Submission to the Parliamentary Joint Standing Committee on Northern Australia - Inquiry into preparing for emerging industries across Northern Australia

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This submission does not reflect a single Australian Strategic Policy Institute (ASPI) perspective; it is the opinion of the two authors.

Background

The Joint Standing Committee on Northern Australia has been tasked with an inquiry of national significance: preparing Northern Australia for the emergence of new industries, new strategic realities and new economic opportunities. On 28 October 2025, the Minister for Resources and Northern Australia referred this inquiry for report by 28 October 2026. This submission responds formally to that invitation.

The Inquiry's terms of reference recognise that Northern Australia is no longer a peripheral economy, but a strategic engine room whose natural resources, geography and industrial potential position it at the forefront of the nation's long-term prosperity and security. Emerging industries such as critical minerals processing, green energy production, carbon abatement, advanced defence sustainment, offshore decommissioning operations and export-focused agricultural and biosecurity systems cannot develop in isolation. They require coordinated planning, sovereign industrial capability, integrated infrastructure, and workforce pipelines that match the scale of demand. More importantly, they need the government to accept a foundational truth: what works south of the 26th parallel does not work in the North.

Traditional frameworks, slow regulatory pathways, fragmented program design, short-term grant cycles, reactive infrastructure investment and southern-centric workforce models, are ill-suited to the realities of Northern development. Frontier economies demand different tools: industry clusters, precinct-based planning, long-term enabling infrastructure, First Nations equity partnerships, and regulatory systems designed for speed, certainty and scale. Without these, Northern Australia risks falling behind competitors who are moving faster to capture the critical minerals, renewable energy and strategic industry opportunities emerging across the Indo-Pacific.

Executive Summary

Northern Australia is on the cusp of a historic transformation. The convergence of global decarbonisation, the rise of critical minerals, intensifying Indo-Pacific strategic competition, and the rapid emergence of new technologies presents a nation-building opportunity unmatched in modern Australian history. Yet, realising this opportunity will require the government to abandon the assumption that the development settings that work in metropolitan Australia will somehow work in the North. They will not. Northern Australia is strategically exceptional, economically distinctive and globally exposed, and it must be governed, invested in and planned for accordingly.

This submission argues that with bold policy reform, integrated planning and sustained national investment, Northern Australia can become the powerhouse of Australia's next industrial era. The challenge is significant, but the opportunity is transformational. The North is ready for government to think differently, act decisively, and build the foundations for industries that will define Australia's economic and strategic future.

Fragmented, project-by-project development will no longer cut it. To compete globally, Australia must pursue scale, speed, and integration through a new operating system for Northern development. That means embracing industry clusters, building fit-for-purpose multi-use precincts, accelerating regulatory processes, and delivering enabling infrastructure ahead of demand rather than well behind it. It means unlocking First Nations equity and participation; securing workforce pipelines; and ensuring that Defence, industry, and critical infrastructure planning are synchronised.

Emerging industries, green energy, carbon abatement, critical minerals processing, advanced defence sustainment, offshore decommissioning, biosecurity innovation and next-generation export agriculture, will only succeed if they are anchored in well-designed hubs where logistics, energy, water, digital infrastructure, R&D capability and trained workers are co-located. Clusters in Darwin, Katherine, Townsville, Cairns, Gladstone, the Pilbara and the Barkly-Beetaloo corridor have the potential to become globally competitive ecosystems if government is prepared to think and act differently.

If Australia fails to move quickly, competitors in Southeast Asia, the United States and the Middle East will capitalise on value-adding opportunities that should sit in the North. Conversely, if Australia seizes this moment, Northern Australia can become a powerhouse of strategic manufacturing, a global supplier of secure, low-carbon energy, a leader in refining critical minerals, and a cornerstone of national defence resilience.

Key Recommendations

1. **Establish a Northern Australia Industrial Transformation Authority.** A statutory authority with real decision-making power is essential to break the cycle of fragmented, slow and risk-averse development. This body would coordinate precincts, streamline regulation and deliver long-term certainty for investors and communities.

2. **Create Northern Regulatory Innovation Zones to accelerate approvals.** Northern Australia requires fast, proportionate, risk-based regulatory processes that reduce approval timeframes by up to 70%. Without regulatory speed, global competitors will outpace Australia in critical minerals, energy and defence industries.

3. **Develop integrated industry clusters and multi-user precincts across Darwin, Townsville, Cairns, the Pilbara and the Barkly–Beetaloo corridor.** Clusters enable the co-location of energy transition corridoors, manufacturing, logistics, workforce, digital connectivity and R&D—conditions that emerging industries need to scale. Competing through isolated projects is no longer viable in the global market.

4. **Deliver enabling infrastructure ahead of demand, not behind it.** The North needs coordinated investment in energy transition, water, transport, digital infrastructure and housing to anchor industrial growth. Demand-led investment models must be replaced with nation-building, strategically sequenced infrastructure delivery.

5. **Underwrite shared infrastructure for critical minerals processing and advanced manufacturing.** Shared utilities, industrial land and common-user facilities dramatically reduce capital barriers and attract downstream value-adding. This will allow Australia to capture value currently lost offshore and secure sovereign supply chains.

6. **Align Defence posture and industry capability with Northern industrial development.** Forward presence, enabling services, sustainment, autonomous systems and munitions stockpiles must be integrated with Northern industrial clusters. Defence cannot operate effectively in the North without complementary industry capacity and workforce resilience.

7. **Establish a Northern Workforce Mobility Scheme and co-located training academies within precincts.** Traditional training pipelines cannot meet the industrial scale emerging in the North. Precinct-based training and mobility incentives will attract and retain skilled workers where they are needed most.

