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# ACOLA and an Australian Energy Transition Research Plan (AETRP)

A strategic research agenda to enable Australia's sustainable, reliable, affordable and fair energy transition

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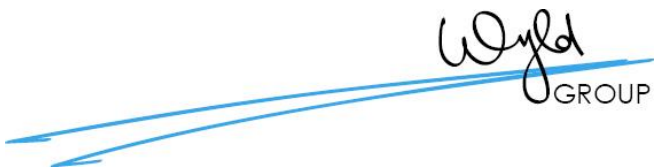
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# What's ACOLA and what does it do?

The five Members of the Australian Council of Learned Academies (ACOLA) hold individual formal recognition as a Learned Academy by the Australian Government through recognition under the Higher Education Support Act (HESA) - Australian Academy of the Humanities, Australian Academy of Science, Academy of the Social Sciences in Australia, Australian Academy of Technology and Engineering and Australian Academy of Health and Medical Sciences.

*Drawing on its network of Australia's leading minds, across academia and industry, ACOLA produces refined, evidence-based reports that aid policy-makers and governments to make informed decisions.*

*Critically, ACOLA's work is interdisciplinary, in recognition that the complexity challenges facing society are most effectively addressed by bringing together specialist expertise from across domains.*



# Background to the AETRP

- ❑ The energy transition is well underway in Australia - but further efforts are required to transform our industries and support the broader socio-economic change required for a successful transition.
- ❑ While net-zero emissions by 2050 is the destination for Australia's emissions, the critical questions are how will we get there, and at what rate?
- ❑ A recent International Energy Agency (IEA) report underscored that the technologies needed to achieve substantial decarbonisation by 2030 already exist, and the policies to drive deployment have been proven.
  - *Post 2030 though, reaching net zero by 2050 will require further innovation and R&D, rapid deployment of current technologies, and accelerating emerging technologies to market.*
- ❑ The IEA also reiterated that the energy transition 'to net zero is for people and about people'. Here in Australia however, and based on experience, there has been limited research into the social and human elements of the transition.
- ❑ With this in mind, it was recognised there is a need for more strategic, coordinated research efforts to underpin Australia's energy transition efforts.

# Initial conclusions from consultations

- ❑ Led by Drew Clarke, at the end of 2019 and early 2020, ACOLA undertook an extensive consultation with the energy sector, (researchers, industry, government, community organisations) on the development of a proposed Research Plan, from which several conclusions came:
  - *While collectively Australian performs well in energy research (especially across science and technology), there is currently no national framework to ensure that efforts are being directed towards the most urgent or critical issues, or to ensure unnecessary duplication.*
  - *Although international developments in research will undoubtedly inform our national pathway, more local research is needed to solve problems that are uniquely Australian.*
  - *A successful transition needs to address the energy trilemma (net zero, affordable and reliable), and it also needs to be fair.*
  - *All actors, from government, industry, research funders and researchers need to progress efforts in a manner that reflects the urgency and scale of this challenge.*
    - ❖ *In particular we need to look at options to increase efficiencies in the way research is funded and undertaken.*

# Developing the AETRP

As a response to these critical issues, ACOLA and the Steering Committee have been working over the past two years to develop the first Australian Energy Transition Research Plan, which was launched in June 2021



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# Australian Energy Research Priorities

## Three themes

- *Energy system dynamics*
- *Social engagement dynamics*
- *Transition dynamics*



# Energy system dynamics

## ❑ Policy regulation

- *Research is required on the policy and regulation aspects of the transition, to ensure we have best practice policies and practices in place.*
- *In particular, further work is needed to consider how our future industries will be regulated.*

## ❑ Communication and engagement

- *Effective engagement on the impacts of the transition is essential.*
- *A successful transition will need effective communication, genuine engagement, community support, and consumer, prosumer and investor confidence.*
- *Further research on how we can achieve best practice engagement and communication will help ensure that the transition efforts are smooth, minimising divisive politics and rhetoric.*

