Sectoral, Systemic and Spatial: Rethinking Australia's Approach to National Industry Policy

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Abstract

The development and implementation of industry policy is an approach by governments to direct, attract or grow targeted industries in a regional or national economy. In Australia, the Commonwealth Government directly promotes and advances certain industries or sectors of national importance. The states and territories also play an integral role in shaping the development of industries and tend to have a more spatial, or place-based, approach to economic development than the Commonwealth. Policy pertaining to nationally important industries has a clear sectoral focus in Australia; however, unlike other countries, such as Canada and the United Kingdom, Australia lacks a truly systemic and spatial nationwide industry framework. This paper contends that this is a missed opportunity for the Australian economy in the face of changing regional and global forces.

Introduction

In recent years, there has been a shift towards national place-based industry policy worldwide. In the face of globally significant economic, social and environmental challenges, many countries are reassessing how and where they incentivise, nurture and sustain industries domestically, rather than relying solely on global supply chains. This shift reflects a collective stepping back from the assumed orthodoxy of absolute globalisation and has been shaped in recent years by a range of forces, including:

- The disruptions to global supply chains created by the COVID-19 pandemic. These disruptions exposed the frailties in service-based economies. Notably the domestic production of key goods and the need to shore up domestic supply chains, ensuring adequate and sustained supplies of critical supplies such as vaccines, medical devices and personal protective equipment;
- Sovereign capability resilience, stemming from changing trade relationships with manufacturing powerhouses such as China, and the impact of Russia's invasion of Ukraine on global food and energy supply chains;
- National economies leading in emerging industries – for example, quantum computing, bio and medical technologies, green energy, space tech etc. – some of which have been accelerated as a result of the previous two factors;
- Market-led economic policies creating large-scale social issues. In industrialised nations such as Australia, the UK and US, this led to the emaciation of production jobs that supported large industries, from a shift to offshore production in emerging nations – the impact of which has seen in the increase in social inequality in many parts of these nations and other countries; and
- The climatic and environmental crises which have been a result of these previous economic policies.

To address these challenges and take advantage of the opportunities these and others present, national industry policy has re-emerged as a core political and economic mechanism for central governments.

The definition of industry policy (or industrial strategy) can vary. Bonvillian (2021) summarises the various definitions and aspirations of industrial policy in the US context[1] and provides one by Robert Atkinson as "a set of policies and programs explicitly designed to support specific targeted industries and technologies"[2].

[1]Bonvillian, WB, 2021 'Emerging Industrial Policy approaches in the United States', Information Technology and Innovation Foundation
[2]Ibid, p3

Many countries, including Germany, South Korea, Singapore, Canada, the United Kingdom and, to a lesser extent, the United States, have applied a spatial or place-based lens to their national industry policy. A recent article from the Brookings Institution noted that after years where place-based federal investment was not a focus in the US, a recent suite of new laws focused on economic recovery and industry development include"…place-based policies [that] seek to advance national goals such as strengthening domestic supply chains, promoting international economic competitiveness, and mitigating the impacts of climate change'[3].

In Australia, the Commonwealth Government[4] has developed policies for industries identified as nationally significant. However, in a recent article, Professor Roy Green contends that "what is clearly missing in Australia, by contrast with most other advanced economies, is a coherent and purposeful approach to industry policy"[5]. Existing industry policy mechanisms do not have a systemic or spatial approach to implementing these policies.

The states largely lead the focus on regional economic development and industry and infrastructure investment. This creates competition between the states for jobs and foreign direct investment. While competition is a good thing, in the Australian economic context, it can materialise in decisions and investments that are to the advantage of a particular state, but to the detriment of the national economy. Such outcomes can lead to the over-dilution of industry activities across the country-reducing the opportunities for critical mass and the advantages that come with this- or it can lead to investment into a region that may not be best-placed from a national perspective, to accommodate it.

This paper contends that for Australia's role in the global marketplace to be maximised, we need to coordinate our approach to investment and development of nationally-significant industries. This position accounts for Australia's significant geographic size, small and concentrated population (56% of Australia's population lives in the four largest cities[6]) and the distance from global markets of Asia, Europe and North America. While Australia's current approach is predominantly sectoral, this paper argues this approach should be expanded to also be systemic and spatial. In the context of this paper, sectoral refers to particular industry sectors; spatial refers to place-based policy mechanisms and systemic refers to a coordinated, nationally-networked approach to industry policy implementation.

[3]Brookings, 'Breaking down an $80 billion surge in place-based industrial policy', (https://www.brookings.edu/blog/the-avenue/2022/12/15/breaking-down-an-80-billion-surge-in-place-based-industrial-policy/, accessed 23 January 2023
[4]The Commonwealth Government is the Federal Government in Australia, with six States and two Territories comprising the Federation of States under the Australian Constitution
[5]Green, R (2022) 'Roy Green on the urgency of the industry task ahead' in Innovation Aus (https://www.innovationaus.com/roy-green-on-the-urgency-of-the-industry-task-ahead/) accessed 08/02/23)
[6]Australian Bureau of Statistics, Census data, 2021

Industry strategy – an Australian approach

National approaches

Australia's legislative and taxation landscape is shaped by the division of powers across three levels of government – National, State and Local[7]. This three-tiered governance structure shapes the role that different levels of government play in the formulation and execution of economic and industry policy.

The result is a series of policy interventions that guide the development of certain nationally significant industries at a national level. A detailed review of all of these is not the scope of this paper, however, it does summarise several of the key ways the Commonwealth is invested in industry policy. These points highlight that much of the focus on industry policy in Australia is sectoral in nature. While there is a spatial consideration for certain policy mechanisms, this is neither coordinated nor systemic.

Growth Centre framework

At a federal level, industry policy is led by the Australian Government's Department of Industry, Innovation and Science. The core program of this national industry policy framework is the Industry Growth Centres Initiative. This framework was identified in 2014 as part of the Australian Government's Industry, Innovation and Competitiveness Agenda[8] and identifies six 'sectors of competitive strength and strategic priority'[9]. Each Growth Centre is established as a not-for-profit organisation tasked with developing a 10-year strategy for the sector, regulatory reform opportunities and other priorities for the sector's development, such as skills pathways. The six Growth Centres are:

- Advanced Manufacturing
- Cyber Security
- Food and Agribusiness
- Medical Technologies and Pharmaceuticals
- Mining Equipment, Technology and Services
- Oil, Gas and Energy Resources

Subsequent to the establishment of the growth centres, other strategies have been developed across a range of sectors in response to more recent global events. One example is the 2020 'Make it Happen' Modern Manufacturing Strategy. This strategy outlines national manufacturing priorities that focus on supply chain resilience and competitiveness in advanced sectors, such as defence and aerospace[10].

While the six Growth Centres reflect the mid-2010's sectoral priorities of the Australian Government, they lack a consistent place-based (spatial) focus. Ostensibly, each growth centre is intended to interact with one another, as no sector operates in isolation. A review of each growth centre's strategic plan, however, highlights a wide variation in both the level of strategy detail, but also the consistency of spatial considerations or implementation. By way of example, the Advanced Manufacturing Growth Centre (AMGC) Competitiveness Plan has a strong focus on skills development and value-adding to existing manufacturing capabilities, but no focus on any regional competitive advantages that may influence where certain types of manufacturing occur[11]. Nor does the Medical Technology, biotechnology and Pharmaceutical Sector Competitiveness Plan[12].The Food and Agribusiness Growth Centre (FIAL) has eight identified clusters across Australia's food-producing regions identified through a competitive tender process.

