renewables into the electricity system	Enabling	R&D

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University of New South Wales	Active	Development and Commercialisation of High Efficiency Silicon Solar Cell Technology	\$6,472,980	\$629,000	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Multi-Junction c-Si Solar Cells Based on Virtual Ge Substrates	\$1,455,000	\$130,000	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	40% Efficient Photovoltaic "Power Cube" Power Tower Receiver	\$1,400,000	\$100,000	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Australia-US Institute for Advanced Photovoltaics (AUSIAPV)	\$83,999,005	\$24,784,692	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Low-cost, high-efficiency Copper-Zinc-Tin-Sulphide (CZTS) on silicon multi-junction solar cells	\$2,612,358	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Towards Ultimate Performance Commercial Silicon Solar Cells	\$2,970,702	\$560,702	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Addressing barriers to efficient renewable integration	\$982,000	\$327,200	NSW	Integrating renewables into the electricity system	Enabling	Other Study
University of New South Wales	Active	Accelerating industrial solar cells efficiency by development of plasma-enhanced chemical vapour deposition (PECVD) - based metal oxides	\$503,389	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Metallised Encapsulant for Silicon PV Modules: A Path to Reduced LCOE for PV	\$1,160,000	\$348,000	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Improving World-Record Commercial High-Efficiency n-type Solar Cells through Recombination Analysis and Innovative Passivation	\$1,785,000	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D

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University of New South Wales	Active	Hydrogenated bifacial PERL Silicon PV Cells with laser doping and plated contacts R&D Project	\$1,100,000	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Hydrogenated and Hybrid Heterojunction p-type Silicon PV Cells R&D Project	\$1,735,000	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Development of Beyond 20% Efficiency Kesterite (CZTSSe) Solar Cells	\$1,331,098	\$399,329	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Advanced high-efficiency silicon solar cells employing innovative atomic scale engineered surface and contact passivation layers	\$2,019,456	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Next Generation Silicon sub-cells for high efficiency III-V/ Si multi-junction solar cells	\$1,144,628	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Integrating industrial black silicon with high efficiency multicrystalline solar cells	\$500,000	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Development of novel hydrogen trapping techniques for breakthrough Si casting and wafering technologies	\$1,968,000	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Efficient Adamantine Thin-Film on Silicon Tandem Cells: The Next Step in Commercial Cell Evolution	\$3,184,166	\$955,250	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Mission Innovation Challenge - Off-Grid Access to Electricity	\$228,000	\$73,600	NSW	Foundation portfolios	Enabling	Other Study
University of New South Wales	Active	Photovoltaic Electrolysis to Generate Hydrogen R&D Project	\$1,319,105	\$0	NSW	Accelerating hydrogen	Hydrogen	R&D

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University of New South Wales	Active	Waste Biomass to Renewable Hydrogen R&D Project	\$1,045,770	\$0	NSW	Accelerating hydrogen	Hydrogen	R&D
University of New South Wales	Active	Module Design for Lower Field Operating Temperature and Improved Yield	\$285,816	\$151,567	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Prototyping a Photoluminescence Imaging Tool for Testing of Fielded Solar Modules	\$100,000	\$50,000	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Active	Launch of a photothermal absorption spectrometer for cost reduction in PV materials	\$100,000	\$50,000	NSW	Integrating renewables into the electricity system	Enabling	R&D
University of New South Wales	Closed	High-Efficiency Silicon/Perovskite Tandem Cells and Modules: Demonstration and Commercial Evaluation	\$3,599,459	\$359,946	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Closed	Researcher travel grant*	\$0	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Closed	Researcher travel grant*	\$0	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of New South Wales	Closed	Researcher travel grant*	\$0	\$0	NSW	Integrating renewables into the electricity system	Solar PV	R&D
University of Queensland	Active	Pilot project to trial Solar F2D2 at University of Queensland's Gatton Solar Farm	\$95,912	\$47,956	QLD	Integrating renewables into the electricity system	Large-scale solar	R&D
University of Queensland	Closed	PV Penetration Project	\$990,000	\$0	QLD	Integrating renewables into the electricity system	Enabling	Other Study

