



A2EP – 2xEP Energy Productivity Summit
04-05 April, 2017
Australian National Maritime Museum
Darling Harbour, Sydney

Session 13
Integrated clean energy (ICE)

Dan Sturrock > presentation follows

James Lewis

Nick Smith

Martin Symes

Tim Stock

Matt Grover

Chair: Travis Hughes



Doing more. Using less.



Australian Government
Australian Renewable Energy Agency

ARENA and Energy Productivity

ARENA

Dan Sturrock
Energy Productivity Summit
5 April 2017

ARENA overview and context

\$800 million
in funding
available
to 2022
following
passage of
Omnibus Bill
in September

Established
in 2012 to:

**Improve
competitiveness**
of renewable energy
Technologies

Increase supply
of renewable energy

\$1.1 billion
committed
to date

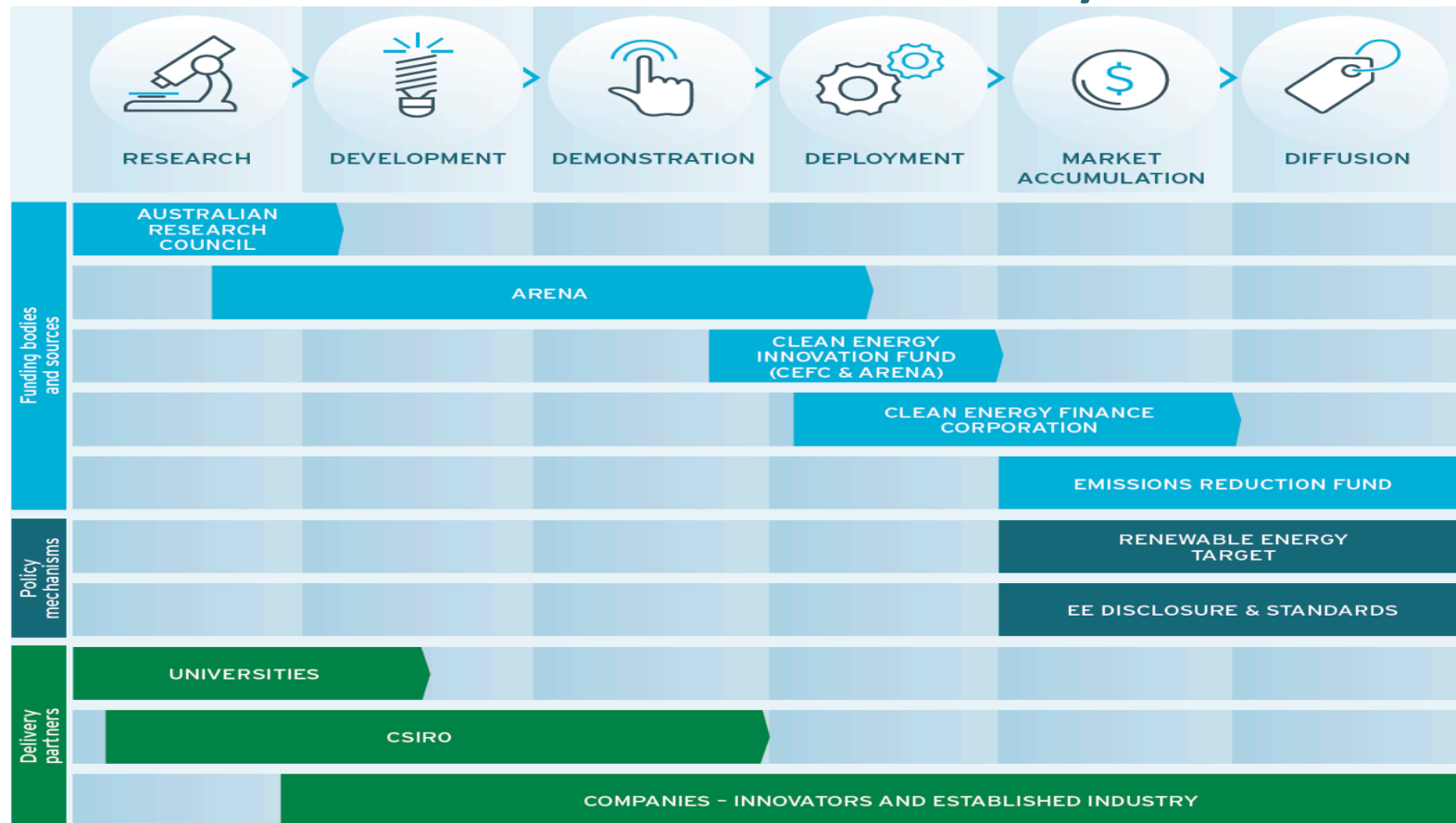
Over 250
supported
projects

ARENA

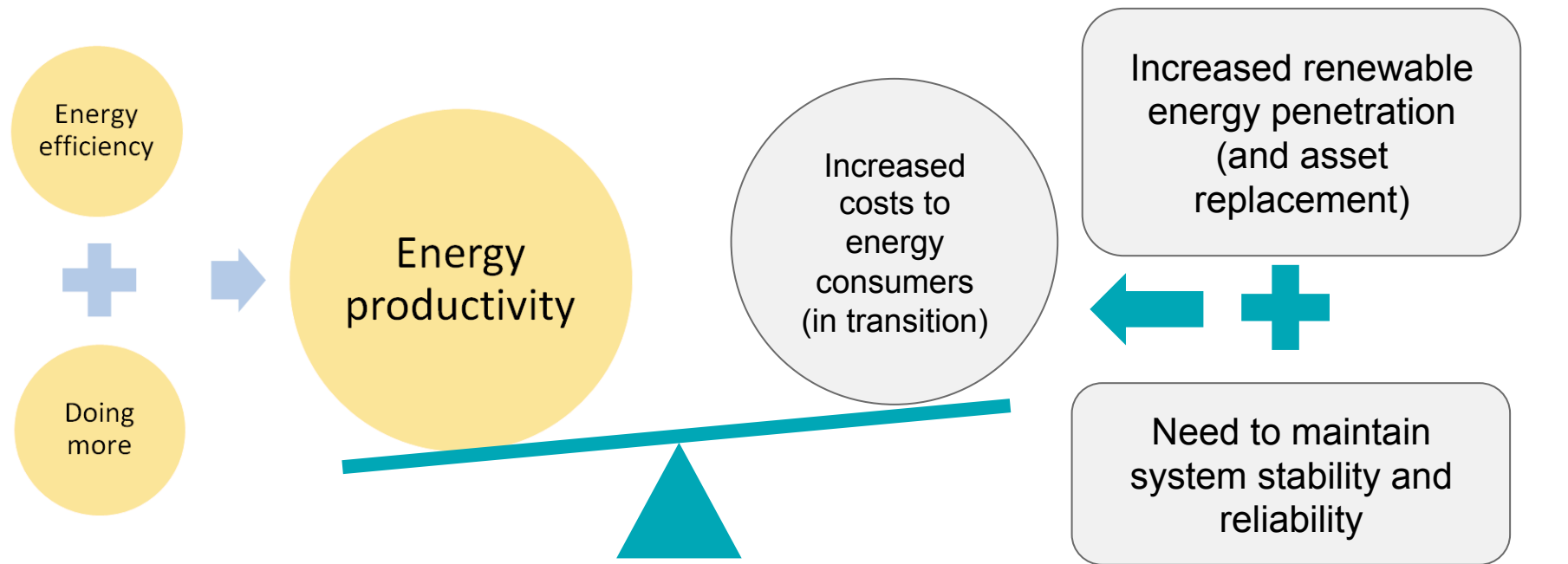
Knowledge | Collect, analyse, interpret and disseminate information
and knowledge

