ARENA CORPORATE PLAN

2019/20 – 2022/23

Australian Government
Australian Renewable Energy Agency

ARENA

Contents

From the Chair

The energy sector is undergoing a profound and complex transformation as the shift to renewable energy gathers momentum. Technological innovation, digitisation and the global drive to reduce emissions are changing the way we generate, use and store electricity and it is influencing the way we live and manage our economy. Our century-old electricity grid and our energy markets are learning to adapt to a more complex, more variable and more decentralised energy mix.

Transitioning the electricity system to deal with an increasing share of renewables and different ways of operating is challenging but 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 and industry are crucial in the pursuit of lower emissions and in ensuring Australia meets its international commitments. New opportunities such as hydrogen are also emerging, driven by the global energy transition.

There are many scenarios for the transition to a low emissions economy but technological development and innovation are part of almost every scenario. ARENA's expertise, deep understanding of the sector and our willingness to seek and 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.

ARENA actively identifies and troubleshoots issues arising from the energy transition – from technological and commercial issues to regulatory and market barriers and provides funding for projects that help solve these issues. We undertake research and inform policy decisions, we bring together people from across the energy sector, governments, startups and universities to collaborate with one another, and share their knowledge.

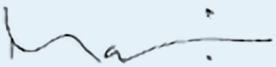
ARENA plays a vital role in helping ensure Australia maximises the benefits from this energy and technology transition and we are an important part of the Australian Government's energy and emissions reduction agenda.

This Corporate Plan builds on our considerable experience and reflects priorities that have evolved to anticipate and address the longer term needs of the changing energy system. As ARENA's current funding horizon narrows, we expect to see the projects we fund now, deliver lasting benefits to the Australian economy.

Yours sincerely
Martijn Wilder AM
Chair

Statement of preparation

I, as Chair of the Board of the Australian Renewable Energy Agency (the accountable authority) present our four-year Corporate Plan as required under paragraph 35(1)(a) of the *Public Governance, Performance and Accountability Act 2013*.



Mr Martijn Wilder AM
Chair, August 2019

Period of coverage

The Corporate Plan is prepared for the reporting period 2019/20 to 2022/23.

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. This version of the 2019-20 Corporate Plan (published 30 April 2020) presents ARENA's revised purpose and performance framework. The target for funds approved for the year has been amended to reflect a decision by the ARENA Board to allocate $70m to a Hydrogen Deployment Round, under which projects will be approved in 2020/21. ARENA at a Glance has also been updated to bring it up to reflect data as of 31 March 2020. The details of Board membership have been updated to reflect changes that took effect following Machinery of Government changes.

About ARENA

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

ARENA was established on 1 July 2012 by the *Australian Renewable Energy Agency Act 2011*. The overarching objective of the ARENA Act is to:

- **improve the competitiveness of renewable energy technologies and**
- **increase the supply of renewable energy in Australia.**

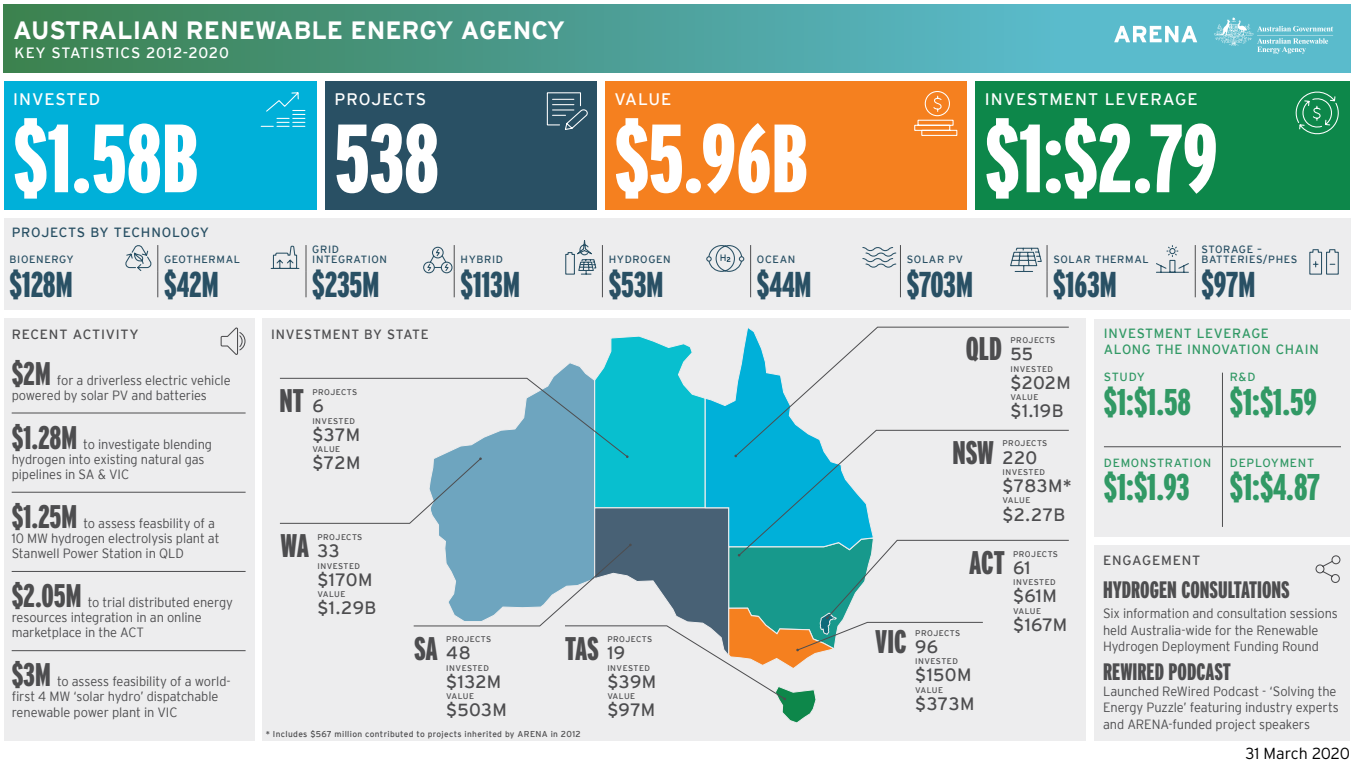
ARENA operates at the leading edge of new energy solutions where both risk and potential reward are high. ARENA aims to bring about transformational change by supporting innovation in energy products, services and business models.

