

Funding Australian industry in the 21st Century

Tony Wood, Alison Reeve, and Esther Suckling

Overview

Australia can be a 21st Century industrial success. Climate change provides the imperative; our vast renewable energy and mineral resources provide the opportunity.

Australia and many other countries have committed to reducing carbon emissions to net zero. Hitting our target will affect every corner of our economy, most profoundly the heavy industry and mining sectors.

Many European countries reduced their emissions by de-industrialising and outsourcing their emissions to China. Australia can follow a different path by supporting export-led industries that can flourish in a net-zero world. The National Reconstruction Fund (NRF) sits squarely on this path.

As part of its *Future made in Australia* agenda, the Federal Government has embraced a vision of a sustainable manufacturing renaissance based on renewable energy, hydrogen, and critical minerals. Realising this vision will require a clear focus based on three elements:

- The overriding imperative is for the government to identify and support those industries that will build on Australia's comparative advantages in a low-emissions world. Dilution of effort will be fatal.
- There will be supply chain challenges in these and other sectors essential to our economy, including priority areas identified by the Government as reflecting a broader range of potential advantages. The critical task is to differentiate between those areas where diversity of supply will address the problem and those where onshore manufacturing may be justified.

- A new approach to industry policy is needed, one characterised by a high level of cooperation between government and industry and a strong governance structure.

Markets alone do not generally provide adequate incentives for the research and development of new technologies, and low-emissions technologies are particularly complex and uncertain. Long-term carbon pricing to drive the deployment of these technologies remains inherently uncertain. And market forces are not good at managing structural transformations at high speed when the future is deeply uncertain.

Many of the necessary policy and funding tools and mechanisms already exist. The former includes the Safeguard Mechanism. The NRF sits alongside the Clean Energy Finance Corporation, the Northern Australia Infrastructure Facility, and Export Finance Australia, and these structures need to be coordinated. A priority for the NRF Board will be to develop a clear investment strategy based on its mandate from the government. Success will require avoiding three traps: overreaching for competitive advantage, picking losers, and short-term policy thinking.

Sustainability will embrace more than climate change. Social outcomes and a wide range of environmental issues will form part of the challenge if the transformation is to be truly sustainable.

The pace and scale of the transformation are becoming clear, as are the global constraints of supply chains. No sector of the economy will be able to escape the consequences of what looks like another industrial revolution, but this time with a deadline.

1 Introduction

This submission is made by Tony Wood, Alison Reeve, and Esther Suckling of the Energy and Climate Change Program at Grattan Institute. Grattan Institute is an independent think tank focused on Australian domestic public policy. It aims to improve policy by engaging with decision-makers and the community.

In November 2022, the Department of Industry, Science, and Resources released a Consultation Paper, 'National Reconstruction Fund'. This submission supports the central thesis of that paper. There is a role for a National Reconstruction Fund (NRF) to support Australia's realisation of opportunities that arise from the alignment of global commitments of net-zero emissions with Australia's comparative advantages in key minerals and renewable energy resources.

The scale, pace, and associated risks that come with this transformation mean the government must play a strategically focused role. However, with that role comes a responsibility to establish a clear investment mandate for the NRF, and governance structures to address the concerns that are traditionally associated with industry policy, including rent-seeking and the government picking losers.

The submission complements a contemporaneous submission by us on Australia's Critical Minerals Strategy, builds on a recent Grattan Institute submission to the Joint Standing Committee on Trade Investment and Growth¹, and draws extensively on two full Grattan Institute reports:

- The next industrial revolution : Transforming Australia to flourish in a net-zero world (2022)
- Start with steel: A practical plan to support carbon workers and cut emissions (2020)

1. <https://grattan.edu.au/wp-content/uploads/2022/12/Green-energy-superpower-submission-Grattan-Institute.pdf>.

A fundamental principle should underpin the NRF's mandate to support industries to move up the global value chain: support downstream minerals or food processing and manufacturing only as far as we can create and maintain a competitive advantage. This usually means where low-cost and/or abundant raw materials and low-cost renewable energy can be combined to overcome the disadvantages of distance and of higher labour costs and taxation rates.

In this submission, we have focused on the priority areas where we can draw on our existing body of work, including heavy industry policy, extraction and processing of key minerals, and low-emissions energy infrastructure. Most of the conceptual thinking around strategic focus and governance applies to the other priority areas identified in the discussion paper.