Although the other growth centres have some level of recognition of spatial considerations, these reflect either the locational comparative advantages of certain areas or the establishment of particular hubs, rather than an intentional, nation-wide spatial and systemic policy framework. This Growth Centres Model is contrasted with international examples later in the paper.

[7]It is noted that while Local Governments play an important part in Australian governance, they are not formally recognised in the Australian Constitution, although each state has its own Local Government Act (or equivalent) that distributed powers to local governments.
[8]ACIL Allen, 2020, Industry Growth Centres Initiative Initial Impact Evaluation
[9]Australian Government, Dept. Industry, Innovation and Science
[10]Australian Government, 2020, 'Make it Happen: The Australian Government's Modern Manufacturing Strategy', (https://webarchive.nla.gov.au/awa/20220816062844/https://www.industry.gov.au/data-and-publications/make-it-happen-the-australian-governments-modern-manufacturing-strategy)
[11]Advanced Manufacturing Growth Centre, 2022, 'Manufacturing Competitiveness Plan, 2022: Transforming Australia from Lucky to Smart'
[12]MTP Connect, 2022, 'Medical Technology, biotechnology and Pharmaceutical Sector Competitiveness Plan'

Commonwealth-priority industries

The defence sector is one nationally significant industry that the Australian Government (and many national governments) has a direct role in developing – as a research partner, manufacturer, customer, and exporter. Bonvillian (2021) illustrates defence's role as a key driver of domestic manufacturing policy in the US. The same case can be made for Australia. Defence is a core portfolio of central governments that directly influences the scale of investment in associated industries. While expenditure is not at the levels seen in the mid-twentieth century, in 2021, Australia spent 2.2% of GDP on defence, while the US spent 3.5%[13].

Investment in defence-related industries also has spatial implications. Both the locational and political attributes of defence infrastructure can lead to place-based industry investment programs. One domestic example was the commitment to deliver Australia's Future Submarine Program in Adelaide in the mid-2010s (now superseded by the AUKUS pact).

Research and grant funding mechanisms

The Australian Government has identified and supports, through a grant funding mechanism, a range of Cooperative Research Centres (CRCs). CRCs support medium to long-term collaborative research programs through matched funding streams. The CRCs vary in both length and area of focus, but the intention is to assist in complex problem-solving areas of research. They can be sectoral (for instance, cybersecurity and future energy), social and environmental (future food systems, blue economy), product specific (Smartcrete, future battery industries) and even spatial (Developing Northern Australia). The CRC programs, however, are time bound, linked to grant funding availability. A case in point is the recent announcement of the closure of the Innovative Manufacturing CRC after seven years of operations[14].

City Deals

The City Deal model, established in Australia in 2016 and building on the UK-based model, is a place-based, tri-partite model for delivering regionally or nationally significant infrastructure that requires federal intervention. The most complex of these city deals to date is the Western Sydney City Deal, involving Commonwealth, State and eight local governments, focusing on the delivery of the Western Sydney Airport as a catalyst for export-focused industry investment in Greater Sydney. The City Deal mechanism is an example of the Australian Government's involvement in explicitly place-based industry policy. It is, however, relatively contained, and reflects a need for Commonwealth intervention to deliver infrastructure that states or local governments cannot, rather than an intentional investment in a national network of precincts with the express aim of developing a coordinated national industry strategy. In that way, while it is both sectoral and spatial, it is not systemic.

[13]World Bank, 2021 (https://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?end=2021&locations=AU-GB-US-CA&name_desc=false&start=1960&view=chart&year=2021). By way of historical comparison, in 1968, Australia's expenditure was 3.8% of GDP while the US was 9.3%.
[14]IMCRC, 2023 'Media Release: IMCRC leaves behind $6+ billion legacy for Australian manufacturing (published 7 February 2023)

Regional Development Australia initiative

The Australian Government has created a national network of committees that reflect and represent local and regional economies across Australia. These RDA Committees comprise business, community and government leaders in each region and are responsible for helping to develop their respective regions. They often work in partnership with local councils and state government agencies in areas such as economic development. There are 48 RDA committees across Australia[15]. The RDA charter states "Regional Development Australia (RDA) is a national network of Committees made up of local leaders who work with all levels of government, business and community groups to support the economic development of their regions[16]."

The RDAs can be seen as a network of place-based organisations, however their primary focus is developing their individual jurisdictions, rather than operating as a networked system of places with a nation-wide strategy for priority industries. That being said, they are a valuable mechanism for the Commonwealth Government to have a local presence across Australia.

National Innovation Policy and Statement of Principles for Australian Innovation Precincts

In 2017, the Australian Government's Innovation and Science Australia agency developed a national innovation plan – 'Australia 2030: Prosperity through Innovation'. This plan is a roadmap for Australia to develop its innovation capabilities. As a plan it has a national, but almost exclusively sectoral focus. It does not have a spatial lens applied to where innovation in certain sectors is focused. The strategy does, however, recognise the role of precincts in driving innovation. One outcome of this strategy was the identified need to develop a Statement of Principles for Australian Innovation Precincts.

The Statement of Principles was published in 2018 and reflects much of the literature regarding innovation precinct discourse, particularly that led by Katz and Wagner of the Brookings Institution. It also includes a range of case studies of innovation precincts domestically and overseas. However, neither the statement of principles nor the Australia 2030 plan spatially articulates where innovation in key industries is concentrated nationally. This again reflects a sectoral national policy mechanism, not one that is spatial or systemic.

[15]Australian Government, https://www.rda.gov.au/about (accessed 24/01/23)
[16]Australian Government, 2020 ' Regional Development Australia Charter'

State-based approaches

The relative lack of involvement of the Commonwealth in spatial industry policy reflects myriad factors, but perhaps the largest of these is the division of powers between the states and the Commonwealth under the Constitution. The Commonwealth has few exclusive powers (mainly pertaining to agendas such as defence, immigration, foreign affairs, currency and tertiary education). It is the states and territories, often in partnership with local governments, that are responsible for place-based (spatial) strategies. This is because they are responsible for utilities and other infrastructure, land management, health and education and policies and legislation regarding housing and employment (among others). They also hold the planning and approval powers that place-based precincts are shaped by. It follows that these responsibilities are inherently more local or regional than Commonwealth jurisdiction would cover[17].

