Investment NSW

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The NSW Industry Development Framework

Increasing prosperity through innovation and competitiveness

Centre for Economic and Regional Development

Acknowledgement of Country

Investment NSW acknowledges that Aboriginal and Torres Strait Islander peoples are the First Peoples and Traditional Custodians of Australia. We thank them for their custodianship of Country — land, seas and skies. We acknowledge the diversity of First Nations cultures, histories and peoples, recognise their enduring connection to our State, and we pay our deepest respects to Elders past, present and emerging.

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The Centre for Economic and Regional Development is part of Investment NSW.

Minister's foreword

Industry policy was once defined by a focus on market-distorting tariffs and protectionism.

Now, it centres around strategic opportunities and refined interventions that position government as a catalyst for change — change that delivers long-term public benefits and promotes a business environment that allows private investment to thrive.

NSW is already well positioned to respond to economic challenges and seize opportunities that demand a rapid transformation of its industry structure. The state's strong economy — along with its skilled workforce, established capital markets, world-class research institutions and natural resources — put its industries and businesses at a global advantage. By instituting policy that prioritises industries and enables emerging technologies, the NSW Government can help businesses and industries harness these strengths, spurring growth at scale amid changing markets and unfolding megatrends.

The NSW Industry Development Framework (the Framework) establishes the foundation for collaborative partnerships across government, industry and research institutions, enabling the development and implementation of successful policy. It recognises the critical role of cooperation between different levels of government and coordination across policies, without which the growth potential of the NSW economy will diminish.

The Framework also creates transparency in the NSW Government's approach to market intervention. It brings industry policy into the light so it can be implemented with confidence and purpose, increasing the prosperity of NSW residents through sustainable economic growth. This is essential to ensure taxpayer funds are used well and used wisely.

With a defined industry policy underpinned by strong governing principles, NSW can deploy the policy levers needed to capture significant opportunities — like the global shift towards net zero emission targets. Such a policy will help drive innovation, motivate the uptake of new technologies, shift jobs and create new ones, and reduce the economic and social costs of transition. It will ensure NSW's industries engage on the global stage with a competitive edge, and will foster a resilient economy that thrives even in the face of future uncertainties.

The Hon. Stuart Ayres

Minister for Jobs, Investment, Tourism and Western Sydney, and
Minister for Trade and Industry

Overview

The NSW Government is committed to building a business environment that is conducive to economic growth and social prosperity. 'Industry policy' uses targeted government interventions to improve the business environment or shift the structure of economic activity towards sectors or technologies that offer better prospects for economic growth.[1] It operates within the wider set of macroeconomic, trade, environmental and labour market policies, and is one component of the NSW Government's broader economic strategy to achieve the best conditions in which industries and firms can thrive.

1. Warwick, K. (2013).

Industry policy complements existing policies by increasing incentives for firms to innovate, scale and lift productivity. Its focused interventions seek to overcome market shortcomings that impede growth in key areas for NSW.

The NSW Industry Development Framework (the Framework) drives an integrated approach to productive structural change and a more resilient post-pandemic NSW economy. It is designed to help the NSW Government efficiently deliver the best industry policy for the benefit of NSW's citizens. It provides a structured approach to developing and evaluating ideas, and then implementing policies that deliver more and better jobs, globally competitive industries, and a resilient economy.

The Framework targets the industries and technologies most likely to deliver public benefits. It builds on the capacity of NSW industries to advance opportunities for faster economic growth and, ultimately, higher living standards.

The Framework identifies the following priority industries of immediate focus to provide exciting opportunities for new, well-paid jobs and increased prosperity for all NSW citizens:

- agriculture and agrifood
- resources
- defence and aerospace
- clean energy and waste
- medical and life sciences
- digital systems and software
- international education and the visitor economy.

The priority industries will be the focus of interventions that accelerate growth by enhancing innovation and the uptake of core enabling technologies — including advanced manufacturing, biotechnologies, and digital technologies such as financial technologies (FinTech).

Priority industries

Agriculture and agrifood

Resources

Defence and aerospace

Clean energy and waste

Medical and life sciences

Digital systems and software

International education

Visitor economy

The Framework outlines interventions in industry development the NSW Government will use to stimulate economic growth and foster public benefits.

Every industry has its own characteristics, challenges and opportunities, so these interventions must address specific issues to deliver the greatest net benefit. The Framework simplifies the choice of intervention by linking policy levers to specific elements of the business environment.

The Framework sets out three key principles for developing industry strategies and cross-cutting technology programs: transparency (including state-wide assessment of benefits and costs), policy alignment and evaluation. It details how the NSW Government — working in partnership with the private sector, research institutions and other levels of government — will support dedicated programs for the priority industries.

The economy has faced several major disruptions over the past 15 years: globally, the 2008 global financial crisis and the COVID-19 pandemic; locally, droughts, fires and floods. These disruptions make the business operating environment risky. Building resilience to similar disruptions can equip businesses and people to better adapt to changed circumstances, lowering the costs of adjustment and speeding up recovery. The Framework supports risk management by assessing potential challenges and the policy levers that can help meet them.

Industry policy context and purpose of the Framework

Governments have a renewed interest in industry policy[2] for its potential role in creating jobs, increasing participation in global supply chains and building resilience to disruptive technologies and events.[3] The ultimate objective of industry policy is to create the best local conditions for industry development and firm performance, to in turn increase the prosperity of citizens through sustainable, long-term economic growth.

Markets are the mechanisms that most efficiently generate prosperity and public benefits, but they do not always function effectively. To correct this, targeted government policies modify the structure of a market economy by changing the way labour, capital, technology and physical assets are used.

