

Research and global case studies of industrial and innovation place-based policy

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Acknowledgment of Country

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We recognise that First Nations sovereignty was never ceded and respect First Nations peoples continuing connection to these lands, waterways and ecosystems for over 60,000 years.

We pay our respects to First Nations Elders, past and present.

Urbis is committed to incorporating our respect for First Nations cultures, peoples and storytelling in our work across the Country. We are proud to have partnered with Darug Nation artist, **Hayley Pigram**, and to profile her artwork – **Sacred River Dreaming**.



The river is the symbol of the Dreaming and the journey of life. The circles and lines represent people meeting and connections across time and space. When we are working in different places, we can still be connected and work towards the same goal.

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Executive Summary

This report has been prepared for the Net Zero Economy Authority (NZEA) to examine how international place-based industrial and innovation policy approaches have been designed and implemented, with a focus on the policy models, delivery settings and place-based attributes and conditions that can support regional economic transition, industry development and investment decision-making.

The project was undertaken through a structured, evidence-based research approach. This included the key phases:

- development of a research framework
- targeted scan of place-based industrial and innovation policy models
- assessment of policy models against agreed relevance criteria
- shortlisting of the most relevant policies and approaches
- preparing detailed international case studies to examine how these approaches operate in practice
- identifying implementation risks and mitigation measures undertaken in these international examples.

Place-based industrial and innovation policy can support regions in managing uneven impacts and opportunities of the net zero transition, but success depends on place-based interventions to each region's assets, capabilities and constraints. Industrial policy and innovation policy serve different but complementary roles: industrial approaches support investment, production, supply chains and employment at scale, while innovation approaches support knowledge creation, commercialisation and long-term capability development. Internationally, the most effective models have a clear strategic purpose, strong governance, sustained funding, coordinated delivery across levels of government, meaningful engagement with industry, workers, communities and Indigenous stakeholders, and realistic sequencing of enabling infrastructure, workforce and market conditions.

Headlines

International case study examples tend to reflect not a single policy model, but an ongoing capacity to coordinate effort, sequence investment and sustain delivery over time. The following key findings are consistent across the research and international case studies.

1. Regional competitive advantage is the primary anchor for place-based policy

Place-based industrial and innovation policy is most credible where it builds on existing or emerging regional strengths, such as energy resources, industrial capability, logistics infrastructure, research institutions, workforce depth and anchor demand. The strongest examples are anchored in clearly defined assets, including renewable energy and critical mineral resources, ports, manufacturing capability, industrial land, research strengths or established supply chains. Policies that seek to replicate international models without regard to local conditions face higher delivery risk and weaker local value capture.

2. Governments increasingly shape markets and share risk, with intervention scaled to ambition

Governments are increasingly using a broad set of economic levers to create investable markets and reduce investor risk, including demand signals, procurement, offtake arrangements, concessional finance, grants, regulation and public risk-sharing. Where ambitions are global and capital-intensive, this is accompanied by substantial and sustained public investment and coordination. By contrast, where objectives are focused on managing the local impacts of nationally driven investment or improving liveability, interventions tend to be more targeted and enabling.

3. Infrastructure and enabling systems must be aligned and sequenced with industrial growth

Infrastructure investment is a common feature of place-based industrial policy, but its form, purpose and scale vary widely across regions and objectives. Investments span economic infrastructure, innovation assets, common-user facilities and social infrastructure such as housing, education and health. The case studies demonstrate that energy, transport, water, land supply, housing, skills, public services and approvals need to be planned and delivered in a coordinated sequence. There is no single correct sequencing model; effective approaches identify constraints early and address them before expecting private investment to scale.

4. Industrial policy is increasingly delivered through place-based, multi-level governance approaches

Across the case studies, there has been a shift from a centrally governed industrial policy toward place-based approaches that rely on coordination and collaboration across federal, state, regional governments, industry and communities. National governments continue to set strategic direction and provide funding, while delivery is coordinated through formal governance structures such as intergovernmental committees, delivery boards and regional development agencies that align investment, sequencing and implementation at a place level.

5. Delivery capability determines whether policy ambition translates into outcomes

The difference between policy ambition and regional outcomes is shaped by delivery capacity. More effective models have clear mandates, capable lead institutions, durable governance arrangements and authority to coordinate across portfolios, jurisdictions, industry and regions. Governance structures are most effective where they have defined responsibilities, decision rights,

influence over funding and accountability for sequencing and implementation. Where delivery capability is weak, well-designed policies risk fragmentation, delay and underperformance.

6. Infrastructure, skills and investment are most effective when delivered as integrated policy packages

Place-based transitions are more likely to progress where infrastructure investment is aligned with land-use planning, skills and workforce development, procurement, innovation support, finance, housing and community investment. Major capital projects alone rarely deliver enduring regional transition outcomes without these supporting conditions.

7. Government should be prepared to stay involved beyond the initial investment decision

The role of government often shifts over time, from setting direction and funding enabling infrastructure, to coordinating delivery, supporting markets, addressing bottlenecks and maintaining confidence through implementation while remaining adaptive.

8. Be cautious about definitive claims of success

Many place-based industrial and innovation policies have not been publicly or consistently evaluated. This means the evidence is stronger through literature than observed examples in relation to common success factors, risks and implementation lessons.

9. Australia's dispersed geography and regions amplifies coordination and delivery challenges

Australia's dispersed geography and regional population distribution create coordination, infrastructure and scale challenges that are less pronounced in many international industrial economies. This increases the importance of regional specialisation, connectivity and cross-regional collaboration when designing and delivering place-based industrial and innovation policy.

10. NZEA is positioned to act as a system coordinator for place-based transition

The findings suggest NZEA's value lies in translating national net-zero and industry objectives into credible, place-based delivery pathways. This includes:

- aligning Commonwealth, state and regional action
- identifying place-specific priorities
- sequencing policy levers
- connecting regions with investment and innovation systems, and
- ensuring workforce, community and First Nations outcomes are embedded from the outset.

11. Successful regional transition depends on both policy design and on region-specific implementation capability.

Across the case studies, the most effective outcomes occurred where policy was tailored to local conditions and supported by coordinated governance, enabling infrastructure, workforce capability and sustained institutional capacity. Conversely, even well-designed policies were less effective where implementation failed to account for regional constraints, sequencing or delivery capability.

Industrial Policy Approaches

Drawing on the extensive global research and literature reviewed, nine place-based industrial policy models were identified and analysed. This list does not include all existing models and theoretical approaches, and is curated to reflect project scope, the Australian context, and relevance to net zero industries.

● Industrial policy ● Innovation policy

Mission-Oriented / Market Creation Industrial Policy ●	Strategic Targeting Model ●	Green / Just Transition Industrial Policy ●
Mazzucato (2018;2021), Rodrik (2004;2008)	Rodrik (2004;2007), Aghion et al. (2015)	Newell & Mulvaney (2013), OECD (2020)
Agency-based Approaches to Place-Based Industrial Strategy ●	Embedded Autonomy / Network Governance ●●	Cluster-based Industrial Policy ●●
Beer et al.(2021)	Evans (1995), Rodrik (2014)	Porter (1990;1998)
Special Economic Zones ●●	Smart Specialisation Strategy (S3) ●●	Industrial Ecosystem Model ●
Farole & Akinci (2011); Zeng (2015); World Bank (2008)	Lundvall (1992); Foray (2015); OECD (2013)	Frosch & Gallopoulos (1989); Graedel & Allenby (1995); Cote (1997); Korhonen (2001)

Innovation Policy Approaches

Drawing on the extensive global research and literature reviewed, eight place-based innovation policy models were identified and analysed. This list does not include all existing models and theoretical approaches, and is curated to reflect project scope, Australian context, and relevance to net zero industries.

● Industrial policy ● Innovation policy

Mission-Oriented Innovation Policy (MOIP) ●	Triple Helix Model for Innovation ●	Regional Innovation Systems (RIS) ●
Mazzucato (2018;2021), Foray, Mowery & Nelson (2012)	Etzkowitz & Leydesdorff (1995; 2000)	Freeman (1987), Lundvall (1992), Nelson (1993), Fagerberg et al. (2005)
Mission-Oriented Innovation Ecosystems ●	Anchor-Based Clustering ●●	Phased Urban Integration ●
Rodrik 2004; Mazzucato (2018;2021); Howard (2025); OECD (2025)	Audretsch & Feldman 1996); Porter (1998); Howard (2025); OECD (2025)	Howard (2025); OECD (2025)
Global Institute on Innovation Districts (GIID) framework ●	Quadruple Helix & Quintuple Helix Model ●	
Wagner, Katz & Biancuzzo (2024)	Carayannis & Campbell (2009;2010)	

International Case Studies of place-based policy and approaches

Case study selection was guided by a set of key criteria, including global coverage, relevance to the Australian context, a diverse range of place-based approaches and policy settings, and variation across industrial and innovation focus. The selected case studies have been included for differing but complementary reasons; some are of interest for the policy models they employ, others for their demonstrated and quantified outcomes, others for their innovative approaches to delivery, and others for the transferable lessons they offer to the Australian context.

The table below shows the selected case studies and applicable place-based approach.

Place-based policy approach	International Case Study
Mission-Oriented Innovation / Market Creation Industrial Policy	Barrow-in-Furness, United Kingdom
Agency-based Approaches to Place-Based Industrial Strategy	Japan: Ministry of Economy, Trade and Industry (METI) – Hokkaido Prefecture
Green / Just Transition Industrial Policy	Germany: Ruhr Green Transition
Mission-Oriented Innovation Ecosystems	Innovate UK Catapult Centres (Energy, Offshore, High Value Manufacturing)
Cluster-based Industrial Policy	South Korea: Space Industry Cluster
Mission-Oriented Innovation / Market Creation Industrial Policy	Industriklivet – Swedish Green Steel Industrial Policy
Cluster-based Industrial Policy / Agency-based approach	Canada: Place-based industrial policy across dispersed regions
First Nations place-based approach	New Zealand: The Māori Economy
First Nations place-based approach	Canada: Wah-ila-toos Single-Window Broker

Common Attributes and Success Factors of International Case Studies

Key insights from the international case studies of industrial and innovation policy approaches were identified through assessments of:

- policy design
- funding mechanisms
- place-based characteristics

Policy Design

Across the case studies, several common policy design attributes emerge, alongside important differences in emphasis and delivery. While no single model is replicated, the cases illustrate how place-based industrial policy is shaped by local institutional capacity, industrial history, competitive advantages and transition objectives.

Key findings include:

- **Strong coordination mechanisms are a defining feature of successful place-based industrial policy.** Effective implementation is typically anchored by a clearly mandated lead institution with responsibility for aligning priorities, sequencing investment and coordinating across governments and stakeholders.
- **Policy success relies on a coordinated package of interventions rather than a single mechanism.** The strongest examples combine infrastructure investment, funding, workforce development, innovation support, governance arrangements and enabling social infrastructure to address multiple barriers simultaneously.
- **Regional specialisation is used to build on comparative advantages and avoid duplication.** Rather than pursuing identical industries in every location, successful approaches leverage distinct regional strengths and connect complementary regions through broader industry ecosystems and supply chains.
- **Workforce capability and supply chain development are central to long-term competitiveness.** Most case studies focus on strengthening local skills, innovation capacity and domestic supply chains to support strategic industries, increase resilience and capture greater economic value locally.
- **Long-term transition strategies provide direction and investment certainty.** While differing in scope and timeframe, all case studies utilise regional transition plans or strategic frameworks to guide economic transformation, coordinate stakeholders and maintain focus over extended periods of change.

Funding Mechanisms

Across the case studies, governments rely on a mix of funding mechanisms to reduce risk, shape markets and crowd in private capital, with notable differences in how these tools are combined.

Key findings include:

- **Direct grants are the most common funding mechanism across place-based industrial policies.** They are typically used to de-risk early-stage investment, develop enabling infrastructure and build foundational industry capability in emerging sectors.
- **Shared testing, demonstration and commercialisation infrastructure can be as important as direct funding.** Dedicated translational institutions help bridge the gap between research and market deployment by reducing technical, commercial and investment risk for industry.
- **Risk-sharing mechanisms are widely used to mobilise private investment.** Tax incentives, co-funding arrangements, concessional finance and public investment are often combined to crowd in private capital and support large-scale industrial development.

- **Market creation mechanisms provide investment certainty for strategic industries.** Long-term procurement, offtake arrangements, government-backed demand and supportive regulatory settings help create the confidence required for industry investment and expansion.
- **No single funding model is universally successful.** Effective funding approaches are tailored to industry maturity, market readiness and regional circumstances, with the strongest examples combining multiple complementary mechanisms to address specific market failures and transition challenges.

Place-based Characteristics

Across the case studies, no single place-based characteristic is universal. Each approach reflects the specific strengths and limitations of the region, reinforcing that industrial policy cannot override underlying geographic, resource or institutional conditions.

Key findings include:

- **Successful place-based industrial policies build on existing regional strengths and competitive advantages.** Rather than creating entirely new industries, most case studies leverage established capabilities, assets, institutions and industry specialisations as a foundation for growth.
- **Natural and strategic endowments can provide a significant competitive advantage.** Access to resources such as critical minerals, renewable energy, ports, industrial land or strategic infrastructure often shapes the industries that regions are best positioned to develop.
- **Research institutions and universities can play an important enabling role.** Many successful industrial ecosystems are anchored by research, innovation and skills institutions that support technology development, workforce capability and commercialisation pathways.
- **Industrial development is strengthened where complementary capabilities are geographically connected.** Effective approaches link research, manufacturing, infrastructure and supply chain functions across regions to create integrated industry ecosystems.
- **Place-based advantages differ significantly between regions.** The strongest examples align policy interventions with local economic conditions, resource endowments, workforce capabilities and institutional strengths, rather than applying a uniform approach across all locations.

First Nations

Across the First Nations case studies, durable economic participation is shown to depend on institutional design choices that embed Indigenous governance, ownership and delivery within industrial activity. Outcomes are shaped less by individual funding programs and more by how authority, capital and delivery responsibility are structured over time.

Several recurring findings emerge across the First Nations case studies, including:

- **First Nations economic participation is inseparable from place:** In both the Māori economy and Wah-ila-toos, economic activity is anchored in land tenure, community governance and regional context. Policy design responds to the specific characteristics of place, including remoteness, resource access and community scale, rather than applying uniform national approaches.
- **Delivery responsibility:** The case studies show that outcomes are stronger where delivery responsibility sits with Indigenous institutions, supported by government funding and coordination rather than direct state control.
- **Coordination reduces friction, but authority matters:** Multi-level coordination is necessary in both cases, but it is most effective where a clearly mandated coordination function exists (such as Wah-ila-toos) or where strong Indigenous governance institutions perform coordinating roles (as in the Māori economy). Informal or fragmented arrangements increase transaction costs for communities.
- **Public risk sharing enables participation where markets alone will not:** Both case studies demonstrate that Indigenous-led projects can benefit from public risk sharing to proceed, particularly in remote or capital-intensive contexts. Grants, settlement capital, pooled investment vehicles and co-funding arrangements reduce barriers to entry and crowd in private capital over time.
- **Workforce and capability development must run in parallel with investment:** Investment in infrastructure or assets alone is insufficient. Both cases embed capability building, leadership development and workforce pathways alongside capital deployment to support long-term Indigenous control and economic participation.

The case studies show that durable First Nations participation depends on embedding governance, ownership and place-based delivery within the policy system itself, rather than layering engagement onto existing frameworks.

Implementation Considerations

Critical enablers, barriers and implementation risks identified throughout this report demonstrate that the success of place-based industrial and innovation policy depends less on the policy model itself and more on how it is implemented within the context of each region. Across the case studies, transition outcomes were shaped by the interaction between regional assets, institutional capacity, governance arrangements, market conditions and delivery capability, highlighting that no single approach is universally applicable.

The analysis shows that even well-designed and well-funded policies can underperform when implementation does not adequately consider regional readiness, sequencing, governance complexity, enabling infrastructure, workforce capacity and community support. Building on the preceding findings, this section focuses on the critical implementation risks that can constrain delivery and identifies practical options to address these barriers and improve the effectiveness of place-based industrial and innovation policy.

Summary

The international case studies show that place-based industrial and innovation policy can be a powerful tool for regional transition, but only where policy design is matched by strong delivery capability, long-term coordination and realistic sequencing. Across the cases, success is less about adopting a single policy model and more about aligning the right mix of governance, investment, infrastructure, workforce and market-shaping levers to the specific conditions of each region.

Governance and delivery capacity are decisive. Multi-level coordination is a universal feature of successful place-based policy, but it is also a major source of delivery risk. The strongest cases are supported by clearly mandated lead institutions, durable governance arrangements and the capability to coordinate across government, industry and regions over time. Sequencing determines whether transitions accelerate or stall. Industrial growth depends on enabling conditions being in place at the right time, including energy, transport, housing, skills, water, land, approvals and market demand. Each phase of transition needs to create the conditions for the next.

Policy levers need to work as a system. No single intervention is sufficient. The most effective approaches combine infrastructure investment, workforce development, demand signals, concessional finance, grants, regulation, social infrastructure and commercialisation support in a sustained and coordinated way. Place matters and policy must reflect each region's starting point. Growing regions, transitioning industrial regions and regions in structural decline require different policy responses. Effective approaches build from existing industrial capabilities, supply chains, institutions, resources and community conditions rather than attempting to replicate models from other jurisdictions. Government has a critical role in bridging risk and creating markets. Across the case studies, government support was central to crowding in private investment, moving innovation toward commercial deployment, and giving industry confidence to invest in emerging net zero opportunities.

1 Project overview and research framework

Project overview

Overview

The project provides a structured and evidence-based assessment through research and leading international case studies of place-based industrial and innovation policies and approaches. This report examines leading place-based industrial and innovation strategies and analyses the determinants of success for these approaches drawing on real world examples.

The report consolidates research, examines place-based industrial and innovation policy and approaches, identifies the common attributes of policy design, funding mechanisms and place-based characteristics of international industrial and innovation policy approaches. The findings will support future decision-making by NZEA by providing clarity on policy options, implementation pathways and the conditions required for successful delivery.

This final report consolidates the methodology, research findings, international case studies, attributes matrices, implementation analysis, insights, learnings and recommendations for NZEA.

Key Objectives

The objectives of this project are to provide NZEA with:

- A clear understanding of leading place-based industrial and innovation policy approaches, how they operate in practice and that could be further studied to inform the work of the Authority;
- The most influential of the place-based industrial and innovation policy approaches and the advantages and disadvantages of each with an outline of implementation in real world examples;
- Common attributes and core success factors for different policy approaches, including policy design, funding mechanisms and place-based attributes;
- Policy levers and mechanisms used to influence outcomes, including funding, regulation, coordination, governance, delivery models, risk management and capability building;
- Implementation considerations of the policy approaches, and considerations for Australian context;
- A comprehensive research report to support informed, confident policy and investment decision-making.

Methodology

This report provides a summary of the work undertaken in Stage 1 and Stage 2 of the project. This includes:

- Developing a research framework to articulate the key inquiry questions and guide research analysis.
- Undertaking a rapid global scan to identify and assess place-based industrial and innovation policy approaches.
- Assessing the policy approaches against criteria including their potential benefits, key success factors, relevance to the Australian context, and implementation considerations.

- Shortlisting the most relevant policy approaches and identifying international case studies that represent the most relevant and critical considerations for the Australian energy transition.
- Deep dive into nine (9) international case studies, examining the common attributes across policy design, funding mechanisms and place-based attributes.

Research framework

Purpose and scope

This research framework establishes how Urbis critically assessed place-based industrial and innovation policy approaches to support the development of net zero industries across Australia.

Building on the rapid review and inception phase, this framework guides analysis to inform practical policy and decision-making. It recognises that there is no singular model for place-based industrial and innovation policy and instead seeks to interrogate the effectiveness of applying policy approaches to the specific characteristics, capabilities, constraints and competitive advantages of different regions.

The scope of this research framework focuses on:

- Which place-based approaches exist in Australia and internationally, and how they work in practice;
- What conditions are required for place-based industrial and innovation policy approaches to succeed;
- Which approaches or elements are most appropriate for the Australian context;
- What delivery mechanisms, governance models and funding pathways are needed to implement these approaches.

Through the research findings, we aim to:

- Identify a combination of approaches and typologies of place-based approaches to industrial and innovation policy that can determine the strongest strategic fit for each priority region;
- Focus on lessons from real-world case studies that are transferable, rather than headline outcomes alone.

Key areas of inquiry and research questions

Our approach is guided by the following key research questions grouped into six inquiry areas through research, stakeholder consultation, and subsequent analysis.

1. What place based industrial and innovation policy approaches are most relevant to supporting net zero industries in Australia?
2. Which contemporary models exist globally and domestically, and how do they differ in design & delivery?
3. Under what conditions do different place based industrial and innovation approaches succeed or fail?
4. What do real world case studies reveal about their design features, delivery mechanisms, governance, trade-offs and risks?
5. What are the common attributes and core factors for different policy approaches, including policy design, funding mechanisms and place-based attributes?
6. What is required to successfully implement these approaches in Australia? What barriers, enablers, and practical actions must be addressed to ensure effective delivery?

Research methodology

Rapid global scan and shortlisting of industrial and innovation theories and approaches

A targeted rapid global scan to identify and assess place-based industrial and innovation policy approaches has been undertaken. The scan draws on publications from major international institutions, leading research institutes, alongside relevant Australian government strategies and policy guidance, supported by targeted desktop research.

The scan identifies relevant approaches within a clear typology, distinguishing between industrial and innovation-led strategies, broad place-based policy models, and mixed approaches. This provides a robust evidence base to support comparison and shortlisting.

Based on relevance to the Australian policy context, relevance, and strategic alignment, a shortlist of approaches for a deeper assessment was decided. Areas of overlap are explicitly considered, recognising that industrial and innovation approaches are not necessarily mutually exclusive and may be effective when combined.

Development of illustrative case studies

Case studies are selected and developed that have significance and relevance to the Australian context, drawing on real-world examples of how the approach has been implemented in practice, either alone or in combination with others. The case studies focus on demonstrating how the policy mechanism operates, the types of outcomes that can be achieved, and the key design features that underpin delivery.

Each case study, where data is available, highlights the common attributes, critical enablers, barriers, and implementation considerations that influence success, providing practical insight into how different approaches function in real-world settings and informing subsequent applicability to the Australian context.

Key definitions

To ensure clarity and consistency throughout the research, the following definitions seek to provide a clear framework for interpretation and support accurate communication of the research findings.

Place-based approach

Refers to a policy framework in which public policy interventions are designed and implemented with reference to the economic, social, institutional and spatial characteristics of specific regions. A place-based approach seeks to leverage local assets, address place-specific constraints or limitations, and ensure that economic and social benefits are captured within local communities.¹

Innovation policy

Refers to the creation, adaptation and application of knowledge and technology to develop or improve products, services, processes or organisational forms that generate value.

Industrial policy

Refers to deliberate government policies or actions to influence the structure and evolution of economic activity by supporting, coordinating or directing specific industries to drive productivity, innovation and economic growth.²

Industrial place-based policy

A form of place-based policy focused on scaling production, enhancing competitiveness and supporting economic transformation in specific locations.³

In the context of the net zero transition, industrial place-based policy emphasises coordinated action across energy supply, enabling infrastructure, skills development and government support to drive regional job creation, investment and economic outcomes. The application of industrial-place based policy is often referred to in the literature as ‘industrial place-based strategy’ or industrial place-based approach’.

¹ OECD (2025) Place-based policies for the future. OECD Regional Development Studies. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/05/place-based-policies-for-the-future_de4634ab/e5ff6716-en.pdf

² Morrison, K. (n.d.) Industry policy as innovation policy. Submission to the Productivity Commission Inquiry into Public Support for Science and Innovation. Available at: <https://assets.pc.gov.au/inquiries/completed/science/submissions/sub049/sub049.pdf>

³ OECD (2025) Place-based industrial policy – Lessons for place transformation. OECD Policy Paper. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/place-based-industrial-policy_e4bba733/43edc0df-en.pdf

Innovation place-based policy

A form of place-based policy centred on knowledge creation, diffusion, and innovation-led development within defined regions.⁴

It emphasises collaboration and coordination amongst research institutions, firms and investors, with effective networking, coordination and partnerships critical mechanisms strengthening success in innovation-led approaches.⁵ The application of innovation-place based policy is often referred to in the literature as ‘innovation place-based strategy’ or ‘innovation place-based approach’.

Note:

This research acknowledges the conceptual differentiation between industrial policy and innovation policy. However, the scope of this research project is explicitly limited to **industrial place-based policy, innovation place-based policy, and place-based approaches**.

Research framework

The table summarises the research framework for the project, outlining the key research questions, scope and limitations, and potential evidence sources. Establishing this framework is important to ensure the research is targeted and analytically robust, providing a clear structure for the evidence gathering and ensuring the analysis remains focused on answering the core questions required to inform NZEA.

Selection of the long-list of policy approaches

The long-list of place based industrial and innovation policy approaches is informed by a targeted review of academic and policy literature, including peer reviewed articles, case studies and publicly available reports. The review provides a strategic, high-level overview of contemporary policy approaches within leading and comparable economies based on available desktop research. This review was used to develop an initial long list of approaches.

The long list is refined using a set of practical filters to ensure relevance and applicability, including prioritising approaches developed or applied within the past 10 to 15 years, focusing on those with demonstrated real world implementation rather than purely theoretical models, and confirming alignment with industrial and innovation policy contexts. To manage overlap across models with similar underlying frameworks, duplicates or closely related approaches are consolidated. Additional emphasis was placed on widely cited approaches and those with clear relevance to Australian economic and political conditions.

⁴ Howard, J.H. (2025) Beyond buzzwords: An integrated framework for understanding place-based innovation ecosystems. Acton Institute for Policy Research and Innovation, 6 November. Available at: <https://www.actoninstitute.au/post/beyond-buzzwords-an-integrated-framework-for-understanding-place-based-innovation-ecosystems>

⁵ World Economic Forum (2025) Innovation Ecosystems: A Toolkit of Principles and Best Practice. Available at: https://reports.weforum.org/docs/WEF_Innovation_Ecosystems_2025.pdf

Table 1 – Research framework

Key research question	Sub questions	Limitations / Scope	Potential sources
Which place based industrial and innovation policy approaches are most relevant to supporting net zero industries in Australia? Which contemporary models exist globally and domestically, and how do they differ in design & delivery?	- What types of place based industrial and innovation policy approaches exist? - Which models are being used globally to support net zero industries? - What comparable approaches exist in Australia? - How do models differ in their objectives, scale, sector focus, governance and delivery?	- Focus on contemporary policy approaches from the past 10 to 15 years. - Global scan prioritises leading and comparable economies, alongside Australian examples. - Insights are drawn from publicly available documentation and supplemented with stakeholder engagement where relevant.	- Desktop research - Literature review (refer to appendix bibliography for details)
Under what conditions do different place based industrial and innovation approaches succeed or fail? What do real world case studies reveal about their design features, delivery mechanisms, governance, trade-offs and risks?	- What enabling conditions support successful innovation vs industrial place based initiatives? - What design features and delivery mechanisms are associated with strong outcomes? - How do governance arrangements shape implementation? - What trade-offs, risks or unintended consequences have emerged?	- Case studies selected to represent a similar sectors and geographies. - Insights are drawn from publicly available documentation and supplemented with stakeholder engagement where relevant. - Depth of analysis may be constrained by data availability.	- Desktop research - Literature review (refer appendix bibliography for details) - Case studies

Key research question	Sub questions	Limitations / Scope	Potential sources
Which industrial and innovation approaches, or elements of these approaches, represent opportunities to stimulate innovation and enable investment?	- What models are most likely to attract investment and industry participation? - Which approaches best support innovation, commercialisation and industry scale up?	- Insights are drawn from publicly available documentation and supplemented with stakeholder engagement where relevant. - Depth of analysis may be constrained by data availability. - Recommendations are indicative and strategic and do not constitute investment or feasibility assessments.	- Desktop research - Literature review (refer to appendix bibliography for details) - Case studies
What is required to successfully implement these approaches? What barriers, enablers, and practical actions must be addressed to ensure effective delivery?	- What institutional, governance, funding, and capability conditions are required to successfully implement place-based industrial and innovation policy approaches? - What practical actions could address these gaps and enable effective implementation?	- Limited to high level implementation considerations. Detailed implementation planning is outside scope. - Insights are drawn from publicly available documentation and supplemented with stakeholder engagement where relevant.	- Literature review (refer to appendix bibliography for details) - Stakeholder engagement - Case studies

2 Global scan of place- based policy and approaches

Global scan of place-based policy and approaches

Introduction and methodology

This section presents the findings of a targeted global scan of contemporary place-based industrial and innovation policy approaches. It brings together insights from leading international institutions, research bodies, and relevant Australian strategies and policy guidance. Details on the reviewed sources are provided in the appendix bibliography of this report.

The chapter establishes a clear typology of approaches, distinguishing between industrial and innovation place-based strategies, broader place-based models, and specific delivery mechanisms. This provides a structured basis for comparing how different models vary in their objectives, scale, sector focus, governance, and design, and establishes a consistent framework for assessment.

Building on the global scan, an initial long-list of approaches is identified and assessed against relevance to net zero transition pathways, strength of evidence and maturity, transferability to the Australian context, ability to operate at meaningful scale, and overall delivery complexity and time to impact.

This assessment provides a shortlist of policy approaches for further consideration. In doing so, the section recognises areas of overlap across approaches, noting that industrial and innovation policy settings can deliver enhanced economic, productivity and social benefits when combined.⁶ The relevant success elements of the industrial and innovation approaches are identified, which provide key insights for the next stages of this research project.

Research questions answered

- What types of place-based industrial and innovation policy approaches exist?
- Which models are being used globally to support net zero industries?
- What comparable approaches exist in Australia?
- How do models differ in their objectives, scale, sector focus, role of government, governance and delivery?
- What enabling conditions support successful innovation vs industrial place-based initiatives?
- What design features and delivery mechanisms are associated with strong outcomes?
- How do governance arrangements shape implementation?
- What trade-offs, risks or unintended consequences have emerged?

⁶ Morrison (2007) Submission to Productivity Commission Study of Public Support for Science and Innovation in Australia – Industry Policy as Innovation Policy. *Productivity Commission*. [online] Available at: <https://assets.pc.gov.au/inquiries/completed/science/submissions/sub049/sub049.pdf>.

Understanding place-based approaches in the transition to a net zero economy

Place-based policy and approaches aim to align national sectoral priorities with the local capabilities and assets of a specific place

Place-based policies are intentionally spatially-targeted to provide support to a place to improve long-term economic development, social, environmental and security objectives, and well-being outcomes. Place-based policies operate with the understanding that social and economic disparities are often shaped by geographic factors such as availability of local resources, connectivity and environmental constraints.⁷

Effective place-based policies aim to efficiently address market failures and are place-sensitive to local conditions, opportunities and integrated cross-sectoral policy action. Different regions will have varying strengths, weaknesses, capabilities, infrastructure, assets and needs, and a place-based approach aims to harness and address these with a tailored solution. Many fields of policymaking have observed that by accounting for these unique contextual factors, a policy is both more likely to work and more likely to deliver a stronger result.

Place-based policies often target dual goals of efficiency and equity.⁸ This approach is typically applied in contexts where a tailored, region-specific intervention can deliver enhanced outcomes at lower cost, particularly in areas facing challenges in maintaining economic competitiveness or achieving outcomes comparable to broader societal benchmarks. While place-based policies often have an economic efficiency rationale, they can also be undertaken for non-economic reasons, including political, social, environmental or security objectives.⁹

Interventions using a place-based approach vary according to the unique context they are being designed for and involve making decisions based on the specific place characteristics. Policy levers such as subsidies, infrastructure, planning controls and investment attraction are used to direct public and private investment towards activities that will complement an area's strengths.

⁷ Organisation for Economic Co-operation and Development (OECD) 2025, Place-based policies for the future, OECD Regional Development Studies, OECD Publishing, Paris, available at: <https://doi.org/10.1787/e5ff6716-en>

⁸ Feigenbaum, P.D. and Gaubert, C. (2025) "Place-Based Policies: Lessons from Theory." National Bureau of Economic Research (Working Paper Series). Available at: <https://doi.org/10.3386/w33517>.

⁹ Organisation for Economic Co-operation and Development (OECD) 2025, Place-based policies for the future, OECD Regional Development Studies, OECD Publishing, Paris, available at: <https://doi.org/10.1787/e5ff6716-en>

Table 2 provides an overview of how place-based policy is defined and classified within the literature.¹⁰ The adoption or development of a place-based policy approach requires consideration of these defining criteria.

Table 2 Summary of key place-based criteria

Intentionally spatially targeted	Targets efficiency or equity
Support from government	Focuses on lagging places or places at risk
Understands local context and conditions	Employs multi-level governance
Enhances productivity, inclusion and/or sustainability	Leverages local assets, knowledge and networks
Aims to improve economic or wellbeing outcomes	

Place-based approaches are well aligned for the net zero transition

Historically, Australia's energy industry has been highly localised, with development distributed according to the availability of key inputs such as coal or gas deposits. This co-location has historically supported highly efficient production and healthy local economies, but leaves regions vulnerable to disruption as fossil fuels are phased out and replaced by renewable alternatives. Accordingly, these areas and regions have both a significant need for support and a highly concentrated, specialised mix of businesses, skills, and infrastructure, making them well suited for place-based policy approaches.

Research by Climateworks highlights that decarbonisation can be accelerated through coordinated, place-based interventions that integrate energy systems, industry and supply chains, rather than treating sectors in isolation. This approach enables shared infrastructure, reduces transition costs, and supports more efficient investment, while also facilitating workforce transition and regional economic diversification. Importantly, place-based models allow national net zero objectives to be translated into locally and regionally tailored strategies, aligning policy, industry and community outcomes within specific regions.

However the distribution of renewable energy resources, network capacity, land use constraints, workforce availability, critical minerals and resource availability, and community impacts are not uniform across Australia's regions, creating differentiated economic opportunities and challenges that require tailored, place-specific transition strategies.

Therefore, these place-based interventions require coordinated planning across land use, infrastructure, and industry policy, alongside locally tailored transition pathways that reflect each region's asset base and economic role. Importantly, this approach enables governments to sequence investment and prioritise high-impact locations, while also supporting regional economic transition and workforce adjustment in communities most affected by structural change.¹¹

¹⁰ Ibid.

¹¹ Ibid.

Figure 1 – Overview of place-based policy to support net zero transition



Source: Urbis, adapted from OECD 2025.

Understanding place-based industrial policy approaches

Place-based industrial policy focuses on scaling production and competitiveness in priority sectors

Place-based industrial policy's primary objective is to scale production and employment in priority industries to drive economic growth. These approaches focus on the deployment and scale up of proven technologies and industries, rather than early-stage innovation and discovery.¹²

Place-based industrial policy can be characterised as having three key aims¹³:

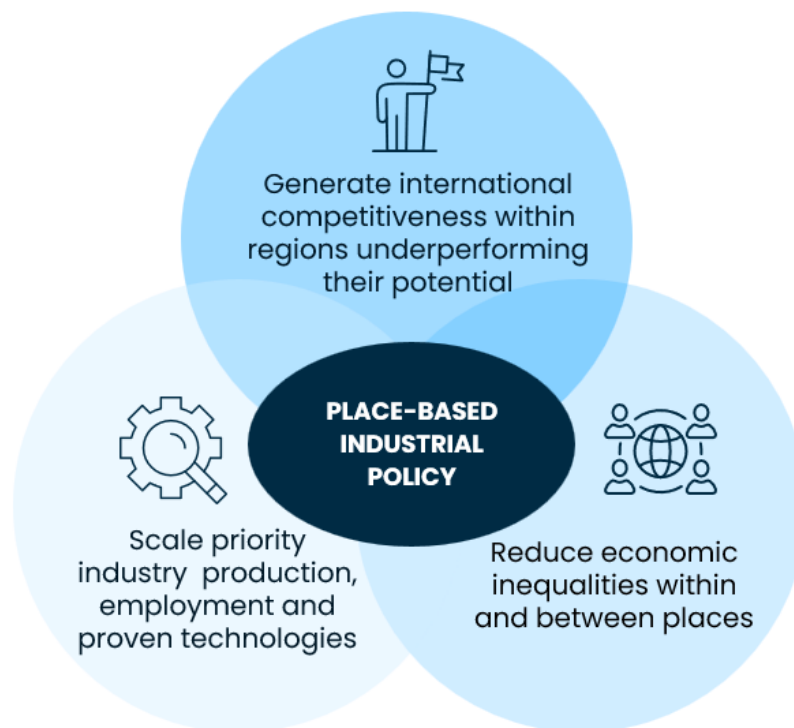
- Generating international competitiveness in a region that is underperforming its potential;
- Decreasing inequality of economic outcomes between places;
- Decreasing inequality of economic outcomes within places.

In the context of the net zero transition, place-based industrial policy centres on developers, energy infrastructure providers, and government working together within specific regions to drive job creation, build local supply chains, and support the energy transition.

Figure 2 shows the interrelationship of the place's characteristics, key objectives, and key outcomes of a place-based industrial policy model.

Figure 2 – Place-based industrial policy

Source: Urbis, adapted from OECD 2025.



¹² OECD (2025) Place-based policies for the future. OECD Regional Development Studies. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/05/place-based-policies-for-the-future_de4634ab/e5ff6716-en.pdf

¹³ Productivity Institute UK. (2025) Delivering successful place-based industrial policy. Productivity Insights Paper No. 056, July. The Productivity Institute. Available at: <https://www.productivity.ac.uk/wp-content/uploads/2025/07/PIP056-Place-based-industrial-policy-25-July-2025.pdf>

Strategic locations and coordinated industry ecosystems enable industrial scale-up

‘Place’ in this context is defined as a strategic location optimised for targeted industrial activity, with a focus on enabling transformational economic outcomes.¹⁴ The approaches target defined geographic areas based on local capabilities, competitive advantages, and industry opportunities. These locations are typically selected based on factors such as resource endowments, infrastructure access, and proximity to markets.

Key actors in these approaches include established firms, manufacturers, anchor employers, suppliers, regional development agencies and government. Coordination across these stakeholders is critical to enabling efficient production, supply chain development and industry growth, including the development of integrated supply chains and access to domestic and export markets.

Industrial approaches prioritise proven sectors with a focus on scale and low risk

Place-based industrial approaches play a central role in driving industry expansion and economic development by supporting the scale up of proven sectors and technologies.¹⁵ As a result, the overall risk profile is comparatively lower, with a focus on commercially viable industries and scalable activity.¹⁶ However, effectiveness of these approaches is heavily dependent on mitigating risks related to inequitable distribution of benefits and aligning industry goals with community interests rather than narrow, elite-driven agendas.¹⁷

Success is typically measured through job creation (e.g. jobs by industry), output growth of priority sectors (measuring through a composition of output shift), investment attraction (through measuring major project pipeline value), and improvements in sector competitiveness, including export growth, increased value chain depth, and broader regional economic development.¹⁸

¹⁴ OECD (2025) Place-based industrial policy – Lessons for place transformation. OECD Policy Paper. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/place-based-industrial-policy_e4bba733/43edc0df-en.pdf

¹⁵ OECD (2025) Place-based industrial policy – Lessons for place transformation. OECD Policy Paper. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/place-based-industrial-policy_e4bba733/43edc0df-en.pdf

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

Government can enable industry development through coordinated policy levers and system-wide governance

Government's role in place-based industrial approaches is typically to enable, coordinate, and invest in the conditions that support industry development. Place-based industrial policy requires a double act between national and the state, territory or local institutions, particularly to balance their respective priorities.¹⁹

Policy levers available to government to influence industrial outcomes include:

- Infrastructure investment (e.g. transport, energy, water, digital) and access to enabling and / or common user infrastructure);
- Land use planning, zoning and approval pathways;
- Production tax incentives and direct industry support;
- Broader business incentives (e.g. grants, concessional finance);
- National renewable energy and ESG targets;
- Talent and skills development (including migration settings);
- Research, development and commercialisation support (e.g. Cooperative Research Centres (CRC), innovation hubs, university partnerships); and
- Market creation mechanisms (e.g. government procurement, offtake agreements, demand guarantees).

These levers work to support industry scale up, attract investment, and strengthen industrial talent.

Effectiveness depends on strong industry targeting and delivery

The effectiveness of place-based industrial policy depends on strong targeting of industry, institutional capacity, and long-term coordination and policy certainty. These approaches are most suitable where there is a clear rationale for intervention, such as market failures, structural economic challenges, or regions with distinct industrial strengths and untapped potential. They are less effective in contexts where private markets can operate efficiently without intervention, or where environments are prone to corruption or rent-seeking behaviour.

Effective design also requires meaningful local stakeholder engagement and co-design, alongside a balanced approach to supporting existing industries while attracting new investment.²⁰ Delivery is enabled by strong multi-level governance, coordinated implementation, and long-term policy certainty, supported by access to investment, enabling infrastructure, and workforce and skills development.

Table 3 outlines key considerations for designing and implementing place-based industrial policy, highlighting the critical factors that help to ensure policies are effective, practical, and tailored to local conditions while supporting long-term economic growth and regional outcomes.

¹⁹ Ibid.

²⁰ Brookings Institution (2020) Foundations of regional economic transformation. Washington, DC: Brookings Institution.

Table 3 – Summary of implementation and design considerations for place-based industrial policy

Implementation and design considerations	Why this is important
Alignment with regional capabilities, infrastructure, and existing strengths	Grounding policy in a region's existing industry base, workforce, infrastructure, and natural assets enables more targeted and feasible investment. This ensures interventions build on comparative advantage rather than attempting to create capabilities from scratch and helps to leverage agglomeration benefits.
Alignment with complementary place-based regional policies	Coordinating with existing regional strategies and policy settings strengthens overall impact and avoids fragmentation. This enables a more coherent approach to improving regional competitiveness through aligned priorities and interventions.
Integrate national objectives with regional and local priorities	Effective place based industrial policy connects national strategic objectives with local strengths and opportunities. This avoids purely top-down approaches and instead directs investment to locations best positioned to deliver on shared priorities.
Local stakeholder ownership and co design	Engaging local stakeholders in the design and delivery of initiatives supports stronger uptake, legitimacy, and long-term sustainability. This includes leveraging local institutions and delivery partners as active drivers of change.
Strong industry–research linkages and innovation systems	Ensuring strong linkages between research, industry and broader innovation ecosystems helps support knowledge transfer, commercialisation and productivity growth, and help ecosystems move up the value chain.
Long term policy commitment and certainty	Sustained policy commitment, stable funding and long-term certainty are critical to enabling investment and industry development. This helps build investor confidence, support long lead time projects, and avoid disruption from short term policy changes.
Strong governance, coordination, and delivery capability	Effective governance arrangements are required to coordinate across federal, state, and local governments, while aligning industry, investors, and regional stakeholders.
Balance between supporting existing industries and attracting new investment	A balanced approach supports the growth and transition of existing firms while also attracting new investment. This helps manage displacement risks and avoids creating uneven outcomes across the local economy.

Sources: OECD (2025), Place-based industrial policy: Lessons for place transformation, SGS Economics (2023), Productivity Institute UK (2025), European Union (2017) Smart Specialisation Strategy S3 guidance

Risks primarily arise from poor design and delivery

Key risks relating to place-based industrial policy stem from poor targeting and implementation, including funding non-additional activity, favouring incumbent firms, and crowding out private investment. One key challenge is determining what sector to prioritise, alongside understanding a places' readiness.

In Australia, there is a real risk that domestic competition in the absence of a nationally coordinated industry policy undermines abilities to compete globally, with each state seeking to build a competitive advantage in priority sectors.^{20F²¹}

If not effectively managed, these challenges can limit broader economic and community benefits, contribute to uneven regional development, and undermine long-term political and public support for place-based industrial policy.

²¹ SGS Economics and Planning (2023), Australia needs a new spatial industry strategy, SGS Economics and Planning, Canberra. Available at:

https://sgs-assets.spicyweb.net.au/main/SGS-Economics-and-Planning_Australia-needs-a-new-spatial-industry-strategy.pdf

Table 4 – Summary of risks relating to place-based industrial policy

Risk	Description
Misalignment with local needs	Misalignment with local needs can reduce community engagement and undermine policy effectiveness and support
Overestimate a places' readiness and sector capabilities	Misjudging a region's readiness and sector capabilities can result in poorly targeted investment, limiting industry development and reducing overall policy effectiveness
Perceived favouritism in resource allocation	Concentration of resources in specific locations can create perceptions of favouritism, leading to political, industry, and community tension
Exposure to global market volatility	Shifts in global demand, commodity prices and cost structures can undermine the viability of targeted industries, particularly in export-oriented sectors, which can lead to failed investments
Underestimation of support requirements	The level of policy, infrastructure and financial support required to establish competitive industries may be underestimated, leading to under-delivered outcomes or the need for sustained and escalating public investment
Technology and sector misallocation risk	Public investment may be directed toward sectors, technologies or projects that are not commercially viable or globally competitive without ongoing subsidy, resulting in inefficient allocation of resources and limited long-term industry sustainability
Changing government priorities	Changing government priorities, funding or policy settings can disrupt long-term industry development, reduce investor confidence and undermine delivery of place-based initiatives
Insufficient or poorly timed enabling infrastructure	Insufficient or poorly timed enabling infrastructure (e.g. energy, water, transport) can delay or prevent relevant industry transition despite strong policy intent
Capture by incumbent firms	Benefits may be captured by incumbent firms, limiting participation from smaller businesses and reducing broader community outcomes
Uneven regional development	Investment concentrated in priority areas may drive growth in some regions at the expense of others
Regional job displacement	Industry transition may lead to job losses in some regions, contributing to regional inequality if not managed effectively

Sources: Productivity Institute UK (2025) Delivering successful place-based industrial policy, OECD (2025) Place-based industrial policy – Lessons for place transformation, Gill, J. (2023) Sectoral, systemic and spatial: Rethinking Australia's approach to national industry policy – SGS Economics & Planning.