8. **Embed First Nations equity, skills development and governance into every major precinct.** First Nations participation must move beyond employment into equity and decision-making roles. Effective partnerships strengthen social licence, accelerate development and build intergenerational prosperity.

9. **Create a dedicated offshore decommissioning hub in Darwin or Broome.** Decommissioning is an emerging multi-billion-dollar industry with precise sovereign capability requirements. A purpose-built cluster would attract global expertise and create long-term, high-skill jobs in the North.

10. **Establish Northern Biosecurity Innovation Hubs that link government, Indigenous rangers, industry, and advanced surveillance technologies.** The North is Australia's biosecurity shield, yet current capabilities are

fragmented and under-resourced. Integrated hubs will enhance surveillance, reduce risk to agriculture, and support secure export supply chains.

11. **Upgrade barge landings and marine access with unified standards and integrated biosecurity.** Remote communities and emerging industries depend on reliable, safe maritime access. Modern landings will strengthen supply chains, emergency response capacity and regional economic participation.

12. **Build a coordinated Northern R&D network focused on applied, commercial-ready innovation.** Research must directly support decarbonisation, Defence, critical minerals, advanced manufacturing, autonomous systems and tropical science. An applied research network will turn Northern industry challenges into commercial opportunities.

Introduction: Northern Australia at the Frontier of National Security and Economic Renewal

Northern Australia is entering a defining moment in its modern history. Long recognised as strategically vital, the North has never before sat at the centre of so many converging national imperatives: the transition to net zero, intensifying Indo-Pacific competition, growing pressure on global supply chains, and the urgent need to expand sovereign industrial capability. It is simultaneously Australia's forward operating platform for Defence and the nation's most promising landscape for next-generation industries—green energy exports, critical minerals processing, AI compute, decarbonised heavy industry, advanced manufacturing and world-class environmental management.

Yet unlocking this potential requires a fundamental shift in how governments and industry understand the North. Northern Australia is a frontier economy: vast, lightly populated, high-cost, and logistics-constrained, yet uniquely rich in natural endowments, strategic geography and industrial promise. Its constraints are real, but its advantages are extraordinary—if approached with the right tools.

The key challenge is not a lack of opportunity; it is the absence of scale. Emerging industries such as critical minerals, hydrogen and ammonia, rare-earth magnet production, battery precursors, carbon capture and storage, defence sustainment, decommissioning, AI compute, biosecurity innovation and precision agriculture cannot thrive as standalone ventures. They succeed only when embedded within clusters—places where energy systems, digital connectivity, logistics infrastructure, skills pipelines, capital, regulatory certainty and research capability are deliberately integrated.

Northern Australia must now be treated as a national interest region, governed through distinct policy mechanisms designed for frontier conditions. Incremental reform has been attempted for decades; it has not delivered the scale required. Meeting the strategic and economic moment now facing Australia demands structural reform, bold policy innovation and a willingness to act with speed and ambition.

A New Operating System for the North

Preparing Northern Australia for emerging industries requires confronting a hard but unavoidable truth: government must begin doing things differently in the North. Not because Northern Australia is failing, but because it is fundamentally different. When governments attempt to apply southern policy templates to frontier conditions, the result is predictable: slow approvals, stalled projects, inflated costs and unrealised potential.

Northern Australia is unique. Its opportunities are vast, but its constraints are unforgiving. It is a region where geography shapes economics, where logistics determine feasibility, and where small delays compound into multi-year strategic setbacks. In this environment, government action—or inaction—becomes a strategic variable. Preparing the North for emerging industries means abandoning incrementalism and embracing an entirely new operating system built around speed, scale and integration.

Speed: Time as a Strategic Variable

In the global competition for capital, talent and industrial capability, time is now a decisive factor. While Australia's approval processes often stretch to five or seven years, competitor nations routinely advance comparable projects to operational status within 18 to 24 months. Investors notice this. So do strategic partners. And so do rivals.

Lengthy approvals in the North are not merely a bureaucratic inconvenience—they are a sovereign risk. In the case of critical minerals, for example, delays cause offtake partners to pursue supply from Indonesia or the Gulf.

In hydrogen and ammonia, long lead times erode commercial feasibility as global prices shift and competitors undercut Australian offerings. In Defence, the ability to sustain forward-deployed forces is shaped by whether enabling industry and infrastructure arrive in years or decades.

If Australia continues at its current pace, Northern Australia will not lead emerging industries, it will watch them develop elsewhere.

Scale: Building Critical Mass in a Frontier Economy

Emerging industries do not thrive through isolated, standalone projects. They require critical mass—a concentration of workforce, energy supply, digital connectivity, land availability, logistics capability, capital access and research partnerships. In short, they require scale.

Yet scale is precisely what Northern Australia lacks when approached through traditional development models. High capital costs, sparse populations, fragmented infrastructure, and small labour pools make project economics fragile. But when development is coordinated—when energy precincts, industrial clusters, processing hubs, logistics networks and training pipelines are planned together—scale emerges, and the North becomes globally competitive.

Critical minerals processing, magnet manufacturing, green ammonia production, AI compute, carbon abatement, decommissioning and advanced defence sustainment all require a large, stable platform to operate. None can survive in the long term as isolated facilities scattered across the region. They must be deliberately aggregated into clusters that build scale, share costs, and reinforce one another.

Without scale, Northern Australia will remain an exporter of raw materials rather than a value-adding industrial region.

Integration: Ending Siloed Planning

The third imperative is integration. For too long, Northern Australia has been planned through disconnected policy streams—Defence on one track, infrastructure on another, skills on a third, and critical minerals, energy transition and regional development on several more. This fragmentation is not sustainable.