Done carefully, industry policy can support, shape and grow economic activity and deliver broad public benefits. Done poorly, it diverts resources away from other activities, lowering growth and employment. Flow-on effects can then amplify into higher costs and less choice for consumers.

In the decade following the 2008 global financial crisis, more than 84 countries, accounting for 90% of global gross domestic product (GDP), adopted formal policies designed to stimulate economic growth by enhancing the competitiveness of local industries.[4]

In developed economies, this burst of industry policy development was driven by pressure to reduce unemployment and the fear of ‘deindustrialisation’, in the face of increasing global competition from economies with lower labour costs and the rise of advanced manufacturing in other developed economies. (It is worth noting that although industry policies in other jurisdictions may provide important lessons, they should not be directly emulated in NSW).

“Industrial Policy is any type of intervention or government policy that attempts to improve the business environment or to alter the structure of economic activity toward sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of such intervention.”

Warwick K. (2013, p.16)

2. Chang & Andreoni (2020)
3. Disruptive events include pandemics and climate-related risks and opportunities.
4. UNCTAD (2018).

Most developed countries responded to the increasing use of global value chains by supporting their manufacturing sectors and related service sectors with relevant regulatory and facilitating policies.[5]

This ‘restructuring’ process has since accelerated with the advent of disruptive technologies such as robotics and automation, digitalisation, Industry 4.0 and the Internet of Things, making formal industry policies a significant element in global industrial competition.

In the pandemic-disrupted world of today, governments are implementing large-scale recovery plans but also using targeted policies to bolster resilience. The impacts of the pandemic have reinforced the urgency of global societal challenges and emphasise the complementary role of public and private investments.

Governments often intervene in industry development through investment attraction activities, research and development (R&D), direct investment, tax concessions, market regulation and trade facilitation. These government policies can have a complex impact on industry development — they have the potential for positive and negative outcomes, both intended and unintended. Centralised policy coordination can help avoid unintended negative impacts and maximise returns on public investment across different agencies and levels of government. A coherent industry policy consistent with wider policy objectives is critical.

Investment NSW and Regional NSW, as the primary economic development agencies for the NSW Government, have a central role to play in designing, coordinating and implementing the policies, programs and activities that form NSW's industry policy.

This includes improving existing programs and activities; conducting scoping and evidence-based design for new programs and activities; and, where appropriate, helping fast-track specific projects and critical policy choices.

The Framework will drive an integrated approach to productive structural change in NSW's post-pandemic economy. Its purpose is to ensure the NSW Government delivers the best industry policy that benefits NSW citizens — one that comprehensively responds to the challenges of future structural transformation and is implemented coherently within the wider set of macroeconomic, trade, environmental and labour market policies.

5. UNCTAD (2018).

Industry development is important to the NSW economy and future prosperity

With the state's macroeconomic fundamentals largely in place, a current policy focus is on using well-designed industry policy to strengthen the NSW economy at the microeconomic level. Effectively implementing industry policy is also one component of the NSW Government's broader economic agenda to lead a recovery from the effects of the COVID-19 pandemic.

The NSW Industry Development Framework sits alongside complementary policy directions on:

- NSW participation in the international trade landscape *(Trade Statement – Locally Invested, Globally Connected)*
- the economic development of regions *(A 20-Year Economic Vision for Regional NSW – Refresh)*
- global business and talent connections *(Global NSW – Connected, Smart, Vibrant)*
- accelerating the transition of R&D into new industries, jobs, products and services *(Turning ideas into jobs: Accelerating research and development in NSW)*
- developing and investing in clean technologies to ensure economic prosperity from decarbonisation *(Net Zero Plan: Stage 1 2020-2030)*.

NSW 2040 Economic Blueprint: Investing in the State's Future also outlines a range of key aspirations for NSW to experience continued success in a changing world and expanding global economy.

Accelerating growth opportunities and effecting change

Industries grow as they accumulate enabling capabilities and productive capacities.[6] These 'enabling capabilities' include the know-how and skills of individuals and enterprises, as well as collective knowledge and sources of creativity. The 'productive capacities' are embodied in production factors, including physical and technological infrastructure.

Through sustained investment in enabling capabilities and productive capacities, NSW industry policies aim to accelerate the pace of industry development and structural change, to increase competitiveness and productivity.

Industry policy that promotes innovation to increase competition and lift productivity has the greatest prospect for accelerating economic growth and, ultimately, delivering better living standards.[7]

Innovation can bring about better-quality or lower-cost goods and services, and higher incomes for workers. By bringing higher-quality or lower-cost goods and services to market, innovating firms gain market share and periods of higher profits compared to their competitors, which also boosts individuals' incomes.

"Productivity growth is essential for long-term improvements in the standard of living. Achieving the efficiency improvements — both within sectors and within firms — necessary for such growth is a challenge for all countries, whether developing or more advanced ... productivity growth will stem from efficiency improvements within sectors, as the most efficient competitors gain market share at the expense of those lagging behind (allocative efficiency) and as competition pushes all remaining firms in the sector to improve their performance (firm-level efficiency)."