2 Consultation questions

Positioning Australia to thrive in a net-zero global economy requires overcoming barriers associated with technical, financial, and policy risks. Industry policy (which includes, but isn't limited to, funding) can be justified for three reasons.

First, markets do not generally provide adequate incentives for research and development of new technologies, because knowledge is often intangible, risky, and difficult to appropriate. Low-emissions technologies are particularly complex and uncertain.

Second, many of the technologies that might produce large emissions reductions are expensive and high-risk. Early investors face high costs, low returns, and the risk of competitors free-riding on their initiative. Investors require a reliable, long-term carbon price to underpin their investments. Yet a carbon price is inherently uncertain because it depends on the decisions of governments. For both these reasons, investment in low-emissions technologies is and will remain critically inadequate.

And third, there is a time imperative. Market forces are not good at managing structural transformations at high speed when the future is deeply uncertain. Moreover, the long-lived nature of industrial assets means that the industry is particularly poorly suited to fast changes.

Australia needs a 21st Century industry policy to address these challenges. A new industry policy can firmly position Australia to capitalise on trade opportunities and boost our economy. Creating new employment and economic opportunities will be important to sustain support among the Australian people for the transition to net zero.

2.1 Priority areas

The imperative to shift to a net-zero economy will be the biggest driver of innovation world-wide over coming decades. Australia is well-placed to capitalise on abundant raw materials and renewable energy to ride this wave of innovation.

Steel and aluminium are existing commodities that will be needed in a net-zero world. Grattan Institute analysis has demonstrated the case to support green steel in Australia, and the NRF would be an ideal vehicle to fund a first-of-a-kind demonstration plant. To these, we suggest adding cement and ammonia. Ammonia is a front-runner to replace bunker fuels for long-distance shipping, and without net-zero shipping an export-oriented economy like Australia's will shrink. Figure 2.1 on the following page shows the opportunity ammonia presents.

Renewable energy or hydrogen produced from renewable energy will underpin the clean version of these commodities. The case for manufacturing hydrogen electrolyzers rests on the scale and importance of electrolyser supply that will be needed in Australia to underpin the production of renewable hydrogen. The case for NRF funding should be based on the underlying economics of electrolyser production (materials, labour, etc), and the potential concentration of the global supply chains if Australia is dependent on imports.

The Consultation Paper does not specifically include critical minerals under 'renewables' or 'value-add in resources', despite the government's separate focus on this as a strategic priority. We assume this sector is implicitly included in both priority areas.

2.1.1 Picking a winning portfolio

Industry policy is often criticised as ‘picking winners’. This may have applied to post-war industry policy, but 21st Century industry policy is different.

Instead of choosing individual ‘winners’, the NRF should aim to pick a winning portfolio of industries. To do so, it needs to act like an investor: understand deeply the fundamentals of each sector it invests in, understand the customer base and global markets for the product, balance risk and reward, and bail out of failing investments quickly.

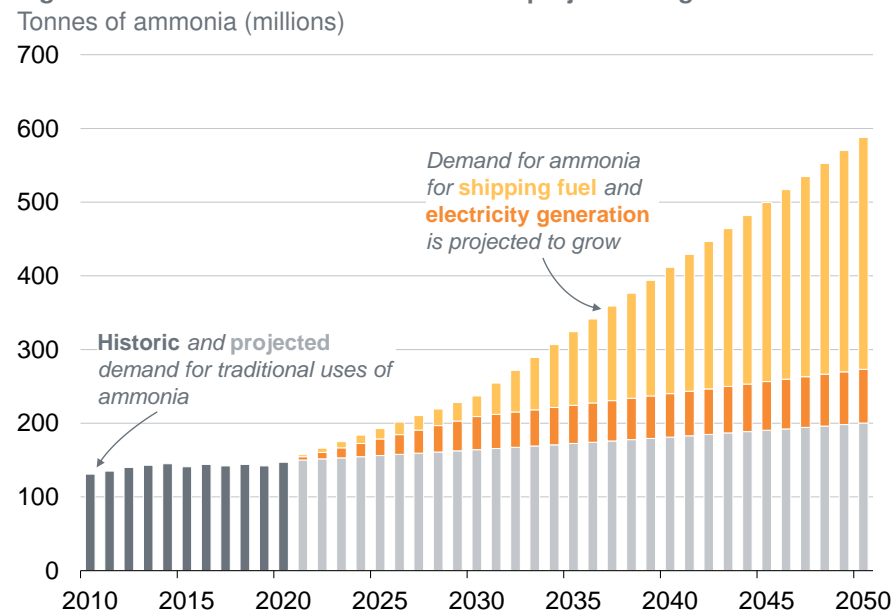
This is particularly the case when attempting to move up the value chain. The NRF should support this only so far as Australian companies can create and maintain a competitive advantage. Labour costs, tax, logistics, and worker location are as important to these economics as are resource and energy inputs.

