



Australian Government  
Australian Renewable Energy Agency



ARENA

# Bioenergy Roadmap Forum – May 2016

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# Australian Renewable Energy Agency

**\$2.5 billion**  
in funding  
to 2022

**\$330 million**  
commitment  
target to  
June 2016

Established  
in 2012 to:

**Improve  
competitiveness**  
of renewable energy  
technologies

**Increase supply**  
of renewable energy  
in Australia

**\$1.1 billion**  
committed  
to date

**249**  
supported  
projects

**58** completed  
projects

Knowledge | Collect, analyse, interpret and disseminate information  
and knowledge

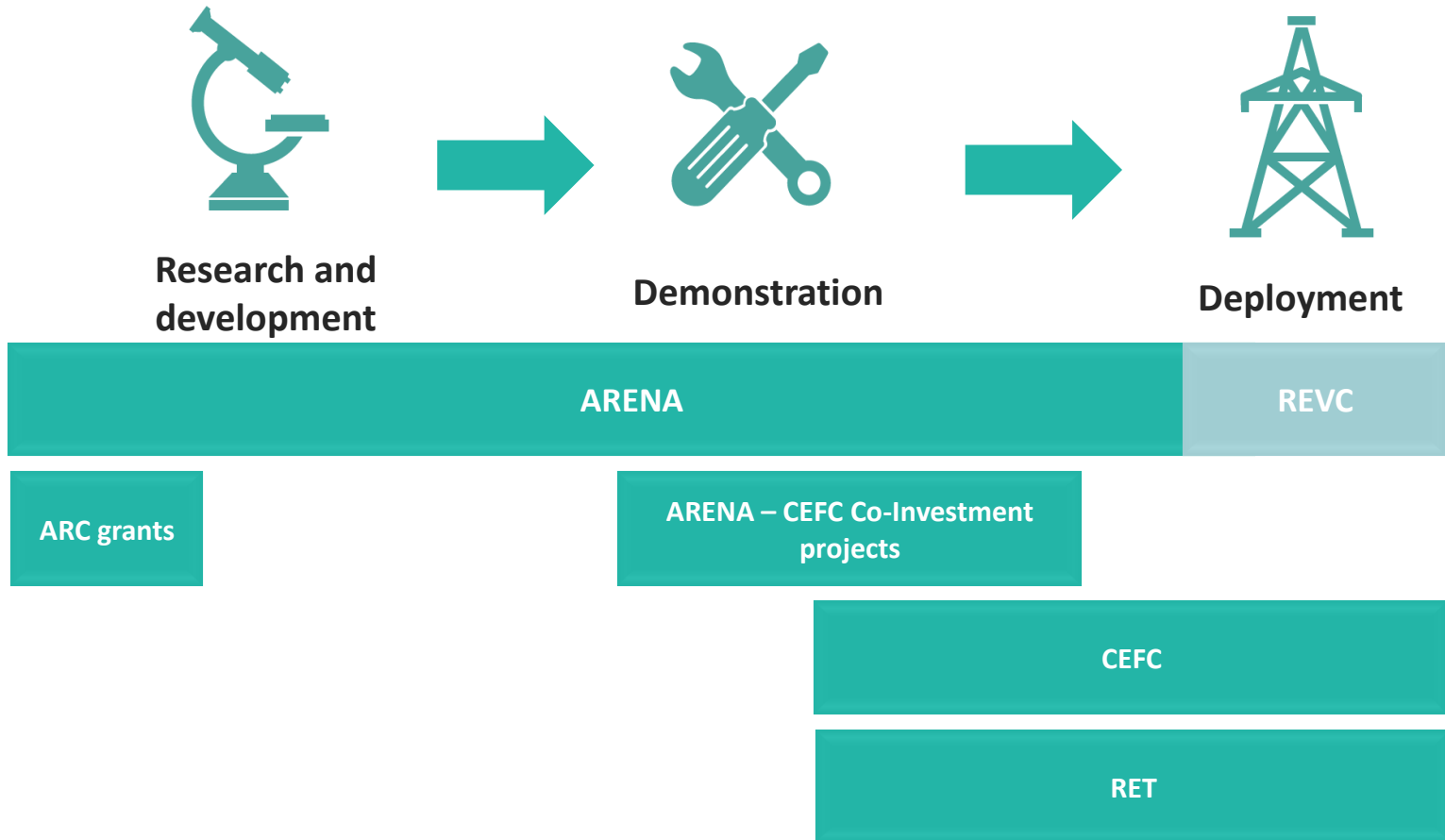
# Recent announcements

23 March 2016 - Australian Government announced intention to:

- Retain ARENA and CEFC
- Expand ARENA's mandate to include energy efficiency and low emissions technologies
  - Requires regulation