OECD (2015a)

6. International Labour Office (2014).
7. OECD (2015a).

Figure 1: NSW Industry Development Framework

VISION

Increased prosperity through sustained economic growth

OUTCOMES

More and better jobs | **Globally competitive industries** | **A resilient economy**

POLICY PRIORITIES

Policies to support innovation and competitiveness in industries important to the NSW economy

- **Emerging:** industries that promote significant spillover gains to the broader economy
- **Existing:** industries with high trade exposure that are important in terms of their overall contribution to NSW gross state product (GSP)
- **Technologies:** industry capabilities generating high-value-added growth potential and ongoing advantage from rapid technology adoption

POLICY LEVERS

	POLICY TARGET	POLICY INSTRUMENTS
Demand-side interventions	Domestic markets	**Strategic public procurement and regulation** – Inclusive supply chains; clean and digital technologies in infrastructure; minimum standards. **State-based branding and marketing campaigns**
	International markets	**Trade facilitation and promotion** – Trade fairs; linkage programs; concierge services; branding
Supply-side interventions	Skills	**Vocational training and higher education** – Skill recognition; infrastructure; strengthening business and provider links **Training grants and wage tax credits**
	Production capacity	**Investment attraction and facilitation** – Domestic and foreign direct investment (FDI); relocation incentives **Supplier and value chain resilience and development**
	Technology	**R&D incentives, incubators and scale up programs** – Research partnerships and innovation networks **Regulatory reform facilitating industry innovations**
	Financial capital	**Venture capital, small and medium enterprise (SME) finance schemes**
	Infrastructure	**Cluster models** – Precincts and industrial zones; planning policies **Infrastructure development, co-funding and provision** – Shared facilities; information and communications technology (ICT) infrastructure; improved transport networks

Enabling macroeconomic, trade, labour, socioeconomic and environmental policies*

(e.g. competition policy, fiscal policy, international commitments, foreign investment review, education policy, regulation)

*Managed by the NSW Treasury and other NSW agencies or the Australian Government

PRINCIPLES

Transparent governance
Clear policy objectives, evidence of market failure, accountability and effective administration to design and implement policy (including use of cost benefit analysis).

Policy alignment
Alignment with other NSW policies and related Australian Government policies to avoid unintended consequences or duplication.

Evaluation
Clear mechanisms to detect and correct problems with the design or implementation of industry policy and refine as circumstances change.

A framework for NSW industry policy

The Framework provides guidance on the design of industry policy that fosters the development of selected priority industries. The objective is to maximise public benefits at the least cost, consistent with broader NSW Government objectives. The Framework supports better matching of policy levers to the opportunities and challenges specific to an industry. It does this by linking policy levers to specific elements of an industry's operating environment that may be constraining growth — such as markets, skills, production capacity, technology, financial capital and infrastructure.

In this sense, the Framework (set out in Figure 1), is a risk management framework for government interventions in industry development. Risk management thinking underpins the design of industry policy and the interventions used.

Defining vision and outcomes

The NSW Government agenda for industry policy centres on the overarching goal of increased prosperity through sustained economic growth (see Figure 1). The intended outcomes of industry policy are threefold: more and better jobs, globally competitive industries, and a resilient economy. Industry-specific interventions are one approach to enhancing these outcomes and are often combined with a mix of economy-wide support, highlighting the importance of cohesive policies.

'More and better jobs' is about creating job opportunities and improving the quality of jobs by ensuring workforce skills develop and adjust readily to changing demands in the labour market. Designing and delivering high-quality education and training programs tailored to industry requirements is one factor contributing to this outcome.

Globally competitive industries capture market share and grow their markets. This occurs as a result of improving production processes and technology, which in turn improves productivity, access to inputs and infrastructure, and alignment of workforce capabilities with industry needs.

A more resilient economy with a diverse industrial base and adaptable workforce has greater capacity to respond to economic shocks and recover rapidly by reallocating resources to capture new growth opportunities. There are broad economic risks and opportunities posed by climate change and the need to prioritise long-term investment into resilience to enable NSW to capture the potential benefits.

Each of these outcomes is achieved through targeted industry interventions that address the most significant challenges and opportunities in an industry.

Market failure rationales for industry policy

Externalities

New knowledge and innovation can spill over and benefit other firms and the broader community without rewards going to the innovating firm. This can lead to underinvestment in innovation and R&D, as the private incentive to invest is reduced.

Imperfect information

Inadequate information about costs, prices, risks or quality — for producers or consumers — can lead to problems financing industry innovation and adopting new innovations. When lenders are reluctant to fund innovative projects there are fewer opportunities for innovating firms to attract investment funding. This smaller capital market can be a significant problem for start-ups and SMEs that have no established track record or insufficient capital to lower lender risk by co-financing.

Coordination failure

Parts of markets can fail to form when it is difficult and costly for buyers and sellers to find each other. Coordination failure can occur in labour markets (where skills are mismatched); segments of finance markets (where venture capital services high-risk investment and banks service low-risk investments but no lender services medium-risk investments); and innovation markets (where there are poor connections between research institutes that hold commercially relevant knowledge and businesses that can use it).