ARENA as an innovation catalyst

ARENA

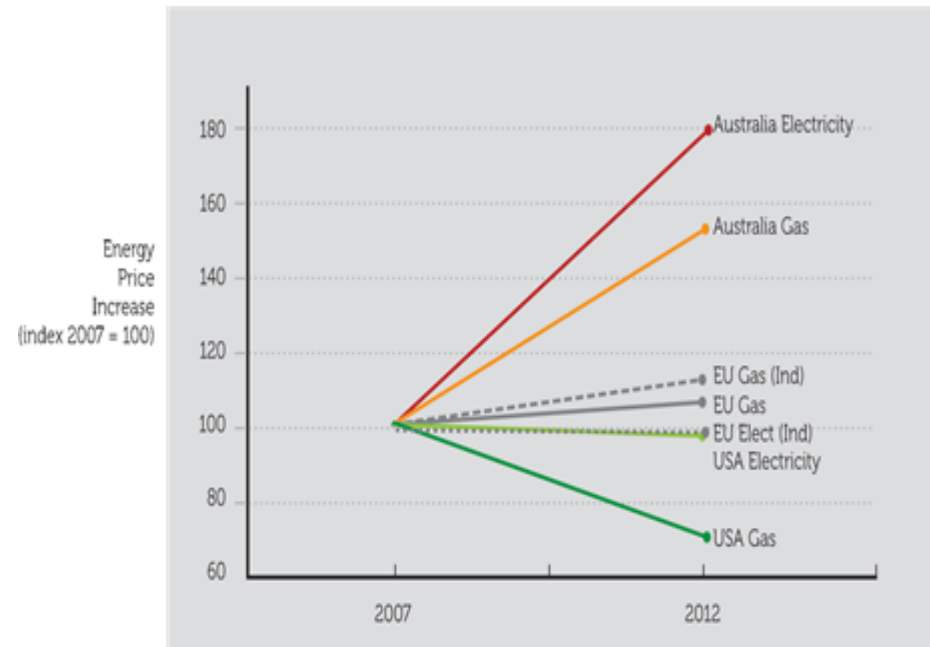
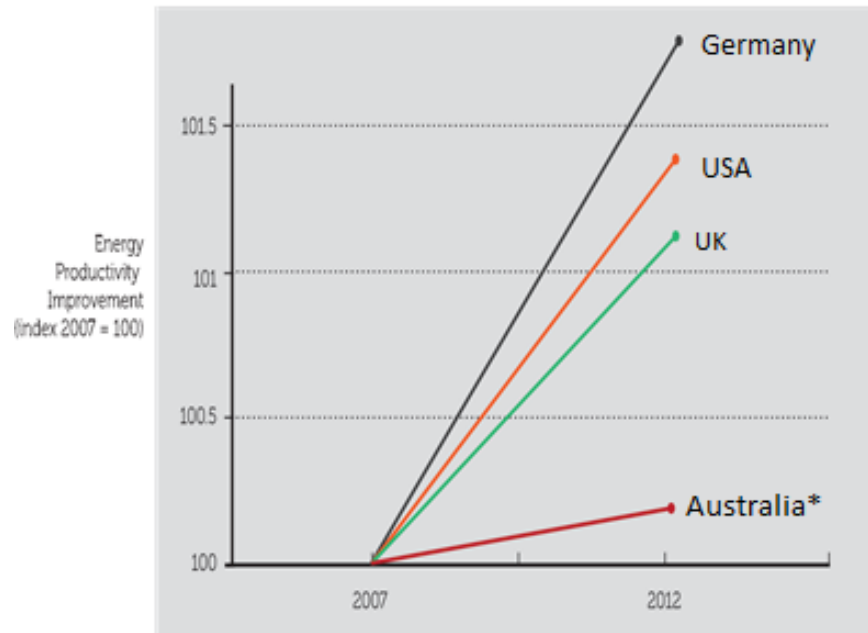


Energy Productivity is highly complementary to renewable energy



The benefits of EP can balance the higher costs of decarbonisation

With lots of room for improvement



- Since 2007 Australia has had slow rates of EP improvement and highest energy price increases
- There should be a clear case for improvements....

So what is ARENA's role in improving EP?

Why?

- ARENA's technology remit is being expanded to include energy productivity
- Presents an opportunity to drive innovation and commercialisation in sectors outside electricity generation

What is ARENA aiming to achieve?

- Driving innovation to help Australia meet National Energy Productivity Plan (NEPP) goal
- Show the potential for improvements above and beyond the NEPP

Delivery

- To be determined - new area for ARENA
- 2017 work will primarily be developing scope, targets and funding approach