- Predominantly invest via debt and equity under the Clean Energy Innovation Fund
  - Requires regulation
  - Jointly managed by ARENA and CEFC
- Retain \$1.3 billion in savings from May 2014 Budget
  - Requires legislative change

# Advancing renewables along the path to commercialisation

## COMMERCIALISATION PATHWAY



## ARENA'S RELATIONSHIP WITH CEFC

# ARENA's role

## Structured grant funding:



- 'Bridge the gap'
- Reduce investment risk
- Leverage other investment

## Subsequent knowledge sharing:



- Address real and perceived barriers
- Create linkages between researchers, industry and investors
- Accelerate path to commercial adoption without subsidy



# 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, 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**

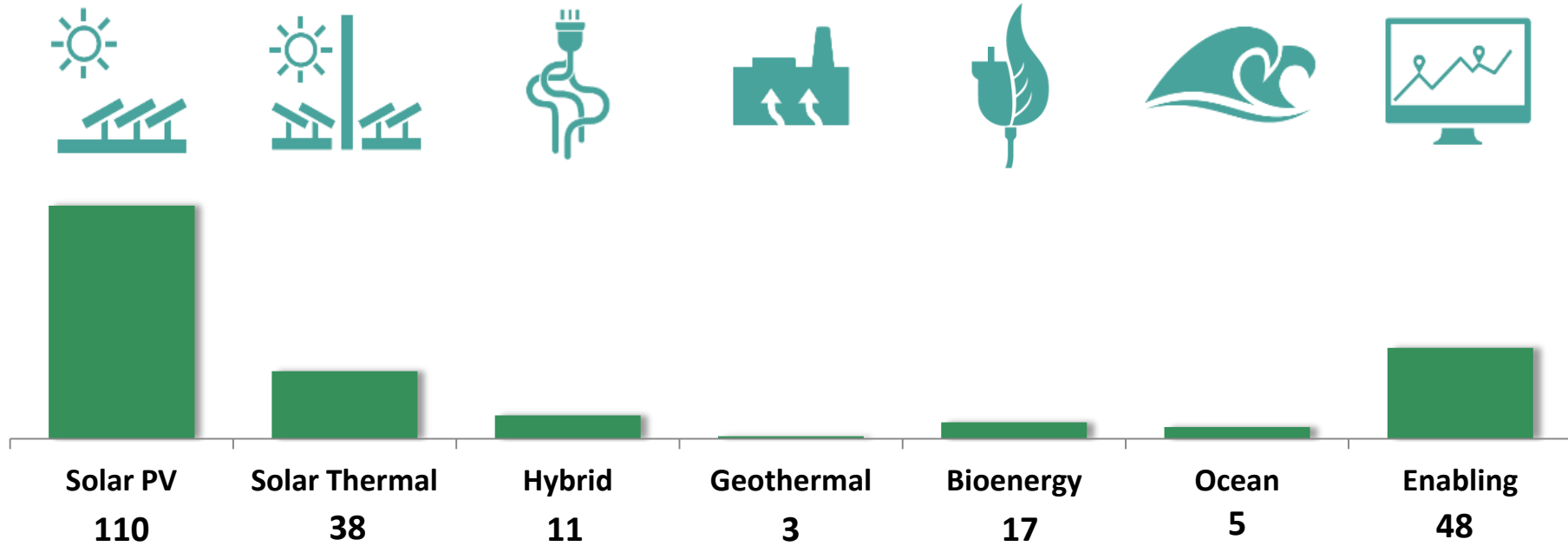
- Several relevant projects signed recently year
- Likely to consolidate with IRG priority