## ❑ Social licence and participation

- *Justice, equity, fairness, health and wellbeing should apply across social and geographic contexts.*
- *For an inclusive transition, we need to better understand perspectives and values to facilitate genuine collaboration and participation at all scales and across all sectors.*

# Social engagement dynamics

## ❑ Governance

- *Further assessment of the governance of the transition needs critical attention.*
- *We need to consider how current energy-related governance structures and institutions (across government industry, non-profits, community, research) can be optimised to enhance governance, collaboration and decision-making.*

## ❑ Risks

- *New pathways will lead to new risk scenarios.*
- *Comprehensive, interdisciplinary research can help us navigate risks, and minimise disruption to our economy and industry.*

## ❑ Industry

- *For Australia to be a clean energy superpower, we will need the necessary skills and capabilities, self-reliance, and export potential to establish a robust industry sector.*

# Transition dynamics

## ❑ Technology

- *Self-explanatory: Australia needs to continue to invest and drive research in technology R&D to drive down costs and encourage uptake of current technologies, and to bring emerging technologies to market.*

## ❑ Transition pathways

- *There are currently multiple techno-social pathways that Australia can take to reach net zero emissions by 2050 or earlier.*
- *The actual pathway and technology mix will evolve: requiring ongoing research and modelling to ensure that Australia continues down the trajectory that causes the least disruption and harm to our society and economy.*

## ❑ Systems integration

- *The energy ecosystem has multiple interdependencies, including supply chains, sectors, infrastructure, markets, regulation and end users.*
- *To date, there has not been sufficient analysis of how these systems interact with each other in a holistic manner, to consider wider impacts and linkages.*

# Where are we at now with the AETRP?

- ❑ Research briefing papers for each of the three Themes are being finalised.
  - *Each briefing paper explores the research currently being undertaken in Australia, research gaps, and what opportunities can be provided if Australia pursues research in the key topics for each Theme.*
- ❑ A Research Translation paper is being finalised.
  - *Our first report in June 2021 emphasised that the research and innovation sector will play a critical role in paving a 'clever pathway' for Australia to reach this target.*
  - *Further, there is the opportunity to help reduce global emissions through the export of Australian research breakthroughs and by pivoting our export future towards renewable energy-intensive products.*
  - *There are three critical limbs for research and innovation to paving this pathway:*
    - ❖ *Appropriate prioritisation of urgent and strategic research;*
    - ❖ *The funding of that priority research; and*
    - ❖ *The translation of that research to impact.*

# Obstacles impeding the flow of research to impact

- ❑ Combined together, the prioritisation and translation of appropriate research can help support an Australian energy transition that efficiently and effectively addresses the energy trilemma both domestically and globally; *reaching net zero emissions reliably and affordably, while placing the wellbeing of society at its centre.*
- ❑ While there is not much readily available literature on Australian energy research translation, there is a general understanding of some of the key barriers, including a lack of:
  - *Appropriate funding, effective collaboration, non-academic incentives, translation of research to policy, and engagement with users.*
- ❑ Importantly, it is clear that many research activities within the humanities, arts and social sciences (HASS) domains face a double dilemma:
  - *Not being sufficiently prioritised/funded, and challenges in effectively communicating findings to impact.*
- ❑ Australia's current approach to research translation is not sufficient for the urgency of the challenge of achieving a reliable, affordable and fair transition to net-zero emissions.

## Next steps

- ❑ Implicitly, there is a need for a broader breadth of, an increase in and greater coordination of Australian energy research.
- ❑ ACOLA is undertaking further consideration and analysis of the current diversity and quantum of funding for energy research and research translation, which will be presented in a separate paper.
- ❑ We encourage researchers to engage in interdisciplinary research where possible because this will yield particularly insightful knowledge.
- ❑ For funders, we encourage them to utilise the priorities ACOLA has identified in their funding guidelines and assessment of applications, to help ensure funding has the most impact or benefit.