To achieve this, ARENA provides grant funding to projects, shares knowledge and collaborates across the energy sector.

ARENA has supported 538 renewable energy projects, driving innovations in solar PV, batteries, biofuels, hydrogen, solar thermal, ocean energy, pumped hydro, distributed energy and demand response. We have provided over $1.58 billion in funding, with a total project value of $5.96 billion.

To learn about ARENA's achievements and outcomes to date, read our Annual Report. For more information about ARENA's investment priorities, read our Investment Plan.

To find out more about ARENA, go to www.arena.gov.au.



Achieving our purpose

An energy system that has remained relatively unchanged for decades is now shifting to one that is much more decentralised, increasingly consumer-centric and in which new forms of energy production are rapidly entering the mix. This shift is most advanced in the electricity sector, with other sectors just at the start of their transitions.

The potential benefits of this shift are many – more affordable and reliable energy, more choice and control for energy users, reduced energy price and carbon risk, new sources of jobs and growth and lower emissions.

The challenge lies in how best to ensure Australia is able to capture these benefits of transformation of this complex and vital sector while ensuring energy security, reliability and affordability.

ARENA's core work is helping Australia manage this energy sector transformation more smoothly, and achieve the benefits faster:

- investing in innovative research and ground-breaking renewable energy technologies and projects. Using its expertise and funding, ARENA helps promising technologies that are too early stage, or too high risk, to rely solely on private sector investment alone to move towards commercial readiness

- sharing knowledge and lessons learnt to improve understanding, fix problems and inform decision-making. ARENA shares knowledge with industry and energy bodies, and provide advice to government, so that decision makers can draw on data and insights from ARENA-funded projects. Sharing lessons from funded projects helps the entire industry move new technologies towards commercial readiness more quickly

- building networks and collaborating across the energy sector to build skills, encourage dialogue and help meet emerging challenges. Energy sector transformation benefits from coordination between many different players across government, industry and the research sector. ARENA's innovation lab, A-Lab, is one of the ways we catalyse this coordination and collaboration.

Figure 1 summarises how ARENA supports Australia's energy transition.

Figure 1 - Shaping Australia's future energy system

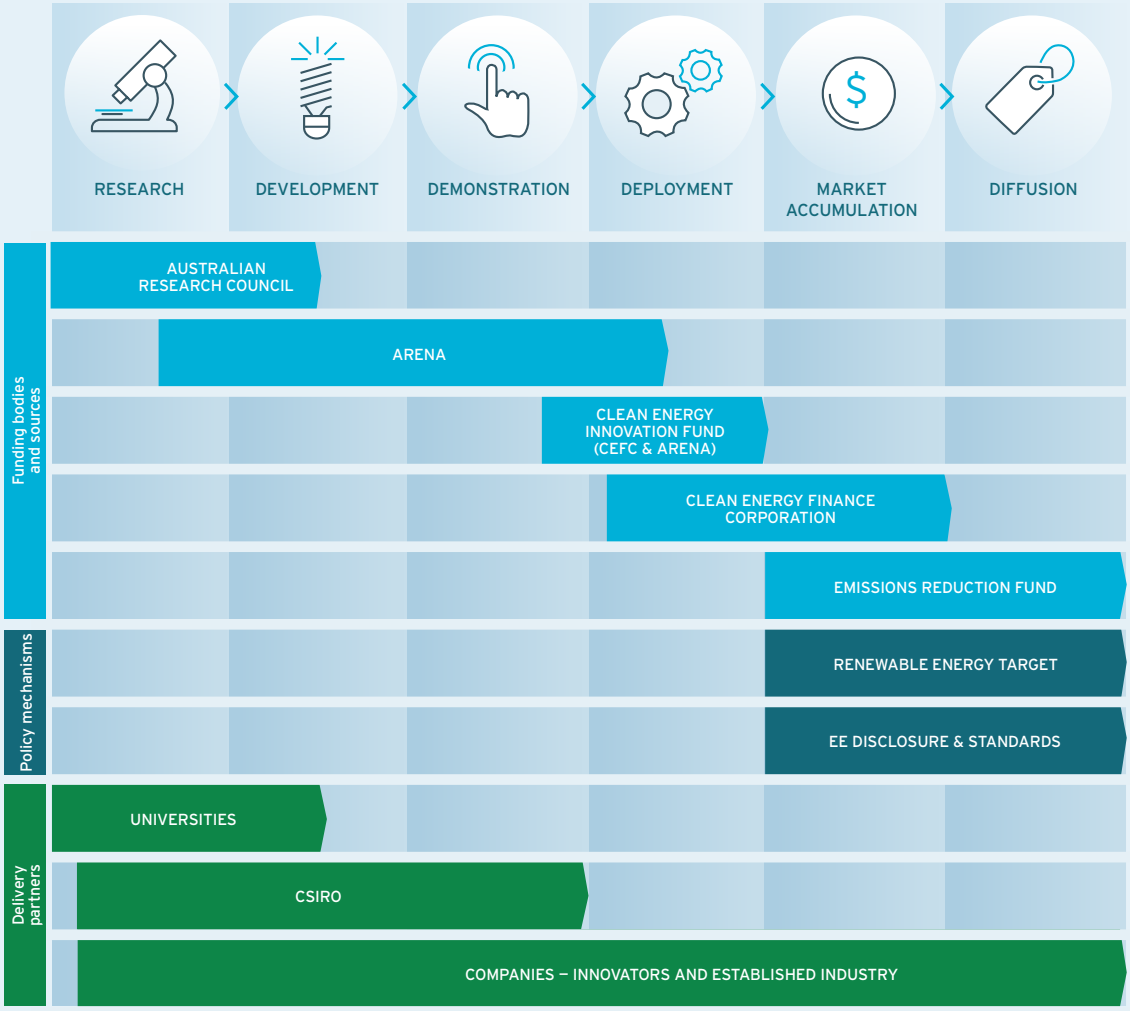
TO IMPROVE THE COMPETITIVENESS OF RENEWABLE ENERGY TECHNOLOGIES AND INCREASE THE SUPPLY OF RENEWABLE ENERGY THROUGH INNOVATION THAT BENEFITS AUSTRALIAN CONSUMERS AND BUSINESSES