Place-based industrial policy models

Drawing on the extensive global research and literature reviewed, nine place-based industrial policy models have been identified. This long-list does not include all existing models and theoretical approaches, but rather the most relevant to this research project's core themes. This list has been curated to reflect the project scope, Australian context, and relevance to net zero industries.

- Industrial policy
- Innovation policy

Mission-Oriented / Market Creation Industrial Policy ●	Strategic Targeting Model ●	Green / Just Transition Industrial Policy ●
Mazzucato (2018;2021), Rodrik (2004;2008)	Rodrik (2004;2007), Aghion et al. (2015)	Newell & Mulvaney (2013), OECD (2020)
Government sets clear missions (e.g. net zero), directs investment and policy toward achieving them, and actively creates new markets through coordination, funding and demand signals. This typically involves aligning regulation, funding and procurement to accelerate priority industries and reduce risk for private investment.	Government prioritises a limited number of sectors based on comparative advantage and growth potential, focusing support to drive scale, productivity and spillovers. Support is concentrated through incentives, infrastructure and policy settings to help selected industries grow and compete internationally. Strong public-private collaboration and agglomeration as key enablers.	Targets decarbonisation while ensuring economic and social outcomes (e.g. jobs, equity), often combining climate policy with regional transition support. This combines investment in clean industries with workforce transition programs and targeted support for affected regions and communities.

Agency-based Approaches to Place-Based Industrial Strategy ●	Embedded Autonomy / Network Governance ●●	Cluster-based Industrial Policy ●●
Beer et al.(2021)	Evans (1995), Rodrik (2014)	Porter (1990;1998)
Relies on strong regional institutions or development agencies to lead, coordinate and deliver industrial development locally. Delivery is led by dedicated agencies that coordinate planning, attract investment and manage projects aligned to regional priorities.	Focuses on strong but balanced relationships between government and industry, where government is connected enough to understand markets but independent enough to avoid capture. This is achieved through structured engagement with industry alongside clear governance and decision-making independence.	Supports geographically concentrated industries by building on existing strengths, networks and supply chains to drive productivity and innovation. This focuses on strengthening local supply chains, supporting collaboration between firms and investing in shared infrastructure within key locations.

Special Economic Zones ●●	Smart Specialisation Strategy (S3) ●●	Industrial Ecosystem Model ●
Farole & Akinci (2011); Zeng (2015); World Bank (2008)	Lundvall (1992); Foray (2015); OECD (2013)	Frosch & Gallopoulos (1989); Graedel & Allenby (1995); Cote (1997); Korhonen (2001)
Designated areas offering regulatory flexibility, infrastructure and incentives to attract investment and enable industry clustering. These zones typically provide serviced land, streamlined approvals and financial incentives to attract industry.	Regions identify and prioritise industries based on local strengths through collaboration between industry, research and government, with a strong focus on innovation. Priorities are set through structured engagement, with funding and R&D support directed toward agreed focus areas.	Takes a whole-system view of industry, supporting connections between firms, institutions and supply chains rather than individual projects or sectors. This involves coordinated investment in shared infrastructure, targeted support across the value chain, and programs that link businesses with research, skills and funding.

What are the key success factors in place-based industrial policy approaches?

The key success factors observed across the long-list of place-based industrial policy models is outlined in Table 5, distilling what consistently drives effective design and delivery. While individual approaches vary in focus and context, common patterns emerge around the importance of strategic clarity, place-based targeting, coordinated governance, and system-level integration. Together, these factors provide a practical framework for designing and assessing place-based industrial policies, highlighting the conditions required to translate policy intent into sustained economic, social, and innovation outcomes.

Table 5 Success factors for place-based industrial policy approaches

Success factors	What this means in practice
Clear strategy with aligned policy and investment	Set a focused strategic direction with clear priorities, and align funding, regulation, and procurement to reinforce delivery and crowd in private investment.
Place-based targeting grounded in regional strengths	Prioritise sectors and interventions based on local capabilities, assets, and comparative advantage rather than applying uniform national approaches.
Effective governance and delivery capability	Combine strong multi-level coordination with empowered regional institutions that have the authority, capability, and leadership to deliver.
Integrated system design and coordination	Align policy levers across infrastructure, skills, innovation, and industry to operate as a coherent system rather than fragmented initiatives.
Public-private collaboration and network density	Enable deep, structured collaboration across government, industry, research, and communities to support alignment, trust, and collective action.
Clustering enabled by anchor assets and shared infrastructure	Leverage anchor institutions and firms, alongside investment in shared infrastructure, to drive agglomeration, spillovers, and ecosystem growth.
Workforce development and just transition pathways	Align skills, retraining, and employment pathways with industry needs, ensuring inclusive outcomes, particularly in transitioning regions.
Adaptive, phased delivery with continuous learning	Adopt staged and flexible delivery models supported by strong data, monitoring, and feedback loops to enable iteration and long-term impact.

What hinders the success of place-based industrial policy approaches?

Table 6 synthesises the common failure points observed across the long-list of place-based industrial policy models, capturing the recurring factors that can constrain impact or lead to underperformance. Across different approaches, failure is most often associated with gaps in institutional capability, weak alignment between policy intent and on-the-ground delivery, and insufficient grounding in economic and place-specific realities.

Table 6 Hindrances and failure points for place-based industrial policy approaches

Common Hindrances and failure points	What to watch out for
Weak governance, capability and coordination	Limited delivery capability at regional level, fragmented institutions, or poor coordination across agencies and jurisdictions undermining implementation.
Misalignment between strategy and delivery	Disconnect between national objectives and local execution, or lack of a shared vision among stakeholders leading to incoherent or stalled delivery.
Lack of clear economic rationale and place alignment	Interventions not grounded in regional strengths or demand, including artificial clusters or zones that lack a viable economic logic.
Poor policy design distorting markets	Overprotection of incumbents, distorted competition, or poorly designed incentives that attract low-commitment investment and reduce long-term productivity.
Insufficient or poorly structured funding	Inadequate, short-term, or misaligned funding that fails to crowd in private investment or sustain partner engagement.
Weak monitoring, data and learning systems	Limited data capture, evaluation, and feedback loops, reducing the ability to adapt, learn, and remain aligned to objectives over time.
Failure to manage transition and distributional impacts	Delayed transitions, lack of job pathways, poor community engagement, and uneven distribution of benefits across regions or populations.
Coordination and collaboration failures across the ecosystem	Weak networks, misaligned incentives, or poor information flows limiting collaboration, reducing spillovers, and constraining system-wide impact.

Understanding place-based innovation policy approaches

Place-based innovation policy focuses on commercialising knowledge and leveraging local strengths

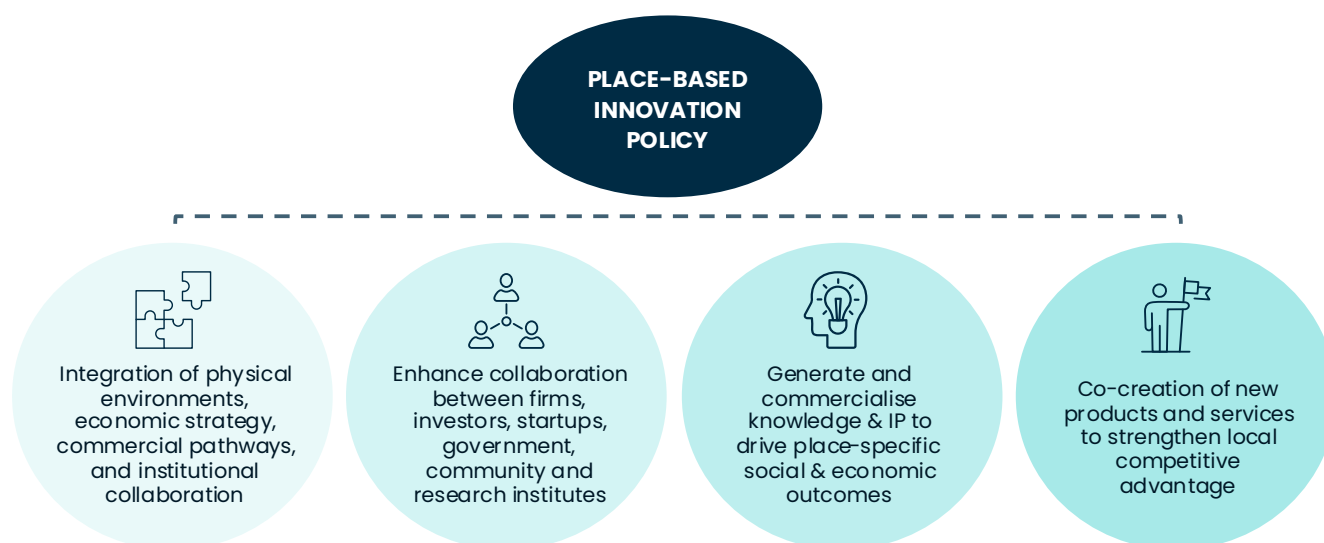
Place-based innovation policy focuses on knowledge creation and diffusion, emphasising collaboration between research institutions, firms, and investors. It is primarily concerned with generating and commercialising new knowledge and intellectual property to drive long-term economic and social outcomes. It represents a shift from economy-wide innovation policy to approaches tailored to the specific strengths and opportunities of places.^{22,23}

Defined geographies and dense ecosystems enable innovation through collaboration

In this context, 'Place' is defined as a location where proximity enables interaction and the production of innovative goods and services. These approaches target defined geographic areas based on local capabilities, competitive advantages, and emerging opportunities.²⁴

Central to place-based innovation policy is the connection between key actors, including universities, research institutions, startups, investors, firms, and government, with effective networking, coordination, and partnerships critical to success. These actors collectively form innovation ecosystems, which help to co-create new technologies, products, and services, and where the density and diversity of interactions drive knowledge transfer and innovation outcomes.²⁵

Figure 3 – Place-based innovation policy



Source: Urbis

²² OECD (2025) Place-based policies for the future. OECD Regional Development Studies. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/05/place-based-policies-for-the-future_de4634ab/e5ff6716-en.pdf, Grillitsch, M. (2018) 'Place-based innovation policy for industrial diversification in regions', Planning Studies, doi:10.1080/09654313.2018.1484892. Available at: <https://www.tandfonline.com/doi/pdf/10.1080/09654313.2018.1484892>

²³ Productivity Commission (2017) An overview of innovation policy. Shifting the Dial: 5 year Productivity Review, Supporting Paper No. 12. Canberra: Productivity Commission. Available at: <https://assets.pc.gov.au/inquiries/completed/productivity-review/report/productivity-review-supporting12.pdf>

²⁴ Ibid.

²⁵ Howard, J.H. (2025) Behind the buzz: How innovation ecosystems deliver value and how to measure it. Acton Institute for Policy Research and Innovation, 22 May. Available at: <https://www.actoninstitute.au/post/behind-the-buzz-how-innovation-ecosystems-deliver-value-and-how-to-measure-it#:~:text=From%20Concept%20to%20Consequence%20What,research%20by%20Autio%20et%20al>

Innovation activity is measured through a system of inputs, activities, and outcomes

Innovation activity is not measured through a single metric. Instead, it is assessed through a suite of indicators spanning inputs, activities, and outcomes, with particular emphasis on business innovation, IP and job creation, collaboration and network strength, number of startups, and investment flows.²⁶

Government plays an enabling role through coordinated policy levers and system-wide governance

Government's role in place-based innovation approaches is to enable, coordinate, and invest in the conditions that support innovation. Policy levers available to government to influence innovation outcomes include:

- investing in shared research infrastructure and facilities;
- directly funding research and commercialisation activities;
- building talent and skills;
- facilitating industry–research linkages;
- urban planning and place-based policies;
- reducing red-tape and providing tax incentives;
- coordinating ecosystem governance;
- supporting technology transfer (e.g. incubators and accelerators);
- providing access to capital (e.g. concessional loans); and
- designing procurement and demand side policies.

These levers are most effective when deployed in combination to strengthen local innovation ecosystems.²⁷ Realising this requires strong governance, with alignment across portfolios and coordination across all levels of Government to support innovation, industry, and regional development outcomes.

Effectiveness depends on strong industry targeting and delivery

Innovation ecosystems thrive through intentional integration of physical spaces, economic strategies, commercial outcomes, and institutional collaboration. Successful place-based innovation policy models combine local competitive advantage, strong talent and culture, enabling infrastructure, and dense collaboration networks, underpinned by place-based specialisation and integration with the broader ecosystem.²⁸

Effective governance and mobilisation of relevant actors, all working towards a shared vision with key roles and responsibilities.

²⁶ Ibid

²⁷ Department of Industry, Science and Resources (2020) Driving effective Government investment in innovation, science and research: Appendices. Department of Industry, Science and Resources. Available at: https://www.industry.gov.au/sites/default/files/2022-06/iga_driving_effective_government_innovation_innovation_science_and_research_appendices.pdf, World Economic Forum (2025) Innovation Ecosystems: A Toolkit of Principles and Best Practice. Available at: https://reports.weforum.org/docs/WEF_Innovation_Ecosystems_2025.pdf

²⁸ Bajada et al., 2022, Enablers of successful innovation precincts, Regional Studies, Regional Science. Available at: <https://opus.lib.uts.edu.au/bitstream/10453/165349/2/Enablers%20of%20successful%20innovation%20precincts.pdf>

Table 7 – Summary of Implementation and design considerations for place-based innovation policy approaches

Implementation and design considerations	Why this is important
Design for integrated ecosystems, not isolated interventions	Innovation outcomes rely on the integration of physical environments, economic strategy, commercial pathways, and institutional collaboration. Policy should be designed as a coordinated system, ensuring initiatives reinforce one another rather than operate in silos.
Position anchor institutions as commercial engines	Support universities and research organisations to actively translate research into market-ready products and services through industry partnerships, spinouts, and applied research, strengthening their role as attractors of talent and investment. This helps ensure innovation generates economic and industry outcomes, not just research outcomes.
Prioritise integrated place design over standalone infrastructure	Focus on creating mixed-use, walkable innovation precincts with strong digital infrastructure, serviced land, and active programming that enable collaboration, knowledge exchange, rather than delivering isolated physical assets.
Enable platform governance and system orchestration	Establish and support intermediary organisations that act as neutral convenors, coordinating stakeholders, aligning incentives, and facilitating collaboration across sectors.
Commit to long-term, staged investment and policy continuity	Provide sustained public commitment through phased investment and stable policy settings that extend beyond electoral cycles, enabling ecosystems to grow and mature over time while crowding in private investment.
Embed global connectivity from the outset	Design policies that enable international research collaboration, attract global talent, and create export pathways, positioning the ecosystem as part of global innovation networks.
Champion inclusion and a shared vision	Develop a shared narrative for the ecosystem that aligns diverse stakeholders around a common purpose and vision. This includes developing explicit goals for social and economic inclusion to ensure that benefits are broadly distributed, building the public support required for long-term success.

Sources: Adapted from Howard, J (2025), Acton Institute for Policy Research and Innovation, Bajada (2022), Wagner et al (2017)

Innovation-led approaches support structural transformation but require tolerance for risk and experimentation

These approaches play an important role in supporting structural economic transformation by translating research and innovation into new industries, particularly in emerging sectors such as net zero and advanced manufacturing. As a result, the overall risk profile is higher, with experimentation and failure accepted as part of the innovation process. This reflects the experimental nature of innovation, where testing novel ideas and accepting failure enables learning, iteration, and the refinement of technologies and business models over time.

Additional risks relating to place-based innovation policy stem primarily from weak ecosystem connectivity and fragmented governance. If not addressed, these challenges can limit innovation impact, reduce participation, limit outcomes and reinforce regional disparities, undermining long-term economic success.

Table 8 – Summary of risks relating to place-based innovation policy

Risk	Description
Weak ecosystem connectivity	Poor coordination between universities, firms, investors, and government can limit knowledge transfer, collaboration, and commercialisation
Concentration of innovation in leading regions	Innovation activity may concentrate in already strong regions, reinforcing spatial inequalities and limiting broader diffusion of benefits
Limited commercialisation outcomes	Investment in research and early-stage innovation may not translate into scalable businesses, jobs, or productivity gains resulting in failed investments
Underestimation of support requirements	The level of policy, infrastructure, sequencing and financial support required to establish innovation activities may be underestimated, leading to under-delivered outcomes or the need for sustained and escalating public investment
Lack of global connectivity and market access	Limited global connectivity and weak access to international markets may reduce the innovation ecosystem ability to attract investment, scale firms, and integrate into global value chains.
Poor industry targeting	Efforts are spread too broadly or directed towards sectors without a clear competitive advantage, resulting in duplication with other innovation ecosystems and reduced industry engagement
Exclusion of smaller firms and startups	Barriers to access (e.g. funding, networks, capability) can limit participation from startups and SMEs, reducing overall ecosystem dynamism
Fragmented governance and policy silos	Lack of coordination across portfolios and levels of government can weaken delivery, create duplication, and reduce overall policy effectiveness
Policy failure due to uncertainty and higher failure rate	Innovation is inherently uncertain and non-linear, making outcomes difficult to predict and increasing the likelihood of failed investments

Sources: OECD (2020) Broad-based innovation policy for all regions and cities, Muro, M. et al. (2025) Foundations of regional economic transformation, Brookings Institution (2026).

Place-based innovation policy models

Drawing on the extensive global research and literature reviewed, eight place-based innovation policy models have been identified. This long-list does not include all existing models and theoretical approaches. This list has been curated to reflect the project scope, Australian context, and relevance to net zero industries. This page provides a high-level snapshot with Chapter 5 delving into additional details for each policy model.

● Industrial policy ● Innovation policy

Mission-Oriented Innovation Policy (MOIP) ●	Triple Helix Model for Innovation ●	Regional Innovation Systems (RIS) ●
Mazzucato (2018;2021), Foray, Mowery & Nelson (2012)	Etzkowitz & Leydesdorff (1995; 2000)	Freeman (1987), Lundvall (1992), Nelson (1993), Fagerberg et al. (2005)
A framework in which governments set clear, time-bound societal missions (e.g. net zero emissions) and actively align innovation, industrial, regulatory, and investment policies to achieve them.	Innovation is driven by collaboration between government, industry and universities. This model focuses on building partnerships, joint research initiatives and knowledge sharing to support innovation and regional growth.	A systemic framework focused on institutional coordination across innovation, education and skills, investment and regulation (within a region) to align institutions to national and regional policy objectives (e.g. net zero transition).

Mission-Oriented Innovation Ecosystems ●	Anchor-Based Clustering ●●	Phased Urban Integration ●
Rodrik 2004; Mazzucato (2018;2021); Howard (2025); OECD (2025)	Audretsch & Feldman 1996); Porter (1998); Howard (2025); OECD (2025)	Howard (2025); OECD (2025)
Aligns funding, institutes and industry around defined public purpose, or priority areas (e.g. net zero, advanced manufacturing) to scale research, development and commercialisation. The Australian Government's 2026 Strategic Examination of Research and Development recommends this approach. ²⁹	Builds around existing institutional or corporate anchors, such as major universities, hospitals, or globally significant firms to attract talent, investment and suppliers. This technically is a subset of RIS and focuses on supporting the growth of surrounding industries through collaboration.	Involves the staged development of innovation precincts over long time horizons using sequenced investment, continuous institutional learning, and policy adaptation to progressively build scale and capabilities.

²⁹ Commonwealth of Australia 2025, Ambitious Australia: Strategic Examination of R&D Final Report December 2025. Available at: <https://www.industry.gov.au/sites/default/files/2026-03/ambitious-australia-strategic-examination-of-research-and-development-final-report.pdf>.

Global Institute on Innovation Districts (GIID) framework ●	Quadruple Helix & Quintuple Helix Model ●
Wagner, Katz & Biancuzzo (2024)	Carayannis & Campbell (2009;2010)
Focuses on dense, mixed-use innovation districts where research, industry and startups co-locate. This approach integrates land use, infrastructure and governance to support collaboration, knowledge exchange and commercialisation in defined areas. It emphasises the integration of economic, spatial, and social assets.	Builds on the Triple Helix Model by including the community, end-users and environmental considerations. This expands innovation beyond institutions to incorporate social needs, user input and sustainability outcomes in policy and project design.

What are the key success factors for place-based innovation policy approaches?

Table 9 synthesises the key success factors observed across the long-list of place-based innovation policy models, distilling what consistently drives effective design and delivery. While these models vary in structure, consistent themes emerge around the importance of clear strategic direction, strong institutional alignment, and the integration of economic, physical, and social assets within specific places. These factors highlight the conditions required to foster dynamic, collaborative innovation ecosystems that translate knowledge into commercial outcomes, while also supporting long-term sustainability, resilience, and regional competitiveness. Section 4 provides additional details relevant for each policy model.

Table 9 Success factors for place-based Innovation policy approaches

Success factors	What this means in practice
Clear missions and strategic focus	Define ambitious, time-bound missions or priority areas with measurable outcomes to guide innovation activity and investment.
Integrated, system-wide coordination	Align policy levers across innovation, industry, infrastructure, and regulation to operate as a coherent system rather than fragmented interventions.
Strong multi-level governance and institutional alignment	Ensure coordination across national, regional, and local levels, supported by capable institutions and clear roles in delivery.
Dense networks and cross-sector collaboration	Enable sustained interaction between government, industry, research institutions, and communities to drive knowledge exchange and innovation.
Anchor institutions and clustering dynamics	Leverage globally competitive institutions and co-location of firms, start-ups, and research to generate agglomeration benefits and spillovers.
Effective research translation and commercialisation	Establish clear pathways to convert research into market outcomes, supported by partnerships with venture capital and industry.
Sustained investment and patient capital	Provide long-term, stable funding, including blended finance and risk-sharing mechanisms, to support innovation over extended time horizons.
Place-based design and asset integration	Integrate economic, physical, and social assets, tailored to local strengths and opportunities. Including providing strong digital infrastructure and serviced land.
Adaptive governance, learning and evaluation	Embed continuous monitoring, evaluation, and iteration, supported by a willingness to adapt and try new approaches.

What hinders the success of place-based innovation policy approaches?

Table 10 synthesises the common failure points observed across the long-list of place-based innovation policy models, capturing the recurring factors that can constrain impact or lead to underperformance. Across different approaches, failure is most often associated with gaps in governance and coordination, weak alignment between strategy and local delivery, or insufficient connection to market demand and commercial pathways. Chapter 4 provides additional details relevant for each policy model.

Table 10 Hindrances and failure points with place-based innovation policy approaches

Common Hindrances and failure points	What to watch out for
Weak governance and institutional fragmentation	Poor coordination across regional / local government, and State / Commonwealth government, leading to misalignment between national strategy and regional delivery.
Misalignment between strategy and place-based delivery	Failure to translate national innovation priorities into locally tailored approaches, limiting relevance and impact at the regional level.
Insufficient scale, funding and long-term commitment	Under-resourced initiatives or short-term funding cycles that prevent ecosystems from reaching critical mass or sustaining momentum.
Weak industry engagement and demand signals	Over-reliance on research and government grants, with limited private sector investment, resulting in weak commercial pull and low adoption.
Failure to translate innovation into commercial outcomes	Strong research activity without effective pathways to scale-up, industrial application, or market deployment.
Lack of clear economic rationale or market viability	Over-engineered or supply-driven interventions not grounded in real demand, leading to underutilised assets or misallocated capital.
Overconcentration or lack of diversification	Innovation activity concentrated in a small number of locations or sectors, increasing vulnerability and reinforcing spatial or economic imbalances.
Premature scaling or forced ecosystem development	Attempting to build clusters or scale ecosystems before foundational capabilities, infrastructure, or demand are in place.
Limited capability and capacity at the regional level	Weak institutional, workforce, or industry capability constraining the ability to absorb investment and deliver outcomes effectively.

Comparing place-based innovation and industrial policy approaches

Innovation and industrial policies serve distinct objectives and can differ in purpose and design, however, the two can play a reinforcing role to each other to drive economic transformation. Both deliberately target investment and intervention to a specific location, recognising economic outcomes are shaped by local conditions, capabilities and relationships. In practice, both rely on coordinated action across infrastructure, land use, talent and skills, investment attraction and governance, and aim to lift productivity, employment and long-term economic performance within a defined place. The distinction lies in how value is created and optimised. Both are vulnerable to breakdowns in governance, coordination, and misalignment between strategy and delivery. Industrial policy failures tend to centre on market dynamics and transition risks while innovation-focused approaches are more susceptible to commercialisation gaps and translating innovation into scalable market outcomes.

Table 11 provides a summary of the key similarities and differences between place-based innovation and industrial policy approaches.

Table 11 Summary of place-based innovation and industrial policy approaches

	Place-Based Innovation Policy	Place-Based Industrial Policy
Primary focus	Generate and commercialise new knowledge and IP to drive long-term economic and social outcomes	Scale production and employment in priority industries to drive economic growth
Policy models	Shaped around anchor institutions such as universities or research institutes; industry clusters supported by shared infrastructure and skills; mission-led challenges around common goals; and living labs or testbeds that enable real-world experimentation.	Regionally targeted national priorities; nationally defined priorities allocated through open competition; targeted place development, including Special Economic Zones; locally defined priorities within a national framework; and decentralised approaches.
Spatial targeting	Both target a defined geographic area based on local capabilities, competitive advantages, and opportunities	
Key actors	Universities, research institutions, startups, investors, firms and government	Established firms, manufacturers, anchor employers, suppliers, regional development agencies, and government
Definition of place	A location where proximity enables interaction and production of innovative goods and services	A strategic location optimised for targeted industrial activity and aim to be transformational
Role of government	Both enable coordination, reduces regulatory barriers and invests in enabling conditions and infrastructure	
Policy levers	Shared research infrastructure, talent and skills, funding, industry research linkages, technology transfer, access to capital, ecosystem governance and coordination, reducing red tape, urban planning and place-based policies	Infrastructure investment, land use and zoning, production tax incentives, business incentives, national renewable energy and ESG targets, R&D supports, talent and skills pipelines and market creation mechanisms
Governance model	Both require coordination across portfolios and levels of government	
Risk profile	Higher risk, experimentation and failure accepted, requires lower investment	Lower risk, emphasis on proven industries and scalable activity, requires substantial investment
Measures of success	IP outputs, jobs created, collaboration and networking, and long-term productivity gains	Jobs created, output growth, investment attracted and sector competitiveness

What place-based industrial and innovation initiative examples exist across Australia?

This diagram below is not exhaustive and provides a sample of some of the current or planned models of place-based industrial and innovation approaches across Australia.

Table 12 – Comparable approaches across Australia

- Innovation policy
- Industrial policy

Pilbara Hydrogen Hub Western Australia Mission Oriented Innovation Ecosystems An innovation hub targeting the development of a skilled workforce for the net zero transition, including for the production and export of renewable hydrogen.	Brisbane Knowledge Corridor Brisbane, Queensland Triple Helix Model for Innovation + Anchor-based Clustering A vertical corridor connecting health, education and employment precincts via public transport links.	Lindfield Collaboration Hub Sydney, New South Wales Triple/Quadruple/Quintuple Helix Model for Innovation Co-location facilities for tech startups at CSIRO's Lindfield facility.
Collie Just Transition Collie, Western Australia Green / Just Transition Industrial Policy A policy initiative supporting transition of workers and local economies to support economic diversification in the shift away from coal-fired power by 2030.	Latrobe Valley Regional Economic Transition Victoria Agency-based Place-based Industrial Strategy A process to adapt to the closure of Hazelwood Power Station, designed in consultation with locals.	Tech Central Innovation Hub Sydney, New South Wales Global Institute on Innovation Districts (GIID) Framework Tech cluster oriented around innovation and collaboration.
Lot Fourteen Adelaide, South Australia Anchor-based clustering An innovation district in Adelaide's CBD focused on defence, space, hi-tech and creative industries.	Parkville Biomedical Precinct Melbourne, Victoria Triple Helix Model for Innovation + Anchor-based Clustering Health and medical research hub clustered around the University of Melbourne and major hospitals.	Hunter-Central Coast Renewable Energy Zone New South Wales Green/Just Transition Industrial Policy Transition of regional economies from coal mining/power to clean industry powered by renewables.

3

Place-based industrial models and theories

Place-based industrial models and theories

Mission-oriented/market creation industrial policy

(Mazzucato 2018; Rodrik 2014)

Mission-oriented innovation policies (MOIP) act as a central pillar in modern industrial policy, particularly in the context of market creation. Rather than targeting individual firms or sectors in isolation, this model sets clear, time-bound societal missions (e.g. achieving net zero emissions by 2050) and mobilises innovation, investment, and regulatory systems toward these goals rather than relying solely on market forces.³⁰

Rather than passively responding to market signals, MOIP aim to foster deliberate direction for market creation, aligning public and private actors around solving complex.³¹ By combining purpose-driven innovation with coordinated policy tools, missions actively shape new markets and industries, not just support existing ones.³²

- | | |
|-------------------|---|
| Objectives | <ul style="list-style-type: none">▪ Solve systemic challenges (climate, energy transition)▪ Create new markets▪ Crowd-in private investment |
|-------------------|---|

- | | |
|--------------|---|
| Scale | <ul style="list-style-type: none">▪ National (strategy)▪ Regional (delivery) |
|--------------|---|

- | | |
|--------------------------------|--|
| Governance and Delivery | <ul style="list-style-type: none">▪ Central mission agencies or early ‘pioneers’/groups demonstrate commitment and establish coordinated structures and key actions to guide change.³³▪ Leverage partnerships and inclusion of new participants to bring in additional tools, funding and expertise to scale impact.³⁴▪ Portfolio funding combined with public procurement |
|--------------------------------|--|

³⁰ OECD 2024, Mission-oriented innovation policies for net zero, OECD Publishing, Paris. Available at https://www.oecd.org/en/publications/mission-oriented-innovation-policies-for-net-zero_5efdbc5c-en.html

³¹ Rodrik, D. 2004, Industrial policy for the twenty-first century, Harvard University, Cambridge, MA. Available at: <https://papers.ssrn.com/sol3/Delivery>.

³² OECD 2024, Mission-oriented innovation, OECD. Available at: <https://www.oecd.org/en/topics/sub-issues/mission-oriented-innovation.html>

³³ OECD 2024, Mission-oriented innovation policies for net zero, OECD Publishing, Paris. Available at https://www.oecd.org/en/publications/mission-oriented-innovation-policies-for-net-zero_5efdbc5c-en.html

³⁴ Ibid.

Key Success Factors and design features

Design features

- Clear targets and timelines.
- Risk-sharing instruments.
- Policy coordination across domains.
- Direct funding to private industry.
- Enabling infrastructure.
- Evolving policy model that requires regular evaluation to enhance effectiveness and build on initial strategic plans developed by early theorists of the approach.³⁵

What works

- Clarity, scale and coordination as key enablers to operationalise policy at a national scale.
- Strong ambition and promotion of broad objectives to address systemic and large-scale policy challenges.

What fails

- Can be challenged by weak delivery capability at a state and regional level or misalignment between national policy objectives and state/regional level delivery.
- Poor budgeting allocation or share of funding can limit cooperation and motivation across partners, particularly across jurisdictions.
- Requires strong data capture and regular monitoring and evaluation of pilot projects to strengthen outcomes and continue to evolve policy, ensuring alignment with overarching mission objectives.³⁶

Examples

Global

- EU Mission: Climate-neutral and smart cities (Europe)
- Industrial Decarbonisation Research and Innovation Centre (United Kingdom)
- Energy 'Earthshots' (i.e. Hydrogen) (United States of America)
- Green Steel industrial policy (Sweden)

Australian

- CSIRO Missions Program (i.e. Towards Net Zero, Hydrogen Industry, Smart Energy)
- Future Made in Australia

³⁵ European Commission 2017, Strategic Research and Innovation Agenda (SRIA): Chapters 2–4. Luxembourg: Publications Office of the European Union. Available at: https://research-and-innovation.ec.europa.eu/document/download/4a706109-deaa-46b6-9e96-a5143a1ff9a3_en

³⁶ Ibid.

Key risks and trade-offs

- Politicisation of mission-oriented policy or market creation.
- High scrutiny to demonstrate impact and effectiveness due to long-term ambition and policy challenge.
- Overemphasis on technological innovation.
- Poor influence over broader policy due to misalignment in state versus national orientation.
- Limited or insufficient engagement with private resources and stakeholders.
- Limited data capture to identify systemic effects of change resulting from policy initiative.
- Location may not be the most competitive for new industries, despite government support.

Strategic Targeting Model

(Rodrik, 2004;2007; Aghion et al. 2015; OECD 2024)

At its core, the strategic targeting model refers to the deliberate selection and support of specific sectors, technologies, or capabilities by the state to accelerate industrial transformation. The strategic targeting model reflects a more selective and interventionist approach to industrial policy, where governments identify and support sectors with the greatest potential for productivity growth, learning spillovers, and global competitiveness.³⁷

OECD (2025) reframes this model through both a pro-competitive and place-based lens, noting that industrial policy is justified where coordination failures, and systemic transformation challenges prevent private investment from emerging, and that effective sector targeting requires alignment between local capabilities and national strategies rather than uniform sectoral strategies.³⁸ In its traditional form, it prioritises specificity over broad subsidies, using tools like tax incentives, R&D grants, and public procurement to "pick winners" with potential for scalability. However, the OECD’s reframed interpretation seeks to move beyond ‘picking winners’ and towards tailoring activities and interventions to place, combining selectivity with competition policies to create more discipline within the market.³⁹

Objectives	▪ Build competitive and scalable industries in strategic sectors. ▪ Enable structural transformation and productivity growth. ▪ Address coordination failures in emerging industries (e.g. net zero transition). ▪ Create and shape new markets (e.g. critical minerals processing).
Scale	▪ National scale with regional targeting.
Governance and Delivery	▪ Strong state–industry coordination mechanisms. ▪ Embedded autonomy (close to firms, but with discipline). ▪ Cross-level governance between national strategy and regional implementation, focused on a particular initiative or initiatives. ▪ Contemporary industrial policy requires coordination across industry, innovation, competition and regional policy to reframe this model.

³⁷ OECD (2024) Pro-competitive industrial policy. OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/05/pro-competitive-industrial-policy_1c257970/7c6b4708-en.pdf

³⁸ OECD (2025) Place-based industrial policy. OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/place-based-industrial-policy_e4bba733/43edc0df-en.pdf

³⁹ OECD (2024) Pro-competitive industrial policy. OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/05/pro-competitive-industrial-policy_1c257970/7c6b4708-en.pdf

Key Success Factors and design features	Design features ▪ Selective targeting of activities with spillovers and scalability. ▪ Performance-based conditional support and export discipline. ▪ Strong alignment for net zero export sectors and industries. ▪ Strong alignment between industrial policy and competition policy, as well as complementary policies for skills, infrastructure development, funding and regulation.⁴⁰ ▪ Targeting must be context-specific and based on regional capabilities, assets, market demand and commercial realities.				
Examples	<table> <tr> <th>Global</th><th>Australian</th></tr> <tr> <td> ▪ Semiconductor Cluster (Taiwan) ▪ CHIPS & Science Act (United States of America)/ EU Chips Act (Europe) ▪ EV Policy & 2030 Climate Strategy (China) ▪ Sectoral Capital Plan 2026–2030 (Ireland) </td><td> ▪ National Reconstruction Fund ▪ Critical Minerals Strategy ▪ National Hydrogen Strategy ▪ Defence Shipbuilding and Sustainment (Osborne, SA and Henderson, WA) </td></tr> </table>	Global	Australian	▪ Semiconductor Cluster (Taiwan) ▪ CHIPS & Science Act (United States of America)/ EU Chips Act (Europe) ▪ EV Policy & 2030 Climate Strategy (China) ▪ Sectoral Capital Plan 2026–2030 (Ireland)	▪ National Reconstruction Fund ▪ Critical Minerals Strategy ▪ National Hydrogen Strategy ▪ Defence Shipbuilding and Sustainment (Osborne, SA and Henderson, WA)
Global	Australian				
▪ Semiconductor Cluster (Taiwan) ▪ CHIPS & Science Act (United States of America)/ EU Chips Act (Europe) ▪ EV Policy & 2030 Climate Strategy (China) ▪ Sectoral Capital Plan 2026–2030 (Ireland)	▪ National Reconstruction Fund ▪ Critical Minerals Strategy ▪ National Hydrogen Strategy ▪ Defence Shipbuilding and Sustainment (Osborne, SA and Henderson, WA)				
Key risks and trade-offs	▪ Government or geopolitical instability generates high risk. ▪ Weak institutions and policy fragmentation creates high risk. ▪ Distorted competition and risk of protecting incumbents and new industries. ▪ Subject to anti-dumping rules and global trade policy considerations. ▪ Potential for exacerbating regional inequity within strategic targeting due to entrenched monopolies or inefficiencies within distorted market conditions.⁴¹ ▪ Need for targeted support and complementary policies like competition policy to ensure government interventions are counteracted.				

⁴⁰ Productivity Institute UK (2025) Place-based industrial policy. Productivity Institute Policy Paper No. PIP056. Available at: <https://www.productivity.ac.uk/wp-content/uploads/2025/07/PIP056-Place-based-industrial-policy-25-July-2025.pdf>

⁴¹ Frick., Rodríguez-Pose and Wong (2021) 'Toward economically dynamic places: regional development and industrial policy', *Regional Studies*, 55(10), pp. 1633–1645. Available at: <https://www.tandfonline.com/doi/10.1080/00343404.2021.1947485>

Green / Just Transition Industrial Policy

(Newell & Mulvaney 2013; OECD 2025)

Provides a place-based model ensuring decarbonisation aligns with social equity and regional economic transition, particularly in regions historically dependent on fossil fuels. Green industrial policy in particular seeks to support addressing of barriers to achieving decarbonisation objectives, such as funding constraints, access to skills and infrastructure, regulatory barriers, lack of market demand or first-mover disadvantages.⁴²

The just transition model extends industrial policy to drive decarbonisation objectives while managing the social, economic and spatial consequences of structural change. OECD (2025) positions just transition as a core pillar of place-based industrial policy, requiring integrated interventions across industry policy, labour markets, social policy, and regional development. The model prioritises sequencing and coordination, ensuring that new industries and employment pathways are developed ahead of, or alongside, industrial change/decline.⁴³

Objectives

- Decarbonise industry.
- Build new green industries and value chains.
- Protect workers and communities embedded in fossil fuel economies.⁴⁴
- Enable new industries.
- Address energy poverty and unequal access to clean energy sources, ensuring fair distribution of costs and benefits.

Scale

- Regional
- State-led restructuring of the economy to simultaneously create new low-carbon markets and net zero industries while managing political, social and spatial conflicts of change.⁴⁵

Governance and Delivery

- Strong government role as coordinator, mediator of competing interests and distributor of transition costs and benefits through policy intervention (i.e. managing skills transition, employment, infrastructure and investment).
- Transition authorities to strengthen institutional capacity and coordination at national and regional level.
- Industry, workforce and community transition programs and planning.

⁴² Newell, P. and Mulvaney, D 2013 The political economy of the “just transition”. ICAS Working Paper No. 66. The Hague: International Institute of Social Studies. Available at: https://www.iss.nl/sites/corporate/files/66-ICAS_CP_Newell_and_Mulvaney.pdf

⁴³ OECD 2025, Green industrial policies. Available at: <https://www.oecd.org/en/topics/green-industrial-policies.html>

⁴⁴ Ibid.

⁴⁵ Newell, P. and Mulvaney, D 2013 The political economy of the “just transition”. ICAS Working Paper No. 66. The Hague: International Institute of Social Studies. Available at: https://www.iss.nl/sites/corporate/files/66-ICAS_CP_Newell_and_Mulvaney.pdf

Key Success Factors and Design features	Key features
	▪ Workforce retraining and skills development. ▪ Regional investment funds. ▪ Infrastructure repurposing. ▪ Green industrial policy focuses on market creation through clean tech subsidies, infrastructure and industrial transition programs. ▪ Transition management through system coordination (i.e. transition authorities or other bodies to strengthen governance framework) to phase out policies (i.e. fossil fuels investment) and drive transition pathways for sectors and communities. ⁴⁶
	What works
	▪ Early planning and explicit, transparent management of trade-offs. ▪ Community buy-in. ▪ Funding certainty. ▪ Ability to leverage competitive strengths for new industries. ▪ Regionally targeted and context-specific approaches.
	What fails
	▪ Delayed transition. ▪ Lack of jobs pipeline and transferable skills into new industries. ▪ Poor communication and coordination of impacted industries and community. ▪ Can result in regional conflicts, with ‘winning’ versus ‘losing’ regions. ▪ Benefits of green industrial growth are often realised and concentrated elsewhere from the communities within which are most immediately impacted. ⁴⁷

Examples	Global	Australian
	▪ Ruhr Transition (Germany) ▪ Inflation Reduction Act (United States of America) ▪ Just Transition Framework (South Africa) ▪ Just Transition Strategy for the Energy Sector (Chile) ▪ Ayana Renewable Power – Just Transition (India)	▪ Latrobe Valley Regional Transition (Victoria) ▪ Hunter Regional Plan (New South Wales) ▪ Collie Just Transition Plan (Western Australia)

⁴⁶ Ibid.

⁴⁷ Ibid.

Key risks and trade-offs

- Political backlash and resistance from key workers, regional communities or incumbent firms.
- Push-back from fossil fuel industry on timing closures.
- Stranded assets and infrastructure.
- Low skill and workforce availability to support new industry.
- Impacted communities typically characterised by legacy industries (i.e. fossil fuel dependent regions).
- Delayed transition outcomes.

Agency-Based Place-Based Industrial Strategy

Beer, Barnes & Horne (2021); Grillitsch & Sotarauta (2020); Moulaert et al. (2016)

This model centres on the role of regional institutions, leadership, and agency capacity in shaping industrial development trajectories. It reflects a shift in the literature from viewing regions as passive recipients of policy, to recognising them as active agents in economic transformation.⁴⁸ The model emphasises that local actors (development agencies, regional development authorities, government, industry groups) play a critical role in interpreting, adapting, and implementing national industrial policy frameworks and translating them into place-based outcomes.⁴⁹ Within this context, agency is defined as the capacity of actors to act purposefully and effect change.⁵⁰

Objectives

- Unlike traditional industrial policy which typically targets sectors, this model seeks to:
- Enable regional path creation and transformation.
- Enable local coordination and build adaptive capacity or agility of regions to pivot away from declining industries or capture new market opportunities.⁵¹
- Align local actors, narratives and opportunities to unlock new growth trajectories for regions.
- Establish the conditions within which agency, opportunity spaces and regional discourse are mobilised to strengthen transformational regional objectives.

Scale

- Regional
- Deeply place-based and locally grounded

Governance and Delivery

- Decentralised but coordinated model.
- Emphasis on local leadership, coalition building and institutional entrepreneurship.
- Regional agencies empowered to act as leaders.
- Success relies on multi-level coordination and local actors.⁵²

⁴⁸ Beer et al., (2021) Place-based industrial strategy and economic trajectory: advancing agency-based approaches. Available at: <https://www.tandfonline.com/doi/full/10.1080/00343404.2021.1947485>

⁴⁹ Moulaert et al. (2016) Agency, structure, institutions, discourse (ASID) in urban and regional development. *International Journal of Urban Sciences*, 20(2), pp.167–187.

⁵⁰ Grillitsch & Asheim (2018) Place-based innovation policy for industrial diversification in regions, *European Planning Studies*, 26:8, 1638–1662, DOI: 10.1080/09654313.2018.1484892

⁵¹ Ibid.

⁵² Beer et al., (2021) Place-based industrial strategy and economic trajectory: advancing agency-based approaches. Available at: <https://www.tandfonline.com/doi/full/10.1080/00343404.2021.1947485>

Key Success Factors and design features**Key features**

- Local leadership and spatially dependent development pathways.
- Recognises the unique strengths, assets, constraints and opportunity spaces within regions to shape decision-making.
- Regional transformation occurs when there is overlap between agency (local actors), opportunity space (regional economic conditions) and discourse (local narratives).⁵³
- Civic leadership as a key condition for success.⁵⁴

What works

- Encouraging dense networks and collaboration for industrial transition.
- Actors actively align strategy, expectations and investment to ensure success.
- Agency is distributed but coordinated, with multiple actors playing complementary roles.⁵⁵

What fails

- Without an effective agent to drive change this model cannot succeed. In some cases, some regions lack the capable firms or institutions to drive change.⁵⁶
- Model doesn't guarantee that agency coordination and collaboration will be effective, undermining potential success.
- Without shared vision or when competing narratives exist amongst actors, effective industrial change is limited.⁵⁷

Examples**Global**

- Ruhr Industrial transition (Germany)
- Pittsburgh Steel industry Transition to Knowledge Economy (United States of America)

Australian

- Latrobe Valley Regional Transition (Victoria)

⁵³ Ibid.⁵⁴ Ibid.⁵⁵ Ibid.⁵⁶ Ibid.⁵⁷ Moolaert et al. (2016) Agency, structure, institutions, discourse (ASID) in urban and regional development. International Journal of Urban Sciences, 20(2), pp.167-187.