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University of Queensland	Closed	Researcher travel grant	\$1,828	\$1,662	QLD	Integrating renewables into the electricity system	Solar PV	R&D
University of South Australia	Active	Mawson Lakes, Displacement of Gas by Thermal Energy Storage	\$103,500	\$50,000	SA	Supporting industry to reduce emissions	Enabling	R&D
University of South Australia	Closed	Maximising solar PV with phase change thermal energy storage	\$995,290	\$0	SA	Integrating renewables into the electricity system	Enabling	R&D
University of South Australia	Closed	Researcher travel grant	\$1,333	\$1,333	SA	Integrating renewables into the electricity system	Solar thermal	R&D
University of South Australia	Closed	Researcher travel grant	\$2,229	\$2,229	SA	Integrating renewables into the electricity system	Enabling	R&D
University of Tasmania	Active	Tidal Energy in Australia - Assessing Resource and Feasibility to Australia's Future Energy Mix	\$2,494,860	\$877,932	TAS	Foundation portfolios	Marine	Other Study
University of Tasmania	Active	Optimal DER Scheduling for Frequency Stability Study	\$527,582	\$158,275	TAS	Integrating renewables into the electricity system	DER integration	Other Study
University of Technology Sydney	Closed	Develop lithium-sulfur batteries for large-scale electrical energy storage	\$830,000	\$24,000	NSW	Integrating renewables into the electricity system	Battery storage	R&D
University of Technology Sydney	Closed	Networks Renewed: Using innovative inverter and battery storage technologies to improve network power quality, reduce costs and support solar PV	\$1,599,340	\$0	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
University of Technology Sydney	Closed	Researcher travel grant*	\$0	\$0	NSW	Integrating renewables into the electricity system	Battery storage	R&D



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PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
University of Technology Sydney	Closed	Researcher travel grant*	\$0	\$0	NSW	Accelerating hydrogen	Hydrogen	R&D
University of The Sunshine Coast	Closed	Control and manage the moisture content of woody biomass to create certainty in the quality and supply for bioenergy	\$300,000	\$0	QLD	Foundation portfolios	Bioenergy	Other Study
University of Western Australia	Active	From single to multiple wave energy converters: Cost reduction through location and configuration optimisation	\$994,198	\$340,000	WA	Foundation portfolios	Marine	R&D
University of Western Australia	Active	Methanol from Syngas R&D Project	\$1,079,875	\$0	WA	Accelerating hydrogen	Hydrogen	R&D
University of Wollongong	Active	Smart Sodium Storage System for Renewable Energy Storage	\$2,707,000	\$494,687	NSW	Integrating renewables into the electricity system	Battery storage	R&D
University of Wollongong	Active	Investigation of the Impact and Management of Harmonic Distortion for Large Renewable Generators	\$146,400	\$0	NSW	Integrating renewables into the electricity system	Enabling	Other Study
University of Wollongong	Closed	Researcher travel grant*	\$0	\$0	NSW	Integrating renewables into the electricity system	Marine	R&D
Vast Solar Pty Ltd	Closed	6MWth grid connected CSP research, development and demonstration facility with thermal energy storage	\$9,896,960	\$0	NSW	Integrating renewables into the electricity system	Solar thermal	Demonstration
Vestas Wind Systems A/S	Active	Wind Forecasting for the NEM Project	\$405,754	\$246,610	SA	Integrating renewables into the electricity system	Market data and information	Demonstration
Voyages Indigenous Tourism	Closed	Yulara 1.8MW Dispersed Solar PV Project	\$447,525	\$0	NT	Integrating renewables into the electricity system	Solar PV	Demonstration