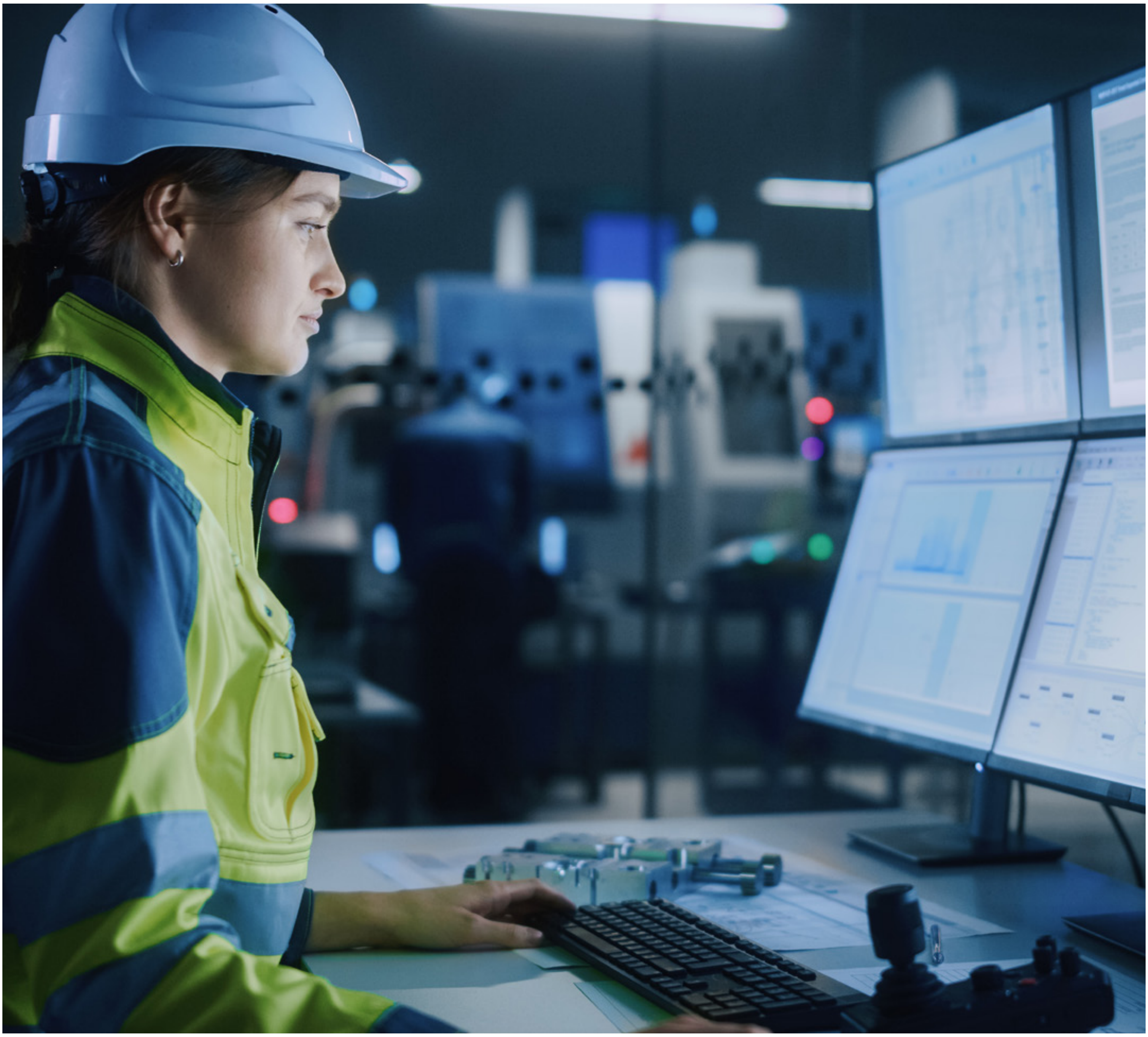
Minimising risks that could slow growth or reduce incomes

The right policy levers can change the allocation of resources between industries and firms, and shift the structure of the economy in a way that contributes to stronger opportunities for economic growth, innovation and improved social outcomes.[8] But unless there is a market failure (Box, page 11), using a policy lever to implement interventions that promote one sector at the expense of another risks weaker economic growth overall.

Poorly designed industry policies can have unintended impacts that slow economic growth. For this reason, industry policy must be implemented in a manner consistent with the government's role in addressing market failure, promoting equity and stimulating competition.

Formal industry policy is based on the evidence that not all government interventions are effective, that different interventions have different cost-to-benefit ratios (and hence different rates of return on public investment), and that some interventions have a higher risk of unintended negative impacts.

There will always be a risk of failure in selective industry policy; considered risk is an important factor. In general, the risks will be higher when the targeting is more specific, such as when targeting individual businesses or specific technologies. These risks may be worth taking where the potential public rewards are large. A good way to manage this risk is to take a portfolio approach to industry policy by utilising a mix of policy levers and priority industries.



8. Impact Evaluation Working Group (2012).

Prioritising to achieve scale and impact

> "What differentiates industrial policy from other policy is that it is necessarily selective among industries, products and stages of the value chain."
>
> **International Labour Organization (2014, p. 391)**

With limited resources available to help implement industry policy, public investment needs to be well targeted and objectives clearly defined. The NSW Government will direct available funding towards the industries and technologies most likely to deliver public benefits, and will leverage NSW's advantage to bring forward opportunities for higher rates of economic growth. Industries that are independently realising their growth and employment potential do not require industry-targeted government support but will still be supported by economy-wide policies.

Identifying industries important to the NSW economy

By identifying a few industries in which NSW has a strong actual or prospective advantage and global growth potential, the NSW Government can invest at the scale required to realise positive change.

In NSW, industry policy will be most active in industries and situations where the opportunities to realise greater overall prosperity appear strongest (see Figure 2), namely:

- **Emerging**: Industries that generate significant positive spillover benefits for the broader economy and people of NSW, such as improved environmental outcomes, health outcomes, quality of life or national security.
- **Existing**: Industries with high trade exposure that are important in terms of their overall contribution to NSW Gross State Product (GSP). High trade exposure indicates a comparative advantage and a lower risk that industry growth will displace existing industries.
- **Technologies**: Industry capabilities that can generate high-value-added growth potential for the NSW economy by realising significant and ongoing productivity improvement and competitive advantage from early adoption. ICT, scientific services and manufacturing play key roles in delivering transformational technology solutions to the priority industries and their supply chains.

The priority industries and core enabling technologies are based on the capacity of these industries and technologies to contribute to the economy in different ways.

These priorities will be reviewed periodically and revised as economic conditions and opportunities change.