Key risks and trade-offs

- Capacity gaps if local agencies lack technical knowledge or are faced with resourcing constraints to design and implement effective policies and strategies.
 - Fragmentation across multiple agencies across regions, resulting in potential policy inconsistency, duplication of effort or reduced scale of benefit.
 - Fails under weak institutions or where governance quality is low.
 - Strong in locations where regional governance is well established, strengthening coordination and embedded knowledge.
-

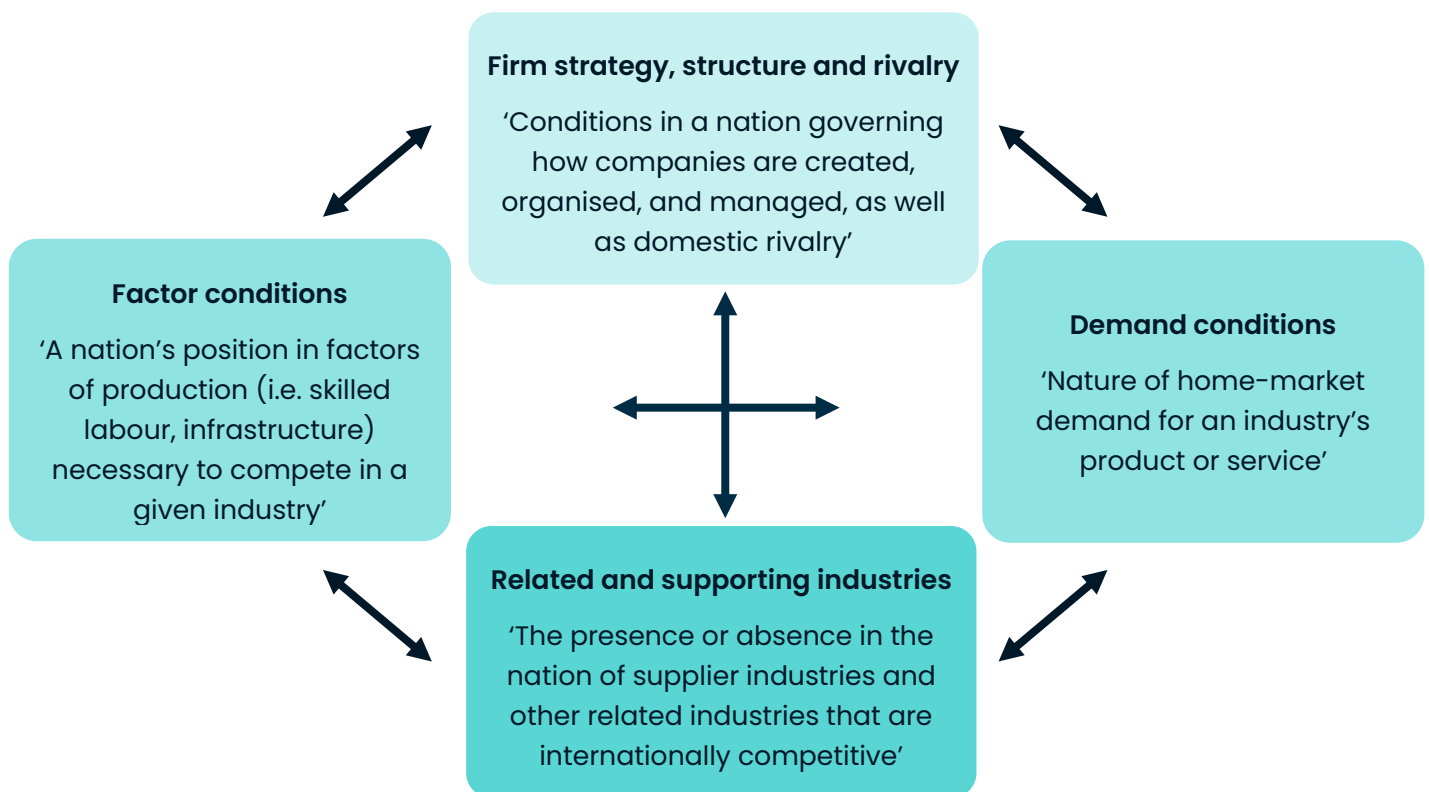
Cluster-Based Industrial Policy

(Porter, 1998; Moulaert et al., 2016; Vlados, 2019; World Economic Forum, 2023)

Focuses on geographic concentrations of interconnected firms and institutions, driving productivity and innovation through proximity.⁵⁸ Grounded in economic theory, this model emphasises the role of agglomeration economies⁵⁹ whereby productivity gains arise when firms, workers and institutions co-locate. Industrial policy aims to target specific regions or clusters, aiming to build ecosystems of interconnected firms/institutions and capabilities.⁶⁰

Infrastructure, skills, innovation and governance are integrated from a place-based lens, with clusters facilitating spillover of knowledge, labour market pooling and supplier networks, enhancing overall economic competitiveness.⁶¹ Key to understanding cluster-based industrial policy is Porter's Diamond Model of National Competitiveness⁶², which explores how factors including demand conditions, factor conditions, firm strategy, structure and rivalry, and related and supporting industries create natural conditions for establishing firms, generating competition within key industries and developing national competitive advantages (see Figure 5).⁶³

Figure 4 Determinants of National Competitive Advantage



Source: Reproduced from Porter (1990, p.196)

⁵⁸ World Economic Forum (2023) How industrial clusters act as engines of national competitiveness. Available at: <https://www.weforum.org/stories/2023/07/industrial-clusters-four-governance-models-deliver-net-zero-goals/>

⁵⁹ Combes & Gobillon (2014) The empirics of agglomeration economies. International Trade and Regional Economics. Available at: <https://sciencespo.hal.science/hal-03460237v1/document>

⁶⁰ Porter, M. E., 2008, *On competition*. Available at: https://www.academia.edu/2917808/On_competition

⁶¹ Productivity Institute UK, 2025, Delivering successful place-based industrial policy. Available at: <https://www.productivity.ac.uk/wp-content/uploads/2025/07/PIP056-Place-based-industrial-policy-25-July-2025.pdf>

⁶² Porter (1990) The Competitive Advantage of Nations. *Harvard Business Review*, 68(2), pp.73-93.

⁶³ Vlados (2019). Porter's Diamond Approaches and the Competitiveness Web. *International Journal of Business Administration*. 10(5). doi: 10.5430/ijba.v10n5p33. Available at: <https://sciedupress.com/journal/index.php/ijba/article/view/16224>

Objectives

- Enhance productivity, job creation, and regional competitiveness via agglomeration economies (knowledge spillovers, collaboration).⁶⁴
- Reduce spatial disparities and inequity across regions by tailoring national industrial policy objectives to regional strengths and competitive advantages, helping to mobilise underutilised or untapped local resources and assets.⁶⁵
- Support building specialised regional economies and enhancing innovation and economic growth within industry.
- Enable public and private partners to establish a shared vision for transformation, aligned to specific local and regional economic priorities.⁶⁶

Scale

- Regional and regional sub-areas.
- Local clusters.
- Coordinated national ecosystem of individual regional clusters.

Governance and Delivery

- Public-private partnerships via models like industry-led consortiums, government councils and collaborative governance structures.⁶⁷
- Multi-level governance, with local implementation.

Key Success Factors and design features

Key features

- Supply chain integration between firms, suppliers and service providers, improving coordination and scaling.⁶⁸
- Skilled labour pooling allows firms to access specialised skills and knowledge, supporting continuous learning and productivity within clusters.⁶⁹
- Shared infrastructure (i.e. transport networks, R&D facilities, technology systems and knowledge infrastructure) drives efficiency.
- Export orientation enhances competitiveness through exposure to global demand and competition.⁷⁰
- Establishment of clear economic identity, flexible funding models, local leadership and viable projects.

What works

⁶⁴ SGS Economics & Planning 2023, Sectoral, Systemic and Spatial: Rethinking Australia's Approach to National Industry Policy. Available at: https://sgs-assets.spicyweb.net.au/main/SGS-Economics-and-Planning_Australia-needs-a-new-spatial-industry-strategy.pdf

⁶⁵ World Economic Forum, 2023, How industrial clusters act as engines of national competitiveness. Available at: <https://www.weforum.org/stories/2023/07/industrial-clusters-four-governance-models-deliver-net-zero-goals/>

⁶⁶ Parrilli, M. D. 2024, Cluster policy: the challenging and complex horizon in the 2020s. European Planning Studies, 32(9), 1868–1884. <https://doi.org/10.1080/09654313.2023.2239281>

⁶⁷ Ibid.

⁶⁸ World Economic Forum, 2023, How industrial clusters act as engines of national competitiveness. Available at: <https://www.weforum.org/stories/2023/07/industrial-clusters-four-governance-models-deliver-net-zero-goals/>

⁶⁹ Ibid.

⁷⁰ Productivity Institute UK, 2025, Delivering successful place-based industrial policy. Available at: <https://www.productivity.ac.uk/wp-content/uploads/2025/07/PIP056-Place-based-industrial-policy-25-July-2025.pdf>

- Leveraging existing industrial base to establish critical mass of key actors.
- Ensuring sustained collaboration through strong governance structures and data-driven performance monitoring.
- Strong model for transitioning industrial regions to build on existing infrastructure, assets, resources and skills. ⁷¹

What fails

- Artificial cluster creation (mentality of “build it and they will come”) with alignment to regional priorities. ⁷²
- Regions lose their competitive advantage as market conditions shift.
- Poor leadership, vague identities, misaligned incentives cause stagnation.

Examples

Global

- World Economic Forum Transitioning Industrial Clusters (TIC) initiative
- HyNet North West (United Kingdom)
- Silicon Valley (United States of America)
- Tripartite Space Industry Cluster (South Korea)

Australian

- Western Trade Coast (Western Australia)
- I3net (Illawarra Innovative Industry Network) Illawarra Shoalhaven (New South Wales)
- East Gippsland Agri-Food Cluster (Victoria)
- Subsea Innovation Cluster Australia (Western Australia)

Key risks and trade-offs

- Lock-in to declining industries.
- Regional inequality exacerbated without appropriate share of benefits.
- Not applicable in regions with no industrial base.
- Poor leadership, vague identities, misaligned incentives cause stagnation.

⁷¹ Ibid.

⁷² Ibid.

Special Economic Zones (SEZs)

Farole & Akinci (2011); Zeng (2015), World Bank (2011)

SEZs are geographically bounded areas where governments implement preferential regulatory, fiscal, and trade conditions to attract investment and stimulate industrial activity.⁷³ From a place-based innovation perspective, SEZs represent a spatially concentrated intervention, but literature analysis suggests that without strong linkages to local firms, skills systems, and supply chains, they risk becoming isolated zones.⁷⁴ The World Bank emphasises that SEZs are fundamentally about overcoming coordination failures that create barriers to investment, including weak infrastructure, lack of multi-level governance coordination between public and private sectors, poor regulatory environments or slow approvals and land constraints.⁷⁵

Objectives

- Attract foreign direct investment (FDI).
- Promote export growth.
- Drive place-based industrialisation outcomes and local economic activation.
- Generate jobs, alleviate unemployment and positive spillover effects.

Scale

- Regional with localised zones

Governance and Delivery

- Typically led by a centralised zone authority to act as a single interface for investors.
- Public-private model whereby government enables development and shapes regulatory conditions, with private operating/delivering.
- Delivery via fiscal incentives, infrastructure, streamlined regulatory pathways and multi-level governance and coordination.⁷⁶

Key Success Factors and design features

Key features

- Strategic location, reliable infrastructure to draw investors.
- Strong regulatory flexibility, political alignment and access to market.
- Strengthening critical links to transport and logistics corridors to improve economic outcomes.
- Financial incentives to attract investment (e.g. tax concessions).
- Target specific value chains / sectors that are built around existing comparative advantages.⁷⁷
- Integration into domestic and global supply chains (including trade facilitation).

⁷³ CEPR (2019) Special economic zones: Lessons from the global experience. PEDL Synthesis Paper. Centre for Economic Policy Research, London. Available at: <https://grp.cepr.org/publications/pedl-synthesis-papers/special-economic-zones-lessons-global-experience>

⁷⁴ World Bank (2011) Special economic zones: Progress, emerging challenges, and future directions. Washington, DC: World Bank. Available at: <https://documents1.worldbank.org/curated/en/275691468204537118/pdf/644300NEWS0Eco000PUBLIC00BOX361537B.pdf>

⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ Ibid.

- Labour and skilled workforce critical to success.⁷⁸

What works

- Successful SEZs are embedded in national/sector strategy, not standalone real estate plays.⁷⁹
- Strong alignment between incentives, infrastructure, and target industries.
- Must leverage existing or known underutilised comparative advantages (e.g. ports, labour, energy, clusters).⁸⁰
- Clear economic purpose and strategic alignment, and the ability to evolve over time.
- Reliable utilities and serviced land reduce operational risk for private investors, providing more certainty.⁸¹
- SEZs succeed when they generate agglomeration effects. Key to this are attraction of anchor firms, development of economic ecosystems, knowledge spillovers, clustering and productivity gains.⁸²

What fails

- “Build it and they will come” zones established with no demand logic or alignment to place-specific characteristics.⁸³
- Incentive-led model can attract firms with low commitment and limit long term investment.
- Limited access to critical transport and utilities infrastructure lowers investor demand or creates underutilised zones.⁸⁴
- Due to scale, without strong framework governance can become weak due to involvement of multiple agencies and actors.
- Failure to upgrade over time or enhance maintenance may lock zones into lower-value activities or stagnant growth, resulting in zones remaining as isolated economic enclaves.⁸⁵

⁷⁸ CEPR (2019) Special economic zones: Lessons from the global experience. PEDL Synthesis Paper. Centre for Economic Policy Research, London. Available at: <https://grp.cepr.org/publications/pedl-synthesis-papers/special-economic-zones-lessons-global-experience>

⁷⁹ Ibid.

⁸⁰ Chen., Silva, and Li (2025) ‘Are Special Economic Zone policies effective? An empirical analysis of the transport and logistics sector’, Applied Economics. Available at: <https://www.tandfonline.com/doi/10.1080/00036846.2025.2450389>

⁸¹ Ibid.

⁸² Ibid.

⁸³ World Bank (2011) Special economic zones: Progress, emerging challenges, and future directions. Washington, DC: World Bank. Available at: <https://documents1.worldbank.org/curated/en/275691468204537118/pdf/644300NEWS0Eco000PUBLIC00BOX361537B.pdf>

⁸⁴ Ibid.

⁸⁵ Ibid.

Examples	Global	Australia
	▪ Jebel Ali Free Zone (Jafza) (Dubai) ▪ Katowice Special Economic Zone (Poland) Special Economic Zones (i.e. Shenzhen, Zhuhai, Shantou, Xiamen & Hainan Province, China)	State Development Areas (SDAs) in Western Australia are designated, master-planned precincts under the State Development Act 2025 designed to facilitate major industrial, infrastructure, and resources projects. They promote economic growth by streamlining approvals, offering common-user infrastructure, and securing land for strategic industries.

Key risks and trade-offs

- Risks high investment costs without guarantee of significant economic return.
- Temporarily slow growth effects, with majority of impact realised in the long term.
- Potential to create unequal growth and spatial concentration of investment, further exacerbating regional disparities.
- Streamlined planning approvals may cause unintended impacts on the environment and biodiversity.
- Can create enclave economies without strong linkages to local skills, systems, industries and supply chains.
- Tax incentives impact government taxation revenue.

Place-based Industrial Ecosystem Model

Frosch & Gallopoulos (1989); Graedel & Allenby (1995); Cote (1997); Korhonen (2001)

A place-based industrial ecosystem is a geographically concentrated network of firms, supporting institutions, and infrastructure designed to generate economic growth by leveraging local strengths. Within an industrial ecosystem, firms interact across value chains, creating clusters of complementary industries that can increase productivity, attract investment, and stimulate innovation.^{86, 87} Strong industrial ecosystems feature an interconnected network of actors across multiple stages of value chains to enable resource and skills exchange, innovation, supply chains economic growth and resilience.⁸⁸ The objective of an industrial ecosystem model is to create a self-reinforcing cycle in which investment, skills, and innovation co-locate to generate regional economic value.⁸⁹

Objectives	▪ Concentrate industrial activity to stimulate investment, create jobs, and enhance regional growth and productivity. ▪ Leverage local comparative advantages by aligning industries with the region’s natural resources, skills, infrastructure, and market access. ▪ Attract and retain investment. ▪ Stimulate innovation and knowledge spillovers through collaboration between actors. ▪ Increase resilience and adaptability to evolve with changing market conditions. ▪ Develop skills aligned to needs of industry, enhancing regional capacity and productivity.
Scale	▪ Operate at multiple geographic scales, depending on the objectives and resources available.
Governance and Delivery	▪ Combination of public facilitation, private participation and institutional coordination. ▪ Ecosystem governance may evolve with phased development.

⁸⁶ Frosch and Gallopoulos (1989) ‘Strategies for manufacturing’, Scientific American, 261(3), pp. 144–152. Available at: <https://cushman.host.dartmouth.edu/courses/engs171/older/IndustrialEcosystem.pdf>

⁸⁷ Batabyal and Nijkamp (2024) ‘Industrial ecosystems, regional resilience and sustainable development’, Technological Forecasting and Social Change, 205, Article 123028. Available at: <https://www.sciencedirect.com/science/article/pii/S0040162524004542>

⁸⁸ European Cluster Collaboration Platform (2026) Definition of Industrial Ecosystems. Available at: <https://www.clustercollaboration.eu/in-focus/industrial-ecosystems/definition>

⁸⁹ Frosch and Gallopoulos (1989) ‘Strategies for manufacturing’, Scientific American, 261(3), pp. 144–152. Available at: <https://cushman.host.dartmouth.edu/courses/engs171/older/IndustrialEcosystem.pdf>

Key Success Factors and design features	Key features and success factors - Clusters co-locate complementary industries and shared infrastructure such as transport, energy, and logistics networks. - Strong collaboration and governance.⁹⁰ - Targets sectors where the region has comparative advantage, attracts anchor firms, and develops supplier networks. - Phased implementation begins with infrastructure and anchor firms, followed by the gradual addition of complementary industries and ecosystem support. - Planning considers productivity, innovation, and economic impact across the entire ecosystem rather than individual firms.⁹¹ Success occurs when ecosystems leverage local strengths, cluster complementary industries, provide coordinated governance, and align private incentives with regional economic goals.⁹² What fails - When there is no strong economic rationale and infrastructure or incentives are disconnected from local strengths.⁹³ - Weak coordination prevents firms from collaborating, reducing spillovers and regional benefits.⁹⁴ - Poor spatial design limits effective clustering and resource sharing. - Misaligned incentives encourage firms to prioritise individual gains over system-wide growth.⁹⁵						
Examples	<table border="0"> <thead> <tr> <th>Global</th><th>Australian</th></tr> </thead> <tbody> <tr> <td> - Rotterdam Port Industrial Cluster (Netherlands) </td><td> - Kwinana Industrial Area (Western Australia) </td></tr> <tr> <td> - Detroit Automotive Cluster (United States of America) </td><td> - Western Sydney Aerotropolis (New South Wales) </td></tr> </tbody> </table>	Global	Australian	Rotterdam Port Industrial Cluster (Netherlands)	Kwinana Industrial Area (Western Australia)	Detroit Automotive Cluster (United States of America)	Western Sydney Aerotropolis (New South Wales)
Global	Australian						
Rotterdam Port Industrial Cluster (Netherlands)	Kwinana Industrial Area (Western Australia)						
Detroit Automotive Cluster (United States of America)	Western Sydney Aerotropolis (New South Wales)						
Key risks and trade-offs	- Concentration of economic activity can increase inequality if benefits do not extend to surrounding areas. - Reliance on anchor firms or specific industries increases vulnerability to economic shocks. - High coordination and investment costs are required to align multiple actors and sectors. - Unequal capture of value can create tensions between firms, workers, and governments over costs and benefits.						

⁹⁰ Ibid.

⁹¹ Ibid.

⁹² Batabyal and Nijkamp (2024) 'Industrial ecosystems, regional resilience and sustainable development', *Technological Forecasting and Social Change*, 205, Article 123028. Available at: <https://www.sciencedirect.com/science/article/pii/S0040162524004542>

⁹³ Frosch and Gallopoulos (1989) 'Strategies for manufacturing', *Scientific American*, 261(3), pp. 144–152. Available at: <https://cushman.host.dartmouth.edu/courses/engs171/older/IndustrialEcosystem.pdf>

⁹⁴ Batabyal and Nijkamp (2024) 'Industrial ecosystems, regional resilience and sustainable development', *Technological Forecasting and Social Change*, 205, Article 123028. Available at: <https://www.sciencedirect.com/science/article/pii/S0040162524004542>

⁹⁵ Ibid.

Embedded Autonomy / Network Governance

Evans (1995); OECD (2018; 2025); Rodrik et al. (2023)

Embedded autonomy provides a foundational governance framework for industrial policy, arguing that effective states must be simultaneously embedded in industry networks and autonomous from them. This dual role enables government to readily access information about industry needs and constraints, whilst also maintaining the necessary discipline and independence required to allocate resources and funding effectively.⁹⁶ This model combines Evans’ (1995) concept of embedded autonomy (state–industry relations) with OECD place-based and network governance approaches that operationalise these relationships at the regional level.⁹⁷

Evidence from the OECD (2025) builds on Evans’ theory of embedded autonomy, identifying how coordination failures (not just market failures) act as critical barriers to industrial transformation, particularly in the context of the net zero transition.⁹⁸ In this model, strong outcomes occur when embedded networks improve coordination while autonomous institutions maintain discipline. Failure arises when either embeddedness or autonomy breaks down.

Objectives	Embedded autonomy aims to balance social embeddedness with government autonomy to drive economic development outcomes. - Ensures policies are shaped by real-world social and economic contexts.⁹⁹ - Keeps policy-making autonomous from capture by particular industry interests and maintain capacity to implement policies effectively even when firms or actors have competing interests. - State achieves coordination while retaining impartiality for decision making on behalf of broader public good.
	Network governance focuses on facilitating collaboration, flexibility and trust when coordinating multiple actors to respond to policy challenges. ¹⁰⁰ Strong focus on collaboration, information sharing, continuous learning and building trust between public, private and community stakeholders to address common objectives.
Scale	- National/regional - Localised networks

⁹⁶ Evans (1995) Embedded Autonomy: States and Industrial Transformation. Princeton University Press. Available at: <http://www.jstor.org/stable/j.ctt7t0sr>

⁹⁷ OECD (2018) Rethinking regional development policy-making. OECD Multi-level Governance Studies. OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2018/04/rethinking-regional-development-policy-making_glg8b3be/9789264293014-en.pdf

⁹⁸ OECD (2025) Place-based policies for the future. OECD Regional Development Studies. OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/05/place-based-policies-for-the-future_de4634ab/e5ff6716-en.pdf Available at: <https://urbisau.sharepoint.com/sites/P0065844/Shared%20Documents/General/apo-nid330749.pdf>

⁹⁹ Evans (1995) Embedded Autonomy: States and Industrial Transformation. Princeton University Press. Available at: <http://www.jstor.org/stable/j.ctt7t0sr>

¹⁰⁰ de Propriis and Bailey (2026) ‘Industrial policy, place and regional resilience’, Regional Studies, Regional Science, 13(1), Article 100079. Available at: <https://www.sciencedirect.com/science/article/pii/S2590051X26000079>

Governance and Delivery

- Delivery relies on network governance structures that connect governments, firms, and institutions within specific regions or clusters.¹⁰¹
- State is embedded in industry networks but retains autonomy to discipline firms, with an emphasis on information flows from industry to state.¹⁰²
- Decentralised implementation with central steering, combining local leadership and flexibility.
- National governments set strategic direction while regional and local actors tailor implementation to local economic conditions.¹⁰³

Key Success Factors and design features

Key features and success factors

- **Network-based coordination:** Government uses its embedded position within regional industry networks to coordinate and align investments (i.e. into skills, infrastructure and innovation) while maintaining autonomy to set direction.¹⁰⁴
- **Place-based co-design** tailors policy through engagement with regional actors.¹⁰⁵
- **Regular and open firm-state interactions:** Continuous information and feedback exchanges between firms and government through governance. Within this model, government maintains autonomous capacity to act on this information and make policy decisions without capture.¹⁰⁶
- **Regional institutional capacity:** Core condition for embedded autonomy to ensure effective governance and state's ability to coordinate actors to generate even place-based outcomes.¹⁰⁷

¹⁰¹ Ibid.

¹⁰² Evans (1995) *Embedded Autonomy: States and Industrial Transformation*. Princeton University Press. Available at: <http://www.jstor.org/stable/j.ctt7t0sr>

¹⁰³ de Propriis and Bailey (2026) 'Industrial policy, place and regional resilience', *Regional Studies, Regional Science*, 13(1), Article 100079. Available at: <https://www.sciencedirect.com/science/article/pii/S2590051X26000079>

¹⁰⁴ Evans (1995) *Embedded Autonomy: States and Industrial Transformation*. Princeton University Press. Available at: <http://www.jstor.org/stable/j.ctt7t0sr>

¹⁰⁵ OECD (2018) *Rethinking regional development policy-making*. OECD Multi-level Governance Studies. OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2018/04/rethinking-regional-development-policy-making_glg8b3be/9789264293014-en.pdf

¹⁰⁶ de Propriis and Bailey (2026) 'Industrial policy, place and regional resilience', *Regional Studies, Regional Science*, 13(1), Article 100079. Available at: <https://www.sciencedirect.com/science/article/pii/S2590051X26000079>

¹⁰⁷ Evans (1995) *Embedded Autonomy: States and Industrial Transformation*. Princeton University Press. Available at: <http://www.jstor.org/stable/j.ctt7t0sr>

What works

- Balance of embeddedness and autonomy enables coordination without capture.¹⁰⁸
- Continuous state–industry interaction enables learning and adaptation.
- Strong regional networks align actors and investments within places.¹⁰⁹

What fails

- Over-embeddedness can result in capture, weakening state’s capacity to discipline firms.¹¹⁰
- Weak embeddedness can result in poor information flows between government and industry, leading to weak alignment of overarching policy with industry delivery.¹¹¹

Examples

Global

- Advanced Research Projects Agency (ARPA) model for energy and health sciences (United States) – contemporary example of embedded autonomy in industrial policy through ‘active program management’ and independence from bureaucracy while still keeping close public sector ties to private sector.¹¹²
- South Korea – example of bureaucratic autonomy with deep social embeddedness to drive industrial transformation.¹¹³

Australian

- Whyalla Regional Industrial Transition (South Australia)
- Automotive Industry Transition (South Melbourne, Victoria)

Key risks and trade-offs

- Autonomous agencies may become overly top-down, ignoring local needs if embeddedness is weak.
- Even if embedded, national-level priorities may not match local socioeconomic conditions.

¹⁰⁸ Ibid.

¹⁰⁹ OECD (2018) Rethinking regional development policy-making. OECD Multi-level Governance Studies. OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2018/04/rethinking-regional-development-policy-making_glg8b3be/9789264293014-en.pdf

¹¹⁰ Evans (1995) Embedded Autonomy: States and Industrial Transformation. Princeton University Press. Available at: <http://www.jstor.org/stable/j.ctt7t0sr>

¹¹¹ Ibid.

¹¹² Rodrik et al. (2023) The new economics of industrial policy. NBER Working Paper No. 31538. National Bureau of Economic Research, Cambridge, MA. Available at: https://www.nber.org/system/files/working_papers/w31538/revisions/w31538.rev0.pdf

¹¹³ Ibid.

Smart Specialisation Strategy (S3)

(Foray 2021; OECD 2025)

Smart specialisation is an EU place-based, innovation-led industrial policy framework that prioritises regional economic transformation through tailored identification of regional competitive advantages and coordinated investment into research and innovation.^{114, 115} The approach applies an ‘entrepreneurial discovery process’ (EDP) involving public, private and institutional stakeholders to help guide investment towards key strategic areas, seeking to build globally competitive niches within industry. The model seeks to explicitly build on existing regional assets and socioeconomic conditions to drive strategic impact and industrial growth.¹¹⁶

It is particularly relevant in contexts where resources are constrained, and choices must be made between competing opportunities. Within this model, regions identify distinct comparative advantages and focus innovation investments accordingly.¹¹⁷

Objectives	▪ Avoid duplication and fragmentation of funding and investment across regions by focusing effort towards key strategic areas. ▪ Build globally competitive niches based on local strengths and innovation capabilities.¹¹⁸ ▪ Align innovation with regional strengths, industrial transformation objectives and funding to strategic priorities.
Scale	▪ Regional (EU regions)
Governance and Delivery	▪ Entrepreneurial discovery process (EDP) as core governance mechanism, involving continuous stakeholder engagement and structured discovery to identify opportunities, strategic industrial priorities and pathways for investment and delivery.¹¹⁹ ▪ Multi-stakeholder governance structure (firms, universities, research institutes, government agencies and civil society) to support co-creation and implementation.
Key Success Factors and Design features	Key features and success factors ▪ Evidence-based prioritisation: regions utilise data and benchmarking to select strategic areas for investment.¹²⁰

¹¹⁴ OECD (2025) Place-based industrial policy. OECD Publishing, Paris. Available at:

https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/place-based-industrial-policy_e4bba733/43edc0df-en.pdf

¹¹⁵ Foray et al (2021) Smart specialisation strategies—insights gained from a unique European policy experiment on innovation and industrial policy design. *Rev Evol Polit Econ* 2, 83–103. Available at: <https://doi.org/10.1007/s43253-020-00026-z>

¹¹⁶ McCann and Ortega-Argilés (2018) ‘Smart specialisation as place-based policy: lessons learnt’, *Regions e-zine*. Available at: <https://regions.regionalstudies.org/ezine/article/smart-specialisation-as-place-based-policy-lessons-learnt/>

¹¹⁷ Ibid.

¹¹⁸ Abbott and Fitjar (2025) Missions, conditions and the policy transfer of Smart Specialisation in the European Union. *Regional Studies*, 59(1). <https://doi.org/10.1080/00343404.2024.2377679>

¹¹⁹ Marinelli (2017) Smart Specialisation at work: The entrepreneurial discovery as a continuous process – S3 Working Paper Series No 12/2017. Available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC108571> Marinelli (2017) <https://publications.jrc.ec.europa.eu/repository/handle/JRC108571>

¹²⁰ Ibid.

- Iterative place-based strategy through continuous learning and feedback mechanisms within localised context.
- Innovation funding alignment.
- Strong for regions identifying key net zero industries to build on existing strengths.
- Key pillars include: Localisation, Prioritisation and Participation (drawing on quadruple helix model).¹²¹

What works

- Strong data and governance through effective EDP and regional data capture to help align strategic prioritisation with real-world economic conditions of regions.¹²²
- Industry engagement and active participation by key actors increases potential for impact.

What fails

- Poor data availability, low regional expertise in innovation policy and fragmented public agencies may undermine effective implementation of S3 strategies, resulting in disproportionate benefits.¹²³
- Dominant firms or interest groups may influence selection of key strategic areas to benefit themselves.
- Regions may focus too narrowly, creating vulnerability to economic shocks if selected niches decline within the market.¹²⁴
- S3 prioritises related diversification, meaning that new, emerging or disruptive industries may be overlooked for investment.
- Wealthier, more equipped regions (stronger industry networks, availability of human capital and innovation capability) benefit disproportionately.

Examples	Global ▪ European Union Regional Innovation Strategies (Europe) ▪ Renewable energy regions & cleantech innovation (Spain)
Key risks and trade-offs	▪ Over-specialisation resulting in regions focusing too narrowly on existing strengths, missing emerging opportunities.¹²⁵ ▪ In some regions, strategies may not align with actual regional knowledge strengths and skills, reducing effectiveness. ▪ Not applicable for regions needing rapid structural transformation without capabilities. ▪ Can exacerbate regional inequalities with more developed regions with stronger networks benefitting disproportionately.

¹²¹ European Commission (n.d.) S3 Community of Practice. Directorate-General for Regional and Urban Policy. Available at: https://ec.europa.eu/regional_policy/policy/communities-and-networks/s3-community-of-practice/about_en

¹²² McCann and Ortega-Argilés (2018) 'Smart specialisation as place-based policy: lessons learnt', Regions e-zine. Available at: <https://regions.regionalstudies.org/ezine/article/smart-specialisation-as-place-based-policy-lessons-learnt/>

¹²³ Ibid.

¹²⁴ Ibid.

¹²⁵ Ibid.

4 Place-based innovation models and theories

Place-based innovation models and theories

Triple/Quadruple/Quintuple Helix Model for Innovation

(Etzkowitz & Leydesdorff, 1998; 2000; Carayannis & Rakhmatullin 2014)

The Triple Helix model conceptualises innovation as emerging from systematic interaction between government, industry, and research institutions.¹²⁶ It frames innovation ecosystems as networked, co-evolving systems, where institutional boundaries blur and hybrid organisations (e.g. research commercialisation hubs) emerge.¹²⁷ These interconnected networks are critical to driving economic growth and competitiveness.¹²⁸ The extended models build on this by widening participation and purpose:

- **Quadruple Helix Model:** Adds civil society (e.g., communities, media, NGOs) as a fourth actor. This brings public values, user perspectives, and social acceptance into innovation, supporting co-creation and improving legitimacy.¹²⁹
- **Quintuple Helix Model:** Further adds the environment as a fifth dimension. Innovation is not only socially embedded but also ecologically grounded, aligning outcomes with sustainability and environmental stewardship.¹³⁰

Objectives

- Drive innovation-led regional growth.¹³¹
- Strengthen knowledge creation and diffusion.
- Enable commercialisation of research.
- Build globally competitive industrial ecosystems.

Scale

- National, regional
- Precinct / cluster level

¹²⁶ Etzkowitz and Leydesdorff (1998) The triple helix as a model for innovation studies. *Science and public policy*, 25(3), pp.195–203. <https://www.unimontagna.it/web/uploads/2022/12/The-Triple-Helix-as-a-model-for-innovation.pdf>

¹²⁷ Cai (2022) Neo-Triple Helix model of innovation ecosystems: integrating Triple, Quadruple and Quintuple Helix models. *Triple Helix*, 9(1), pp.76–106. https://brill.com/view/journals/thj/9/1/article-p76_7.pdf

¹²⁸ Etzkowitz and Leydesdorff (2000) The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research policy*, 29(2), pp.109–123. Available at: https://yvesgingras.uqam.ca/wp-content/uploads/sites/150/20Etzk-Leides.Triple.Helix_.pdf

¹²⁹ Carayannis and Rakhmatullin (2014) The quadruple/quintuple innovation helixes and smart specialisation strategies for sustainable and inclusive growth in Europe and beyond. *Journal of the Knowledge Economy*, 5(2), pp.212–239. Available at: <https://link.springer.com/article/10.1007/s13132-014-0185-8>

¹³⁰ Ibid.

¹³¹ Etzkowitz and Leydesdorff (2000) The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research policy*, 29(2), pp.109–123. Available at: https://yvesgingras.uqam.ca/wp-content/uploads/sites/150/20Etzk-Leides.Triple.Helix_.pdf

Governance and Delivery	▪ Network governance (non-hierarchical). ▪ Government-led policy and regulatory development, funding support for research. ▪ Anchored by universities, public research institutes, firms, start-ups. ▪ Delivered through innovation precincts, R&D partnerships, co-funded programs.
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Key Success Factors and design features

Government

Creates conditions for innovation by:

- Formulating industry and innovation policy.
- Developing regulation.
- Providing funding for research.

Research Institutes

- Knowledge-intensive institutions that:
- Provide technologies and platforms.
- Support R&D activity.
- Enable new and growing ventures without the high costs of capital-intensive industries.
- Support the translation of research into commercial outcomes.

Industry

- Established firms attract new firms and skilled labour to a location.
- Start-ups drive productivity through collaboration.
- Lead the commercialisation of research outcomes.

Examples

Global

- Innovation Centre (Denmark)
- Fraunhofer Society – accelerating advanced manufacturing and hydrogen economy (Germany)
- 22@Barcelona (Spain)

Australian

- Smart Sensing Network (New South Wales)
- mRNA Vaccine Manufacturing (Victoria)
- Future Food Systems Cooperative Research Centre

Key risks and trade-offs

- Weak industry demand.
- Fragmented governance.
- Over-reliance on academia without active investment.
- Risk of innovation without industrial scale-up.
- Spatial inequality if concentrated in major cities.

Mission-Oriented Innovation Policy (MOIP)

(Mazzucato 2018; Rodrik 2014)

Whilst a relatively new policy approach, mission-oriented innovation policies (MOIP) act as a central pillar of modern industrial policy, particularly in the context of market creation.¹³² Rather than targeting individual firms or sectors in isolation, this model sets clear, time-bound societal missions (e.g. achieving net zero emissions by 2050) and mobilises innovation, investment, and regulatory systems toward these goals rather than relying solely on market forces.¹³³ The Australian Government’s recent Strategic Examination of Research and Development (SERD) final report (2026) recommends an MOIP approach to support mobilisation and scaling of RD&I across Australia.¹³⁴

Rather than passively responding to market signals, they aim to foster deliberate direction for market creation, aligning public and private actors around solving complex. By combining purpose-driven innovation with coordinated policy tools, missions actively shape new markets and industries, not just support existing ones.¹³⁵

Objectives	▪ Solve large-scale, complex policy challenges (climate, energy transition). ▪ Direct innovation toward public value outcomes. ▪ Create new markets.
Scale	▪ National scale with often regional focus for delivery.
Governance and Delivery	▪ Central mission agencies (i.e. CSIRO) or early ‘pioneers’/groups demonstrate commitment and establish coordinated structures and key actions to guide change.¹³⁶ ▪ Leverage partnerships and inclusion of new participants to bring in additional tools, funding and expertise to scale impact.¹³⁷ ▪ Portfolio funding combined with public procurement.
Key Success Factors and design features	Key design features ▪ Clear targets and timelines. ▪ Policy coordination across domains.

¹³² Organisation for Economic Cooperation and Development (OECD) 2024, Mission-oriented innovation, OECD. Available at: <https://www.oecd.org/en/topics/sub-issues/mission-oriented-innovation.html>

¹³³ Organisation for Economic Co-operation and Development (OECD) 2024, Mission-oriented innovation policies for net zero, OECD Publishing, Paris. Available at https://www.oecd.org/en/publications/mission-oriented-innovation-policies-for-net-zero_5efdbc5c-en.html

¹³⁴ Commonwealth of Australia 2025, Ambitious Australia: Strategic Examination of R&D Final Report December 2025. Available at: <https://www.industry.gov.au/sites/default/files/2026-03/ambitious-australia-strategic-examination-of-research-and-development-final-report.pdf>.

¹³⁵ Organisation for Economic Cooperation and Development (OECD) 2024, Mission-oriented innovation, OECD. Available at: <https://www.oecd.org/en/topics/sub-issues/mission-oriented-innovation.html>

¹³⁶ Organisation for Economic Co-operation and Development (OECD) 2024, Mission-oriented innovation policies for net zero, OECD Publishing, Paris. Available at https://www.oecd.org/en/publications/mission-oriented-innovation-policies-for-net-zero_5efdbc5c-en.html

¹³⁷ Ibid.

- Evolving policy model that requires regular evaluation and evolution to enhance effectiveness and build on initial strategic plans developed by early ‘pioneers’ of the approach.¹³⁸
- Risk-sharing with industry.

What works

- Clarity, scale and coordination as key enablers to operationalise policy at a national scale.
- Strong ambition and promotion of broad objectives to address systemic and large-scale policy challenges.
- Entrepreneurship mindset and appetite for risk.

What fails

- Can be challenged by weak delivery capability at a state and regional level or misalignment between national policy objectives and state/regional level delivery.
- Poor budgeting allocation or share of funding can limit cooperation and motivation across partners, particularly across jurisdictions.
- Requires strong data capture and regular monitoring and evaluation of pilot projects to strengthen outcomes and continue to evolve policy, ensuring alignment with overarching mission objectives.¹³⁹
- Lack of regional tailoring to deliver place-based outcomes.

Examples

Global

- Horizon Europe – EU Missions (European Union)
- Moonshot R&D Program (Japan)
- Impulsing Paradigm Change through Disruptive Technologies (ImPACT) Program (Japan)

Australian

- Future Made in Australia
- AquaWatch Australia (CSIRO)
- Clean Hydrogen Mission

Key risks and trade-offs

- Political complexity often impeding capacity for achieving targets in line with aims for timing.¹⁴⁰
- Crowding out private innovation.
- High scrutiny to demonstrate impact and effectiveness due to long-term ambition and policy challenge.
- Overemphasis on technological innovation.
- Poor influence over broader policy due to misalignment in state versus national orientation.¹⁴¹
- Limited or insufficient engagement with private resources and stakeholders.

¹³⁸ Ibid.

¹³⁹ Ibid.

¹⁴⁰ Organisation for Economic Cooperation and Development (OECD) 2024, Mission-oriented innovation, OECD. Available at: <https://www.oecd.org/en/topics/sub-issues/mission-oriented-innovation.html>

¹⁴¹ Ibid.

Mission-Oriented Innovation Ecosystems

(Rodrik 2004; Mazzucato (2018;2021); Howard 2025; OECD 2025)

Mission-oriented innovation ecosystems are place-based innovation systems aligned to a clear public purpose (e.g. net zero), translating national priorities into regional delivery. They use missions as coordination mechanisms, aligning investment, institutions, and industry within specific regions.¹⁴²

This model reflects a shift toward directional, systems-based policy that shapes the path of innovation while enabling local adaptation based on the capabilities, skills, resources and competitive advantages of regions.¹⁴³ The Australian Government’s recent Strategic Examination of Research and Development (SERD) final report (2026) recommends this approach to support mobilisation and scaling of RD&I across Australia.¹⁴⁴

Objectives	▪ Align regional innovation activity with national strategic priorities. ▪ Accelerate development of mission-critical industries (e.g. net zero value chains).¹⁴⁵ ▪ Coordinate fragmented actors across the ecosystem. ▪ De-risk and crowd-in private investment.
Scale	▪ National (mission setting) ▪ Regional (delivery)
Governance and Delivery	▪ Central mission setting (national/state). ▪ Regional delivery through innovation precincts, industry clusters, public-private partnerships. ▪ Governance: strategic direction is centralised, however, implementation is locally adaptive.

¹⁴² Mazzucato, 2018, Mission-oriented innovation policies: challenges and opportunities, Industrial and Corporate Change, Volume 27, Issue 5, Pages 803–815, <https://doi.org/10.1093/icc/dty034>

¹⁴³ World Economic Forum, 2025, Innovation Ecosystems: A toolkit of principles and best practice. Available at: https://cisp.cachefly.net/assets/articles/attachments/95679_wef_innovation_ecosystems_2025.pdf

¹⁴⁴ Commonwealth of Australia 2025, Ambitious Australia: Strategic Examination of R&D Final Report December 2025. Available at: <https://www.industry.gov.au/sites/default/files/2026-03/ambitious-australia-strategic-examination-of-research-and-development-final-report.pdf>.

¹⁴⁵ Howard 2025, Behind the Buzz: How Innovation Ecosystems Deliver Value—and How to Measure It. Available at: <https://www.actoninstitute.au/post/behind-the-buzz-how-innovation-ecosystems-deliver-value-and-how-to-measure-it>

Key Success Factors and design features**Key design features**

- Clearly articulated mission with measurable outcomes.
- Coordinated policy mix (R&D, infrastructure, demand-side instruments).
- Long-term funding certainty.
- Institutional alignment across levels of government.
- Embedded evaluation and learning.

What works

- Clear, credible mission.¹⁴⁶
- Policy consistency over time.
- Strong regional capability to respond.
- Successful ecosystems under this model require alignment across capital, infrastructure, talent, and governance systems, not just funding.¹⁴⁷

What fails

- Weak translation from national strategy to regional delivery.
- Fragmented governance.

Examples**Global**

- EU Hydrogen Valleys (Europe)
- Innovate UK Catapult Network (United Kingdom)
- Regional Clean Hydrogen Hubs (H2Hubs) (United States of America)
- CERN Green Village (Geneva)

Australian

- Advance Queensland – whole-of-innovation ecosystem initiative (Queensland)
- AgTech Innovation Ecosystem (Central Queensland)

Key risks and trade-offs

- Over-centralisation reducing local innovation.¹⁴⁸
- Misalignment between national priorities and regional capabilities.
- Risk of “mission drift” without accountability.
- Not applicable where regional institutional capacity is weak.
- Strong where national mission priorities align with existing regional industrial base.
- Can build new systems, but works best in regions with existing capability.