## APPENDICES

PROPONENT NAME	PROJECT STATUS	PROJECT NAME	FINANCIAL ASSISTANCE COMMITTED (EX GST)	FINANCIAL ASSISTANCE PAID 2019-20 (EX GST)	PRIMARY LOCATION	INVESTMENT PRIORITY	PRIMARY TECHNOLOGY	INNOVATION STAGE
Wattwatchers	Active	My Energy Marketplace Deployment Project	\$2,703,133	\$264,239	NSW	Integrating renewables into the electricity system	Enabling	Demonstration
Wave Swell Energy Limited	Active	UniWave200 King Island Project	\$4,035,628	\$2,690,000	TAS	Foundation portfolios	Marine	Demonstration
Whitsunday Solar Farm Pty Ltd	Active	Whitsunday Solar Farm	\$5,359,706	\$0	QLD	Integrating renewables into the electricity system	Large-scale solar	Deployment
Windlab Limited	Active	LIDAR for Wind Forecast Projects	\$393,107	\$20,600	QLD	Integrating renewables into the electricity system	Market data and information	Demonstration
Yara Pilbara Fertilisers Pty Ltd	Active	Renewable Ammonia Feasibility Study	\$995,000	\$398,000	WA	Accelerating hydrogen	Hydrogen	Feasibility 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	\$1,607,696	ACT	Integrating renewables into the electricity system	DER integration	Demonstration
Zero Mass Water (Australia) Pty Ltd	Closed	SOURCE Hydropanel Demonstration Project	\$420,000	\$50,000	NSW	Integrating renewables into the electricity system	Solar PV	Demonstration
<b>TOTAL</b>		<b>285</b>	<b>\$1,204,032,438</b>	<b>\$192,518,088</b>				

\*Project proponent took up an offer of a researcher travel grant under the Commercialisation of R&D Pilot but subsequently decided not to seek reimbursement of travel costs.

APPENDIX 2: INDEX OF COMPLIANCE WITH ANNUAL REPORT REQUIREMENTS

The following table lists the information ARENA is required by law to include in this report, and where in the report the information is located.

TABLE 9: INDEX OF COMPLIANCE WITH ANNUAL REPORT REQUIREMENTS

REFERENCE	WHERE	REQUIREMENT
<i>Australian Renewable Energy Agency Act 2011</i> (ARENA Act) (section 70)	P126-160	<b>Funding provided under ARENA Act</b> Provide particulars of each person to whom financial assistance was provided or committed during the year: <ul style="list-style-type: none"> <li>› name of the person</li> <li>› nature and amount of the financial assistance</li> <li>› renewable energy technology or technologies to which the assistance relates</li> </ul>
	P95-127	Provide an assessment of the extent to which agreements for the provision of financial assistance entered into during the year have progressed, or are expected to progress, the principal objectives and priorities as stated in the general funding strategy in force for the year
<i>Australian Renewable Energy Agency (Consequential Amendments and Transitional Provisions) Act 2011</i> (Schedule 2, Part 2, section 28)	P134-162	<b>Funding provided under a transferred agreement</b> 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: <ul style="list-style-type: none"> <li>› name of the person</li> <li>› nature and amount of the financial assistance</li> <li>› renewable energy technology or technologies to which the assistance relates</li> </ul>
ARENA Act (section 11)	P62	<b>Ministerial requests</b> Provide details of each request made by the Minister under s11 asking ARENA to consider providing financial assistance for a specified project
ARENA Act (section 13)	P62	<b>Ministerial directions</b> Provide details of each direction made by the Minister under s13 requiring ARENA to provide advice
<i>Public Governance, Performance and Accountability Act 2013</i> (PGPA Act) (section 46)	Yes	<b>Overarching requirements</b> After the end of each reporting period, the accountable authority of the entity (ARENA Board) must prepare and give an annual report to the entity's responsible Minister, for presentation to the Parliament, on the entity's activity during the period. The annual report must include the entity's annual performance statements and annual financial statements (paragraph 39(1)(b) and subsection 43(4)). The annual report must be given to the Minister by: <ul style="list-style-type: none"> <li>› the 15th day of the fourth month after the reporting period for the entity (namely 15 October), or</li> <li>› the end of any further period granted under subsection 34C(5) of the Acts Interpretation Act 1901.</li> </ul>
PGPA Act (section 46), Public Governance, Performance and Accountability Rule 2014 (PGPA Rule) (section 17BB)	P9	<b>Approval of annual report by accountable authority (ARENA Board)</b> 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 s46 of the Act
<i>PGPA Act</i> (section 46), PGPA Rule (section 17BC)	Yes	<b>Parliamentary standards of presentation</b> Comply with the guidelines for presenting documents to the Parliament
PGPA Act (section 46), PGPA Rule (section 17BCA)	Yes	<b>Digital reporting tool</b> As soon as practicable after the annual report has been presented to the Parliament, the annual report must be published using the digital reporting tool administered by the Finance Minister.
PGPA Act (section 46), PGPA Rule (section 17BD)	Yes	<b>Plain English and clear design</b> The annual report must be prepared having regard to the interests of the Parliament and any other persons who are interested in the annual report Provide information that is relevant, reliable, concise, understandable and balanced Use clear design Define acronyms and technical terms Use tables, graphs, diagrams and charts Include any additional matters as appropriate
PGPA Act (section 46), PGPA Rule (section 17BE)	P3, 62	<b>Contents of annual report</b> Details of the legislation that established ARENA P3, 62
	P14, 62, 96	Summary of ARENA's objectives and functions as set out in the legislation
	P3, 14, 96, 97	ARENA's purpose as set out in the corporate plan for the period
	P62	Name and title of the responsible Minister(s) during the period