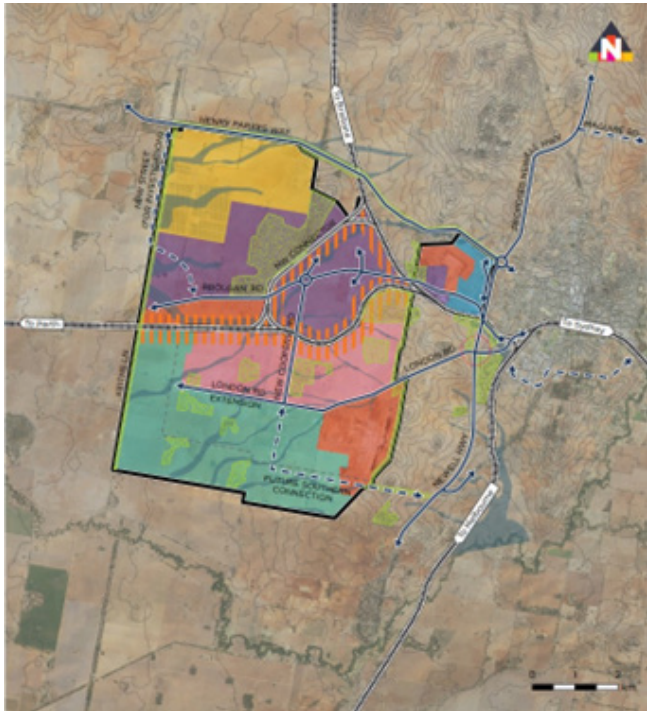
How each state approaches place-based strategies varies (be it economic, infrastructure, planning etc.), and this paper does not examine each in detail. It is instructive, however, to understand what these can look like. A brief precis of several NSW place-based policy frameworks that have an industry attraction component is provided in this paper to illustrate the range of state-based approaches.

Special Activation Precincts

Special Activation Precincts (SAPs) are large-scale regional hubs that are intended to 'create jobs, attract investors and fuel economic development'[18]. They were established as a network of five hubs across Regional NSW by the Regional Growth NSW Development Corporation to catalyse investment around key regional infrastructure such as Inland Rail expansions and local industry clusters (Parkes, Wagga, Moree), Defence and Aviation infrastructure (Williamtown) and other locational advantages (Snowy, Narrabri). Led by the NSW Government in partnership with local governments and major stakeholders, they are explicitly focused on fast-tracking investment into regional economies, with the state government's focus being to remove barriers to entry or delivery (for instance, early-stage infrastructure, business attraction, coordinated approvals processes etc). Each SAP is large, but clearly defined within existing localities. For instance, the Parkes SAP is 4,821 hectares in size (See Figure 1).

Special Activations Precincts are by their nature place-based, and the economic vision for each is shaped by its own competitive advantages, with the over-arching aspiration being to increase jobs and economic activity in Regional NSW.

FIGURE 1: PARKES SPECIAL ACTIVATION PRECINCT



Source: NSW Government, 2020, Parkes Special Activation Precinct Masterplan

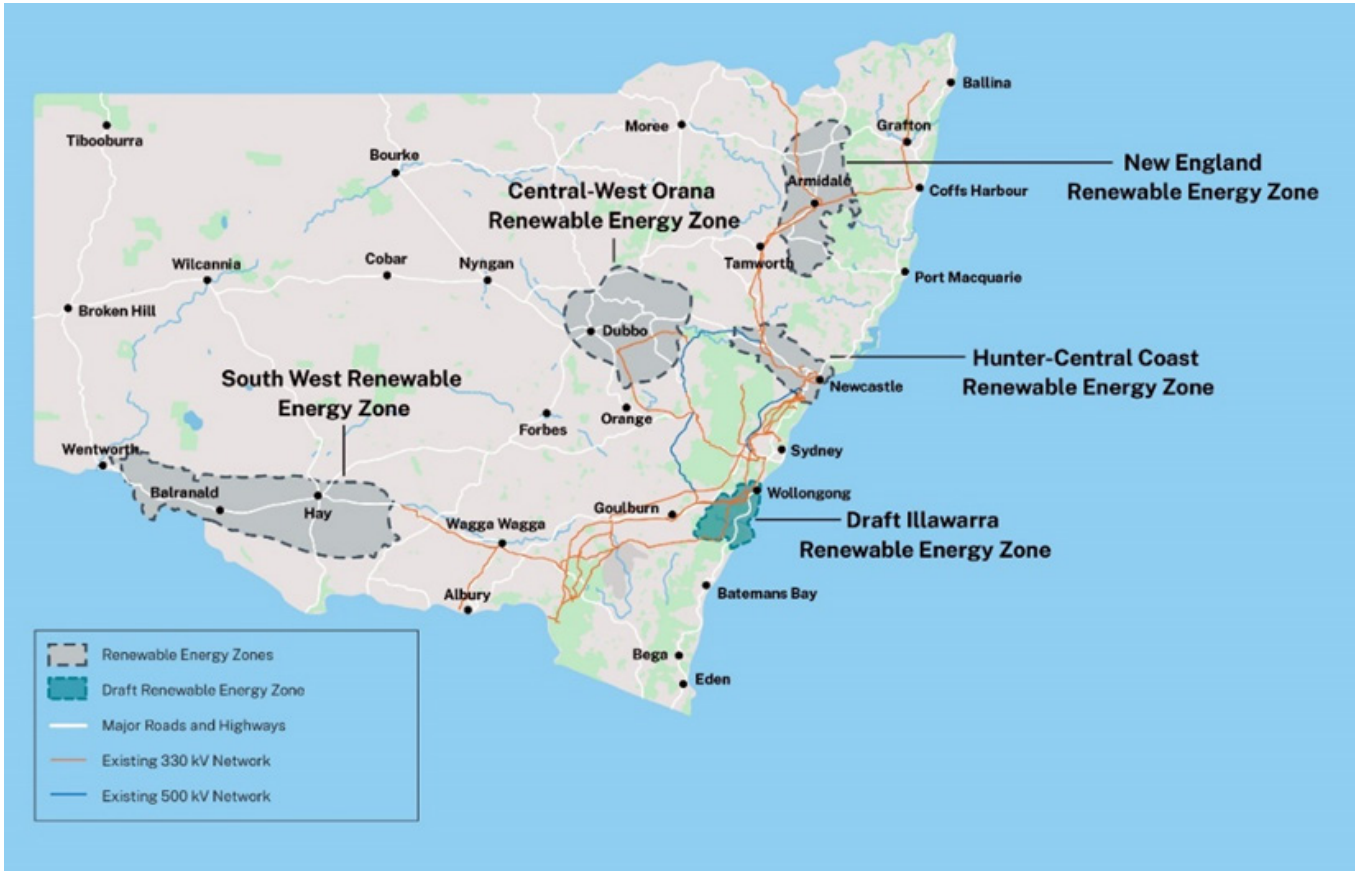
[17]The principle of Subsidiarity in governance applies in this context. This principle holds that issues should be addressed by the governance level closest to them. It follows, therefore, that place-based policy settings are driven by local and state governments, as with some exceptions, the Commonwealth is too far removed.
[18]NSW Government, 2019, Special Activation Precincts: Supercharging Regional Economies through Innovative Planning

Renewable Energy Zones

Renewable Energy Zones (REZs) are zones of super-regional scale where the NSW Government is seeking to invest growth in renewable energy infrastructure. There are five REZs across NSW which will be the focus for energy generation, storage and transmission infrastructure. They have been established to grow renewable energy generation in NSW and to reduce reliance on fossil fuel-based energy generation. The REZs are supported by a suite of complementary policies to increase the job and industry growth opportunities in Regional NSW, with strategies such as the Renewable Energy Sector Board's Plan[19] that outlines priorities regarding regional economic development, skills pathway opportunities and economic transition – particularly in those regions with strong coal mining activity.

