

Setting direction

A purposeful
approach to modern
industry policy



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Executive summary

The concept of industrial policy – when a government attempts to steer economic development by supporting key industries – is back in vogue: many governments around the world have begun implementing opinionated and directional industry policies. And further, many academic economists have challenged the prevailing economic orthodoxy, which rejected industrial policy for its past associations with protectionism, clientelism and economic inefficiency; risks that are mitigated and avoided in modern industrial policies. It is time for Australian governments to consider a more integrated and purposeful approach.

Globally and at home, there is deep uncertainty around major trends reshaping economies, from the risk of the knowledge economy to the implications of a changing climate. In Australia, our governments are grappling with a narrow industrial base, an export basket that is heavily exposed to other countries' industrial transitions, and an R&D and innovation system that is less active (as a proportion of the economy) than most OECD countries.

Modern industry policy is a purpose-driven approach where governments provide a strategic direction or goal and implement an integrated suite of policies to signal and support industries in that direction. This is not a resurrection of the industry policies prior to the 1980s and 1990s of microeconomic reform – characterised by heavy interventions to protect domestic industries – but rather it acknowledges that complex challenges demand complex responses.

Governments should consider more directional industry policymaking in situations where market failures prevent the most efficient and socially-beneficial industries emerging, where the country's long-term competitive advantage does not overlap with short-term investment horizons, or where the national innovation system is struggling to coordinate actors across the economy. These are compelling rationales for bold public action to catalyse innovation and shape future industries.

The Commonwealth government already has several initiatives – like the National

Reconstruction Fund and the CSIRO's "missions" – that between them pursue over 30 unique industrial goals. However, this policy landscape lacks overall coordination: imagine if these resources were marshalled and coordinated behind a smaller number of more precise goals? There is a need to better bridge research, innovation and commercialisation systems to enable this.

Governments around the world have taken different approaches in a common attempt to implement more integrated, modern industry policy. We have analysed these approaches along three dimensions: *directionality*, *policy mix diversity*, and *governance*. These governments have decided to take a more directional approach to industry development, and the challenge then becomes one of *how* to do this effectively. Our integrated framework for modern industry policy provides guidance on how Australia's federal government could deploy its industry policy to invest in a sustainable and prosperous economy for tomorrow.

Directionality — Setting a clear direction (narrow, defined priorities), backed with a high-level political and fiscal commitment that signals directions to industry and the economy.

Policy mix diversity — Mobilising a comprehensive set of policy tools for a government-wide approach to support the directional goals, including boosting innovation, supply-side coordination, helping firms get to scale and building demand.

Governance — Convening ministers or departments at a high level to ensure alignment, providing a forum for engagement and leadership from industry itself, and building institutional capacity.

It is also worth being clear about when these integrated and directional industry policies are valuable. This is an approach for developing key industries towards clear and purposeful goals – such as decarbonisation of heavy industry, or the

development of an end-to-end biotech sector – and it does not replace the need for broad economy-wide innovation and industry policy.

It is time for Australia to develop a modern approach to industry policy to respond to an ever-changing environment – whether navigating a climate transition, building supply-chain resilience, or sowing the seeds for long-term prosperity.

Modern industry policy

Open economies like Australia are subjected to major trends that are reshaping today's global economy. These include major shocks like the Covid-19 pandemic, physical and transition risks of climate change, geopolitical tensions like the war in Ukraine, increasing digitisation, and vulnerability of extended global supply chains. This external environment invites concerns that range from sovereign capability ("can we meet our essential needs?") to economic prosperity ("will our grandchildren have good jobs?") and more. Yet optimism remains, as opportunities abound for Australia to build new industries that contribute to our shared prosperity.

The modern industry policies required today – and that are being implemented by many governments around the world – are a change in approach, swinging the pendulum of economic philosophy back towards being more purposeful and directional. This is not a resurrection of the industry policies prior to the 1980s and 1990s of microeconomic reform, which were characterised by heavy and protectionist interventions.¹ But rather, modern industrial policies acknowledge that complex challenges demand complex responses.

In this report, we interchangeably use the terms *modern industry policy*, *purposeful industry policy*, or *directional industry policy* to describe this type of approach, where governments provide strategic direction and implement an integrated suite of policies to signal, steer and support the economy in that direction.

Many examples of these approaches are inspired by 'moonshots', 'missions', or 'grand challenges', but the conceptual idea is often the same: articulating a specific goal, backed by concrete policy decisions, in order to coordinate and steer industrial development.² Recent examples include the United States' Inflation Reduction Act and Chips and Science Act, or the similarly-focussed EU Chips Act. More generally, a study of several high-income countries shows that a decent proportion (29%) of industry policies are allocated to sectoral support, with the rest being sector-agnostic policy tools (such as general tax-offsets available to any firm).³ As we explore in the final

section, many government programs in Australia already explicitly target the development of specific industries.

Sector-focused industry policy – where the government specifies an overarching direction towards particular sectors – is often met with scepticism from economists, who fear a return to protectionism or worse. There is merit to this. There is always the risk that sector-based decisions may not improve the country's prospects; no prospective industrial direction has guaranteed success. This risk is particularly acute if decisions simply favour industries with better lobbying, or those that capture a minister's imagination. Lobbying capacity and ministerial engagement may not necessarily correlate to sectors that are productive or socially useful.⁴ Indeed, directing capital to these industries could *exacerbate* regulatory capture and the power of vested interests by concentrating resources towards firms that are most influential already. However, these risks exist for almost any other area of government (such as disability care, competition policy, or taxation) where policymaking can be influenced to benefit vested interests. The risks must be managed, but they do not themselves make a sufficient argument against an entire field of policy.

When does industry policy make sense?

For the reasons discussed above, governments should be cautious of completely disregarding the prevailing orthodoxy and starting with a blank page. Identifying industrial goals should generally start from a clear-eyed assessment of a country's comparative advantages and strengths. However, there remain clear circumstances that would justify greater direction-setting from government, and governments should be just as cautious of single-mindedly hewing to the idealised 'hands-off' economic philosophy. Broadly speaking, governments should consider more directional industrial policymaking in situations where:

1. the government has a secondary policy goal to achieve; or
2. in situations where market failures (or ‘system failures’) prevent the most efficient and socially-beneficial industries emerging in the short term.

Certain directions of industry development may provide social or geo-strategic benefits, and the fundamental political role of government is to decide trade-offs between competing policy goals. For instance, supporting development of a domestic industry may make critical supply chains more secure or resilient, or it may specifically ease an economic transition by utilising existing capital and labour, smoothing a bumpy transition for people and communities.

Sometimes the most economically efficient outcome is not the one that society would choose – and only governments, not markets, can decide these trade-offs.

Of course, the risk here is that this could become a wild card rationale that the government can play at any time: claiming that the secondary benefits justify the government’s intervention in capital allocation across the economy. And so this rationale should be used wisely.

Industry policy is also a valid option in response to failures in capital markets. Unregulated markets exhibit specific failures that can be addressed by policy and regulation. This is an orthodox view; many Nobel prizes have been awarded on this basis.⁵ The capital markets that invest in new industries are no different: for instance, markets underinvest in learning and innovation if they cannot capture the benefits; or they over-invest in activities that inflict negative externalities on society; or they exhibit tendencies towards anti-competitive consolidation. For example, in the initial wave of the Covid-19 pandemic we saw the consequences from markets that prioritised highly optimised just-in-time supply chains, while failing to account for the social externalities of long-term systematic risks.

There is also a specific failure of global capital markets that presents some of the strongest rationale for government intervention in industry development: the failure to invest in *future* comparative advantage. Capital markets do a good job of allocating investment and activity based on today’s comparative advantage (i.e.

which firms and industries are most profitable *today?*). However, we can say with some certainty that the successful industries of 2050 will look very different to the successful industries of today.