Industries across the 'emerging' and 'existing' priority categories (see Figure 2) will form the investment portfolio for NSW industry policy. The intention is that strategic investment across the portfolio of industries will minimise risk from industry selection.

Industry policy priorities are designed to help grow industries to their potential. They also support the development and uptake of core enabling technologies and encourage growth in focus precincts (see Figure 2). The intended result is net gains that raise living standards in NSW above what would otherwise occur.

The mix of prioritised industries also supports diversity in the NSW economy's industry base, away from a narrow export mix of low-value-added products.

The NSW Government supports the growth of these industries and technologies through policy interventions that:

- build up specific industries linked to realising environmental or other strategic goals (such as sovereign capacity and industrial diversity)
- position industries for major structural shifts (such as Industry 4.0)
- enhance industry competitiveness by shifting businesses closer to the productivity frontier.[9]

The state's investment in and management of critical infrastructure sits outside core industry policy but is a complementary investment (see Figure 2). Critical infrastructure is important for all industries, and poor-quality or inadequate economic infrastructure — electricity, water, sanitation, communication and transport network systems — raises costs for all firms. Poor quality infrastructure also restricts the flow of goods, services, people and market information, both within the economy and abroad. This has implications for the integration of NSW businesses into global value chains, and economic growth in NSW more broadly. The uptake of enabling core technologies that improve the operation and maintenance of critical infrastructure can ensure efficient provision and pricing, and keep all NSW industries competitive.

9. The productivity frontier refers to industry-leading businesses that have the highest productivity within an industry.

Digital technology in agriculture

The adoption of digital technology in agriculture has enabled the collection and analysis of data to improve decision making, increase productivity, and improve the traceability of produce from paddock to consumer.

Among many other technologies, sensors, imaging technology and farm management software provide analytical data and tools used to monitor crops and livestock health in real time and support optimal management. Benefits include better risk management, production cost savings and increased consumer confidence in the supply chain.

Figure 2: Framework priority industries and enabling technologies

Critical infrastructure

- Telecommunications
- Utilities (water, energy)
- Transport

Framework priorities

Emerging industries

- Clean energy and waste
- Medical and life sciences
- Digital systems and software
- Defence and aerospace

Existing industries

- International education
- Visitor economy
- Agriculture and agrifood
- Resources

Core enabling technologies

- Digital technology
- Advanced manufacturing
- Biotechnology

Focus precincts

- Aerotropolis
- Westmead
- Tech Central
- Renewable Energy Zones
- Hydrogen Hubs
- Special Activation Precincts
- Regional Job Precincts

Overview of policy levers

The choice of best industry intervention depends on the underlying constraints and opportunities, and evidence of their significance.[10]

Well-designed policy interventions target specific components of each industry's productive capacity, enabling capabilities or markets. They are also designed to achieve long-term industry sustainability without the need for ongoing government support.

The Framework categorises interventions into demand-side and supply-side levers (see Figure 1), and how best to use each to support industry innovation, competitiveness and productivity.

Industry interventions tend to focus on supply-side interventions even when some of the key impediments are not related to supply.[11] Depending on the issue, a complementary mix of demand-and supply-side interventions may be most effective.

For example, gains from interventions targeting production capabilities may be limited by the capacity of domestic markets to absorb additional production.

More recently, industry policies across international and interstate jurisdictions are placing more emphasis on support for skills and technology, public–private partnerships, and government facilitation and coordination. These 'softer' interventions can reduce the risk of industry policy distorting markets, and help ensure industry policy is administered in line with Australia's free trade agreements and World Trade Organization rules.[12]

> "A good industrial strategy should have 'edges' around it, delineating where the free play of markets is good enough from where strategic intervention is needed."
>
> **UK Institute for Government, 2020**

10. Policy interventions need to provide the best value for taxpayer money. The presence of constraints in an industry is not enough to justify government intervention; the expected gains from intervening would need to exceed the cost of doing so (including program operation costs).
11. Warwick and Nolan (2014).
12. World Trade Organization (2020).

Demand-side interventions target either domestic or international markets to increase product demand (see Figure 1).

Domestic market levers

- **Strategic public procurement** and regulation can create demand for specific goods or services, stimulating the market. Public procurement can establish or scale up emerging markets and supply chains to a size and scale that lifts investor confidence in new technology and increases access to finance. Examples of strategic public procurement include switching public transport systems to renewable fuel sources, using renewable energy technology in public buildings, and introducing public 'missions' to encourage innovation.[13] Strategic public procurement can provide incentives for businesses in particular industries to innovate, acquire knowledge and learn new processes, particularly when there are opportunities to reapply new capabilities in future projects. Regulation — such as introducing standardised product ratings and minimum standards for goods — can directly influence demand for affected goods. For example, more stringent building efficiency and accessibility standards can shift the need for certain materials and building designs. While public procurement is not the preferred policy tool to address social disadvantage and economic participation, it has been used to provide opportunities for the economic participation of disadvantaged groups, for example indigenous businesses.
- **State-based marketing and branding campaigns** can increase awareness and knowledge of a state's unique product offering. The most prominent example is tourism promotion, including campaigns in both domestic (interstate) and international markets.

