

27/03/2025

SERD Review Panel
Australian Department of Industry, Science and Resources

via email: RDreview@industry.gov.au

Dear SERD Review Panel,

ACOLA AETRP response to Strategic Examination of R&D Review

I am writing on behalf of the Australian Council of Learned Academies (ACOLA) Australian Energy Transition Research Plan.

ACOLA is the forum whereby Australia's Learned Academies come together to contribute expert advice to inform national policy; and to develop innovative solutions to complex global problems and emerging national needs. Through the Learned Academies, ACOLA has access to more than 3,200 of Australia's greatest minds to bring together critical thinking and evidence to inform robust policy decisions.

In late 2019, ACOLA commenced discussions with the Australian energy sector on the need for an Australian Energy Transition Research Plan (Research Plan). In mid-2020, this work officially commenced following strong stakeholder support.

The Research Plan and related briefing papers identify urgent and strategic research priorities and actionable research questions for a successful Australian energy transition to net zero (nominally by 2050). These are outlined below.

- [Report 1: Australia's Energy Transition Research Plan](#)
- [Report 2: Australia's Funding of Energy Research – Quantum and Comparison](#)
- [Report 3: Energy System Dynamics \(Theme 1\)](#)
- [Report 4: Social Engagement Dynamics \(Theme 2\)](#)
- [Report 5: Transition Dynamics \(Theme 3\)](#)
- [Report 6: Energy Research Translation](#)

Together, these reports address the critical pathways required to reach net-zero emissions, namely: the prioritisation of urgent and strategic research (Report One, Three – Five), the funding of energy research and translation (Report Two), and the translation of research to impact (Report Six)

Of note to the SERD review is Report 2 on Australia's funding of energy research, which showed that Australia's reported government R&D spend is substantially lower relative to other economies.

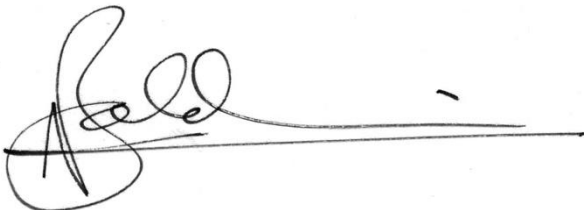
ACOLA recently conducted an updated data analysis for this report (see Attachment 1 – yet to be published). Key messages include:

- Australia’s reported government spend on energy transition R&D (as reported to the International Energy Agency - IEA) has fallen by a factor of ~4 since it peaked in 2013, and has been flat for the past decade at a time when the energy transition needs to accelerate.
- From being in the mid-range of spending for comparator countries, Australia now finds itself at the bottom of the list, both as a percentage of GDP and as a percentage of total R&D spend. The latter illustrates that energy transition research is not a high priority for Australia, even though we are currently a world leader in renewable energy technology adoption.
- Australia’s reported government spend on energy research does not include expenditure through the R&D Tax Incentive (R&DTI) – which also shows the same decline over the past decade. While this may be due to other factors (e.g. the relocation of research overseas for multinationals), when the R&DTI trend is combined with the trend in IEA-reported government spending, this paints a bleak picture for Australia’s energy transition if research is regarded as a lead indicator.

While international energy transition research is progressing strongly, Australia cannot rely solely on international research to support its own transition. Australia must continue to build its own research capabilities to find local solutions and strategies to solve local problems. Our unique energy environment will give rise to distinct energy transition research considerations over the coming decade. Research in the human sciences, humanities, arts and social sciences in particular will inform Australia-specific solutions for our energy transition trajectory. The scale and complexity will require unprecedented investment in new research to develop and scale technologies, as well as to support and enable the significant cultural and societal shift needed.

ACOLA and the Steering Committee of the Australian Energy Transition Research Plan would be pleased to discuss the submission and data analysis presented in Attachment 1, or any details of the work of the Australian Energy Transition Plan. Please contact Dr Lauren Palmer, Director, Policy and Projects at lauren@acola.org.au.

Kind regards,



Professor Ken Baldwin FTSE
Chair, ACOLA Australian Energy Transition Research Plan

Attachment 1

Government Spending on Energy R&D in Australia

The Australian Council of Learned Academies (ACOLA) steering committee for the [Australian Energy Transition Research Plan](#) (AETRP) have been analysing data on Australian government R&D spending on energy (see our first 2022 publication [Report 2: Australia’s Funding of Energy Research – Quantum and Comparison](#)).

This paper provides an overview of the most recent AETRP data analysis.