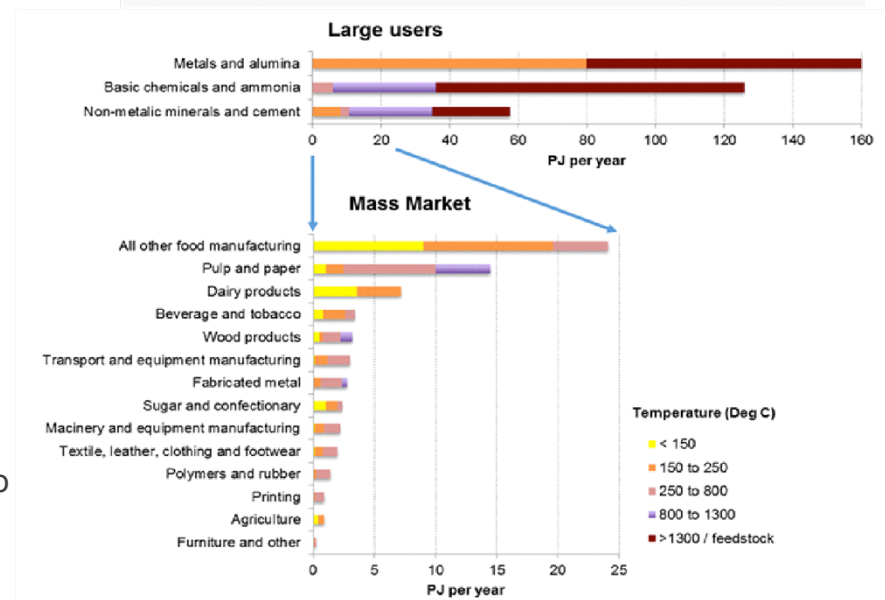
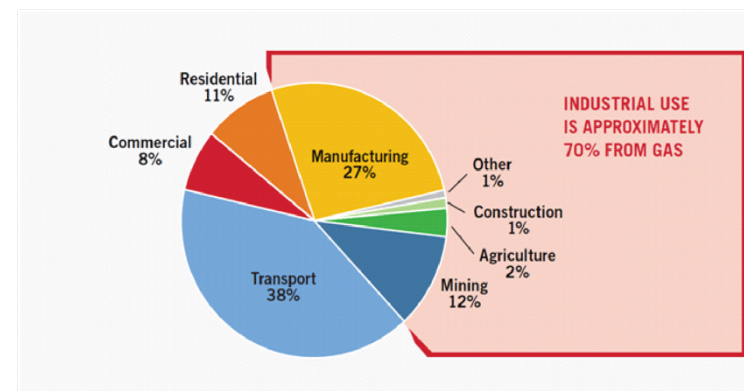
We are consulting with the sector to define ARENA's role?

- ARENA recently released a stakeholder survey posing the following questions:
 1. Where are the innovation opportunities to drive major energy productivity improvement and which of these could ARENA most effectively support?
 2. Do you have a project idea which might align with ARENA's new focus on energy productivity? Would you like to pursue this project idea further in the near future?
 3. How do you think ARENA should evaluate energy productivity projects? What do you consider to be important for funding guidelines and selection criteria?

But some of our existing projects have a strong energy productivity focus

Renewables for Industrial Process

- The non-mining industrial sector consumes c31% of total energy in Australia
- Of this energy generation approximately 70% is from gas, with a large proportion used for the purposes of generating thermal energy
- ARENA engaged IT Power in late 2015 to undertake a study to assess whether renewable energy could play a role in displacing this gas generation
- Conclusions: the most prospective sectors were those with either:
 - access to low cost biomass or waste streams; or
 - those located in areas of reasonable solar resources with low process temperature requirements (i.e. up to 250°C).



ClimateWorks - Deep Decarbonisation Projects

Decarbonisation Pathways (project finished):

Prepare practical national pathways to help implement decarbonisation policies
with a focus on opportunities to reduce vehicle emissions

Support international climate change negotiations by helping decision makers
understand how deep decarbonisation can be achieved

Electric Vehicle Pathways (project ongoing):

- Seeks to understand economic, infrastructure and policy development drivers that underpin the transition to electric vehicles.
- Will deliver more efficient productivity outcomes in transport sector
- Entering consultation phase engaging with key policy makers, fleet managers and industry
- Final report expected to be published December 2017

Integrating CST into the Bayer alumina process

Lead organisation: University of Adelaide. **Program:** Research and development
ARENA funding: \$4.5 million. **Total project value:** \$15.1 million

Alumina processing using concentrating solar thermal: Alcoa-University of Adelaide collaboration

Aim: Determine economic viability of using low temperature solar concentrators to provide heat for alumina processing.

Impact: If research idea is taken through to commercial stage – could displace up to 2.5 GW of gas capacity (80PJ per annum) in alumina refining sector



Biogas in sugarcane transport & milling

Lead organisation: University of Queensland **Program:** Research and development

ARENA funding: \$2.1 million **Total project value:** \$5.7 million

The project aims to develop technologies to further integrate bioenergy into the sugarcane production, transport and milling processes to lower costs and emissions.

Biogas using AD with sugarcane trash as feedstock

Biofuels using hydrothermal liquefaction with AD solids as feedstock



Unitywater Wastewater Treatment Plant

Lead organisation: Unitywater **Program:** Advancing Renewables

ARENA funding: \$296,000 **Total project value:** \$697,000

Demonstrate co-digestion of sewage biosolids and other feedstocks within existing AD facility at smaller localised wastewater treatment plants

Study will examine technical and commercial viability of small to medium WTPs producing biogas and renewable energy behind the meter



ARENA

If commercially viable, offers alternative opportunity to power generation for WTPs of similar scale