¹⁴⁶ Howard 2026, How Innovation Districts Emerge: Pathways, Preconditions, and Policy Implications, Acton Institute for Policy Research and Innovation. Available at: <https://www.actoninstitute.au/post/how-innovation-districts-emerge-pathways-preconditions-and-policy-implications>

¹⁴⁷ OECD 2025, OECD Science, Technology and Innovation Outlook 2025: Driving Change in a Shifting Landscape, OECD Publishing, Paris, <https://doi.org/10.1787/5fe57b90-en>.

¹⁴⁸ Ibid.

Anchor-Based Clustering

(Audretsch & Feldman 1996; Porter 1998; Howard 2025; OECD 2025)

Anchor-based clustering builds innovation ecosystems around existing institutional or corporate anchors, such as major universities, hospitals, or globally significant firms. The model draws on agglomeration economics and innovation systems theory, showing that proximity to strong institutions creates cumulative advantages through knowledge spillovers, talent attraction, and firm formation.¹⁴⁹ Research highlights that anchor institutions play a disproportionate role, acting as hubs for talent, networks, and capital, meaning ecosystems are more effectively built on existing strengths rather than being created from scratch.¹⁵⁰

Objectives

- Leverage existing institutional strengths.
- Build dense innovation ecosystems.
- Attract firms, talent, and capital.

Scale

- Highly localised (precinct / district level).
- Can scale regionally over time.

Governance and Delivery

- Anchor institutions act as system leaders.
- Supported by local government, development agencies, private sector partners.¹⁵¹
- Governance tends to be network-based, with anchors providing coordination rather than central control.¹⁵²

Key Success Factors and design features

Key design features

- Co-location (innovation districts, science parks, startups).
- Strong university and industry linkages.
- Talent pipelines and mobility.
- Venture capital presence.
- Physical infrastructure enabling interaction.
- Density and connectivity as critical enablers.

¹⁴⁹ Porter (1998), Clusters and the new economics of competition, Harvard Business Review, vol. 76, no. 6, pp. 77–90.

Available at:

[https://dlwqtxtslxzle7.cloudfront.net/30781778/Michael Porter Cluster Location and the new economics of competitiveness-libre.pdf](https://dlwqtxtslxzle7.cloudfront.net/30781778/Michael%20Porter%20Cluster%20Location%20and%20the%20new%20economics%20of%20competitiveness-libre.pdf)

¹⁵⁰ Audretsch and Feldman (1996), 'Knowledge spillovers and the geography of innovation and production', American Economic Review, vol. 86, no. 3, pp. 630–640. Available at: <https://dlwqtxtslxzle7.cloudfront.net/4188195/audretsch-feldman-libre.pdf>

¹⁵¹ Beer, McKenzie and Stephenson (2019) 'Regional innovation governance and place-based policies: design, implementation and implications', Regional Studies, Regional Science, vol. 6, no. 1, pp. 1–19. Available at: <https://www.tandfonline.com/doi/epdf/10.1080/21681376.2019.1578257>

¹⁵² Porter (1998), Clusters and the new economics of competition, Harvard Business Review, vol. 76, no. 6, pp. 77–90. Available at:

[https://dlwqtxtslxzle7.cloudfront.net/30781778/Michael Porter Cluster Location and the new economics of competitiveness-libre.pdf](https://dlwqtxtslxzle7.cloudfront.net/30781778/Michael%20Porter%20Cluster%20Location%20and%20the%20new%20economics%20of%20competitiveness-libre.pdf)

What works

- Globally competitive anchor institutions.
- Strong knowledge-commercialisation pathways.
- Access to capital.

What fails

- Weak translation from research to industry.
- Lack of scale-up pathways.
- Over-reliance on a single anchor.

Examples**Global**

- MIT Kendall Square (United States of America)
- Medicon Valley (United States of America)
- Stanford/Silicon Valley (United States of America)

Australian

- TechCentral (New South Wales)
- Monash Technology Precinct (Victoria)
- Adelaide BioMed City (South Australia)
- Macquarie Park Innovation District (New South Wales)

Key risks and trade-offs

- Spatial concentration resulting in inequality.
- Over-specialisation.
- Vulnerability if anchor declines.
- Not applicable where no strong anchor exists.
- Strong option where universities, firms or institutions already have an established presence or lead within the sector.¹⁵³

¹⁵³ OECD (2025), OECD Science, Technology and Innovation Outlook 2025: An ecosystems approach to industrial policy, OECD Publishing, Paris. Available at: https://www.oecd.org/en/publications/oecd-science-technology-and-innovation-outlook-2025_5fe57b90-en/full-report/an-ecosystems-approach-to-industrial-policy_a9c00ad7.html

National & Regional Innovation Systems (NIS/RIS)

Freeman (1987); Lundvall (1992); Nelson (1993); Fagerberg et al. (2005)

NIS/RIS frameworks conceptualise innovation as the outcome of interactions between institutions, including firms, universities, governments, and financial systems.¹⁵⁴ OECD (2025) builds on this idea but argues that traditional NIS/RIS approaches must evolve toward more granular, place-based and ecosystem-oriented models, particularly for addressing complex transitions like net zero. NIS focuses on the country as a whole, while RIS emphasises local and regional dynamics, leveraging unique assets, industrial clusters, and networks.¹⁵⁵

Objectives	▪ Accelerate innovation and technology diffusion. ▪ Foster regional economic development and resilience. ▪ Build competitive advantage in key sectors. ▪ Support industry transitions through localised innovation networks.¹⁵⁶
Scale	▪ NIS: National-level, broad policy framework, coordination of R&D and national strategies.¹⁵⁷ ▪ RIS: Regional/local scale, targeting specific place-based clusters, industries, or ecosystems.¹⁵⁸
Governance and Delivery	▪ Multi-level governance structure, where national agencies coordinate funding, standards, and strategic direction.¹⁵⁹ ▪ Regional bodies implement local programs and cluster initiatives. ▪ Incubators, accelerators, innovation hubs, collaborative R&D programs, start-ups and public-private partnerships act as key delivery mechanisms.

¹⁵⁴ Fagerberg and Sapprasert (2011) National innovation systems: the emergence of a new approach, Science and Public Policy, Volume 38, Issue 9, Pages 669–679, <https://doi.org/10.3152/03023421X13070021633369>

¹⁵⁵ World Economic Forum (2025), Innovation ecosystems 2025, World Economic Forum, Geneva. Available at: https://reports.weforum.org/docs/WEF_Innovation_Ecosystems_2025.pdf

¹⁵⁶ Productivity Commission (2023), An overview of innovation policy, Supporting Paper No. 12, Productivity Review, Australian Government, Canberra. Available at: <https://assets.pc.gov.au/inquiries/completed/productivity-review/report/productivity-review-supporting12.pdf>

¹⁵⁷ Howard (2023), Policy imperatives for national innovation ecosystem development, Acton Institute for Policy Research and Innovation, Canberra. Available at: <https://www.actoninstitute.au/post/policy-imperatives-for-national-innovation-ecosystem-development>

¹⁵⁸ OECD (2025), Regional impact of public R&D organisations: Insights and international comparisons for innovation diffusion in the United Kingdom, OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/regional-impact-of-public-r-d-organisations_3a4d4c0a/587d7e6c-en.pdf

¹⁵⁹ Beer, McKenzie and Stephenson (2019) ‘Regional innovation governance and place-based policies: design, implementation and implications’, Regional Studies, Regional Science, vol. 6, no. 1, pp. 1–19. Available at: <https://www.tandfonline.com/doi/epdf/10.1080/21681376.2019.1578257>

Key Success Factors and design features	Key design features ▪ Networks of firms, research institutions, investors, and policymakers generate critical mass and connectivity within regions.¹⁶⁰ ▪ Targeted investment via place-based, sector focused support for R&D and innovation initiatives. ▪ Alignment of regional and national innovation, industrial, and spatial policy to maximise outcomes. ▪ Continuous program monitoring and evaluation strengthens impact of policy interventions. ▪ Physical (labs, testing facilities) and soft infrastructure (skills, business advisory services) support outcome delivery. What works ▪ Leveraging strong local-industrial knowledge and networks. ▪ Facilitating multi-level coordination between national and regional bodies.¹⁶¹ ▪ Applying sufficient scale and sustained funding to reach critical mass.¹⁶² ▪ Establishing clear sector focus aligned with local capabilities. What fails ▪ Without proper establishment, fragmented governance can result in misalignment between national and local objectives.¹⁶³ ▪ Insufficient funding or overly small-scale initiatives can impact achievement of sustained outcomes. ▪ Model can result in overreliance on a single sector without diversification.¹⁶⁴ ▪ Potential for circumstances where regions/state may force clusters where critical mass or local capability is missing.¹⁶⁵
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¹⁶⁰ SGS Economics and Planning (2023), Australia needs a new spatial industry strategy, SGS Economics and Planning, Canberra. Available at: https://sgs-assets.spicyweb.net.au/main/SGS-Economics-and-Planning_Australia-needs-a-new-spatial-industry-strategy.pdf

¹⁶¹ OECD (2019), What works in innovation policy? New insights for regions and cities, OECD Publishing, Paris. Available at: https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/07/what-works-in-innovation-policy-new-insights-for-regions-and-cities_0532aeb5/4419aef4-en.pdf

¹⁶² Ibid.

¹⁶³ Beer, McKenzie and Stephenson (2019) 'Regional innovation governance and place-based policies: design, implementation and implications', Regional Studies, Regional Science, vol. 6, no. 1, pp. 1–19. Available at: <https://www.tandfonline.com/doi/epdf/10.1080/21681376.2019.1578257>

¹⁶⁴ Ibid.

¹⁶⁵ Ibid.

Examples	Global	Australian
	▪ Fukuoka Region (Japan) ▪ Dutch Province of Noord Brabant (South Netherlands Region Global Knowledge Hub) – Eindhoven (“Brainport”) (Netherlands) ▪ Baden-Württemberg (Germany) ▪ Montreal Region Quebec (Canada)	▪ AgTech Regional Innovation Network (Victoria) ▪ Central Queensland Region (advanced manufacturing) ▪ NSW Central Coast Region (advanced manufacturing) ▪ Upper Spencer Gulf Region (mining & heavy industry)
Key risks and trade-offs	▪ Balancing national strategic priorities with local interests and capacity for adaptation. ▪ Avoiding short-term experimentation for innovation without clear evaluation frameworks. ▪ Ensuring equitable participation of SMEs and regional actors.¹⁶⁶ ▪ Managing risk of political capture by dominant firms or universities.¹⁶⁷	

¹⁶⁶ Fagerberg and Sapprasert (2011) National innovation systems: the emergence of a new approach, Science and Public Policy, Volume 38, Issue 9, Pages 669–679, <https://doi.org/10.3152/030234211X13070021633369>

¹⁶⁷ Ibid.

Phased Urban Integration

(Howard 2025; OECD 2025)

Phased urban integration recognises that innovation ecosystems develop incrementally over long time horizons, through sequenced investment, institutional learning, and policy adaptation. Rather than attempting to build an ecosystem rapidly, this approach focuses on staging development and focusing on four core domains for innovation ecosystems: Placemaking, Economics, Business, and Governance.¹⁶⁸ Research emphasises that successful ecosystems require patient capital, institutional continuity, and adaptive governance, all of which are central to this model.^{169, 170}

Objectives	▪ Enable sustainable, long-term ecosystem growth. ▪ Build trust and institutional capacity over time. ▪ Avoid boom–bust development cycles.
Scale	▪ Urban / regional ▪ Expands over time as ecosystem matures
Governance and Delivery	▪ Long-term institutional stewardship. ▪ Iterative policy design. ▪ Strong role for local government and anchor institutions. ▪ Governance is characterised by continuity and adaptability.¹⁷¹
Key Success Factors and design features	Key design features ▪ Staged infrastructure investment. ▪ Long-term land use planning. ▪ Incremental cluster development. ▪ Blended finance models. ▪ Continuous stakeholder engagement. ▪ Supports organic growth while maintaining strategic direction. What works ▪ Policy stability over decades. ▪ Patient capital. ▪ Strong institutional trust within governance model.

¹⁶⁸ Howard (2025), Beyond buzzwords: An integrated framework for understanding place-based innovation ecosystems, Acton Institute for Policy Research and Innovation, Canberra. Available at:

<https://www.actoninstitute.au/post/beyond-buzzwords-an-integrated-framework-for-understanding-place-based-innovation-ecosystems>

¹⁶⁹ World Economic Forum (2025), Innovation ecosystems 2025, World Economic Forum, Geneva. Available at:

https://cisp.cachefly.net/assets/articles/attachments/95679_wef_innovation_ecosystems_2025.pdf

¹⁷⁰ Global Institute on Innovation Districts (GIID) (n.d.), What are innovation districts?, Global Institute on Innovation Districts, USA. Available at: <https://giid.org/articles/what-are-innovation-districts/>

¹⁷¹ OECD (2025), Place-based industrial policy, OECD Publishing, Paris. Available at:

https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/place-based-industrial-policy_e4bba733/43edc0df-en.pdf

What fails

- Short political cycles.
- Fragmented governance.
- Premature scaling.

Examples**Global**

- Cambridge Science Park (United Kingdom)
- MIT Kendall Square (United States of America)
- One North (Singapore)
- 22@Barcelona (Spain)
- Porto Digital (Recife, Brazil)

Australian

- Parkville Biomedical Precinct (Victoria)
- Fisherman's Bend (Victoria)
- Western Sydney Aerotropolis (New South Wales)

Key risks and trade-offs

- Slow delivery timelines.
 - Risk of losing momentum.
 - Difficulty maintaining alignment across governments.
 - Not suitable where rapid economic transformation is required immediately.
 - Challenging to generate success in politically volatile environments.
 - Strong option for planned precincts and long-term regional transformations.
 - Starting points can start small and scale gradually over time.
-

Global Institute on Innovation Districts (GIID) Framework

Wagner, Katz and Biancuzzo (2024)

The Global Institute on Innovation Districts (GIID) Framework is used by governments and leaders around the world as a tool to support innovation precincts to scale and thrive.¹⁷² The GIID Framework provides a theory of change for how innovation precincts grow and develop successfully. It focuses on how economic, physical, and networking assets combine to create innovation ecosystems.¹⁷³

The GIID Framework sets out a series of connected strategies which can be deployed together in order to achieve a precinct’s ambitions, noting that the three most common ambitions across global innovation precincts are to build industrial critical mass, advance sustainability, and advance equity and inclusion.¹⁷⁴

Objectives

- Enable system-wide coordination of industrial policy.
- Address structural and coordination failures across the value chain.
- Accelerate development and scaling of emerging industries.
- Align public and private actors around shared outcomes.
- Create self-reinforcing regional industrial ecosystems.

Scale	▪ National (setting policy conditions) ▪ Regional (where system integration occurs) ▪ Precinct/cluster (delivery)
Governance and Delivery	▪ Governance under GIID is integrative rather than hierarchical, requiring coordination across multiple actors and policy domains.

¹⁷² Global Institute on Innovation Districts (GIID) (n.d.), What are innovation districts?, Global Institute on Innovation Districts, USA. Available at: <https://giid.org/articles/what-are-innovation-districts/>

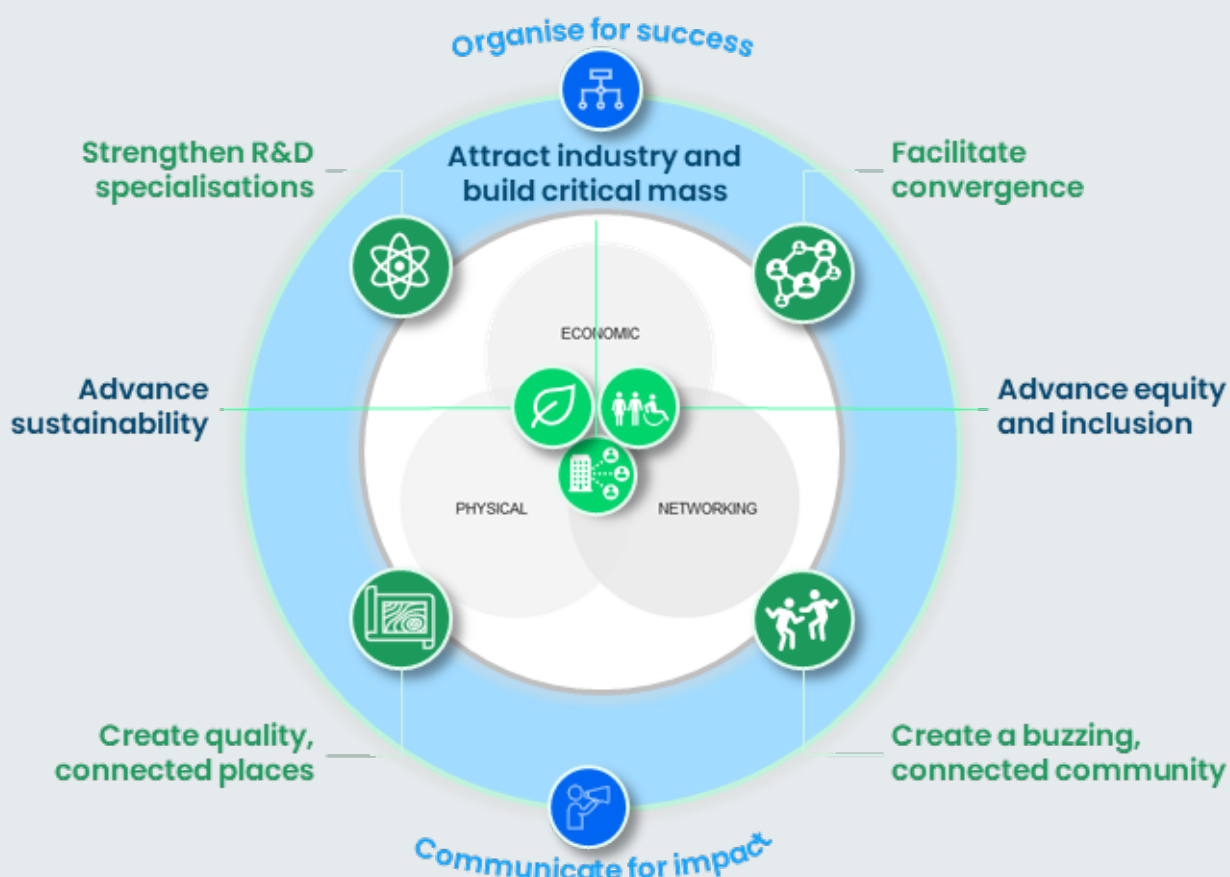
¹⁷³ World Economic Forum (2025), Innovation ecosystems 2025, World Economic Forum, Geneva. Available at: https://reports.weforum.org/docs/WEF_Innovation_Ecosystems_2025.pdf.

¹⁷⁴ Ibid.

Key Success Factors and design features

Key design features

- **Economic assets** are the firms, institutions and organisations that drive, cultivate or support an innovation-rich environment.
- **Physical assets** are the public and privately-owned spaces—buildings, open spaces, streets and other infrastructure—designed and organised to stimulate new and higher levels of connectivity, collaboration, and innovation.
- **Networking assets** are the relationships between actors – such as between individuals, firms, and institutions – that have the potential to generate, sharpen, and/or accelerate the advancement of ideas.¹⁷⁵
- Supports new industry creation and industrial transition.
- Highly effective for early-stage innovation and commercialisation.
- Flexible model across regional contexts.



¹⁷⁵ Global Institute on Innovation Districts (GIID) (2023), Why government matters: The role of the public sector in innovation districts, Global Institute on Innovation Districts, USA. Available at:

https://www.giid.org/app/uploads/2023/06/GIID_Why_Gov_Matters_Final_June-15.pdf

Examples

Global

- MIT Kendall Square (United States of America)
- 22@ Barcelona (Spain)
- Toronto MaRS Discovery District (Canada)
- Stockholm Green Innovation District (Sweden)

Australian

- TechCentral (New South Wales)
- Monash technology Precinct (Victoria)
- Melbourne Connect & Melbourne Innovation Districts – City North (Victoria)
- Tonsley Innovation District (South Australia)

Key risks and trade-offs

- Complexity of coordination resulting in slow decision-making.
- Risk of over-engineering systems without market viability.
- Misallocation of capital if demand signals are weak.
- Institutional overload at regional level.
- Not applicable where institutional capacity is weak, or where underlying industrial or resource bases do not exist.

5

Short-list of innovation and industrial policy models

Short-list of place-based innovation and industrial policy models

Refining the long-list of place-based innovation and industrial policy models

To understand which policy models and approaches should be further explored in detail, a long-list of policy models were assessed. The assessment was guided by a set of seven assessment criteria points. These criteria evaluated each model's relevance to net zero transition pathways, strength of evidence and maturity, transferability to the Australian context, ability to operate at meaningful scale, and overall delivery complexity and time to impact. Each model was ranked as having a low, medium or high alignment to the seven assessment criteria points.

The assessment resulted in a shortlist of policy models for deeper assessment.

Figure 5 – Assessment process



Table 13 – Criteria to guide assessment of the long-list policy models

Assessment criteria	Guiding assessment question
Relevance to net zero transition pathways	Can the model support net zero objectives (for example clean energy, green industry, emissions reduction, or enabling infrastructure), rather than broader or indirect innovation goals?
Evidence of delivering outcomes and impact	Is there credible evidence the model has delivered outcomes elsewhere, and delivered impact (versus being experimental or unproven)?
Applicability to Australian context	Can the model reasonably translate to Australia's policy, regulatory, and market settings without requiring fundamental system changes?
Applicability to regional settings	Has the model been successfully applied outside major cities, or is it inherently dependent on dense urban ecosystems, large population bases, or major research institutions?
Ability to operate at scale	Can the model be deployed at a scale relevant to regional economies and the net zero transition, rather than being niche, pilot based, or limited in impact?
Ease of implementation	Is the model relatively straightforward to implement within realistic timeframes, without requiring excessive coordination, long lead times, or high institutional complexity?
Role of Government and delivery capability	Is the role of government clearly defined, and does it have the mandate, capability, and levers required to implement the model successfully?

Assessment of long-list of place-based industrial and innovation models

The following table provides an overview of the assessed policy models against the seven criteria points. The assessment ratings are articulated in the table below, noting these are subjective and any assessment would be based on Urbis' professional judgement with the intent of focussing NZEA's consideration of shortlisted options and the likely benefits, success factors, and implementation considerations. Alignment is assessed on a three-point scale against the criteria points, where Low indicates limited alignment, Medium indicates moderate alignment, and High indicates strong alignment.

Table 14 – Table of assessment

	Policy model	Relevance to net zero transition pathways	Evidence of delivering outcomes and impact	Applicability to Australian context	Applicability to regional settings	Ability to operate at scale	Ease of implementation	Role of government and delivery capability
Industrial	Mission-Oriented / Market Creation Industrial Policy	High	Medium	High	High	High	Low to Medium	High
Industrial	Strategic Targeting Model	Medium	Medium	Medium	High	Low to Medium	Medium	Medium to High
Industrial	Green / Just Transition Industrial Policy	High	Medium	High	High	High	Medium	High
Industrial	Agency-based Approaches to Place-Based Industrial Strategy	Medium	Medium	High	High	Medium	Medium	High
Industrial	Embedded Autonomy (Developmental State)	Medium	Medium	Low	Medium	High	High	High
Industrial	Special Economic Zones	Low to Medium	Medium	Low	Medium	High	Medium	High
Industrial	Smart Specialisation Strategy (S3)	Medium	Medium	Low	High	Medium to High	Medium to High	Medium

Policy model		Relevance to net zero transition pathways	Evidence of delivering outcomes and impact	Applicability to Australian context	Applicability to regional settings	Ability to operate at scale	Ease of implementation	Role of government and delivery capability
Industrial	Industrial Ecosystem Model	Medium to High	High	Medium	High	Low	Low	Medium
Industrial	Cluster-based Industrial Policy^	High	High	High	Medium	High	High	Medium
Innovation	Triple / Quadruple / Quintuple Helix Model for Innovation	High	High	High	Medium	High	Low	High
Innovation	Mission-Oriented Innovation Policy (MOIP)	High	High	High	Low	High	Low to Medium	High
Innovation	Mission-Oriented Innovation Ecosystems^	High	High	High	High	High	Low to Medium	High
Innovation	Anchor-Based Clustering	Low to Medium	High	High	Low	Medium	Medium	Medium
Innovation	National & Regional Innovation Systems (NIS/RIS)	Medium	Medium	High	High	Medium	Medium	Medium
Innovation	Phased Urban Integration	Low to Medium	Low to Medium	Medium	Medium to High	Low	High	High
Innovation	Global Institute on Innovation Districts (GIID)	Low	Medium to High	High	Low	High	Medium	Low to Medium

Shortlisted policy approach & international case studies

The following place-based industrial and innovation policy models scored the highest against the assessment criteria. Relevant international case studies were selected in consultation with NZEA.

Policy Model	Assessment Results	International Case Studies
Mission-Oriented Innovation / Market Creation Industrial Policy	This model scored highly on relevance to transition pathways, evidence of delivering outcomes and impact, applicability to Australian and regional settings, ability to operate at scale, and role of government and delivery capability.	Barrow-in-Furness, United Kingdom
Agency-based Approaches to Place-Based Industrial Strategy	This model scored highly on relevance to net zero transition pathways, applicability to Australian and regional settings, and role of government and delivery capability.	Japan: Ministry of Economy, Trade and Industry (METI) – Hokkaido Prefecture
Green / Just Transition Industrial Policy	This model scored highly on relevance to net zero transition pathways, applicability to Australian and regional settings, ability to operate at scale, and role of government and delivery capability.	Germany Ruhr Green Transition
Mission-Oriented Innovation Ecosystems	This model scored highly in terms of relevance to net zero transition pathways, evidence of delivering outcomes and impact, applicability to Australian and regional settings, and ability to operate at scale.	Innovate UK Catapult Centres (Energy, Offshore, High Value Manufacturing)
Cluster-based Industrial Policy	This model scored highly on relevance to net zero transition pathways, evidence of delivering outcomes, applicability to the Australian context, ability to operate at scale, and ease of implementation.	South Korea Tripartite System Space Industry Cluster
Mission-Oriented Innovation / Market Creation Industrial Policy	This model scored highly on relevance to net zero transition pathways, evidence of delivering outcomes and impact, applicability to Australian and regional settings, ability to operate at scale, and role of government and delivery capability.	Industriklivet – Swedish Green Steel Industrial Policy
Cluster-based Industrial Policy / Agency-based approach	This model scored highly with relevance across federally coordinated links between specialised regions through funding, tax incentives and infrastructure to mobilise private capital across a dispersed economy.	Canada – place-based industrial policy across vast and dispersed regions

Following preliminary analysis of the selected international case studies which demonstrated limited alignment to First Nations contexts, NZEA and Urbis agreed that two First Nations-specific international case studies were required the two selected case studies are as follows.

Long-run jurisdictional comparator	A Treaty-based economic participation model demonstrating cross-sector Indigenous economic integration at scale over the long run.	The Māori Economy, New Zealand
Institutional design for NZEA's brokering role	A federally backed clean energy coordination model demonstrating structured brokering between First Nations communities and the energy transition, with a funding-cliff risk cautioning against short electoral-cycle horizons	Wah-ila-toos, Canada

6

International Case Studies

International Case Studies

Purpose & Approach

This section draws on a selection of global case studies that reflect a range of key themes and approaches to place-based industrial and innovation policy. These case studies represent different place-based approaches and policies, and span across North America, Europe and Asia. Each of the case studies have been selected as they contain key learnings, success factors or challenges that are relevant to the current state of the Australian energy transition. These case studies are used to understand the attributes and drivers of the policies and approaches, what has driven success, where challenges have emerged, and how outcomes have been sustained over time, with a focus on lessons that are transferable to Australian settings.

Analytical focus

The case studies analysis includes:

- Selection of relevant global case studies that span diverse delivery models and policy approaches.
- Identification of success enabling factors, including policy design characteristics (such as scale, sequencing and coordination) and place-based attributes (including competitive advantage, market demand, institutional capability and infrastructure readiness).
- Examination of policy levers and mechanisms used to influence outcomes, including funding, regulation, coordination arrangements and capability-building initiatives.
- Identification of key challenges and constraints encountered during implementation, including coordination complexity, workforce pressures and infrastructure needs.

Several of the case studies are recent or still evolving, and the analysis therefore focuses on observed design features and early signals rather than making judgements about effectiveness or long-term success.

Framework for comparison

To synthesise insights across the case studies, a matrix-based framework has been developed to identify alignment of the case studies with successful place-based industrial approaches and attributes. These include:

- Identification of recurring patterns in success factors, including how combinations of policy levers and enabling conditions shape outcomes.
- Common attributes of effective approaches, with a focus on governance, delivery models, and approaches to managing risk and uncertainty.
- Enabling and sustaining factors*, including the role of common-user infrastructure, regional government presence, community sentiment and confidence, and the continuation of impacts over time.
- Structured assessment of key dimensions within the matrix, including prevalence, sequencing, prioritisation, relative importance, social licence, community sentiment and durability of impact.

This approach recognises that place-based industrial policy operates within complex systems and long time horizons. Rather than seeking to identify a single best-practice model, the case studies are used to highlight patterns, opportunity costs and considerations that can inform future policy development.

Note: Enabling factors, as observed across the case studies, reflect the combination of policy tools, institutional arrangements and market shaping mechanisms that together created the conditions for industrial and innovation policy to take hold. They are not an exhaustive checklist of prerequisites for successful place-based industrial and innovation policy, but rather the distinctive mix of factors that made each approach viable in its specific context.

Case study selection was guided by a set of key criteria, including global coverage, relevance to the Australian context, a diverse range of place-based approaches and policy settings, and variation across industrial and innovation focus. The selected case studies have been included for differing but complementary reasons; some are of interest for the policy models they employ, others for their demonstrated and quantified outcomes, others for their innovative approaches to delivery, and others for the transferable lessons they offer to the Australian context.

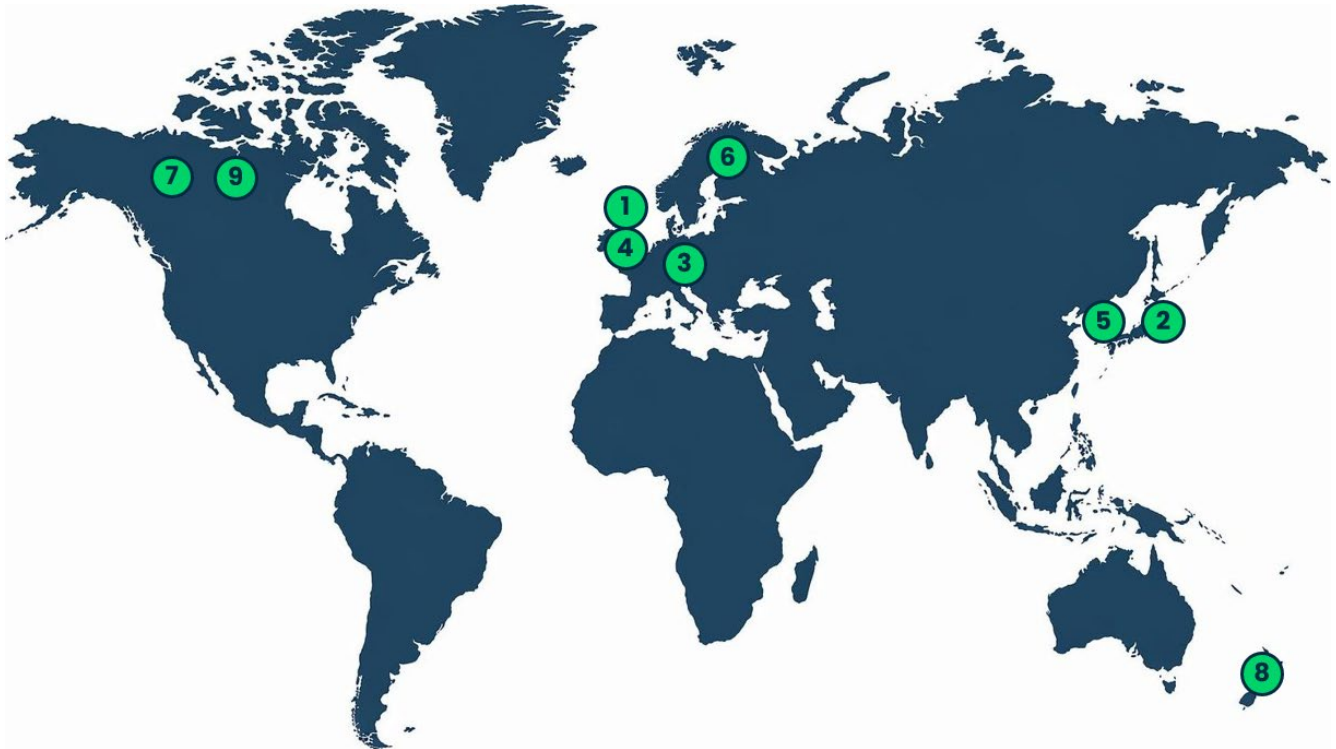
The below table shows the selected case studies and applicable place-based approach.

Table 15 Overview of international case studies

Place-based policy approach	International Case Study	Overview
Mission-Oriented Innovation / Market Creation Industrial Policy	Barrow-in-Furness, United Kingdom	Defence-shipbuilding strategy with strong central coordination, long-term government procurement and investment in local enabling infrastructure.
Agency-based Approaches to Place-Based Industrial Strategy	Japan: Ministry of Economy, Trade and Industry (METI) – Hokkaido Prefecture	Central economic agency aligning regional investment, R&D funding and market-shaping tools for strategic industries and regional transition.
Green / Just Transition Industrial Policy	Germany Ruhr Green Transition	Long-term restructuring of a legacy industrial region through sustained federal involvement, workforce transition and supply-chain reconfiguration.
Mission-Oriented Innovation Ecosystems	Innovate UK Catapult Centres, United Kingdom (Energy, Offshore, High Value Manufacturing)	Network of translational institutions sharing R&D, testing and demonstration infrastructure to bridge research and commercialisation.
Cluster-based Industrial Policy	South Korea Tripartite System Space Industry Cluster	Multi-region space strategy assigning specialised roles across three regions; manufacturing, R&D and launch, coordinated nationally with variable regional alignment.

Place-based policy approach	International Case Study	Overview
Mission-Oriented Innovation / Market Creation Industrial Policy	Industriklivet –Swedish Green Steel Industrial Policy	Green transition using low-cost renewable energy and public co-funding to de-risk pilots and scale low-carbon steel in northern Sweden.
Cluster-based Industrial Policy / Agency-based approach	Canada – place-based industrial policy across vast and dispersed regions	Federally coordinated ecosystem between seven specialised regions through funding, tax incentives and infrastructure to mobilise private capital across a dispersed economy.
First Nations case study	The Māori Economy, New Zealand	Cross-sector economic participation, long-run jurisdictional comparator.
First Nations case study	Wah-ila-toos, Canada	Clean energy coordination, institutional design of government brokering role.

International case study locations



- 1 Barrow-in-Furness, United Kingdom
- 2 Japan: Ministry of Economy, Trade and Industry (METI) – Hokkaido Prefecture
- 3 Germany: Ruhr Green Transition
- 4 Innovate UK Catapult Centres (Energy, Offshore, High Value Manufacturing)
- 5 South Korea Tripartite System Space Industry Cluster
- 6 Industriklivet – Swedish Green Steel Industrial Policy
- 7 Canada: Place-based industrial policy across vast and dispersed regions
- 8 The Māori Economy, New Zealand
- 9 Wah-ila-toos, Canada

Case Study 1

United Kingdom: Barrow-in-Furness

Market Creation Industrial Policy

Headlines

- Aligns nationally significant defence-industrial expansion with local regeneration and infrastructure program including housing, health, transport and town centre renewal, alongside industrial investment.
- Established a single place-based delivery framework (Team Barrow) bringing together central government, local government and BAE Systems to coordinate priorities, approve project funding (Barrow Delivery Board), sequence investment and resolve delays.
- Underpinned by the Plan for Barrow – *Barrow Rising*, a formal 10-year transformation plan (2025–2035) with dedicated transformation fund tied explicitly to plan's delivery horizon. A near-term delivery plan (2024–2027) provides a short-term horizon operational layer within the longer-term strategic framework to support governance establishment, PMO staffing, independent chair appointment and commencement of the transformation agenda¹⁷⁶
- Committed £200 million over 10 years through the Barrow Transformation Fund to support enabling infrastructure, housing, workforce capability, transport and place-making linked to the Barrow Rising agenda.

Core distinguishing factors include:

- i) Trilateral governance framework between local and Federal Government and BAE Systems.
- ii) Integration of social infrastructure as industrial enablers.
- Early delivery momentum is evident, including housing starts, transport upgrades and workforce investment aligned to industrial growth timelines¹⁷⁷.
- As a region with a strong industrial heritage and established defence manufacturing base, Barrow was not in structural decline, but rather, in this case the challenge was in managing the pace and pressure of rapid industrial expansion driven by significant government defence procurement, and ensuring the local community and enabling infrastructure could keep up¹⁷⁸.

¹⁷⁶ Barrow Rising – Progress, 2025 <https://barrowrising.uk/progress/>
<https://barrowrising.uk/2025/07/unveiling-our-10-year-transformation-plan/>

¹⁷⁷ Barrow Rising – Progress, 2025 <https://barrowrising.uk/progress/>

¹⁷⁸ <https://www.cumbria-industries.org.uk/barrow-1901-a-description-of-its-industries/>

Context

Barrow-in-Furness is a prominent industrial shipyard and port town, located within Cumbria, northwest England. The region has been at the heart of the UK's shipbuilding and defence manufacturing industry since the 19th century. Recent industrial policy shifts have sought to support the benefits of expanded defence investment and manufacturing activities in the region. The approach emerged in response to rapid expansion of the UK's sovereign capability under the Dreadnought Alliance, SSN-AUKUS programs and Nuclear Defence Enterprise¹⁷⁹.

Industrial transition in Barrow-in-Furness has been characterised by a place-based industrial policy approach, in which industrial expansion of submarine manufacturing and construction is being coordinated alongside housing, transport, workforce capability, public health and urban regeneration through a single delivery structure and decade-long transformation plan¹⁸⁰. The strategy is underpinned by a partnership between the UK government, Westmorland and Furness Council and BAE Systems and more than £200 million in UK Government investment under the Barrow Transformation Fund tied to the 10-year transformation agenda for Barrow¹⁸¹.

Timeline

- **2022:** UK Government announces major investment commitments into the Dreadnought submarine program and sovereign defence capability expansion.
- **2023:** Team Barrow and governance structures formalised to coordinate regional transformation and delivery priorities.
- **2024:** Expansion of Barrow Rising implementation and infrastructure planning workstreams across housing, transport, workforce and regeneration.
- **2025:** Release of updated Barrow Rising 2025–2035 strategic framework and long-term investment sequencing agenda.

Place-based approach or policy

- Single place-based industrial delivery framework – aligning industrial expansion, urban regeneration and enabling infrastructure and placemaking investment.
- Trilateral public-private partnership/governance structure established involving UK government, Westmorland and Furness Council and BAE Systems to deliver Barrow Rising strategy (via Team Barrow & Barrow Delivery Board)¹⁸².

¹⁷⁹UK Government, 2026 <https://www.gov.uk/government/publications/defence-nuclear-enterprise-2025-annual-update-to-parliament/defence-nuclear-enterprise-2025-annual-update-to-parliament>

¹⁸⁰ Barrow Rising, 2024 <https://barrowrising.uk/2025/07/unveiling-our-10-year-transformation-plan/>

¹⁸¹ <https://barrowrising.uk/2025/07/unveiling-our-10-year-transformation-plan/>

¹⁸² <https://barrowrising.uk/our-plan/>

- The partnership emerged from a shared recognition between the UK government, Westmorland and Furness Council and BAE Systems that sustaining submarine delivery required a coordinated, place-based response beyond defence investment alone¹⁸³.
- From 2023, cross-government collaboration and local council meetings, followed by a six-month “deep dive” into Barrow’s socioeconomic and workforce needs provided the evidence based for formal agreement on Barrow’s 10-year transformation agenda and establishment of the formal governance model. This was further endorsed by senior government officials and backed by the £200 million+ Barrow Transformation Fund¹⁸⁴. (House of Commons Defence Committee, 2025b).
- The Barrow Rising Strategy focuses on revitalising Barrow’s Town Centre and place renewal, with investment into public realm, transport connectivity, new housing and local amenities and services. The plan’s three priority areas centre around (1) town centre and housing, (2) creating the conditions for growth, and (3) reformed public services¹⁸⁵ (Barrow Rising, 2024).
- Key initiatives under the strategy focus on traditional economic development functions, including town centre improvements, local business and community grants, improved public services and facilities, in addition to enhancing infrastructure to support innovation, education and connectivity.
- Governance model designed to coordinate rather than replace institutions across health, housing, transport, education, skills and economic development.
- Strong focus on sequencing infrastructure, workforce capability and industrial growth together to support long-term needs and Defence Nuclear Enterprise mandate. The model recognises housing, transport, health, education and liveability as critical industrial policy imperatives rather than separate social issues.
- Alongside industrial expansion, long-term broader objectives include strengthening local supply chains, expanding SME participation and enabling economic diversification.

Regional economic transition plan or strategy

- Underpinned by the Plan for Barrow – Barrow Rising, a formal 10-year transformation plan (2025–2035) with dedicated transformation fund tied explicitly to plan’s delivery horizon. A near-term delivery plan (2024–2027) provides a short-term horizon operational layer within the longer-term strategic framework to support governance establishment, PMO staffing, independent chair appointment and commencement of the transformation agenda¹⁸⁶.

¹⁸³ House of Commons Defence Committee, 2025a <https://committees.parliament.uk/oralevidence/16787/docx>

¹⁸⁴ House of Commons Defence Committee, 2025b) <https://committees.parliament.uk/oralevidence/16787/docx>

¹⁸⁵ Barrow Rising, 2024 <https://barrowrising.uk/our-plan/>

¹⁸⁶ Barrow Rising, 2025 https://barrowrising.uk/wp-content/uploads/2025/07/BarrowRising_10YearPlanForBarrow.pdf

Problem or catalyst for change	▪ Rapid expansion and need for submarine production and defence activity following significant government investment and mandate of the UK's Defence Nuclear Enterprise¹⁸⁷. ▪ Longstanding skills shortages, labour market challenges and work retention issues constraining industrial growth capacity. ▪ Existing transport, housing and public service infrastructure insufficient to support the projected industrial expansion. ▪ Barrow economy heavily dependent on singular strategic industrial base and government defence procurement cycles. ▪ Concern that industrial expansion alone would not automatically generate regional economic growth without deliberate coordination and investment across a range of areas. ▪ Increased pressure for government to act in this case due to the strategic and national security significance of the submarine production – particularly given geopolitical context and the Defence Nuclear Enterprise and Dreadnought Alliance.
Region and market place-based characteristics	▪ Relatively isolated coastal industrial town in north-west England with long historical dependence on defence manufacturing and heavy industry. ▪ BAE Systems operates as the dominant anchor employer and industrial actor. ▪ The region has existing skills/workforce capability in submarine construction and advanced defence manufacturing. ▪ Region experiences enduring socioeconomic challenges despite high-value industrial activity (i.e. health inequalities, lower educational attainment and workforce participation challenges). Population & Labour Force: ▪ The estimated resident population is 67,407 in the Barrow-in-Furness Local Authority (ONS, 2021). ▪ Between 2011 and 2021 total population decreased by over 2,000 people. (ONS 2011, 2021). Total households remained similar, suggesting that the average household size decreased (ONS, 2011, 2021). ▪ Risk of inability for local economy to fully capture benefits of industrial expansion identified as a challenge given ongoing constraints in housing, workforce capacity, transport, education, health and local infrastructure.

¹⁸⁷ <https://www.gov.uk/government/publications/defence-nuclear-enterprise-2025-annual-update-to-parliament/defence-nuclear-enterprise-2025-annual-update-to-parliament>

Market factors:

- Dreadnought program and wider defence pipeline provides unusual long-term investment certainty, however, this creates potential overreliance for Barrow on a singular dominant industry.
- Strong government demand and strategic national security agenda underpinning growth of industrial activity creating local economic dependence on public investment cycles and defence procurement.
- Barrow’s role as the UK’s submarine construction location provides a strong supply-chain anchor, however, broader local economic benefits are likely to depend on the extent to which local firms and SMEs can participate in forming an industrial ecosystem with breadth.

Shock factors:

- Rapid increase in labour demand associated with investment into submarine expansion, with employment in the BAE shipyards growing from under 11,000 in 2023 to 13,500 in April 2026 and projected to reach 16,500 by 2027 (Defence Nuclear Organisation, 2026).
- Recent and projected job creation is expected to place additional pressure on Barrow’s housing market and local infrastructure. In response, the £200 million Barrow Transformation Fund includes plans for 12,000 new homes across the region over a decade, alongside supporting investment in community infrastructure and services (Defence Nuclear Organisation, 2026).