For instance, the decarbonisation of the global economy is proceeding in a lumpy and unpredictable fashion, and capital markets are a long way from fully internalising these shifts. Global capital markets mostly optimise for relatively short return horizons – even private equity funds rarely look beyond seven years. The long-term prosperity of the country relies not just on exploiting our comparative advantage today, but in setting up Australia to have strong industries in the future. Box 1 explores further the idea that government intervention in industrial development can have positive benefits for long-term productivity.

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Additionally, modern industry policy may be an appropriate response to system failures (as distinct from market failures); both in national innovation systems and political systems. Since the 1990s, economists and policymakers have been viewing innovation as the output of a complex *national innovation system* (combining researchers, coordinating institutions, know-how, physical infrastructure, knowledge-diffusion norms and so on), not as the output of individual profit-maximising actors.⁶ When there are deficiencies in a national innovation system, there is strong rationale for targeted government interventions. However, the effectiveness of government intervention can be limited by constraints in the *political system*. For instance: Australia’s level of R&D activity (1.7% of GDP) is significantly below the OECD average (2.7% of GDP) as well as below econometric estimates of the optimal productivity-maximising rate (easily upwards of 2.5%).⁷ The market does not allocate

the most efficient level of capital to innovation, and while the government can – and does – remediate this through broad industry-agnostic policies like university funding or the R&D tax offset, this government R&D expenditure is at its lowest level in 30 years (0.49% of GDP).⁸ It is clear that political constraints would prevent the

government spending another 1% of GDP on broad-based innovation and R&D policy. Modern industry policy – where government identifies an ambitious goal and marshals activity and resourcing around it – can short-circuit these considerations, building ambition and consensus across the economy for investment.⁹

Box 1. Industrial policy and an empirical understanding of productivity

For over 50 years economists have recognised that long-run productivity improvements are not the result of random technology ‘discoveries’ or ‘shocks’, but rather they arise from endogenous factors within the economy, such as levels of innovation or investments in human capital.

This is not just an academic observation – as a society we celebrate investments in education, scientific progress, and partnership in part because we know these activities raise living standards over the long term.

More recently, economists have been bringing a higher level of empirical analysis to bear on industrial policy, utilising natural experiments to test causal impacts.¹⁰ For instance, industrial policy in Finland (to meet production targets as part of Soviet war reparations) led to higher education, wages, and upward mobility compared to other regions of Finland;¹¹ trade protection from English imports in some regions of Napoleonic France led to increased higher GVA (compared to unprotected regions) for the following century;¹² and changes in area-specific eligibility for an EU subsidy scheme showed that subsidies for SMEs flowed to significantly increased employment (i.e. firms did not simply pass the subsidy back to shareholders/owners).¹³

The direction of structural transformation in an economy is highly consequential, and industrial policy – where governments attempt to shape economic development – can have real and positive impacts on long-run term productivity.

An integrated strategy for industry development

For governments that want to take a purpose-driven approach to industry development, the challenge becomes one of *how* to do this effectively. Industry ministries across OECD countries have generally had their policy toolkit stripped back, reflecting the prevailing consensus that private markets will achieve the most efficient capital allocation (as discussed above). Modern industry policy should aim to use the whole apparatus of government to encourage industry development in key priority areas. Importantly, this does not mean a shift towards clientelism and sheltered industries. Rather, it means government must embrace its position as a keystone player in the economy, setting a shared direction and leading a collaborative and coherent approach.

The OECD has published a mission-oriented innovation policy framework with three key dimensions that they observe in modern industry policy approaches around the world: strategic orientation, policy coordination and policy implementation.¹⁴ In this report we have adapted this OECD framework to focus on *directionality*,

policy mix diversity, and *governance* as shown in table 1.

All three dimensions are valuable, and their interplay can make the difference between a minister's rhetorical moment (a press release stating an industrial goal) and a country truly capitalising on a difficult industrial opportunity. It is not enough for governments to simply set a target for their industry ministry when many important factors sit outside the industry portfolio, such as workforce development (education), research, business regulation, and more.

Looking abroad, it is clear that recent examples of purpose-driven industry policy reform usually include some mix of the dimensions described above, with most countries experimenting with whole-of-government coordination frameworks and a diverse mix of policy tools to achieve their goals. They are not strictly required for success but they provide a useful lens through which to assess any approach. Table 2 summarises several of these international case studies, and where possible, include the main or most national approach.

Table 1. Three dimensions for successful purpose-driven industry policy

Directionality	Government sets a clear direction (narrow, defined priorities), backed with a high-level political and fiscal commitment, and strong articulation that signals directions to industry and the economy.
Policy mix diversity	Government deploys a holistic suite of policy tools to achieve its goals, working across the entire innovation chain: (1) boosting innovation, (2) supply-side coordination, (3) getting to scale, and (4) building demand.
Governance	Government establishes effective governance systems to coordinate departments around priorities, allocate resources, and monitor progress.

Table 2. Three dimensions of industry development

Case study	Directionality	Policy mix diversity	Governance
High Tech Strategy 2025 (Germany)	○	●	●
Integrated Innovation Strategy (Japan)	○	●	●
Mission-Driven Top Sector (Netherlands)	○	●	●
European Chips Act (EU)	●	●	○
Green Industrial Initiative (Norway)	○	●	●
Industrial Strategy (UK) - withdrawn	○	●	○
Made-in-Canada Plan (Canada)	●	○	○
Inflation Reduction Act (US)	●	○	○
Build Back Better: Plan for Growth (UK)	○	●	

● = present

○ = present but weak

In the remainder of this section, we investigate each of these three dimensions further. It is also worth being clear about the limits of integrated and directional industry policies – this is an approach for developing key industries at the margins, for the specific reasons discussed in the section above. This approach does not replace the need for broad economy-wide innovation and industry policy (such as general university funding, general R&D incentives, and an openness to capital investment in Australia). Indeed, as we describe below in our discussion of *directionality*, this approach works best for a very small number of targeted priorities. It does not replace general industry and innovation policy.

Directionality

An integrated industry development plan requires a clear and purposeful direction. The most basic form of direction setting is as a form of conditionality (firms that want to access public incentives must align with directional goals), but it can certainly go further than this.¹⁵ Setting clear directional goals ensures that a myriad of actors – bureaucrats, investors, researchers, political advisers, small businesses, suppliers, etc. – are relatively aligned in their efforts.

Setting a direction is ultimately a political decision, although in the section on *governance* below we discuss ways that industry and other stakeholders should be involved in this decision-making. Policymakers will need to be able to answer for the value of a large public investment – and whether it is in service of specific social challenges, or whether it plays to our nation’s strengths – especially if the value and profits are not shared widely.

The basic principles of good goal setting apply: directions that are measurable, have time frames, and describe a precise end-state will provide clarity throughout implementation. A good strategic direction for a modern industry policy firstly requires a small number of priorities or goals – any more than four or five is unrealistic to direct a whole-of-country effort around. These goals should have precisely formulated industry objectives that describe a market or sectoral goal, which should avoid being too broad, for instance “12Mt/yr domestic green iron production” is better than “net zero industries”. However, it should also avoid being so narrow as to only allow specific technologies or firms (for instance “12Mt/yr H₂-DRI iron production” is probably too specific).

For the goals to have high-level legitimacy, it requires a mandate from top authorities – such as cabinet – in order to mobilise other parts of government and the economy.

Many modern industrial goals are general, not specific

The strongest form of directionality is not just about sizing up a grand challenge, but it is also about articulating this challenge in a way that it is

clear *what specific activity* the government wants to encourage. This is the point above about the difference between “net zero industries” and identifying, specifically, which industries the government wants to decarbonise. When looking abroad at examples of modern industrial policy in other countries, we find that all governments are good at identifying their broad challenges but very few have precisely formulated objectives.

