



Australian Government

Australian Renewable Energy Agency

ARENA

Investment Plan

2013/14 - 2015/16

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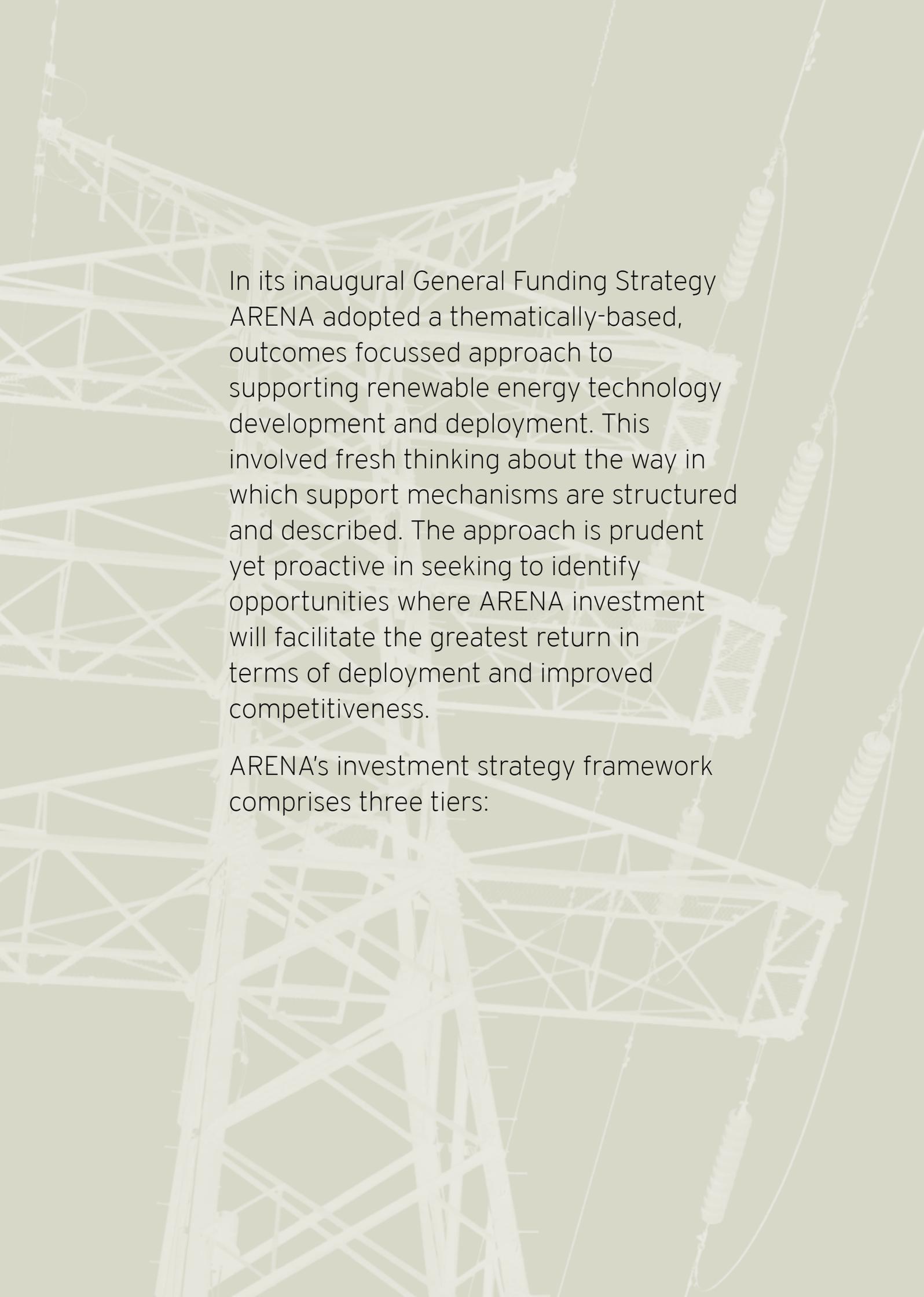
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This document should be read in conjunction with the ARENA General Funding Strategy. It will be updated from time to time as ARENA releases new, or modifies existing, initiatives. If an inconsistency arises, the General Funding Strategy takes priority.