Objectives (before)	Under Barrow Rising, the mandate of the policy and transformation agenda include: ▪ Enabling and sustaining the UK Defence Nuclear Enterprise ▪ Strengthening and diversifying the local economy ▪ Improving productivity, and ▪ Coordinating investment across housing, skills, transport, health and public services. “By 2035, Barrow will be a thriving, prosperous town where our people flourish and grow.”¹⁸⁸
Operating and delivery model	▪ Co-ordinated delivery model: The Barrow model features a single delivery framework designed to coordinate across multiple institutions and policy priorities (i.e. industry, housing, health, transport, infrastructure). ▪ Trilateral governance: Team Barrow and the Delivery Board bring together central government, local government and BAE Systems under an independent chair to sequence investment and resolve delivery bottlenecks.

¹⁸⁸ Barrow Rising, 2025 https://barrowrising.uk/wp-content/uploads/2025/07/BarrowRising_10YearPlanForBarrow.pdf
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- **Distributed delivery:** Existing institutions retain responsibility for delivery in their respective domains, with the board aligning activity rather than replacing agencies. Members of the Barrow Delivery Board are empowered to agree priorities, sequence activity and agree on the allocation of transformation funding within their delegations, and to act as accountable sponsors who can rapidly unlock approvals through Ministers, departments, council executives or BAE Systems where authority sits above the Delivery Board. The model recognises that statutory, ministerial and corporate powers remain with their parent institutions whilst still affording members a level of decision-making authority on the distribution of transformation funds¹⁸⁹.
- **System integration focus:** The model prioritises coordination, investment facilitation and delivery oversight instead of direct operational control. The Barrow Delivery Board features a mixed body of members, some with genuine institutional decision-making authority in their respective roles (i.e. Westmorland and Furness Council, BAE Systems, Ministry of Housing, Communities and Local Government), and other members acting more as conduits and workstream sponsors to offer value through access to policy and political insight, advocacy, facilitation support and funding levers (i.e. Ministry of Defence, Homes England, the MP of Barrow and Furness)¹⁹⁰.
- **Long-term public investment:** More than £200 million under the Barrow Transformation Fund supports delivery alongside substantial national defence investment.
- **Housing and transport delivery:** Over 800 new homes are being delivered at Marina Village, supported by £23 million in road upgrades to key industrial sites.
- **Anchor-led regeneration:** BAE Systems has invested in town-centre properties to strengthen community assets and local spending.
- **Community investment:** £5 million has been committed to a Social Impact Fund and a further £5 million to the Brilliant Future Fund supporting schools and young people.
- **Industrial capacity building:** Plans for a National Smart Advanced Manufacturing Hub include more than 80 development-ready sites for business expansion.
- **Cultural regeneration:** A long-term Cultural Strategy and Culture Fund are being developed with regional and national partners.
- **Delivery outcomes:** The governance approach improves sequencing, accountability and integration across complex multi-agency systems.

¹⁸⁹ Barrow Rising 2025; House of Commons Defence Committee 2025 <https://barrowrising.uk/about/team-barrow/>
<https://committees.parliament.uk/writtenevidence/162977/pdf/>

¹⁹⁰ Barrow Rising, 2025 <https://barrowrising.uk/about/team-barrow/>
<https://committees.parliament.uk/writtenevidence/162977/pdf/>

Government role

- National government plays a strategic coordinating and enabling role focused on aligning industrial expansion in defence and manufacturing with broader regional development outcomes, providing long term direction, funding and coordinating departments across infrastructure, housing, education, workforce capability and public services.
- Rather than directly managing industrial operations, government's role is centred around reducing delivery bottlenecks within the broader system, helping shape the enabling conditions for industrial transformation to occur at pace.

Outcomes (to date)

- Evidence of sustained economic benefits for the local population has been limited to date (potentially indicating a difficulty in translating outcomes into local social and economic impact) however the Dreadnought programme and wider defence-industrial pipeline are expected to increase labour demand over a multi-decade timeframe.
- Early employment evidence suggests an additional 2,500 jobs have been created at BAE System Burrow between 2023 and 2026, with an additional 3,000 expected by 2027 (Defence Nuclear Organisation, 2026).
- Employment rate (employed persons as a percentage of working age population) in Westmorland and Furness has increased from 75.6% in 2013 to 80.9% in 2023 (ONS, 2023)
- Economically inactive residents in Westmorland and Furness in the YE September 2023 was 17.6%, considerably lower than the rest of the North West (22.8%) and has fallen substantially from 22.7% in the prior year and (ONS, 2023).
- Sectoral employment shifted significantly with a 3.1% decline in manufacturing and a 4.5% increase in public administration and defence, coinciding with the start of major government investment in the region (2011-2021, ONS).
- Gaps between the skills required for the high-value industrial activity and those available remains an ongoing challenge to generating further employment and economic benefits for the region. There is no known evidence to date of improved supply chain benefits and productivity benefits.
- Current flow-on benefits are primarily focused on induced growth (defence spending spilling over into local services) rather than the establishment of self-sustaining, non-defence industries.

Enabling conditions

- Presence of long-term strategic industrial anchor of ship manufacturing in the region that provided skilled labour and enabling infrastructure. The UK Government anchored submarine production at Barrow through successive strategic defence decisions over several decades, reinforced in recent years by explicit long-term defence commitments¹⁹¹.
- Acknowledgment of historic stop-start procurement cycles that caused significant boom-and-bust impacts were no longer feasible, with UK Government actively and deliberately moving towards longer, more certain submarine production pipelines to avoid repeating this pattern¹⁹².
- Stable long-term industry demand associated with government investment and strategic priorities.
- Establishment of a single coordinating governance structure aligning key existing institutions across policy domains, and bridging the gaps between government, industry and community priorities.
- The model seeks to coordinate between industrial investment and delivery timelines, and local enabling infrastructure delivery, supported by a 10-year £200m in Government investment commitment from 2026 (Defence Nuclear Organisation, 2026).
- Integration of housing, education, workforce capability, health and transport into industrial policy delivery.
- Recognition that industrial competitiveness depends on broader local systems capacity and liveability.

Challenges

- Continued socioeconomic disadvantage despite concentration of high-value industrial activity within the region. This appears to reflect skills mismatches and long-standing housing and liveability constraints, with a significant share of workers living outside the town and limited spillover into the local economy, despite the concentration of high-value defence manufacturing (Nelson, 2025).
- Significant housing shortages associated with rapid workforce growth.
- Mismatch between industry labour demand and local workforce capacity, further exacerbated by difficulties attracting and retaining talent.
- Ongoing reliance on a singular defence industry anchor and government-funded procurement pipeline.
- Risk that infrastructure and public service delivery cannot scale at the pace required by industrial expansion.

¹⁹¹ <https://committees.parliament.uk/writtenevidence/162977/pdf/>

¹⁹² <https://committees.parliament.uk/oralevidence/16787/docx>

Learnings

- Industrial policy must integrate enabling systems, not just fund industry in order to deliver regional transformation.
- Place-based single coordinating governance mechanism between government, industry and community can improve delivery outcomes across fragmented systems.
- Long-term government demand certainty is a major enabler of regional industrial transition, but can also entrench dependence and reduce local adaptability.
- Anchor firms can catalyse growth but also create concentration risk.
- Regional liveability is an industrial competitiveness issue, not a singular policy pursuit. Without simultaneous investment into regional social and enabling infrastructure, systems and community capacity, successful industrial transition is limited.
- Industrial transitions demand sequencing across infrastructure, housing, workforce and industrial expansion activities, not isolated projects.
- Institutional capacity matters just as much as funding, with delivery capability and institutional coordination often the limiting factor in place-based industrial policy.

Case Study 2

Japan: Ministry of Economy Trade and Industry (METI) Hokkaido Prefecture

Agency-Based Approach to Place-based Industrial Model

Headlines

- Aligns national decarbonisation and energy-security objectives with regional economic diversification, positioning Hokkaido as a strategic hub for renewables, energy transition technologies and startup-led growth outside Japan's major metropolitan centres.
- Adopts a central economic agency with regional delivery arms. METI provides long-term strategic coordination, while regional Bureaus of Economy, Trade and Industry translate national priorities into place-based implementation tailored to Hokkaido's conditions.
- Operates through long-term institutional continuity, with overarching strategic plans operationalised at the regional/prefectural level rather than a single fixed-horizon region plan for METI broadly. The organisation's *Strategic Energy Plan*¹⁹³ provides medium-term policy direction. At the regional level however, time-bounded plans do exist and are deployed at a city and prefecture level within METI's broader strategic framework. For example, in response to Japan's Regional Revitalisation Strategy (2014), Sapporo (located in the Hokkaido prefecture) launched the *Sapporo Future Revitalisation Plan* for 2015–2020, followed up by the *Startup City Sapporo* initiative from 2023¹⁹⁴.
- METI Combines market creation with ecosystem development rather than direct state control. Fixed-price purchasing, subsidies, capacity mechanisms and demonstration funding are used to de-risk private investment alongside support for innovation, startups and industrial clustering.
- Core distinguishing factors:
 - METI embedded as a standing delivery institution, not a time-limited program or investment.
 - Regional bureaus adapt national policy to local conditions, rather than applying uniform programs.
 - Market-shaping tools used to incentivise private investment, without direct state ownership.
- Government-backed demand and long-term coordination, including renewable energy development was supported by fixed-price purchasing arrangements, subsidies and capacity mechanisms, while METI and prefectural institutions provided strategic coordination over a longer policy horizon.

¹⁹³ https://www.enecho.meti.go.jp/category/others/basic_plan/pdf/2025_strategic_energy_plan.pdf

¹⁹⁴ <https://www.tandfonline.com/doi/full/10.1080/21582041.2024.2433018#d1e116>

- Early momentum is evident, including renewable energy demonstration projects, startup ecosystem activity and announced external industrial investment, while longer-term employment and diversification outcomes remain emerging.
- A region in active demographic and economic decline, ageing communities and historic overreliance on primary industries, Hokkaido's industrial policy challenge was not managing growth pressures, but rather in curbing stagnation and repositioning a shrinking regional economy around emerging energy transition and innovation opportunities.

Context

Japan's Ministry of Economy, Trade and Industry (METI) emerged from reforms to the former Ministry of International Trade and Industry (MITI) during the early 2000s, demonstrating a broader shift in Japan's industrial policy approach away from highly centralised post-war developmental state model and towards a more contemporary economic agency model. Historically, Japan's approach to industrial expansion was characterised by selective state-led interventions across key industries, with a heavy emphasis on trade protections, foreign exchange allocation, export promotion and industrial coordination to enhance national competitiveness.

Within this shift, Hokkaido has become a key focus of place-based industrial policy. Despite challenges including population decline, ageing communities, labour shortages and dependence on primary industries such as agriculture, fisheries and resources, the region's strong renewable energy potential in offshore wind, geothermal, biomass and hydrogen has positioned it as strategically important to Japan's decarbonisation and energy security agenda. METI's role in Hokkaido consequently evolved toward facilitating infrastructure, investment, industrial clustering, startups, innovation and cross-sector collaboration at a regional level¹⁹⁵.

Alongside energy transition objectives, Hokkaido has increasingly focused on regional innovation and startup ecosystem development since 2020. METI, local government and regional organisations have sought to strengthen entrepreneurship, ICT, biotechnology and innovation-led regional diversification through startup acceleration programs, university-industry collaboration and developing a startup ecosystem. This reflects a broader shift in Japanese industrial policy toward fostering regional innovation ecosystems and knowledge-intensive industries, aligned to regional comparative advantages and industrial and energy transition priorities.

¹⁹⁵ https://www8.cao.go.jp/cstp/openinnovation/ecosystem/beyondlimits_en.pdf

Timeline

- **1949:** Ministry of Commerce and Industry reorganised into the Ministry of International Trade and Industry (MITI), tasked with curbing post-war inflation across Japan, coordinating trade and investment policy, and restoring productivity across industry.
- **1950s–1970s:** MITI plays central role in guiding Japan's high-growth industrial policy era, with support for heavy and chemical industries, export growth, technology upgrading and coordinating between government and industry.
- **1970s–1980s:** Major structural change and energy shocks across Japan following global oil crises and rising environmental pressures see MITI shifting policy and role towards energy security, government efficiency, industrial restructuring and technological innovation.
- **1990s:** Faced with slower growth and increasing global competition, MITI reduced direct government intervention, promoted deregulation, competition policy, trade liberalisation and international economic engagement, with inauguration of the World Trade Organisation in 1995.
- **2001:** MITI renamed as the Ministry of Economy, Trade and Industry (METI), with an emphasis on the role of innovation systems, SMEs, services, productivity and technological transformation alongside continued trade and industry policy.
- **2010s–present:** METI has expanded its focus to include energy transition, climate policy, supply chain resilience, economic security and green transformation, acting as a strategic coordinator rather than direct controller of industry.

Place-based approach or policy

- Evolution from a highly centralised developmental-state model toward a more networked and horizontally coordinated industrial policy framework.
- METI functions as a central economic agency coordinating national industrial, energy and innovation priorities through regional implementation and delivery arms including the Hokkaido Bureau of Economy, Trade and Industry.
- Hokkaido has been positioned as a strategic regional hub for renewables, energy transition technology experimentation, startup ecosystem development and regional industrial diversification linked to Japan's broader decarbonisation and energy security agenda¹⁹⁶.
- Strong emphasis on industrial clustering and ecosystem development linking government, universities, utilities, startups, research institutions and private industry to support commercialisation, entrepreneurship, investment attraction and regional industrial transition.

¹⁹⁶ <https://reglobal.org/japans-energy-transition-balancing-surging-demand-with-decarbonisation-ambitions/>

These arrangements incorporate elements commonly associated with triple-helix governance approaches linking government, universities and industry¹⁹⁷.

- METI and regional partners supported startup ecosystem development through initiatives such as J-Startup HOKKAIDO, designed to support high-growth regional startups through mentoring, networking, accelerator access, investor engagement opportunities and international market exposure¹⁹⁸.
- Government intervention focused on enabling infrastructure, de-risking investment, innovation support and market facilitation rather than direct state ownership or economic command.

Regional economic transition plan or strategy

- Overarching strategic plans operationalised at the regional/prefectural level rather than a single fixed-horizon region plan for METI broadly.
- The organisation's Strategic Energy Plan provides medium-term policy direction. At the regional level however, time-bounded plans do exist and are deployed at a city and prefecture level within METI's broader strategic framework. For example, in response to Japan's Regional Revitalisation Strategy (2014), Sapporo (located in the Hokkaido prefecture) launched the Sapporo Future Revitalisation Plan for 2015–2020, followed up by the Startup City Sapporo initiative from 2023.

¹⁹⁷ Etzkowitz & Leydesdorff (2000). The dynamics of innovation: from National Systems and 'Mode 2' to a Triple Helix of university–industry–government relations. *Research policy*, [online] 29, pp.109–123. Available at: https://yvesgingras.uqam.ca/wp-content/uploads/sites/150/20Etzk-Leides.Triple.Helix_.pdf.

¹⁹⁸ <https://startuphokkaido.medium.com/hokkaido-going-green-c411d2dcc44e>

Problem or catalyst for change

Shifts in economic structuring, deregulation, globalisation and decentralisation reforms shaped Japan's industrial policy approaches, with MITI transitioning to METI, revealing a shift toward more contemporary policy focused less on direct state-economic command and more on strategic coordination, innovation, productivity, energy security, resilience and regional economic diversification¹⁹⁹.

- While METI retained strong strategic coordination capacity, industrial policy increasingly shifted toward enabling private investment, supporting innovation, strengthening regional development and fostering collaboration between government, industry and research institutions.
- Slower economic growth, intensifying global competition, demographic decline and regional economic imbalance increased pressure for Japan to strengthen innovation capacity and diversify industrial activity beyond major metropolitan centres such as Tokyo, Osaka and Nagoya²⁰⁰
- The Fukushima nuclear disaster in 2011 further accelerated concern around energy security, electricity system resilience and dependence on imported fossil fuels, significantly increasing policy attention toward renewable energy deployment, transmission infrastructure and regional energy transition strategies (IEA; METI Strategic Energy Plan).
- Hokkaido became strategically important as a consequence due to its renewable energy generation potential, lower disaster risk exposure relative to major metropolitan cities and capacity to support national decarbonisation objectives.
- Simultaneously, concerns regarding regional economic stagnation, startup underdevelopment and concentration of innovation activity within Tokyo increased focus on strengthening regional entrepreneurship ecosystems and innovation capacity²⁰¹.
- METI and associated agencies increasingly viewed startup ecosystem development as a mechanism for supporting regional diversification, technology commercialisation and knowledge-intensive economic growth outside major metropolitan centres²⁰².

¹⁹⁹ Chrome-extension://efaidnbmnmbpcjpcglclefindmkaj/https://apps.v.main.teikyo-u.ac.jp/tosho/keizaigaku43-2-03.pdf

²⁰⁰ Regions in industrial transition 2023: New approaches to persistent problems, 2023, OECD Regional Development Studies, Paris

²⁰¹ METI, 2024 https://www.meti.go.jp/policy/newbusiness/global_promotion.pdf

²⁰² METI, 2024 https://www.meti.go.jp/policy/newbusiness/global_promotion.pdf

Region and market place-based characteristics	Population & Labour Force ▪ Hokkaido faced with long-term population decline, ageing demographics, workforce shortages and economic concentration in primary industries. ▪ Hokkaido's population declined 8.1% between 2000 and 2020, losing an estimated 458,500 residents due to low birth rates and insufficient migration to fill this gap, which has led to a rapidly ageing population. ▪ The labour force has further shifted into tertiary sectors since 2000 which has grown by 7.1 percentage points (Japan Bureau of Statistics (2000, 2020)). Industry ▪ The prefecture leads Japan's semiconductor and electronic production, concentrated in the west of the Hokkaido. (MUFG, 2023) ▪ Climate transition pressures and decarbonisation objectives increased focus on renewable energy, hydrogen and industrial transition pathways. ▪ Japan's dependence on imported fossil fuels and vulnerability to energy security shocks increased pressure for renewable energy expansion and diversification in Hokkaido. ▪ Need to attract private investment and industrial activity into regional economies outside core metropolitan areas. ▪ Hokkaido is the destination of approximately three-quarters of Japan power transmission and distribution investment, enabling energy and electricity production and export (MUFG, 2023). Location ▪ Hokkaido's location is strongly suited to offshore wind energy production, hosting the largely potential in Japan, with one-third of the nation's 45GW offshore wind implementation target intended to come from Hokkaido by 2040 (MUFG, 2023). ▪ Hokkaido contains the largest forest area in Japan, which creates comparative advantages in carbon neutrality (MUFG, 2023) ▪ Natural capital is also strong in agriculture and fisheries, providing a strong base for food production (MUFG, 2023). ▪ A significantly lower population density in Hokkaido than the rest of Japan (63 in Hokkaido, compared to 334 people per square km in all of Japan as of 2020), indicates significant upside potential for greenfield investment and land development (City Population, 2022) ▪ Despite a small population, the potential energy production and elevated levels of transmission investment in Hokkaido places the prefecture as a northern energy export hub for the southern three islands that together account for more than 95% of the Japan's population (City Population, 2022).
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**Objectives
(before)**

- METI's overarching mission is to strengthen Japan's economy and industry by supporting private-sector vitality, advancing international economic relations, and ensuring a stable and efficient supply of energy and mineral resources.
- For Hokkaido, METI's focus is around diversifying regional industry, strengthen energy security and resilience to Japan's disaster risk, promoting green transformation, accelerating startup growth and supporting industrial transition²⁰³.

**Operating and
delivery model**

- The METI model demonstrates an integration of a whole range of government functions relating to the economic development agenda of Japan, structure through a distributed governance framework combining central strategic coordination with regional implementation, investment facilitation, startup ecosystem development and ecosystem coordination.
- METI provides national policy direction and implementation support across industrialisation, energy transition, startup and innovation ecosystem development, technology and economic security priorities, including (JETRO, 2025):
 - Targeted funding for Green Transformation across sectors
 - Digital transformation support through Transformation Investment Promotion Tax System
 - Startup support through funds like the Green Innovation Fund
 - Central body driving 17 strategic sector plans including Public-private investment pathways
 - Facilitate investment in special zones including deregulated administrative procedures, specialised tax incentives and local subsidies (UN Trade and Development, 2024).
- Regional implementation is operationalised through regional Bureaus of Economy, Trade and Industry, including the Hokkaido bureau, including managing and funding regional industrial clusters and monitor the development and progress of implementation activities.
- METI's regional arms act as intermediaries between national government priorities and place-based implementation.

²⁰³ <https://startuphokkaido.com/en/about/> <https://tsh-gx.jp/en/mission/>

Government role	▪ Within this model, METI functions as the central strategic coordinating body, driving system stewardship across national industrial strategy, energy security and resilience, decarbonisation, regional development and innovation policy. ▪ As the central agency, METI acts as a coordinator between national and regional policy, with regional Bureaus of Economy, Trade and Industry acting as intermediary institutions responsible for place-specific policy operationalisation and coordination aligned to regional strengths. In the Hokkaido prefecture, this has seen the Hokkaido Bureau position the region within Japan's broader national decarbonisation and energy security objectives, aligning industrial policy with offshore wind, hydrogen, energy transition, green transformation and startup development. ▪ METI's regional bureaus, including the Hokkaido Bureau of Economy, Trade and Industry, act as on-the-ground delivery arms, helping translate national industrial, energy and innovation policy into regionally tailored economic development initiatives²⁰⁴. ▪ The Hokkaido Bureau has broad practical responsibilities across regional economic policy, industrial technology, industry-university-government collaboration, intellectual property, manufacturing, food and tourism, next-generation industries, aerospace, SME support, commercial revitalisation, logistics, energy policy, power, fuels, environmental policy and resource circulation. ▪ The Bureau also has direct industrial development and investment-facing functions, including industrial location, regional industrial promotion, corporate attraction, logistics efficiency and the planning of measures needed to support regional industrial activity. METI's regional Invest Japan Offices further provide investment information, guidance on licensing procedures, support with investment-related regulatory inquiries and other business-entry assistance²⁰⁵. ▪ While it has significant influence through funding administration, stakeholder coordination and policy implementation, it does not possess independent funding authority, statutory planning powers or the ability to establish regional regulations. ▪ Government's role within the METI model extends beyond just providing fiscal incentives to drive industrial transition, and towards deliberately addressing enabling systems and building functional regional ecosystems (for example, grid and transmission infrastructure investment, permitting and regulations, startup ecosystem development)²⁰⁶.
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²⁰⁴ https://www.meti.go.jp/english/policy/economy/industrial_council/pdf/250603008_01.pdf

²⁰⁵ https://www.meti.go.jp/english/policy/economy/industrial_council/pdf/250603008_01.pdf

²⁰⁶ METI, 2025 https://www.meti.go.jp/english/policy/economy/industrial_council/pdf/250603008_01.pdf

Outcomes (to date)	▪ Renewable energy deployment and transition-related demonstration projects increased significantly, supported by government-backed coordination and market mechanisms, evidenced by recent investment commitments from wind farm developers (63MW capacity). ▪ Major industrial investment from US property group to establish a distribution business park. ▪ Since METI's involvement, Hokkaido has also hosted significant innovations including the Large-scale Energy Storage System Demonstration Project led by METI, in collaboration with Sumitomo Electric and Hokkaido Electric Power Network (Sumitomo Electric, 2025). ▪ Hokkaido's J-Credit (carbon credits) issued have increased nearly 400% in the three years to 2023 (MUFG, 2023). ▪ Hokkaido Food Complex established under the Comprehensive Special Zones for International Competitiveness framework found to have ¥298.8 billion economic ripple effect from FY2012 – FY2016 from increased competitiveness of food sector (Hokkaido Economic Federation, Hokkaido Food Industry Promotion Organization, 2022) ▪ Despite coordinated planning, demographic challenges and population decline continued rapidly over the past two decades. ▪ US\$546 million in planned industrial investment from outside investors was announced in 2024, with potential to generate an estimated 9,500 construction job-years based on an average employment yield of 17.8 jobs per US\$1 million invested. ▪ The employment impacts from recent energy and logistics investments remain largely forecast rather than observed, meaning their long-term contribution to regional employment and diversification should be treated as emerging rather than proven.
Enabling conditions	▪ Alignment between national and regional priorities, including through Comprehensive Special Zones for International Competitiveness framework for food sector competitiveness, power transmission investment and offshore wind energy development planning. ▪ Government-backed demand and long-term coordination, including renewable energy development was supported by fixed-price purchasing arrangements, subsidies and capacity mechanisms, while METI and prefectural institutions provided strategic coordination over a longer policy horizon. ▪ Flexible regional implementation and institutional collaboration. The model allowed Hokkaido to adapt national industrial policy priorities to local conditions, supported by collaboration between government, universities and industry through demonstration projects and regional development initiatives.

Challenges	Once the plan was authorised by government, it seems to be difficult to revise it flexibly. We should understand this kind of rigidity of the governmental plan and necessity of flexibility to the changing real world. ▪ Demographic decline, ageing populations and labour shortages remain major structural constraints despite increasing industrial and innovation investment in Hokkaido (Statistics Bureau of Japan; OECD Regional Outlook). ▪ For focus on renewables: Grid and transmission constraints remain a major bottleneck to renewable energy expansion, with renewable generation potential exceeding current transmission capacity to mainland demand centres (Renewable Energy Institute) ▪ For focus on startups: Innovation and startup ecosystem benefits remain unevenly distributed. While Sapporo has strengthened as a startup and innovation hub, many regional towns continue to face economic stagnation, labour shortages and limited spillover benefits. ▪ Distributed governance structure increases coordination complexity, requiring alignment across ministries, regional bureaus, local and regional governments, utilities, universities, startups and private industry. This can contribute to fragmented delivery and slower implementation timelines (RIETI, Cambridge Industrial Innovation Policy report)
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Learnings	▪ METI transfers industrial, innovation and startup policy frameworks to the regional and municipal level, but retains strategic direction, funding control and performance oversight, creating a form of “centralised decentralisation” (F. Kitagawa, 2024). ▪ Contemporary industrial policy in Japan is evolving from a highly centralised developmental-state model towards more networked and enabling governance approaches, while still retaining strong coordination through central economic agencies like METI. ▪ The case highlights the importance of aligning national industrial priorities with regional comparative advantages, as seen with Hokkaido positioned around renewable energy, security and industrial decarbonisation, leveraging its strengths. ▪ METI’s regional coordination model demonstrates how national industrial strategy can be operationalised at a regional level through intermediary bureaus to ensure priorities and policy are adapted to local economic and infrastructure conditions. ▪ The case of METI’s interventions in the Hokkaido prefecture reveal how place-based industrial policy can support more geographically distributed industrial development and reduce concentration risks and improve resilience in the national economy. ▪ Within this example, government plays a market-shaping and risk-reduction role across infrastructure and industrial systems.
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Case Study 3

South Korea: Space Industry Cluster

Cluster-Based Industrial Policy

Headlines

- Deliberately distributes a national strategic industry across three specialised regions, assigning clear functional roles across the space value supply chain: launch (Goheung), manufacturing (Jinju–Sacheon) and R&D and talent (Daejeon).
- Uses cluster-based industrial policy to accelerate a shift from state-led to private-sector-driven space activity, positioning South Korea to compete in the global space economy under a long-term national roadmap.
- Combines place-based clustering with strong national coordination, linking infrastructure, R&D, manufacturing, workforce development and commercialisation through a centrally coordinated but regionally differentiated model.
- Core distinguishing factors include:
 - Clear functional specialisation across regions, rather than concentration or duplication.
 - Creation of a dedicated national space agency (KASA) to coordinate strategic sovereign capability across ministries, regions and industry.
- Early outcomes include new national governance capacity, with KASA established in 2024, and early commercial momentum, including increased public investment and a measurable rise in domestic space-related exports following the launch of the cluster framework.
- The three cluster regions represent a mixed picture. Daejeon functions as a growing knowledge and research hub²⁰⁷, while Sacheon and Goheung are smaller, declining population regions being deliberately activated through national industrial investment to build sovereign capability and anchor economic activity in areas that might otherwise continue to decline²⁰⁸.

²⁰⁷ <https://www.investkorea.org/dj-en/cntnts/i-1268/web.do>

²⁰⁸ <https://carnegieendowment.org/research/2025/10/south-koreas-industrial-policy-for-the-new-space-economy>

Context

The tripartite space cluster model was established to support South Korea's transition from a state-led space program toward a more commercially driven "new space" economy, with the aim of positioning the country as a competitive player in the global space sector. The policy sits within South Korea's long-term ambition to become a "global space economy powerhouse" by 2045, as set out in the Future Space Economy Roadmap²⁰⁹.

The model reflects a broader shift in industrial policy toward ecosystem-building approaches that accelerate private-sector participation, commercialisation and industrial diversification in strategically important industries. Rather than concentrating activity in a single location, the cluster framework leverages regional comparative advantages by tapping into existing research institutions, manufacturing capability and workforce strengths across multiple locations. Distinct regional hubs were identified to support launch infrastructure, satellite manufacturing and aerospace production, alongside R&D and talent development.

Timeline

- **1989:** Establishment of the Korea Aerospace Research Institute (KARI), forming the foundation of South Korea's national aerospace R&D capability.
- **2022:** South Korean government formally announces the 'Tripartite Space Industry Cluster' framework and broader Future Space Economy Roadmap.
- **2024:** Formal establishment of the Korea AeroSpace Administration (KASA) as the central coordinating institution for national space policy, industrial promotion and commercialisation.

Place-based approach or policy

- Approach seeks to incorporate elements of cluster-based and ecosystem-oriented industrial policy, seeking to strengthen collaboration between government, universities, research institutes, startups, SMEs and major firms²¹⁰.
- South Korea has historically operated with a state-led model, however the state's Fourth Space Development Promotion Plan (2022) envisions public-private partnerships transferring launch capabilities to the commercial sector, shifting from state-led to commercially driven ventures²¹¹.

²⁰⁹

https://www.ifri.org/sites/default/files/migrated_files/documents/atoms/files/ifri_lee_shin_space_industry_south_korea_2024.pdf

<https://carnegieendowment.org/research/2025/10/south-koreas-industrial-policy-for-the-new-space-economy>

²¹⁰ Carnegie Endowment for International Peace, 2025 <https://carnegieendowment.org/research/2025/10/south-koreas-industrial-policy-for-the-new-space-economy>

²¹¹ <https://stip.oecd.org/stip/interactive-dashboards/policy-initiatives/2025%2Fdata%2FpolicyInitiatives%2F999995765>

- The policy links regional economic development objectives with national strategic priorities including sovereign capability, economic security, advanced manufacturing competitiveness and participation in global space markets.

Regional economic transition plan or strategy Anchored in the Fourth Space Development Promotion Basic Plan (2022) and the Future Space Economy Roadmap, with an explicit target long-term horizon of 2045 to make South Korea one of the world's top five space powers. Every five years, the government sets mid- to long-term policy goals and strategic plans to develop the space industry across R&D, infrastructure, talent, international cooperation and private sector development, providing a structure five-year action planning cycle towards its 2045 objectives²¹² based on the *Space Development Promotion Act*.

- Problem or catalyst for change**
- Capitalising on global growth associated with space industry.
 - Diversification of regional areas of South Korea while leveraging areas of competitive advantage.
 - Persistent military threats from North Korea prompting need for sovereign defence capabilities, including the Space programs²¹³
 - Transition driven by falling launch and satellite costs, higher launch frequency, mass production, growing commercial applications, and the increasing role of private firms in space development.

Region and market place-based characteristics

- South Korea's space cluster is structured as a three-hub model, with Daejeon focused on research and talent development, Sacheon on satellite and aerospace manufacturing, and Goheung on launch operations and launch-vehicle commercialisation.

Population:

- The three strategic regions are vastly different in scale, with Daejeon the largest at 1,488,435, followed by Sacheon at 111,184 and Goheung with 60,045 residents, all three regions have had declining populations since 2015 (City Population, 2023).
- Daejeon has the strongest population and highly-skilled labour base, suited to R&D, research commercialisation and talent pipeline functions.
- Sacheon has a smaller labour market but a more specialised aerospace and advanced manufacturing workforce, supporting its role as the satellite and aerospace manufacturing hub.

²¹²https://www.kasa.go.kr/prog/bbsArticle/BBSMSTR_000000000041/view.do%3Bjsessionid%3D1Hz4Y1fGruKwpY0uTbYlQqIB6toVDarAopk-gP07T.homepage!0?mno=sub01_01&nttid=B000000002885Cf4jd8

<https://stip.oecd.org/stip/interactive-dashboards/policy-initiatives/2025%2Fdata%2FpolicyInitiatives%2F99995765>
https://elaw.klri.re.kr/eng_service/lawView.do?hseq=17131&lang=ENG

²¹³ JIPA, 2023 <https://www.airuniversity.af.edu/JIPA/Display/Article/3428148/developing-the-direction-of-military-space-capabilities-in-south-korea/>

- Goheung has a smaller population base and lower-density geography, making it better suited to launch operations, testing and infrastructure-intensive space activity rather than large-scale labour-intensive industry.

Industry:

- Strong manufacturing capability in Sacheon reported to account for 52.4% of South Korea's aerospace industry revenue and 45.4% of its aerospace workforce (SED, 2026).
- Dependence on public investment for R&D, KASA's 2025 R&D implementation plan allocated KRW 806.4 billion across 44 R&D projects, with the aerospace R&D support budget rising by around 43.3% from 2024 (KASA, 2025).

Location:

- Goheung benefited from the prior presence of launch infrastructure, Sacheon possessed an established base of aerospace manufacturing capability, and Daejeon had a high concentration of scientific research institutions. Together, these pre-existing assets provided the foundations for the development of the aerospace cluster across these three strategic locations²¹⁴.
- Sacheon serves as South Korea's primary aerospace manufacturing hub, with an established, full-cycle industrial base covering aircraft and space system design, manufacturing, testing and maintenance, repair and overhaul (MRO), and is now home to KASA.
- Goheung anchors launch and testing activities, leveraging the Naro Space Center, South Korea's only satellite launch facility, and is positioned to host more field-oriented space agency functions tied to launch operations.
- Daejeon functions as the national research and talent centre for space and advanced science, hosting KARI (historically), 46 research institutes and a large concentration of high-tech firms, reinforcing its role as Korea's "science capital"²¹⁵.

Objectives (before)

- Strengthen private sector participation and investment in the Korean space economy.
- Position South Korea as a globally competitive space economy and advanced technology leader by 2045.
- Strengthen sovereign capability and national technological competitiveness.
- Strengthen national capability, industrial leadership and commercialisation in the space economy.

²¹⁴ <https://carnegieendowment.org/research/2025/10/south-koreas-industrial-policy-for-the-new-space-economy>

²¹⁵ <https://www.investkorea.org/dj-en/cntnts/i-1272/web.do>

Operating and delivery model

- The model operates as a distributed national cluster built around the three specialised hubs, seeking to build a competitive position in the global space market by investing in components, subsystems and infrastructure that align with existing regional industrial and technological strengths.
- The cluster model combines place-based industrial policy with nationally coordinated strategic planning, linking infrastructure investment, research capability, manufacturing, commercialisation and workforce development across the space industry value chain.
- Public funding remains central to the model. Government plans include approximately KRW380.8 billion allocated between 2024–2030 under the Space Industry Cluster Tripartite System Construction Project (R&D) towards launch vehicles in Jeonnam, satellites in Gyeongnam and research and talent development in Daejeon, with plans to grow the space industry to a value of KRW 100 trillion and foster 1,000 space companies by 2045²¹⁶.
- Established defence aerospace firms, including Hanwha, KAI, LIG Nex1 and Hyundai Rotem are central to the model, drawing on government-enabled technology transfer and advanced manufacturing strengths to expand into commercial space activities and bridge the gap between defence and the emerging commercial markets for space.
- South Korea's defence sector plays a central role in building the domestic space industry by acting as a major anchor customer, with military space R&D funding averaging around \$1.36 billion annually since 2022²¹⁷.
- The Korea Institute for Defence Technology Planning and Advancement, a subsidiary of the Ministry of National Defence's acquisition arm, plays a key role in convening established and emerging aerospace firms to help catalyse growth and private sector investment across the sector²¹⁸.

Government role

- National government establishes long-term strategic direction, legislative frameworks, industrial policy priorities and funding commitments while coordinating across ministries, defence agencies, research institutions and regional governments.

²¹⁶ https://www.kasa.go.kr/prog/bbsArticle/BBSMSTR_000000000041/view.do?bbsId=BBSMSTR_000000000041&nttId=B000000000759Uq5vX6

²¹⁷ <https://indopacificsecurity.org/wp-content/uploads/IIPS-Elevating-South-Koreas-Role-in-the-Regional-Space-Ecosystem.pdf>

²¹⁸ <https://indopacificsecurity.org/wp-content/uploads/IIPS-Elevating-South-Koreas-Role-in-the-Regional-Space-Ecosystem.pdf>

- KASA provides central institutional coordination intended to reduce fragmentation across the space sector and strengthen integration between industrial policy, R&D, infrastructure planning and commercialisation²¹⁹.

Outcomes (to date)

- Outcomes to date are institutional and infrastructure-based, including the establishment of KASA, designation of the three specialised cluster districts, launch of the Space Industry Cluster Tripartite System Construction Project, and identification of delivery institutions across the Daejeon, Sacheon and Goheung nodes.
- The model has strengthened strategic coordination and commercialisation intent, by creating clearer institutional ownership, linking R&D, manufacturing and launch infrastructure, and explicitly seeking to shift South Korea's space sector toward greater private-sector participation and commercial space activity.
- Commercial and economic outcomes remain emerging rather than proven, as implementation only began recently, KASA was established in 2024, and most targets, including that by 2045 South Korea attains 10% of the global aerospace market share with over 2,000 companies employing over 500,000 workers in aerospace jobs, are projected outcomes rather than demonstrated impacts at this stage (KASA, 2025).

Enabling conditions

- Alignment of industrial nodes/hubs to existing regional strengths and comparative advantages rather than attempting to create entirely new industrial ecosystems.
- Aligned long-term vision at a national level and coordinated industrial policy.
- Strong research and institutional capability concentrated in Daejeon through universities, research institutes and public laboratories.
- Existing aerospace and manufacturing capability in Sacheon supporting industrial upgrading into satellite systems and aerospace production.
- Presence of critical national infrastructure including the Naro Space Centre launch facility in Goheung.
- Significant public investment into enabling infrastructure, R&D, commercialisation support and cluster development.

²¹⁹https://www.kasa.go.kr/prog/bbsArticle/BBSMSTR_000000000041/view.do?bbsId=BBSMSTR_000000000041&nttid=B000000002538TolcF4

Challenges

- Governance and implementation challenges: The tripartite cluster model creates significant governance and coordination complexity across three geographically distributed hubs, multiple ministries, research institutions, regional governments and private firms. Coordination challenges were one of the key drivers behind the establishment of the Korea AeroSpace Administration (KASA) in 2024 to centralise strategic oversight and reduce fragmentation²²⁰.
- Crowding in private capital: High capital intensity, long development cycles and early funding approvals ahead of firm delivery structures have made private investors cautious, despite clear policy intent to leverage private funding. Resultingly, the space industry remains heavily dependent on public funding, procurement and state coordination.
- Fragmented institutional coordination: Overlapping mandates across ministries, defence agencies and civilian bodies complicate strategic alignment, sequencing of investments and effective ecosystem development²²¹.
- Limited outcomes realisation to date: Evidence of large-scale commercialisation and globally competitive private launch capability is still emerging. Because many investments are long-term and enabling in nature, it remains difficult to quantify direct economic outcomes, productivity gains or commercial spillovers at this stage of implementation.
- Regional imbalance risks remain: While the distributed cluster model seeks to spread industrial benefits across regions, higher-value research, talent and innovation functions remain concentrated in Daejeon, potentially limiting spillovers into smaller regional economies.
- Limitations of spatial clustering: Korea's geographic constraints and dispersed implementation reduce the effectiveness of regional cluster models, limiting benefits from shared infrastructure, specialised supply chains, knowledge spillovers and collaborative R&D²²².

Learnings

- Cluster-based industrial policy works best when treated as a whole-of-system market-building strategy: Physical hubs must be integrated with industry support, procurement, finance, skills, governance and commercialisation, rather than relying on infrastructure investment alone.
- Anchor clusters in existing strengths and clear economic logic: Successful clusters are tied to existing strengths and a clear economic rationale. Each location plays a defined role within a broader national value chain, with complementary capabilities rather than duplication.

²²⁰ <https://carnegieendowment.org/research/2025/10/south-koreas-industrial-policy-for-the-new-space-economy>

²²¹ <https://carnegieendowment.org/research/2025/10/south-koreas-industrial-policy-for-the-new-space-economy>

²²² <https://carnegieendowment.org/research/2025/10/south-koreas-industrial-policy-for-the-new-space-economy>

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- Precinct development on its own does not guarantee success: Weak governance, vague roles, artificial cluster creation and over-reliance on public infrastructure can lead to stagnation rather than transformation.
 - Define roles early and clearly: Multi-region cluster systems can work where regions have distinct roles and are connected by strong coordination mechanisms. Without this, clustering risks fragmentation and unproductive inter-regional competition.
 - Governance quality determines outcomes: Weak governance, fragmented institutional responsibility and unclear decision-making can undermine otherwise well-funded cluster initiatives, resulting in implementation risks and stalled progress.
 - Multi-region cluster systems require strong coordination: Without determining distinct, complementary roles between regions in a distributed industrial cluster model, clustering risks fragmentation and unproductive inter-regional competition and tension.
 - Sequence public funding to reduce investor risk: Public funding is most effective when it is used to de-risk early stages and then progressively give way to private capital, rather than locking projects into long-term public dependence. Strong project governance and clearly defined procurement pathways provide further investor confidence, improving ability to crowd in private capital.
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Case Study 4

United Kingdom: Innovate UK Catapult Centres

Mission-Oriented Innovation Ecosystems Policy

Headlines

- The Innovate UK Catapult Centres model demonstrates a mission-oriented innovation ecosystem approach focused on translational capability, commercialisation and industrial scaling rather than research generation alone.
- The model seeks to address a core structural market failure in the UK: strong research generation capacity but weak commercialisation, demonstration and industrial adoption capability.
- Sector-specific Catapults are aligned to nationally significant growth and transition industries.
- Long-term institutional continuity is critical. The Catapult model works because it provides ongoing translational capability across several industrial and technological areas rather than short-term project funding alone.
- The model reveals how place-based industrial policy is most effective when built around existing regional comparative advantages rather than attempting to create entirely new industries in disconnected locations.
- Core distinguishing factors include:
 - Permanent, not-for-profit institutions providing long-term capability beyond project cycles.
 - Location within regions with existing industrial, research and supply-chain strengths.
- Catapults help to reduce commercialisation risk for firms by providing access to physical innovation infrastructure, R&D expertise and demonstration environments.
- A response to uneven regional growth rather than uniform economic or structural decline, the Catapult model explicitly sought to spread translational innovation capacity beyond the dominant “Golden Triangle” (university cities of Cambridge, London and Oxford), addressing the persistent gap between high-performing southern regions and lower-productivity areas (such as South Wales and South Yorkshire) where industrial decline left weak private sector investment and limited R&D activity (UK Department for Business, Energy and Industrial Strategy, 2021).

Context	The Innovate UK Catapult Centres were established following the recommendations of the Hauser Review (2010) to address a longstanding weakness in the United Kingdom’s innovation system: strong global research performance but weak commercialisation and industrial translation outcomes. Catapults were designed as mission-oriented innovation institutions capable of supporting industrial transition, commercialisation and ecosystem development through long-term translational capability rather than short-term grant programs alone²²³. The network combines national strategic coordination through Innovate UK with regionally embedded innovation ecosystems and sector-specific infrastructure. Catapults were intentionally distributed across multiple regions to leverage existing industrial capability, research strengths, supply chains and labour markets while also supporting regional economic development and innovation diffusion. The model reflects a broader shift in industrial policy toward systems-oriented and ecosystem-based approaches, where government acts less as a direct operator and more as a convenor, coordinator and market-shaping institution. Catapults linked to national priorities around net zero transition, industrial resilience, advanced manufacturing capability, digitalisation, clean energy systems and regional development agendas²²⁴.
Timeline	▪ 2004: Innovate UK founded within the Technology Strategy Board as part of the Department of Trade and Industry. ▪ 2019: Innovate UK name adopted in full and incorporated as part of the UKRI together with Research England and the Research Councils. ▪ 2010: Hauser review commissioned, recommending the establishment of Technology and Innovation Centres across the UK. ▪ 2011: Technology and Innovation Centres renamed as ‘Catapults’ Centres first established as critical component of Innovate UK’s portfolio. ▪ 2014: Hauser review of Catapult network, identifying progress and key recommendations for government. ▪ 2017: Independent review of Catapult progress by Ernst and Young, finding overall progress across all Catapult, whilst identifying key areas for improvement and critiques of the model. ▪ 2021: Third review of Catapult centres published by BEIS, focused on strengthening R&D capacity at a place-level and improve broader productivity outcomes.
Place-based approach or policy	▪ National innovation network combining sector-specific innovation centres with regional innovation ecosystems and physical infrastructure.

