



Australian Government
Australian Renewable Energy Agency



ARENA

ARENA's Priorities in Biofuels

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Australian Renewable Energy Agency



Accelerating
Australia's shift
towards a
sustainable,
affordable and
reliable energy
future

\$800m funding
available to support
innovative energy
technology -
certainty for ARENA
and renewable
energy sector

\$1.1 billion funding
committed to support
over 270 projects
150 active projects
60 completed projects

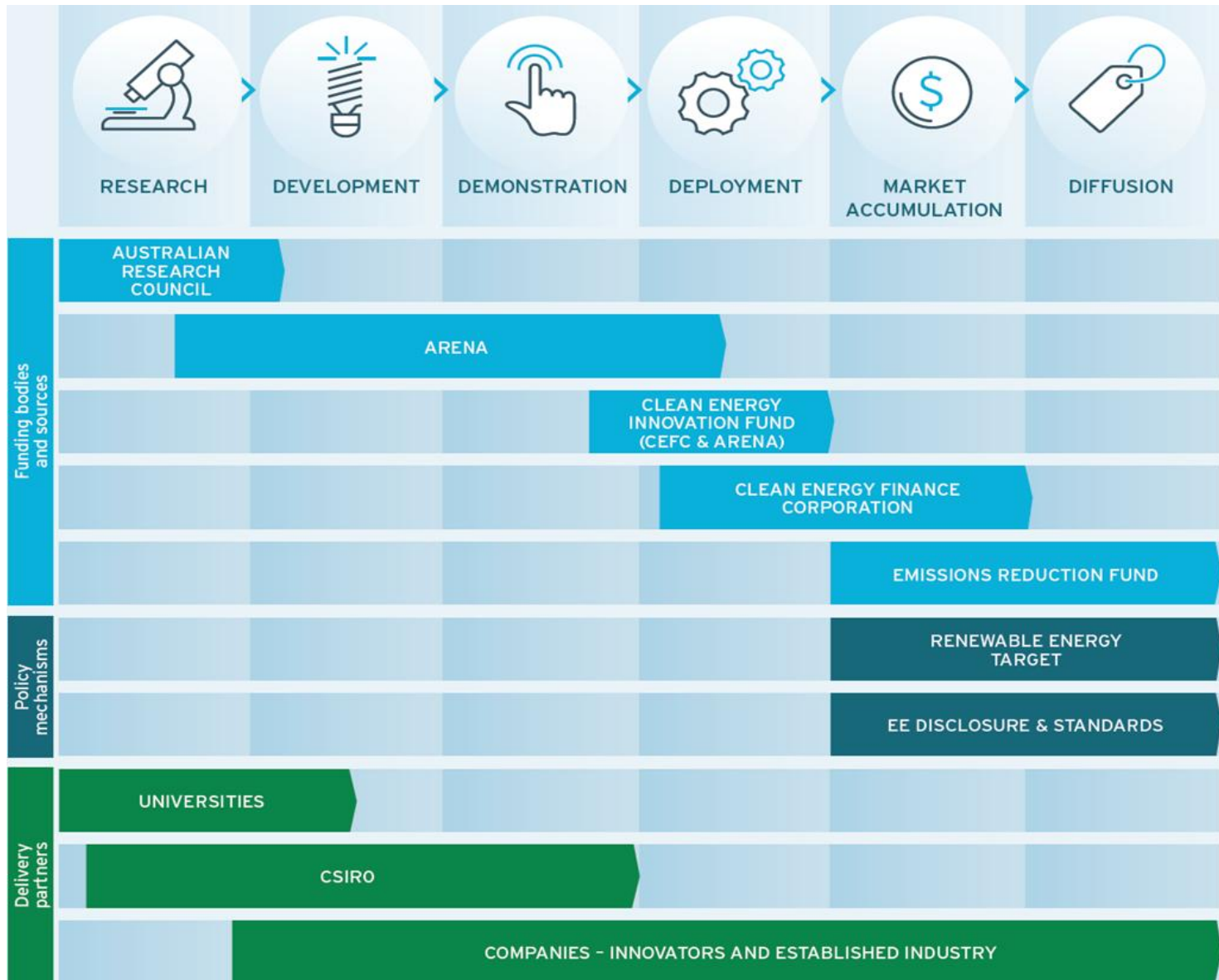
ARENA

Knowledge Sharing | Collect, analyse, interpret and disseminate

- Address real and perceived barriers
- Build on lessons learnt
- Accelerate path to commercial adoption without subsidy



Partnerships across innovation chain



ARENA

Opportunities for Biofuels



Investment Plan



Programme Guidelines

Investment Priorities



- **Integrating renewables and grids (IRG)**

- Establishing innovation lab to build quality projects to complement existing portfolio.



- **Renewables for industrial processes**

- Working with industry stakeholders to determine prospective opportunities to demonstrate renewables (including bioenergy) reduce costs and improve productivity.