Investment Plan

2013/14 - 2015/16



In its inaugural General Funding Strategy ARENA adopted a thematically-based, outcomes focussed approach to supporting renewable energy technology development and deployment. This involved fresh thinking about the way in which support mechanisms are structured and described. The approach is prudent yet proactive in seeking to identify opportunities where ARENA investment will facilitate the greatest return in terms of deployment and improved competitiveness.

ARENA's investment strategy framework comprises three tiers:

Investment Approach

- **Tier 1**

- **Strategic Initiatives**

- Strategic initiatives are larger in scope and scale and typically fund market-oriented, near commercial, projects. While ARENA expects to implement only a small number of strategic initiatives over time, this is where the bulk of ARENA's funding is likely to be allocated, given the costs associated with large scale demonstration and deployment.

- **Tier 2**

- **Supporting Initiatives**

- Supporting initiatives are of more limited scope and address specific roadblocks to the success of a strategic initiative; they may also create the pre-conditions necessary for the emergence of the next generation of strategic initiative solutions.

- As their name implies, the purpose, design and timeframe of supporting initiatives will be strongly defined by the strategic initiative they are supporting.

- **Tier 3**

- **Complementary Initiatives**

- Complementary initiatives provide ARENA with the flexibility to invest in a diverse range of opportunities maximising the prospects of ultimately fulfilling all of its functions. These initiatives may have a wider scope and often address themes common to multiple initiatives, helping balance the ARENA portfolio. ARENA anticipates that this tier of the investment strategy will support a diverse mix of activities and provide scope for trialling more innovative funding models.

Governance

The ARENA Board decides which renewable energy projects will be financially supported, according to the General Funding Strategy and Investment Plan. ARENA's Board is comprised of six Board members appointed by the Minister for Resources and Energy, and the Secretary of the Department of Resources, Energy and Tourism. The appointed members of the Board have skills in renewable energy technology, commercialisation, business investment and corporate governance.

ARENA takes a portfolio approach, with each investment selected through a careful analysis of its potential benefits in making renewable energy more affordable and increasing supply. ARENA is committed to being an agent of change through its transparency, encouraging project participants to share knowledge regarding renewable energy barriers, ensuring that project outcomes are replicable and building a strong culture of learning-by-doing.

ARENA seeks to build a portfolio of investments, supporting a range of different projects across the innovation chain - from research in the laboratory to large-scale technology projects - with a focus on attracting investors. This approach covers both innovative technology solutions for earlier-stage projects and innovative commercial models for later-stage projects. ARENA welcomes investment proposals from both foreign and Australian based companies that would result in increasing the supply and competitiveness of renewable energy in Australia.

Performance Measurement

ARENA has developed a range of key performance indicators to assist in assessing its performance against its objectives.

ARENA is aware that in order to achieve its objectives it must be an effective and efficient organisation and hence ARENA will also measure itself on this basis.

Indicators for both its legislative objectives and its organisational effectiveness are designed to be quantifiable and applicable across the full range of ARENA's work.

Figure 1. ARENA Performance Measurement

What → **How** → **Measure**

| What | How | Measure |
|---|--|---------------------------|
| Improve the competitiveness of renewable energy technologies | Improve the technical and commercial readiness of technologies within Australia from ARENA's actions. | Yes / No |
| | Enter agreements to deliver two significant multi-participant knowledge-sharing products by December 2013. | Complete / Incomplete |
| | Fund a range of knowledge sharing projects by May 2014. | Number of projects |
| | Maintain a diverse portfolio of technologies. | Take-up of ARENA programs |

| | | |
|---|---|------------------------|
| Increase the supply of renewable energy in Australia | Increase the total amount of renewable energy within Australia from ARENA's actions. | MWs of capacity funded |
| | ARENA funding leverages additional funding and in-kind contributions from project partners. | Leverage ratio |
| | Finalise the assessments of one round of ARENA's Regional Australian Renewables Initiative by April 2014. | Complete / Incomplete |
| | Design and launch one new investment strategy (program) by June 2014. | Complete / Incomplete |

| | | |
|-------------------------------------|---|----------------------------|
| Organisational effectiveness | Conduct a baseline stakeholder survey by April 2014. | Complete / Incomplete |
| | Increase the number of ARENA website visitors by at least 20 per cent from May 2013 to June 2014. | Number of website visitors |
| | Review the ARENA General Funding Strategy for 2014-15 to 2016-17 and submit to Minister by June 2014. | Complete / Incomplete |
| | Develop the ARENA work plan for 2014-15 and submit to Minister by June 2014. | Complete / Incomplete |