Although much larger in scale than the SAPs (see Figure 2), the REZ's are also a good example of industry and economic development-focused spatial policy, in this case focused on developing the renewable energy sector as both a sector to support a greener NSW economy and as a job creation sector in its own right.

FIGURE 2: NSW RENEWABLE ENERGY ZONE LOCATIONS



Source: NSW Government, 2022, https://www.energyco.nsw.gov.au/renewable-energy-zones/renewable-energy-zone-locations

[19]NSW Government, 2022, NSW Renewable Energy Sector Board's Plan, (https://www.energy.nsw.gov.au/sites/default/files/2022-09/nsw-renewable-energy-sector-board-plan.pdf - accessed 24/01/23)

Innovation Precincts

The final example of place-based industry strategies is the diverse range of strategies across NSW (but predominantly focused on Greater Sydney) to create a network of 'Innovation Precincts' targeting investment in a range of sectors. One example of this is the Tech Central[20] precinct in central Sydney. This precinct leverages the assets of universities, research institutions, critical mass of economic activity and access to deep labour markets. Tech Central then uses these assets to attract national and international investment in a breadth of tech-focused sectors including bio and med-tech, deep tech and digital tech.
These innovation precincts are inherently place-based, leveraging existing competitive, comparative and collaborative advantages to drive investment in target sectors. They are often built around very particular assets such as a hospital, university or major anchor industry partners.

The emphasis on precincts in the Greater Sydney context grew out of a focus on poly-centrism that has been a driving force in that city's strategic planning vision for nearly two decades. The poly-centric model plans for a city as a series of distributed centres where jobs, services, retail and cultural activities cluster. The model also recognises the need for major centres (the Sydney CBD, Parramatta and the future Aerotropolis) as an anchor. This understanding reflects agglomeration theory where knowledge intensive jobs tend to cluster in large centres with good access to labour markets and strong business-to-business connections. In this way the precinct-based model does imply an adoption of systemic, sectoral and spatial policy.

State-wide policies

These various place-based strategies give effect to less place-based, state-wide strategies, for example, the NSW Economic Blueprint (developed by NSW Treasury) or Modern Manufacturing aspirations. These tend to be aspatial, focusing on sectoral strengths and state-wide growth aspirations. That said, the Modern Manufacturing Taskforce's 'Making it In NSW' does recommend having a series of Manufacturing Capability Centres across NSW, linked to the soon-to-be completed Advanced Manufacturing Research Facility in Western Sydney.
Each state has their own version of these place-based approaches to industry strategy.

Challenges with the prevailing approach to industry policy in Australia

This paper identifies three issues with how industry strategy is developed and applied in Australia.

A lack of express alignment between Commonwealth and States

There appears to be little, if any, direct and intentional alignment between the Commonwealth's stated strategic industries and those shaping the more place-based strategies being developed at a state level. This is not to say that there is no alignment – indeed, many of the sectors of focus at a state level correspond to those identified as national priorities. The issue is that there is no policy mechanism to ensure that the industries identified at a national level are driving state-led, place-based industry policy. In this regard, it can be argued that Australia's approach is sectoral, but not systemic nor spatial.
It appears that the alignment between state and federal policies is left to the states. This is expressed clearly by the NSW Modern Manufacturing Taskforce's recommendations to the NSW Government, when it notes that a modern manufacturing strategy in NSW should be developed 'in close alignment with the Commonwealth's evolving priorities and delivery mechanisms' (p18) and should 'align NSW more strongly with the Commonwealth, thereby placing NSW in a better position to access Commonwealth funding' (p19)'.

This is, without doubt, a critically important recommendation to ensure that NSW's aspirations align with those of the Commonwealth. But this directive is coming from the state, not the Commonwealth.

While this may reflect the division of powers in the Federation, it is not the optimal approach. It lacks the coordination required to attract the foreign direct investment needed and ensure that a country with a small and dispersed consumer base, high labour costs and a long distance from the global markets of the US, Europe and Asia, is as globally competitive as it could be.

[20]NSW Government, Tech Central 'https://www.tc.sydney/

Overly competitive inter-state investment attraction strategies

A resultant issue of the previous challenge is that each state tends to operate as an island in direct competition with all other states. While strategies and policies may talk of the importance of enhanced inter-state collaboration[21], in practice, the way in which State governments are structured reinforces the emphasis on inter-state competition. In NSW, for instance, there is a state government agency – Investment NSW – whose remit is to "facilitate economic development and attract investment, and reinforce NSW as the most desirable place in the world to visit, study, invest and do business"[22] [italics added by author to highlight the focus on the competitiveness of the state government].

Competition between states is not an issue per se and this paper does not contend that competition should not exist. However, again – in a mid-sized economy a long way from the global economic centre of gravity, when it comes to nationally-significant industries, competition should focus on ensuring that Australia is the most desirable place in the world to visit, study, invest and do business.

The Modern Manufacturing Taskforce reinforces this point in their Making it in NSW report of 2022 that "…there is some concern that excessive overt competition between the Australian states has distorted the FDI [foreign direct investment] market. The overall recommended approach is that FDI should be drawn to Australia, and NSW, based on competitive advantage. It should not devolve into a zero-sum game of cheque book courtship"(NSW Modern Manufacturing Taskforce 2022)[23].

Business case structures that reinforce a zero-sum game mindset

Another outcome of the Commonwealth Constitution in practice is the vertical fiscal imbalance that exists in Australia. With the exception of a few taxes (stamp duty, land tax, gambling tax, Council rates etc.), the majority of tax in Australia is collected by the Commonwealth government and spent centrally or distributed to the states. Unlike other regional jurisdictions across the world, such as the US and Canada, Australian states and local governments are unable to raise local taxes on income or transactions to pay for specific projects or infrastructure.

This constraint means that states are particularly focused on 'value for money' in their range of infrastructure projects to ensure that investment provides the best return to government. The definition of 'value' is a vexing discussion, and one not explored here. However, one of the primary mechanisms for assessing value is through the business case process. While varying across states, in summary, a business case assesses an infrastructure project (for example) against a range of other scenarios, such as a 'do nothing' or a next best option scenario. As part of this, a business case is often required to demonstrate that it has a positive Benefit-cost ratio (BCR) whereby economic benefits outweigh costs.

This appraisal mechanism is an important tool to ensure public money is effectively spent (although there are various critiques about this in the Australian context – see, for instance, the Grattan Institute[24]). This has an inherently in-built zero-sum game mindset whereby the attraction of a job into the state is seen as a 'win' to that state's economy, even if that job has simply transferred over the border from another state and even if the loss of that job (or business, or industry) from the other state is a greater 'cost' to Australia's competitiveness than the benefits derived from its relocation for that state. Furthermore, the new jobs might simply be transferred from other activities, particularly in a constrained labour market.

The upshot of the Australian approach is that the lack of inter-governmental coordination, coupled with our hyper-competitive state-centric approach, means that Australia risks not properly competing on the global stage in industries where we have natural or technological advantages, but which require co-ordination, rather than competition, between the states to ensure precincts, programs and investment more broadly are working towards a common national aspiration. A top-down, nationally-focused framework that is systemic and spatial, in addition to sectoral, has the potential to provide such guidance.