The emerging strategic landscape demands that the North be viewed as an integrated system. Defence capability depends on industrial capacity; industrial capacity depends on energy security; energy security depends on coordinated infrastructure; infrastructure depends on workforce; and workforce depends on housing and social infrastructure. None of these can succeed if planned in isolation.

An integrated northern strategy must synchronise:

- Defence posture and sustainment needs
- Decarbonisation and renewable energy generation
- Critical minerals mining and downstream value-adding
- Biosecurity and agricultural resilience
- Workforce mobility, migration and training
- First Nations governance, equity and enterprise
- Remote and regional infrastructure investment.

Fragmentation is the enemy of competitiveness. Integration is now a national security requirement.

A New Operating System Built on Four Pillars

If Australia is serious about preparing Northern Australia for emerging industries, it must move beyond incremental reforms and adopt a new operating architecture. This architecture rests on four mutually reinforcing pillars.

Pillar 1: Precinct-Based Development Anchored in Industry Clusters

Industry clusters create the density required for new industries to flourish. They consolidate energy, logistics, workforce, R&D, digital systems, and investment into coherent precincts such as Middle Arm, the Barkly–Beetaloo energy corridor, and emerging hubs in Townsville, Cairns and the Pilbara. Clusters enable value-adding, reduce costs and attract global partners. They are the foundation of modern industrial ecosystems.

Pillar 2: Strategic Enabling Infrastructure Delivered Ahead of Demand

In the North, infrastructure cannot wait for demand—it must anticipate it. Multi-user energy systems, digital corridors, water infrastructure, transport networks, housing and ports must be delivered early to unlock industrial activity. Without this, emerging industries cannot scale, and private investment remains too risky.

Pillar 3: Regulatory Innovation Zones

Fast, predictable approvals are essential. Regulatory innovation zones—tailored to Northern conditions—would provide proportionate environmental assessments, coordinated multi-agency approvals, and clear timeframes. Certainty attracts investment; delay repels it.

Pillar 4: Long-Term First Nations Equity and Participation Frameworks

First Nations peoples are central to the success of Northern Australia. Long-term frameworks for equity participation, governance, skills and enterprise development must be integrated into every major precinct. This is not just a matter of justice; it is an economic and social foundation for regional stability and sustainable development.

Laying the Foundations for Australia's Future

Everything else—critical minerals value chains, the energy transition, defence industry capability, biosecurity, decommissioning, marine access and R&D—depends on getting these foundations right. Australia has attempted incremental reform in the North for decades, and the results have been inconsistent and slow to materialise.

Northern Australia needs a new operating system—one defined by speed, scale and integration. With the right strategy, the North can become the industrial, strategic and energy powerhouse of Australia's next century. Without it, we risk missing a once-in-a-generation opportunity.

Response to the Inquiry's Terms of Reference

A - The Global Transition to Net Zero: Northern Australia as an Energy Super Region

The global transition to net zero is reshaping the geography of industry, the flow of capital, and the strategic priorities of nations. For Australia, nowhere is this transformation felt more acutely—or offers more promise—than in Northern Australia.

With some of the world's best solar irradiation, vast land availability, proximity to Indo-Pacific markets, and an established export orientation, the North has the natural and strategic foundations to become a renewable energy super region.

But potential alone is insufficient. Without deliberate policy design and targeted investment, Northern Australia will be overtaken by faster, more coordinated competitors in the Middle East, Southeast Asia and North America.

Single projects do not drive the emerging energy economy; it is driven by systems—integrated platforms capable of producing firm, reliable, large-scale renewable energy anchored to industrial demand.

The North's competitive edge lies in its ability to co-locate energy production, downstream processing, advanced manufacturing and export infrastructure. A green hydrogen or ammonia plant in isolation is commercially fragile. But positioned within

an energy-industrial precinct that includes critical minerals processing, AI compute capacity, decarbonised manufacturing, logistics hubs and water security, those same projects become globally competitive.

To seize this opportunity, three shifts are essential.

First, Australia must treat energy as strategic infrastructure, not merely an outcome of market forces. The government has a critical role in underwriting early transmission corridors, long-duration storage, gas back-up and water security. These are the foundational systems required to create firmed, 24/7 industrial energy—something the market alone cannot deliver at frontier scale.

Second, Northern Australia must develop large, multi-user energy precincts rather than scattered renewable projects. Places like Middle Arm, the Pilbara, and the emerging Barkly–Beetaloo energy corridor can anchor industrial ecosystems if designed with integrated power, land, water, digital and logistics solutions. Energy must be built to support clusters—not the other way around.

Third, Australia must accelerate regulatory pathways. Renewable megaprojects in the North currently face 5–10 years of approvals. Unless Australia can dramatically shorten development timelines, Northern Australia will lose its window to become a first mover in green energy exports and low-carbon industrial production.

The opportunity is enormous. With coordinated action, Northern Australia can deliver:

- Green ammonia and hydrogen exports at scale
- Renewable-powered critical minerals processing and magnet manufacturing
- Low-carbon fuels for Defence and heavy transport
- AI compute and data centres powered by firm renewable energy carbon sequestration, and nature-based abatement industries resilient energy systems supporting regional communities.

B - Developing the Critical Minerals Industry: A Hub-and-Cluster Strategy for Sovereign Value

Critical minerals have become the backbone of the global energy transition, advanced defence capabilities, and high-technology manufacturing. Northern Australia sits at the epicentre of this opportunity, with world-class deposits of rare earths, lithium, vanadium, manganese, cobalt and key battery precursors.

Yet despite this natural advantage, Australia captures only a fraction of the potential value. Most of our minerals leave the country in raw form, only to be processed, refined and manufactured offshore—often in strategic competitor nations.