²²³ https://www.ciip.group.cam.ac.uk/wp-content/uploads/2023/09/UK_Final.pdf

²²⁴ https://www.ciip.group.cam.ac.uk/wp-content/uploads/2023/09/UK_Final.pdf

	- Place-based innovation model designed around existing regional comparative advantages, including research and industrial capability, labour markets and supply-chain ecosystems. - Mission-oriented innovation ecosystem approach focused on translational capability, commercialisation and industrial scaling rather than research generation alone. - Sector-specific Catapults aligned to nationally significant growth and transition industries (i.e. renewable energy, digital systems, high-value manufacturing, medicine and cell and gene therapy). - Strong emphasis on ecosystem coordination and “triple helix” style collaboration between government, universities, firms, investors and research institutions.
Regional economic transition plan or strategy	Underpinned by the UK government’s broader R&D Roadmap (2020) agenda, Innovate UK deliver rolling strategic delivery plans that sit above individual Catapult five-year funding cycles, providing network-level direction²²⁵.
Problem or catalyst for change	- Weak commercialisation outcomes despite strong university research performance/reputation globally and insufficient support for scaling innovation. - Persistent “valley of death” between research and market deployment, particularly in capital-intensive and technically complex sectors. - Historic underinvestment in demonstration, testing and translational infrastructure required to scale innovation capability across the UK - Brexit increased pressure to strengthen sovereign capability, industrial resilience and domestic innovation ecosystems. - Recognition within policy and academic literature that research funding alone was insufficient to accelerate commercialisation, industrial adoption and new market creation.
Region and market place-based characteristics	Population and location factors: - The employment rate in the UK increased from by 4.5 percentage-points since the catapult centres were established, from 70.5% in Q1 2011 to 75% in Q1 2026 (ONS, 2026). - Economic inactivity was 20.9% in Q1 2026, down from 23.4% in the start of the first year of establishment in Q1 2011 (ONS, 2026). - As of 2018, the ‘Golden Triangle’ region of the UK, including (South East, East of England and London) accounted for 53% of total R&D spending in the UK. (Gray, N., & Broadhurst, K., 2023). - The Catapult Network, adopts a decentralised approach, and operates nine, sector-based centres across more than 65 locations throughout the UK (Catapult, 2025).

²²⁵ <https://www.gov.uk/government/publications/uk-research-and-development-roadmap>

- Catapults are embedded in specialised regional clusters, including South Wales compound semiconductors and South Yorkshire advanced manufacturing (Munday, 2024; Lichfields, 2022).
- The Catapult network centres are employ more than 6,000 workers throughout the UK as of 2025 (Catapult, 2025).
- Uneven regional performance across innovation sectors and translational capability for research outcomes.

Market factors:

- SMEs face particular barriers to high-value innovation projects due to limited resources, expertise and infrastructure (Lichfields, 2022).
- As such, public investment in innovation has increased substantially in the UK, accounting for circa 30% of R&D investment (Gray et al., 2023).
- The UK Government is targeting to national R&D expenditure from 1.7% of GDP in 2018 to 2.4% by 2027 (Gray et al., 2023).
- Regional innovation outcomes remain uneven, with CSA Catapult operating in a South Wales context of weak productivity growth, low business R&D spending and manufacturing-sector pressure (Munday, 2024).

Shock factors:

- Economic and political shocks have periodic impacts on the Network from pre-establishment to election cycle funding decisions (Mittra, 2026).
- The 2008 financial crisis and accompanying austerity period in the UK served as a catalyst for major policy response for technology and innovation-based growth by 2011 (Mittra, 2026).
- The Brexit decision in 2016 and subsequent EU withdrawal in 2020 provided for significant political attention to the national innovation policy framework (Mittra, 2026).
- Resulting from this, the July 2021 UK Innovation Strategy, £1.6bn core funding for Catapult was agreed for the Q2 2023– Q1 2028 (DSIT, 2023).
- The AI acceleration post 2022 has induced the UK Government to announce a goal of becoming an international leader in AI, which may lead to further centres being established or considered for Catapult (Mittra, 2026).

**Objectives
(before)**

- Improve research translation and commercialisation outcomes.
- Support strategic sector development and crowd in private investment.
- Strengthen innovation ecosystems / clusters.
- Enhance productivity and economic growth outcomes.

Operating and delivery model

- Independent not-for-profit model operating between government, universities, firms, investors and research institutions²²⁶.
 - Government: Establishes, funds and sets strategic priorities for the Catapults. The UK Government's R&D Roadmap committed to enhancing the Catapult network and facilitating access to its facilities and capability. Independence is deliberate, with government providing funding but not directly operating the Catapults.
 - Universities and research institutions: Provides the supply of foundational science and talent to help bridge the gap between research and industry.
 - Firms (industry partners): Support the demand side and act as primary co-funder in the model. Firms access specialist facilities and co-develop technologies at readiness levels where commercial risk would otherwise deter investment.
 - Investors: Provides growth capital once technologies are sufficiently de-risked.
 - The Catapult (independent not-for-profit): The connective tissue, supporting innovation through R&D infrastructure, specialist expertise, partnerships and business support. The Catapults seek to convene actors from across government, academia and industry to collaborate and catalyse innovation and commercialisation outcomes.
- Catapults function as translational infrastructure institutions focused on later-stage R&D, demonstration, testing and commercialisation.
- Distributed national network with sector-specific missions and regionally embedded delivery.
- Model designed to support middle-stage Technology Readiness Levels where technologies are too advanced for research funding but still too risky for fully commercial finance.
- Physical infrastructure is central to the model as an enabler for innovation and industrial growth, including testing facilities, manufacturing demonstrators, laboratories, digital platforms and prototyping environments. These assets lower the cost, risk and time required for firms to move from proof-of-concept to commercial deployment, narrowing the valley of death.
- The model addresses commercialisation risk by giving firms access to specialist equipment, applied R&D capability and technical expertise they may not hold internally (Munday, 2024; Lichfields, 2022).

²²⁶ <https://stip.oecd.org/stip/interactive-dashboards/policy-initiatives/2023%2Fdata%2Fpolicyinitatives%2F4453>

Government role	▪ Government as founder, strategic coordinator, ecosystem architect and long-term funding partner through Innovate UK. ▪ Government identifies priority sectors and missions linked to national industrial strategy, net zero transition and economic competitiveness. ▪ Innovate UK oversees the broader network while Catapults retain operational independence to tailor delivery to sector-specific industry needs.
Outcomes (to date)	▪ Since 2011, more than £2.5 billion in combined public and private investment leveraged across the network (BEIS, 2021). ▪ More than 14,000 industry collaborations and over 8,000 SME engagements supported across Catapult activities by 2019–20 to progress commercialisation of R&D (Catapult Network, 2020). ▪ Network expanded to more than 65 locations across the United Kingdom (Catapult, 2025). ▪ Expansion of regional innovation activity and knowledge/industrial clusters. ▪ In 2021/22, Catapult’s Advanced Manufacturing Research Centre (AMRC) directly supported 520 FTE jobs, up from eight FTE jobs when first established in 2001 and a total UK employment impact of around 1,250 FTE jobs (Lichfields, 2022). ▪ The AMRC generated an estimated £55.8 million in direct annual GVA in 2021/22, based on 520 direct FTE jobs and an estimated £107,400 GVA per worker (Lichfields, 2022). ▪ The AMRC is estimated to have helped attract more than £260 million of investment to the Advanced Manufacturing Park, creating over 600 jobs (Lichfields, 2022). ▪ CSA Catapult-supported projects are estimated to have created 1,325 FTE jobs, safeguarded 3,393 FTE jobs and supported more than £600 million of UK GVA (Munday, 2024). ▪ The 29 CSA Catapult project’s supported a little over £600 million of UK GVA (Munday, 2024)
Enabling conditions	▪ Long-term institutional model: Catapults provide stable, sector-focused innovation infrastructure that supports firms across multiple project cycles rather than one-off grant funding. ▪ Specialist infrastructure and technical capability: Centres reduce commercialisation barriers by giving firms access to advanced equipment, testing facilities, prototyping support and applied R&D expertise they may not hold internally (Munday, 2024; Lichfields, 2022). ▪ Industry–research collaboration: The model works best where Catapults are embedded in strong local clusters and connect firms, universities, research institutes and supply chains, such as CSA Catapult in South Wales and AMRC in South Yorkshire (Munday, 2024; Lichfields, 2022). ▪ Hybrid public–private funding model: Public funding helps de-risk early-stage innovation, while industry co-investment and commercial partnerships help orient activity toward market needs and adoption pathways.

Challenges

- **Success varies by execution:** Uneven performance across the Catapult Centres network: While the model is viewed widely as successful, outcomes have been varied due to inconsistent performance measurement, uneven market failure analysis, poor data collection and governance challenges (House of Lords, 2021; Mittra, 2026). Performance variation across the network is largely driven by structural and systemic factors rather than individual capability, including different maturity amongst Catapults, disproportionate constraints of R&D funding caps that's impact research-intensive catapults and KPIs that fail to account for sectoral differences (House of Lords, 2021)²²⁷.
 - The High Value Manufacturing Catapult has been a clear standout, generating 75% of total network income in FY19–20, largely driven by its maturity, established industrial relationships and embeddedness in existing Midlands manufacturing clusters (House of Lords, 2021).
 - Newer catapults such as the Compound Semiconductor catapult, remain heavily reliant on core government funding due to shorter operating history and longer commercialisation timelines (House of Lords, 2021).
- **Agglomeration benefits are not automatic:** Some regions have captured better agglomeration and spillover benefits compared to others, particularly where existing industrial clusters or supply chain ecosystems were already present or mature (Mittra, 2026).
- **Local value capture remains contested:** There is ongoing debate regarding how much economic value remains locally embedded, or whether this value is diffuse nationally and globally through supply chain and commercialisation pathways (Mittra, 2026).
- **Network scale brings operational complexity:** Establishing and scaling a network of translational institutions creates significant operating model complexity, with elements of the early model unable to remain robust and manage complexity effectively (Hauser, 2014).
- **Funding balance is difficult to sustain:** Funding model tensions exist, with critics arguing overreliance on commercial income within the model risks pushing Catapults towards 'safer' or more 'market-ready' work that strays away from their core public purpose. On the other hand, if treated too much like public organisations, they lose the agility and commercial credibility that is valuable to industry (House of Lords, 2021; Mittra, 2026).
- **Collaboration can be structurally constrained by restrictive funding rules:** Constraints on collaboration, with restrictive R&D funding rules cited as limiting collaborative activities and the ability to fully leverage national research strengths within university partnerships (House of Lords, 2021).

²²⁷ House of Lords, 2021 <https://publications.parliament.uk/pa/ld5801/ldselect/ldsctech/218/21805.htm>

Learnings

- **Research funding alone is not enough to drive place-based innovation and industrial policy outcomes:** Accelerating commercialisation across strategic industrial sectors demands durable intermediary institutions to convene, demonstrate, translate and de-risk activities across the whole system. As such, strong industry engagement is central to the model. Catapults are intended to be industry-facing organisations that respond to commercial needs and facilitate collaboration between firms, universities, investors and government.
 - **Innovation institutions need a clear purpose and defined market role:** Effective institutions and intermediaries are built around a clearly defined rationale within the innovation ecosystem and market role, with clear gaps they are designed to address.
 - **Credible governance unlocks market confidence:** The 'arm's length' governance model enables greater industry trust, commercial responsiveness and agility while maintaining alignment to national strategic priorities.
 - **Long-term settings matter when realising effective policies:** Sustained funding, strong governance frameworks with clear autonomy and performance frameworks that reflect the long-term time horizons necessary to operationalising translational activities are essential.
 - **Place fit matters:** Translational capability should be designed around existing or emerging regional comparative advantages and strengths, supply chains, labour markets and demand rather than simply placing institutions in regional locations.
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Case Study 5

Industriklivet – Sweden Green Steel

Market Creation Industrial Policy

Headlines

- Uses climate policy to deliberately reshape an export-critical industrial sector, aligning industrial competitiveness, decarbonisation, energy security and regional development within a single long-term transition agenda.
- Focuses on market creation rather than technology push, combining carbon pricing, public funding, certification, procurement and long-term offtake agreements to de-risk early commercial deployment of fossil-free steel.
- Delivers transition through layered, whole-of-government coordination, including climate legislation, sector roadmaps (Fossil Free Sweden) and targeted funding instruments (Industriklivet), rather than a single standalone green steel policy. Fixed national net zero target of 2045 provides an overarching planning horizon. Place-specific plans (i.e. for Norrbotten and Västerbotten) provide a place-specific regional plan layer addressing housing, transport, energy supply and permitting in key green steel transition regions ²²⁸.
- Core distinguishing factors:
 - Climate Act and Fossil Free Sweden roadmaps lock in long-term direction, aligning targets, sector plans and funding.
 - Offtake agreements, carbon pricing and guarantees de-risk first commercial plants, incentivise private capital.
 - Steel investment is sequenced with power, hydrogen and grid build-out, not treated in isolation.
- Clear progress toward early commercialisation is evident, with hydrogen-based steelmaking moving beyond pilots, major private investment secured, early offtake agreements in place and Sweden positioned as a first mover in fossil-free steel production.
- Sweden's regions had existing mining, energy and industrial assets to build on to drive industrial and economic growth. The policy challenge, however, was scaling a new industrial pathway fast enough to sustain regional economies that without transition, faced long-term decline as conventional steel and fossil fuel industries declined.

²²⁸ <https://academic.oup.com/oicc/article/2/1/kgac004/6640156?login=false>

Context	▪ Sweden's green steel transition emerged from the convergence of long-term climate policy, industrial competitiveness concerns and technological shifts in hydrogen-based steelmaking. ▪ The transition formed part of a broader whole-of-government industrial and climate agenda rather than a standalone steel policy. ▪ Fossil Free Sweden (2016), Sweden's Climate Policy Framework and Climate Act (2017), and sector decarbonisation roadmaps created long-term policy direction for industrial transition. ▪ Steel production represented one of Sweden's largest industrial emissions sources, while also remaining strategically important to exports and industrial capability and employing 44,600 workers (Jernkontoret, 2023). ▪ HYBRIT (SSAB, LKAB and Vattenfall) emerged as the first incumbent-led fossil-free steel pathway, followed by H2 Green Steel/Stegra in 2020 as a commercially driven challenger model. ▪ Industriklivet ("Industrial Leap"), established in 2018 and administered by the Swedish Energy Agency, became Sweden's flagship industrial decarbonisation support mechanism focused on de-risking industrial transition and commercialisation. ▪ The model evolved within the context of increasing EU carbon pricing, growing demand for low-emissions materials and heightened European concerns regarding energy security and industrial sovereignty.
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Timeline	▪ Pre-2016: Foundational policy thinking and growing pressure to respond to emissions constraints and industrial competitiveness within the steel sector. ▪ 2016: Launch of Fossil Free Sweden as key government-industry platform and enabler for sector transition and planning across the economy. ▪ 2017: Climate Policy Framework adopted, providing long-term direction, policy certainty and emissions targets. ▪ 2018: Steel Industry Climate Roadmap published under Fossil Free Sweden to translate national climate objectives into sector specific transition pathways. Industrial Leap ('Industriklivet') launched to enable transition of the Swedish industrial sector, with responsibilities delegated to the Swedish Energy Agency. ▪ 2016–2020: Incumbent led innovation, with HYBRIT emerging as the first major transition pathway. ▪ 2021: Stegra (formerly H2 Green Steel) is launched with a more commercially driven, greenfield business model, and has secured €6.5 billion with the aim of producing 5 million tonnes of green steel by 2030. ▪ 2020: onwards: Public support mechanisms and funding, including through Industriklivet and related state aid layered onto projects.
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Place-based approach or policy	▪ Integration of industrial policy, climate policy, energy policy and regional development objectives within a single transition agenda. ▪ Government-industry coordination through Fossil Free Sweden and sectoral transition roadmaps. ▪ Public support spanning feasibility studies, pilot projects, demonstration facilities and early commercial deployment. ▪ Strong focus on market creation and demand formation through green procurement, certification, lead markets, partnerships, and long-term offtake agreements. ▪ Policy approaches recognised enabling infrastructure, electricity systems and regional capacity as core industrial competitiveness issues rather than secondary considerations. ▪ Development of the 2024 Strategy for Norrbotten and Västerbotten targeting structural challenges in the regions, including energy supply, transport, permitting and housing, specific to the regions. ▪ Regional support instruments are designed around geographic disadvantage, including investment grants for companies establishing in designated "regional development areas" and a transportation grant that directly compensates for the logistics cost penalties of operating in remote northern regions (covering distances over 401km in Norrbotten, Västerbotten, Jämtland and Västernorrland).
Regional economic transition plan or strategy	▪ Fixed national net zero target of 2045 provides an overarching planning horizon. Place-specific plans (i.e. for Norrbotten and Västerbotten) provide a place-specific regional plan layer addressing housing, transport, energy supply and permitting in key green steel transition regions
Problem or catalyst for change	▪ Steel production remained one of Sweden's largest industrial emissions sources and globally accounts for approximately 7–8% of CO₂ emissions. ▪ Rising EU ETS carbon prices increased the economic risk associated with conventional coal-based steelmaking. ▪ Sweden sought to maintain industrial competitiveness while aligning heavy industry with national net zero and fossil-free objectives. ▪ Energy security and industrial resilience concerns in Europe increased interest in domestic low-carbon industrial capability and reduced fossil fuel dependence. ▪ European energy security concerns and dependence on imported fossil fuels increased interest in transition. ▪ Automotive and manufacturing industries increasingly demanded low-emissions steel products to meet emissions reduction targets. ▪ Sweden identified an opportunity to establish first-mover advantage in fossil-free industrial manufacturing and green materials exports.

Region and market place-based characteristics

Population & Labour Force:

- Sweden combines low population density with a relatively strong labour market, with more than 5.8 million people active in the labour market in 2023 (EURES, 2025)
- Sweden's employment rate was 77.4%, around 7 percentage points above the EU average of 70.4% (EURES, 2025), providing a relatively strong labour market base to support industrial transition, alongside existing industrial capability across the steel, mining and engineering sectors.

Resources:

- Abundant low-cost clean electricity from hydroelectric, nuclear and wind energy (IEA, 2026), with Harsprånget Hydroelectric Power Station located in Northern Sweden.
- Access to high-quality iron ore resources, with over 80 million tons produced in 2024 (SGU, 2025). Most mines are located in Sweden's three ore regions, Norrbotten, Skelleftefältet (both in the North) and Bergslagen.
- High institutional trust and social licence for industrial transition.

Location and Infrastructure:

- Northern Sweden benefits from a power system that is around 96% renewable and nuclear, with large-scale hydropower providing stable, low-cost baseload electricity essential for energy-intensive green steel production.
- HYBRIT's pilot project for hydrogen gas storage has been constructed in Luleå in the North of Sweden.

Market factors:

- Growing international demand for low-carbon industrial materials.
- Strong export orientation of Swedish green steel industry.
- Strategic partnerships between steel, automotive and manufacturing firms.
- Increase in mining exploration licences from 750 to 810 valid licences from the end of 2023 to the end of 2024 (SGU, 2025).
- 44,600 workers employed across steel industry in Sweden (2023)
- Employment in the mining industry was 8,847 in 2024, down from 10,610 in 2023 due to completion of major mine projects (SGU, 2025).
- Increased concentration of ore market with increasing extraction despite a decline in the number of mining fields (SGU, 2025)

Shock factors:

- Rising EU ETS carbon prices.
- European energy security concerns and fossil fuel dependency risks.
- Supply chain resilience concerns and interest in industrial sovereignty.

Objectives (before)	Sweden's green steel industrial policy aimed to transform the country into a global leader in low-carbon industrial manufacturing by replacing coal-based steelmaking with hydrogen-based fossil-free steel production. ▪ Policy direction and targets were anchored within Sweden's Climate Policy Framework and Climate Act. ▪ Goal to establish Sweden as a leading fossil-free industrial economy and strategic partner in the global green transition. ▪ Strengthen industrial competitiveness in green steel industry. ▪ Building sovereign capability in fossil-free steel and hydrogen technologies. ▪ Supporting export opportunities for premium green steel and industrial decarbonisation technologies. Support national climate targets including: ▪ 85% net emissions reduction (national target), ▪ 50% reduction in industrial emissions, ▪ 95% reduction in steel sector emissions per tonne, ▪ 100% fossil-free electricity system.
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Operating and delivery model	▪ End-to-end transition pathway: The model integrates technology development, demonstration, commercialisation and market formation rather than treating them as separate policy stages. ▪ Early commercialisation focus: Policy support focuses on de-risking early commercialisation (not just R&D), including Industrikivet funding and state subsidies. For example, Hybrit's pilot project for Hydrogen Storage located in Luleå in the North of Sweden. ▪ Defined technology pathway: The core production route is hydrogen direct reduction of iron ore combined with electric arc furnace steelmaking, supported by electrification, recycling, scrap quality improvements and lower-emissions transport. ▪ Dual delivery: Transition is pursued through two complementary project forms—HYBRIT as an incumbent-led, integrated value-chain model (SSAB, LKAB, Vattenfall), and H2 Green Steel (Stegra) as a privately led challenger bringing speed and competitive pressure. ▪ Ecosystem-based governance: Delivery depends on coordinated participation from government agencies, municipalities, grid operators, private investors, downstream buyers and EU institutions within a distributed governance model. ▪ Market-formation instruments: Procurement, certification, lead markets, partnerships and long-term offtake agreements are used to create demand for low-emissions steel. ▪ Scale-up over research: Policy emphasis is on scaling first-of-a-kind projects through investment support, enabling infrastructure, demand creation and long-term policy certainty rather than research funding alone.
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	▪ Blended finance model: Public funding acts as risk-sharing for early commercialisation, combining grants, loans and guarantees alongside private capital. ▪ Major public commitments: mixed funding with public subsidy, including: – SEK3.1 billion for HYBRIT – SEK3.8 billion for H2 Green Steel/Stegra through the Industrial Leap / state-aid framework – EU Innovation Fund grant of EUR143 million to HYBRIT – EUR750 million in senior debt from the European Investment Bank to H2 Green Steel, and – A Swedish National Debt Office green credit guarantee covering 80% of a EUR 1.2 billion loan to H2 Green Steel. ▪ EU Policy Support: EU Green Deal Implementation means carbon border adjustments and higher emissions trading prices, which shifts competitiveness toward low-emissions steel producers.
Government role	▪ Government sets long-term direction through climate legislation and industrial roadmaps. ▪ Provides enabling support via Industriklivet and related state aid mechanisms. ▪ De-risks early commercial deployment through public finance and guarantees. ▪ Shapes enabling conditions including energy, infrastructure and regulatory settings.
Outcomes (to date)	▪ Sweden has moved green steel from pilot demonstration toward early commercialisation, with HYBRIT demonstrating hydrogen-based steelmaking and Stegra's Boden facility positioning Sweden as one of the first locations for commercial-scale hydrogen-DRI green steel production (LeadIT and SEI, 2026). ▪ The green steel transition is generating major expected regional economic impacts, with Stegra's current Boden project expected to support 4,000–5,000 construction jobs and more than 1,500 operational roles, and a forecast of 15,000 jobs to be supported in the Luleå and Boden region as a whole (Nordic Labour Journal, 2022) ▪ Hydrogen-based direct reduction has become the leading green steel pathway, but its scale-up remains constrained by the availability and cost of green hydrogen, electricity and supporting infrastructure, with each tonne of green steel requiring around 50–55 kg of hydrogen. ▪ Acceleration of transition, with 99.6% of electricity generation coming from renewable or nuclear sources in 2024. ▪ Sweden has become a net exporter of electricity over the past 15 years, exporting 19.4% of its total production in 2024 and was the third highest

exporter in the EU in 2023 after France and Germany respectively (IEA, 2026).

- Wind electricity generation has underpinned Sweden's recent growth in green steel, increasing 148% in 10 years from 16,322 GWh in 2015 to 40,419 GWh in 2024 (IEA, 2026).
- Dominance in regional market iron production, with 89% of the EU's iron production is in Sweden, with the two major players, LKAB and Kaunis Iron AB producing 25 million tonnes in 2023 (SGU, 2025).
- Securing early offtake agreements and private capital investment, with Stegra securing €1.4 billion in finance in early 2026 to complete Boden project (Stegra, 2026)

Enabling Conditions

- Access to cheap and stable renewable electricity is a key prerequisite for Green Steel production, of which Sweden has an abundance.
- Together, SSAB (Partially State Owned Swedish Steel Manufacturer), LKAB (State Owned Swedish mining company), and Vattenfall (State Owned Swedish power utilities) launched HYBRIT, creating a common research platform to decarbonize the entire iron and steel value chain (Roosevelt Institute, 2024).
- Strong state direction through climate legislation and coordinated industry roadmaps, combined with active public risk-sharing and financing at national and EU levels that reduced uncertainty and made early commercial investment viable (Roosevelt Institute, 2026).
- In 2021, Sweden empowered the National Debt Office to issue green credit guarantees covering up to 80 per cent of qualifying loans, reducing financing risk and capital costs, including a €1.2 billion guarantee that helped enable H2 Green Steel's first commercial-scale investment (Roosevelt Institute, 2026).
- The EU Emissions Trading System both increased the cost of conventional steel production and generated funding for decarbonisation, with ETS revenues supporting the EU Innovation Fund, which provided €143 million to HYBRIT and selected H2 Green Steel as one of 41 projects sharing €3.6 billion in support (Roosevelt Institute, 2026).
- State ownership of key firms, notably LKAB and Vattenfall, allowed the Swedish government to influence strategic direction through board appointments and ownership targets, enabling deeper coordination across mining, energy and steel value chains in support of decarbonisation (Roosevelt Institute, 2026).

Challenges

- Significant uncertainty remains around timing, profitability, and full system readiness for scale-up.
- Success depends on large-scale enabling infrastructure, including low-cost electricity, hydrogen systems, transmission networks, permitting capacity, and workforce mobilisation. Enabling infrastructure has been delivered through coordinated public-private investment involving national and municipal governments,

state-owned energy and mining companies, private industry and EU funding mechanisms (European Commission, 2026).

- Criticism that the model prioritises “phase-in” of new green capacity without sufficiently planning for “phase-out” of high-emissions production.
- Concerns that industrial expansion in northern Sweden may intensify land-use pressures on Sami communities, biodiversity, and local environments.
- Rapid industrial growth has outpaced housing, services and municipal finances, exposing local governments to significant risk when large projects stall or fail, as seen in Skellefteå.
- In Northvolt municipality the accelerated scale-up of manufacturing has revealed labour shortages in key sectors (aged care and health services) as the community grew.
- Expanding energy and mining infrastructure is intensifying pressure on Sámi lands, threatening reindeer herding and raising unresolved legal and rights concerns.
- Key structural barriers include electricity supply constraints and pricing, transmission bottlenecks, permitting delays, high hydrogen costs, uncertain demand, and uneven regional capacity (housing, labour, services).

Learnings

- The model illustrates the value of iterative policy evolution, where governance adapts over time rather than relying on a single, fully centralised or pre-designed strategy
- Industrial policy effectiveness depends on addressing enabling system constraints, not just providing incentives.
- Early-stage integration of place-based requirements is critical, including housing, skills development, transport, and social licence, which must be embedded prior to major investment decisions.
- Vertical integration across the supply chain (HYBRIT linked mining (LKAB), energy (Vattenfall) and steelmaking (SSAB) was possible because of structural conditions including cheap low-emissions electricity, high-quality iron ore, strong state capacity and existing industrial capability.
- Sustainability depends indirectly on policy-driven demand creation. Carbon pricing, emissions standards, procurement rules and border adjustment mechanisms effectively help create demand for green steel by increasing the future cost of conventional production.
- Long-term legitimacy depends on incorporating justice, land-use considerations, and community consent as core design elements of industrial transition policy.

Case Study 6

Germany: Ruhr Green Transition

Just Green Transition Industrial Policy

Headlines

- Represents a multi-decade transition from a coal- and steel-based industrial economy, responding to long-run competitiveness decline rather than a single policy shock.
- Relied on sustained, public-investment-led delivery, with governments absorbing adjustment costs through infrastructure investment, regional redevelopment and labour market support over several decades.
- Combined industrial restructuring with welfare-oriented transition measures, including early retirement and retraining to manage large-scale workforce displacement.
- Core distinguishing factors:
 - Long-term policy continuity and political commitment across multiple decades.
 - Integration of economic restructuring with social policy and regional regeneration.
- The Ruhr transition has not been a single overarching long-term transition plan, but has been delivered through a succession of policies across six decades, with governance and strategy evolving in response to emerging conditions and technological changes rather than a pre-defined roadmap. In recent decades, the Ruhr shifted towards more deliberate long-horizon planning for green transition (for example, a cross-sectoral hydrogen development plan currently in development)²²⁹.
- Structural outcomes include the near-complete phase-out of coal mining, with employment contracting by around 475,000 jobs between 1955 and 2018, alongside growth in advanced manufacturing and service sectors over time.
- A cautionary case of managed regional decline, the experience of the Ruhr reveals both the significant scale of deindustrialisation and the hard limits of what even sustained, multi-decade public investment can achieve in reversing economic and social consequences of industrial decline.

²²⁹ <https://www.thyssenkrupp.com/en/newsroom/press-releases/pressdetailpage/joint-press-release--the-ruhr-as-a-pioneer-region-of-the-hydrogen-economy--eight-companies-and-institutions-are-developing-a-cross-sectoral-development-plan-for-hydrogen-infrastructure>

Context	The Ruhr Green Transition Industrial Policy refers to the decades-long transformation of Germany's largest coal and steel region and workforce, beginning in the 1960s and accelerating from the 1980s onward, into a more diversified and lower-emissions economy focused on advanced manufacturing, clean energy, environmental technologies, logistics, research and innovation. In response to industrial decline, mine closures and severe environmental impacts, governments used coordinated industrial policy, infrastructure investment, university expansion, workforce transition programs and redevelopment of former industrial sites to improve economic resilience, reduce emissions and reposition the region for long-term competitiveness.
Timeline	▪ 1850s–1950s: Industrial growth period, with the Ruhr emerging as Europe's largest coal and steel industrial cluster. ▪ 1950s–1970s: Post-war period and coal market shocks, with cheaper imports undermining the Ruhr's coal competitiveness. Emphasis on protectionist industrial policies to preserve coal and steel industry employment. Ruhr Development Program implemented during the late 1960s to support regional economic transition, shifting away from heavy-industry and fossil fuel-industry dependence towards knowledge and service economy. ▪ 1970s–1980s: Welfare-oriented restructuring policies implemented to cushion the social impacts of declining heavy- and fossil-fuel industries. Active deployment of social partnerships, industrial subsidies and labour market protections. ▪ 1990s: Integrated regional transformation efforts, with an emphasis on ecological and urban renewal to restore the Emscher River system, industrial brownfields reuse and preserve local industrial heritage. ▪ 2000s: Economic repositioning to strengthen local knowledge economic and services, with a focus on expanding research institutions and universities, grow service sectors and diversify the economy. ▪ 2018: Closure of final coal mine in Bottrop, marking the end of over 200 years of coal production in the Ruhr region. ▪ 2020s: Green industrial policy interventions reposition the Ruhr as a hub for industrial decarbonisation, following the influence of key policy frameworks (i.e. EU Green Deal, 'just transition' approaches, EU climate policies and green steel production).
Place-based approach or policy	▪ Long-term, adaptive policy approach evolved through successive, complementary policies that responded to changing economic conditions while maintaining a consistent focus on regional restructuring and diversification. ▪ Phased and cumulative delivery: Early focus on preserving coal and steel and managing social impacts shifted over time toward diversification, innovation, urban renewal and environmental restoration.

	▪ Evolving governance model: Delivery moved from a predominantly top-down industrial adjustment approach to more regionalised and, in later phases, participatory and challenge-based programs.
Regional economic transition plan or strategy	The Ruhr transition notably lacked a single overarching long-term transition plan, and instead was delivered through successive waves of reactive policy across six decades, with governance and strategy evolving in response to emerging conditions rather than a pre-defined roadmap. In recent decades, the Ruhr shifted towards more deliberate long-horizon planning for green transition (for example, a cross-sectoral hydrogen development plan currently in development).
Problem or catalyst for change	▪ The Ruhr region has encountered a prolonged process of industrial transition driven by the declining competitiveness of coal and steel production, intensified by cheaper coal imports and shifting patterns of global industrial competition from the mid-1950s onwards. ▪ The concentration of energy, steel and fossil-fuel intensive industries within a historically dense industrial area generated a highly specialised and strongly unionised workforce. ▪ As the region's mining and heavy industries declined, the Ruhr region faced persistent structural unemployment, socioeconomic decline and rising poverty, of which still to this day persist – revealing the challenges of managing long-term regional transition under conditions of industrial decarbonisation, industry transition and changing policy priorities across the region and Europe more broadly post-war.
Region and market place-based characteristics	▪ Structural change unfolded over approximately 60 years, from the late 1950s through to the closure of the final hard coal mine in 2018, demonstrating that transition in old industrial regions is a long-run process rather than a short-term adjustment. Population: ▪ Population density in the Rhineland coal-mining district is well above the German average at circa 490 persons per square kilometre compared to Germany's 235 in 2015, providing the agglomeration conditions that allowed heavy industry to scale (WWF, 2019). Labour: ▪ Decades of concentrated coal and steel activity built a deep, specialised labour pool that anchored the region's twentieth-century economy. ▪ From the mid-1950s, cheaper imported coal eroded export competitiveness, contracting the coal mining workforce by 99.3% (or approximately 475,000 workers) between 1955 and 2018, to just 3,371 workers by 2018 (WRI, 2021). ▪ Despite diversification into services, logistics, and green industries, regional unemployment has remained above the national average, underscoring that structural transition is a long-run process.

Location:

- Ruhr's central location supported both its industrial peak and its pivot to logistics and advanced manufacturing, centrally located in Europe.

Shocks:

- The transition was triggered primarily by long-run economic competitiveness shocks rather than climate policy, including cheaper imported coal, substitution by oil and gas, and changing global industrial markets.
- These sustained market pressures progressively eroded the viability of domestic coal production, driving workforce contraction and the need for long-term public intervention.

**Objectives
(before)**

- Reduce structural unemployment and manage labour displacement in the region from the decline of coal and steel industries.
- Diversify the regional economy away from historic dependence on coal mining and heavy industry.
- Address severe environmental degradation, poor land quality and industrial pollution from decades of intensive mining and manufacturing activity.
- Support social cohesion during industrial transition and economic restructuring.
- Retain and transition highly specialised industrial capabilities and workforce skills into emerging sectors.
- Expand education, research and innovation capacity to support economic growth and knowledge intensive industries.

Operating and delivery model

- **Long-term, phased delivery model:** The Ruhr transition was delivered over more than six decades through several waves of industrial adjustment, regional redevelopment and urban regeneration, ecological restoration and economic diversification rather than through a single program or institution. The scale and depth of the Ruhr's structural challenges, including simultaneous industrial decline, mass unemployment, severe environmental degradation and social dislocation made a single program and policy response impossible. Each structural challenge operated on a different timeline and required different institutional responses, making a phased delivery model a necessity rather than an active design choice.
- **Integrated and place-based approach:** The approach to transition combined industrial policy, labour market adjustment, infrastructure investment, urban renewal, environmental remediation, innovation policy and workforce development within an integrated regional development framework tailored to local conditions across the Ruhr region.
- **Multi-level governance:** Delivery relied on coordinated action between the national government, state government, regional organisations, municipalities, European institutions, trade unions, industry, universities and infrastructure agencies. Funding and implementation responsibilities were distributed across these levels of government and institutions.
- **Public investment-led delivery:** The operating model relied heavily on sustained public investment over multiple decades. This funding including funds for land regeneration, early retirement and pension plans, long-term investment in higher education, resulting in 22 universities and over 250,000 students by 2014.
- **Dedicated delivery institutions:** Transition implementation was supported through regional coordination entities, particularly the Ruhr Regional Association (RVR), alongside specialist and project-based delivery bodies. The RVR coordinated regional planning, cross-municipal priorities and region-wide redevelopment initiatives, while specialist organisations delivered defined infrastructure, environmental restoration and urban regeneration projects.
- **Role within multi-level governance:** Federal and North Rhine-Westphalian governments primarily established policy direction, funding and transition support, while municipalities managed local land-use planning and redevelopment. The RVR provided the coordinating layer between these levels, aligning projects across municipal boundaries and connecting local delivery with broader regional strategies.

Government role	▪ Integrated structural change: National government provided industrial subsidies, labour market adjustment measures and long-term funding for economic restructuring and social transition. Development of the first university in the region to assist in upskilling labour force. ▪ Centralised structural policy: Government of North Rhine-Westphalia acted as the principal strategic coordinator of structural transformation, industrial modernisation and regional diversification. Implementing a centralised structural policy approach, government targeted technology and innovation programs for mining, energy, economy and steel during the mid-1970s-1980s. ▪ Regionalised structural policy: From the late 1980s, governance shifted towards decentralised and place-based regional development. Regional and municipal governments coordinated place-based redevelopment, brownfield regeneration, urban renewal, ecological restoration and industrial heritage preservation to support economic diversification and improve regional liveability.
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Outcomes (to date)	▪ Complete cessation of hard coal production within the Ruhr region following the closure of the final coal mine in 2018. ▪ Transition from a coal and steel industrial economy toward a more diversified economy including advanced manufacturing, logistics, professional services, health, culture and technology sectors. ▪ Expansion of advanced manufacturing (with lead exports of chemicals, mechanical engineering, automotive and mobility and electrical engineering) and service industries (growth of roughly 900,000 in the mid-1960s to around 1.3 million by 2020). ▪ Research and innovation capacity expanded significantly, with the University Alliance Ruhr now comprising three major universities, around 110,000 students and 14,000 academics, supporting the region's shift from coal and steel dependence toward a knowledge and innovation economy (University Alliance Ruhr, 2026) ▪ Large-scale environmental restoration and brownfield regeneration, including the 5.5 billion euro Emscher River re-naturalisation project and redevelopment of former industrial sites into green, cultural and innovation precincts. ▪ Although the service sector expanded to over 70% of employees compared to the manufacturing sector falling to below 30%, this was insufficient to fully offset manufacturing and industrial job losses, contributing to a persistent employment gap and higher unemployment pressures (WWF, 2019). ▪ Between 1964 and 2014, growth in the service sector in Ruhr (84.7% increase in employment) was smaller than the national average of 116.4% (WWF, 2019).
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- Overall, growth in service sectors including knowledge sector have been significant yet well-below national averages and that required to adequately substitute losses in the manufacturing sector (WWF, 2019). This reflects the scale of legacy industrial job losses, skill specificity within the regional workforce, and delayed economic diversification, which together limited the capacity of service-sector growth to fully substitute for manufacturing employment.

Enabling conditions

- Long-term policy continuity and sustained political commitment across multiple decades of transition.
- Coordinated governance between national-state-local levels. Originally, this governance took a top-down approach, however, challenges in co-ordinating with industry led to inefficiencies. In the late 1990s a more bottom-up, regionally oriented approach (“regionalised structural policy”) enabled local actors to lead project delivery in partnership with national and state authorities (World Resources Institute, 2026).
- Strong social partnerships between government, industry and labour unions to support management of workforce transition and welfare.
- Significant sustained infrastructure, transport, urban regeneration and environmental remediation investment
- Expansion of universities and knowledge/innovation institutes to catalyse workforce and industry growth.
- Adoption of integrated regional planning approaches, strengthened by place-based governance and regional coordination mechanisms.

Challenges

- Inequitable transition outcomes: Transition benefits across the Ruhr region were unevenly shared. Incumbent workers were relatively well protected, whereas migrants, younger and lower-skilled workers and some communities received less support.
- Delayed economic diversification: Significant time and public funding went towards propping up the declining coal and steel industries, which as a result slowed economic diversification and prolonged structural challenges in the region.
- Top-down governance: Approaches used early in the transition were often driven by central government and did not sufficiently respond to local conditions and needs, particularly in attracting new businesses and driving development in the region.
- Entrenched political interests: Corporatist governance and political-industry coalitions protected certain sectors, delaying release of land, reinforcing path dependency and constraining change during transition.
- Persistent socioeconomic and spatial inequality: Economic and environmental outcomes were varied across the Ruhr region, with enduring disparities between more established and lower developed neighbourhoods.

- Limits of apparent successes stemming from policy intervention: Some environmental improvements resulted from industrial decline rather than effective policy responses, and new jobs were often lower paid and lower status than higher value jobs lost in the transition away from mining and heavy industry.
- Fragmented coordination: Path dependency, institutional tensions and competing regional interests hindered the effectiveness of governance frameworks, strategic coordination, diversification and timely transition and redevelopment across the region.

Learnings

- Integrated, place-based transitions are key: More robust outcomes occur when industrial transition, regional development, workforce reskilling and urban renewal are treated as interconnected, rather than separate policy issues.
- There is no single blueprint for successful industrial transition: The long-term transition of the Ruhr is not a model to be replicated directly, but rather, reveals important lessons around the importance of early action, collaborative multi-stakeholder (and multi-government), building regional capacity and continually learning from failure to reach sustainable, locally-responsive outcomes and large-scale industrial change.
- Cautioning overprotection of declining industries: Prolonged support for legacy industries can delay diversification and weaken long-term outcomes for regional transformation.
- Industrial transition cannot rely solely on market adjustment to succeed: It requires intentional investment into workforce transition and sustained workforce outcomes, enabling infrastructure, ecosystems for education, knowledge transfer and innovation, and prioritisation of regional liveability.
- Proactive government coordination is critical: Effective industrial transition demands strong and coordinated public sector leadership across funding, infrastructure, labour adjustment, institutional development, enabling infrastructure and convening of system actors to respond to complex, evolving and place-specific change.

Case Study 7

Canada: Place-based industrial policy across dispersed regions

Cluster-based industrial ecosystem

Headlines

- Canada is attempting to overcome the challenges of dispersion and vast geography of its industrial regions through a combination of networked, place-based industrial ecosystems, strategic infrastructure investment, coordinated funding mechanisms and ensuring regional specialisations.
- Operates through layered, time bound policy instruments rather than a single unified regional economic plan. The Pan-Canadian Framework (2016) provides overarching policy direction with successive program and budget cycles providing medium-term direction. Regional Development Agencies (RDAs) set annual departmental priorities within their regional mandates, providing operational flexibility within federal budget cycles rather than fixed long-term horizon plans²³⁰.
- Global Innovation Clusters (formerly Superclusters) form part of this broader approach, operating as industry-led, nationally networked innovation platforms rather than traditional geographically dense clusters²³¹.
- Policies focused on linking regionally specialised industrial ecosystems across mining, processing, manufacturing, ports and export infrastructure (e.g. critical minerals in northern regions lead to battery manufacturing in Quebec.)
- The federal government is deploying a suite of levers, including Investment Tax Credits (ITCs), the Strategic Innovation Fund (SIF), and Regional Development Agencies (RDAs) to align capital investment, investment attraction, sector innovation and regional delivery.
- The 2016 Pan-Canadian framework on clean growth and climate change, set the policy foundations for the transition.
- Core factors of the Canadian approach includes:
 - Multi-level governance coordination (Federal, provincial and municipal)
 - Leveraging of existing regional strengths
 - Regional delivery agencies (Regional Development Agencies), which support administration of programs and funding delivery

²³⁰ <https://www.canada.ca/en/economic-development-quebec-regions/corporate/departmental-publications/2025-26-departmental-plan.html>

<https://natural-resources.canada.ca/climate-change/canadas-green-future>

https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/05/canada-s-transition-to-net-zero-emissions_ae0aa32d/efc1f36a-en.pdf

²³¹ <https://ised-isde.canada.ca/site/global-innovation-clusters/en>

<https://ised-isde.canada.ca/site/global-innovation-clusters/en/about-canadas-innovation-clusters-initiative>

- Canada's approach explicitly recognises it cannot replicate the density and scale of European or East Asian industrial regions and instead pursues a coordinated, networked model of place-based industrial development.
- As a country characterised by regional divergence rather than uniform economic growth or decline, Canada's challenge isn't one of a singular declining or failing region. Rather, this case reveals learnings around preventing further concentration, activating dispersed regional economies with different strengths, and ensuring communities facing decarbonisation and industrial transition are not simply left behind.

Context

Following the COVID-19 pandemic, global supply chain disruptions and the introduction of the US Inflation Reduction Act, Canada accelerated the shift toward an updated place-based industrial policy model. This approach moved away from a single national strategy toward strengthening regionally specialised industrial ecosystems, accelerating clean economy investment, improving industrial resilience, and supporting enabling infrastructure across a geographically dispersed economy.

A central focus of this shift was improving coordination between federal and provincial governments to reduce fragmentation, duplication and interregional competition for investment. Within this shift, Global Innovation Clusters (GICs) emerged as part of the policy mix, with the intention of connecting firms, technologies and supply chains across regions, complementing more explicit regional policy mechanisms such as RDAs, infrastructure funding and ITCs to strengthen regional industrial and innovation outcomes (Wolfe & Southin, 2026).

Canada's vast geography, regionally differentiated economies and federal governance structure led to the development coordinated national frameworks to support effective ecosystem development and long-term competitiveness.