- **Off-grid areas**

- Economic challenges of lower diesel prices
- Technical lessons could be relevant to grid applications



- **Fringe-of-grid and network constrained areas**

- Several relevant projects signed recently year
- Likely to consolidate with IRG priority

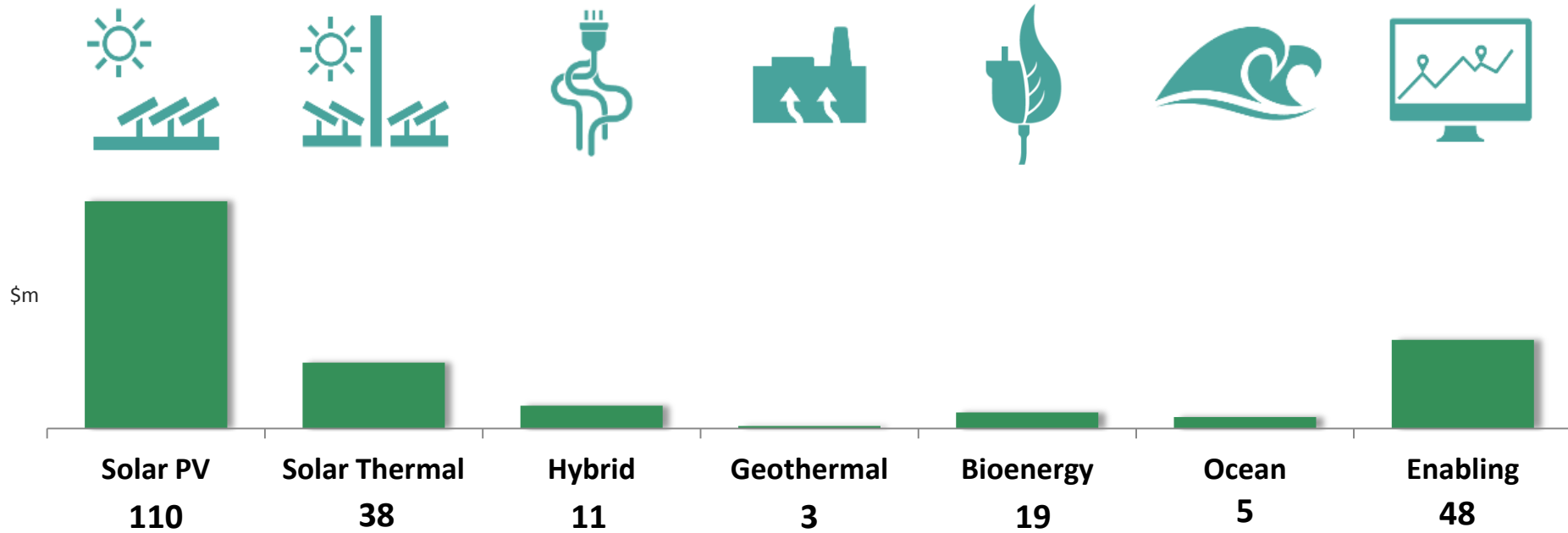


- **Large-scale solar PV**

- 12 successful applicants announced September 2016



ARENA Portfolio



Biofuels *Deep Dive*



Opportunities

- Expertise in agricultural science
- Land and climate
- Niche market opportunity due to dispersed population
- Co-benefits: waste disposal, employment, carbon footprint

Barriers

- Lack of policy support
- Sustainability and cost of aggregating feedstocks
- Complex and fragmented supply chain
- Lack of market pull
- Lack of refining capacity

Key Drivers



Queensland Government Biofutures Initiative

Promote biotechnology and biofuel industries

\$5 million for a Biofutures Industry Development Fund

\$4 million for a Biofutures Acceleration Program.

\$5 million for a Biofutures Commercialisation Program

\$5 million for the establishment of Biofutures Queensland

Virgin / Air New Zealand RFI

Air New Zealand and Virgin Australia announced a partnership to investigate options for locally produced aviation biofuel

ASTM certification process is critical to assessment and success

Bioenergy Projects

- To date ARENA has funded 19 projects in bioenergy / biofuels
- Australian Biofuel Investment Readiness Program (ABIR) projects
 - Muradel
 - James Cook University
 - Licella
- Knowledge Sharing / Evaluation
 - *Algae Forum* Wednesday, 5 August 2015 – Melbourne's AusIndustry Offices
 - 25 people from R&D, industry and government
 - To communicate the outcomes of two of ARENA's recently completed projects
 - To discuss the barriers to the production of algae biofuels
 - To evaluate ABIR program to shape biofuel investment priorities

Bioenergy and Biofuels



Bioenergy

- waste to energy
- pathways that meet local demand (heat &/or power)
- efficient aggregation, processing and development of renewable feedstock
- purification of biogas



Biofuels

- pathways that meet demand (incl. aviation/marine fuel)
- efficient aggregation, processing of renewable feedstock
- processing of bio-crude into refined, drop-in fuels suitable for end users
- acceptance of co-products for commercialisation

Southern Oil Refining



Lab Scale

Northern Oil
Laboratories

Determine processing
requirements

ARENA



Demonstration

Northern Oil
Refinery

Trial requirements in
batch runs

QLD Government



Pilot

Pilot Facility

Trial requirements in a
continuous facility



Full Scale

Commercial
Facility

Full run



Queensland University of Technology

Utilising biogas in sugarcane transport and milling



- Biogas using AD with sugarcane trash as feedstock
- Biofuels using HTL with AD solids as feedstock
- Project Partners:
 - QUT
 - Griffith University
 - Manildra Harwood Sugars
 - Sunshine Sugar
 - Utilitas Pty Ltd

Bioenergy Australia

Participation in the International Energy Agency's Bioenergy program



- Task 37: Energy from Biogas
- Task 38: Climate Change Effects of Biomass and Bioenergy Systems
- Task 39: Commercialising Conventional and Advanced Liquid Biofuels from Biomass
- Task 42: Biorefining in a Future Bioeconomy
- Task 43: Biomass feedstocks for energy markets



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\$1.1 Billion
committed to support projects

\$2.7 Billion
In project value facilitated by ARENA investment

37 new projects
worth \$365M announced in 2014-15

Largest solar farm
in the southern hemisphere now sending electricity into the grid

30+ remote communities
& industries to benefit from \$140M in ARENA funding for 12 project in remote off-grid & fringe-of-grid locations

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Award winning
World Environment Day Award (UN)