REFERENCE	WHERE	REQUIREMENT
	P62	Any directions given by a Minister under an Act or instrument during the period
	P62	Any government policy orders that applied under s22 of the Act
	P62	Particulars of any non-compliance with ministerial directions or government policy orders
	P95-127	Annual performance statement for ARENA for the period in accordance with paragraph 39(1)(b) of the Act and s16F of the Rule
	P62	Statement of any significant issue 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
	N/A	An outline of the action taken to remedy that non-compliance
	P21-23, 166-67	Information on each member of the ARENA Board during the period, including: <ul style="list-style-type: none"> <li>&gt; name, qualifications and experience</li> <li>&gt; number of meetings attended during the period</li> <li>&gt; whether executive or non-executive member</li> </ul>
	P68	Organisational structure
	P170-71	Statistics on the number of ongoing and non-ongoing employees for this and the previous reporting period, in relation to: full-time employees, part-time employees, gender and location
	P180	Location/s of major activities or facilities
	P19-20, 60-61	Main corporate governance practices used by ARENA during the period: <ul style="list-style-type: none"> <li>&gt; Board committees and their main responsibilities</li> <li>&gt; education and performance review processes for members of the Board</li> <li>&gt; ethics and risk management policies</li> </ul>
	P66 + Note 3.3 in Financials	Information on related entity transactions: <ul style="list-style-type: none"> <li>&gt; the decision-making process undertaken by the ARENA Board for making a decision if <ul style="list-style-type: none"> <li>• the decision is to approve ARENA paying for a good or service from another Commonwealth entity or a company, or providing a grant to another Commonwealth entity or a company, and</li> <li>• ARENA and the other Commonwealth entity or the company are related entities, and</li> <li>• the value of the transaction, or if there is more than one transaction, the aggregate value of those transactions, is more than \$10,000 (incl. GST)</li> </ul> </li> <li>&gt; the value of the transaction, and, if there is more than one transaction, the number of transactions and the aggregate value of the transactions</li> </ul>
	P60	Any significant activities and changes that affected ARENA's operations or structure during the period
	P66	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
	P66	Particulars of any report on ARENA given during the period by: <ul style="list-style-type: none"> <li>the Auditor-General</li> <li>&gt; a Committee of either House, or both Houses, of the Parliament</li> <li>&gt; the Commonwealth Ombudsman</li> <li>&gt; the Office of the Australian Information Commissioner</li> </ul>
	N/A	An explanation of required information not obtained from a subsidiary
	P61	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)
	P24-25	Information on the ARENA audit committee during the period: <ul style="list-style-type: none"> <li>a direct electronic address of the charter determining the functions of the audit committee</li> <li>&gt; name, qualifications, knowledge, skills or experience of each member</li> <li>&gt; number of meetings attended during the period</li> <li>&gt; remuneration of each member</li> </ul>
	P61, P169-70, Note 3.2 of Financial Statements	Information about executive remuneration
	P163	An index identifying where the requirements set out in Schedule 2A are to be found in the annual report
PGPA Act (section 39), PGPA Rule (section 16F)	P95-127	<b>Annual performance statement</b> Statements of preparation Results achieved Analysis of performance
PGPA Act (section 42), Public Governance, Performance and Accountability (Financial Reporting) Rule 2015	P70-93	<b>Financial statements</b> 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