Timeline

- **2016:** Introduction of the Pan-Canadian Framework on Clean Growth and Climate Change (PCF), leading to the integration of climate and industrial policy, and stronger federal-provincial coordination
- **2017:** Innovation Superclusters Initiative launched, focused on industry-led collaboration and national innovation networks.
- **2020:** Focus on sovereign capability and domestic manufacturing. With increase emphasis on critical minerals and energy security primarily through grants and tax expenditures as well as financial instruments.
- **2022:** Superclusters renamed Global Innovation Clusters and extended, large-scale clean economy incentives and ITCs introduced.
- **2024:** Net zero industrial transition and clean manufacturing and infrastructure, aligning regional strengths with national net zero objectives

Place-based approach or policy	- Canada's recent industrial policy shift is being delivered through a stronger place-based model that recognises the country's vast geography, dispersed population and highly differentiated regional economies and comparative strengths (M. Drabo, HM. Morgan, 2022). - Utilising networked industrial ecosystems, strategic infrastructure investment, coordinated funding mechanisms and regional specialisation at a place-based level. - RDAs and regional strategies anchor region-specific ecosystem development, by providing a defined geographic remit and place-embedded delivery capability, while Global Innovation Clusters function as connective tissue across the regions, supporting collaboration in priority technology and sector areas. - This hybrid approach reflects a practical response to geographic dispersion, applying place-based approaches where density exists, focused on leveraging the distinct economic strengths, infrastructure assets, workforce capabilities and natural resources, and applying networked coordination measures where it does not. However, evidence from the Global Innovation Clusters experience highlights the limitations of networked models when local cluster governance and place-embedded coordination is weak (Wolfe and Southin, 2026). - Rather than replicating similar industries across all regions, an intent is to build vastly dispersed ecosystems connected through national coordination, enabling infrastructure and shared investment framework (Future Skills Centre, 2025).
Regional economic transition plan or strategy	Operates through layered, time bound policy instruments rather than a single unified regional economic plan. The Pan-Canadian Framework (2016) provides overarching policy direction with successive program and budget cycles providing medium-term direction.
Problem or catalyst for change	- Canada has a vast landmass, dispersed population (ca. 4.5 people/km²), and regionally specialised economies separated by significant distances. - Long transport distances increased costs for manufacturing, transmission infrastructure, freight and workforce mobility. - Other factors include productivity slowdown, weak business investment, limited scale-up of innovative firms, decarbonisation requirements, supply chain resilience concerns and growing global competition following COVID-19 and changing US trade policy. - The Global Innovation Clusters were introduced partly to address some of these critical gaps by mobilising industry-led collaboration, though subsequent review of the approach suggests that funding alone is unable to compensate for weak place-based coordination (Wolfe & Southin, 2026).

Region and market place-based characteristics

- Persistent urban-rural economic divide, with rural communities older, less educated, less employed and lower-paid than urban counterparts; Canada's gap in post-secondary attainment between urban and rural areas is the largest in the OECD (Public Policy Forum, 2020).
- Historic industrial specialisation by region is present with dispersed networks of economic and industrial activity.

Population & Labour

- Population density rose from 3.75 to 4.43 persons per km² between 2009 and 2022, reflecting sustained growth concentrated in major urban centres and significant growth in small cities, with 85% of Canada's population living in urban areas as of 2025 (Statistics Canada, 2026).
- Labour force participation and employment rates fall sharply with rurality, from roughly 80% and 76% respectively in the most urban areas to 71% and 60% in the most rural areas (Public Policy Forum, 2020).
- Around 10% of Canadians live in communities classified as susceptible to workforce disruption from decarbonisation and structural change (Future Skills Centre, 2025).

Industry

- Between 2015 and 2019, six metropolitan areas (Toronto, Montreal, Vancouver, Ottawa-Gatineau, Calgary, and Edmonton) captured 77% of national employment growth, while some smaller cities recorded flat or negative growth (Public Policy Forum, 2020).
- Specialised industrial activity includes:
 - **Ontario** – existing automobile manufacturing, university and R&D ecosystem, legacy manufacturing infrastructure. The largest industries by revenue are commercial banking, new car dealers, and automobile wholesaling (IBISWorld, 2026).
 - **Quebec** – existing hydroelectricity generation and low emissions grid, proximity to export routes and markets. The largest industries by revenue are commercial banking, new car dealers, and gasoline and petroleum wholesaling (IBISWorld, 2026).
 - **Alberta** – existing oil and gas industry, pipeline infrastructure, engineering industrial workforce, geological storage potential, industrial emissions. The largest industries by revenue are oil drilling and gas extraction, gasoline and petroleum wholesaling and commercial banking (IBISWorld, 2026).
 - **Atlantic region** – existing offshore oil and gas infrastructure, ports, export routes, coastal and geological suitable for wind development. The top employing sectors are health care and social assistance, followed by retail trade and public administration. Target sectors identified by Atlantic Trade and Investment Growth Agreement are advanced manufacturing, aerospace and defence,

cyber security, energy innovation, health innovation and life sciences and ocean/blue economy (Atlantic 4, 2026).

- **North region** – existing reserves of critical minerals (lithium, nickel, cobalt, graphite and rare earth, mining industry, resources workforce and infrastructure corridors (CanNor, 2022).

Location

- Canada's federal training, employment insurance, and regional economic development supports are largely designed for the general population rather than tailored to susceptible communities, leaving a gap that targeted place-based interventions could fill (Future Skills Centre, 2025).

Shocks

- COVID-19 pandemic
- US Inflation Reduction Act

Objectives (before)

- Development of nationally connected innovation ecosystems to offset challenges of vast geographic distances, fragmented regional economies, dispersed population centres and highly specialised provincial industries.
- Develop complementary rather than competing regions, to reduce duplication, align specialisations and integrate regions into national supply chains that are large enough to support investment, scale and market certainty.

Operating and delivery model

- Canada adopted a multi-instrument delivery model, recognising that no single policy tool could address the challenges of dispersion. The policy approach responded by focusing on connecting geographically dispersed ecosystems through national coordination mechanisms, innovation networks, infrastructure investment and supply chain alignment.
- RDAs provide place-embedded delivery funded by the federal government, tailoring national programs to regional contexts. RDAs are designed to work closely with provincial governments, municipal governments, indigenous organisations, industry, university, and stakeholders to administer and tailor federally funded industrial policy programs to the economic conditions of their region.
- Within federally approved objectives, budgets and broad program terms and conditions, RDAs have delegated flexibility to establish regional priorities, tailor funding calls and delivery approaches, assess and select projects, and structure contribution agreements around regional development needs.
- This flexibility is bound rather than fully autonomous, as RDAs cannot independently alter federal legislation, tax incentives or overarching national policy objectives, but can adapt program implementation and investment decisions to regional conditions.

- In 2023–24, FedDev (the RDA responsible for southern Ontario) invested CA\$415 million in over than 590 projects, including over 140 clean growth projects, including in a \$12 million program to support six companies scale EV production (FedDev Ontario, 2024).
- Atlantic Canada Opportunities Agency (ACOA) invested CA\$396.8 million across 2,470 projects in Atlantic Canada, including the Dizolve biodegradable cleaning strip manufacturing project in New Brunswick (ACOA, 2024).
- Global Innovation Clusters operate as industry-led consortia, funding collaborative R&D and supply-chain projects across Canada's regions.

Outcomes (to date)

- Development of 'Lead Regions' in sector specific pursuits, predominantly based on existing characteristics, infrastructure and workforce. These are as follows:
 - Alberta hydrogen and CCUS
 - Ontario EV manufacturing
 - Québec electrified manufacturing
 - Atlantic Canada offshore industries
 - Northern regions critical minerals.
- Since 2018, the Skills Development Fund has invested \$34 million in 15 projects to support training in the mining and mining supply and services sectors. This is specifically to support advanced manufacturing.
- Through the previous Expedited Long-Term (ELT) and Long-Term 1 (LT1) procurements Ontario has secured almost 3,000 MW of battery storage capacity to support renewable energy generation.
- Since 2022, jobs in Alberta tied to large-scale industrial projects (including oil and gas facilities, mining sites, and pipelines) have increased by 59%, aligning with the construction of the Pathways Alliance carbon capture and storage (CCS) network.
- Development of six Regional Development Agencies covering all of Canada by economic blocks (RDAs):
 - Atlantic Canada Opportunities Agency (ACOA)
 - Canada Economic Development for Quebec Regions (CED)
 - Ontario (FedDev Ontario)
 - Federal Economic Development Agency for Northern Ontario (FedNor)
 - Prairies Economic Development Canada (PrairiesCan)
 - Pacific Economic Development Canada (PacifiCan)
 - Canadian Northern Economic Development Agency (CanNor)
- These regional development agencies (RDAs) are funded and run by the Federal government, operating as regionally embedded federal delivery agencies.

- RDAs are designed to work closely with provincial government, local government, indigenous organisations, industry, university, and stakeholders.
- The specific role of the RDAs is to provide a place-based federal presence that coordinates across governments, applies a regional lens to policy design and investment decisions, and delivers tailored business support and programs that strengthen local economies (Government of Canada, 2026).
- Clean Economy Investment Tax Credits (ITCs) were introduced in 2023 as an interventionist and investment-led policy to drive investment and uptake of clean technologies.
- Six major credits have been announced, covering the following technologies:
 - Enacted:
 - Clean Technology ITC: Renewables, storage, electrification
 - Clean Technology Manufacturing ITC: Battery and clean manufacturing supply chains
 - CCUS ITC: Carbon capture, utilisation and storage
 - Proposed:
 - Clean Electricity ITC: Clean generation and transmission
 - Clean Hydrogen ITC: Hydrogen production
 - EV Supply Chain ITC: EV and battery manufacturing facilities
- Early indications are that although they have improved positioning of these clean economy sectors, they are not yet guaranteed globally competitive industries.
- In addition, Global Innovation Clusters have demonstrated high levels of industry participation and national collaboration, however mixed levels of strengthened local cluster dynamics.

Government role

- A negotiated, place-based industrial policy model, where national government shaped the overarching national industrial policy framework and incentives, while provinces shaped regional ecosystem development within that framework. RDAs operate as a place-based federal presence within provinces, translating national objectives and funding into region-specific delivery in coordination with provincial and local governments. Role break-downs below:
- Federal Government key roles included:
 - Setting national transition objectives
 - providing major funding and incentives
 - developing coordination frameworks
 - setting the emissions targets
 - infrastructure investment signals
 - national competitiveness strategy

- Provincial Governments key roles include:
 - sector prioritisation within region
 - investor attraction strategies
 - workforce and energy policies
 - local infrastructure upgrades
 - implementation and ecosystem development
 - regional economic transition pathways

Enabling conditions

- **Alignment with existing regional strengths:** Canada anchored industrial development in pre-existing regional capabilities, infrastructure, workforce skills and natural advantages.
- **Combination of place-based and networked policy models:** Canada blended regionally embedded ecosystem development with nationally connected innovation and supply-chain networks to manage geographic dispersion.
- **Use of multiple complementary policy instruments:** Canada combined ITCs, RDAs, infrastructure investment, strategic funds and Global Innovation Clusters rather than relying on a single industrial policy lever.
- **Regional delivery capability through RDAs:** RDAs provided embedded institutional capacity to tailor national programs to local economic conditions and coordinate stakeholders on the ground.
- **Recognition of geographic reality:** The policy model explicitly acknowledged that Canada could not replicate dense industrial geographies, leading to a more realistic networked ecosystem approach.

Challenges

- **Interprovincial competition and fragmentation:** Ongoing tension across regions of interprovincial competition and fragmentation of agreed place-based specialisations with interregional competition, with duplication risks remaining province competition for investment.
- **Strategic concentration versus political balance:** Tension between strategic concentration and political regional balance is evident in the design of Global Innovation Clusters. These networked innovation platforms struggle to substitute for dense, place-based cluster governance.
- **Limited capture of learnings and adaptive mechanisms:** There are limited institutional mechanisms for policy learning and adaption across the programs to date.
- **Program fragmentation and administrative burden:** Risk of over-fragmentation across programs due to multiple funding streams, agencies and industrial initiatives. This can create complexity, overlap and administrative burden for firms and regions.

- **Uneven regional institutional capacity:** Some regions possess stronger universities, industry networks and delivery capability than others, leading to uneven ecosystem performance.

Learnings

- Canada's experience demonstrates that place-based industrial policy in dispersed regions and economies requires a coordinated and networked policy approach, combining regional delivery with national coordination.
 - Global Innovation Clusters are most effective as complementary instruments, not substitutes for place-specific ecosystem governance.
 - A suite of Clean Economy Investment Tax Credits marks a deliberate shift toward a capital-attracting industrial approach.
 - Clear role demarcation (i.e. federal framework setting, regional/provincial ecosystem leadership, regional delivery) is essential to reduce fragmentation.
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8

First Nations Case Studies

Case Study 8

New Zealand: The Māori Economy

Project context

Trigger and catalyst

The contemporary Māori economy is the cumulative product of three foundations of redress and recognition that, taken together, have built a NZ\$126 billion asset base over roughly thirty years.²³² The constitutional starting point is Te Tiriti o Waitangi (1840), whose second article guarantees Māori tino rangatiratanga (self-determination) over their lands, villages and taonga (treasures).²³³ The mechanism that transformed Treaty-based constitutional claims into economic assets was the Treaty settlement process. Emerging from the establishment of the Waitangi Tribunal in 1975 and its 1985 extension to hear historical claims, the process enabled iwi to pursue redress for Crown breaches of Te Tiriti o Waitangi through negotiated settlements with the Crown. These negotiations are now administered by Te Tari Whakataū (Office for Māori Crown Relations).²³⁴

The 1992 Sealord Fisheries Settlement, worth approximately NZ\$170 million, settled Māori commercial fisheries claims on a full-and-final basis. It enabled Māori, through the Treaty of Waitangi Fisheries Commission, to acquire a 50% stake in Sealord Products Ltd, included Crown funding of NZ\$150 million, and guaranteed Māori 20% of quota for all new species entering the Quota Management System. It was the first major nationwide Treaty settlement and demonstrated that historical Treaty grievances could be converted into substantial commercial assets held and managed by Māori.²³⁵ Two settlements followed: the Waikato-Tainui Raupatu settlement in 1995 (NZ\$170 million plus a Royal Apology signed in person by Queen Elizabeth II), and the Ngāi Tahu Claims Settlement in 1998, also NZ\$170 million plus statutory rights of first refusal over Crown property within their rohe (traditional territory/area).²³⁶

²³²Business and Economic Research Ltd (BERL) for the Ministry of Business, Innovation and Employment, "Te Ōhanga Māori 2023 – The Māori Economy 2023," 10 March 2025, <https://www.mbie.govt.nz/business-and-employment/economic-growth/te-ohanga-maori-the-maori-economy/te-ohanga-maori-the-maori-economy-reports>.

²³³New Zealand Ministry for Culture and Heritage, "The Treaty of Waitangi," [nzhistory.govt.nz](https://nzhistory.govt.nz/politics/treaty-of-waitangi), <https://nzhistory.govt.nz/politics/treaty-of-waitangi>.

²³⁴Treaty of Waitangi Act 1975 (NZ), <https://www.legislation.govt.nz/act/public/1975/0114/latest/DLM435368.html>; Waitangi Tribunal, <https://www.waitangitribunal.govt.nz/>.

²³⁵Te Tari Whakataū (Office for Māori Crown Relations), Te Tai – Treaty Settlement Stories, <https://tetai.nz/>.

²³⁶Te Tari Whakataū (Office for Māori Crown Relations), Te Tai – Treaty Settlement Stories, <https://tetai.nz/>.

Waikato Raupatu Claims Settlement Act 1995 (NZ). Ngāi Tahu Claims Settlement Act 1998 (NZ).

Link to broader economic and policy context

This is not a clean-energy case study. It is a whole-of-economy case study, selected for NZEA because it demonstrates what sustained, treaty-grounded First Nations economic participation produces across an economy over a generation. New Zealand is the closest comparable jurisdiction to Australia – a Westminster political system, a settler society in the Pacific, and a Crown that has come to accept, that Indigenous economic agency is a foundational requirement of national prosperity rather than a sector-specific question.

The Māori economy sits inside a broader architecture that combines four reinforcing layers: redress (settlements giving iwi seed capital and statutory interests in Crown property); recognition (Treaty, Tribunal and Aotearoa New Zealand's support for UNDRIP, creating a normative frame); participation (devolved commissioning models, sectoral inclusion workstreams, and procurement settings); and commercial vehicles (Post-Settlement Governance Entities, the pooled iwi investment fund Te Pūia Tāpapa, and individual iwi holdings companies). It is the interlocking of these four layers, not any single one, that produced the asset base now reported in Te Ōhanga Māori 2023.

Region and market characteristics

Population and demographics

The 2023 Census notes that nearly one million New Zealand residents identify as being of Māori descent, 19.6 per cent of the population.²³⁷ The age structure is distinctive: 55 per cent of the Māori population is under 30 years of age, against approximately one-third for the total New Zealand population.²³⁸ The Māori economic story is therefore also a demographic story, the share of the New Zealand workforce that is Māori will rise materially over the next two decades regardless of policy choices.

Land, resources and tenure

The Māori commercial-asset base sits across multiple tenure forms:

- Māori freehold land, land held by Māori under Te Ture Whenua Māori Act 1993, often in multiply-owned trusts and incorporations – remains the most distinctive.
- Returned Crown lands held through Post-Settlement Governance Entities (PSGEs), with statutory rights of first refusal extending the iwi land base over time as the Crown disposes of property.
- Settlement-cash-derived commercial property and investment portfolios held off-Country, including significant urban property holdings (Ngāti Whātua Ōrākei in central Auckland is the most visible example).

²³⁷Statistics New Zealand, "2023 Census population and dwelling counts," <https://www.stats.govt.nz/>.

²³⁸BERL, *Te Ōhanga Māori 2023 – The Māori Economy 2023* (2024), p 25, Te Ōhanga Māori 2023 (as above), demographic summary.

Workforce participation and pathways

Between 2018 and 2023, Māori self-employment grew by 49 per cent, and the number of Māori employers grew by 31 per cent.²³⁹ Māori labour-force participation continues to lag behind the non-Māori rate. However the gap is closing in younger age cohorts, and the quality of Māori workforce participation has shifted materially toward professional services, knowledge-intensive sectors, and entrepreneurship.

Commercial viability and sectoral concentration

Te Ōhanga Māori 2023 shows a substantial sectoral shift over five years. Food-and-fibre remains a Māori economic strength, growing 32 per cent over the period. However professional, scientific and technical services, together with property, are now the leading contributors to growth.²⁴⁰ The asset base is also shifting up the value chain, from primary industries such as fisheries, forestry and pastoral agriculture into integrated supply chains, value-added processing, property development and infrastructure investment.

Operating and delivery model

Operations

The operating model of the Māori economy is best understood as a layered system. At the base sit individual PSGEs, the iwi-controlled legal vehicles into which Crown settlement assets are vested. PSGEs typically structure themselves as a charitable trust holding a commercial holdings company – for example, Te Rūnanga o Ngāi Tahu sits above Ngāi Tahu Holdings Corporation, and Waikato-Tainui sits above Tainui Group Holdings.²⁴¹ PSGEs invest settlement assets, distribute returns to whānau (family and community), and act as long-horizon institutional investors in regional and national economies.

Sitting above the PSGEs is partnership architecture; the Iwi Chairs Forum (a regular gathering of post-settlement iwi leadership), the Federation of Māori Authorities, and Te Ohu Kaimoana as the body that manages the assets of the 1992 fisheries settlement.²⁴² Increasingly, this architecture is also commercial: Te Pūia Tāpapa, established in 2018, is a NZ\$115.5 million pooled direct-investment fund backed by 28 iwi and Māori entities, structured as a limited partnership and operating as a preferred investment partner alongside the New Zealand Superannuation Fund and Ontario Teachers' Pension Plan.²⁴³

²³⁹BERL, *Te Ōhanga Māori 2023 – The Māori Economy 2023* (2024), pp iii, 26, Te Ōhanga Māori 2023, employment growth analysis.

²⁴⁰BERL, *Te Ōhanga Māori 2023 – The Māori Economy 2023* (2024), pp 8, 26–30, Te Ōhanga Māori 2023, sectoral analysis.

²⁴¹Tainui Group Holdings, "About TGH," <https://www.tgh.co.nz/about-tgh/>; Te Rūnanga o Ngāi Tahu, "Ngāi Tahu Holdings Corporation," <https://ngaitahu.iwi.nz/about-ngai-tahu/our-business/>.

²⁴²Iwi Chairs Forum; Federation of Māori Authorities, <https://foma.maori.nz/>; Te Ohu Kaimoana, <https://teohu.maori.nz/>.

²⁴³Te Pūia Tāpapa Fund, <https://www.tepuiatapapa.co.nz/>; NZ Super Fund, "TPT invests in Aotearoa's largest pathology business," 5 February 2021, <https://nzsuperfund.nz/news-and-media/tpt-invests-in-aotearoas-largest-pathology-business/>.

Key actors and governance

The state-side institutional architecture has three primary pillars. Te Puni Kōkiri (the Ministry of Māori Development) is the lead policy and commissioning agency for Māori development; it commissions Whānau Ora (family-centred) and, until recently, co-led the Crown–Māori Economic Growth Partnership He Kai Kei Aku Ringa with the Ministry of Business, Innovation and Employment. Work on He Kai Kei Aku Ringa has since stopped under the current government, whose Māori economic-growth work is now pursued through the Going for Growth with Māori (Tōnui Māori) programme.²⁴⁴

Treasury holds responsibility for fiscal policy and has developed He Ara Waiora, a wellbeing framework grounded in Mātauranga Māori that informs aspects of policy development and budget advice.²⁴⁵

The Māori-side architecture is structured around PSGEs and their commercial entities, the Iwi Chairs Forum, the Federation of Māori Authorities, Te Ohu Kaimoana, and from 1 July 2025, four new Whānau Ora commissioning agencies (Rangitāmiro, Māhutonga, Te Tauraki and The Cause Collective).²⁴⁶ Whānau Ora itself is the devolved commissioning model created in 2010 in which Te Puni Kōkiri bulk-funds commissioning agencies, which in turn devolve service delivery to Māori providers and navigators working directly with whānau.

Government's role

The Crown's role has evolved markedly over the thirty-year period. In the early settlement phase, it was primarily a redress-and-quantum role. Negotiating settlements, exchanging cash and Crown property for full-and-final discharge of historical grievances. From the mid-2000s onward, the Crown's role broadened into recognition (statutory acknowledgements, co-governance arrangements, and legal personhood for Te Urewera in 2014, the Whanganui River as Te Awa Tupua in 2017, and collective redress arrangements for Taranaki Maunga (2025)).²⁴⁷

The National, ACT and NZ First coalition government formed after the 2023 election has actively rolled back several elements of this architecture: Industry Transformation Plans have been wound up²⁴⁸; Whānau Ora commissioning has been entirely re-tendered; and the Treaty Principles Bill attempted to legislate a Crown-defined reading of the Treaty. The Bill was defeated at second

²⁴⁴Te Puni Kōkiri, "Whānau Ora," <https://www.tpk.govt.nz/en/nga-putea-me-nga-ratonga/whanau-ora>; MBIE, "He Kai Kei Aku Ringa: Strategy and action plan," <https://www.mbie.govt.nz/business-and-employment/economic-growth/maori-economic-development/he-kai-kei-aku-ringa-strategy-and-action-plan> (work on the strategy has stopped); Te Puni Kōkiri, "Going for Growth with Māori | Tōnui Māori," <https://www.tpk.govt.nz/en/a-matou-whakaarotau/maori-economic-development-growth/going-for-growth-with-maori-tonui-maori>.

²⁴⁵The Treasury New Zealand, "He Ara Waiora," <https://www.treasury.govt.nz/information-and-services/nz-economy/higher-living-standards/he-ara-waiora>.

²⁴⁶Te Puni Kōkiri, Whānau Ora commissioning 2024–25 (as above); The Treasury, OIA-20240895, March 2025, <https://www.treasury.govt.nz/sites/default/files/2025-03/oia-20240895.pdf>.

²⁴⁷Te Urewera Act 2014 (NZ). Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 (NZ). Taranaki Maunga Collective Redress Act 2025 (NZ).

²⁴⁸MBIE, "Industry Transformation Plans" (archived as previous economic development work), <https://www.mbie.govt.nz/business-and-employment/economic-growth/previous-economic-development-work/industry-transformation-plans>.

reading on 10 April 2025 by 112 votes to 11.²⁴⁹ The architecture has therefore remained intact despite significant political challenge.

Funding model

Settlement values have frequently been criticised as representing only a small proportion of estimated historical loss.²⁵⁰ Two significant settlements, Waikato-Tainui 1995 and Ngāi Tahu 1998, include relativity clauses that guarantee five-yearly top-ups so the two settlements remain at fixed proportions of total Treaty settlement spending, effectively indexing redress entitlements. Both settlements also include rights of first refusal over Crown property within rohe, which have proven materially more valuable than the original cash component because they fed early commercial pipelines for Tainui Group Holdings and Ngāi Tahu Property. Ongoing Crown investment runs through Vote Māori Development and Vote Health (Whānau Ora), and through sectoral Vote items where Māori workstreams are embedded.

Delivery structures

Delivery is fundamentally devolved. Settlement assets are vested in PSGEs and managed under their own governance; commissioning is devolved to Māori-led agencies; service delivery is provided by Māori providers; capital deployment goes through iwi-controlled commercial vehicles. The model is characterised by substantial devolution of delivery responsibility.

Outputs, outcomes and scale

Outputs

Te Ōhanga Māori 2023, the most recent authoritative measure of the Māori economy, commissioned by MBIE and produced by Business and Economic Research Ltd (BERL) – places the Māori asset base at NZ\$126 billion as at 2023, up from NZ\$69 billion in 2018, an 83 per cent increase over five years.²⁵¹ The Māori contribution to gross domestic product is reported at NZ\$32 billion in 2023, up from NZ\$17 billion in 2018, equivalent to approximately 9 per cent of national output.²⁵² Eighty-six Treaty settlements have been signed into law as at January 2023, with total financial redress of NZ\$2.6 billion.²⁵³

Outcomes

Outcomes are visible at three levels. At iwi level, the ten largest post-settlement iwi together hold approximately NZ\$8.1 billion in commercial assets, with Ngāi Tahu Holdings (around NZ\$2.1 billion)

²⁴⁹Radio New Zealand, "The unusual death of the Treaty Principles Bill," 10 April 2025, <https://www.rnz.co.nz/news/thehouse/557908/the-unusual-death-of-the-treaty-principles-bill>.

²⁵⁰Waitangi Tribunal, Ngāi Tahu Report 1991 (Wai 27), Crown valuation summaries; subsequent academic analyses of settlement quantum.

²⁵¹BERL, *Te Ōhanga Māori 2023 – The Māori Economy 2023* (2024), p 11, Te Ōhanga Māori 2023 (as above), headline asset and GDP estimates.

²⁵²BERL, *Te Ōhanga Māori 2023 – The Māori Economy 2023* (2024), pp 6–7, Te Ōhanga Māori 2023 (as above), GDP contribution estimates.

²⁵³Te Tari Whakataū, *Te Tai – Treaty Settlement Stories* (as above), settlement totals as at January 2023.

and Tainui Group Holdings (around NZ\$2.1 billion) the two largest.²⁵⁴ At sector level, Māori-owned businesses and Māori authorities operate at meaningful scale across primary industries, property, tourism, professional services and increasingly clean energy. At population level, intergenerational wealth transfer is now visible, most clearly in the rapid growth of Māori entrepreneurship between 2018 and 2023.

Timeframes and scale of impact

The Māori economy is a thirty-year build. The first significant commercial settlement completed in 1992. The first published Māori economy estimates (NZ\$16 billion) appeared in 2003. The NZ\$126 billion figure for 2023 represents an approximately seven-fold increase over twenty years. There is no shortcut, the architecture is iterative, intergenerational, and dependent on sustained institutional commitment.

Success enablers and examples

Elements that have driven success

Three elements stand out, the:

- Interlocking architecture: redress, recognition, participation and commercial vehicles reinforce each other, and removing any one weakens the others.
- Devolved delivery, the state does not run the Māori economy; iwi, PSGEs, the Federation of Māori Authorities, Whānau Ora commissioning agencies and Māori businesses do. The Crown's role is to fund, recognise and clear obstacles.
- Intergenerational governance: PSGEs operate on perpetual time horizons, which aligns capital allocation with the needs of mokopuna (grandchildren) rather than electoral cycles.

Examples of success

Three concrete examples illustrate the architecture in action. Ngāi Tahu Holdings Corporation manages a diversified ~NZ\$2 billion commercial portfolio across property, farming, forestry, seafood, tourism and investments. Its property arm holds assets of NZ\$805.9 million, and in June 2024 it entered a joint venture with Fiera Comox (85%) and Kāi Tahu (15%), selling a 35-year cutting right over its West Coast plantations while retaining the underlying land.²⁵⁵ Tainui Group Holdings developed the 610-hectare Ruakura Superhub inland port and industrial precinct, attracting NZ\$1 billion joint-venture investment from Brookfield Asset Management in April 2025.²⁵⁶ Te Pūia Tāpapa demonstrated that iwi capital can be pooled at scale and deployed alongside sovereign-wealth

²⁵⁴TDB Advisory, "Iwi Investment Report 2023," <https://www.tdb.co.nz/wp-content/uploads/2024/02/TDB-Advisory-Iwi-Investment-Report-2023.pdf>

²⁵⁵Te Rūnanga o Ngāi Tahu, Ngāi Tahu Holdings Annual Report 2024; Ngāi Tahu Holdings Corporation press release on Fiera Comox JV, 9 July 2024.

²⁵⁶Radio New Zealand (RNZ), "Tainui Group Holdings announces \$1b development with major investment firm Brookfield", 10 April 2025, <https://www.rnz.co.nz/news/national/557925/tainui-group-holdings-announces-1b-development-with-major-investment-firm-brookfield>

fund partners. Its 2021 investment in Asia Pacific Health Group sat alongside NZ Super Fund (48 per cent) and Ontario Teachers' Pension Plan (48 per cent), with Te Pūia Tāpapa holding 4 per cent.²⁵⁷

Challenges and barriers

Design and delivery challenges

The distribution of settlement benefits is uneven. The ten largest post-settlement iwi hold approximately two-thirds of all post-settlement iwi commercial assets; many of the remaining settled iwi received financial redress under NZ\$20 million and operate with thin commercial machinery.²⁵⁸ Capability gaps in smaller PSGEs, particularly around investment governance and reinvestment discipline, remain a persistent risk.

Unintended consequences and criticism

Two persistent criticisms warrant acknowledgement.

1. Despite the NZ\$126 billion asset base, Māori remain over-represented across negative socio-economic indicators including health, education attainment, household wealth and incarceration. A fact explicitly acknowledged in the 2023 refresh of He Kai Kei Aku Ringa.^{258F259}
2. Settlement value has consistently been criticised as inadequate. Crown valuers themselves placed the 1990-dollar loss to Ngāi Tahu alone at NZ\$12–15 billion against an eventual NZ\$170 million settlement.^{259F260} The architecture has produced a substantial commercial asset base, but it has not closed the inequities that the redress was nominally designed to address.

Barriers

Political volatility is now the principal barrier. The current government has cancelled Industry Transformation Plans, re-tendered Whānau Ora commissioning, and attempted to legislate a Crown-defined reading of the Treaty. Waikato-Tainui's 2023–24 Annual Report opens by describing dealings with an incoming government that, in the Trust Board's words, has continued to act on its election commitments in ways the Board considers reduce Māori influence in statute.²⁶¹ The architecture is resilient, the Treaty Principles Bill was defeated, but the resilience is being actively tested.

²⁵⁷NZ Super Fund (as above); Direct Capital, "NBR: Maori investment fund takes out first stake," 16 July 2020, <https://www.directcapital.co.nz/news/2020/7/16/nbr-mori-investment-fund-takes-out-first-stake>.

²⁵⁸TDB Advisory, "Iwi Investment Report 2023," <https://www.tdb.co.nz/wp-content/uploads/2024/02/TDB-Advisory-Iwi-Investment-Report-2023.pdf>

²⁵⁹MBIE/Te Puni Kōkiri, He Kai Kei Aku Ringa 2023 refresh (as above), gap analysis.

²⁶⁰Te Rūnanga o Ngāi Tahu, "Understanding Relativity", *Te Karaka*, <https://ngaitahu.iwi.nz/opportunities-and-resources/publications/te-karaka/understanding-relativity-tk76>

²⁶¹Waikato-Tainui, *Annual Report 2023–24*, 1 August 2024, <https://www.tgh.co.nz/news-and-resources/waikato-tainui-annual-report-2024/>.

Key learnings

The Māori economy demonstrates that treaty-grounded First Nations economic architecture can be built deliberately, over a generation. The four-layer model (redress, recognition, participation, commercial vehicles) is reproducible in modified form in jurisdictions without a treaty. Devolved commissioning works; sectoral inclusion works; pooled investment vehicles with sovereign-wealth-fund partners work. Dedicated First Nations economic-development machinery is more effective than embedding First Nations workstreams in generic agencies.

Australia begins from a different constitutional starting point: no treaty, no settled redress process, and no statutory recognition of First Nations sovereignty. The redress engine that capitalises the Māori system is therefore not directly available. The operating model, however, is largely transferable:

1. The PSGE model can be reproduced under Australian trust and corporations law for Aboriginal and Torres Strait Islander Prescribed Bodies Corporate, Native title holding entities, and Land councils. Existing native title and land rights settlements already capitalise many such entities; the institutional design challenge is around governance maturation, investment capability and intergenerational discipline rather than initial capitalisation.
2. A pooled First Nations investment vehicle modelled on Te Pūia Tāpapa is directly relevant. The Clean Energy Finance Corporation (CEFC), Future Fund, Northern Australia Infrastructure Facility (NAIF) and the major superannuation funds could play the preferred-partner role that NZ Super plays alongside Te Pūia Tāpapa. This is the single most transferable, least politically contested model in the entire case.
3. Devolved commissioning modelled on Whānau Ora may be the most useful single design idea for NZEA's regional First Nations engagement: bulk-fund a small number of place-based First Nations commissioning partners with multi-year, multi-purpose mandates; devolve service delivery to community-controlled organisations; measure outcomes, not outputs.
4. Dedicated First Nations economic-development machinery, a single named agency with policy, commissioning and convening authority, is more effective than embedding First Nations workstreams across multiple generalist departments.

For NZEA specifically, the Māori experience supports a 20-to-30-year operating horizon, an explicit commissioning architecture, and a positioning that locates NZEA as the delivery and coordination layer beneath the national First Nations Clean Energy Strategy – analogous to how Te Puni Kōkiri commissions Whānau Ora to deliver outcomes within the broader Crown policy frame.

Case Study 9

Canada: Wah-ila-toos Single-Window Broker

Project context

Trigger and catalyst

Wah-ila-toos was created to solve a coordination problem. Before 2023, Canadian federal Indigenous clean-energy funding ran through siloed programmes at multiple departments: Natural Resources Canada (NRCan), Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Indigenous Services Canada (ISC), Environment and Climate Change Canada (ECCC), and Infrastructure Canada (INFC). Indigenous proponents seeking funding for a single project routinely had to submit separate applications to multiple departments, each with different eligibility criteria, reporting requirements and decision timelines.²⁶² The cost was real: communities with the highest energy poverty and the strongest case for clean-energy investment also faced the highest administrative burden in accessing federal funding.

The immediate predecessor programmes, Clean Energy for Rural and Remote Communities (CERRC, launched 2018 at NRCan), Northern Responsible Energy Approach for Community Heat and Electricity (Northern REACHE) (CIRNAC), and the Indigenous Off-Diesel Initiative (IODI, launched 2019), had each independently demonstrated that Indigenous-led clean-energy projects could displace diesel cost-effectively, but their combined effect was diluted by the fragmentation of the application architecture.²⁶³

Link to broader economic and policy context

The Wah-ila-toos design also reflects the larger Canadian policy shift signalled by the United Nations Declaration on the Rights of Indigenous Peoples Act (UNDA), passed on 21 June 2021, and the UNDA Action Plan released on 21 June 2023.²⁶⁴ These commitments, particularly the Action Plan's measures on Indigenous economic participation, established a normative imperative for federal programmes to be co-designed with First Nations, Inuit and Métis partners on a distinctions basis, and to be progressively transitioned toward Indigenous-led decision-making.

²⁶²Natural Resources Canada / Wah-ila-toos, "Wah-ila-toos: Clean Energy Initiatives in Indigenous, rural and remote communities," [canada.ca](https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/reduce-emissions/reducing-reliance-diesel), <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/reduce-emissions/reducing-reliance-diesel>.

²⁶³Natural Resources Canada, "Clean Energy for Rural and Remote Communities Program," <https://natural-resources.canada.ca/funding-partnerships/clean-energy-rural-remote-communities-program>; Crown-Indigenous Relations and Northern Affairs Canada, Northern REACHE Program <https://www.rcaanc-cirnac.gc.ca/eng/1481305379258/1594737453888>; Impact Canada, "Indigenous Off-Diesel Initiative," <https://impact.canada.ca/en/challenges/off-diesel>.

²⁶⁴Department of Justice Canada, United Nations Declaration on the Rights of Indigenous Peoples Act (UNDA), Bill C-15 (2021); UNDA Action Plan, 21 June 2023, <https://www.justice.gc.ca/eng/declaration/index.html>.

Canada's diesel context provides the operational urgency. More than 280 remote off-grid communities consume approximately 682 million litres of diesel annually, of which roughly two-thirds is used for heating and one-third for electricity generation; approximately three-quarters of these communities are Indigenous.²⁶⁵ In some Nunavut communities, electricity costs have been more than ten times the Canadian average on a per-kilowatt-hour basis.²⁶⁶ Wah-ila-toos was designed to confront this energy-poverty profile through a coordinated federal response in partnership with the communities themselves.

The name itself signals the design intent. Wah-ila-toos was gifted at a ceremony on Treaty 6 Territory on 6 February 2023 by Kookum Barbara Bruce (Red River Métis), Elder Edna Agnes Ekhiyalak Elias (Kugluktuk, Nunavut), and Gaagum Hilistis Pauline Waterfall (Haíłzaqv Nation). It is a hybrid coined word combining wāhkōhtowin (Nehiyaw/Michif), ilagiit (Inuinnaqtun) and waa-wax-toos (Haíłzaqv!a), three words from three Indigenous languages, each meaning kinship.²⁶⁷

Region and market characteristics

Geographic scope and remote-community context

Wah-ila-toos is pan-Canadian in scope, with operational concentration in the remote off-grid communities of Yukon, the Northwest Territories, Nunavut, northern British Columbia, northern Alberta, northern Ontario, northern Quebec and Newfoundland and Labrador. Communities served include First Nation reserves, Inuit hamlets, Métis settlements and a smaller number of non-Indigenous remote communities.

Distinctions-based design

The architecture is distinctions-based. First Nations, Inuit and Métis are treated as separate constitutional partners with distinct rights, governance structures and energy contexts. This is a deliberate departure from earlier programmes that treated Indigenous communities as a single category, and it materially shapes how the Indigenous Council is composed and how regional delivery is structured.

²⁶⁵Pembina Institute (D. Lovekin), "Diesel Reduction Progress in Remote Communities," 2021; summarised in Lark Scientific, <https://www.larkscientific.org/in-depth-research/overcoming-diesel-dependence-in-canada>.

²⁶⁶Canada Energy Regulator, "Energy Use in Canada's North: An Overview of Yukon, Northwest Territories, and Nunavut — Energy Facts," <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/archive/energy-use-canada-north-facts-2011/energy-use-in-canadas-north-overview-yukon-northwest-territories-nunavut-energy-facts.html>.

²⁶⁷Government of Canada, "The Clean Energy in Indigenous, Remote and Rural Communities Hub gifted an Indigenous name," 6 February 2023, <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/reduce-emissions/reducing-reliance-diesel/clean-energy-in-indigenous-remote-rural-communities-hub-gifted-indigenous-name.html>.

Energy demand and diesel context

Energy demand in remote Indigenous communities is shaped by extreme climate, small population scale, isolation from interconnected grids, and seasonal access constraints. Diesel reliance produces three reinforcing costs: high household energy bills (despite federal subsidies); local air pollution and associated health effects; and economic leakage as fuel imports consume household and community-government cashflow. Renewable replacement is technically feasible but requires upfront capital that few small remote communities can access without coordinated federal support.

Workforce and capability

A central feature of the Wah-ila-toos ecosystem is parallel investment in Indigenous workforce and project-leadership capability. This is anchored by the Indigenous Clean Energy Social Enterprise (ICE SE) and its 20/20 Catalysts Program, a national training programme for Indigenous clean-energy practitioners, and by IODI's Energy Champions, who receive direct stipends to lead community engagement and project governance.²⁶⁸

Operating and delivery model

Operations

Wah-ila-toos operates as a single-window coordination hub bringing together five federal departments: National Resources Canada (NRCan) (lead), Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Indigenous Services Canada (ISC), Environment and Climate Change Canada (ECCC) and Environment and Climate Change Canada (INFC).²⁶⁹ Indigenous proponents engage through a single intake point and are routed to the most suitable funding stream by a pathfinding officer who acts as the named single point of contact across the federal architecture. A no-wrong-door approach means any community with a clean-energy idea can find a clear path forward, regardless of which department or programme they reach first..

Beyond the intake function, dedicated programme officers work directly with funded communities on a relationship-based, full project-lifecycle basis. Supporting self-determined priorities, providing technical and project-development support, and remaining the consistent federal face for the community across the multi-year development of each project. This is a significant departure from the application-processing model of the predecessor programmes.

²⁶⁸Indigenous Clean Energy Social Enterprise, "20/20 Catalysts Program," <https://indigenoucleanenergy.com/>; Government of Canada, "Indigenous Off-Diesel Initiative - Cohort 2," <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/reduce-emissions/reducing-reliance-diesel/indigenous-off-diesel-initiative/iodi-cohort-2.html>.

²⁶⁹Natural Resources Canada / Wah-ila-toos hub page (as above).

Key actors and governance

The single most distinctive governance feature of Wah-ila-toos is the Indigenous Council, a six-member, distinctions-based body, with First Nations, Inuit and Métis representation, that provides guidance on programme design, supports strategic projects, and shapes long-term clean-energy strategy. Its members are drawn from across the three Indigenous groupings and from the principal clean-energy regions (Gwich'in, Inuit, Cree, Anishinaabe, Heiltsuk and Haida) ²⁷⁰ The Council is supported by an independent consultant and a federal secretariat.

The Council's authority is best described as consequential influence trending toward joint decision-making. The Council has been actively involved in major funding decisions and its November 2024 report *Kinship and Prosperity: Proven Solutions for a Clean Energy Landscape* fed directly into the development of Canada's Clean Electricity Strategy.²⁷¹ The Council itself, however, has argued explicitly that the current model must progress further to meet the commitments of the UNDA: in *Kinship and Prosperity's* words, the Council frames its objective as joint decision-making in which "no consensus means no" – a statement of where the model is heading rather than where it currently sits.²⁷² Delivery partners include ICE SE, which administers IODI Cohort 2 and runs the 20/20 Catalysts Program, and the Pembina Institute, which supported IODI Cohort 1.²⁷³

Government's role

The federal government's role in Wah-ila-toos is fivefold: funder (across five departments), convener (of the single-window architecture), partner (with the Indigenous Council), capability-builder (through ICE SE and IODI), and policy connector (linking project-level lessons to national strategy). Importantly, the federal government is not the deliverer, projects are owned, operated and increasingly equity-held by Indigenous communities, partnerships and corporations.

²⁷⁰Government of Canada, "New Indigenous Council to Play Key Role in Advancing Clean Energy Projects in Indigenous, Rural and Remote Communities," 6 February 2023, <https://www.canada.ca/en/natural-resources-canada/news/2023/02/new-indigenous-council-to-play-key-role-in-advancing-clean-energy-projects-in-indigenous-rural-and-remote-communities.html>.

²⁷¹Wah-ila-toos Indigenous Council, "Kinship and Prosperity: Proven Solutions for a Clean Energy Landscape," 21 November 2024, ISBN 978-0-660-74337-0, <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/reduce-emissions/reducing-reliance-diesel/indigenous-council-for-wah-ila-toos/kinship-and-prosperity-proven-solutions-for-a-clean-energy-landscape.html>.

²⁷²*Kinship and Prosperity* (as above), recommendation on Joint Decision-Making and Free, Prior and Informed Consent.

²⁷³Indigenous Clean Energy Social Enterprise (as above); Pembina Institute, IODI Cohort 1 reports.

Funding model

The Wah-ila-toos envelope is CAD\$300 million over the 2022–2027 period: CAD\$238 million for projects and CAD\$62 million for administration.²⁷⁴ Funding is structured on rolling intake, with for-profit organisations eligible only as project partners (not primary applicants). Project ceilings differ by stream:

- capacity-building projects up to CAD\$5 million,
- energy-efficiency and demand-side pilots up to CAD\$1 million,
- bioheat projects up to CAD\$10 million; up to 100 per cent of eligible project costs.

Delivery structures

Wah-ila-toos governs delivery across three principal funding streams, CERRC (NRCan), Northern REACHE (CIRNAC) and IODI (NRCan/ICE SE), and coordinates with sister programmes including the Smart Renewables and Electrification Pathways Program (SREPs), which has financed several of the largest Indigenous-led projects in the broader ecosystem.