NEED	ARENA ACTIVITIES	OUTCOMES	FASTER, SMOOTHER TRANSITION	ULTIMATE IMPACT
• Rapid change in the electricity sector is creating challenges for security, reliability and affordability • Australia needs to meet its international commitments to reduce emissions • Energy costs are rising for industry, and reducing emissions is difficult	• Investing in innovative research and ground-breaking renewable energy technologies and projects • Sharing knowledge and lessons learnt to improve understanding, fix problems and inform decision-making • Building networks and collaborating across the energy sector to build skills, encourage dialogue and help meet emerging challenges	• Improved competitiveness of renewable energy technologies • Industry and government better informed to navigate the energy transition • Better collaboration on energy innovation	• Private investment in commercial projects • Deployment at scale of new business models products and services • Changes to market rules and frameworks	• Secure, reliable and affordable electricity system with more renewable energy • Commercial scale value chains in renewable hydrogen established • Industry reduces cost and emissions via renewable energy

ARENA complements other elements of the Australian Government's support for clean energy innovation and reform of the energy sector (Figure 2).

We work alongside organisations such as the Clean Energy Finance Corporation (CEFC), the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Australian Energy Market Operator (AEMO), the Australian Energy Market Commission (AEMC), the Australian Energy Regulator (AER), the Energy Security Board (ESB) and innovators in industry. We also work alongside other Government initiatives such as the Regional and Remote Communities Reliability Fund, Climate Solutions Fund and the Renewable Energy Target. For further detail, see 'How we work', 'Operating environment' and 'Our capabilities' (below).

Figure 2 - A partnership across the innovation chain



ARENA's funding for innovation in renewable energy complements other economy-wide measures to support RD&D and commercialisation including Australian Research Council funding, R&D tax credits, and patents. These measures boost or stimulate private investment in innovation.

Compared to some other sectors, private investors are less able to capture the full societal value of innovation in clean energy. ARENA's targeted focus on innovation in renewable energy addresses this, lowering the cost of transitioning the energy system to reduce emissions. Furthermore ARENA's support of startups, innovative Australian companies and researchers helps Australia to prosper through the energy transition.

Our plan-on-a-page

OUR PURPOSE

TO IMPROVE THE COMPETITIVENESS OF RENEWABLE ENERGY TECHNOLOGIES AND INCREASE THE SUPPLY OF RENEWABLE ENERGY THROUGH INNOVATION THAT BENEFITS AUSTRALIAN CONSUMERS AND BUSINESSES

HIGH LEVEL OUTCOMES

- Improved competitiveness of renewable energy technologies
- Industry and government better informed to navigate the energy transition
- Better collaboration on energy innovation

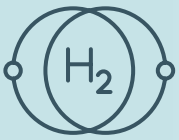
OUR ACTIVITIES

- Investing in innovative research and ground-breaking renewable energy technologies and projects
- Sharing knowledge and lessons learnt to improve understanding, fix problems and inform decision-making
- Building networks and collaborating across the energy sector to build skills, encourage dialogue and help meet emerging challenges

OUR PRIORITIES

INTEGRATING RENEWABLES INTO THE ELECTRICITY SYSTEM

Delivering technology and business model solutions to enable higher shares of renewables in the electricity sector



ACCELERATING HYDROGEN

Supporting the growth of Australia's hydrogen industry for domestic applications and export

SUPPORTING INDUSTRY TO REDUCE EMISSIONS

Progressing technologies to reduce costs and reduce emissions

Performance framework

Taken together, the performance measures tell a story of ARENA's achievement of our purpose. ARENA funding supports research, development, demonstration, deployment and commercialisation of renewable energy technologies, and technologies that assist those technologies to be integrated into the electricity system or end use sectors.

Figure 3 – Our performance framework

Activity	Expected results	Who benefits	Performance measure	Rationale	Data source	Baseline	Target
Outputs and effectiveness							
Providing financial assistance to Australian scientists, innovators and businesses in the renewable energy sector	More solutions for delivering value through lower cost renewable energy to Australian consumers and businesses	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.	**Output** ARENA provides financial assistance to support renewable energy technologies across the Agency's priority areas	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 Statement performance measure to 'provide assistance to new projects across the Agency's approved priority areas'.	Grants Management System (based on funds approved and committed for new projects)	$292.6m funds approved in 2018-19 $188.1m funds committed in 2018-19 Detailed breakdown in Annual Performance Statement	$111.5m funds approved in FY19/20 $140m funds committed in FY19/20
			Effectiveness Private sector capital makes taxpayers' dollars go further and achieve greater impact	Private sector capital contributes to ARENA's purpose, and shows 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.	Grants Management System	For 2018/19 leverage across the portfolio was 1:2.83 (breakdown by innovation stage in Annual Performance Statement)	Leverage falls between 1:2 and 1:3 across the portfolio
			Effectiveness ARENA-funded projects advance renewable energy technology, enabling technology and energy business models	This medium term measure indicates progress along the innovation pathway towards improved competitiveness. The Technology Readiness Level tracks progress from blue sky research to technical maturity. It applies to research, development and demonstration projects. The Commercial Readiness Index measures progress towards commercial viability. It applies to a wide range of projects including studies, pre-commercial deployment projects and knowledge sharing.	Grants Management System (drawing on independent assessment of outcomes at project completion)	Analysis in ITP's Solar RD&D synthesis (July 2018) showed that 97% of projects that intended to make a TRL advance had achieved a TRL advance of at least one.	80% of completed projects achieve advance in TRL or CRI indicators over the life of the project.
			Effectiveness ARENA-funded projects bring forward supply of renewable energy in emerging areas	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.	Grants management system and ARENA analysis	From 50 out of 479 projects, cumulative total capacity as at Dec 2019 was 945 MW for projects generating electricity.	Total electricity generation from ARENA-funded demonstration and deployment projects matches the output intended at time of commitment.