[21]NSW Modern Manufacturing Taskforce, 2022 'Making it in NSW: Time for Action'
[22]Investment NSW, 2023, https://www.investment.nsw.gov.au/about-investment-nsw/ (accessed 24/01/23)
[23]NSW Modern Manufacturing Taskforce, 2022 'Making it in NSW: Time for Action'
[24]Grattan Institute – Terrill M & Batrouney H, 2018 'Unfreezing Discount Rates: Transport Infrastructure for Tomorrow'

Lessons from international approaches

Spatially and systemically focused industry policy does exist across the world at a national level. This paper briefly reviews three different approaches to industry policy that reflects this[25]. These three case studies are:

- Canada's Global Innovation Clusters Program
- The United Kingdom's Catapult Network
- The United States' recent suite of economy-building legislation

Many other countries have strong approaches to industry policy, including Germany, Singapore, South Korea and China. These three have been chosen as a sample and also as they reflect similarities in Australia's economic and political structure and is not a reflection of them being necessarily the best approaches globally. They do, however, provide some good lessons for Australia.

Canadian Global Innovation Clusters Program

Overview

In 2017, the Canadian Government outlined an Innovation and Skills Plan as part of that year's federal budget. This Plan launched the Global Innovation Clusters Program (known at that time as the Innovation Superclusters Initiative). The intention of the Superclusters program was to firstly identify, then develop, a series of nationally significant clusters of innovative industries to "…make it easier for innovators and potential customers to work closely together on research, development and demonstration activities that pursue major commercial opportunities, to boost productivity, and create jobs and drive economic growth"[26].
This approach to concentration and support of innovation jobs followed the growing theory of innovation clusters taking shape at the time (see for example Katz and Wagner, 2014), driven by the desire of regions and nations to replicate the activities of places such as Silicon Valley.

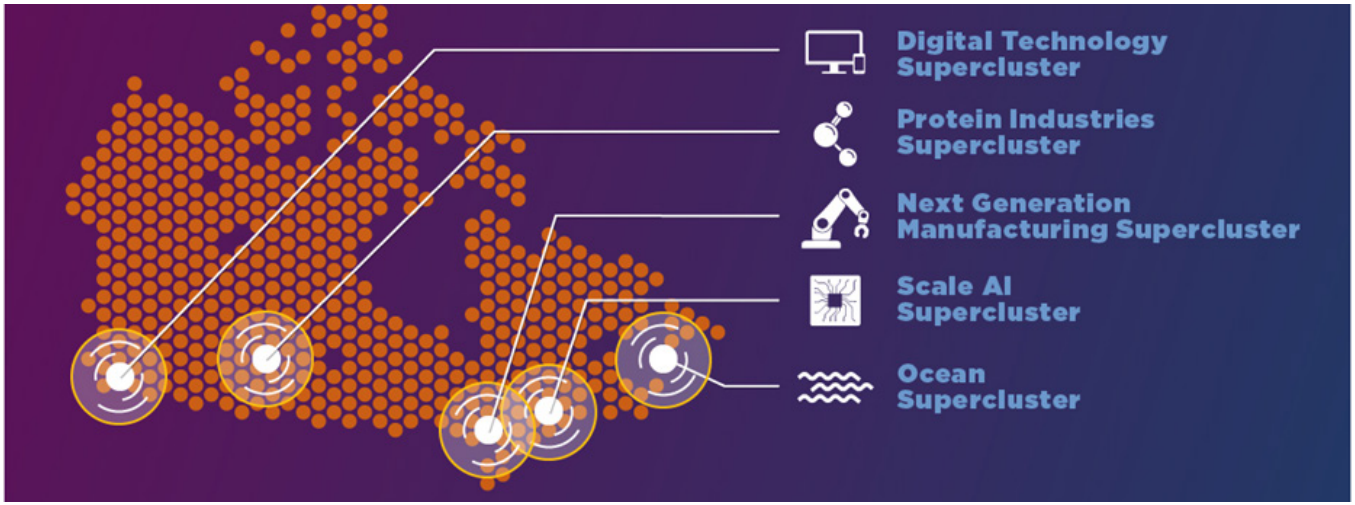
[25]While these case studies have been identified because of their various similarities with Australia from an economic, social and governance structure, it is noted that no country is exactly the same and the applicability of one system in the Australian context will be challenged by issues such as taxation systems, legislated delegations of power etc. The intention of this review is to highlight how other countries have approached this issue with the intention of developing principles that Australia could apply in the domestic context.
[26]Government of Canada, 2017' Budget 2017: Building a Strong Middle Class (Ch 1 – Skills, Innovation and Middle Class Jobs" https://www.budget.canada.ca/2017/docs/plan/chap-01-en.html

Five clusters were identified through a competitive application process, and assessed according to their expected benefits to Canada, how they positioned Canada for Global Leadership and their plans to generate new Intellectual Property to benefit Canada's economic development[27,28]. The five clusters identified were:

- British Columbia – Digital Technology
- Prairies – Protein industries
- Ontario – Next Generation Manufacturing
- Quebec – Scale AI
- Atlantic Canada – Ocean

Notwithstanding the critiques on the political influence of the chosen clusters, each reflected the relative competitive, comparative and collaborative advantages of the chosen regions with respect to the cluster focus. The initial budget allocated close to C$1 Billion to the initiative over five years. As with all modern innovation cluster programs, the intention was to bring together partners across the public, private and academic sectors to concentrate efforts on research and development and downstream commercialisation as a means of increasing Canada's economic productivity.

FIGURE 3: CANADIAN GLOBAL INNOVATION CLUSTERS NETWORK



Source: https://brookfieldinstitute.ca/wp-content/uploads/Superclusters_Final2.pdf

[27]Government of Canada, Innovation, Science and Economic Development Canada (ISED) https://ised-isde.canada.ca/site/global-innovation-clusters/en/about-canadas-innovation-clusters-initiative (accessed 25/01/2023)
[28]Critiques of the program have also noted the inevitability of political influence on where clusters were identified (see, for instance, Owens 2022).

