GeoDataDecisions

Saving Australia's Industrial Future

Building Coordinated Supply Chain Ecosystems

White Paper

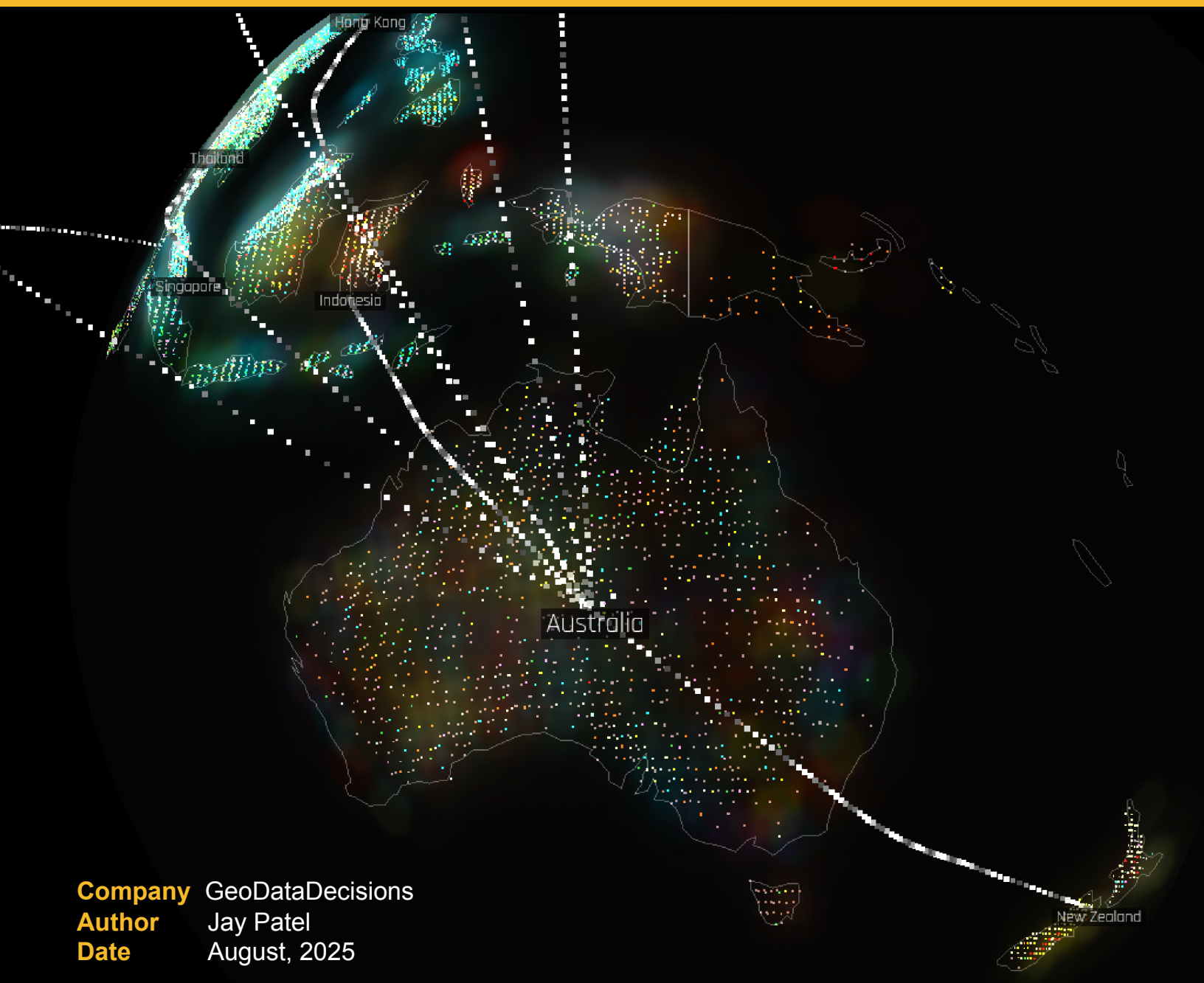

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Table of Content

GeoDataDecisions

Preface and Acknowledgments

This white paper addresses a critical structural weakness in Australia's economy: the fragmentation of our industrial base and the absence of coordinated supply chain ecosystems. While the analysis draws primarily from mining and infrastructure where these challenges are most visible but the implications extend across energy transport and automotive industries.