## APPENDICES

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REFERENCE	WHERE	REQUIREMENT
Environment Protection and Biodiversity Conservation Act 1999 (section 516A)	P65	<b>Environmental performance</b> Information on: <ul style="list-style-type: none"><li>&gt; accord between ARENA's activities and ecologically sustainable development (ESD) principles</li><li>&gt; ARENA's contribution of outcomes to ESD</li><li>&gt; effects of these activities on the environment</li><li>&gt; measures to review and minimise effects on the environment</li></ul>
Freedom of Information Act 1982 (Part II)	P64	<b>Information Publication Scheme</b> Actions taken to comply

## APPENDIX 3: MANDATORY INFORMATION FOR TRANSPARENCY PORTAL

These mandatory tables have been prepared for use in the Australian Government's Transparency Portal, which can be found at [www.transparency.gov.au](http://www.transparency.gov.au).

TABLE 10: DETAILS OF ARENA BOARD DURING CURRENT REPORTING PERIOD (2019-20)

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
Mr Martijn Wilder AM	BEC (Hons), LLB Honours, LL.M, GAICD	<p>Founding Partner of Pollination Capital Partners</p> <p>Formerly 20 years as Head, Global Environmental Markets and Climate Change, Baker &amp; McKenzie</p> <p>Former Board Member, Clean Energy Finance Corporation</p> <p>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</p>	Chair Non-executive member	17 April 2018	-	7/8
Ms Samantha Hogg	GAICD	<p>Chief Financial Officer, Transurban Limited</p> <p>Chair, Tasmanian Irrigation Chair, TasRail Director, Hydro Tasmania Director, MaxiTRANS</p>	Non-executive member	17 April 2018	-	8/8
Ms Susan Jeanes	Tertiary qualifications in politics and environmental studies	<p>Consultant, Jeanes Holland and Associates</p> <p>Former Chief Executive Officer, Australian Geothermal Energy Association Former Chief Executive Officer, Renewable Energy Generators Australia</p> <p>Chair, South Australian Centre for Geothermal Energy Research and Centre for Energy Technology</p>	Non-executive member	17 April 2018	-	8/8

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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 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	-	8/8
Mr Dougal McOmish	Tertiary qualifications in economics	Director, Eco Advisory Former Chief Operating Officer, Sundrop Farms	Non-executive member	17 April 2018	-	7/8
Ms Stephanie Unwin		Chief Executive Officer, Horizon Power  Director, Zenith Energy  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
Ms Jo Evans	-	Nominated delegate of Secretary of the Portfolio Department	Ex-officio member	N/A	-	8/8

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TABLE 11: DETAILS OF ARENA RISK AND AUDIT COMMITTEE (RAC) 2019-20

NAME	QUALIFICATIONS, KNOWLEDGE, SKILLS OR EXPERIENCE OF RAC MEMBERS	NUMBER OF RAC MEETINGS	TOTAL ANNUAL REMUNERATION
Ms Samantha Hogg	Non-executive ARENA Board member GAICD Chief Financial Officer, Transurban Limited Chair, Tasmanian Irrigation Chair, TasRail Director, Hydro Tasmania Director, MaxiTRANS	1/1*	See Table 12
Ms Meg McDonald	Non-executive ARENA Board member 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	5/5	See Table 12
Mr Dougal McOmish	Non-executive ARENA Board member Tertiary qualifications in economics Director, Eco Advisory Former Chief Operating Officer, Sundrop Farms	3/4*	See Table 12
Mrs Jenny Morison	RAC Chair, Independent Committee member FCA, BEc 38 years of broad experience in the accounting profession, commerce and government	5/5	See Table 12
Ms Karen Hogan	Independent Committee member Bachelor of Commerce (Accounting), Fellow, CPA Australia GAICD Over 30 years' experience in governance with expertise in Finance, Human Resources and Information and Communication Technology	5/5	See Table 12

\*Membership of the Risk and Audit Committee changed during the reporting period.