For instance, the Netherlands’ Mission-Driven Top Sector Policy has an overarching goal around the agriculture sector, under which it aims to “reduce the use of raw and auxiliary materials”, and become “climate-proof and weather-resilient”.¹⁶ These are no doubt important goals, but they won’t align stakeholders around clear strategic trade-offs (i.e. what needs to change to achieve these goals?).

Setting clear directional goals ensures that a myriad of actors – bureaucrats, investors, researchers, political advisers, small businesses, suppliers, etc. – are relatively aligned in their efforts.

Another example is the Made-in-Canada Plan, which was released in Canada’s 2023 budget and coordinates government efforts towards their goals of industrial decarbonisation.¹⁷ The plan was developed to meet the scale of the US Inflation Reduction Act (itself a highly directional policy), and includes a financial commitment of \$54.4 billion in tax credits over 10 years. Anchored by the vision of a clean economy, there are eight priorities: electrification, clean energy, clean manufacturing, emissions reduction, critical minerals, infrastructure, electric vehicles and batteries, and major projects.

The United Kingdom’s industrial strategy over recent years provides a case study in the value of directionality. The UK’s 2017 industrial strategy had four broad priorities (AI & data economy, clean growth, future of mobility, and ageing society) with twelve sector deals that identify key sectors and industries that have a role in tackling

these priorities. This is starting from a point of modest – but certainly not *strong* – directionality. In 2021, following a change of Prime Minister, a pandemic, and the unfolding reality of Brexit, the government published a new industrial strategy (*Build Back Better: our plan for growth*) with notably less direction compared to the previous strategy. *Build Back Better* has an emphasis on sector-agnostic productivity priorities, such as skills and infrastructure.¹⁸ This lack of directionality is consequential and appears to have hampered clear alignment across government and industry, with a UK parliamentary committee finding, “without a shared focus, policymaking risks becoming fragmented, offering piecemeal solutions to sectoral problems within different Government departments rather than a strategic whole-of-government approach to meeting national challenges.”¹⁹

High-level political and fiscal mandate

The ideal high-level mandate would come from a central whole-of-government portfolio or leader – such as the Prime Minister, Treasurer, or even National Cabinet. The Covid-19 pandemic, for instance, provides an example of political leaders providing a high-level mandate for substantial policy changes.

While the implementation of industry-oriented policies might come from other ministries (as discussed below in our next two sections), central leadership is a key component of directionality. Because success requires many stakeholders to work in alignment, a high-level mandate is critical to ensure the goal is taken seriously by different agencies, firms, and decision-makers – otherwise they will be more interested in pursuing their own priorities or their own interpretation of a goal. As the UK parliamentary committee for industrial policy states, “[industrial policy] will require clear political leadership and responsibility from the heart of Government to make it happen”.

While most instances of successful modern industry policy display a high level of directionality, this is not unambiguously good (or easy) to achieve. There are several considerations for policymakers to keep in mind when setting a strategic direction:

- Treasury and finance departments will always need to balance ambitious policy goals (that often require spending) with fiscal priorities.
- Quantifying ambition can be difficult, particularly when many exogenous factors will influence the final outcomes (often over the course of decades). It carries political risk to announce a goal and then fail to meet it – but if governments are serious about their grand ambitions they will need to embrace this risk.
- Goals can sometimes cause explicit conflict between departments and agencies, for instance advancing climate-related goals may harm stakeholders (fossil fuel companies) of the natural resources portfolio.²⁰ This is addressed further in the governance dimension below, but it is precisely why a high-level political mandate is critical.
- Structural transition will (in most cases) create winners and losers. When the transition is directed by the market, this tension is implicit and less politically salient. When the transition is articulated as a government goal, the tension becomes explicit and it is important to build social legitimacy for the strategic direction.
- Several countries that we include in our analysis – such as Japan, Norway, and the UK’s 2017 strategy – blurred the lines between grand societal challenges, industrial goals, and enabling investments. This makes it difficult to align disparate actors.

Policy mix diversity

One of the key premises behind many modern approaches to industry policy is that transformative new industries need more than just capital. New industries face many challenges and there are many relevant areas of policy that can be brought to bear. Modern purpose-driven approaches to industry policy often mobilise a broad sweep of policy tools to ensure the full apparatus of government is supporting its industrial vision. In Table 3 we offer a framework to consider a non-exhaustive list of 13 policy tools across four areas: boosting innovation, supply-side coordination, getting firms to scale, and building demand.

We recommend governments explore a *relevant diversity* of policies to support industrial goals – which is a fine line between providing support across each part of the commercialisation journey, versus simply trying to tick as many boxes as possible. In our analysis, we count a government's policy mix as diverse if they have activity in each of the four categories.

Indeed, just as with having too many goals for directionality, committing to too many policies may risk a loss of focus. Governments using this framework for policy development should spend time scoping their industrial goal, clearly identifying the binding constraints, and prioritising a diverse policy mix to resolve those constraints.

Governments should be particularly attuned to policy interventions that create shared value – not just supporting a single firm or project, but creating resources, financial flows, or enabling infrastructure that supports many projects.

Modern purpose-driven approaches to industry policy mobilise a broad sweep of policy tools to ensure the full apparatus of government is supporting its industrial vision.

A diverse range of policy interventions can also risk making things too complicated and difficult for industry to engage with. This is particularly true if there is overlap between interventions – e.g. R&D grants, start-up loans, equity investments, and production subsidies are all different ways that the government helps businesses access capital. If these are all operating in parallel through different departments, the overheads on firms to navigate the system are quite high. In this case, there is value in creating streamlined touch points or a one-stop shop coordination agency (something we explore in the next section on governance).

Table 3. Policy instruments across the innovation-to-commercialisation pipeline

Boosting innovation	
Public R&D expenditure	Funding to public organisations, universities and research institutes, for research contributing to industrial development priorities. This can include postgraduate loans and scholarships.
Private R&D support	Financial support to business R&D and innovation projects that have relevance to industrial priorities.
Innovation clusters	This approach bridges the gap between research and industry, and consists of industrial precincts of R&D centres that specialise in technology and innovation, and benefit from geographical proximity.
Supply-side coordination	
Education and training	The enlarged and new industries will create jobs and therefore will require a focus and strategy on these sectors to develop and transform jobs and skills. This might look like particular subsidies, and new TAFE centres in regions.
Skilled migration	Attracting and retaining the best talent around the world in Australia towards key industries. In Germany's High Tech Strategy, they attract top international researchers to the country with the

	'Artificial Intelligence Global Futures Labs' competition and by funding 100 additional AI professorships. ²¹
Enabling technology and common infrastructure	The development of new industries can often be inefficient as firms make many parallel investments in enabling technologies and infrastructure. Government support for key enablers such as digital systems, physical infrastructure (e.g. goods transport networks or energy transmission), or major research facilities can make it easier for new ventures to secure investment.
Getting to scale	
Start-up grants	Start-up grants can support a range of activities including proof-of-concept or demonstration projects, up to seed funding or initial investment rounds (at which point they overlap with the next category). In Australia ARENA fills this function for climate-related businesses, while in Germany, its High Tech Strategy includes an open, competitive project funding program set up to address the mission's challenge – in particular to answer the major unresolved questions in cancer research. ²²
Investment capital	Many government schemes provide capital to new industries. These investments – such as loans, equity and venture capital – are intended to deliver a return to government and may include 'capital recycling' (where the profit generated from your first investments are then reinvested in subsequent investments). We also count investment tax credits as a form of investment capital.
Economic subsidies	Subsidies that operate either on a per-unit basis (such as production or consumption subsidies) or on a contingent basis with a de-risking effect (such as a contract-for-difference) can help support the business case for new industries – closing any gap between market price and the cost of production, and giving investors confidence. One of the most prominent recent examples has been the widespread use of tax credits in the US Inflation Reduction Act for a range of products in the clean energy value chain.
Go to market & accelerator programs	Accelerator and 'go to market' programs work with innovative businesses on late-stage development and strategic market entry decisions. An example of this is Germany's Pilot-E program which is a cross-agency scheme that provides a one-stop shop for streamlined support to selected industry-led consortiums, which can help shorten lead times from concept to final product. ²³
Building demand	
Public procurement	Government procurement can contribute to enable a level playing field in markets, and can help to foster sustainable and inclusive growth. For Australia, public procurement by all levels of government accounts for over 15% of GDP.
Growing international markets	Governments can use their international engagement to support new industries. For instance, this might include negotiating international agreements that promote demand for priority industries (e.g. harmonised carbon border adjustments, or co-investment with other governments in value chains that will demand Australian goods); or developing multilateral standards that promote new products; or advocating for reduction in tariff (and non-tariff) barriers that prevent trade in new industries.
Regulating demand	Regulatory reform can also be used to shift behaviour and support new industries. At a broad level (non-sector specific), good competition policy supports innovation. Sector-specific regulatory support can be fraught, as it risks a return to protectionism, but can be justified when required to make markets operate more efficiently (e.g. as the Australian Safeguard Mechanism puts a price on the externality of carbon emissions, levelling the playing field for lower-emissions competitors).