The green supply chain is an example where the opportunity for Australia to create and maintain a competitive advantage is based on a favourable assessment of the underlying economics.²

The story is more complicated for more complex manufactured products such as batteries. Australia has 50 per cent of the world market for the raw materials required for battery manufacture, but less than 1 per cent of the market for the next stages in the chain: metallurgy to turn ores into metals and then producing active materials; followed by cell manufacturing and assembly.³

As Figure 2.2 on the following page shows, Australia’s advantages in energy and materials are maintained when turning ores to metals and metals to active materials, but shrink on turning active materials to cells. In the case of energy, this is because energy is a smaller

Figure 2.1: Global demand for ammonia is projected to grow



Sources: Statista (2022), IEA (2021).

2. Wood et al (2020).

3. Accenture (2021a).

percentage of overall cost; for materials it is because one quarter of the material requirements at this stage (representing 20 per cent of input cost) would need to be imported.⁴

Moving beyond cell manufacture to battery assembly further dilutes Australia’s comparative advantages because at that stage labour costs would make up a greater percentage of costs or the process would need to be highly automated. There is no fundamental reason why highly automated manufacturing should not be pursued in Australia – although we have few successful examples to build on, meaning the number of jobs included would be low.

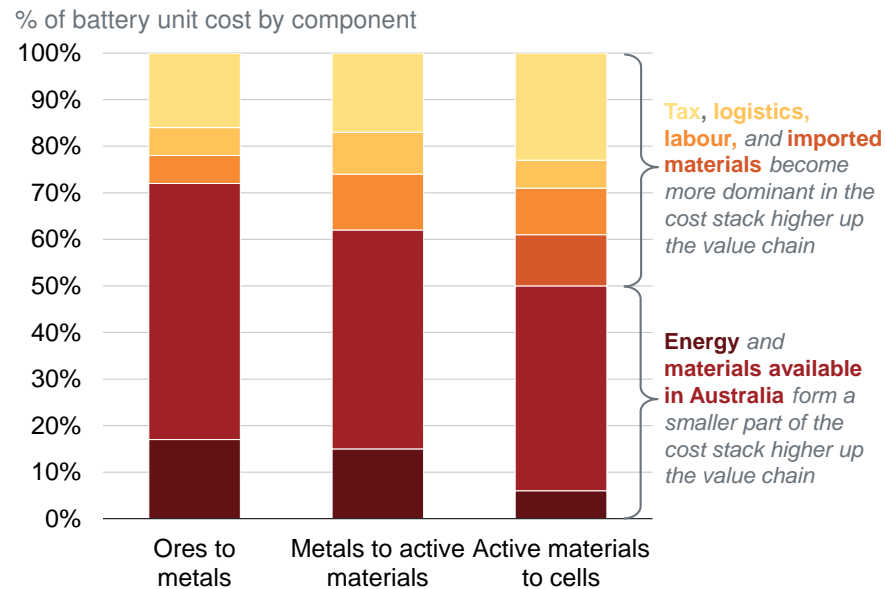
Before subsidising manufacturing of complex products that use Australian critical minerals, the NRF should commission independent, rigorous assessment of other costs, such as tax, logistics, labour, and imported materials, compared to competitor countries. Any policy to promote moving up the value chain can then focus on areas where Australia truly has a competitive advantage.

2.1.2 Avoid picking losers

More important than not ‘picking winners’ is ensuring that the government is not propping up ‘losers’: industries that aren’t economic and do not have a chance of becoming so.

There are three traps for governments to avoid: threats of job losses that coincide with a region or an election; claims that a ‘pivot to green’ will be possible in just a few more years; and claims that a facility or industry contributes to national security.

Figure 2.2: Australia’s advantage reduces further along the battery value chain



Source: Grattan analysis of Accenture (2021b) and Frith (2021).

