

Getting Over The Line:
ARENA's Advancing Renewables Program & Opportunities for Bioenergy

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Business Development & Transactions



Australian Government
Australian Renewable
Energy Agency

ARENA

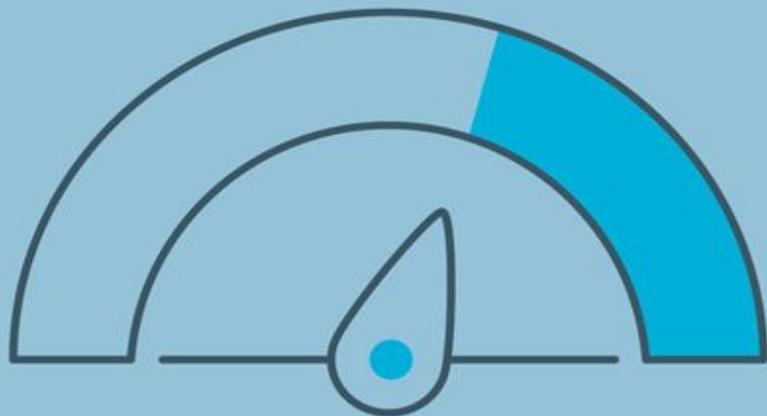
ARENA'S HISTORY

In March 2016, the Australian Government announced its intention to:

- Retain ARENA
- Expand ARENA's mandate to include energy efficiency and low emissions technologies
- Jointly with the Clean Energy Finance Corporation (CEFC), manage the Clean Energy Innovation Fund
- Regulation passed and the CEFC mandate changed

In September 2016, the Parliament passed the Omnibus Bill that provided for **\$800m of uncommitted funding** for ARENA to deliver on its objectives.

As at 30 June 2017, ARENA had **committed approximately \$1.032 billion to over 317 projects**.



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

FAST FACTS: OUR PROJECTS



Generated
142
technology
patents
(30 September 2016)

Helped
to break

14

solar cell efficiency
world records
(30 September 2016)



Unlocked



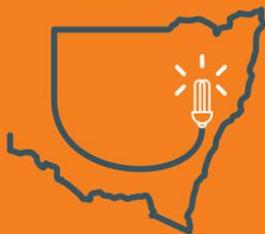
\$2.5 billion

in other renewable energy
investment
(30 June 2017)

Today can
generate

263 MW

of electricity
(30 June 2017)



AND THERE ARE:



\$1.9

billion

more worth
of projects in
our pipeline

(31 August 2017)

INVESTMENT PRIORITIES



DELIVERING SECURE AND RELIABLE ELECTRICITY

Delivering affordable low emission electricity solutions that keep the lights on.



ACCELERATING SOLAR PV INNOVATION

Making solar PV more efficient and affordable through research and development.



IMPROVING ENERGY PRODUCTIVITY

Helping reduce energy cost and emissions in the transport, building and industry sectors.



EXPORTING RENEWABLE ENERGY

Creating new, scalable export value chains in renewable energy.

ADVANCING RENEWABLES PROGRAM : OBJECTIVES

- Reduction in the **cost** of renewable energy
- Increase in the **value delivered** by renewable energy
- Improvement in **technology readiness** and **commercial readiness** of renewable energy
- Reduction in or removal of **barriers** to renewable energy uptake
increased skills, capacity and knowledge relevant to renewable energy

**Supports a broad range of development, demonstration
and pre-commercial deployment projects, including
feasibility studies**