In Table 4 we use the framework from Table 3 to examine the same international examples

discussed above, assessing what sort of policy tools they use to achieve their goals. The case

studies range from being a country-level prospectus for investment (i.e. UK Industrial Strategy, Japan's Integrated Innovation Strategy) to focused, fully-fledged plans with a clear architecture of how it will operate (i.e. EU Chips Act, US Inflation Reduction Act).

Most examples in Table 4 have a primary focus either on *boosting innovation* and research (such as Germany's High Tech Strategy) or on helping firms in *getting to scale* (such as Norway's Green Industrial Initiative). As a general rule, we did not observe any international case studies where the primary focus was on *supply-side coordination* or

on *building demand*, these more often seemed to be minor complementary features.

All the international programs we have studied include some form of R&D or start-up funding (sometimes as grants, and sometimes as debt/equity investments). Beyond this, there is a significant diversity in the policy areas used to support each goal. Some governments focus their activities narrowly on providing financial support to businesses, but others (such as Norway's Green Industrial Initiative) describe their policy mix as "common prerequisites" that collectively serve the development of new industries.²⁴

Table 4. Policy mix of international industry strategies and policies.

	Boosting innovation			Supply-side coordination			Getting to scale				Building demand		
	Public R&D expenditure	Private R&D support	Innovation clusters	Education and training	Skilled migration	Enabling technology and infrastructure	Start-up grants	Investment capital	Economic subsidies	Go to market programs	Public procurement	Expanding international markets	Regulating demand
High Tech Strategy 2025 (Germany, 2019) ²⁵	●	○	●	○	○	○	○	●	○	○			○
Integrated Innovation Strategy (Japan, 2023) ²⁶	●	○	○	○		○		●		○		●	○
Mission-Driven Top Sector (Netherlands, 2019) ²⁷	●	○	○				●	●	○	●			
European Chips Act (EU, 2023) ²⁸	●	●	●	●		●	○	●		●			
Green Industrial Initiative (Norway, 2022) ²⁹	○		○	●		●	●	●		○	●	○	●
Industrial Strategy (UK, 2017) - withdrawn ³⁰	●	○	●			●	○	○		●			○
Made-in Canada Plan (Canada, 2023) ³¹		●				●	●	●	○				●
Inflation Reduction Act (US, 2023) ³²	●	○		●		○	●	●	●		●		

● = clearly included as part of overarching framework

○ = there is an existing policy (but not explicitly linked to directional goals) or a policy instrument is only used for a narrow part of industrial strategy

Boosting innovation

Research and innovation are not only key to economic complexity, but are important efforts in continuously tackling complex societal challenges. Public R&D expenditure was the second most deployed policy tool (after investment capital), across all case studies except for the Made-in-Canada Plan. The jurisdictions mostly had a clear sense of where public R&D was being directed, with it at least partially aligning with an explicit industrial direction, such as the IRA's \$2 billion to the Department of Energy National Laboratories and the EU Chips Act pilot lines and funding to both public and private researchers.^{33,34}

Some government's top-level industrial strategies are rather light in terms of detail, but we can see the evidence of their influence in later policies. For instance, Norway's Green Industrial Initiative had no mentions of R&D, but its later long-term plan for research and higher education includes funding for R&D areas related to the Green Industrial Initiative goals.³⁵ Many governments also had private R&D incentives, although these were more likely to be general incentives, without explicit alignment with the industrial goals.^{36,37}

Several governments had some form of policy to encourage or fund innovation clusters and co-location, but in many cases these were general in nature (a statement of intent to encourage co-location) or otherwise pursuing different goals/challenges other than those articulated in the top direction-setting strategy.³⁸ Notable examples of governments doing this well include Germany's High Tech Strategy (which describes a battery research factory and clusters for battery cell production) and the EU Chips Act which has proposed competence centres specifically for semiconductors.^{39,40}

Supply-side coordination

A challenge for new industries is building up the enabling capabilities and resources – such as workforce and infrastructure – in parallel with the (often uncertain) growth of these industries. Across the case studies, we frequently observed that policies related to workforce development

were general in nature, rather than specifically targeting directional industry goals.

For instance, Japan's Integrated Innovation Strategy and Germany's High Tech Strategy both talk about building competencies (such as education, skills and technology) as a priority *in general*, rather than describing specific skills or technologies required to achieve goals. Notable contrasts included Norway's long-term plan for research and higher education, which gives priority to several skills that align with the country's Green Industrial Initiative goals,⁴¹ and the US Inflation Reduction Act's \$200 million to train home efficiency contractors (one of the most concrete and explicit examples we observed).⁴²

Furthermore, skilled migration appears to be one of the least deployed policy interventions across jurisdictions. The migration policies that we did observe are either very niche, such as the German High Tech Strategy's attraction of international talent via artificial intelligence professorships, or otherwise entirely general: many jurisdictions had some pathway for skilled migrants, but this had no explicit alignment to the goals articulated in their industrial strategy.

Case study governments that had a heavier emphasis on industrialisation rather than innovation had clear provisions for enabling technology and infrastructure for industry goals, which can be a common prerequisite for multiple priorities. This includes incentives for building semiconductor factories by allowing them to get "open EU foundry" status, or digital infrastructure such as full-fibre broadband.^{43,44}

Getting to scale

Even when new industries have promising technology and are free of supply constraints, new industries and firms still must run a gauntlet of scale-up and financing before they are a commercial success.⁴⁵ Governments support firms at this stage through their balance sheet and fiscal policy (such as debt or equity investment capital, grants, and economic subsidies) or through helping firms navigate nascent markets.

Investment capital – in the form of either loans or equity investments – has been the only instrument that is present in all case studies analysed. Though necessary and important, an essential trait of modern industry policy is going beyond financial mechanisms to broader policy systems. The Made-in-Canada Plan is particularly narrow in this regard, and while the budget announcement mentions other policies such as migration, workforce, trade strategy and innovation clusters, these are stated generally without explicitly linking to the Made-in-Canada Plan goals, which would have been an opportunity to strengthen its strategy.⁴⁶

Grants were also common, particularly for countries that had an industrial goal focussed on green industry, such as Norway's NOK 100 million Green Investment Grant in 2022 and Pilot-E, a cross-agency fast track funding scheme for the business sector producing low emission technologies. In our set of case studies, other (non-green) grant programs tend to be more general and not aligned to explicit industrial goals.