4. Grattan Institute analysis of Directorate for Internal Policies (2018) and Frith (2021).

Regional jobs must be sustainable

Australian governments have a sorry track record of propping up uneconomic facilities in regional areas, and justifying this on employment grounds.⁵

Governments need to be much better informed about which facilities have a future and which don't, and clear-eyed about whether facilities in distress are worth saving. As well, governments should apply stricter funding criteria, to ensure funding reaches the industrial facilities with the most potential to contribute to a resilient net-zero economy.

In particular, governments should not assist companies that aren't prepared to commit to net-zero emissions by 2050 or earlier, and to set an interim target, with capital to back it up.

Beware claims of a 'pivot to green'

Some companies may approach governments seeking support to prevent a facility closing because the facility could, with changes in technology, pivot to producing green commodities. Some of these opportunities may be genuine, others may be rent-seeking.

Governments should arm themselves with comprehensive analysis on the technical options for pivoting to green commodities well before facilities approach closure dates. They should also make sure they understand the production scale required for an Australian facility to be internationally competitive. That way, a decision to support continued operation can credibly be conditional on reorienting towards cleaner production that is sustainable in the long term without subsidies.

5. For example, the Mount Isa copper smelter in Queensland and the Portland aluminium smelter in Victoria. These are discussed further in Wood et al (2022).

National security

Car manufacturing in Australia had its roots in the idea that local manufacturing capability would be critical to national defence should Australia find itself in another war.⁶

Despite cars costing up to five times as much to make in Australia as elsewhere, this Cold War concern persisted as a reason to continue subsidising the industry right until its end. In 2008, the then industry minister justified assistance to Ford on the grounds that 'you can't make a jet fighter without having a strong car industry'.⁷ And in 2013 and 2015, industry submissions to Senate inquiries were still playing up links to defence capability.⁸

More recently, investment in critical minerals has been justified on national security grounds, amid concerns that China's dominance of parts of the supply chain endangers Australia's access to materials and products.⁹ Some of these concerns may be justified. Where governments should be cautious is in jumping to the conclusion that the best way to mitigate supply chain risk is to manufacture something ourselves. Diversifying supply, stockpiling, signing agreements with friendly allies to allow access to reserves, or making an effort to switch to products, practices, or technologies that are less vulnerable to supply chain disruptions should also be explored.¹⁰

Otherwise, Australia may find itself propping up uneconomic industries for no material increase in security, just as happened for car manufacturing.

6. Phillips (2013).
7. Carr (2008).
8. FCAI (2015).
9. Coyne (2022).
10. Hellyer (2020).

2.2 Innovation pathways

A stated aim of the NRF is to build pathways for Australian-developed innovation and research to reach commercialisation.

The pathway that Australia followed for renewable energy innovation provides a valuable precedent and a useful example to follow. It has consisted of a full suite of support activities:

- Basic research funding through the Australian Research Council (grants)
- Industry-led research funding through the Cooperative Research Centres program and CSIRO (grants, ongoing funding)
- Applied R&D funding through the Australian Renewable Energy Agency (grants)
- Trial and demonstration funding through ARENA, with provisions to disseminate project lessons broadly (grants, recoupable grants)
- Company-building support through the Clean Energy Innovation Fund, jointly administered by ARENA and the Clean Energy Finance Corporation (discount angel and venture capital)
- Large-scale deployment funding through the Clean Energy Finance Corporation (discount loans, equity, and other financial instruments)
- Demand underwriting through the Renewable Energy Target (creating a value for the green premium).
- Commercial renewable energy facilities with no subsidies.

Intervention and support has been tailored to meet the needs of industry over time as innovations move from the laboratory to the market. A critical element is an exit strategy where subsidies are no

longer provided directly by government but by legislation to create market demand.

The Consultation Paper implies the NRF will straddle roles of the Clean Energy Innovation Fund and CEFC. This will be successful only if all other parts of the continuum exist (discussed further in Section 2.4).

2.3 Investment mandate: returns, financial instruments, and working with other investors

The proposed structure and governance arrangements for the NRF are sound. A balance needs to be achieved between continual government or ministerial intervention and failure to adapt to changing circumstances. Setting the investment mandate and priorities every three years may achieve an appropriate balance.