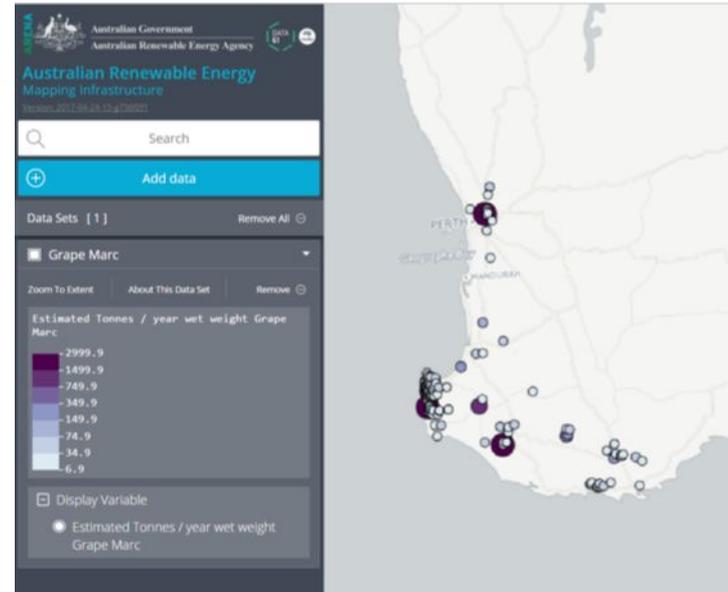
AUSTRALIAN BIOMASS FOR BIOENERGY ASSESSMENT



RURAL
INDUSTRIES

Research & Development
Corporation

- ❑ Mapping geospatial biomass data on the AREMI platform.
- ❑ Layers that can be overlaid to give reliable information to potential end-users and investors.
- ❑ Supply-chain and logistical analytics to be developed.



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BIOENERGY AUSTRALIA



- ❑ Enables Australian representation and knowledge distribution in five key tasks in the International Energy Agency's Bioenergy program;
 - Energy from Biogas
 - Climate Change Effects of Biomass and Bioenergy Systems
 - Commercialising Conventional and Advanced Liquid Biofuels from Biomass
 - Biorefining: Sustainable Processing of Biomass into a Spectrum of Marketable Bio-based Products and Bioenergy
 - Biomass Feedstocks for Energy Markets.



MOUNT ALEXANDER SHIRE FEASIBILITY STUDY

- ❑ Located in Castlemaine, VIC
- ❑ Feasibility study for a community led consortium seeking to integrate A/D in an industrial ecology context.
- ❑ Aims to make use of mixed waste streams drawn from a limited catchment area, located at Coliban's local WWTP.
- ❑ Participants include Mount Alexander Sustainability Group, Mount Alexander Shire Council, Coliban Water, George Weston Foods and Billman's Foundry.
- ❑ Behind the meter electricity and heat usage.



UNITYWATER SEWAGE W2E FEASIBILITY STUDY



Unitywater

- ❑ Kawana, Sunshine Coast QLD
- ❑ Demonstrating that co-digestion of sewage biosolids and higher calorific feedstock within an anaerobic digestion facility can be cost effective at smaller, localised wastewater treatment plants in Australia.
- ❑ Refer ARENA's [*Opportunities for Renewable Energy in the Australian Water Sector Report*](#)
- ❑ Several waste streams will be investigated as part of this activity, including captured and treated sewage, as well as FOG and other wastes from local industry and businesses.
- ❑ Electricity will displace grid sourced generation in a behind-the-meter arrangement.



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GOULBURN BIOENERGY PROJECT



- ❑ Southern Meats abattoir & Quantum Power Limited
- ❑ Animal processing waste & effluent
- ❑ Quantum Power proposes to operate the Project on a build, own, operate and maintain (BOOM) basis.
- ❑ Estimated output: c.3,000,000 kWh pa, looking to displace <75% of peak load
- ❑ \$4.55m total project value



UTILISING BIOGAS IN SUGARCANE TRANSPORT AND MILLING

- ❑ Aims to develop technologies to further integrate bioenergy into the sugarcane production, transport and milling process to lower costs and emission intensity.
- ❑ Sugarcane trash and bagasse will be converted to biogas and upgraded to biomethane for use in sugarcane farming and transportation. Solids from biogas production will be converted via hydrothermal liquefaction to biofuels and chemicals.
- ❑ Could significantly reduce the need for conventional fossil fuels used in farm machinery, sugarcane and sugar products transport, and supplement fuel for cogeneration during the non-crushing season.