If Australia is to build sovereign industrial capability and secure its role in Indo-Pacific supply chains, Northern Australia must become a value-adding critical minerals powerhouse, not just a quarry.

The challenge is not geology—it is industrial architecture. Downstream processing requires energy, water, digital connectivity, logistics, capital certainty, workforce depth and long-term policy stability. These are not attributes that emerge organically in a frontier region. They must be deliberately planned and built through industry clusters: coordinated precincts where multiple projects co-locate, share infrastructure, collaborate on innovation and reduce cost barriers through scale.

Australia must move from opportunistic project-by-project development to a hub-and-cluster strategy that concentrates processing, refining and advanced manufacturing into globally competitive industrial ecosystems.

Three actions are critical.

First, the government must underwrite enabling infrastructure—power, water, digital networks, transport corridors and common-user processing facilities. These are high-cost, high-risk inputs that individual projects cannot shoulder on their own. Without shared infrastructure, downstream processing will remain uneconomic.

Second, Australia must secure long-term offtake partnerships with Japan, Korea, the US and Europe. These nations are urgently seeking alternative supply chains to reduce exposure to geopolitical risk. By coordinating sovereign offtake agreements, Australia can provide the certainty investors require to build multi-billion-dollar processing and magnet-making capacity in the North.

Third, Northern Australia needs regulatory certainty and speed. Approvals designed for metropolitan environments—dense populations, high land-use conflict, and long consultation cycles—are a poor fit for the North’s geography and economic conditions. Tailored regulatory innovation zones can reduce project lead times and strengthen Australia’s competitive standing.

C - Supporting the Development of Export Industries: Building Competitive Advantage at the Northern Edge

Northern Australia has always been an export region. However, the next decade will redefine the nature, scale and strategic weight of those exports. The global economy is undergoing structural shifts—toward secure supply chains, low-carbon products, critical minerals, green fuels, advanced food systems and niche high-value manufacturing.

Northern Australia is positioned at the "northern edge" of the continent where geography, resource endowment and Indo-Pacific proximity converge to create advantages unmatched elsewhere in Australia. But those advantages will only translate into export-led growth if the North can build globally competitive industrial ecosystems, not just isolated export projects.

For decades, Northern Australia's export performance has been constrained by a simple structural reality: the region has world-class commodities but underdeveloped systems. Ports are often single-purpose rather than multi-user. Transport corridors lack integration. Industrial land is fragmented. Logistics chains are long, expensive and vulnerable. And too often, export industries operate

independently rather than as part of coordinated clusters. In an era where speed, scale and certainty matter more than ever, this system is no longer fit for purpose.

To unlock the next generation of export industries, Northern Australia must shift from a commodity-export mindset to a value-chain powerhouse mindset. This means creating the conditions for green ammonia, hydrogen derivatives, rare-earth magnets, processed critical minerals, low-carbon fuels, high-integrity agricultural exports, manufactured components and defence sustainment products to compete on quality, reliability, environmental credentials and strategic alignment.

Three strategic shifts are essential.

First, Australia must build port and logistics systems that match the ambition of emerging industry. Darwin, Townsville, Cairns, Broome and Gove require coordinated upgrades that transform them into multi-commodity, multi-user export hubs with integrated customs, biosecurity, storage, energy interfaces and digital tracking systems. Remote regions also need modernised barge landings to improve supply chains and strengthen resilience for local communities and industry.

Second, export competitiveness requires integrated supply chains linking mining, manufacturing, energy, R&D and workforce capability into coherent clusters. When value-adding industries are co-located with energy precincts, water security, digital infrastructure and transport corridors, export costs fall, and competitiveness rises. This is not theoretical: the world's most successful export economies—from the Netherlands to South Korea—are built on exactly this model.

Third, Australia must recognise that export markets increasingly demand security, sustainability and reliability. The Indo-Pacific's leading economies want low-carbon products, transparent supply chains, high environmental standards and partners capable of delivering through crises. Northern Australia can meet these expectations—if the government accelerates infrastructure delivery, provides regulatory certainty, and establishes long-term investment frameworks.

D - Supporting the Decommissioning Industry: Creating a Sovereign Capability and a New Northern Economic Frontier

Australia is entering a multi-billion-dollar decommissioning era. Over the next two decades, hundreds of offshore oil and gas wells, platforms and subsea structures across Northern waters will require dismantling, material recovery, environmental remediation and long-term monitoring. This challenge is often framed as a liability—but for Northern Australia, it represents one of the most significant emerging industrial opportunities of the 21st century.

With the right policy settings, decommissioning can become a sovereign capability that delivers high-wage jobs, advanced engineering expertise, regional investment and enhanced environmental stewardship.

Currently, Australia has only a limited domestic decommissioning capacity. Companies rely on expensive international contractors, offshore logistics chains, and specialised vessels and equipment sourced from the Middle East or the North Sea. This model is financially inefficient, strategically vulnerable and environmentally

suboptimal. By contrast, Northern Australia—with its proximity to offshore fields, existing maritime infrastructure, potential skilled workforce, and deep-water access—has the natural advantages required to become a regional centre of excellence in offshore decommissioning.

Three strategic actions are essential.

First, government and industry must establish a dedicated decommissioning cluster in Darwin or Broome. This cluster would integrate heavy dismantling yards, subsea engineering facilities, robotics and automation workshops, environmental remediation services and specialised training centres. Clusters reduce costs by consolidating capability, enabling multi-user facilities and creating predictable project pipelines. They also foster innovation—in materials recycling, robotics, AI-driven inspection systems and low-impact removal technologies.