The only case study that provided direct support by subsidising specific products was the US Inflation Reduction Act – all other support was either structured as a form of investment/loan, or as a grant that was unrelated to production volume. Some case studies spoke about contracts-for-difference and tax subsidies – particularly for energy sector investments – however it was often unclear that these explicitly aligned with top-level directional industry policy goals. In our set of case studies, go to market programs often appear in policy mixes with a greater focus on research and innovation activities. For example, the Netherlands has €11.5 million in its Annual Business Development Budget for developing transition markets and helping companies reach commercial viability – including stages of market research, product development, and guidance on value proposition.⁴⁷

Building demand

Many of the case studies in our analysis acknowledge the value of demand-side policies as a strategic tool, but very few incorporate policy interventions that explicitly stimulate

demand for new industries. Among the case studies, the US Inflation Reduction Act solely presents a clear public procurement strategy that is aligned with the government's industrial goals. For instance, the Act includes USD \$4.15 billion to subsidise agencies purchasing low-carbon materials and USD \$3 billion for the U.S. Postal Service to purchase zero-emission delivery vehicles and associated infrastructure.⁴⁸

Interventions to boost international demand appear sparsely across our case studies. Japan is the sole exception, with a clearly articulated strategy to engage in setting international standards and trade deals that align with its Green Transformation plan.⁴⁹ Other jurisdictions merely convey statements of intent for strategic international partnership, acknowledging its importance without including this as part of their plan of action. Of course, it is also possible that countries have coherent strategies for engaging with trade partners to advance industrial goals, but they keep this confidential and refrain from publishing for diplomatic reasons.

Several governments make reference to regulatory changes that will spur demand for new industries, but few industry policy plans actually articulate what these changes will be. The Made-in-Canada Plan has built in pollution pricing and regulatory frameworks as a pillar in the strategy, which includes large-emitter pricing systems and clean fuel regulations.⁵⁰ Norway's Green Industrial Initiative includes a plan to review the Tax Committee's assessments of how more correct environmental pricing and regulation can contribute to its industrial goals.⁵¹ Other governments included statements about regulations that were not clearly linked to their industrial goals – such as plastics regulations in Germany or building regulations in the UK.

Governance

The tasks described above – mobilising broad swathes of the government and the economy in support of a strategic direction – require alignment across many actors. Most governments pursuing a purpose-driven industry policy have implemented some form of overarching governance and coordination mechanism. This is generally not intended as central planning by the governments we have studied, but rather achieves several useful goals:

1. ensures alignment and consensus regarding directionality, particularly when trade-offs within government need to be resolved;
2. provides a forum to convene multiple government departments at a high level;
3. creates a mechanism to engage and coordinate with industry/sector leaders;
4. provides authorisation for individual initiatives and programs; and
5. builds institutional capacity to effectively administer policies.

In several cases this is spearheaded (or at least co-led) by a central agency with the ability to reach across portfolios and silos, and to more effectively compel participation and alignment from disparate parts of government. This governance level is where the *directionality* of a precise strategic goal is formulated and tracked, and where alignment is achieved across a *diverse policy mix*. It is also where authorising powers are negotiated and coordination mechanisms are set up.

Inter-ministerial alignment

In Germany's High Tech Strategy 2025, an inter-ministerial coordination mechanism was created in the form of a roundtable at a state secretary (ministerial) level. A High-Tech Forum was also established to support this ministerial roundtable, consisting of members from industry, civil society, and the scientific community.⁵² Norway's Green Industrial Initiative outlines processes for government coordination and closer interactions between business and government through a green industry council chaired by the Minister of Trade and Industry.⁵³

Similarly, Japan's Cross-ministerial Strategic

Innovation Promotion (SIP) Program is inter-ministerial in design but with even more centralised leadership. There is high-level governance through a council headed by the Prime Minister, and with several individual programs beneath this council with delegated leadership and decision-making.

Due to their federated composition, Canada and Australia alike will face regional challenges – both from diverse geographies and labour markets, as well as from the challenge of coordinating across jurisdictions. Canada hosts Regional Energy and Resource Tables that bring together federal and provincial governments, in collaboration with key stakeholders. These groups identify region-specific opportunities and strategically direct public and private capital to support economic growth, climate outcomes and sustainable jobs. This includes managing some of the funding under the Made-in-Canada Plan.⁵⁴

Institutionalising industrial policy

Institutions can be designed to support a national innovation system and as a means to address the failure of an overall system to coordinate the skills, knowledge, innovations and investment needed for new industries.⁵⁵ These kinds of institutions are key for governments to stimulate collaboration between actors in the innovation system – companies, researchers, public sector and civil society. In their most powerful form, these institutions can be used to engage and get buy-in from leaders in industry, set grand visions, build broad legitimacy and momentum, facilitate collaborations and distribute funding.

Vinnova is Sweden's agency for innovation, funding around SEK 3.5 billion each year (approx. AUD \$500 million) in research and innovation conducted by third parties like businesses or universities.⁵⁶ Similarly, Innovate UK (part of UKRI) is the UK's national agency that helps firms in the development and commercialisation of new products, processes and services, and convenes relevant organisations, people and required resources together. The agency is key to the UK's innovation ecosystem, with its Catapult network and connection to other government policy areas. From 2022-23 to 2024-25, Innovate UK has been allocated GBP 2.4 billion in government spending (approx. AUD 4.7 billion).⁵⁷

Institutional capacity

Achieving purpose-driven industry development goals requires a high degree of institutional capacity. There are numerous ways for governments to fail: agencies could overreach, and through their own clumsiness push aside productive activity; or on the flip side, the transaction costs of genuinely cross-departmental policymaking could prevent any transformative initiatives in the first place. Strong or complete coordination between agencies does not guarantee successful outcomes, but a joined-up approach can certainly help. Broadly speaking, institutional capacity can be increased by ensuring agencies are effectively resourced (investing in capacity), and by changing the environment they operate within to make it easier to achieve goals (reducing transaction costs).

Japan's Strategic Innovation Promotion (SIP) program provides a compelling example of the value of reducing transaction costs: the broad leadership mandate and autonomy given to program directors was identified by the OECD as a key factor leading to success.⁵⁸ In this case, the individual directors that reported to the Prime Ministerial council had flexibility to target actions and investments to where they believe they are most impactful. This was combined with a reallocation of 4% of the science and technology budgets of all ministries to fund SIP initiatives, incentivising inter-ministerial cooperation.

It is also important that there are mechanisms to monitor and evaluate the shared objectives in respective departments, as well as new ways of working and improvement of coordination efforts. For instance, Sweden's Challenge Driven Innovation Initiative embedded evaluative

measures into its goals to ensure the program was aligned with the vision. Japan has an independent evaluation body for both the entire SIP system as well as its programs. It conducts an advanced and interim evaluation during the term, with its results fed back into its plans, and a final one upon program termination.⁵⁹

As mentioned above, the main goal of governance for purpose-driven industry policy should focus on government capability to deliver against its goals, not on centrally planning economic development. There are some governance considerations that need to be kept in mind when developing a modern approach to industry policy:

- Bringing together government and industry authorities that form a wide range of representation may lead to a top-heavy approach that suffers from over-governance.⁶⁰
- Central agencies have less capacity and have competing policy priorities, which may potentially lead to risk aversion and inertia.
- Aligning the activity of government departments with a high-level strategic direction will necessarily require trade-offs when departments represent different interests.
- Collaboration between central government and state/regional/local governments would need sufficient powers, funding and support available – and may struggle with limited resources and priority afforded by central government.

Industry development in Australia

In the introductory section we describe the dominance of the ‘hands-off’ economic philosophy, which broadly assumes the best way to promote industry development is to let private capital markets make allocative decisions. Despite the general acceptance of this philosophy among many economic policymakers, it is not universally applied – the Australian government’s current policy landscape is not entirely sector-agnostic, and there are already many initiatives that attempt to set a direction for industry development. However, these initiatives generally lack the coordination and focussed directionality discussed above – they are not connected at a whole-of-government level – and none of them employ a full diversity of policy levers to achieve their goals. Therefore the framework for modern industry policy, as discussed in prior sections, can provide guidance in how the federal government could further develop its spread of industry-related policies. In short, a modern industry policy would benefit from tying these various threads together into a focussed vision, and a higher level of coordination and deployment of varied policy tools.