I acknowledge the guidance of senior industry colleagues whose three decades of leadership experience provided deep context for this work and the contributions of professional and academic sources cited herein.

The paper is intended for:

- Policy makers seeking to move beyond reactive bailouts towards systemic solutions
- Industry leaders looking to enhance competitiveness through collective action and
- University commercialisation managers exploring how data-driven platforms can be scaled into national infrastructure.

Executive Summary

Australia is at risk of industrial irrelevance. Productivity has stagnated, manufacturing capacity has eroded and government responses have focused on emergency interventions rather than structural solutions.

1. Productivity Plateau: Australia has fallen from 6th to 16th in OECD productivity rankings. In 2015, labour productivity was comparable to the United States; today, the US is 18% ahead.
2. Leakage Loops: Core industries export raw materials (iron ore, lithium) but import finished goods at multiples of their export value, eroding jobs and supply resilience.
3. Industrial Attrition: Facility closures (Hazelwood, Gibson Island, Whyalla) trigger cascading effects across dependent supply chains.
4. Reactive Policy: The $135m Nyrstar bailout exemplifies a pattern of expensive, short-term interventions.

By contrast, international peers have created data space ecosystems:

- Europe's Catena-X links 130+ automotive companies through secure production data sharing.
- America's OSDU integrates energy exploration data across operators.

Recommendation: Australia should establish industrial technology ecosystem foundational data spaces—secure, federated networks that enable manufacturers, suppliers and downstream industries to share operational metadata (not core IP), creating transparency, reducing costs and strengthening resilience.

The potential is material: savings of $15b+ and the protection of more than 20,000 jobs at risk.

The Problem Story

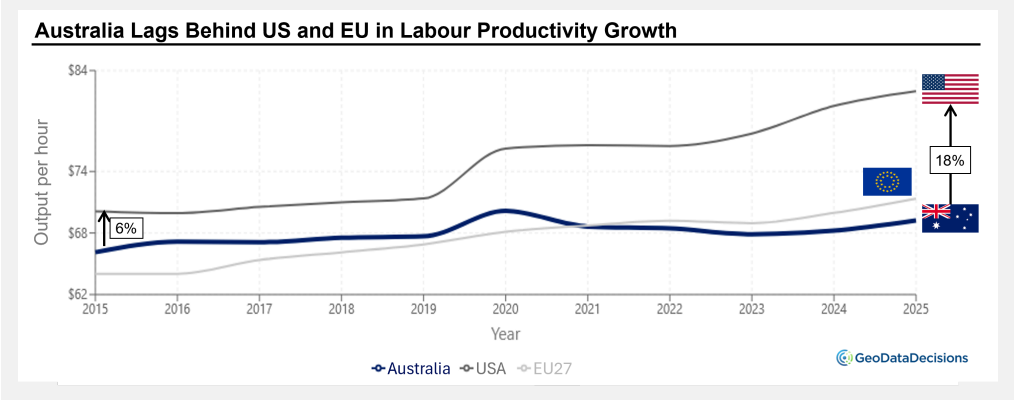
Australia's Economic Decline

1. The Great Australian Stagnation

Imagine this: Back in 2015, the average Australian worker generated $65 of economic value per hour, trailing the US by just a few dollars and staying competitive with major European economies. There was genuine pride in knowing our workforce could match the world's best, dollar for dollar, hour for hour.

Fast forward to today. That same Australian worker still produces around $68-70 per hour. The American worker? Over $80, 18% more productive. Europe has overtaken too.

While the world accelerated, Australia barely moved.



The Resource Curse: How Success Became Our Trap

Commodity booms provided "sugar hits" through higher export prices, masking our fundamental productivity problem. Our resource wealth made the Australian dollar so strong that importing manufactured goods became cheaper than making them locally. Combined with 1980s-90s tariff reductions, we dismantled our manufacturing base in favor of digging things out of the ground.

