

The role of ARENA in Australia's Energy Industry

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Australian Renewable Energy Agency



Australian Government
Australian Renewable
Energy Agency



ARENA is on a mission to



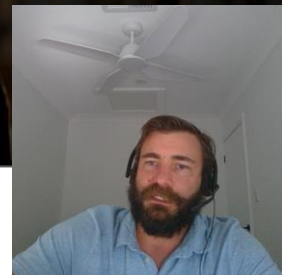
support the **global transition** to net zero emissions



by accelerating the pace of **pre-commercial innovation**



to the **benefit of Australia.**



AUSTRALIAN RENEWABLE ENERGY AGENCY

KEY STATISTICS 2012-2021

ARENA



INVESTED

\$1.70B



PROJECTS

586



VALUE

\$6.92B



INVESTMENT LEVERAGE

\$1:\$3.06



PROJECTS BY TECHNOLOGY

BIOENERGY

\$131M



GEOTHERMAL

\$42M



GRID INTEGRATION

\$270M



HYBRID

\$110M



HYDROGEN

\$60M



OCEAN

\$44M



SOLAR PV

\$725M



SOLAR THERMAL

\$178M



STORAGE - BATTERIES/PHES

\$143M



RECENT ACTIVITY



\$71.9M

Future Fuels Fund launched to help businesses and regional communities take advantage of opportunities offered by hydrogen, electric, and bio-fueled vehicles

\$1.98M

to demonstrate aggregated hot water heater load control

\$1.6M

for a residential electric vehicle charging orchestration trial

\$1.49M

to commercialise repurposed EV battery and inverter systems

RELEASED

State of DER Technology Integration Report, which identifies what is required to integrate DER into Australian electricity markets

INVESTMENT BY STATE

NT

PROJECTS

7

INVESTED

\$39M

VALUE

\$82M

WA

PROJECTS

37

INVESTED

\$186M

VALUE

\$1.83B

SA

PROJECTS

52

INVESTED

\$150M

VALUE

\$602M

TAS

PROJECTS

19

INVESTED

\$40M

VALUE

\$97M

VIC

PROJECTS

108

INVESTED

\$199M

VALUE

\$488M

NSW

PROJECTS

238

INVESTED

\$819M*

VALUE

\$2.44B

QLD

PROJECTS

57

INVESTED

\$202M

VALUE

\$1.20B

* Includes \$567 million contributed to projects inherited by ARENA in 2012.

INVESTMENT LEVERAGE ALONG THE INNOVATION CHAIN

STUDY

\$1:\$1.68

R&D

\$1:\$1.63

DEMONSTRATION

\$1:\$1.83

DEPLOYMENT

\$1:\$5.73

ENGAGEMENT

INDUSTRIAL ENERGY PROGRAM

Consulted more than 80 people on the Industrial Energy Program, which helps users identify and reduce energy costs.

DEIP CEO F

Distributed Energy Integration Program (DEIP) CEOs met to discuss priorities.



Strategy and Investment Priorities

TO SUPPORT THE GLOBAL TRANSITION TO NET ZERO EMISSIONS
BY ACCELERATING THE PACE OF PRE-COMMERCIAL INNOVATION,
TO THE BENEFIT OF AUSTRALIAN CONSUMERS, BUSINESSES AND WORKERS

DRIVE IMPACT WITHIN OUR STRATEGIC PRIORITIES

OPTIMISE THE TRANSITION TO RENEWABLE ELECTRICITY



- › Enable ultra low-cost renewable generation
- › Improve the economics of energy storage
- › Optimise large-scale integration
- › Support flexible demand

COMMERCIALISE CLEAN HYDROGEN



- › Support a viable clean hydrogen industry across the full value chain

SUPPORT THE TRANSITION TO LOW EMISSIONS METALS



- › Accelerate the transition to low emissions steel value chain
- › Accelerate the transition to a low emissions aluminium value chain

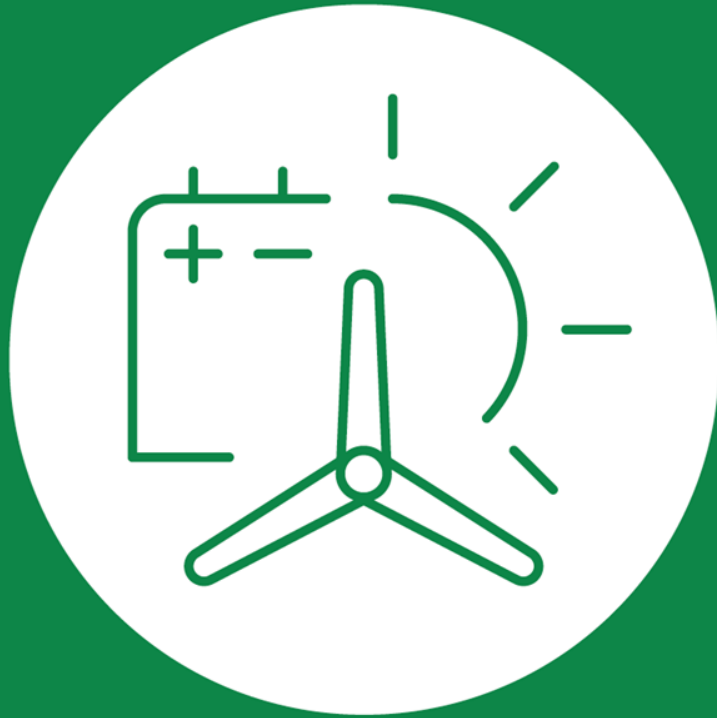
- › Scale up carbon capture and storage (CCS)
- › Reduce the cost of soil carbon measurement