Knowledge Management

\$40 - \$60m

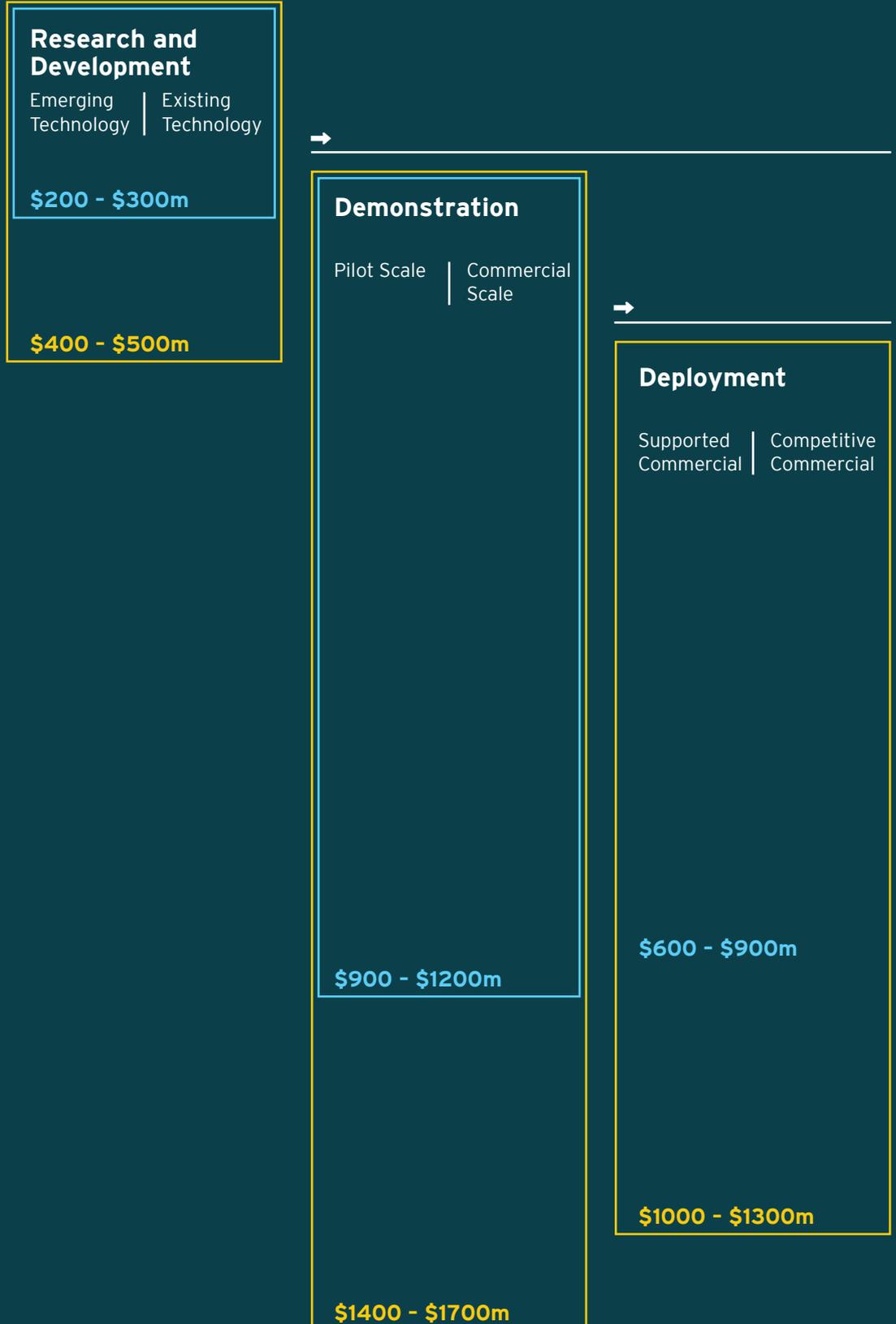
\$35 - \$55m



Figure 2.
ARENA's Indicative
Funding along the
Innovation Chain

**Uncommitted
funding by
innovation
chain stage**

**Indicative
funding
allocation
(all funds)**



Funding allocation along the innovation chain

To achieve ARENA's objectives most effectively, the majority of ARENA's funding will be invested in demonstration and early deployment projects, which help de-risk and build investor confidence in renewable technologies. These types of projects require high volumes of capital.