Insights

Similarities exist between the two countries across geographic scale and concentration, political structure, historical parallels, GDP and export industries. With respect to the development of spatially focused industry policy, reflecting on Canada's approach to the Global Clusters Innovation Clusters initiative is instructive for Australia in developing our own. A series of insights from the Canadian Global Innovation Clusters Program are of relevance to Australia:

- **A clear spatial and sectoral focus, but not systemic.** The Global Innovation Clusters program applies a clear spatial lens to its sectoral strategy, by identifying five distinct regions as the epicentre of sectoral activity. What it does lack, however, is an apparent focus on ensuring that these five clusters work as major anchors in a national inter-connected system.
- **The program is led by a national economic development agency.** The program is run by Innovation, Science and Economic Development Canada, an agency with an explicit focus on economic development, innovation performance and 'increasing Canada's share of global trade[29]. In Australia, these sit across a number of portfolios and agencies (Austrade, CSIRO, Dept. Infrastructure, Transport, Regional Development, Communication and the Arts etc), and there is no single agency with an express focus on a national economic development strategy.
- **Provides a clear spatial plan for industry investment without precluding activity taking place outside of clusters.** The reality of an advanced and distributed economy such as Canada is that industries in the five industry clusters will also exist across the country. The initiative does not limit these activities taking place outside of the clusters. Rather, it sends a clear signal to domestic business and research partners, current and future students and international investors, of where the Canadian Government is focusing its investment and support efforts with respect to industries of national importance.
- **Risk of over simplification.** The corollary to the previous observation is that the identification of five key industries, with a strong place-based focus, could be construed as a significant over-simplification of a complex national economy. It is important, therefore, that any place-based industry policy of a national scale is not absolute in its expectations and that targeted industries must only be developed in the anointed cluster. There will invariably be a range of activities associated with each industry across the country, and most likely regionally-specific clusters that concentrate around an established industry anchor, a particular university program or a local advantage (infrastructure, natural resource etc) that lends itself to clustering.
- **Defining clusters at a national scale is challenging.** Some criticism has been levelled at the program that the clusters lack definition and it is easy to see how this can be the case. While most innovation cluster theory is built around clearly defined precincts (Kendall Square in Boston, Silicon Valley in San Francisco etc), defining an entire city or region as a cluster has its challenges. One of the key propositions in innovation precinct theory (see Katz and Wagner) is the value placed on proximity to form and maintain both formal and informal networks. It also makes it more challenging to assess the outcomes of the program, as it may be harder to identify what economic activity has resulted from the program's intervention, rather than simply being a by-product of agglomeration that occurs in cities anyway.

[29]Government of Canada, Innovation, Science and Economic Development Canada (ISED) (https://ised-isde.canada.ca/site/ised/en) accessed 25/01/2023)

UK's Catapult Network

Overview

The UK Catapult Network was conceived of in 2011 to help the UK Government build regional economies (referred to as 'levelling up' in the UK), increase productivity and make the country more competitive[30]. In its current structure, the program is overseen by Innovate UK, one of nine 'councils' under the umbrella of the UK Research and Innovation- a non-departmental public body sponsored by the Department for Business, Energy and Industrial Strategy (BEIS). As of 2020, the network had directed over £2.5bn of private and public sector investment across a range of industrial research agendas that align with a suite of UK government agendas, including R&D advancement, levelling up regional disparities, net zero and developing talent [31].

The Catapult Network comprises nine Catapults – centres of technological activity, R&D infrastructure and business activity and support that focus on sectors of national importance to the UK. These catapults are:

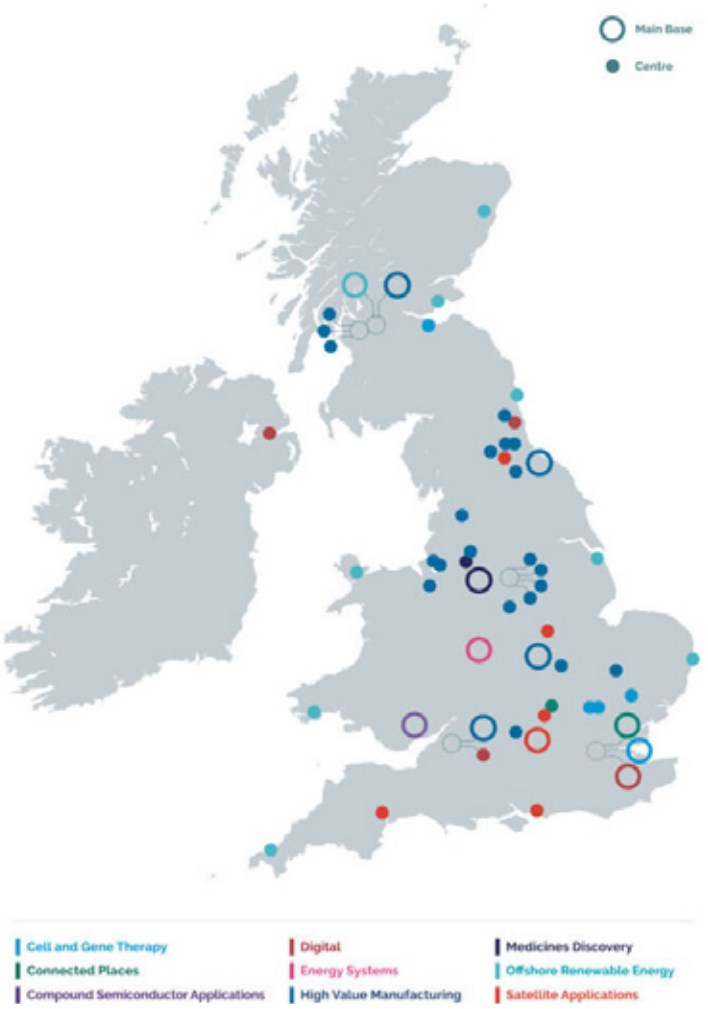
- Cell and Gene Therapy Catapult
- Compound Semiconductor Applications Catapult
- Connected Places Catapult
- Digital Catapult
- Energy Systems Catapult
- High Value Manufacturing Catapult
- Medicines Discovery Catapult
- Offshore Renewable Energy Catapult
- Satellite Applications Catapult

Each catapult is run as an independent not-for-profit organisation.

The network reflects the complex system of a national economy. While each Catapult has a 'Main Base', centred in a part of the country with a particular specialisation, critical mass of industry activity or R&D asset (for instance, a university program or infrastructure), each Main Base is supported by a network of fifty centres located throughout the country – again centred on a particular competitive advantage (see Figure 4). In this way, this system-wide approach is both sectoral and spatial.

The importance of this systemic, sectoral and spatial approach to industry policy is reflected in the outcomes of the multi-faceted nature of the programs it has delivered. The UK Government and its partners are able to address complex problems that span multiple sectors by virtue of this networked system. By way of example, Innovate UK highlights the successes in responding to the COVID-19 crisis, with the High Value Manufacturing, Medicines Discovery and Cell and Gene Therapy Catapults all planning a role[32].

FIGURE 4: UK CATAPULT NETWORK



Source: Catapult.org.uk (https://catapult.org.uk/about-us/why-the-catapult-network/)

[30]Innovate UK, 2020, 'The Catapult Network: Driving prosperity across the UK'
[31]ibid
[32]Innovate UK, 2020, 'The Catapult Network: Driving prosperity across the UK'

Insights

The UK is sometimes a challenging country to use as a case study in the context of Australia. While it shares a similar parliamentary structure, and strong historical and trade relationships, it is geographically much smaller, has a much larger and complex economy that is closer and more networked into both the European and North American economies and does not have a state-level government (meaning that the UK's Central Government has a much greater degree of influence on regional areas). Notwithstanding these significant differences, the Catapult Network model is instructive for Australia in pursuing a more coherent spatial industry policy.