## BOARD AND COMMITTEE MEMBER REMUNERATION

All Board Directors of ARENA are appointed by the Australian Government through our Minister. The Board is governed by the provisions of the ARENA Act.

Fees for the Board members (other than the ex-officio member) are set and paid according to the relevant Remuneration Tribunal Determinations. Statutory superannuation is paid in addition to the fees set by the Tribunal.

Fees for independent Board sub-committee members, including Risk and Audit Committee members, are paid on a fee for service basis under a service contract. Such service is procured on normal business terms and conditions.

## EXECUTIVE REMUNERATION

The salary for the ARENA CEO is determined by the Remuneration Tribunal and the role is currently classified as a Full-time Public Officer (FPO) and gazetted in the listing of Government positions.

The salary of the ARENA CFO is guided by the principles set out in our Remuneration Guidelines (the Guidelines) which are monitored and endorsed by the People and Culture Committee, which is a committee of the Board.

Under these guidelines a transparent process is taken to attract and retain specialist skills at a competitive cost. The process involves using industry surveys and specialists (such as the Financial Institutions Remuneration Group) to review market data and determine benchmarks. This is then considered in the context of public service roles and compensation bands and remuneration is approved by the Board.

The Chief Operating Officer and other senior executives are employees of ARENA's Portfolio Department, where remuneration is determined by the Secretary in accordance with relevant policies of the Department. Executives and other highly paid staff are remunerated in accordance with their contracts of employment and relevant governing provisions. They are seconded to ARENA free of charge in accordance with section 62 of the ARENA Act.

Details of the ARENA Board and Executive remuneration is provided in Note 3.2 of the Financial Statements and Tables 12 and 13 below.

TABLE 12: EXECUTIVE AND AUDIT COMMITTEE REMUNERATION DISCLOSURES 2019-20

NAME	POSITION	SHORT-TERM BENEFITS		POST-EMPLOYMENT BENEFITS	OTHER LONG-TERM BENEFITS	TERMINATION BENEFITS	TOTAL REMUNERATION
		BASE SALARY	OTHER BENEFITS AND ALLOWANCES	SUPER-ANNUATION CONTRIBUTIONS	LONG SERVICE LEAVE		
<b>Key Management Personnel</b>							
Martijn Wilder	Chair	\$61,185	-	\$5,812	-	-	\$66,997
Samantha Hogg	Board Member; Risk and Audit Committee Member	\$24,731	-	\$2,349	-	-	\$27,080
Susan Jeanes	Board Member	\$22,812	-	\$2,167	-	-	\$24,979
Meg McDonald	Board Member; Risk and Audit Committee Member	\$30,395	-	\$2,888	-	-	\$33,283
Dougal McOmish	Board Member; Risk and Audit Committee Member	\$17,483	-	\$1,661	-	-	\$19,144
Stephanie Unwin	Board Member	\$22,386	-	\$2,127	-	-	\$24,513
Darren Miller (Note 2)	Chief Executive Officer	\$373,821	-	\$25,385	\$176	-	\$399,382
Ian Kay (Note 3)	Chief Financial Officer	\$471,617	-	\$24,464	(\$16,241)	-	\$479,840
Nicola Morris (Note 4)	Chief Operating Officer	\$236,253	-	\$45,379	\$7,530	-	\$289,162
<b>Total</b>		<b>\$1,260,683</b>	<b>-</b>	<b>\$112,232</b>	<b>(\$8,535)</b>	<b>-</b>	<b>\$1,364,380</b>
<b>Audit Committee Members (engaged on fee for services basis; amounts shown are GST exclusive)</b>							
Jenny Morison	Risk and Audit Committee Chair	-	\$16,288	-	-	-	\$16,288
Karen Hogan	Risk and Audit Committee Member	-	\$5,800	-	-	-	\$5,800
<b>Total</b>		<b>-</b>	<b>\$22,088</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>\$22,088</b>