Activity	Expected results	Who benefits	Performance measure	Rationale	Data source	Baseline	Target
Collaboration and knowledge sharing to increase the stock of knowledge and its diffusion to relevant audiences.	Industry learns more quickly. Government, energy market bodies and the public are better informed to navigate the energy transition.	Industry, energy market bodies, policy makers, consumers and businesses benefit through a faster, smoother and less expensive energy transition.	**Output** ARENA funds or produces, and makes available, new knowledge products	This short-term measure indicates the level of knowledge sharing activity. Grant recipients share knowledge to help others learn from their experience. ARENA also commissions and publishes reports to complement grant recipient knowledge sharing.	Grants Management System and internal ARENA dashboard	In 2018/19 grant recipients completed 156 knowledge sharing deliverables and ARENA produced 243 knowledge sharing products.	Total of 400 knowledge sharing deliverables completed and knowledge sharing products produced
			Effectiveness ARENA shares knowledge to enhance the competitiveness of renewable energy technologies	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.	Event participant survey responses and ARENA stakeholder reputation research findings (extending beyond grant recipients)	In 2019 75% of stakeholders surveyed reported that knowledge shared by ARENA has informed part of their decision making processes	At least 75% of stakeholders surveyed report that knowledge shared by ARENA has informed part of their decision making processes
			Effectiveness The public is better informed about renewable energy technologies and the role they can play in Australia's energy transition	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.	Google Analytics Media monitoring statistics	767,000 website unique page views for 2018/19 37 project-related media releases reached a collective 37 million people in 2018-19	10% increase in visitor traffic (unique page views) to ARENA website
			Effectiveness Collaboration partners value collaboration with ARENA	Positive feedback and tangible outcomes demonstrate that collaboration is relevant and useful and that it is facilitated effectively.	Survey data	In 2019 85% of survey respondents rate ARENA's performance as "good" or better	85% of survey respondents rate ARENA's performance as "good" or better
Efficiency							
			Efficiency ARENA operates efficiently in the administration of public funds	This efficiency measure demonstrates efficient use of taxpayer resources. A trailing five-year average will even out project delivery variance.	Financial Management Information System	In the five years to 2018-19 operating costs were 13.51% of total expenditure.	Operating costs do not exceed 12% of total expenditure over a rolling five year period.[1]

1 This efficiency 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 14.5% to 16.5%. By 2021/22 performance should converge to 12%.

Reporting of evaluation findings

Findings of evaluations will be reported as part of the Annual Performance Statement to complement ARENA's performance measures. Over the planning period ARENA expects to contribute to improvements in the competitiveness of technologies in each of its priority areas, as set out in its Investment Plan 2019, as well as foundation portfolios established in previous years. This is reflected by the topics set out in Table 1.

Once a technology is competitive, a wide range of Australian and global market and policy factors influence market adoption. This determines the level of renewable supply and the benefits for Australians from lower costs, emission reduction or growth of new industries. ARENA therefore draws on independent analysis of its contribution via evaluations. This follows a rolling schedule that covers the overall suite of projects in three years.

Table 1: Evaluation schedule

2019-20	2020-21	2021-22	2022-23
All of ARENA International Engagement Program (funding announcement) Commercialisation of R&D pilot (internal evaluation) (funding announcement) Renewable Energy Venture Capital Fund (mid-term evaluation)	Distributed energy including electric vehicles Demand response (funding announcement)	R&D including Solar PV R&D, Australian Centre for Advanced Photovoltaics and Australian Solar Thermal Research Institute System security and reliability (including large-scale batteries, pumped hydro energy storage, concentrated solar thermal, bioenergy and energy from waste, and short term forecasting) Renewable hydrogen (including R&D round)	Remote Area Renewables (including RAR program) Renewable Energy Venture Capital Fund

Evaluations are expected to review the extent to which projects funded and knowledge shared by ARENA are achieving desired outcomes (including stated goals in any funding announcement), and leading towards desired long-term impacts. This includes effectiveness categories from the performance framework. Where quantitative modelling is used it is expected to draw on standard modelling techniques such as set out in CSIRO Impact Evaluation Guide. This methodology should be varied to reflect ARENA's purpose, in particular by estimating the long-term increase in supply of renewable energy. In short, the modelling approach is expected to take into account at least the following factors:

- An estimate of the 'baseline' supply of renewable energy (i.e. counterfactual)
- An estimate of how much the outcomes from the portfolio will change the supply of renewable energy, including the timing of that change
  - Together with the baseline, this provides an estimate of the magnitude of impact
- Where impacts are expected to occur in future, an estimate of the likelihood of the change occuring
- An estimate of ARENA's contribution to the change occuring

Our investment approach

The principles that guide how ARENA provides financial assistance are laid out in our General Funding Strategy (GFS).

ARENA's approach to developing and delivering investment priorities is:

- targeted for maximum impact
- technology neutral
- responsive and agile
- diverse
- commercially focused

ARENA is committed to achieving maximum impact and value from the projects it funds.

When making funding decisions, we ask:

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

Our approach to investment is set out in detail in our Investment Plan, which describes our funding programs and initiatives and our three investment priorities. We expect to invest the bulk of our remaining funds in accordance with our investment priorities.

Operating environment

A series of reviews and inquiries in recent years have highlighted both pressing needs and significant opportunities for innovation in Australia's energy system.

The ESB's second Health of the National Electricity Market report[2] states that 'the fundamentally different characteristics of variable distributed energy resources to traditional generation mean that changes to the way the NEM operates must be made.'

ARENA places a high priority on trialling and developing solutions to support the transition of the electricity system in light of the characteristics of wind and solar energy sources. As recommended by the 'Independent Review into the Future Security of the National Electricity Market', this includes funding 'proof-of-concept' projects that can inform regulatory decisions and market design.

Interest in renewable hydrogen as an energy carrier has grown steadily in Australia over the last few years. A National Hydrogen Strategy is currently being developed to help set a national vision for hydrogen and coordinate activity to help realise this vision. ARENA is playing an important role in the development of the Strategy, including through knowledge sharing from our funded projects, and in related items such as the CSIRO Hydrogen RD&D Roadmap, and our activities will be informed by the findings and recommendations of this work.

Industry accounts for around 40% of total final energy use in Australia. Less than a quarter of this is electricity consumption, with the remainder consisting predominantly of fossil fuels—in gas, liquid and solid form—used for process heating and other applications. With the notable exception of sugar milling and pulp and paper processing, renewable energy use is very low across most industrial sectors. Higher east coast natural gas prices in recent years have increased interest in solutions with less volatile energy costs. ARENA is supporting industry to identify and implement renewable energy alternatives for process heating and other industrial uses.

We take into account significant market trends as part of our planning, such as those described under 'transitioning energy systems' below. As an innovation agency, ARENA operates in the context of high uncertainty for the future evolution of the energy system. We aim for the financial support we provide to contribute to the competitiveness of renewable energy under one or more plausible scenarios for policy, regulation and technological progress.