BEFORE APPLYING FOR ARENA FUNDING

- Consider how the proposal aligns with the **investment priorities** in this Investment Plan
- Consider if the proposal and applicant entity is **eligible** for a funding program
- Review the **guidelines** for the ARP funding program **in full**
- Consider the potential value of **knowledge-sharing** from the project
- **Contact ARENA at an early stage** to discuss the proposal and its potential to attract funding from other related sources



BIOENERGY - WHAT WE'RE LOOKING FOR

- Assessment of bioenergy for electricity and/or heat, or liquid fuels informed by an initial market analysis designed to maximise ARENA's impact on long-term cost-competitiveness - **what's the addressable market? (Minimum thresholds: 50MWe/100MWth or 500ML+)**
- Bioenergy project applications to include **life cycle assessments** of energy and carbon based on our [Method & Guidance document](#)
- Advanced/drop-in fuels that have the potential to cost-competitively displace non-renewable liquid fuel use in Australia over the long term, with particular emphasis on **aviation, marine, defence and heavy vehicle applications**
- Biofuels activities that **overcome market challenges**, while focusing on supply chains and pathways that can meet demand for liquid fuels
- Projects that are economically dependent on **co-products are fine**, noting ARENA would typically **fund only the renewable component**.



CURRENT OPPORTUNITIES FOR BIOENERGY

- **MSW for electricity:** advanced methods (excl. incineration) to convert MSW to electricity for grid stability and to reduce emissions (incl. co-firing)
- **Agricultural wastes for combined heat & power (CHP):** focusing on use of crop residues (e.g. sugarcane, wheat, cotton, nut) to co-fire with existing plants or in small-scale, distributed co-gen units <2 MW
- **Advanced biofuels:** renewable “drop in” fuels derived from biomass (plants, trees, algae, waste and other organic matter, bio-oils), noting priority sectors
- **Gas displacement - decentralised:** biogas, syngas and/or solid fuels for direct use and/or upgrade to displace heat and power consumption in industrial applications, typically in the 1-5 MW range
- **Gas displacement - centralised:** derivation of bulk renewable gas - synthetic natural gas, bio-hydrogen (as a gas or as liquid ammonia) - from biomass resources for use in scalable domestic and export applications



ADDITIONAL GUIDANCE FOR APPLICANTS: HANDY HINTS

Objectives, investment priorities & Guidelines: how will this 'fit' for ARENA and is it compliant?

Evidence of pre-work: provide pre-feasibility assessments, concept papers etc

Project structure: show how each of the participants will contribute to successful delivery.

Future investor(s): demonstrated engagement or early commitment.

Impact: What is the market opportunity the technology or solution might represent? What will make the next and *nth* projects cheaper and able to operate on a commercial basis, without government support?

Commitments & partners: letters of support from key stakeholders including land access, feedstock source, equipment provider, finance, etc. The applicant needs to demonstrate that the necessary partners (e.g. EPCM, O&M, legal, accounting/audit) have been appointed and/or that a competitive process has been designed or preferably, is already in process to select them (with evidence of this provided).

Risk Assessment: identification of any key risk factors and discussion of mitigation strategies.

Project Financials: assessment of overall project economics including all volumes, revenue sources, expenses, expected returns to all finance sources, etc, with all relevant underlying assumptions tabled. This should follow a conventional project finance methodology and format, to support the business case and would typically be prepared or at least reviewed by a finance/accounting professional.

Budget: a detailed budget for the proposed scope of activity

Land/site access: further detail on access to any land required should be provided.

Technical: further detail should be provided on the technical options/configurations that have been considered, that justify the focus of the next level of investigation.

Capability & Experience: further detail should be provided regarding the relevant experience of the applicant with respect to the solution being brought forward, evidence of reference plants etc.

Commodities: further details should be provided on the commodity outputs from the process (incl. co-products) and the basis of any assumptions made (e.g. link to technology providers, offtake pricing, market demand/maturity etc).

Size: further details should be provided on the proposed size of the facility (including, where relevant, appropriate supply chain access to available feedstock). It is best if applicants have already decided upon the preferred size/scope of their facility prior to making an approach (in terms of targeted electrical/thermal output, fuel volume, storage capacity etc).

Feedstock: detail is required regarding the access rights, cost, required volume, seasonality, variability and quality of feedstock expected to be sourced, with preliminary indications of supply terms, prices and commitments being made.

Mind the gap: why do you need our help and how do you justify the funding request?



Join us and find out more



AustRenewableEnergy



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