In our analysis of the Commonwealth’s policy, we have identified over 30 unique industrial priorities across several umbrella initiatives, mostly concentrated in the Industry and Education portfolios. These are summarised numerically in Table 5 and range from the CSIRO’s “missions” to the priority focus areas of the newly established National Reconstruction Fund (NRF),

and several more (see appendix Table A.5 for more descriptions). In our analysis we have only looked at Commonwealth priorities, but several of the state and territory governments have similar schemes as well.

The initiatives in Table 5 show heavy alignment to certain themes, such as climate, future agriculture industries, medicine/biotech, and natural resources (these first four rows in Table 5 were the most common themes). Despite this thematic alignment, we can see that the many individual items in each row (see appendix Table A.5) are not aligned behind a specific goal that would meet the standard we described above: *“precisely formulated industrial objectives that describe a market or sectoral goal, which should avoid being too broad”*. Nonetheless, these emerging themes give a sense of what is important to the government, and could form the foundation for truly directional industrial goals.

Indeed, the Commonwealth does seem to be attempting to align several of these initiatives behind the (relatively new) NRF and its seven thematic priorities. The NRF itself is mostly constituted to be a lending vehicle and does not have a diverse policy mix at its disposal, however the Commonwealth appears to be making efforts to explicitly align other industry programs behind the NRF themes. This integration, while being laudable, has not been precisely articulated and would not reach the level of ‘integrated industry policy’ that we describe in this report.

Table 5. Overlapping priorities of industry initiatives in Australia (excluding states/territories).

	National Reconstruction Fund	Industry Growth Centres (powering Australia)	Cooperative Research Centres	Missions (CSIRO)	Research Translation and Commercialisation Agenda				Other climate programs
					RTCA (excluding Trailblazer & AEA)	Trailblazer Universities Program	Australian Economic Accelerator	Main Sequence Ventures	
Climate & net zero	•	•	•••••	••••		•	•	•	••••
Agricultural industries	•		•••	••		•	•	•	
Health & medicine	•		••	••			•	•	
Minerals & natural resource value chain	•		••			•	•		
Defence	•		•	•		•			
Waste & pollution			•	•		•			
Space			•			•		•	
Capability					••			••	
Manufacturing			••						
Infrastructure & buildings			•	•					
Water			•••	•					
Transport	•		•						
Climate adaptation				••					
Finance			•						

• = individual program/priority area

Note: dark green indicates very common thematic priorities, light green is moderately common, and grey are uncommon.

Governance is a core factor of our framework, and Australia has a history of institutions, such as the Economic Planning Advisory Commission, Bureau of Industry Economics and the Industry Commission, which have variously provided expert advice on industrial opportunities, as well as a forum for business and labour representatives to put forward their view to government. These institutions were merged into the Productivity Commission in the 1990s. In the decades since, Australia has established other institutions such as Industry Innovation and Science Australia (IISA), an independent statutory board of entrepreneurs, investors, researchers and educators. IISA provides whole-of-government advice on industry, innovation and science matters, including the selection of new Cooperative Research Centres (CRCs), itself a scheme that funds industry-led collaborations between industry, researchers and end users, to which the government has committed a total of \$823 million from 2023-24 to 2026-27.⁶¹

Looking internationally we have observed and discussed three key dimensions of modern industry policy. From these, we develop a set of clear recommendations for the Australian Government:

Directionality

Identify a small number of priority areas or goals worthy of an ambitious pursuit.

- Formulate objectives under these areas that are specific, measurable and time-bound.
- Objectives may refer to 'grand challenges', but the objectives should also describe what specific activities or industries the government wants to encourage.
- Attain clear political legitimacy from a top-level authority (e.g. the Prime Minister or Cabinet).
- Articulate the package in a way that signals the government's commitment and the opportunities for the market.

There are some commonly-recurring themes across the Commonwealth's industry policies identified in Table 5. These could be made more

precise and given a high level political mandate, for instance: *decarbonising iron, aluminium and ammonia industries* (instead of "resources"), *developing climate resilient and low-emissions agricultural technology* (instead of "value add in agriculture"), or *growing an end-to-end domestic biotech sector* (instead of "medical science"). Political legitimacy can come from Cabinet itself, or from existing mandates for multi-ministerial coordination, such as the 2023 Employment White Paper.

Policy mix diversity

Deploy a diverse policy mix to support the new industry development pipeline.

- Scope the policy avenues available and prioritise the right policy mix for each industrial goal, by boosting innovation, coordinating supply, helping industries get to scale, and building demand.
- Identify what can provide shared value (e.g. common infrastructure or technologies) for different actors working towards a similar goal.
- Streamline processes and touch points for industry to navigate funding and support systems – such as a cross-agency scheme or one-stop-shop coordination agency.

There is a relatively diverse policy mix sitting underneath the broad set of Commonwealth initiatives described in Table 5. However it is worth reflecting that while this overall mix is quite diverse, each program/initiative focuses on its own set of priorities (see appendix Table A.6), and the policy mix seems to mostly be a function of which department the program/initiative sits in. Perhaps most obviously, the National Reconstruction Fund only deploys a narrow set of policy tools (as far as we can tell from publicly available material: only loans) to achieve its goals. There is clearly potential to align the Commonwealth's policy landscape – which includes a diverse set of tools – behind a common set of industry development goals.

Governance

Set up the appropriate governance structures to ensure the government delivers on its commitment and ambition.

- Ensure alignment and consensus regarding directionality, particularly when trade-offs within government need to be resolved.
- Provide a forum to convene multiple government departments at a high level.
- Create robust connection points to engage and coordinate with industry/sector leaders.
- Establish mechanisms for regional coordination across all levels of government.
- Provide authority for individual initiatives and programs.

central role is that they do not have the mandate to coordinate work in other portfolios, or with the states and territories.

While all of the currently-existing initiatives were no doubt constituted for good reasons, there is clearly an opportunity to bring them together under a set of coordinated industrial objectives (and indeed, to bring in other policy areas to improve the policy mix diversity). For instance, a steering subcommittee of Cabinet or an inter-ministerial group could make decisions across all of these programs to ensure they are complimentary, not duplicative.

Furthermore, Australia could benefit from a coordinating agency that pulls together the threads of Australia's national innovation system, much like Innovate UK or Vinnova in Sweden, discussed above. This could be a one stop shop for supporting the innovation and industry ecosystem – with a role to set grand visions; engage and get buy-in from leaders in industry, government and research (not just technical experts); facilitate collaborations; advise government; and coordinate funding.

Such an institution would go beyond the responsibilities of current institutions like IISA, CSIRO, or the new NRF (although any one of these agencies could be given the mandate and resources to play this central role). It is also important that this kind of agency has the ability and mandate to coordinate across government agencies and jurisdictions. Part of the reason the existing crop of institutions do not play this

Box 2. Case study: renewable export industry superpower ⁶²

This modern approach to industry policy could be deployed around major challenges like developing new low-carbon export industries. This is a clear priority of the Commonwealth government and serves as a useful case study. The framework in this report provides a guide for government action:

Directionality

The government has already signalled its general ambition in broad terms: it wants Australia to be a “renewable energy superpower”. But a more specific and narrow strategic orientation would help galvanise action and send a signal to industry and investors. This could include:

- which sectors (but not technologies) the government is targeting – is it just hydrogen, or also emissions-intensive commodities like iron, or also enabling technologies like solar cells?
- what order of magnitude the government imagines when it says “superpower” – are these \$10 bn/year industries or \$100 bn/year?
- what policy settings the government will use to back its goal?