TRANSITIONING ENERGY SYSTEMS

Renewable energy production continues to increase in Australia and around the world as a result of technical, economic, social and policy developments. Australia has set a target to reduce emissions by 26-28 per cent below 2005 levels by 2030 as a party to the Paris Agreement, which requires all parties to the agreement to take action on climate change from 2020.

In the electricity sector, one of the most significant trends is the shift towards more distributed energy, driven by falling technology costs and consumer choices. Other major changes occurring in the energy system include:[3]

- **the share of variable renewable electricity generation (solar PV and wind) is increasing rapidly**
- **digital technologies are enabling greater automation and decentralised decision-making**
- **electric vehicles are expected to disrupt the transport sector, and link it much more closely with the electricity sector**
- **buildings and appliances are becoming more energy efficient, and combined with structural changes in the economy, this has led to relatively flat domestic energy consumption.**

In industry, the transition of direct combustion to renewable sources is still at a very early stage but will be critical to achieving long term emission reductions.

Energy efficiency, electrification, direct production of renewable heat, and production of synthetic fuels using renewable sources are all potential pathways to reducing emissions in hard-to-abate sectors.

Australia's international trade in energy (primarily coal, natural gas and uranium) contributes substantially to Australia's gross national product and terms of trade. In the long term, Australia's energy commodity trade will be affected by international climate policy developments and the availability of competing energy sources in importing countries. At the same time, demand for low emissions energy commodities such as hydrogen is expected to grow strongly.

There is increasing interest from the corporate sector, including from their boards and the financial institutions that lend to and invest in them, in the environmental sustainability of their supply chains.

2 The Health of the National Electricity Market, 2018 Annual Report, Energy Security Board

3 CSIRO Low Emissions Technology Roadmap, 2017

Operational considerations

ARENA's funding and expenditure profile for the four years ending 30 June 2023

$m	2019-20	2020-21	2021-22	2022-23
Total available to spend carried forward from prior year	260.8	233.8	151.9	55.5
Add: amounts available to spend per s.64 of the ARENA Act	254.7	134.0	132.5	0.0
Add: CEIF receipts and profile adjustments	27.3	23.0	0.0	3.1
Less: Forecast grant and operating expenses	-309.0	-238.9	-228.9	-49.3
Total available to spend at the end of the year	**233.8**	**151.9**	**55.5**	**9.3**

The ARENA Act contains a profile of annual appropriation of funds that ARENA is able to draw down on to meet its liabilities in each year. Funds that are not drawn down in a financial year can be rolled over to future financial years, up to 30 June 2022. Currently, ARENA cannot draw down against the appropriation post 30 June 2022 but it is able to retain and spend ARENA money held in its bank account.

This year's Corporate Plan for the first time extends to the period beyond 2022, when the ARENA Act no longer provides funding from consolidated revenue for ARENA to allocate to grants. ARENA can make payments from any funds that are returned to ARENA from completed and closed projects.

In the absence of changes to the funds available for financial assistance, ARENA's activities in the planning period will be phased as follows:

- **In FY19-20 ARENA intends to approve the majority of remaining funds provided under the ARENA Act, so that these projects have at least two years to be completed and for funds to be paid out.**
- **In FY20-21 to FY21-22, ARENA will make smaller additional approvals as funds allow.**
- **Beyond 30 June 2022, ARENA will manage residual contract obligations (which extend to 2027 in some cases), with a focus on benefit realisation and knowledge sharing from funded projects.**

Currently ARENA does not have any major milestone payments scheduled beyond 30 June 2022, although it does have a potential liability related to the REVC investment. ARENA is actively considering options to manage funding risk in the event of slippage, and contract delivery risk for non-financial milestones occurring after 30 June 2022.

ARENA's priorities for the planning period

PRIORITY 1
INTEGRATING RENEWABLES INTO THE ELECTRICITY SYSTEM

MAXIMISING BENEFITS FROM EXISTING INVESTMENTS

We have built a strong portfolio of projects across technologies that will help integrate renewable energy into the electricity system. These projects are managed and lessons learned are shared and applied to increase the potential for affordable, secure and reliable electricity from renewables for more Australians.

Examples include:

- demonstration of frequency control and other essential electricity system services from wind generators, large batteries, flexible loads, distributed resources such as household batteries, and ancillary equipment such as synchronous condensers
- a trial involving 11 projects to explore the potential for wind and solar farms to provide their own, more accurate, forecasts of their output into AEMO's central dispatch system, helping reduce grid instability and reduce costs
- a demand response trial in partnership with AEMO, comprising 10 projects
- a wide range of distributed energy resource trials, demonstration projects and innovative business models. This includes demonstration of market platforms for coordinating distributed energy resources at scale, and a portfolio of projects demonstrating ways to increase network hosting capacity (thereby reducing curtailment)
- feasibility studies and support for demonstration and early project experience in flexible resources like pumped hydro, battery storage and concentrated solar thermal (CST) technology
- 12 projects funded through ARENA's Large Scale Solar round
- research and development into technology improvements for flexible resources, such as batteries and CST
- providing support for solar PV innovation, including through the Australian Centre for Advanced Photovoltaics (ACAP) to continue reductions in solar PV cost and improvements in performance
- analysis and early deployment project experience in hybrid approaches to improving reliability such as co-locating solar, wind and batteries
- electric vehicle charging infrastructure and studies, which will address barriers to electric vehicle take-up and provide data to inform integration of electric vehicles with the electricity system and renewable electricity supply
- built environment projects demonstrating how higher shares of renewable electricity can be enabled through, for example, energy efficiency improvements, thermal storage and energy management systems
- bioenergy and hybrids of bioenergy with non-renewable fuels such as municipal solid waste projects
- projects funded under the Regional Australia's Renewables (RAR) initiative, which are trialing renewable energy solutions, including hybrid systems, for communities and industry in regional and remote locations.

The practical experience of industry participants in these innovative projects delivers direct benefits, informing further investment decisions, which helps reduce costs and sharpen the value proposition for future and larger scale projects.

MAKING NEW INVESTMENTS

We will continue to support innovative projects across key technologies such as large-scale batteries, pumped hydro energy storage and concentrated solar thermal, where these provide benefits incremental to projects already funded. We will also continue to look for innovative technologies and approaches that demonstrate how system security can be maintained affordably with higher shares of variable renewable energy.