- **Similarities to the Australian Growth Centre model, but far more spatial.** The identification of the nine Catapults, each with a sectoral focus and at arms-length from government governance structure, shares similarities with the Australian Growth Centres model. The key difference is that the Catapult Network has a very clear spatial component. That is, there are places identified that are where these industry clusters are focused. Further, these are identified at a national level.
- **More systems-focused than Canadian model.** The strategy's spatial manifestation is similar to the Canadian model. The key difference is that, unlike the Canadian model which over-simplifies the inherent complexity of a networked national economy, the UK Catapult model reflects this systems approach to economic activity by identifying both Main Bases and a network of smaller centres across the country.
- **The Catapult model is already held as a model to aspire to in Australia.** It is unsurprising that the UK Catapult model is being adopted (or aspired to) in both Australia and overseas[33]. The NSW Modern Manufacturing Taskforce refer to it repeatedly as an approach that NSW should look to emulate as part of its 'Making it in NSW' report[34]. As a model that is sectoral, spatial and systemic, it is a highly advanced model of national industry policy. The risk of such a model being applied at a state level in Australia however, is that it will continue to reinforce the inter-state competition that a nationally focused model would overcome.

[33]The UK version itself was built upon a German approach – the Fraunhofer model
[34]NSW Modern Manufacturing Taskforce, 2022 'Making it in NSW: time for Action'

United States' legislative agenda

Overview

In recent years, the US national legislative agenda has been driven variously by a focus on COVID recovery, building (or rebuilding) sovereign manufacturing capabilities in the face of geopolitical challenges and domestic socio-economic political forces. It has led to ambitious levels of government expenditure. As Brookings identifies, across three laws – the American Rescue Plan Act, the Infrastructure and Jobs Act, the CHIPS and Science act and the Inflation Reduction Act, the United States Government has committed to US$3.8 Trillion in total spending[35]. The article from Brookings makes special mention though of the nearly US$80 Billion within these Acts directed to place-based industrial policy.

The article quoted provides a detailed breakdown of what this looks like and so this paper does not replicate this. For the purposes of this paper, it is also important to note a subtle distinction in 'place-based' industry policy that the Brookings article does not pick up. The Brookings summary appears to identify any funding stream that supports the development of infrastructure. For example, the US$39 Billion CHIPS for America Fund[36] invests in facilities to develop semiconductors, although it is not clear whether there is an intentional systems-wide strategy for developing this capability across the US. For the purposes of this paper, the focus is on system-wide place-based interventions in a way that is more akin to the Canadian and UK models. Within this frame, the US's legislative agenda includes:

- The US$10 Billion Regional Technology and Innovation Hubs program focuses on 20 geographically distributed "regional technology and innovation hubs" in areas that are not technology centres. This is led by the US's Economic Development Agency with a focus on expanding innovation capacity across the US;
- The US$8 Billion Regional Clean Hydrogen Hubs program to establish at least four regional clean hydrogen hubs across the US;
- The US$6.5 Billion Regional Innovation Engines and Translation Accelerator program as part of the larger CHIPS Act
- The US$3.1 billion Collaborate Innovation Resource Center Program to support collaboration at high education institutions[37].

These are just some examples of the suite of place-based investments that the United States government is committing to over the coming years. What they do highlight is the scale of place-based industry policy investment that the United States is committing to.

Insights

Like the UK, drawing comparisons from the United States must be done carefully as, aside from geographic size, it is vastly different to Australia in many ways, including economic complexity and activity, population, trade relationships and political and legislative structure. It does, however, have a three-tiered government structure.

- **Highlights the importance of nationally directed, place-based investment.** The size of the investment from the United States Government highlights both the importance that the central government places on place-based (spatial) industry policy interventions, and the role that central governments have in direct investment at local and regional levels.
- **Highlights the role of a national economic development agency.** Several of the programs are led by the Economic Development Administration (a bureau of the US Dept. Commerce). The Administration is the only one with an exclusive focus on economic development and its mission is "to lead the federal economic development agenda by promoting innovation and competitiveness, preparing American regions for growth and success in the worldwide economy"[38]. Like the Canadian Innovation, Science and Economic Development agency and the Innovate UK organisation, it highlights the importance that other national governments place on having a specific body focused on national economic development.
- **Does not appear to be driven by an over-arching industry strategy.** While the various programs outlined in the Acts are expansive, there does not appear to be an holistic, nation-wide spatial strategy that is informing the investment in particular sectors in the way that both the Canadian and UK models have. In this regard, while the US has both a sectoral and spatial focus, it is hard to see a system-wide approach (although this is more likely to appear in the detailed programs listed above).

[35]Brookings, 2022 'https://www.brookings.edu/blog/the-avenue/2022/12/15/breaking-down-an-80-billion-surge-in-place-based-industrial-policy/ (accessed 16/01/2023)
[36]A fund focused on the development of the US's domestic semiconductor manufacturing sector
[37]Brookings, 2022 'https://www.brookings.edu/blog/the-avenue/2022/12/15/breaking-down-an-80-billion-surge-in-place-based-industrial-policy/ (accessed 16/01/2023)
[38]US Economic Development Administration (https://www.eda.gov/about) accessed 25/01/23)

Considerations for Australia

The need for a different approach

The reflection on Australia's approach to industry policy and the insights gained from a review of international approaches provides lessons for Australia to more effectively develop its national industry policy framework. A central tenet is the proposition that Australia must have a more spatially-focused and systemic national industry policy framework to ensure that, as a nation, our investments and endeavours enable us to most effectively compete on the global stage. As the NSW Modern Manufacturing Taskforce notes:

> "Federation impacts the way states and territories compete for Commonwealth and private sector funding and resources. A focus on regional capabilities and strengths, with a future-focused agenda (such as the renewable energy transition) should be the primary drivers of investment, rather than a 'who has the biggest state cheque book' approach." (NSW Modern Manufacturing Taskforce, 2022, Making it in NSW)

Australia has long-demonstrated its capacity to compete in emerging and high-value industries in the global economy. Our long-standing role in supporting global resources through iron ore and coal; the development of renewable technologies such as photovoltaics; the development of wi-fi, to name a few. In coming years and decades, we have further capacity to develop world-leading capabilities in existing and emerging sectors. Critical minerals extraction and processing, renewable energy generation and associated technologies and quantum computing are just some areas where we are already global leaders.

If Australia is to fully capitalise on these and other emerging industries, it is vital that it is done in a coordinated way to ensure that Australia competes on the global stage, rather than NSW, or Victoria, or Queensland (or any state on its own). Competitive and productive states are essential to a competitive and productive Australia, however, the way in which industry policy is currently structured domestically risks diluting our intellectual and financial investment in nationally significant industries through an overly competitive domestic economy.

It is important, therefore, that Australia's national approach to industry policy is sectoral, systemic and spatial. This paper identifies a series of considerations for Australia to achieve this.

Considerations for Australia

National alignment of Commonwealth and State industry priorities

There is currently little evidence that a policy mechanism exists to ensure direct, concerted and managed alignment between the Commonwealth Government's industry priorities and those driving state-based spatial industry policies.