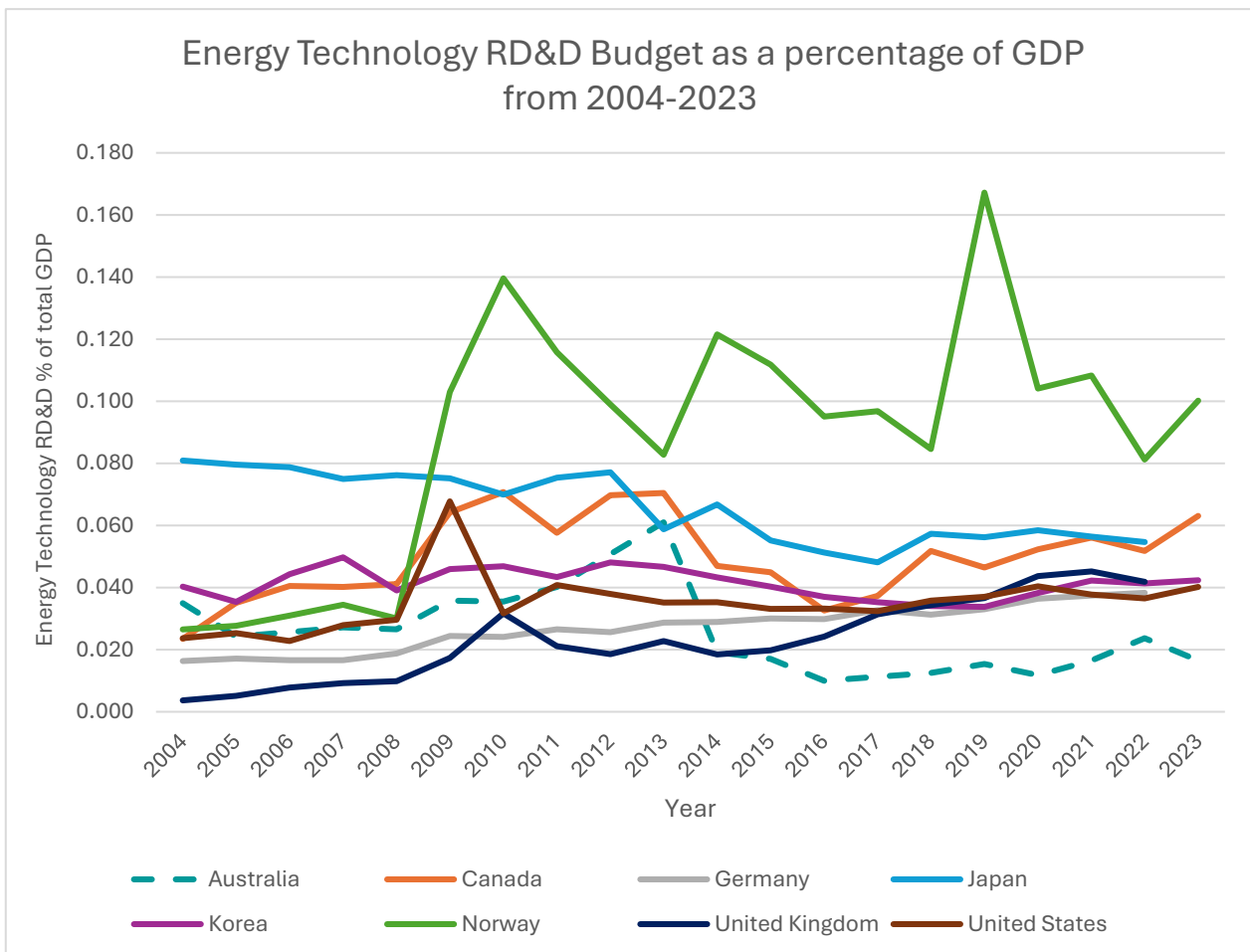


Figure 1: Energy RD&D as a percentage of GDP from 2004-2023

Figure 1 shows Australia’s standing against our key international comparators as reported by respective governments to the International Energy Agency (IEA). During the early 2000s, Australia maintained a fairly constant position near the lower-middle of the spending pack. Between 2008-2013 Australian spending rose to the upper middle of the group. However, from 2013-2021, there was a rapid decline with spending reaching levels around one sixth to one quarter of the peak leaving Australia at the bottom of the rankings. The amount rose slightly in 2022 due to an injection of funding into the Australian Renewable Energy Agency (ARENA), but barely approached the early 2000’s level. However, funding has again dipped in 2023 and is tracking near the low level of the past decade.