Second, Australia must articulate a national decommissioning regulatory and capability roadmap. Current regulatory settings lack clarity and consistency, deterring investment and delaying planning. A clear national framework—aligned with safety, environmental and sovereign capability goals—would give industry the certainty needed to invest in long-term infrastructure, workforce development and technology acquisition.

Third, the North must build specialist workforce and training pathways. Subsea robotics, remote inspection, heavy engineering, maritime operations, environmental monitoring and materials recovery all require advanced skills. A Northern Australia Decommissioning Academy could deliver tailored training programs aligned to Defence, offshore energy, and emerging industrial requirements.

Developing domestic decommissioning capability is not optional. It is essential to national sovereignty, environmental responsibility and economic diversification. The alternative—relying indefinitely on foreign vessels, foreign specialists and offshore waste management—leaves Australia strategically exposed and economically disadvantaged. The timing is also critical: the window to build capacity before major decommissioning projects commence on a large scale is narrow.

If Australia moves decisively, Northern Australia can claim leadership in a global growth industry and become the preferred regional hub for decommissioning services across the Indo-Pacific.

E - Supporting the Defence Industry: Integrating Hardening, Sustainment and Sovereign Capability in the North

Northern Australia is the nation's strategic front line. As the Indo-Pacific becomes more contested, Northern bases, ports and airfields are no longer peripheral—they are central to Australia's deterrence posture, operational readiness and support for allied forces.

Yet, Defence capability cannot exist in isolation. No modern military operates effectively without a strong industrial ecosystem behind it: sustainment facilities, munitions storage, fuel resilience, sovereign repair capacity, digital infrastructure and a skilled workforce. Preparing for emerging defence needs, therefore, requires

Northern Australia to build an integrated defence–industry environment rather than just hardened bases.

While Defence is investing in northern infrastructure, the supporting industrial system remains fragmented. Sustainment capacity is limited, supply chains are southern-heavy, and many enabling services—additive manufacturing, autonomous systems maintenance, component repair, digital simulation, and rapid prototyping—are either absent or located thousands of kilometres away. This disconnect creates operational risk. In a crisis, defence capability is only as strong as the industrial support that can be mobilised in real time—and in the North, that capability must be local.

Three strategic shifts are required.

First, Australia must establish dedicated defence-industry precincts in Darwin, Katherine, Townsville and Cairns. These precincts would co-locate sustainment facilities, advanced manufacturing, robotics and autonomous systems hubs, fuel and munitions storage, simulation centres, and training academies. They should be designed as multi-user, joint-allied platforms capable of supporting ADF, US, Japanese and other partner operations. Such precincts are essential for delivering the resilience, redundancy and speed required in an increasingly contested region.

Second, Defence posture and industrial capability must be planned together, not sequentially. Base hardening, runway upgrades, fuel storage, maritime infrastructure, and logistics corridors must be integrated with industry development strategies, workforce planning and export-focussed manufacturing. Defence cannot rely on southern industry to support northern operations during a strategic shock; Northern Australia needs sovereign surge capacity that aligns with the 2026 National Defence Strategy and emerging alliance commitments.

Third, Northern Australia requires a defence-ready workforce pipeline. This means co-located training academies within defence-industry precincts, targeted migration pathways for high-demand roles, and long-term partnerships with First Nations communities to build specialised skills in engineering, logistics, environmental management, and autonomous systems. Workforce scarcity is now one of the greatest threats to Defence’s northern posture—solving it must become a national priority.

Strengthening Northern Australia’s defence industry capability is not simply about supporting the ADF. It is about shaping Australia’s role in the Indo-Pacific, enhancing alliance interoperability, and demonstrating that Australia can sustain credible, forward-operating forces in the face of contest.

Without a strong northern industrial ecosystem, Defence's posture risks becoming brittle. With it, Northern Australia becomes a strategic asset of global significance, capable of supporting operations, regenerating combat power and underpinning national resilience.

F - Supporting Infrastructure: The Backbone of Emerging Industries and National Resilience

Infrastructure is the decisive enabler—or inhibitor—of Northern Australia's future. Emerging industries such as critical minerals processing, green hydrogen and ammonia, AI compute, advanced defence sustainment, decommissioning, and high-integrity agriculture all rely on foundational systems that do not yet exist at the scale or integration required.

In the North, infrastructure is not just a cost of development; it is a strategic capability essential to economic growth, sovereign resilience and national security.

The Northern infrastructure deficit persists because existing planning models are built for metropolitan economies with dense populations and predictable demand curves. Frontier regions, by contrast, require infrastructure delivered proactively and at scale—long before markets mature.

If Australia continues to rely on traditional demand-led investment models, the North will never achieve the critical mass needed to support globally competitive industries. The result will be stranded potential, missed investment opportunities, and the continued migration of value-adding offshore.

Four categories of infrastructure are especially critical.

First, energy infrastructure. Industrial-scale renewable generation, firming systems, long-duration storage, dispatchable gas capacity, hydrogen pipelines and transmission corridors must be built ahead of demand. Without reliable, affordable, 24/7 power, value-adding industries cannot take root, and Defence cannot sustain forward operations. Energy security in the North is now a national security imperative.

Second, digital infrastructure. Emerging industries depend on low-latency, high-capacity digital networks capable of supporting AI compute, simulation, autonomous systems, remote operations, and defence command-and-control. A Northern Digital Spine—linking major precincts from Darwin to Townsville to Cairns—would underpin innovation, attract global investment and ensure Australia remains interoperable with key Indo-Pacific partners.

Third, water and environmental infrastructure. Sustainable access to water underwrites everything from processing plants to agricultural exports to population growth. Investment must shift from ad hoc allocations to long-term water security planning that supports scalable, multi-user industrial precincts. Environmental baselines must be modernised to reflect climate variability and frontier conditions.