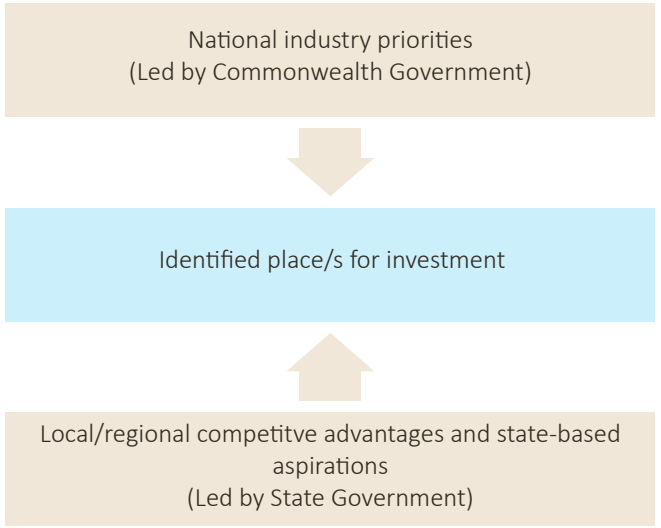
It could be argued that the RDA structure and CRC network provide this, but there does not appear to be a clear line of sight between national industry priorities and how these programs shape Commonwealth interests and investment at a local level. This is not to say that alignment does not occur, but rather, it is not systemic and nation-wide in its direction.

This could include:

- The Commonwealth Government working with States and Territories to develop a nation-wide and place-based assessment of national industry competitive advantages aligned with national priority industries. This would build on the detailed work that many of the states already have and help to identify regions that have significant advantages in support of these industries
- Leveraging the Commonwealth's involvement in key cluster anchor partners – universities, CRCs and federal agencies such as CSIRO, the Australian Space Agency etc

Such an approach would not be exclusively about top-down dictation, but would instead bring together national priorities and local competitive advantages, to identify the most appropriate place or places to direct priority industry investment.

FIGURE 5: TOP DOWN AND BOTTOM UP APPROACH



The imperative for approah is summed up well by the NSW Modern Manufacturing Taskforce:

> "...enhanced cooperation between states and the Commonwealth provides an opportunity to encourage direct investment towards the most appropriate state, city, or region. This approach has the advantage over time of building on a successful ecosystem rather than attempting to create a new one from a low (or no) capability base, as well as being able to build globally competitive scale nationwide."
> (NSW Modern Manufacturing Taskforce, 2022, Making it in NSW)

A systemic and spatial industry policy framework

The UK Catapult network model provides a good example of what a nation-wide, systems-based spatial industry framework might look like. It is recognised, however, that the UK is much smaller geographically than Australia with a greater distribution of economic activity right through the country.

Instead, a model that reflects the Catapult model's recognition of an inter-connected system of specialised activity networks, scaled to the Canadian Global Innovation Cluster model, may be a path forward for Australia to consider. The relative concentration of economic activity, research capabilities and labour to key centres in Australia means that this could be feasible. Building on the previous opportunity, such a model would identify the appropriate region or centre to direct investment into the relevant priority industry. This would give more structure than appears to be present in the US-based model.

This is what many states in Australia already do, and so existing policy settings can be built upon. However, this proposed model would do it at a national level, so as to avoid regions in different states competing for the same FDI target (for instance) and diminishing the opportunity of a more collaborative inter-state approach. It would add a system-wide lens to Australia's industry policy.

Alignment of Commonwealth funding

As a model that spatially reflects the Commonwealth's industry priorities, it follows that a funding mechanism aligned with this should be embedded. The Commonwealth already has this to some extent, with CRCs and Commonwealth Government agencies in key areas receiving funding.

Taking this further, a nationally-networked spatial industry policy could help direct Commonwealth funding by incentivising research, start-ups and others to locate in the nationally identified region or centre in order to gain access to certain funding streams.

Development of a dedicated national economic development agency

In order to bring such a model to life, there would need to be a responsible federal coordinating agency. Economic development sits within a range of portfolios and committees in Australia (for example RDAs), and there is an opportunity to create a more explicit and dedicated agency in the same vein as the US Economic Development Administration or Innovation, Science and Economic Development Canada.

This agency would be responsible for the development and ownership of the national spatial industry policy, working with the existing Growth Centres, other relevant Commonwealth government agencies as well as the states and territories.

In taking a national view, rather than the state-centric approach that currently drives place-based industry policy, this national economic development agency could play a similar role to that of Infrastructure Australia in terms of identifying key national priorities that, in turn, shape where Commonwealth investment is directed.

Review of state-based business case processes

As discussed, the nature of Australian legislation means that the states are often in direct competition for things such as FDI. The business case process and in particular the project cost-benefit assessment and economic impact analysis that influences decision-making can often reinforce a zero-sum game mindset. The costs to another state (or the country as a whole) of a particular investment decision (for instance, the attraction of an industry to NSW from QLD, or to NSW when the value to Australia would have been more if the investment went to Victoria), are not properly accounted for.

The Commonwealth Government, via Treasury, should work with the state treasuries to ensure that business cases better reflect the national interest, rather than the current, narrower state-based perspective.

Support local economies and communities

One of the major critiques of focusing foreign direct investment into regional economies is the often limited flow-on benefits into those regional communities that ultimately occurs. The intentional focus on regional capabilities in driving spatial industry policy should also have a strong emphasis on supporitng local economies and communities. This is a focus of the UK's 'levelling up' program that, in part, underpins the Catapult model. Exploring opportunities to engage local businesses in emerging supply chains, investing in skills development and business capacity building programs and using the procurement power of key industry partners (including government) are some examples of this. This approach is often referred to as Community Wealth Building and has been explored in more detail in the Australian context by Fensham[39].

Manage the hubris

With all politically-driven programs of national importance, it is easy to be swept up in platitudes and hyperbole of the influence that projects and programs will have. The Canadian model has been criticised as being no longer justified, ill-conceived and not delivering on expectation (see for example Sa,2021). A policy mechanism of this scale will have its inevitable drawbacks and shortcomings and it is important that its intention, terms of reference and limitations are made clear from the outset.

[39]Fensham, P 2020 'Community Wealth Building in Australia: A New Focus for Regional Economic Development', May 2020

Conclusion

Australia's geographic remoteness, scale, small domestic market, constitutional structure and dispersed economic activity make it challenging for industries to develop in a coordinated way across Australia. Our approach to industry policy at a national level tends to be aspatial – focused on the sector, rather than where it occurs. The spatial and systemic elements tend to be the domain of the states, but this creates issues regarding excessive competition[40] which risks diluting Australia's competitive offer.

By examining the shortcomings of the Australian model and exploring how other countries approach national industry policy, this paper has shown there is an opportunity in Australia to develop a more coherent, networked industry policy framework that is sectoral, systemic and spatial. Currently, our approach to nationally-significant industries is primarily sectoral alone.

As Australia increasingly explores opportunities to strengthen our domestic supply chains, build our sovereign manufacturing capabilities and explore new opportunities for global export markets, a coordinated approach at a national level is vital. With each state currently clamouring to dominate particular fields (most keenly observed in the fields of bio-technology investment but also in industries such as renewable energy infrastructure), there is a real risk that our desire to compete domestically in the absence of a nationally-coordinated industry policy will undermine our ability to compete against other countries with such a structure in place.

The ideas explored in this paper are not advocating for an exclusively top-down control of all parts of the economy, or having the Commonwealth Government step on the toes of the States and Local Governments. Rather, it is about ensuring for nationally significant industries, Australia adopts a coordinated approach to their development to give the industries the best chance of competing in a global market.

[40]NSW Modern Manufacturing Taskforce, 2022

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