The need for industry policy and government arises from considerations of risks. That means the Board must be constantly attuned to the risks across its portfolio and ensure that there is alignment between that risk profile and the required rate of return. A justification for the NRF's existence is to share risk with the private sector, because the private sector sees some investments as too risky. It follows that the NRF will need a greater risk appetite than its commercial partners. This can be reflected in a lower portfolio return rate, and/or by allowing a longer time horizon over which the required rate of return is measured.

A stated objective is for the NRF to crowd in the commercial institutions. This can be achieved through tools such as longer debt terms and the use of hybrid instruments like quasi-equity funding. The experience of international development banks, and indeed the CEFC, is that appropriate use of these instruments does provide the needed confidence to attract commercial funding. As some of these markets mature, it will be appropriate for the NRF to sell down its investments and recycle the capital.

2.4 Non-financial measures and complementary reforms

Policy and market reforms should support the functioning of the NRF in several areas:

- Clear climate-change policy that enables coverage of the green premiums associated with transformative technologies.
- Policies to support demand, such as embodied carbon standards and potentially government purchasing.

Energy market reform has been going through a difficult period in Australia, with many key reforms being delayed or stymied. Australia's competitive advantage in low-cost renewable energy will need continued attention in energy market reforms so that energy costs stay low and clean energy is available sooner.

2.4.1 Clear carbon policy

The 2023 Safeguard Mechanism reforms put Australia's 200 biggest emitters on notice to manage their emissions. These sites account for about 80 per cent of industrial emissions. The remaining 20 per cent come from thousands of smaller sites, many of which will be potential users of the NRF. These firms currently have no constraints on their emissions, and no target to reduce them, although some may be measuring and reporting their emissions under the *National Greenhouse and Energy Reporting Scheme*.

Australian manufacturers face competition from other countries where carbon emissions are less tightly regulated. The answer is not to loosen our regulation, nor is it to protect Australian manufacturers. It is to ensure NRF funding supports manufacturers to reduce their emissions intensity of production.¹¹ In the medium term, introducing

11. The proposed Safeguard Mechanism reforms target the bulk of assistance to trade-exposed industries, to assist these firms to reduce their emissions via the

a Carbon Border Adjustment Mechanism will be a more effective way of improving competitiveness of Australian firms in a carbon-constrained global economy.

Over time, the government will need to adjust the threshold for participation in the Safeguard Mechanism to keep it effective. Ahead of this, the NRF should require funding applicants to outline their plans to achieve net-zero emissions in their operations. This achieves two ends: it avoids government funding an increase in emissions; and it positions the NRF to meet future climate-related disclosure rules, currently being developed by the Minister for Finance.

2.4.2 Supporting demand

Investment to increase Australia's production in priority areas will not reap benefits if there is no demand for these products, particularly when these products may cost more than competitors' products. This is particularly the case where Australia tries to trade on its abundant renewable energy resources: this will only be successful if there are customers willing to pay a 'green premium'. The absence of a market for recycled plastic was a factor in the collapse of Australia's largest soft plastics recycler in late 2022.¹² Demand for green steel and other green metals is embryonic.

In our 2022 report, *The Next Industrial Revolution*,¹³ we explored in detail how governments can underpin demand for green commodities and products. For materials such as steel, aluminium, cement, and glass, where governments directly purchase very little, we recommended state government embodied carbon mandates as a

Powering the Regions fund. Aligning with these requirements prevents 'grant shopping' by firms that don't like the strict conditions of the Powering the Regions fund.

12. Lu (2022).

13. Wood et al (2022).

better policy. However, within the broader suite of outputs that NRF funding recipients may produce, there may be some products where government purchasing is a suitable market creation vehicle. For others, government should look to situations analogous to energy retailing, where there are a large number of consumers and a small number of suppliers, and consider how purchasing mandates could underpin demand so that new manufacturers can expand.

2.4.3 Stay the course on energy market reform

The vision of an Australian manufacturing renaissance is underpinned by the promise of cheap renewable electricity. Delivering on this promise, in a way that underpins long-term investment, requires governments to continue reforming the energy market.

Current policies at state and federal level, including Rewiring the Nation and Snowy 2.0, are ad-hoc responses to the urgent need to build more generation and transmission ahead of coal-fired power plants retiring. They have arisen because previous governments failed to start reform early enough, and because governments at both levels have lost faith in collective governance of the National Energy Market (NEM).