Australia has recorded its weakest decade of productivity growth in 60 years - just 1.2% annually. It has tumbled from 6th to 16th in OECD productivity rankings.

We became trapped in what economists call "leakage trade loops" - sending raw materials overseas and buying back finished products at premium prices. When commodity prices fell, we were left exposed: an economy that had forgotten how to create value through internal manufacturing and sophisticated supply chains.

The Problem Story

Australia's Economic Decline

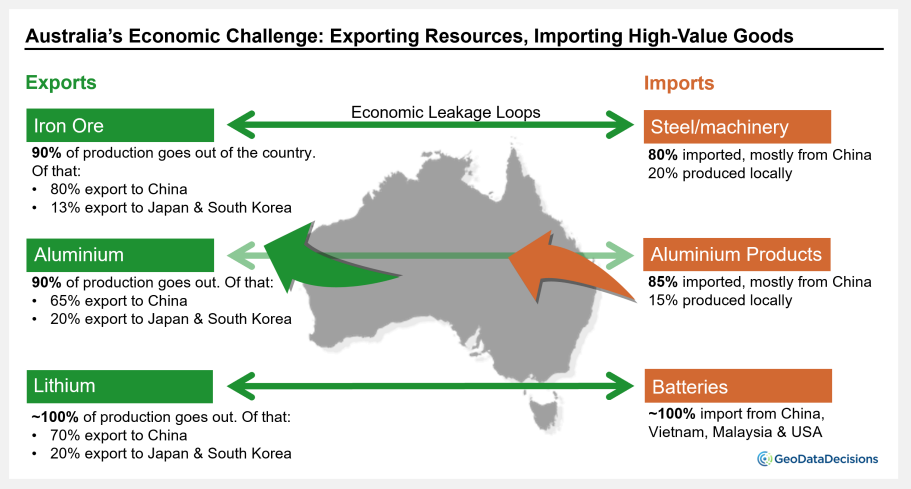
2. The Leakage Loops: How We Export Jobs and Import Dependency

Australia is trapped in economic trade cycles that have persisted for decades - what we call "leakage loops." These cycles systematically drain value from our economy, shipping raw materials overseas only to buy back finished products at premium prices.

Understand this economic pattern using Australia's iron ore industry, our largest export earner:

1. Australia mines iron ore - We extract 900 million tonnes annually
2. 90% leaves our shores - Mostly to China and other Asian markets
3. Buyers process it into steel and machinery - Adding layers of value through manufacturing
4. We import it back at 5-10x the price - The same raw materials return as finished steel, machinery and infrastructure

Result: We've exported the jobs, the technology development and the economic multiplier effects that come with advanced manufacturing.



Beyond Iron Ore: The Lithium Paradox

Australia's raw materials advantage has been an economic blessing, employing hundreds of thousands and generating massive export revenues. But consider this: Australia produces 50% of the world's lithium yet exports 98% unprocessed while importing nearly 100% of our lithium-ion batteries from China and other Asian countries.