Given the major shift to distributed energy currently underway, a continued focus of ARENA's new funding is on projects that help manage the transition to higher shares of distributed energy resources, and that maximise the benefits these resources provide to their owners and to the electricity system.

ARENA's innovation lab, A-Lab, will continue to support the development of new projects and provide new opportunities to collaborate, deepen industry dialogue and share ideas.

KNOWLEDGE SHARING, COLLABORATION AND POLICY ENGAGEMENT

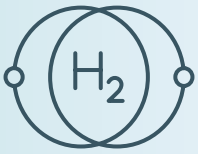
By communicating technology potential to key electricity sector decision-makers, financiers and policy-makers, ARENA is seeking to maximise the benefits from the projects it is supporting. ARENA will continue to provide opportunities for engaging these key players and communicating project results, insights gained and trends. We will support this with analysis of project results and implications.

ARENA's partnerships and engagement with electricity sector bodies is an important part of prioritising new investment and delivering benefits. ARENA will continue to support proponents to work with other agencies, and to draw on project results to provide information that supports agency decisions. For example, AEMO is able to use experience from proof-of-concept projects to adapt its processes and systems and to clarify how market participants can interface with those systems.

The involvement of regulatory agencies such as the Australian Energy Market Commission (AEMC) and the Australian Energy Regulator (AER) also helps to maximise the market-wide learning benefits, for example by supporting change to policy and regulation, or clarifying how policies and regulations apply to new technologies.

Given the range of organisations such as network operators, market bodies and retailers that are part of the electricity sector transition, we are also working to improve collaboration and increase the overall level of sectoral innovation to support a successfully managed transition. In particular, we will continue our A-Lab innovation lab series, and will support the Distributed Energy Integration Program (DEIP).

PRIORITY 2
ACCELERATING HYDROGEN



MAXIMISING BENEFITS FROM EXISTING INVESTMENT

ARENA has provided support for a number of demonstration scale renewable hydrogen projects, and 16 research projects through an R&D funding round, which will provide innovations and developments across the entire supply chain.

Interest in renewable hydrogen continues to grow, and ARENA is ensuring that this fledgling industry will benefit from the innovations and lessons learnt from this portfolio.

Examples of such projects include:

- a trial that injects renewable hydrogen into the natural gas distribution network, that will test the technical, regulatory, environmental and economic barriers to greening the gas grid, and exploiting the network's potential as a means of energy storage
- a demonstration project that explores the use of renewable hydrogen in a micro-grid system, providing it as a direct fuel for heating and cooking, and converting it to electricity for modular homes
- a project that demonstrates the ability for renewable hydrogen to fuel passenger vehicles, heavy vehicles and forklifts, and tests the operation of hydrogen forklifts in warehouse operations
- research that can reduce the cost of producing hydrogen renewably, through electrolysis, thermochemical, biological and photocatalytic methods
- research that improves the conversion of hydrogen into a carrier suitable for export, such as ammonia
- research for innovation for the more efficient use of hydrogen as an energy source.

MAKING NEW INVESTMENTS

ARENA will continue to support the development of a renewable hydrogen energy industry across all parts of the supply chain, to improve cost competitiveness, increase the penetration of renewables into new sectors, and achieve scale-up.

High merit, innovative proposals will be sought in the following areas:

- feasibility studies for projects involving 100+ MW electrolysers projects
- commercial-scale deployments involving 10-40+ MW electrolysers focused on industries and applications with large potential demand for hydrogen (e.g. ammonia production, power to gas) to drive the commercialisation of key component technologies
- demonstration scale projects involving 1-10 MW electrolysers demonstrating new applications such as transport or remote area power systems with onsite hydrogen production and fuel cells/turbines replacing diesel generation, to drive the commercialisation for key component technologies
- projects or activities that support the implementation of the National Hydrogen Strategy.

ARENA will also investigate opportunities to support the development of novel, cutting edge hydrogen technologies that can address the short to medium term needs of the hydrogen sector.

KNOWLEDGE SHARING AND COLLABORATION

The role of hydrogen in the transition to renewable energy has gained significant interest globally, and Australia is recognised as a leading player in this sector, for both domestic development and as a future exporter.

ARENA will continue to bring together innovators from research, the gas, transport, electricity and chemical industries, and government, to identify and address barriers to the scale up of commercially competitive renewable hydrogen. This will include collaboration with the COAG Energy Council Hydrogen Taskforce and Stakeholder Advisory Panel, which has been established to develop a National Hydrogen Strategy for Australia. ARENA will also collaborate with CSIRO on its Hydrogen RD&D Roadmap.

PRIORITY 3
SUPPORTING INDUSTRY TO REDUCE EMISSIONS

MAXIMISING BENEFITS FROM EXISTING INVESTMENTS

Reflecting the early stage of industry's energy transition, ARENA's projects in this area focussed initially on high value off-grid and remote mining applications, predominantly offsetting the relatively high cost of diesel generation. Additionally, a modest number of projects for manufacturing and processing facilities have been supported. These projects are managed and lessons learned are shared and applied to increase the potential for affordable, secure and reliable renewable energy for Australian industry more broadly.

Examples of such projects include:

- integration of PV generation into remote and off-grid mining operations, demonstrating the potential for high renewable penetration into "baseload" operations
- demonstration of biomass boilers to replace fossil fuel fired boilers for industrial heating applications
- demonstration of biogas production for producing electricity on-site to meet industrial process needs
- feasibility studies of renewable energy options for process heating across a range of manufacturing sites
- desktop analyses of the potential to integrate renewable energy, energy storage and load management technologies in select industrial and commercial sites.

MAKING NEW INVESTMENTS

ARENA will continue and accelerate funding projects that advance the uptake of renewable energy in industrial processes.

A significant proportion of energy in industry is directed to process heating applications and renewable energy solutions for these will be a focus.

Particular emphasis will be directed to technologies and projects that have the potential to transition substantial energy end uses, either individually or in aggregate across multiple sites and sectors.

We will continue to support high merit, innovative projects across key technologies such as bioenergy, solar thermal, renewable hydrogen and renewably powered electrification technologies and processes.

Enabling technologies such as energy efficiency, energy storage (electrical, thermal or material), electrification, demand side flexibility to match renewable energy supply and mechanical alternatives to process heating will also be supported where these enable greater uptake and penetration of renewable energy into industrial processes.