DELIVER THE BUDGET PROGRAMS

Future Fuels Fund | Industry Energy Transformation Studies Program | Regional Australia Microgrid Pilots Program
Freight Efficiency Assistance Grants | Freight Energy Productivity Trial Program

Maximise the value of ongoing projects through effective project delivery and knowledge sharing





OPTIMISE THE TRANSITION TO RENEWABLE ELECTRICITY

INVESTMENT PRIORITY





Australia is leading the world in solar PV research

Scientia Professor Martin Green at
the Solar Industrial Research Facility

Vince Allen and David Hu of
SunDrive





OPTIMISE THE
TRANSITION TO
RENEWABLE
ELECTRICITY

Investment Themes

1. Integrate large-scale renewable energy
2. Cost effective energy storage
3. Demand flexibility
4. Ultra-low cost generation





Increase module efficiency to
30%



Reduce installed capital costs to
30c/W



By 2030





COMMERCIALISE CLEAN HYDROGEN

INVESTMENT PRIORITY

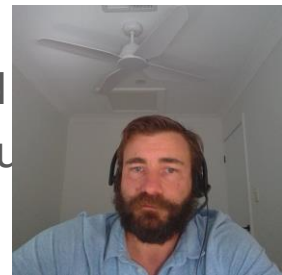




COMMERCIALISE
CLEAN HYDROGEN

ARENA's Focus

1. Reduce the cost of hydrogen produced from renewable energy
2. Research and development to demonstrate technologies that address technical challenges along the rest of the hydrogen value chain
3. Prove the technical feasibility and commercial viability of hydrogen u



HYDROGEN FEASIBILITY AND DEMONSTRATION PROJECTS

ARENA



INVESTED

\$33.2M



PROJECTS

12



VALUE

\$77.5M



INVESTMENT LEVERAGE

\$1:\$1.53



1 YARA PILBARA RENEWABLE AMMONIA FEASIBILITY STUDY

Yara Pilbara Fertilisers

ARENA FUNDING / PROJECT COST
\$1.0M / \$3.7M

2 PROJECT GERI FEASIBILITY STUDY

BP Australia

ARENA FUNDING / PROJECT COST
\$1.7M / \$4.7M

3 THE HAZER PROCESS: COMMERCIAL DEMONSTRATION PLANT

Hazer Group

ARENA FUNDING / PROJECT COST
\$9.4M / \$22.6M

4 ATCO H2 MICROGRID

ATCO Gas Australia

ARENA FUNDING / PROJECT COST
\$1.8M / \$3.7M

5 BLENDING HYDROGEN INTO VICTORIAN AND SOUTH AUSTRALIAN GAS INFRASTRUCTURE

Australian Gas Infrastructure Group

ARENA FUNDING / PROJECT COST
\$1.3M / \$4.2M

6 TOYOTA ECOPARK HYDROGEN DEMONSTRATION

Toyota Motor Corporation Australia

ARENA FUNDING / PROJECT COST
\$3.1M / \$7.4M



FEASIBILITY STUDIES



DEMONSTRATION PROJECTS

7 DYNO NOBEL EXPANSION OF MORANBAH - FEASIBILITY OF RENEWABLE HYDROGEN

Dyno Nobel Moranbah

ARENA FUNDING / PROJECT COST
\$1.0M / \$3.0M

8 STANWELL HYDROGEN DEMONSTRATION

Stanwell Corporation

ARENA FUNDING / PROJECT COST
\$1.25M / \$5.0M

9 QUEENSLAND NITRATES FEASIBILITY STUDY FOR GREEN HYDROGEN AND AMMONIA

Queensland Nitrates (QNP)

ARENA FUNDING / PROJECT COST
\$1.9M / \$3.9M

10 WALLUMBILLA RENEWABLE METHANE DEMONSTRATION

APA Group

ARENA FUNDING / PROJECT COST
\$1.1M / \$2.3M

11 BULWER ISLAND RENEWABLE HYDROGEN PRODUCTION AND REFUELLING PROJECT

BOC

ARENA FUNDING / PROJECT COST
\$1.0M / \$4.2M

12 POWER TO GAS DEMONSTRATION

Jer...

ARENA FUNDING / PROJECT COST
\$7....





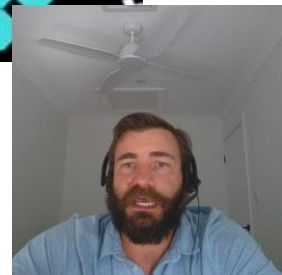
SUPPORT THE TRANSITION TO LOW EMISSIONS METALS

INVESTMENT PRIORITY



Learn more about ARENA projects online

- ARENA's **Knowledge Bank** is an open-source library of reports, studies and tools. Subscribe to our industry newsletter, **Insights**, arena.gov.au/knowledge-bank
- Our **podcast** features energy experts Dr Alan Finkel, AEMO CEO Audrey Zibelman and Managing Director of German Energy Agency, Kristina Haverkamp. Subscribe wherever you get your podcasts.
- **ARENAWIRE** is home to news and analysis about ARENA funded projects. Subscribe to our E-news at arena.gov.au/blog.



Next steps

Contact ARENA:
proposals@arena.gov.au

More information?
Visit arena.gov.au/funding

www.arena.gov.au