ARENA will closely monitor the mix of solutions, funding mechanisms and business models deployed and, where necessary, adjust its level or mode of funding. Bringing the next wave of renewable energy technologies forward is also important, so ARENA will continue to take a flexible and facilitative approach in this area, funding studies and projects which have the potential to overcome barriers impacting on renewable energy technology development.

ARENA is developing commercial readiness tools to identify common barriers across technology solutions and provide a rigorous framework for evaluating the steps required for different renewable energy solutions to progress towards commercialisation. The tools will provide a collaborative framework for discussion and help ARENA engage in meaningful and informed dialogue with stakeholders. For ARENA to achieve its objective of accelerating the commercial deployment of renewable energy - building more renewables, cheaper, faster - a detailed understanding of the commercialisation pathways to unlocking investment capital is required.

ARENA's proposed indicative allocation for its overall funding, including already allocated funds, is outlined in Figure 2.

Of this funding, \$1,100m (as of June 2013) is committed to individual projects. This leaves \$1,900m available. The indicative remaining available funds by innovation chain stage are shown in Figure 2.

Of the \$1,900m of funds not committed to individual projects as of June 2013, \$740m has already been allocated to ARENA's newly launched initiatives. A further \$300m - \$900m is expected to be allocated to other initiatives detailed in this Investment Plan. This leaves \$260m - \$860m for allocation to initiatives in future Investment Plans.

Figure 3. ARENA's Committed Funding, Initiatives with Announced Funding and Funding for Future Initiatives



Note: Figures are rounded to nearest \$10m.

* Includes Regional Australia's Renewables Initiative, Accelerated Step Change Initiative and Removing Roadblocks and the SHARE Initiative which are administered via the Emerging Renewables Program.

** Includes Discovering Renewable Potential through Hybridisation, Integrating Renewables Into the Grid, Building Australia's Next Generation Solar and Upholding and Identifying Australia's Top Renewable Research and Deployment.

Continuing Initiatives

Investment Strategy

ARENA will continue the initiatives outlined in its 2012-13 Investment Plan:

Tier 1

Strategic Initiatives

Regional Australia's Renewables

Supports renewable energy demonstration in regional and remote locations with the objective of increasing the deployment of commercially prospective remote renewable energy generation systems. Such demonstrations are likely to include integrated and hybrid systems.

Deploying utility scale renewable energy (closed to new applicants)

Evaluates the remaining large scale solar projects referred to it by the Minister for Resources and Energy, and supports those approved for funding.

Tier 2

Supporting Initiatives

Removing roadblocks for regional and remote renewable energy

Seeks to overcome roadblocks to strategic initiative outcomes. The current focus is on removing roadblocks to regional and remote deployment including system integration, variability, storage, technology demonstration and testing facilities.

Building Australia's next generation solar

Builds on Australia's world-class solar skills and capabilities, including ongoing former ASI projects. During 2013-14, ARENA will consider expanding our support into other sectors (see *Upholding and identifying Australia's top renewable research and development opportunities* under new initiatives on page 8).

Tier 3

Complementary Initiatives

Emerging Renewables Program

Assists the development of renewable energy technologies at any point of the innovation chain, except basic research and development. The Emerging Renewables program supports innovation and knowledge sharing, with a focus on helping technology developers improve the technology and commercial readiness levels of their technologies.

Renewable Energy Venture Capital Fund program

Funding a \$100 million investment in the \$200 million Southern Cross Renewable Energy Fund managed by Southern Cross Venture Partners.

Advanced Biofuels Investment Readiness program (*closed to new applicants*)

Builds the investment case for significant and scalable pre-commercial demonstration projects for the production of high energy, drop-in advanced biofuels in Australia.