Outputs, outcomes and scale

Outputs

As at 31 March 2024, the Indigenous Council reported that Wah-ila-toos had committed CAD\$97.3 million across more than 100 projects between CERRC and Northern REACHE, with an expected diesel-reduction effect of approximately 18 million litres per year.²⁷⁵ The CERRC stream alone has since grown materially: by March 2025 it had supported over 190 projects, and by October 2025 a cumulative 229 projects with total CERRC budget of CAD\$453 million.²⁷⁶

Outcomes

Four projects illustrate the scale and texture of outcomes, across the clean-energy ecosystem that Wah-ila-toos now coordinates, two delivered under predecessor and partner programmes, and two funded through the current CERRC architecture.

²⁷⁴Wah-ila-toos, "Funding opportunities,"

<https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/reduce-emissions/reducing-reliance-diesel/wah-ila-toos-funding-opportunities.html>.

²⁷⁵Kinship and Prosperity (as above), Section 2 – Where Wah-ila-toos is Now, figures as of 31 March 2024.

²⁷⁶Natural Resources Canada, CERRC programme page (as above), update March 2025; Natural Resources Canada, "Government of Canada contributes to major clean energy projects in Indigenous communities in Quebec," 3 October 2025, <https://www.canada.ca/en/natural-resources-canada/news/2025/10/government-of-canada-contributes-to-major-clean-energy-projects-in-indigenous-communities-in-quebec.html>.

The Gull Bay First Nation (Kiashke Zaaging Anishinaabek) Giizis Energy Solar Storage Microgrid in Ontario, commissioned in 2019 under earlier federal and provincial programmes was Canada's first fully integrated remote renewable-energy storage microgrid: 360 kilowatts of solar PV plus 300 kilowatts / 300 kilowatt-hours of battery storage, displacing approximately 110,000 to 130,000 litres of diesel annually.²⁷⁷ Sree Vyàa Solar at Old Crow (Vuntut Gwitchin First Nation, Yukon), 940 kilowatts of solar plus battery storage, displaces approximately 189,000 litres of diesel. The greenhouse gas reduction over the life of the project will be approximately 16,500 CO₂e/year.²⁷⁸ Within the current architecture, Whitesand First Nation's Sagatay Cogen biomass combined-heat-and-power facility, also in Ontario, is a 6.5 megawatt project supported by CAD\$35 million in federal investment announced in February 2023.²⁷⁹ Innalik Hydro in Inukjuak (Nunavik, Quebec), a 7.5 megawatt run-of-river hydroelectric project serving an Inuit community of approximately 1,800, received a CAD\$14.9 million CERRC contribution confirmed in October 2025 against a total project cost of approximately CAD\$127.8 million.²⁸⁰

Timeframes and scale of impact

Wah-ila-toos consolidated programmes that themselves had operated since 2016 (Northern REACHE) and 2018 (CERRC). Its current envelope runs to 31 March 2027. The November 2024 Kinship and Prosperity report contains an explicit Indigenous Council recommendation that Wah-ila-toos should be sustainably funded to continue its work beyond 2027, a statement that frames the current funding cliff as the principal political risk to the model.²⁸¹

²⁷⁷Independent Electricity System Operator (Ontario) and Natural Resources Canada, Gull Bay First Nation (Kiashke Zaaging Anishinaabek) Giizis Energy Solar Storage Microgrid, commissioned 16 August 2019.

²⁷⁸Yukon News, "Diesel generators go quiet in Old Crow as the Sree Vyàa solar project replaces their need," <https://www.yukon-news.com/local-news/diesel-generators-go-quiet-in-old-crow-as-the-sree-vyah-solar-project-replaces-their-need-7001533>.

²⁷⁹Government of Canada, "Minister Wilkinson Announces \$35 Million in Support for Clean Air and Good Jobs Through New Whitesand First Nation Energy Facility," 28 February 2023, <https://www.canada.ca/en/natural-resources-canada/news/2023/02/minister-wilkinson-announces-35-million-in-support-for-clean-air-and-good-jobs-through-new-whitesand-first-nation-energy-facility.html>.

²⁸⁰Natural Resources Canada, 3 October 2025 release (as above); Innergex, "Financial closing of the Innalik hydro project in Inukjuak, Quebec," <https://www.innergex.com/en/media/financial-closing-of-innalik-hydro>.

²⁸¹Kinship and Prosperity (as above), Section 4 – Concluding Remarks, recommendation on sustained funding beyond 2027.

Success enablers and examples

Elements that have driven success

Three reinforcing design elements drive Wah-ila-toos's effectiveness.

1. The single window: one common application form across CERRC and Northern REACHE, a pathfinding officer as named single point of contact, and a no-wrong-door intake.
2. Dedicated, relationship-based programme officers who stay with communities for the full project lifecycle, rather than transactional application-processing staff.
3. The Indigenous-led design layer: the Council, with a resourced secretariat and consequential authority over programme decisions and policy advice.

These three elements interlock: the single window reduces friction; dedicated officers convert reduced friction into trusted relationships; the Indigenous Council ensures that the architecture continues to evolve in response to community priorities rather than departmental preferences.

Examples of success

The feedback loop from project-level intelligence to national strategy is a measurable success in itself. The Indigenous Council's Kinship and Prosperity report (November 2024) documented six recommendation streams including: ease-of-access (a one-stop shop with an Accelerated Endorsement Protocol), consistent eligibility criteria prioritising 51 per cent or greater Indigenous community ownership, advancement of inclusive opportunities and a Just Transition, acceleration of Indigenous leadership, formal joint decision-making to operationalise UNDA commitments, and sustained funding beyond 2027.²⁸² These recommendations were explicitly acknowledged in NRCan's framing of Canada's Clean Electricity Strategy.

²⁸²Kinship and Prosperity (as above), Sections 3.1–3.6 – six recommendation streams.

Challenges and barriers

Design and delivery challenges

Even with the single-window architecture, internal federal alignment requires constant work. The reason ICE SE and other delivery partners are central is not only their Indigenous-led design legitimacy but also that federal departments alone could not produce the coordinated, relationship-based delivery that the model needs. Coordination across five departments is structurally easier than coordination across a fragmented predecessor architecture, but it is still coordination, not unity.

Unintended consequences and criticism

Two structural critiques are worth noting. First, communities remain under-served at the scale of the problem. The Kinship and Prosperity report documents that Canada is rated 62nd of 67 countries on the Climate Change Performance Index 2024 edition, with the Council framing federal climate effort as inadequate to the task overall.²⁸³ CERRC waitlists already exist for biomass, district heating, combined heat-and-power and research streams. Second, the Indigenous Council has argued that current arrangements fall short of true joint decision-making; the model is moving toward genuine co-governance rather than already there.²⁸⁴

Barriers

The principal barrier is the March 2027 funding cliff. The Council has formally asked for sustained funding beyond that date, but no public commitment is yet on the record. A secondary barrier is the distinction between brokering and delivery: Wah-ila-toos finances projects, but durable Indigenous-controlled energy infrastructure depends on project-level ownership structures, which the Council is pushing as a minimum-51-per-cent Indigenous ownership eligibility criterion in future funding rounds.

Key learnings

Wah-ila-toos demonstrates that an effective First Nations coordination function requires three interlocking elements that must be designed together: a single window with a no-wrong-door intake; dedicated, relationship-based programme officers rather than application processors; and an Indigenous governance layer with consequential authority and a resourced secretariat, not an advisory committee.

²⁸³Germanwatch, CAN International and NewClimate Institute, "Climate Change Performance Index 2024," November 2023, <https://newclimate.org/resources/publications/climate-change-performance-index-2024>; cited in Kinship and Prosperity (as above).

²⁸⁴Kinship and Prosperity (as above), Recommendation 5 – Respect Indigenous Self-Determination through Joint Decision-Making.

7

International Case Studies Insights

International Case Studies Insights

This section summarises the key insights from the international case studies of industrial and innovation policy approaches and provides comparator matrices of common attributes across:

- policy design
- funding mechanisms
- place-based characteristics

Rather than restating each case study (detail provided in previous section 7), it identifies the recurring lessons that are most relevant to NZEA's consideration of regional transition pathways, implementation priorities and future policy design.

Framework for comparison

To synthesise insights across the case studies, a matrix-based framework has been developed to identify alignment of the case studies with successful place-based industrial approaches and attributes. These include:

- Identification of recurring patterns in success factors, including how combinations of policy levers and enabling conditions shape outcomes.
- Common attributes of effective approaches, with a focus on governance, delivery models, and approaches to managing risk and uncertainty.
- Enabling and sustaining factors, including the role of common-user infrastructure, regional government presence, community sentiment and confidence, and the continuation of impacts over time.
- Structured assessment of key dimensions within the matrix, including prevalence, sequencing, prioritisation, relative importance, social licence, community sentiment and durability of impact.

This approach recognises that place-based industrial policy operates within complex systems and long time horizons. Rather than seeking to identify a single best-practice model, the case studies are used to highlight patterns, opportunity costs and considerations that can inform future policy development.

Policy design

Across the case studies, several common policy design attributes emerge, alongside important differences in emphasis and delivery. While no single model is replicated, the cases illustrate how place-based industrial policy is shaped by local institutional capacity, industrial history, competitive advantages and transition objectives.

Key findings include:

- All case studies rely on coordination across different levels of government. This is a consistent design feature underpinning policy delivery, regardless of whether coordination is achieved through delivery boards (Barrow), central economic agencies (Japan), national agencies (South Korea), or federal–provincial arrangements (Canada). In the instances of ‘good’ coordination, coordination is anchored in a clearly mandated lead institution or delivery body (such as Team Barrow or METI), with authority to align priorities, sequence investment and resolve cross-agency bottlenecks. In contrast, South Korea’s space cluster illustrates that even where national mandates and regional roles are formally defined, coordination can break down at the regional level, with competing local priorities and contestation over investment diluting commitment to agreed specialisations across the three cluster regions.
- Barrow-in-Furness and Canada stand out for deploying a wide mix of policy instruments, including direct funding, infrastructure investment, coordination bodies and enabling social infrastructure. This reflects the complexity of delivering industrial growth in places with capacity constraints or highly dispersed geographies.
- Explicit Indigenous partnership frameworks are largely absent across the case studies, with Canada the main exception. In Sweden, significant impacts on Sámi reindeer herding are evident, but these concerns are not embedded as core design elements of the green industrial policy itself.
- Most cases recognise workforce capability development, particularly in regions with strong industrial or mining legacies where upskilling is required for advanced manufacturing. However, approaches differ: Japan and the UK Catapult program place greater emphasis on R&D, innovation and commercialisation of new industries, rather than large-scale redeployment of existing workforces.
- Strengthening domestic and regional supply chains is consistently evident, often linked to sovereign capability, energy security or strategic industries. The emphasis is less on self-sufficiency and more on reducing exposure to global shocks through deeper local and regional ecosystems.
- Regional economic transition plans and/or strategies were a relevant features across all case studies, but differed in their timeframes, duration, integration, deliberateness and levels of effectiveness. The strongest examples, such as Barrow-in-Furness, South Korea and Japan’s METI-led initiatives combined clear long-term horizons between 10–30 years with coordinated industry, workforce and infrastructure planning across near-term horizons. While regional economic transition frameworks were also present in Sweden, the Ruhr, Canada and the UK, their effectiveness varied depending on how deliberately they aligned economic development objectives with place-based implementation and governance.

All cases use place-based specialisation to anchor policy design. Barrow focuses on a single town with deep defence manufacturing capability, South Korea distributes its space program across three regions with distinct roles, Sweden concentrates green steel production in the north to leverage low-cost renewable energy and Canada links specialised regions through national coordination frameworks.

While multi-level governance coordination is the common foundation, the case studies show that effective green and industrial transition policies typically combine a diverse mix of place-specific tools.

Policy design Matrix

Table 16 Comparator matrix – Policy design attributes of international case studies

Policy Design Attributes	United Kingdom: Barrow-in-Furness	Japan: Ministry of Economy Trade and Industry – METI	South Korea: Space Industry Cluster	United Kingdom: Innovate UK Catapult Centres	Industriklivet –Sweden Green Steel Industrial Policy	Germany: Ruhr Green Transition	Canada: Place-based industrial policy across dispersed regions
Multi-level governance coordination	●	●	●	●	●	●	●
Federal government regional presence	●	●	●			●	●
Government procurement or offtake agreements	●	●	●		●		
Workforce transition and upskilling	●		●		●	●	●
Continuity of policy direction	●		●		●	●	●
Sovereign capability objectives	●		●		●		●
Established Central Authorities	●	●	●	●			●
Supply chain resilience	●	●	●		●	●	●
First Nations partnerships and participation		●					●

Policy Design Attributes	United Kingdom: Barrow-in-Furness	Japan: Ministry of Economy Trade and Industry – METI	South Korea: Space Industry Cluster	United Kingdom: Innovate UK Catapult Centres	Sweden: Industriklivet – Green Steel Industrial Policy	Germany: Ruhr Green Transition	Canada: Place-based industrial policy across dispersed regions
Region specialisation	●		●	●	●		●
Regional economic transition plans	●	●	●	●	●	●	●
Low carbon product certification					●	●	●
Addressing declining economic conditions		●				●	

Funding mechanisms

Across the case studies, governments rely on a mix of funding mechanisms to reduce risk, shape markets and crowd in private capital, with notable differences in how these tools are combined.

Key findings include:

- Direct grants, where funding is provided through a targeted selection framework, are the most widely used funding tools. They are used to provide key enabling infrastructure, de-risk early-stage investment and enable initial capability development, including METI's grants to attract industry to Hokkaido, South Korea's support for space-sector startups, and core public funding for the UK Catapult Centres.
- Grants alone may not always be sufficient where the challenge is bridging the valley of death between research and commercialisation. Dedicated translational institutions like the UK Catapult Centres demonstrate that institutionally backed testing and demonstration infrastructure and R&D capability, rather than one-off project funding, reduces the risk and cost for firms attempting to move innovations toward market at the stage where research funding runs out and private capital is not yet willing to commit.
- Investment tax credits and specialised tax incentives are used primarily in Canada and Japan. In Canada, ITCs are combined with co-funding and concessional finance, indicating an emphasis on mobilising private capital rather than relying on direct public expenditure. A similar risk-sharing logic is evident in Sweden with co-funding arrangements for pilot programs.
- Government-backed demand mechanisms feature most clearly in Barrow-in-Furness, Japan and South Korea, where long-term procurement or market commitments underpin investment. In other cases, demand appears to be shaped indirectly through regulation, standards or broader policy objectives rather than explicit funding instruments.

Across the case studies, no single combination of funding mechanisms emerges as universally successful. The effectiveness of funding mixes is heavily context dependent, shaped by factors including the maturity of the industry, regional institutional capacity, market readiness, workforce characteristics and the nature of the transition challenge (growth, diversification or decline). What appears most consistent is not the specific instruments used, but the alignment between funding mechanisms and the underlying market failures they are intended to address.

In practice, early-stage or emerging industries tend to rely more on grants, shared infrastructure and demonstration funding (for example, Catapult Centres and Korea's space sector), while capital-intensive industrial transitions with clearer demand signals combine public risk-sharing with market-creation tools such as offtake agreements, procurement or tax incentives (as seen in Sweden, Barrow-in-Furness and Canada).

Most case studies combine multiple funding mechanisms to crowd in private investment. Jurisdictions with more place-specific and coordinated policy frameworks (such as Barrow-in-Furness and Canada) also deploy the widest range of funding tools, suggesting a relationship between policy sophistication and funding diversity.

Funding mechanism Matrix

Table 17 Comparator matrix – Funding mechanisms identified in international case studies

Attributes	United Kingdom: Barrow-in-Furness	Japan: Ministry of Economy Trade and Industry – METI	South Korea: Space Industry Cluster	United Kingdom: Innovate UK Catapult Centres	Industriklivet – Sweden Green Steel Industrial Policy	Germany: Ruhr Green Transition	Canada: Place-based industrial policy across dispersed regions
Investment tax credits (ITCs)							●
Direct Grants	●	●	●	●	●	●	
Competitive Grants Programs		●		●	●		
Co-funding programs (public-private co-investment)			●	●	●		●
Concessional Finances					●		●
Infrastructure Investment	●		●	●	●	●	●
Government backed demand	●	●	●		●		

Place-based Characteristics

Across the case studies, no single place-based characteristic is universal. Each approach reflects the specific strengths and limitations of the region, reinforcing that industrial policy cannot override underlying geographic, resource or institutional conditions.

Key findings include:

- Most case studies indicate that policies build on established strengths, such as Barrow's shipbuilding and defence capability, Sweden's access to low-cost renewable electricity co-located with steel production, and South Korea's three-node space cluster leveraging manufacturing, research and launch capabilities.
- Access to critical minerals and affordable renewable energy emerges as a key place-based advantage in Sweden and Canada. These conditions reduce operating costs and risk for advanced manufacturing.

- Several cases anchor industrial development around research institutions and universities, most clearly in South Korea where Daejeon functions as the knowledge and R&D hub of the space program.
- Social licence and community acceptance are critical enablers of industrial and innovation policy. Preliminary evidence suggests both Barrow and the Catapult models contributed to social licence outcomes. By contrast, the Swedish experience highlights risk of inadequate engagement with First Nations groups and poor management of housing and health impacts, both of which contributed to a loss of social licence.

Place-based Characteristic Matrix

Table 18 Comparator matrix – Place-based characteristics identified across international case studies

Attributes	United Kingdom: Barrow-in-Umali	Japan: Ministry of Economy	South Korea: Space Industry	United Kingdom: Innovate UK	Industriklivet -Sweden Green Steel	Germany: Ruhr Green Transition	Canada: Place-based industrial
Existing industrial capability	●		●		●	●	●
Social licence and community acceptance	●			●			
Population density and scale		●	●			●	
Common-User infrastructure	●		●		●	●	
Connectivity and export infrastructure	●		●		●	●	●
Regional specialisation	●		●	●			●
Universities & Research Institutions		●	●	●			
Access to critical minerals and/or natural resources		●			●		●
Access to renewable energy	●	●			●		

Summary of Key findings

Learnings and challenges

Across the case studies, multi-level governance coordination emerges as a universal foundation for place-based industrial policy, but this can also be a significant source of efficacy risk given the complex nature of cross-government co-ordination.

Workforce transition and supply-chain resilience are common challenges, though responses vary significantly between regions repurposing existing industrial capability and those building entirely new industries.

Across the case studies, multi-level governance coordination emerges as a universal foundation for place-based industrial policy, but also a persistent source of delivery risk given the complexity of cross-government coordination. While sufficient institutional capacity is highly context dependent, the stronger cases point to common markers, including: a clearly mandated lead institution with authority to coordinate across agencies (for example, METI in Japan and Team Barrow in the UK), flexible delivery arrangements that extend beyond individual funding rounds (such as the UK Catapult Centres) and the capability to sequence infrastructure, workforce and market-shaping interventions over time (as seen in Sweden's green steel transition). Workforce transition and supply-chain resilience remain common challenges, particularly where delivery capacity is thin. Overall, the case studies show that even well-designed policies risk underperforming without institutions able to sustain delivery, monitor outcomes and adapt over time.

Several recurring learnings and findings emerge across the case studies:

- **Coordination is essential**

Multi-level governance is a common feature across all cases, but coordination across governments, agencies and industry is also a persistent source of delay, complexity and delivery risk.

- **Strong social infrastructure is critical to enabling regions to capture the full benefits of industrial growth**

Investment in housing, transport, skills, energy and public services underpins the foundations for fostering sustainable industrial expansion, particularly in remote or rapidly growing regions. To realise this potential, social infrastructure investments must be planned and sequenced alongside industrial development, not treated as an afterthought in order to support population growth and build the community conditions necessary to supporting successful long-term industrial transitions.

- **Workforce transition requires regionally specific approaches**

Regions repurposing existing industrial bases face different challenges to those building new industries, requiring tailored strategies for retraining, attraction and skills development.

- **Market creation and risk-sharing**

Where governments combine demand-side tools, guarantees and blended finance, early commercial investment is more likely to proceed.

- **Government has a critical role in bridging the gap between innovation and commercialisation**

Without active government investment, promising technologies and innovations frequently stall before reaching commercial deployment. Pairing public-risk sharing mechanisms (such as grant funding, collaborative R&D grants, shared infrastructure investment and partnerships) with institutions bridging the gap between research and industry has proven effective in accelerating innovation outcomes and crowding in private investment to higher-risk high value industries.

- **Central economic agencies and authorities hold a distinct set of levers for driving place-based industrial transition**

This includes demand signals that provide industry confidence to invest in new markets, workforce and skills investment to build the labour supply industrial transitions depend on, market-shaping tools to de-risk private capital (i.e. direct grants and public risk-sharing mechanisms), and social infrastructure investment. No single lever is sufficient. Rather, it is their sustained combination and coordination over time that determines whether industrial transitions take hold.

- **Sequencing is context dependent, and does not follow a single linear model**

The case studies suggest that industrial and innovation transitions rarely begin with a complete place-based strategy. In many cases, the initial catalyst is a national policy directive, market shock, strategic industry objective or major project investment, with place-based governance, enabling infrastructure, workforce initiatives and localised programs developing in response. Sweden's green steel transition emerged from the convergence of national climate policy, sector roadmaps, incumbent and private project investment, and later public support for demonstration, commercialisation and market formation. Barrow-in-Furness followed a different pathway, with nationally driven defence procurement and industrial expansion creating local pressures that then required a coordinated place-based response through housing, transport, workforce, health and town centre investment.

- **Place-based industrial and innovation policy looks fundamentally different depending on whether a region is growing, transitioning or in structural economic decline**

Growing regions like Barrow-in-Furness face the challenge of pace, with enabling infrastructure, housing and services needing to keep up with industrial expansion or else growth becomes self-limiting. In regions facing structural economic decline, the case studies suggest that policy tools tend to focus less on accelerating growth and more on rebuilding economic foundations and managing transition. In Japan's Hokkaido and Germany's Ruhr, this included a strong federal government regional presence, sustained multi-level governance coordination, and deliberate efforts to strengthen or reconfigure domestic and regional supply chains.

- **Continuity to build confidence**

Stable funding and policy continuity matter as much as financial scale, particularly for transitions unfolding over decades. Developing sustainable outcomes takes time, in some instances several decades, continuity in policies and governance provides confidence for investors and market participants.

Structural differences shaping place-based policy design

While there are common attributes across these industrial and innovation policy case studies, it should be noted that industrial and innovation policy is highly context dependent. Economic systems, geography, government structure, institutional capacity, resource availability, population density, infrastructure networks, labour markets and geopolitical positioning all materially influence how policies are designed and implemented.

Different countries pursue industrial policy from fundamentally different starting points and under different constraints. Highly urbanised and densely populated economies in Europe and parts of Asia often benefit from concentrated industrial ecosystems, shorter supply chains, integrated transport networks and historically large domestic manufacturing bases. In these contexts, industrial policy can focus more heavily on upgrading existing clusters through firm-level incentives, R&D support, skills deepening and innovation diffusion, as agglomeration effects and market proximity already support scale, coordination and productivity.

By contrast, geographically large and dispersed nations such as Canada and Australia face structurally different challenges. Industrial assets, resource and materials availability, workforce and population are often separated by significant distances, increasing infrastructure costs and creating coordination challenges across regions and jurisdictions. As a result, industrial and innovation policy in these contexts places greater emphasis on enabling infrastructure, deliberate place-based specialisation, regional coordination and supply-chain integration to overcome the absence of natural agglomeration.

Countries with large domestic manufacturing sectors and strong industrial traditions, such as Germany, Japan and South Korea, are often able to leverage deeper supply networks, export-oriented industries, highly specialised workforces and long-established institutional coordination mechanisms. Political and governance structures also significantly differ across the selected case studies. Federal government systems such as Canada and Australia require substantial coordination across national, state/provincial and regional governments, often leading to more negotiated and place-based outcomes.

These international case studies provide insights, learnings and elements of policy models or approaches that are relevant to the Australia context, however the industrial and innovation place-based policies and approaches cannot be directly replicated across jurisdictions without careful consideration of economic conditions, governance arrangements, infrastructure constraints, workforce capabilities, regional characteristics and strategic objectives. Successful policy design typically reflects an alignment between national ambitions and the practical realities of each country's economic geography, institutional structure and comparative advantage.

First Nations Case Study Insights

The First Nations case studies included in this report have been selected to demonstrate how Indigenous economic participation can be structurally embedded within industrial, innovation and clean-energy policy, as opposed to being treated as a downstream inclusion consideration. Unlike many international industrial policy examples, the following examples centre Indigenous institutions as economic actors, decision-makers and long-term asset owners, operating at scale and over extended time horizons.

The Māori economy and Canada's Wah-ila-toos single-window broker illustrate two distinct but complementary dimensions of First Nations economic participation. The Māori economy demonstrates what sustained, treaty-grounded Indigenous economic architecture can produce across a national economy over a generation. Wah-ila-toos demonstrates how governments can redesign funding, governance and delivery systems to remove friction, support self-determined project development, and align clean-energy investment with Indigenous ownership and leadership.

Together, these case studies are relevant to industrial and innovation policy because they reveal how First Nations engagement is not primarily a consultation challenge. It is an institutional design challenge. Outcomes are shaped by whether Indigenous governance, capital, commissioning authority and delivery capability are built into the system itself, rather than appended to it.

These cases also highlight that Indigenous economic participation is intrinsically linked to place. Land tenure, resource access, community governance, workforce pathways and intergenerational objectives all materially affect how industrial and clean-energy transitions unfold on the ground. This makes them directly relevant to the design of place-based policy and to the role of agencies such as NZEA in supporting the net-zero transition.

Table 19 Comparator matrix – Enabling factors for First Nations Participation

Attributes	The Māori Economy (New Zealand)	Wah-ila-toos Single- Window Broker (Canada)
Multi-level governance coordination	●	●
Clearly mandated lead institution		●
Place-based specialisation	●	●
Public risk-sharing and blended finance	●	●
Enabling infrastructure investment		●
Workforce and capability development	●	●
First Nations partnership or leadership	●	●

Key findings

Across the First Nations case studies, durable economic participation is shown to depend on institutional design choices that embed Indigenous governance, ownership and delivery within industrial activity. Outcomes are shaped less by individual funding programs and more by how authority, capital and delivery responsibility are structured over time.

Several recurring findings emerge across the First Nations case studies, including:

- **First Nations economic participation is inseparable from place:** In both the Māori economy and Wah-ila-toos, economic activity is anchored in land tenure, community governance and regional context. Policy design responds to the specific characteristics of place, including remoteness, resource access and community scale, rather than applying uniform national approaches.
- **Delivery responsibility:** The case studies show that outcomes are stronger where delivery responsibility sits with Indigenous institutions, supported by government funding and coordination rather than direct state control. Governments act as funders, convenors and risk-sharers, while Indigenous entities lead decision-making, project development and asset ownership.
- **Coordination reduces friction, but authority matters:** Multi-level coordination is necessary in both cases, but it is most effective where a clearly mandated coordination function exists (such as Wah-ila-toos) or where strong Indigenous governance institutions perform coordinating roles (as in the Māori economy). Informal or fragmented arrangements increase transaction costs for communities.
- **Public risk-sharing enables participation where markets alone will not:** Both case studies demonstrate that Indigenous-led projects can benefit from public risk-sharing to proceed, particularly in remote or capital-intensive contexts. Grants, settlement capital, pooled investment vehicles and co-funding arrangements reduce barriers to entry and crowd in private capital over time.
- **Workforce and capability development must run in parallel with investment:** Investment in infrastructure or assets alone is insufficient. Both cases embed capability-building, leadership development and workforce pathways alongside capital deployment to support long-term Indigenous control and economic participation.

Overall, the case studies show that durable First Nations participation depends on embedding governance, ownership and place-based delivery within the policy system itself, rather than layering engagement onto existing frameworks.

8

Implementation considerations

Implementation considerations

Implementation barriers, risks and mitigation measures and mechanisms

Place-based industrial and innovation policies may underperform not due to their objectives being unclear, but due to a lack of implementation planning, or strategy fails to account for regional readiness, sequencing constraints, governance complexity and the limits of local institutional capacity to deliver on policy. Even well-designed, well-funded interventions can stall where enabling infrastructure lags, governance is fragmented, social license and community buy-in are limited or where transition timelines are misaligned with funding and workforce realities.

Preceding sections have highlighted key findings and enabling factors shaping the design and delivery of industrial and innovation policy over time. Building on this analysis, this section focuses specifically on implementation risks, the points at which otherwise well-designed policies have been constrained, underperformed or faced challenges.

International case studies demonstrate that the effectiveness of industrial and innovation policy depends not only on policy design, but on the ability to manage implementation risks. Across the international case studies, recurring risks emerged including:

- Uncertain market demand and commercial viability can limit private investment where support is not complemented by demand-side mechanisms.
- Fragmented governance and unclear institutional responsibilities can weaken policy certainty, coordination and delivery across multiple levels of government.
- Regulatory fragmentation and poor sequencing of approvals and enabling infrastructure can delay investment and constrain project delivery.
- Attracting investment that is not supported by capable proponents or aligned with regional priorities can reduce the likelihood of successful project delivery and long-term regional outcomes.
- Failure to integrate workforce transition and community benefits can undermine social licence, limit local participation and reduce the long-term benefits of industrial development.

A recurring implementation risk is uncertain or insufficient market demand and commercial viability. While governments frequently invested in supply-side capability through grants, tax incentives and enabling infrastructure, successful industrial policies also reduced market risk by creating demand through procurement commitments, offtake agreements, buyer aggregation, certification standards, export partnerships and other mechanisms that provided credible long-term demand signals. Public investment was typically linked to demonstrated market demand, private co-investment and regional competitive advantage, reducing reliance on ongoing government support.

Another common implementation risk is fragmented governance and unclear institutional responsibilities. In federal systems, policy certainty was strengthened through durable governance arrangements rather than policy statements alone. Successful approaches relied on clearly mandated coordinating functions capable of aligning industry, infrastructure, investment, workforce development and regional delivery across multiple levels of government. While some regions established dedicated delivery entities, others achieved similar outcomes by expanding the coordination role of existing agencies.

Regulatory fragmentation and poor sequencing of approvals and enabling infrastructure also emerged as significant delivery risks. State-controlled planning, environmental approvals and infrastructure delivery often operate on different timeframes to national industrial policy ambitions. Rather than attempting to eliminate these complexities, effective governance arrangements coordinated permitting, land access and infrastructure sequencing early, ensuring regulatory processes supported rather than constrained industrial development.

A further implementation risk is attracting proponents that lack the capability, commercial maturity or strategic alignment required for successful delivery. Rather than competing solely to attract individual projects, successful regions developed investable propositions by packaging land, infrastructure, approvals, workforce capability and funding around regional competitive advantages. Proponents were also assessed against delivery capability, financial capacity and strategic fit, reducing the risk of stalled or underperforming investments.

Finally, failure to integrate workforce transition and community benefits can undermine the long-term success of industrial policy. Regions that achieved more durable outcomes embedded skills development alongside industrial investment from the outset, rather than treating workforce transition as a response to displacement. Community participation was also integrated into project planning and delivery, with practical support enabling local communities to access funding, develop partnerships and share in the economic and social benefits of transition. This strengthened social licence, increased local ownership and contributed to more inclusive regional development.

These findings highlight that implementation success depends on both policy mechanisms and on coordinated governance, effective sequencing and the capacity to align investment, infrastructure, regulation, workforce development and community outcomes over time.

Table 20 Implementation risks

Risks	Where this was observed & mitigation approaches / mechanisms
“Valley of death” Risk of emerging industries struggling to move from early-stage development to commercial deployment	UK innovation system pre-Catapult Models Catapult model mitigates commercialisation risk through shared testing infrastructure, industry-commercialisation partnerships, co-funded pilot environments. Sweden Green Steel – Industriklivet From technically promising low-carbon industrial processes to commercially viable, capital-intensive production through public risk-sharing and market creation mechanisms.
Industrial expansion outpacing enabling and social infrastructure Risks of capacity constraints, increasing pressure on housing and essential services, and undermining workforce attraction, community support and the long-term viability of regional development.	Barrow-in-Furness, United Kingdom, Sweden Green Steel – Industriklivet Integration of housing, transport, land use, urban design, and social infrastructure and services into industrial strategies as seen in Barrow Rising, Sweden’s northern regional strategies.
Workforce transition or insufficient labour supply Risk of regions facing risks of job displacement, stranded skills, declining legacy industries, weak industrial clustering and insufficient workforce capability where new industries, firms, research institutions and investment failed to scale quickly or align around a coherent transition pathway.	Barrow-in-Furness, United Kingdom Parallel investment in skills, retraining and attraction, long-term workforce transition planning, retraining and reskilling programs, regional economic diversification, early retirement and income support, investment in relevant education and university programs. Wah-ila-toos, Canada Supporting Indigenous participation in clean energy projects by reducing coordination barriers and connecting communities with funding, technical capability and delivery support through partner matching. South Korea Space Industry Cluster Concentrated public investment, research capability, firms and institutions around a defined space industry cluster. This helped create the basis for sector-specific workforce development and supplier capability.

Uncertain demand for new low-carbon industrial products

Risk of uncertain demand for new low-carbon industrial products, whether low-carbon products can secure sufficient demand at a price that supports commercial-scale investment.

Sweden Green Steel – Industriklivet

Market-creation tools such as offtake agreements, procurement commitments, certification standards, carbon pricing and emissions regulations.

Japan: Ministry of Economy Trade and Industry (METI) Hokkaido Prefecture

South Korea Space Industry Cluste

Demonstration funding, subsidies, government-enabled market signalling, enabling infrastructure investment, long-term energy transition policy.

Public R&D investment, government procurement, sovereign capability demand signals.

Lack of market confidence in commerciality

Demonstrates how regional investment confidence can be strengthened where demand is anchored.

Barrow-in-Furness, United Kingdom

Major employer anchor, anchor industry, long-term project pipeline, public-private partnerships and risk sharing, workforce and skills alignment, national defence procurement.

Government coordination and stakeholder misalignment

Coordination risks across multiple levels of government, industry and regional stakeholders.

South Korea Space Industry Cluster

Tripartite governance system, national and regional industry alignment, cluster specialisation agreements, coordinated sector-building in selected locations.

Japan: Ministry of Economy Trade and Industry (METI) Hokkaido Prefecture

Agency-based delivery model with a clear lead institution. Regional implementation capability, coordination across land use, infrastructure, skills and regulations.

Canada – place-based industrial policy across dispersed regions

Layered governance model that links federal industrial priorities with regional delivery mechanisms, provincial and territorial strategies, and place-specific investment coordination. Layered federal–regional governance alignment between national, provincial, territorial and regional strategies.

Indigenous engagement treated as secondary	Sweden Green Steel – Industriklivet (Sámi impacts) Embedding Indigenous governance, ownership and devolved delivery, as also seen om Māori economy and Wah-ila-toos case studies.
Community Benefits Risk of failing to deliver lasting regional outcomes where local communities do not realise tangible economic, social and environmental benefits. This can weaken social licence, reduce public support and limit the long-term effectiveness of policy interventions.	Germany Ruhr Green Transition Structural change through a long-term regional renewal agenda, including public investment, negotiated workforce pathways and regional redevelopment, helping to reduce the social shock of coal decline. Visible local benefits included universities, transport improvements, environmental remediation, cultural reuse of industrial sites and service-sector growth. Māori Economy, New Zealand Economic development framed around intergenerational value, local ownership, stewardship of land and resources, and benefits that extend beyond short-term jobs or project revenues. Seen in mechanisms such as Indigenous ownership structures, intergenerational investment models, community-led initiatives, Indigenous investment vehicles, local participation in economic decision-making.
Political certainty and policy reversal Risks of fragmented authority, inconsistent priorities, uncertain funding continuity and unclear investment signals for regions.	Germany Ruhr Green Transition Policy certainty through long-term transition commitment, staged transition planning, durable regional governance, sustained public investment. Canada – place-based industrial policy across dispersed regions Layered governance linking federal priorities with provincial, territorial, Indigenous, regional and industry strategies. Clear connection between place-based investment and national industrial objectives.

Credible investment and anchors

Risk of attracting credible proponents and investors to the region.

South Korea Space Industry Cluster

Concentrated investment, research capability, firms and institutions around a defined sector opportunity, with defined regional specialisation across the value chain.

Barrow-in-Furness, United Kingdom

Public investment to crowd-in private capital, anchor employer-led industrial ecosystem, and sequencing infrastructure with industrial expansion.

Misalignment between Federal ambition and state- controlled delivery regulations

Risk that funding, market demand signals or strategic ambition can outpace the state and regional land use and environmental regulations that can constrain emerging industrial by increasing approval complexity and limiting land use access, and where land, infrastructure, permitting, environmental approvals and regional development responsibilities are split across levels of government.

Canada – place-based industrial policy across dispersed regions

Durable federal-provincial coordination across a layered federal-regional governance, aligning federal ambition with provincial, territorial, Indigenous and regional delivery systems.

Japan: Ministry of Economy Trade and Industry (METI) Hokkaido Prefecture

Regional delivery mechanism to translate national industry policy into practical project conditions at the regional level, at land use, regulatory, infrastructure and investment conditions.

Germany Ruhr Green Transition

Long-term staged redevelopment planning, integrating land reuse, environmental remediation, infrastructure and workforce transition, sequenced environmental remediation, rather than treating approvals as isolated project-by-project basis

9 Conclusion

Conclusion

The research and international case studies demonstrate that place-based industrial and innovation policy and approaches play a significant role in supporting regional transition, industry development and investment confidence. However, the evidence indicates that success is not determined by the adoption of national policy alone, but by combining policy certainty and clear strategic purpose with long-term government coordination, targeted funding mechanisms, strong implementation and delivery capabilities, and a detailed understanding of the characteristics, strengths and constraints of each region or place.

Research findings on policy models

Industrial and innovation policy models perform different but complementary roles. Industrial policy approaches are most relevant where the objective is to scale production, strengthen supply chains, support employment and attract investment into priority sectors. Innovation policy approaches are most relevant where the objective is to build knowledge systems, commercialisation pathways, research-industry collaboration and long-term capability. In practice, the most relevant international examples have an overarching policy approach but selectively combine elements from market creation, cluster-based, agency-led, mission-oriented and just transition approaches, depending on the needs and opportunities of specific regions.

Insights from global case studies

The case studies reinforce the importance of funding mechanisms that reduce risk, and create confidence for private investment. Direct grants, co-funding, concessional finance, procurement, tax incentives, offtake arrangements, common-user infrastructure and dedicated demonstration or commercialisation facilities all have potential value, but their effectiveness is context dependant. Funding mechanisms were rarely used in isolation, and were commonly accompanied by complementary infrastructure, workforce, governance and market-shaping measures.

Policy design and delivery matters. The strongest case studies are underpinned by clear mandates, stable institutional arrangements, multi-level coordinated governance, sequencing of infrastructure and investment, and mechanisms for ongoing coordination between government, industry, communities, workers and First Nations stakeholders. Place-based characteristics are central to this process. Regional assets such as renewable energy resources, industrial land, ports, transport links, skills bases, research institutions, anchor firms, supply chains and community governance structures shape what is feasible and where public intervention is most likely to generate durable outcomes.

Implementation risks and mitigation measures

Implementation risks in place-based industrial and innovation policy are less about the intent of the policy and more about whether implementation approaches match regional conditions. The key risks identified include weak or uncertain market demand, fragmented governance, poorly sequenced infrastructure and approvals, attracting unsuitable proponents, or failing to integrate workforce transition, community benefits and First Nations participation.

The case studies provide insights into the mitigation measures and approaches where governments take a coordinated, place-based approach to implementation.

This includes creating credible market demand signals, establishing clear governance and delivery responsibilities, sequencing enabling infrastructure and regulation early, procurement and offtake agreements, assessing proponents against capability and strategic fit, embedding skills, community participation and local benefit-sharing from the outset.

Considerations for the Authority

The findings in this report highlight roles of both national and regional institutions in delivering national policy and place-based outcomes. Federal government bodies set strategic direction, align funding and policy levers, reduce investment risk and provide long-term certainty. Regional agencies translate national objectives into place-specific delivery pathways, coordinate local stakeholders, identify regional constraints and sequence investment across infrastructure, skills, approvals, industry development and community outcomes. Successful delivery depends on these roles being defined and reinforcing, with federal bodies providing system-wide coordination and regional agencies providing the local intelligence, relationships and delivery capability needed to manage implementation risks.

Federal level agencies are well positioned to act as system coordinator and implementation partner for place-based transition. This value is in supporting alignment between Commonwealth, state, regional and local actors, supporting to prioritise places and sectors based on evidence, identifying the practical steps required to convert opportunity into investment, and ensuring that workforce, community and First Nations outcomes are embedded from the outset rather than added late in delivery. Further insights and considerations for the Authority are outlined below.

- **A central consideration is role clarity.** Place-based industrial policy requires coordination across Commonwealth, state, regional and local actors, as well as industry, research institutions, workers, First Nations stakeholders and communities. The research suggests that weak governance, fragmented responsibilities, short-term funding and lack of accountability can undermine even well-designed policy approaches. In an NZEA context, this raises the question and introduces the opportunity of how the Authority's role as a broker, coordinator and translator between national ambition and regional delivery may be clearly distinguished from the delivery responsibilities of other agencies and partners.
- **The need to test regional opportunities against genuine place-based advantage and readiness.** The research emphasises that successful place-based approaches build on existing strengths, such as energy resources, industrial infrastructure, specialised workforces, research capabilities and supply-chain linkages. They rarely seek to create industries from scratch where there is no underlying comparative advantage. For NZEA's priority regions, this suggests that implementation needs to distinguish between long-term potential and immediate readiness, particularly where regions are seeking to attract similar net zero industries.
- **Sequencing is a recurring implementation challenge.** Dependence on enabling conditions that take time to establish, including transmission, renewable energy supply, water, transport infrastructure, industrial land, planning approvals, workforce pathways and credible market demand. The research suggests that policy interventions need to be staged so regions are not encouraged to pursue industries before the foundations are in place. In parallel, the importance of converting broad regional opportunities into investable propositions. Place-based strategies often identify sectors of interest but provide less clarity on the specific proponents, customers, infrastructure dependencies, approval pathways, funding gaps and delivery responsibilities required to move from aspiration to implementation.

- **Government may consider the role it could play in supporting market formation and reducing investor risk.** This could include facilitating or advocating for government-backed demand mechanisms, such as offtake agreements, procurement commitments or other demand guarantees, to help create early market confidence. By improving demand certainty and signalling long-term policy commitment, these mechanisms can support private investment decisions, accelerate project development and help anchor new manufacturing activity in regions where Australia has emerging or latent competitive advantages.
- Regional action plans and agendas may need to distinguish between immediate actions, enabling actions and longer-term transformation pathways, while also translating priority opportunities into clearly sequenced initiatives with defined owners, dependencies, decision points and measures of progress. This approach can help ensure that regional ambition is aligned with delivery readiness and investor expectations.
- **Innovation policy is connected to industrial demand.** The research distinguishes between industrial policy, which is generally focused on scaling production, investment and employment, and innovation policy, which is focused on knowledge creation, commercialisation, research translation and collaboration. For NZEA's priority regions, the strongest pathway is likely to combine both. However, innovation-led approaches may be weakened where research activity is not connected to industry demand, commercialisation pathways, capital, procurement or firm-level adoption. This suggests a need to consider innovation not only as new technology creation, but as capability-building across existing regional firms and workforces.
- **Stakeholder engagement is an implementation issue, not only a consultation issue.** The research identifies meaningful engagement with communities, workers, First Nations stakeholders and industry as a common success factor. In transition regions, engagement is important because industrial change affects employment, identity, land use, housing, services and community confidence. A practical consideration for NZEA is how stakeholder input can inform prioritisation, identify delivery barriers, shape local benefit pathways and maintain legitimacy over time.
- **Implementation models need to remain flexible and to be adaptive.** The energy transition and the net zero industry development will occur over long timeframes and under uncertain market, technology and policy conditions. Some opportunities may strengthen as enabling infrastructure, demand and investment conditions improve, while others may weaken or fail to attract private investment. This reinforces the importance of monitoring, evaluation, learning and iteration so that regional priorities can be refined as evidence changes.

Recommended short term actions

- Undertake place-based analysis for priority regions to identify existing assets, industry and sector opportunities, constraints, investment readiness, workforce capability, infrastructure gaps, community priorities and First Nations interests.
- Develop regional transition plans distinguished between regions suited to industrial scale-up, innovation-led development, supply chain integration, workforce transition, enabling infrastructure investment or broader diversification.
- Map the funding and policy levers available across Commonwealth, state and regional programs to identify gaps, overlaps and opportunities.
- Identify priority demonstration regions, precincts or sectors where integrated place-based policy approaches could be tested, sequenced and evaluated.
- Establish clear governance and delivery principles for place-based transition, including roles, decision making, accountability arrangements and mechanisms for ongoing industry, community and First Nations engagement.
- Develop an implementation risk framework to support early identification and mitigation of risks relating to infrastructure sequencing, workforce availability, market demand, regulatory approvals, social licence and benefit sharing.
- Build a monitoring and evaluation framework that can track outcomes over time, support adaptive delivery and strengthen the evidence base for future place-based industrial and innovation policy in Australia.

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