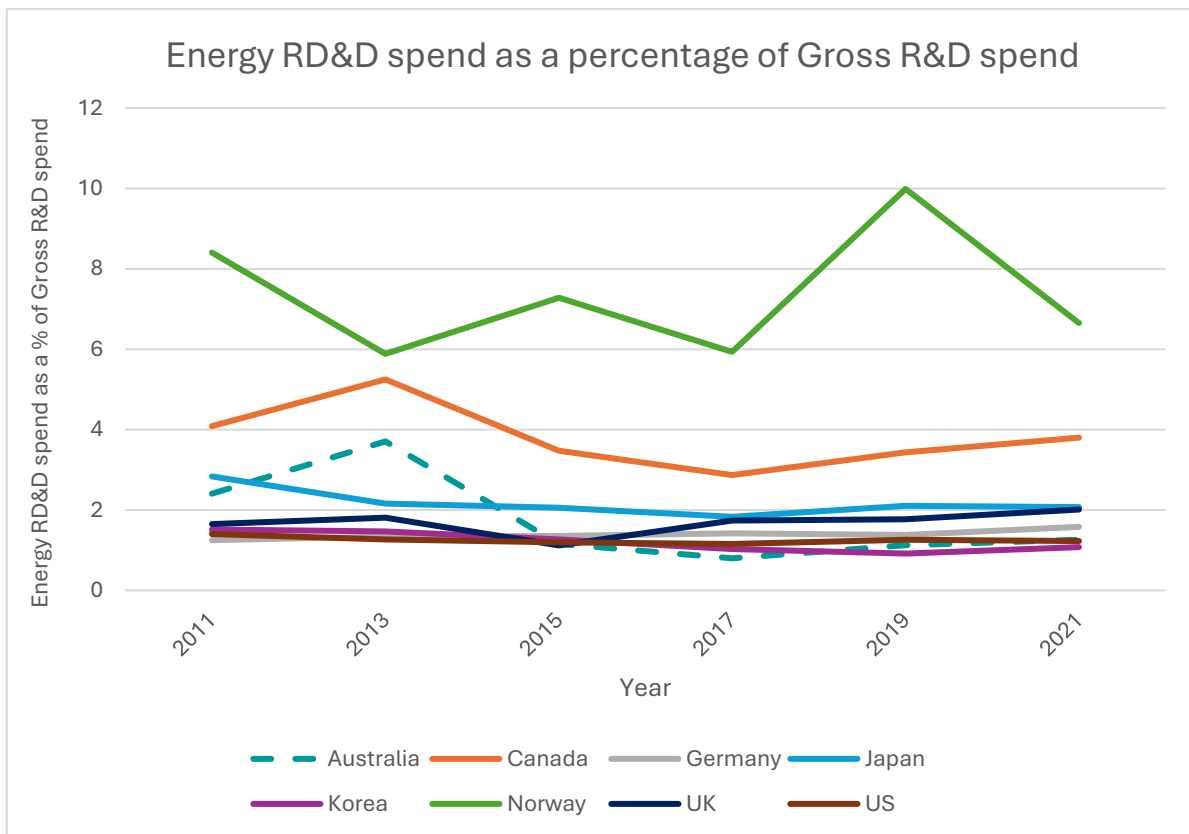


Figure 2: Government spending on energy R&D as a percentage of total government spending on R&D from 2011-2021.

Figure 2 shows government energy research funding as a percentage of all government research funding throughout 2011-2021. Again, Australia peaked in 2013, but from 2015 onwards has been near or at the bottom of the spending pack.

In the past, the relevant Australian Government department (currently the Department of Climate Change, Energy, the Environment and Water) has not included support from the R&D Tax Incentive (R&DTI) in figures reported to the IEA. The AETRP has investigated whether inclusion of the R&DTI would make a difference to Australia’s performance. Figure 3 shows data gleaned from the Science, Research and Innovation budget tables in March 2024 as provided by Dr John Howard (visiting professor at UTS and Executive Director of the Acton Institute for Policy Research and Innovation in Canberra). The R&DTI is broken down into socio-economic objectives (SEOs), with the energy SEO showing a similar behaviour to the overall government energy research spend in Figure 1.

However, the pattern of corporate energy R&D spend may provide a distorted view of the actual situation. Since the acceleration of Australian energy investment into renewables from 2016/7 onwards (as indicated by data on solar and wind installation by the Clean Energy Regulator) new companies have entered the energy market. These are primarily based overseas, while the proportion of traditional fossil fuel-based Australian companies’ participation in the energy market has declined. If the majority of R&D from foreign renewables companies is performed overseas it could explain the recent declining trend in energy R&DTI.