International market levers

- **Trade promotion and facilitation**[14] uses government connections and services to address information asymmetries and high transaction costs. It also creates international business networks to support growth opportunities in local industries. Activities can include international trade fairs, NSW industry branding and marketing campaigns, and business linkage programs. These are often used when the expansion of domestic production is hindered by a small domestic market, or when there are significant barriers to finding overseas customers or suppliers. International networks have become increasingly critical for competitive participation in global supply chains, especially the export and import of manufactured components. Government trade support often focuses on facilitating SME growth through better access to global markets. The regulatory burden of accessing global markets is high for SMEs, yet they are the engine of most economies. Trade promotion and facilitation can support businesses within targeted industries by creating opportunities to acquire knowledge of export markets and methods, knowledge of international sourcing for production inputs, and participation in global supply chains.[15]

Example: Demand-side domestic market policy levers

'Feel New' is a Destination NSW campaign intended to generate new demand for the NSW visitor economy, in response to the effects of the COVID-19 pandemic restricting access to key international tourism markets. The campaign uses multiple media channels (TV, radio, outdoor, digital and social) to promote and increase tourism into NSW.

13. Missions are steps to achieve global challenges set out in the United Nations Sustainable Development Goals. They promote a coordinated approach to addressing significant challenges affecting society, such as climate change, ageing populations, preventative healthcare and sustainable growth. Basing industry policy around these missions means focusing more on major problems and the sectors that contribute solutions – see Mazzucato and Dibb (2019) and Larrue (2021).
14. The NSW Trade Statement (2021) sets the vision for international trade, and the goals and actions needed to increase and diversify NSW exports.
15. Evidence from the Productivity Commission (2019) demonstrated that productivity improves as domestic industries become more exposed to trade and competition.

Supply-side interventions target an industry's inputs to production (see Figure 1).

Skills

- **Vocational training programs and higher education** are critical elements of industry development. They increase the pool of workers who have skills to match the needs of specific industries. Interventions can include strengthening the connection between businesses and training providers, enabling businesses to commission skills and training providers to improve the quality of education. Other examples include investing in education infrastructure, and stimulating the provision of new or specialist equipment to meet training needs. Immigration restrictions related to COVID-19 reduced industry access to skilled migration to meet NSW's skills gaps, highlighting the increasingly important role of education and vocational training in industry policy. Developing knowledge in the workforce that can be easily redeployed for other uses will play a key part in reducing the social costs of the transition to Industry 4.0 and the competitive repositioning involved.
- **Subsidised traineeships and apprenticeships, wage tax credits and training grants** can be used to encourage businesses to provide training for their staff. This can be effective for businesses that tend to underinvest where they see a risk of losing the staff they train to other businesses.

Example: Supply-side skills intervention

Cyber Hub Workforce and Skills program — AustCyber's Sector Competitiveness Plan 2020 highlights skills as a significant barrier to growth in the cybersecurity sector, with 44% of cybersecurity firms stating that they have limited access to specific types of skills. It is projected that the sector will need another 7,000 highly specialised, high-quality jobs by 2024.

This barrier was confirmed by industry consultation undertaken in developing NSW's 2021 Cyber Security Strategy. To reduce this key growth barrier for cybersecurity companies, Investment NSW's Cyber Hub is rolling out a workforce and skills development program. This includes expanding the Cyber Ambassadors program, which sends the industry's best and brightest into NSW high schools to inspire students to enter the cybersecurity workforce. The workforce and skills development program is designed to upskill cybersecurity students at university, and expand the Cyber Work Experience program for Year 9 and 10 students across NSW. This will ensure the pipeline of talent and skills is strong enough to meet future demand in the cybersecurity industry.

Production capacity

- **Investment attraction and facilitation** includes tools for lifting investment by domestic businesses, attracting foreign investment and accelerating associated knowledge transfers and innovation in target industries or their supply chains. Examples of these tools include concierge services for investment, and incentives such as relocation grants or tax concessions. Incentive schemes are generally used with caution and are carefully designed to minimise redundancy and rent-seeking behaviour. In NSW, such schemes will incorporate performance requirements, transparency measures, careful business targeting and specified end dates.[16]
- **Supplier and value chain resilience and development initiatives** enable more reliable and efficient production methods and processes, by encouraging the production and trade of products used in the making of other goods and services. Production is increasingly taking place within internationally dispersed global value chains. Important initiatives forming part of industry policy help selected industries become part of these global value chains and subsequently move into higher-value-added functions within the same or a related value chain.[17] Supplier and value chain initiatives are often undertaken in conjunction with initiatives that raise productivity and develop workforce skills. These interventions can also include government action to ensure access to essential goods that are vulnerable to supply chain disruptions and essential for the wellbeing of residents.[18]

16. See OECD (2003) for a checklist to assess the costs and benefits of using incentives to attract foreign investment, which provides operational criteria for avoiding wasteful effects and excessive reliance on incentive-based strategies.
17. International Labour Organization (2014).
18. Factors that can affect the resilience of a supply chain need to be carefully assessed to ensure the policy response is proportional to the risk — see Productivity Commission (2021).

Example: Supply-side production capacity intervention

Regional Defence Networks Program

Through consultation with industry, Investment NSW has identified a need for the NSW Government to increase its promotion of NSW to defence industry prime contractors, support local supply chain development and strengthen sovereign defence capabilities. Unlike existing business support and advisory services available across NSW, defence-specific guidance requires a deep understanding of the local industry footprint, which can be difficult to obtain, costly due to intermittent demand, and uncoordinated. To address this, Investment NSW's Regional Defence Network Program will establish a panel of suppliers to deliver key services that help match NSW defence businesses with prime contractors, grow local supply chains, increase the number of 'defence-ready' businesses, and strengthen the sovereign defence industry capabilities across NSW focus regions.