KNOWLEDGE SHARING AND COLLABORATION

The transition of industrial processes to renewable energy is at an earlier stage than transition of the electricity sector. Accordingly, ARENA will support developing the knowledge base and industry skills required to assist this transition.

ARENA will work with industry representatives to communicate learnings from projects that can be replicated or adapted within or across sectors. We will further support this with analysis of project results and implications.

ARENA will support and encourage collaboration by industry, technology providers, government and academia to identify viable approaches to achieving increased renewable energy penetration in industry.

CROSS-CUTTING INVESTMENT AREAS

Bioenergy

Bioenergy is a broad category of renewable energy technologies that has applications across ARENA's investment priorities, including electricity generation, hydrogen production and industrial heat, and additionally as a transport fuel.

In order to identify what role bioenergy can play in Australia's energy transition, ARENA will support the development of a bioenergy roadmap.

Commercialising R&D

While Australia ranks highly in R&D, we lag other advanced economies in commercialisation.

Bridging the gap between innovation in the lab and real world impact is challenging, particularly in the energy sector. Recognising this, ARENA is piloting a funding initiative that aims to kick-start the commercialisation of research and lead to an increase in innovative technology available for use in renewable energy.

We will use the results of the pilot to decide whether to expand this funding.

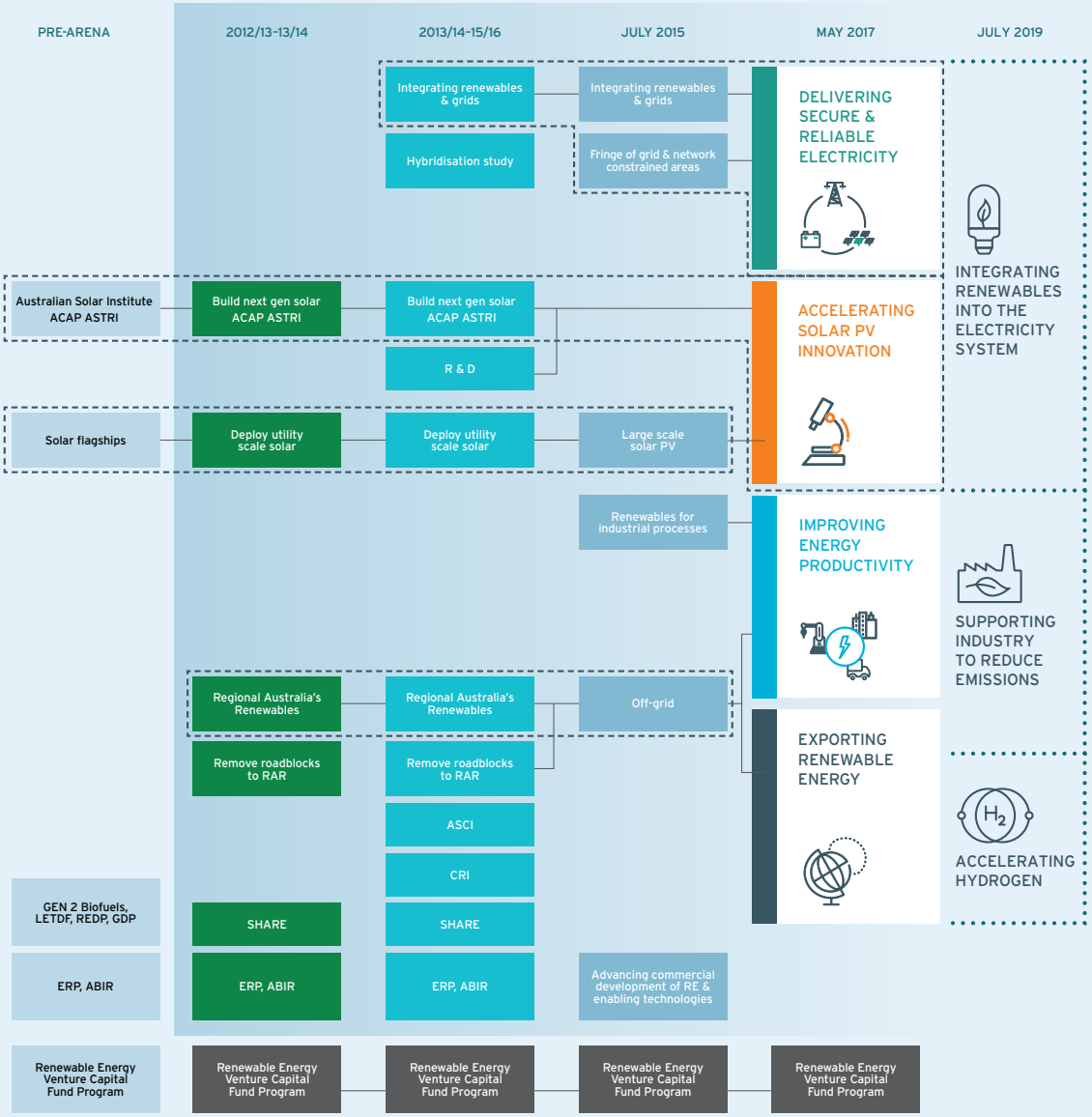
Our priorities evolve to meet changing needs

ARENA operates in an environment that is undergoing fundamental and increasingly rapid change. It is therefore essential that our priorities remain well aligned to broader policy, technology and commercial developments. In this way we can be confident that our activities will contribute most effectively to enabling the energy transition.

Our priorities are also revised to reflect the work, achievements and knowledge we have gained to date.

Figure 5 shows how ARENA's investment priorities have evolved and how they build upon ARENA's, and others', earlier efforts.

Figure 5 – How ARENA's investment priorities have evolved



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

Our capabilities

OUR BOARD

Mr Martijn Wilder AM (Chair)

Ms Samantha Hogg

Ms Susan Jeanes

Ms Meg McDonald

Mr Dougal McOmish

Mr David Fredericks PSM

Ms Stephanie Unwin

ARENA's Board sets investment strategies and priorities, oversees the running of the organisation and approves funding for projects up to $50 million.

Board members have experience or knowledge in renewable energy technology, commercialisation, business investment and/or corporate governance.

The Secretary of the Department of Industry, Science, Energy and Resources is a member ex officio and may nominate an alternate to attend Board meetings.