Supporting High-value Australian Renewable Energy (SHARE) Knowledge

Addresses knowledge gaps through reporting requirements of its programs and targeted projects. It is intended that this will increase knowledge of the barriers which impact renewable energy projects and the possible solutions available. More details are outlined opposite. →

Current SHARE Knowledge priorities

1. Understanding renewable energy potential

Examples include funding the update of the Australian Energy Technology Assessment; development of an inaugural Australian Liquid Fuel Technology Assessment; a review of Australian geothermal pathways; deeper analysis of renewable energy in the Australian Energy Resource Assessment; in depth review of the challenges and prospects of the off-grid market; and detailed study of the technical and commercial feasibility of large scale hybridisation of existing fossil fuel power plants in Australia.

2. Grid integration

Examples include funding an in-depth analysis of the barriers to, and lessons learned in, negotiating grid connection for renewable energy projects and the collection and publishing of solar irradiation data to assist the integration and financing of solar projects.

3. International engagement

Examples include supporting Australian participation in the International Energy Agency's Implementing Agreements where technologies align with ARENA's priorities.

New Initiatives

ARENA will commence support for the following new priorities:

Precursor study to

Strategic Initiative

Discovering renewable potential through hybridisation

Hybridisation of existing fossil fuel generation offers the opportunity to scale up renewable energy technologies at lower cost than construction of a stand-alone renewable plant. Potential trials of hybrid solutions could help demonstrate that renewables can supply power reliably and build experience among generators operating and maintaining renewable energy plants, while also displacing emissions from fossil fuels.

At present there are some key knowledge gaps in hybrid solutions in Australia. These include the technical factors that enable hybridisation, the number of plants and the types of technologies suitable for hybridisation, the level of funding and the factors that influence the decision-making of energy producers when determining the design and scale of power plants.

ARENA will fund a study to examine the potential for widespread integration of renewable energy in existing power stations in Australia and the possible role for ARENA. Subject to the conclusions of this study, ARENA may consider launching a strategic initiative to encourage the broader deployment of hybrid technology, with the objective of demonstrating utility scale renewable energy, which is comparable in cost to fossil fuel generation.

Tier 2

Supporting Initiatives

Integrating renewables into the grid

Due to the success of a range of renewable policy measures and accompanying cost reductions for technologies such as wind and solar photovoltaics, renewables are reaching high penetrations in a number of locations around Australia. This potentially poses an array of challenges and opportunities for network and distribution operators such as forecasting, technical standards and balancing supply with demand to ensure that maximum benefit is derived from high renewable penetration.

ARENA will launch a supporting initiative to review grid integration barriers to higher levels of renewable energy penetration with the objective of increasing the deployment and utilisation of renewable energy generation systems at both residential and commercial scale. This will have a focus on demonstration projects, developed in consultation with network and distribution operators. Studies on grid integration will also be supported through SHARE.

Upholding and identifying Australia's top renewable research and development opportunities

Australia has produced many leading solar researchers who now hold senior positions in the world's top solar companies. ARENA believes that Australia has other significant world leading areas of research and development in the renewable energy field. To cultivate and continue these world-class research areas, ARENA's supporting initiative on research and development will seek to evaluate and identify potential areas to support. Potentially expanding our research and development commitment beyond solar is in keeping with our approach of making investments which have the best prospects for successful commercialisation, regardless of technology.

Tier 3

Complementary Initiatives

Accelerated Step Change Initiative

ARENA has significant discretion in the mechanisms and processes it can use to provide financial assistance. Flexibility of approach is necessary to ensure that ARENA is able to maximise the value of its investments and their contribution to the development of the Australian renewable energy industry.