Technology

- **R&D and innovation incentives** include loans or grants for innovation and research activities. They can also involve public–private partnerships and risk-sharing arrangements between public and private investors, both of which can foster innovation potential. R&D improves the cost and productivity advantage of an industry by helping firms push out the technology frontier, or move closer to it, particularly for SMEs adopting technology and gaining new knowledge. R&D also plays a key role in increasing industry resilience to risks such as increasing climate variability. Well-targeted public research and innovation support that captures the public benefits of increased innovation and leverages private funding can accelerate this process and stimulate commercialisation.
- **Incubators and scale-up programs** encourage start-up businesses to innovate. They also build up entrepreneurship skills in SMEs, enabling them to grow their businesses, and provide the facilities and support networks to enable start-up businesses to develop and market new products.
- **Research and innovation networks** help firms in key industries learn about and accelerate the uptake of complex technologies. Networks also promote knowledge-based processes by facilitating cooperation between firms, public and private research organisations, and training and education providers. Coordinated networks can also generate opportunities for knowledge to spill over into other industries.
- **Regulation reform to support innovation** is important in driving economic growth from new technologies and new products. A supportive regulatory environment is critical to attracting investment. Reforms that deliver outcomes-focused, technology-neutral regulation are important when existing regulations unnecessarily restrict innovation or block new product pathways to market. Timely, effective regulatory reform that better understands the implications for emerging technology businesses will give NSW a real competitive advantage. Specifically, regular reviews can ensure new products and emerging technology businesses reach their potential while also managing potential risks to the community.

Example: Supply-side technology interventions

The National Space Industry Hub is an Investment NSW program that seeks to accelerate the growth of the emerging space sector by addressing its fragmented nature and fast-tracking the commercialisation journey. Operated by Cicada Innovations, the Hub provides free online commercialisation training, an incubator program and subsidised co-working space. It also acts as a convenor for the industry, hosting knowledge-sharing and networking events.

Finance capital

- **Venture capital (VC) and SME finance schemes** can assist the financing of early-stage businesses, where lenders can lack information about a business's ability to generate returns or pay back loans. Public and public–private VC funds that make equity investments in SMEs have been used to induce the development and adaptation of commercially viable technologies related to government service provision.[19] VC funds are increasingly used as a tool for underpinning mission-oriented innovation and supporting the commercialisation of government research. Income-contingent loans have a similar effect as VC funds, except the public upside return is limited to the value of the loan while the downside is similar to VC funding. Both options boost financial support for industry at an acceptable level of financial risk for the state.[20] This makes them useful tools for managing short-term shocks such as COVID-19 pandemic.

Example: Supply-side financial capital intervention

The Medical Devices Fund is a competitive technology development and commercialisation program that supports individuals, companies, public and private hospitals, medical research institutes, universities and the medical devices industry, helping them take local innovations to market. It also seeks to increase the uptake of NSW-developed medical devices that are cost-effective and contribute to improved patient outcomes.

The fund invests in the development and commercialisation of medical devices and related technologies. Since its first round of grants in 2013, Medical Devices Fund recipients have been awarded more than $70 million for 40 projects. These organisations have gone on to raise over $870 million in capital and have seen a 4.7 fold increase in employment. Over 214, 000 patients have now been treated with these technologies.

A unique aspect of the Medical Devices Fund is the repayment requirement: recipients that go on to have commercial success must repay their grant. The trigger for commercial success is agreed with the recipient during the funding agreement negotiation. If a recipient does not reach commercial success there is no obligation to repay.

19. International Labour Office (2014).
20. For additional information on income contingent loans see: theconversation.com/give-people-and-businesses-money-now-they-can-pay-back-later-if-and-when-they-can-134998

Example: Supply-side infrastructure interventions

Tech Central is a NSW priority precinct conceived as an innovation corridor with strong links to domestic and international markets. It also supports collaboration networks encompassing ambitious start-ups, high-tech companies and two of the state's world-class universities. The program offers affordable rental rates for start-up and scale-up companies in a connected location with high amenity, and platforms for joint research, commercialisation and graduate programs.

Special Activation Precincts (SAPs) offer a new way to plan and deliver industrial and commercial infrastructure in dedicated areas in regional NSW. The initiative brings together planning and investment support services to deliver more jobs and economic outcomes in regional areas. For example:

- Moree SAP is a business hub that specialises in agribusiness, food processing and logistics.
- Williamtown SAP capitalises on the emerging aerospace industry around Newcastle Airport and Royal Australian Air Force Base Williamtown.
- Snowy Mountains SAP is leveraging the region's natural beauty and unique climate to grow the visitor economy. It is focused on improving tourism amenity in the area and investing in infrastructure and services.
- Parkes SAP as a natural node for downstream processing and value adding of critical minerals due to its proximity to natural resources and crucial logistics links.

Infrastructure

- **Precincts and industrial zones** are dedicated geographic areas where inter-related firms can co-locate to create productivity benefits (that is, through information spillovers, agglomeration benefits, labour pool sharing and more efficient supply chain linkages) or to manage negative spillovers associated with industrial clustering (that is, noise, dust, chemical drift, odour, heavy vehicle traffic). Governments can provide necessary infrastructure and signalling to encourage firms to locate in these zones.
- **Infrastructure development and provision** involves government support of key basic infrastructure, such as ICT-related infrastructure, shared facilities and water supply or transport network upgrades, in key locations. This also extends to 'soft' infrastructure such as legal and regulatory settings.

Principles underpinning NSW industry policy

Three principles support the effective implementation of industry policy in NSW (see Figure 1 and Figure 3):

1. Transparent governance

Transparent governance enables quality control through external scrutiny and promotes public confidence in policy.[21] It includes thorough assessment of key obstacles to growth; assessing and removing risks from these obstacles; identifying the economic benefits of developing an industry relative to the costs of government support; and publicly reporting expenditure. Critical elements in transparent governance include:

a. evidence of market failure before intervening

b. evidence that the proposed intervention is the best solution to the identified problem

c. evidence that the expected benefits to the people of NSW are greater than the costs of the intervention. The NSW Government is responsible for the welfare of all citizens, which necessitates an economy-wide assessment of benefits and costs.