Fourth, transport and logistics infrastructure. Ports, airfields, rail spurs, strategic roads, and remote barge landings must be upgraded and integrated into coordinated supply-chain corridors. This is fundamental not only for export competitiveness but also for Defence mobility and disaster resilience. Fragmented logistics chains increase costs, lengthen project timelines and expose the industry to operational risk.

Infrastructure delivered piece by piece never delivers scale. To prepare the North for emerging industries, Australia must pursue integrated infrastructure planning that links energy, water, transport, digital and industrial land-use decisions into a unified strategy. This requires new governance structures, faster procurement pathways, shared-use models and sustained long-term investment.

G - Managing Biosecurity Risks: Safeguarding Agriculture, Industry and National Security

Biosecurity is one of Northern Australia's most significant strategic risks—and one of its greatest opportunities for national leadership. The region forms Australia's frontline defence against animal and plant diseases, invasive species, marine pests and emerging zoonotic threats. Yet biosecurity is too often framed narrowly as an agricultural issue. In reality, it is a foundational capability underpinning export markets, food security, environmental integrity, workforce health, Defence readiness and sovereign resilience. As Northern Australia prepares for emerging industries, strengthening biosecurity must become a central pillar of national strategy.

The North's proximity to Southeast Asia, large coastline, porous marine pathways and extensive remote regions make it particularly vulnerable to incursions such as foot-and-mouth disease, African swine fever, lumpy skin disease and exotic plant pathogens.

A single outbreak could cost the Australian economy tens of billions of dollars, shut down export markets, and undermine confidence in emerging industries—from critical minerals and hydrogen to agriculture and defence sustainment. The question is not whether a major biosecurity event will occur, but whether Northern Australia will be prepared to detect, contain and recover from it.

Three major shifts are essential.

First, Australia must establish precinct-level biosecurity hubs integrated into major industrial and export centres such as Darwin, Townsville, Cairns and Broome. These hubs should combine surveillance systems, laboratories, inspection facilities, workforce training, logistics coordination and real-time data networks. When co-located with ports, airports and industrial precincts, they dramatically strengthen risk detection and response.

Second, Northern biosecurity must evolve from manual, labour-intensive practices to technology-enabled surveillance networks. Autonomous sensors, drones, satellite monitoring, AI-enabled diagnostics, and automated reporting systems can provide continuous coverage across vast remote areas. This technology should be deployed in partnership with First Nations ranger groups, who offer unparalleled local knowledge and environmental insight.

Third, biosecurity must be integrated into national economic and strategic planning. As emerging industries—agtech, carbon markets, livestock exports, aquaculture, renewable energy, decommissioning and Defence—expand their footprint in the North, their infrastructure must be designed from the outset with biosecurity in mind. This includes strict ingress and egress controls, shared surveillance platforms, risk zoning and coordinated emergency response mechanisms.

Remote communities, too, rely heavily on robust biosecurity systems. Modernising barge landings, strengthening marine access points, and establishing regional response nodes will protect both local populations and critical supply chains, thereby strengthening national resilience. Failing to invest in these systems would leave entire regions exposed and jeopardise the integrity of national export markets.

H - Workforce: Training, Attracting and Retaining Skilled People for a Frontier Economy

Workforce is the single greatest constraint on the development of emerging industries in Northern Australia. Whether the goal is to expand critical minerals processing, establish decommissioning facilities, build defence sustainment hubs, scale renewable energy precincts, or modernise biosecurity systems, none of it is possible without people—skilled, available and willing to live and work in the North.

Traditional workforce models, shaped by metropolitan labour markets, do not work in a frontier economy with dispersed populations, high operational costs, limited housing, and intense competition for talent.

Northern Australia faces a dual challenge: chronic skill shortages today and an exponentially expanding workforce demand tomorrow. By the late 2020s, the North will require thousands of additional workers across engineering, robotics, environmental science, logistics, digital systems, renewable energy, Defence sustainment, construction, and advanced manufacturing.

At the same time, the region must maintain a workforce capable of supporting health, education, community services, agriculture and tourism. Without a comprehensive, integrated workforce strategy, emerging industries will remain aspirational rather than transformational.

Three structural shifts are required.

First, Australia must establish a Northern Workforce Mobility Scheme that incentivises medium-term relocation for workers in high-demand fields. Financial incentives, guaranteed housing, family support packages, and aligned taxation mechanisms should be explicitly designed for frontier regions. The North's development trajectory is too important to leave workforce attraction to chance.

Second, Northern Australia needs co-located training academies embedded within industrial precincts. These academies should offer industry-led vocational programs, micro-credentials, apprenticeships, robotics and digital systems training, and transitions into highly specialised fields such as subsea engineering, hydrogen operations, precision agriculture and autonomous systems maintenance. Training aligned to clusters—not isolated campuses—creates a direct pipeline from classroom to job.

Third, the North requires a targeted, industry-driven migration pathway. Emerging industries will outgrow the domestic labour supply regardless of training efforts. Tailored migration programs should focus on engineers, technicians, digital specialists, trades, environmental scientists and defence-support personnel, with

visas linked to Northern industry clusters and settlement incentives embedded in the migration framework.

Central to any strategy must be First Nations workforce participation. Northern Australia has a young, rapidly growing First Nations population with enormous potential as industry leaders, innovators, land managers, and technical specialists. Long-term investment in First Nations training, equity participation and leadership pathways will drive enduring economic and social outcomes.

Finally, workforce planning must be aligned with housing, infrastructure and community capability. Workers will not relocate to regions without adequate housing, healthcare, schooling, childcare or social services. Workforce strategy is therefore inseparable from regional development strategy.