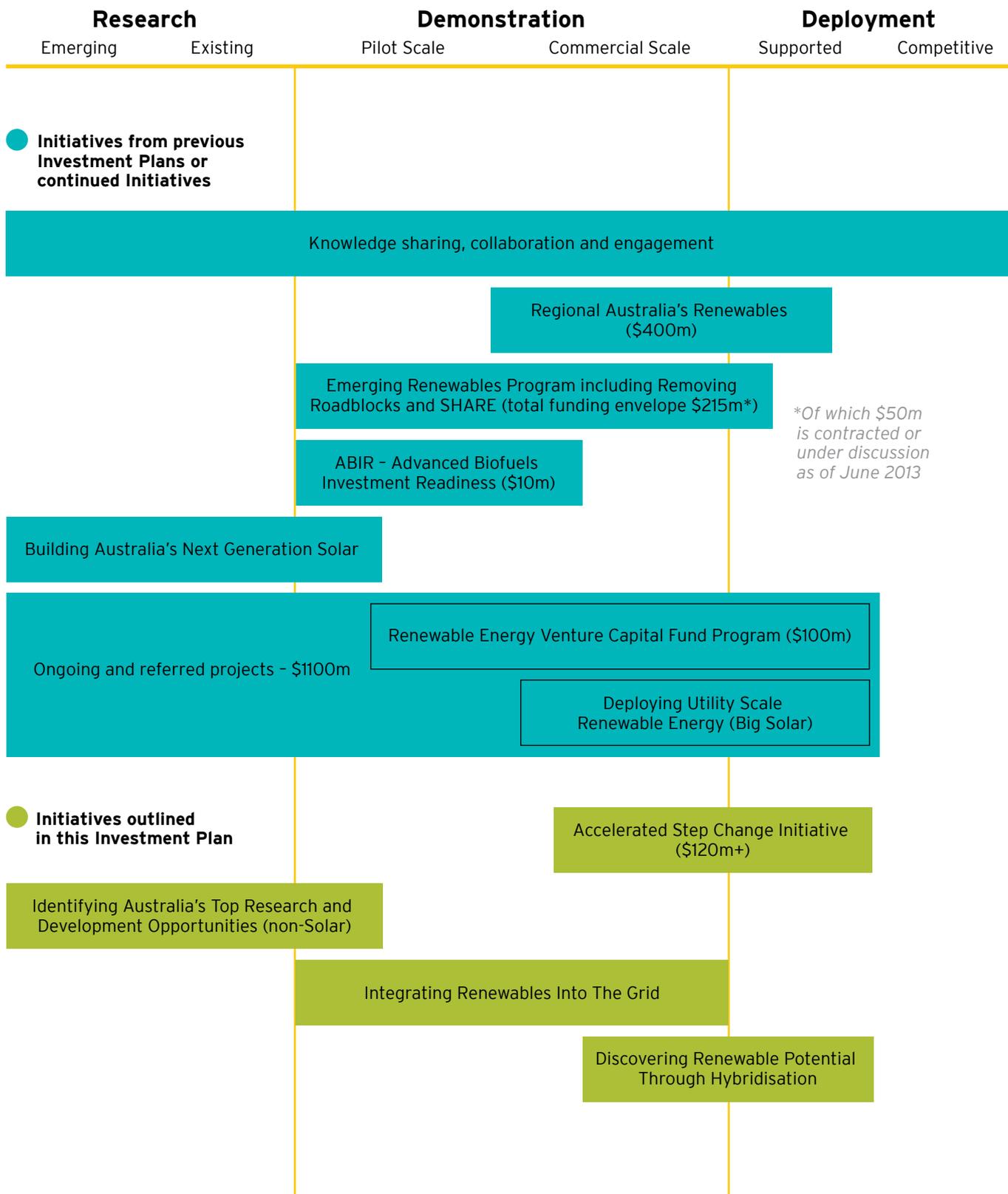
ARENA needs to be adaptable but accountable in the way it responds to the fast pace of change and dynamic nature of the Australian renewable energy industry. It also requires the ability to collaborate with strategic partners (especially other Commonwealth bodies) in order to maximise the leverage and impact of the assistance it provides. To address these needs, ARENA's Accelerated Step Change Initiative (ASCI) will provide a transparent mechanism to provide financial assistance and support for exceptional (high merit) opportunities that might arise or that ARENA might seek out, where those opportunities are not captured by initiatives or programs under its Investment Plan. ASCI targets opportunities exceeding \$20 million and is focussed on helping projects beyond the R&D stage move further and faster along the path to commercialisation.

Framework for the identification of barriers

ARENA is actively developing commercial readiness tools to assist in targeting barriers which are common to a number of different technology solutions. ARENA will work with industry and draw upon international renewable energy commercialisation experience plus commercialisation practices from other sectors to develop its framework.

A diagrammatic summary of ARENA's initiatives across the innovation chain.

Figure 4. Overview of Initiatives (funding amounts included where announced)



ARENA

Further information on initiatives and individual projects is available on ARENA's website
arena.gov.au

Australian Renewable Energy Agency

General enquiries

Phone: +61 2 6243 7773

Fax: +61 2 6243 7037

Email: arena@arena.gov.au

Postal address

GPO Box 643

Canberra ACT 2601

cleanenergyfuture 