2. Alignment with other policies

Industry policy does not operate in isolation. It is supported by a set of government actions across economic, labour, trade and environment policies.[22] Industry policy should avoid interventions that duplicate or work at cross purposes to existing policy, by coordinating with other NSW policy areas, local governments and the Federal Government.

3. Evaluation to measure impacts and guide policy amendments

Establishing clear mechanisms for monitoring progress and early detection of problems in industry policy settings and interventions is central to well-managed industry policy.[23] Where issues are identified, interventions will need to be revised or ceased. Evaluation can also demonstrate where interventions have been most successful. It is not always easy to attribute desired outcomes to specific interventions, which can be a challenge when evaluating the effectiveness of industry policy.

Without these underlying principles, industry policy risks wasting taxpayer money and increasing the regulatory burden without a positive return for the NSW economy and citizens. This can occur when policies are not designed, implemented or monitored to manage:

- rent-seeking behaviour from firms, which can lead to the government subsidising activity that would have occurred even in the absence of intervention
- market distortions that crowd out private investment that would have occurred without government intervention
- industry transition, thereby prolonging industries and businesses that are in decline or not viable without protection and ongoing government support
- ineffective policy administration and governance, which can waste taxpayer money and hinder transparency.

Figure 3: Key design and implementation features

Intervention design

- Be specific on the policy objective for the targeted industry.
- Ensure astute policy design to target the constraint(s) of greatest signficance to an industry's development.
- Ensure policies enhance competition and stimulate innovation.
- Ensure proposed interventions have an end date.

Intervention assessment

- Assess the benefits and costs of proposed interventions prior to implementation.
- Include a description of unquantified costs and benefits.
- Identify any potential risks of proposed interventions to best mitigate risks.

Intervention monitoring

- Monitor the effect of interventions within the target industry and across the economy.
- Monitor the cost of interventions.
- Revise or cease intervention as needed.

21. OECD (2015a); the NSW Audit Office sets out the principles for governance practices that promote public confidence, trust and better agency performance. Examples include risk management, ethics, reporting and governance committees (Audit Office of New South Wales, 2015).
22. For example, regulatory schemes to promote ecologically sustainable development, such as the Biodiversity Offsets Scheme.
23. See Warwick and Nolan (2014) for a detailed assessment of industry policy evaluation approaches (including measurement) across different interventions and the lessons learned.

Working with the private sector and research institutions

The NSW Government is committed to working with industry and research institutions to create opportunities to improve productivity, innovation and employment.

It will use industry policy to signal where it will intervene to better align public and private sector objectives and spur growth. Commitments the Government has already made — such as the Net Zero Plan to reach net zero emissions by 2050 — indicate future directions of economic activity and encourage industry to take a strategic approach in adapting to shifting demands that arise from significant trends.

A thorough understanding of the industry and research ecosystems will be paramount to developing targeted and effective industry policy, so consultation and collaboration with industry groups and research institutions will be central to the policy development process. The Government will draw on industry and research insights to refine policy design and to understand the full impact of these policies.

Towards a new growth era

The NSW Industry Development Framework is the next step in prioritising and coordinating the state's industry programs, and strengthening partnership opportunities with the private sector to realise additional gains for the NSW economy.

The Framework aims to efficiently deliver best industry policy, as summarised in Figure 1. It has a clear objective with three desired outcomes: more and better jobs, globally competitive industries, and a resilient economy.

The policy levers the Government will use to achieve these outcomes are aligned with policy targets, to ensure the right tool is used for the right job. This helps prevent the problem of trying to achieve too many objectives without the right means to achieve them.

The Framework outlines the principles against which policies will be assessed for their net benefit to NSW. This includes evaluation to assess program performance, so interventions can be fine-tuned or ceased if they are not meeting their objectives.

Investment NSW and Regional NSW have the greatest involvement in industry policy development, but the process includes many departments as well as industry bodies and research institutions. This common Framework for industry policy will help coordinate responses across departments, industry and research. The transparency principle will ensure all stakeholders are fully informed of the benefits and costs of programs and can make the most constructive contributions to policy development.

Well implemented industry policy can position NSW to be a more attractive and competitive location for businesses compared to other states and countries.

By targeting market shortcomings that impede growth in areas important to industry development, industry policy can make NSW more conducive to industry and business growth.

Disruptive technologies and significant trends — such as the transition to low-carbon technologies and systems, climate change, cybersecurity risks, and the needs of a rapidly aging population — are changing the way businesses and economies operate. Flexible and responsive industry policy will enable the NSW economy to adapt to changes and minimise the disruptions to NSW residents in a changing global economic environment. Public–private partnerships will pursue opportunities where there are broad economic benefits to be gained from joint investment, accelerating innovation and technological solutions to the challenges presented by these significant trends.

To further the development of effective industry policy in NSW, Investment NSW is currently reviewing the most significant opportunities and challenges for each priority industry. In partnership with other government agencies and the private sector, each review will influence the design of new or modified programs (including key performance indicators) to address challenges and leverage opportunities.

The development of effective and consistent industry policy in NSW will help drive the recovery from the impacts of the COVID-19 pandemic by accelerating the growth of priority industries. Ultimately, successful industry policy will facilitate NSW's transformation into an innovative, resilient and globally competitive economy that improves the prosperity of its residents.

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