I - Empowering and Upskilling Local First Nations People: Building an Inclusive and Sovereign Northern Economy

First Nations peoples are central to the future of Northern Australia. They are not stakeholders on the periphery of development—they are landholders, knowledge custodians, workforce leaders, business owners, and strategic partners whose participation will determine the legitimacy, durability and success of emerging industries.

As Northern Australia enters a new era of economic transformation, empowering First Nations communities is not simply a social priority—it is an economic, strategic and nation-building imperative.

For decades, policy has focused on employment as the primary measure of First Nations participation. While jobs remain essential, the next wave of Northern development requires a more ambitious, structural approach: equity, governance, capability, and enterprise. First Nations communities must become co-creators and co-owners of the Northern economy, not passive recipients of limited opportunities.

Three major shifts are needed.

First, Northern Australia requires long-term First Nations equity frameworks embedded into every major industrial precinct. Equity stakes in renewable energy projects, critical minerals processing, biosecurity hubs, cultural tourism ventures and decommissioning facilities can generate intergenerational wealth and align local governance with national development priorities. Equity transforms participation from transactional into transformational.

Second, the North must invest in First Nations Industrial Academies, co-located with major industry clusters in Darwin, Katherine, Townsville, Cairns and the Pilbara. These academies should provide targeted training in engineering trades, robotics, environmental management, hydrogen operations, defence sustainment, digital systems, and land and sea management. Leveraging existing strengths—such as ranger programs, cultural knowledge and environmental stewardship—these institutions can create the next generation of First Nations technicians, supervisors, entrepreneurs and strategic leaders.

Third, First Nations governance systems must be recognised as core pillars of Northern development, not administrative add-ons. Emerging projects should incorporate co-designed environmental baselines, land and sea management plans, cultural heritage systems and benefit-sharing frameworks. Involving First Nations governance early reduces project delays, strengthens social licence and improves environmental outcomes. This is not about process—it is about embedding development within the cultural, historical and ecological realities of the North.

Across all sectors—critical minerals, hydrogen, Defence, agriculture, tourism, carbon markets, and decommissioning—First Nations enterprises are emerging as regional economic drivers. With strategic support, these businesses can become anchor firms within local value chains, employing community members and contracting into major national and international projects.

First Nations empowerment must be supported by long-term institutional stability. Funding cycles must align with the timelines of major industrial development; skills programs must transition from short-term pilots to enduring structures; and government must create predictable policy settings that allow First Nations businesses to invest, grow, and diversify.

J - Barge Landings and Marine Access: Strengthening Remote Connectivity and Industrial Capability

In Northern Australia, barge landings and marine access points are not minor pieces of infrastructure—they are lifelines. For many remote communities and industries, they are the primary gateways for fuel, construction materials, heavy equipment, food supplies, medical resources and emergency response.

As emerging industries expand across the North—from critical minerals and hydrogen to defence sustainment, aquaculture and decommissioning—the strategic importance of reliable, modernised marine logistics becomes even more pronounced. Put simply: without secure and efficient marine access, remote Northern Australia cannot fully participate in national economic development nor contribute effectively to national resilience.

Yet the North's barge landing infrastructure remains inconsistent in terms of quality, capacity, and safety. Many landings are ageing, single-purpose facilities vulnerable to tidal fluctuations, extreme weather, and erosion. Others lack the biosecurity, digital tracking, security systems and storage necessary to support modern supply chains. In a region where distances are vast and alternative transport routes are limited, these vulnerabilities translate directly into higher costs, reduced competitiveness and lower regional resilience.

Three strategic actions are required.

First, Australia must implement a comprehensive upgrade program for remote barge landings, based on unified design standards tailored to Northern conditions. Modernised landings should incorporate stabilised ramps, all-tide access, secure laydown areas, cargo-handling equipment, lighting, weather monitoring, and resilient construction materials. Upgrading these facilities will reduce supply-chain

disruptions, lower operational costs, and provide remote communities and industries with dependable year-round access.

Second, marine access points must include integrated biosecurity and inspection capabilities. As Northern export industries expand—and as the region remains the frontline against exotic pests and diseases—barge landings must support screening, surveillance, quarantine and rapid response. Co-located biosecurity facilities enable faster, safer movement of goods while protecting Australia's agricultural and environmental assets. They also strengthen compliance with international export requirements, making Northern supply chains more competitive.

Third, marine access must be embedded into broader Defence and national resilience planning. Remote airfields, fuel storage, humanitarian response hubs, decommissioning facilities and Defence mobility corridors all depend on reliable maritime logistics. Modernised barge landings would provide the ADF and allied forces with additional points of entry, diversification of supply routes and redundancy in times of crisis. In a contested Indo-Pacific, redundancy equals resilience.

Improved marine access is not solely about industry—it is about people. Remote communities rely on barges for everyday essentials, and better landing infrastructure enhances community wellbeing, reduces the cost of living, and supports local businesses and employment. When marine logistics fail, communities become isolated. When they function well, communities grow, industries flourish, and national resilience is strengthened.

K - Research and Development: Building a Northern Innovation Spine for Australia's Future Industries

Northern Australia's ability to lead emerging industries will depend not just on resources and infrastructure, but on its capacity to generate, adapt and apply new knowledge. Research and Development (R&D) is the engine that enables industrial clusters to evolve, compete and stabilise over time. Yet the North's innovation ecosystem remains fragmented, under-resourced and disconnected from the large-scale industrial challenges unfolding across the region.

To prepare Northern Australia for its strategic and economic future, Australia must build a Northern Innovation Spine—a coordinated R&D network linking industry, Defence, universities, TAFEs, First Nations organisations and government agencies into a world-class applied research ecosystem.