- **Large-scale solar PV**

- 22 applications proceeding to full application (due 15 June)

# ARENA Portfolio



# Investment focus area – 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





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Find out more at [arena.gov.au](http://arena.gov.au)

ARENA



ARENA at LinkedIn



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# Licella

- Two ARENA supported projects
- Technology uses a proprietary Catalytic Hydrothermal Reactor process to convert cellulosic biomass into bio-crude
- The first project successfully scaled up a pilot plant and demonstrated production of bio-crude
- A second project is underway to develop a pre-commercial plant



# Muradel

- Demonstration facility using microalgae feedstock to produce green crude
- Low-energy algae harvesting and high-performing microalgae strains with potential for economic scale up
- Aim was to build commercial plant
- Move away from algae biomass for fuel



# Other Demonstration Projects and Feasibility Studies

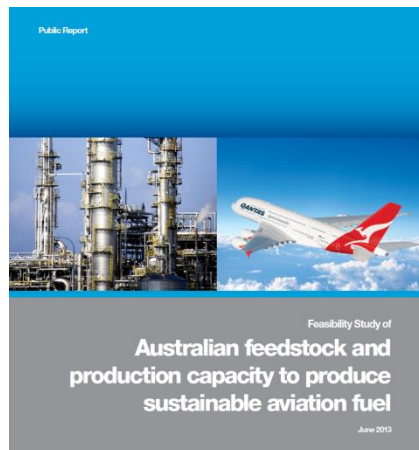
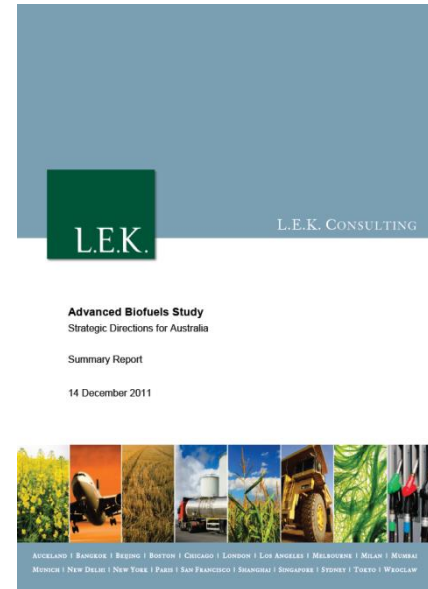
- *Bureau of Sugar Experiment Stations*
  - Investigated technical and commercial feasibility of producing biofuel from sugarcane bagasse
  - Outcome: Whilst technically feasible it is not economic
- *Curtin University of Technology / Renergi (2 demonstration scale projects)*
  - Pyrolysis and biorefining of mallee crops to bio-oil /bio-gas for electricity
  - Outcome: demonstrate technology for commercial plant
- *James Cook University*
  - Demonstration scale facility producing bio-crude using macroalgal biomass
  - Economic modelling submitted to ARENA



James Cook University  
Macroalgal biomass facility

# Technical and Economic Reports

- All reports are public and available online
- *LEK Consulting - Advanced Biofuels in Australia (2011)*
- Biofuels industry could be of significant future value and scale



- *Qantas and Shell – Aviation Biofuels (2013)*
- Aviation biofuels industry is technically viable in Australia
- Challenges include availability and cost of the feedstocks, and availability of refining infrastructure.