Current commitments may be sufficient, and perhaps necessary, to get over the once-in-a-generation transformation of the market. But supporting electrification of the economy, and a manufacturing renaissance, will require up to five times more electricity than is currently consumed in the NEM.¹⁴

Governments cannot muddle and subsidise their way to an electricity system of that size within 27 years. And investors will not invest in manufacturing if they are not confident a key input will be available for the long term at a reasonable price.

14. Based on a scenario where Australia exports about 1,800 petajoules (PJ) of hydrogen per year in 2050, and produces about 50 million tonnes of green steel per year using 200 PJ of hydrogen: Reedman et al (2021, pp. 10, 58).

The federal government should show leadership by starting the the process of future NEM reform now. Fundamental market restructuring may not be needed for another decade. But if past reforms are any guide, that whole decade will be needed to sort out the detail.

2.4.4 Focus, streamline, and consolidate existing industry funding programs

In February 2022, we analysed the range of programs in place to support businesses.¹⁵ Of the 255 programs available to the industrial sector at that date, 189 provided grant funding, 18 provided subsidies or rebates, and 6 provided loans, with the remainder providing advice, tax incentives, or sponsorship.¹⁶ For programs where grant size was capped, most grants were less than \$5 million (see Figure 2.3 on the following page).

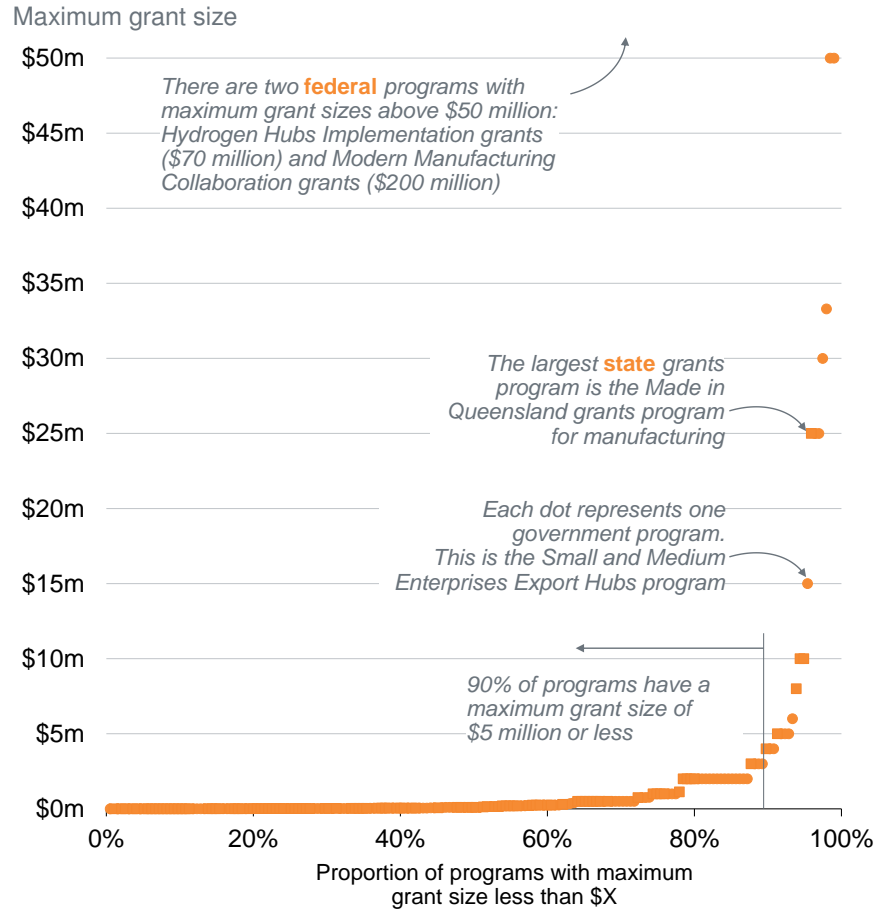
Establishing the NRF is an opportunity to reassess whether these programs are necessary. If these programs function as the ‘pipeline’ that develops nascent innovative technology – analogous to the role that ARENA plays for the CEFC – then they need to be aligned with the aims of the NRF.¹⁷

15. Wood et al (2022).

16. Grattan analysis of DISER (2022).

17. Some assessment may have been made through the October 2022 Budget process, but it would be worthwhile repeating when the functions and roles of the NRF are clearer.