For too long, research in the North has been defined by isolated centres of excellence or short-term project funding. Emerging industries require a different approach: sustained, problem-driven research embedded directly within industrial precincts. Critical minerals processing, green energy systems, hydrogen safety, advanced fuels, remote automation, subsea engineering, carbon measurement, precision agriculture and biosecurity surveillance all demand applied innovation delivered in real time. This kind of research cannot be outsourced to institutions thousands of kilometres away; it must be embedded within the Northern economy itself.

Three strategic shifts are essential.

First, Australia must establish applied R&D hubs inside major industry clusters, including Darwin's Middle Arm, the Barkly–Beetaloo energy corridor, Townsville's manufacturing precincts, Cairns' maritime and Defence hubs, and the Pilbara's resource centres. These hubs should co-locate researchers with engineers, regulators, Defence personnel, industry leaders and First Nations land managers. Such proximity accelerates innovation, reduces costs and ensures solutions are fit for Northern conditions.

Second, the North needs a coordinated research agenda aligned to national priorities. Instead of fragmented projects, Australia should invest in long-term programs focused on frontier challenges: decarbonising heavy industry, improving the durability of tropical infrastructure, strengthening defence sustainment, automating remote operations, enhancing biosecurity resilience, understanding climate impacts, and building sovereign capability in materials, batteries, and hydrogen systems. These challenges require interdisciplinary collaboration and multi-year funding frameworks—not sporadic grants.

Third, R&D must be linked directly to commercialisation pathways. Too much research in Australia fails to transition into deployable technologies or scalable businesses. A Northern Innovation Spine would embed industry mentors, prototyping facilities, demonstration sites and venture support directly into precincts, ensuring innovations move rapidly from ideas to commercial products. First Nations enterprises should also play a core role in commercialisation, leveraging traditional knowledge and land management expertise to drive innovation in environmental stewardship, carbon markets and biosecurity.

The benefits of a robust Northern R&D network extend well beyond industry. It strengthens Defence capability by enabling the rapid adaptation of technologies, logistics systems and sustainment methods to Northern operating conditions. It enhances regional resilience by improving the performance of infrastructure and emergency response systems. It creates new pathways for First Nations youth and builds intellectual capital that stays in the North.

Conclusion: A Northern Australia Cluster Model: Building the Industrial Architecture of a Sovereign Economy

If Northern Australia is to become a globally competitive engine of national resilience and economic renewal, it must move beyond project-by-project development and adopt a cluster-based industrial architecture. Clusters are the foundation of modern economic success. They bring together energy systems, logistics, capital, digital networks, regulatory certainty, research capability, workforce pipelines and industry in one integrated geography. For Northern Australia—a frontier economy with dispersed population centres and high operational costs—clusters are not optional; they are the only path to achieving the scale needed for emerging industries to succeed.

The world’s most competitive industrial regions—from the Ruhr Valley to Rotterdam, Houston and Singapore—are built around clusters. These ecosystems concentrate complementary industries, shared infrastructure and professional services, generating efficiencies and innovation that no single project can deliver alone. For

Northern Australia, clusters offer the same promise: they transform geographic isolation into strategic advantage by creating self-reinforcing centres of expertise.

A robust Northern Australia cluster model should include five interlocking cluster types.

1. Energy and Decarbonisation Clusters. These clusters consolidate large-scale renewable generation, hydrogen and ammonia production, carbon capture and storage, long-duration storage, and hybrid systems integrating gas and renewables. They provide firmed energy for industrial users and reduce emissions across value chains. Middle Arm, the Pilbara and the Barkly–Beetaloo corridor are natural locations for these clusters.

2. Critical Minerals and Advanced Manufacturing Clusters. Co-locating extraction, processing, magnet manufacturing, battery precursor production and recycling creates end-to-end critical minerals capability in the North. Downstream processing becomes viable only when energy, water, logistics and talent are concentrated in one place. Nolans, Middle Arm and Townsville offer the foundations for this cluster type.

3. Defence and Sovereign Capability Clusters. These precincts align Defence posture with industrial capacity. They bring together sustainment facilities, autonomous systems testing, simulation hubs, munitions storage, rapid prototyping, additive manufacturing and joint-allied logistics. Darwin, Katherine, Townsville and Cairns are essential nodes for defence clustering.

4. Decommissioning and Offshore Services Clusters. Darwin or Broome can anchor world-leading subsea engineering, heavy dismantling, robotics, inspection, environmental remediation and materials recovery. This cluster builds sovereign capability while positioning Australia as the Indo-Pacific's decommissioning hub.

5. Biosecurity, Agriculture and Food Resilience Clusters. These clusters integrate export inspection, technology-enabled surveillance, research on tropical agriculture, climate adaptation and advanced food systems. They underpin agricultural exports, protect biodiversity and enhance national resilience.

Together, these clusters form a Northern Industrial Spine—a connected network of precincts that share infrastructure, supply chains, data systems and workforce development programs. This model accelerates approvals, attracts investment, lowers costs, strengthens supply chain resilience, and expands Defence interoperability. Most importantly, it turns Northern Australia into a strategic industrial ecosystem rather than a scattered collection of isolated projects.

Clusters provide the structural conditions required for Northern Australia to realise its potential as a powerhouse of national resilience, economic competitiveness and strategic influence. They are the architecture upon which the North's next industrial era must be built.

Northern Australia is not a problem to be solved; it is an opportunity to be unlocked. With the right policy architecture, it can anchor Australia's next industrial era,

strengthen national security, and create a resilient economic future for generations to come. The window is open, but it will not remain so forever. Now is the moment for Australia to be bold.