Policy mix diversity

The Commonwealth already has a range of policies and institutions developing new green export industries: R&D expenditure and grants (ARENA), investment capital (CEFC), economic subsidies and de-risking (Hydrogen Headstart and the Capacity Investment Scheme), and regulatory support (the Safeguard Mechanism).

Certainly more could be done on each of these fronts, but more importantly, there are large chunks of the policy mix framework that are absent. Broadly speaking, the Commonwealth's late-stage investments should be complimented by supporting early-stage ventures and innovation clusters, building a new workforce, and resolving regulatory bottlenecks.

Governance

The Commonwealth's vision of a renewable export superpower overlaps significantly with broader issues of economic decarbonisation, for which there are already pre-existing coordinating bodies (such as the Net Zero Economy Agency's focus on regional transition in fossil fuel communities, or the Energy and Climate Change Ministerial Council's focus on decarbonising the domestic electricity grid).

In pursuing the goal of developing new green export industries, it may not be necessary to establish an entirely new model or forum for governance. But it certainly would require some adaptation of scope or mandate – perhaps through National Cabinet which saw some success in coordination in the first years of the covid-19 pandemic.

Conclusion

The time is ripe for Australia to develop a modern approach to industry policy; an approach that proactively responds to a changing global landscape, whether it is facing a great climate transition, building supply-chain resilience, or planting the seeds for long-term prosperity. We also know the successful industries of 2050 will look very different to the successful industries of today. The areas where Australia has a comparative advantage are likely to be quite different from the industries that dominate the Australian economy today.

Responding to these long-term trends is not something that private capital markets do well. There remains a critically important role for governments in navigating major industrial transitions. In our analysis, we emphasise that a modern integrated approach to industry policy has three key dimensions: directionality, a diverse policy mix, and governance. Governments can set **strategic directions** for new industries – articulating clear and specific goals around which to rally businesses and bureaucrats alike. Furthermore, complex

challenges require complex responses, and goals are most likely to be achieved when the whole apparatus of government is used to deploy a **diverse and appropriate policy mix**. Of course, aligning many government agencies – not to mention many governments at different levels – requires serious **coordination and governance**.

In reviewing many examples of modern industry policy from around the world, success does not just depend on the presence of these three dimensions (directionality, policy mix diversity, and governance), but whether they are integrated and executed well as part of an ambitious and clearly articulated strategy. It involves developing the machinery of government, building our public sector capability to perform its best, and involving industries and regions in charting future pathways. The case studies in this paper are forerunners that provide lessons and opportunities for taking an integrated approach to industry policy — so that Australia can put its best foot forward in shaping future industries that contribute to a flourishing and prosperous society.

Appendix

In our analysis of the Commonwealth's policy, we have identified over 30 unique industrial priorities across several umbrella initiatives, mostly concentrated in the Industry and Education portfolios. This table provides a descriptive summary (expanding on the simplified summary in Table 5 in the main body of this report) and ranges from the CSIRO's "missions" to the priority focus areas of the National Reconstruction Fund (NRF), and several more. In our analysis we have only looked at Commonwealth priorities, but several of the state and territory governments have similar schemes as well.

Table A.5. Overlap map of industry initiatives in Australia.

	National Reconstruction Fund	Industry Growth Centres (powering Australia)	Cooperative Research Centres	Missions (CSIRO)	Research Translation and Commercialisation Agenda				Other climate programs
					RTCA (excluding Trailblazer & AEA)	Trailblazer Universities Program	Australian Economic Accelerator	Main Sequence Ventures	
Climate & net zero	Renewables and low emissions technologies	Renewable technologies, including batteries	Zero Net Emissions from Agriculture CRC; Heavy Industry Low-carbon Transition CRC; Future Fuels CRC; Future Energy Exports CRC; RACE for 2030 CRC; Future Battery Industries CRC	Towards net zero; Hydrogen Industry Mission; Renewable Energy Powerhouse; Smart Energy	Applicable	Clean energy	Renewables and low emissions technologies	Decarbonise the Planet	CEFC; ARENA; Emissions Reduction Fund; Capacity Investment Scheme
Agricultural industries	Value-add in the agriculture, forestry and fisheries sectors		Food Agility CRC; Future Food Systems CRC; CRC for High Performance Soils	Future Protein Mission; Trusted Agrifood Exports	Applicable	Food & beverage - agricultural productivity and farm gate output	Value-add in agriculture, forestry and fisheries sectors	Feed 10 Billion people	
Health & medicine	Medical science		Digital Health CRC; CRC Solving Antimicrobial Resistance in Agribusiness, Food and Environments (SAAFE)	Infectious Disease Resilience; Minimising Antimicrobial Resistance	Applicable		medical science	Reach Humanity Scale Healthcare	
Minerals & natural resource value chain	Value-add in resources		CRC for Transformations in Mining Economies; Marine Bioproducts CRC		Applicable	Resources technology and critical minerals technology	value-add in resources		
Defence	Defence capability		Cyber Security CRC	Catalysing Australia's Biosecurity	Applicable	Defence			
Waste & pollution			Fight Food Waste CRC	Ending plastic waste		Recycling			
Space			SmartSat CRC		Applicable	Space		Bridge the gap to Space	
Capability					Workforce mobility initiatives □ National Industry PhD Program; Intellectual Property Framework			Enable the Next Intelligence Leap; Supercharge Industrial Productivity	
Manufacturing			Sovereign Manufacturing Automation for Composites (SoMAC) CRC; SmartCrete CRC						
Infrastructure & buildings			Building 4.0 CRC	Critical Infrastructure Protection and Resilience					
Water			Blue Economy CRC; Marine Bioproducts CRC; One Basin CRC	AquaWatch Australia					
Transport	Transport		iMove CRC						
Climate adaptation				Climate Resilient Enterprises; Drought resilience					
Finance		Digital Finance CRC							

The Commonwealth already has quite a broad diversity of programs and initiatives that target support to specific industrial priorities of the governments choosing. While this overall policy mix is quite diverse, each program/initiative focuses on its own set of priorities, and it appears to mostly be a function of which department the program lives in (e.g. Education department programs focus on research and education). There is clearly potential to align the Commonwealth's policy landscape – which includes a diverse set of tools – behind a common set of industry development goals.

Table A.6. Current industry development policy mix at the Commonwealth level.

Program / initiative	Boosting innovation			Supply-side coordination			Getting to scale				Building demand		
	Public R&D expenditure	Private R&D support	Innovation clusters	Education and Training	Skilled migration	Enabling technology and infrastructure	Start-up grants	Investment capital	Economic subsidies	Go to market programs	Public procurement	Expanding international markets	Regulating demand
Powering Australia plan ⁶³			●	●		●	●	●	●		●		●
National Reconstruction Fund ⁶⁴								●					
Powering Australia Industry Growth Centre ⁶⁵							●						
University Research Commercialisation Package ⁶⁶	●						●			●			
CSIRO Missions ⁶⁷	●	●		●									
Cooperative Research Centres ⁶⁸	●	●											

Endnotes

¹ Reserve Bank of Australia. (2000). *The Politics of Economic Change in Australia in the 1980s and 1990s*.

² For instance, the idea of “missions” has been recently popularised by economist Mariana Mazzucato in her 2021 book *Mission Economy: A moonshot guide to changing capitalism*.

³ Criscuolo, C. Et al. (2023). *Quantifying industrial strategies across nine OECD countries*. *OECD Science, Technology and Industry Policy Papers*, No. 150. OECD Publishing.

⁴ For more on the best contemporary arguments against modern industrial policy, see: Bloom, N. et al. (2019). *A Toolkit of Policies to Promote Innovation*. *Journal of Economic Perspectives*, 33(3), or Pack, H. & Saggi, K. (2006). *Is There a Case for Industrial Policy? A Critical Survey*. *The World Bank Research Observer*, 21(2).