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TABLE 13: INFORMATION ABOUT REMUNERATION FOR SENIOR EXECUTIVES

TOTAL REMUNERATION BANDS	NUMBER OF SENIOR EXECUTIVES	SHORT-TERM BENEFITS		POST-EMPLOYMENT BENEFITS	OTHER LONG-TERM BENEFITS	TERMINATION BENEFITS	TOTAL REMUNERATION
		AVERAGE BASE SALARY	AVERAGE OTHER BENEFITS AND ALLOWANCES	SUPERANNUATION CONTRIBUTIONS	SUPERANNUATION CONTRIBUTIONS	AVERAGE TERMINATION BENEFITS	AVERAGE TOTAL REMUNERATION
<b>Average total remuneration</b>							
\$270,001 - \$295,000	1	\$242,539	-	\$37,514	\$9,473	-	\$289,526

Note 1: Figures in the table are reported on an accrual basis. Base salary includes movements in annual leave liabilities.

Note 2: The CEO's remuneration is set by the Remuneration Tribunal and was \$387,960 per annum in total for 2019-20. Additional remuneration of \$11,422 was the result of movements in leave balances and leap year adjustment.

Note 3: An overstatement of long service leave liability in 2019 was corrected in 2020, resulting in a net credit in long service leave expense for the current financial year.

Note 4: The Chief Operating Officer is seconded by the Portfolio Department to ARENA free of charge.

Note 5: The Senior Executive is seconded by the Portfolio Department to ARENA free of charge.

TABLE 14: INFORMATION ABOUT REMUNERATION FOR OTHER HIGHLY-PAID STAFF

TOTAL REMUNERATION BANDS	NUMBER OF OTHER HIGHLY-PAID STAFF	SHORT-TERM BENEFITS			POST-EMPLOYMENT BENEFITS	OTHER LONG-TERM BENEFITS	TERMINATION BENEFITS	TOTAL REMUNERATION
		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
	0							

TABLE 15: ALL ONGOING EMPLOYEES CURRENT REPORTING PERIOD (2019-20)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULLTIME	PART TIME	TOTAL MALE	FULLTIME	PART TIME	TOTAL FEMALE	FULLTIME	PART TIME	TOTAL INDETERMINATE	
NSW		2								2
Total		2								2

TABLE 16: ALL NON-ONGOING EMPLOYEES CURRENT REPORTING PERIOD (2019-20)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULLTIME	PART TIME	TOTAL MALE	FULLTIME	PART TIME	TOTAL FEMALE	FULLTIME	PART TIME	TOTAL INDETERMINATE	
Total		0								0

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TABLE 17: ALL ONGOING EMPLOYEES PREVIOUS REPORTING PERIOD (2018-19)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULLTIME	PART TIME	TOTAL MALE	FULLTIME	PART TIME	TOTAL FEMALE	FULLTIME	PART TIME	TOTAL INDETERMINATE	
NSW		2								2
Total		2								2

TABLE 18: ALL NON-ONGOING EMPLOYEES PREVIOUS REPORTING PERIOD (2018-19)

	MALE			FEMALE			INDETERMINATE			TOTAL
	FULLTIME	PART TIME	TOTAL MALE	FULLTIME	PART TIME	TOTAL FEMALE	FULLTIME	PART TIME	TOTAL INDETERMINATE	
Total		0								0

TABLE 19: SIGNIFICANT NON-COMPLIANCE WITH FINANCE LAW

DESCRIPTION OF NON-COMPLIANCE	REMEDIAL ACTION
N/A	N/A

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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	Australian Performance Statement, Australian Public Service
ARENA	Australian Renewable Energy Agency
ARENA Act	<i>Australian Renewable Energy Agency Act 2011</i>
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	Concentrated solar power / concentrated 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	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
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	<i>Freedom of Information Act 1982</i>
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)

## APPENDICES

H <sup>2</sup>	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	<i>Public Governance, Performance and Accountability Act 2013</i>
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
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
REZ	Renewable energy zone
secure (grid or power system)	The ability of the power system to continue operating even in the event of the 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	<i>Work Health and Safety Act 2011</i>

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