OUR PEOPLE

The Agency's values empower our people to take an agile, commercially-oriented and outcome-driven approach to achieving our purpose.

ARENA has a skilled, productive and highly motivated team drawn from diverse backgrounds in the business, industry, finance, research and government sectors. We work with innovators in support of projects that generate the knowledge needed to bring about transformative change.

ARENA blends public and private sector expertise to ensure that it appropriately balances innovation and accountability in the design and delivery of its activities.

ARENA's leadership team and staff have expertise and experience in energy policy, Australia's electricity market, energy technology and project finance.

A strong culture of mutual support, teamwork and collaboration built on expertise in stakeholder engagement has been central to ARENA's 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.

Our open and collaborative approach enables us to build strategic partnerships and pursue joint initiatives that draw on the complementary strengths of key players in the Australian energy system.

INSTITUTIONAL CAPABILITIES

ARENA is an integral part of the Government's innovation agenda and a key actor in Australia's energy innovation ecosystem. We identify where, and what kind of, innovation is necessary for enabling an effective and efficient transition of the energy system.

To deliver on this role, we have the people, systems and processes in place to identify the innovation needs of system operators, regulators, consumers and industry and to design and deliver financial assistance mechanisms and knowledge sharing that addresses those needs.

A consultative approach to identifying innovation needs

We are experienced in identifying innovation needs, in consultation with industry, government and the research community. We are able to find influential innovators and other key energy sector participants, bring them together, and make projects happen.

Through A-Lab in particular, ARENA creates cross-sector partnerships and world first projects that draw on a network of people with a wide range of expertise and passion to drive systemic change in the energy sector.

We believe A-Lab can enable breakthrough creative thinking on some of the most exciting and complex challenges facing the energy sector.

Rigorous project assessment and selection

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

ARENA workers are empowered to take innovative approaches to finding and funding high-quality and potentially transformative projects and to pursuing opportunities that are not being adequately pursued by either the private sector or other funding agencies.

ARENA draws on the technical expertise of the ARENA Advisory Panel. The Panel's expert members provide advice to support the development and selection of projects and initiatives for funding by ARENA.

Risk-based approach to project management

ARENA's client managers are focussed on managing projects to success. Our people are strongly customer and outcome-focused. We work closely with project proponents to ensure that each project delivers value for money.

ARENA's entire project portfolio is risk-rated and managed accordingly. This allows us to balance rigour and efficiency, maximises the chances of each project succeeding and ensures that we can quickly terminate non-performing projects.

Increasing impact through knowledge sharing

ARENA has been at the forefront of forging a new approach to getting the most impact from publicly-funded innovation projects. This involves sharing the knowledge generated by each project out to those who need it and can best use it to help ARENA achieve its purpose. For example, this may involve convening ARENA projects, relevant industry players and state governments to share lessons and discuss the challenges and opportunities of virtual power plants, or hosting a webinar for industry on lessons learned from a specific project.

ARENA has a dedicated team of people with a mix of analytical, engagement and communication skills that is now delivering an ambitious knowledge sharing strategy that is breaking new ground for public sector agencies.

A learning organisation

ARENA invests significant effort in ensuring that it is optimally structured to achieve its strategic objectives. ARENA is committed to providing a supportive and stimulating work environment that recognises and rewards high performance and enables continuous improvement.

Risk oversight and management

ARENA has in place a robust risk management framework, with an overarching Board-approved Risk Management Policy and Framework, which is annually reviewed. Risk reporting is a standing item at all Risk and Audit Committee (RAC) meetings, with the report considered by the Board on a quarterly basis. ARENA's risk report comprises a Risk Appetite Statement and a detailed Strategic Risk Management Dashboard (Dashboard).

ARENA's Dashboard identifies risks across the spectrum of safety, compliance and mandate; people, environment and operations; and innovation technology and projects. Within these categories are identified strategic risks such as Work Health and Safety (for ARENA workers and with respect to projects); legislative non-compliance; fraud and cyber security. Other key risks include failure to meet commitment targets and fund quality projects.

The Dashboard assigns a risk owner for all identified strategic risks; sets out the existing internal controls in place to manage such risks, and details the mitigation in place to bring risks to within the Board's risk appetite.

Management is committed to developing a risk-aware culture across the organisation and has established a dedicated risk and assurance function which will facilitate ARENA's move to an enterprise-based approach to identifying and managing risk.

As ARENA operates at the leading edge of new energy solutions and is responsible for the efficient and effective use of public monies, a rigorous and balanced approach to managing risk both at project level and at Agency level is undertaken. At project level, we acknowledge that some projects may not succeed; the Board has a high willingness to accept this risk in the pursuit of innovative renewable energy outcomes.

Internal controls in place include risk-rating of all applications and approved projects to ensure risks are contractually addressed and, at contract management stage, that appropriate resources are deployed to manage higher-risk projects. Controls for the risks inherent in project selection include having an appropriately skilled and resourced Business Development and Transactions team that has in-depth industry knowledge. The ARENA Advisory Panel, composed of qualified experts, provides advice to the ARENA Board and staff to inform project selection and decisions regarding the provision or termination of funding.

The RAC provides a critical role in oversight of ARENA's risk and assurance processes with an annual work plan that includes an internal audit program and ongoing monitoring of implementation of audit recommendations.

Over the period covered by this Corporate Plan, we will maintain our internal control framework, including:

- policies and procedures that support compliance with legislative and policy requirements. Attendance at annual governance training is a mandatory requirement for all ARENA workers
- a positive compliance and management environment, with clear delegations, which are regularly subject to internal audit
- an internal audit function that seeks to appropriately balance performance and compliance audits
- a risk management framework, including fraud control, risk management plans, security and business continuity management and disaster recovery
- compliance with Australian Public Service values and Code of Conduct and ARENA values is a requirement of all ARENA workers
- monitoring controls through effective planning and reviews at all levels of the organisation, and ongoing budget management
- accountability mechanisms, including reports, management sign-off with respect to compliance, reviews and individual performance management arrangements.

Further information is available at
arena.gov.au

Australian Renewable Energy Agency

To explore potential for funding visit:
arena.gov.au/funding

Postal Address
GPO Box 643
Canberra ACT 2601

Location
2 Phillip Law Street
New Acton ACT 2601

Australian Government
Australian Renewable Energy Agency

ARENA