⁵ For instance, just in the last 15 years Nobel prizes in economics were awarded to: Milgrom and Wilson (2020) for improvements to auction theory, particularly for atypical markets; Nordhaus and Romer (2018) for externalities from climate change and technological development; Thaler (2017) for advancing behavioural economics’ understanding the many ways humans make “irrational” decisions; Tirole (2014) for analysis of how market power and concentration can influence outcomes; and Diamond, Mortensen and Pissarides (2010) for how search frictions affect market outcomes. All these cases (and many more) look at ways to design policies or regulations to shape markets, given the failure of unregulated markets to maximise welfare.

⁶ Edler, J. & Fagerberg, J. (2017). *Innovation policy: what, why, and how*. *Oxford Review of Economic Policy*, 33(1)

⁷ For R&D stats, see: Department of Industry, Science and Resources. (n.d.). *Science and research data*. For a relatively conservative estimate of the optimal R&D investment rate, see: Coccia, M. (2009). *What is the optimal rate of R&D investment to maximize productivity growth?*. *Technological Forecasting and Social Change*, 76(3).

⁸ Commonwealth of Australia. (2023). *Science and research*.

⁹ Bloom, N. et al. (2019). *A Toolkit of Policies to Promote Innovation*. *Journal of Economic Perspectives*, 33(3).

¹⁰ Juhász, R, Lane, N. J., and Rodrik, D. (2023). *The New Economics of Industrial Policy*. *NBER Working Paper Series*.

¹¹ Mitrunen, M. (2019). *Essays on the Political Economy of Development*. *Stockholm University*.

¹² Juhász, R. (2018). *Temporary Protection and Technology Adoption: Evidence from the Napoleonic Blockade*. *American Economic Review*, 108(11).

¹³ Criscuolo, C., Martin, R., Overman, H. G., Reenen, J. V. (2019). *Some Causal Effects of an Industrial Policy*. *American Economic Review*, 109(1).

¹⁴ See the MOIP Framework’s dimensions and principles: OECD. (2023). *The overall methodological framework*.

¹⁵ Mazzucato, M. and Rodrik, D. (2023). *Industrial Policy with Conditionality: A Taxonomy and Sample Cases*. *UCL Institute for Innovation and Public Purpose, Working Paper Series (IIPP WP 2023-07)*.

¹⁶ Ministry of Economic Affairs and Climate Policy. (2019). *Dutch missions for grand challenges: Mission-driven Top Sector and Innovation Policy*.

¹⁷ Government of Canada. (2023). *A Made-in-Canada Plan: Affordable Energy, Good Jobs, and a Growing Clean Economy*.

¹⁸ HM Treasury. (2021). *Build Back Better: our plan for growth*.

¹⁹ House of Commons. (2021). *Post-pandemic economic growth: Industrial policy in the UK*.

²⁰ Bergek, A. (2023). *Directionality challenges for transformative innovation policy: lessons from implementing climate goals in the process industry*. *Industry and Innovation*. Routledge, 30(8).

²¹ Federal Ministry of Education and Research. (2019). *The High-Tech Strategy 2025 Progress Report*.

²² Federal Ministry of Education and Research. (2019). *The High-Tech Strategy 2025 Progress Report*.

²³ OECD STIP Compass. (2023). *Pilot E*.

²⁴ Ministry of Trade, Industry and Fisheries. (2022). *Roadmap - The Green Industrial Initiative*.

²⁵ Federal Ministry of Education and Research. (2023). *The High-Tech Strategy 2025 Progress Report*; See more on start-up grants – Federal Ministry for Economy and Climate Protection. (n.d.). *EXIST start-up grant*; See more on investment capital and economic subsidies – Jones Day. (2023). *Germany Launches EUR 50 Billion Funding Program for Decarbonization of Heavy Industry*.

²⁶ Cabinet Office, Government of Japan. (2023). *Integrated Innovation Strategy 2023*; there are policies for education and training (PhD internship program, or general commitment to STEAM) but none of this is actually aligned to their innovation strategy’s priorities; See more on enabling technology and infrastructure, investment capital, expanding international markets, and regulating demand – GR Japan. (2023). *Overview Of*

Japan's Green Transformation (GX); separately to this strategy, Japan has a big strategy on start-ups, lots of investment capital, but does not seem to do grants – Cabinet Secretariat. (2022). *Startup Development Five-year Plan*; regulating demand: main Integrated Innovation Strategy mentions regulations for the AI sector but not clear on the extent to which this is about support/building demand (vs. managing risks).

²⁷ OECD. (n.d.). *Mission Driven Top-Sector Policy*; See more on private R&D incentives – Ministry of Economic Affairs and Climate. (2017). *PPP supplement Research and Innovation*; they refer to clusters off-hand, but this may just be existing business co-location rather than a deliberate policy choice to create innovation clusters; see more on investment capital, economic subsidies, and go to market programs – NWO. (2023). *Kennis- en Innovatieconvenant 2024-2027*; they have recognised and stated the need for public procurement, international markets and regulation but has not been established in their plans.

²⁸ European Commission. (n.d.). *European Chips Act*; start-up grants: European Commission says they are already supporting the semiconductor industry through the EIC Accelerator scheme. EU Chips Act includes \$300m for a thematic challenge in the Accelerator scheme – European Innovation Council. (n.d.). *EIC Accelerator*.

²⁹ Ministry of Trade, Industry and Fisheries. (2022). *Roadmap - The Green Industrial Initiative*; education and training: nothing in Green Industrial Initiative talks about concrete measures to increase workforce, however the Long-term plan for research and higher education talks about priority in several areas of skills that reflect the industrial initiative – Norwegian Ministry of Education and Research. (2022). *Long-term plan for research and higher education 2023–2032*; catapults exist but are not aligned to the initiative goals – Nordic Testbed Network. (2021). *Norwegian Catapult develops a national infrastructure for innovation*; start-up grants – Climate Policy Database. (2001). *Climate and Energy Fund - Enova (Industry) Norway (2001)*; public procurement – Norwegian Ministry of Petroleum and Energy and Norwegian Ministry of Climate and Environment. (2020). *The Norwegian Government's hydrogen strategy*.

³⁰ HM Government. (2017). *Industrial Strategy: Building a Britain fit for the future*; UK has a 2016 skills plan published a year before the 2017 Industrial Strategy, however neither priority areas are aligned with each other.

³¹ Government of Canada. (2023). *A Made-in-Canada Plan: Affordable Energy, Good Jobs, and a Growing Clean Economy*; see private R&D incentives – Government of Canada. (n.d.). *Business Innovation and Growth projects*; see grants and subsidies – Government of Canada. (n.d.). *Funding amounts and conditions: Strategic Innovation Fund*.

³² The White House. (2023). *Building a clean energy economy: a guidebook to the inflation reduction act's investments in clean energy and climate action*. R&D funding is available for private firms in some niche schemes (e.g. aviation fuels, enriched uranium) but does not seem to be a component for big IRA priorities.

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³⁶ Cabinet Office, Government of Japan. (2023). *Integrated Innovation Strategy 2023*.

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³⁹ Federal Ministry of Education and Research. (2023). *The High-Tech Strategy 2025 Progress Report*.

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⁶¹ Department of Industry, Science and Resources. (2023). [Cooperative Research Centres Program Round 25](#).

⁶² Phillips, T. (2023). *Green Gold: A strategy to kickstart Australia's renewable industry future*. Centre for Policy Development.

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⁶⁴ National Reconstruction Fund Corporation. (n.d.). [What we do](#).

⁶⁵ Commonwealth of Australia. (2024). [Powering Australia Industry Growth Centre](#).

⁶⁶ Department of Education. (n.d.). [Research Translation and Commercialisation Agenda](#).

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