Figure 2.3: Most grants programs available to the industrial sector provide very small grants



Notes: Includes state and federal programs listed in the federal government's grants database as at 18 February 2022. Excludes COVID and disaster response programs, programs announced in the 2022 federal budgets, and commitments made during the 2022 federal election campaign.

Source: Grattan analysis of DISER (2022) data.

Bibliography

- Accenture (2021a). *Future Charge: Building Australia's Battery Industries*. Future Battery Industries Co-operative Research Centre. <https://fbicrc.com.au/wp-content/uploads/2021/06/Future-Charge-Report-Final.pdf>.
- (2021b). *Future Charge Building Australia's Battery Industries*. <https://fbicrc.com.au/wp-content/uploads/2021/06/Future-Charge-Report-Final.pdf>.
- Carr, S. K. (2008). *Kim Carr: Interview with ABC Melbourne Regarding Ford Australia*. <https://webarchive.nla.gov.au/awa/20090912060505/http://minister.innovation.gov.au/Carr/Pages/INTERVIEWWITHABCREGARDINGGFORDAUSTRALIA.aspx>.
- Coyne, J. (2022). "Government commits \$240 million to critical minerals projects in mission to end Australia's reliance on China". *Australian Strategic Policy Institute*. <https://www.aspi.org.au/news/government-commits-240-million-critical-minerals-projects-mission-end-australias-reliance>.
- Directorate for Internal Policies (2018). *Research for TRAN Committee – Battery-powered electric vehicles: market development and lifecycle emissions*. European Parliament's Committee on Transport and Tourism. [https://www.europarl.europa.eu/RegData/etudes/STUD/2018/617457/IPOL_STU\(2018\)617457_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2018/617457/IPOL_STU(2018)617457_EN.pdf).
- DISER (2022). *Grants and programs finder*. <https://business.gov.au/grants-and-programs>.
- FCAI (2015). *FCAI interim submission to the Senate Economic Legislation Committee Inquiry into the Future of Australia's Automotive Industry*. Federal Chamber of Automotive Industries. <https://www.fcai.com.au/library/publication/FCAI%5C%20submission%5C%20-%5C%20Senate%5C%20Automotive%5C%20industry%5C%20Inquiry.PDF>.
- Frith, J. (2021). "EV Battery Prices Risk Reversing Downward Trend as Metals Surge". *Bloomberg Asia Edition*. <https://www.bloomberg.com/news/newsletters/2021-09-14/ev-battery-prices-risk-reversing-downward-trend-as-metals-surge>.
- Hellyer, M. (2020). "Supply chain security: lessons from Australia's defence industry". *Australian Strategic Policy Institute*. <https://www.aspistrategist.org.au/supply-chain-security-lessons-from-australias-defence-industry/>.
- IEA (2021). *Net Zero by 2050: A Roadmap for the Global Energy Sector*. International Energy Agency. <https://www.iea.org/data-and-statistics/data-product/net-zero-by-2050-scenario>.
- Lu, D. (2022). "Soft plastic, not fantastic". *The Guardian*. <https://www.theguardian.com/environment/2022/dec/28/soft-plastic-not-fantastic-what-to-do-with-australias-bread-bags-and-chip-packets>.
- Phillips, K. (2013). "Australia's auto industry: from military paranoia to dreams of modernity". *ABC Online*. <https://www.abc.net.au/radionational/programs/rearvision/australian-auto-industry-myths/4808616>.
- Reedman et al (2021). Reedman, L., Chew, M. S., Gordon, J., Sue, W., Brinsmead, T., Hayward, J. and Havas, L. *Multi-sector energy modelling*. CSIRO and ClimateWorks. https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/isp/2021/csiro-multi-sector-modelling.pdf?la=en.
- Statista (2022). *Ammonia production worldwide from 2010 to 2021*. <https://budget.gov.au/2021-22/content/bp2/index.htm>.
- Wood et al (2020). Wood, T., Dundas, G. and Ha, J. *Start with steel: A practical plan to support carbon workers and cut emissions*. Grattan Institute. <https://grattan.edu.au/report/start-with-steel/>.
- Wood et al (2022). Wood, T., Reeve, A. and Suckling, E. *The next industrial revolution: Transforming Australia to flourish in a net-zero world: chart pack*. 2022-08. Grattan Institute. <https://grattan.edu.au/report/next-industrial-revolution>.