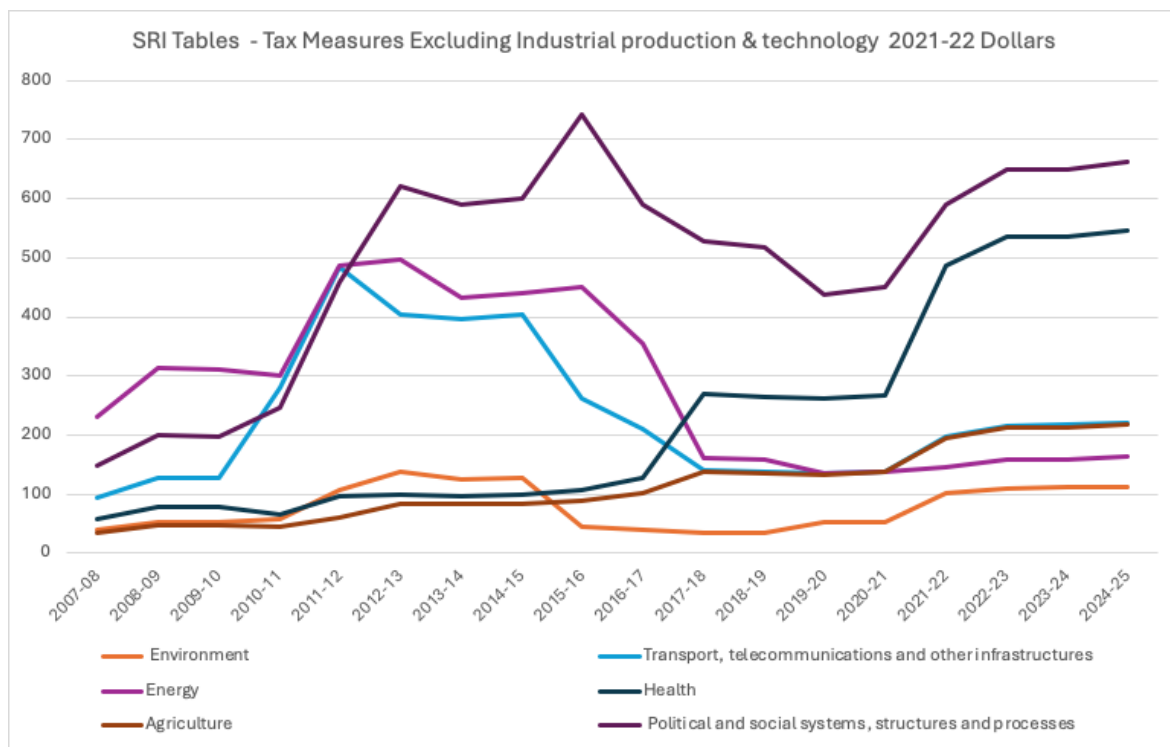


Figure 3: Investment in R&D by SEO for R&DTI, 2007-08 to 2024-25, (\$m inflation-adjusted) (Source: [Science, Research and Innovation in Australia: What the Data Tells Us, Sydney, 2024](#))

Figure 3 is expressed in inflation adjusted dollars. If we take the 2023-4 value of ~\$150m, while Australia's GDP is ~US\$1,790,000m (~AU\$2,750,000m @ US\$0.65/AU\$1.00), then this represents ~0.05 parts per thousand units of GDP on the scale of Figure 1, or ~30% of the Australian Government direct spend on energy R&D. If the R&DTI value is added to the direct spend (yielding ~0.23 parts per thousand units of GDP) Australia is still left at the bottom of the group of comparator countries and still appears to be worsening over time.

In summary, not only is funding for energy research in Australia low in absolute terms, it is low relative to our support for *all* research compared to our key international comparators. If Australia were to double the amount of funding by government on R&D in general to approach the OECD average of 2.7% for *all* R&D funding, and government spending on energy research were also doubled, this would still not be competitive with our main comparator countries.

Given that research investment is often a lead indicator of future performance in areas that apply such research, this does not bode well for progressing Australia's energy transition. Australia faces unique social, economic and technological challenges, including its geography and isolation, while transforming both domestic and export economies to exploit its renewable energy advantage. Research can support this transition, and keep us globally competitive.

If Australia is to capture these significant economic and workforce growth opportunities, government investment overall in R&D needs to be increased, with energy research increasing as a percentage of total government R&D investment to align with the 2024 National Science and Research Priority "transitioning to a net-zero future".