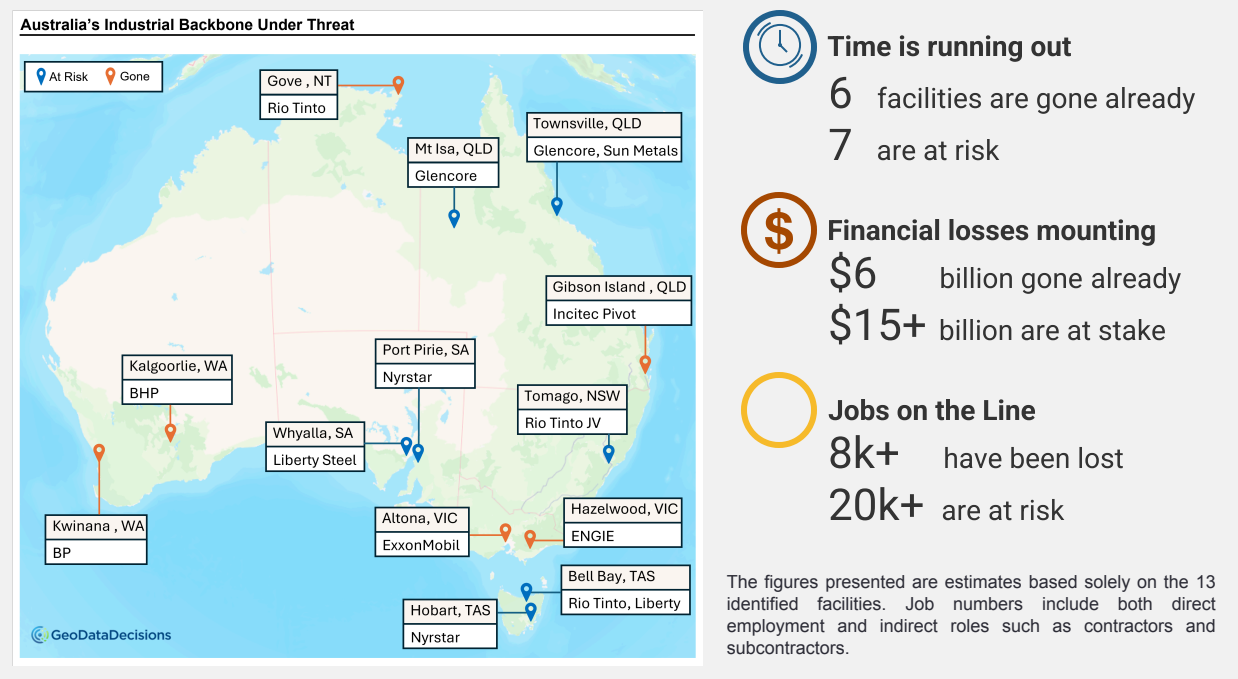
We literally dig up the future, ship it overseas, then buy it back as finished technology at premium prices. This creates near-complete dependency on foreign supply chains for critical infrastructure from electric vehicles (EVs) to grid storage systems essential for our renewable energy transition.

Why Now?

The Perfect Storm

Australia's Industrial Backbone is Collapsing

The crisis isn't theoretical, it's happening right now across Australia. Look at this map of our major industrial facilities and you'll see a pattern that should terrify every Australian: our industrial backbone is disappearing before our eyes.



The Cascade Effect is Accelerating

Here's what makes this crisis urgent: these facilities don't operate in isolation. They're interconnected nodes in a fragile industrial ecosystem. Take **Whyalla Steelworks**. If it closes, the ripple effects cascade through South Australia's industrial network. The Dyno Nobel Phosphate Hill mine, 140km from **Mount Isa**, employs 500 people and relies on copper smelter by-products for fertiliser production. Lose the smelter, lose the mine. Lose both and Queensland's agricultural supply chains face critical disruption.

We've seen this pattern before. When **Gibson Island's** ammonia plant closed, it didn't just affect Incitec Pivot, it disrupted fertiliser supply chains across Queensland agriculture. When **Hazelwood** shut down, energy price shocks rippled through Victoria's entire manufacturing sector.

The domino effect means every closure makes the next one more likely. We're not just losing individual facilities - we're dismantling the industrial links that make Australian manufacturing viable.

What We Have to Tackle

The Four Critical Gaps We Must Close

The collapse of multiple facilities and decade-long productivity stagnation stem from four interconnected vulnerabilities.

Supply Chain Blindness: When Left Hand Doesn't Know Right Hand

- Australian manufacturers lack transparency into domestic supply networks, struggling to identify local alternatives during disruptions and missing opportunities with nearby suppliers
- **Example:** During Whyalla Steelworks' 2024 crisis, significant delays resulted from difficulties rapidly sourcing iron ore domestically, reflecting broader information vacuums across Australian industry

The Scale Disadvantage: Fighting Alone Against Giants

- Australian manufacturers operate as isolated firms battling integrated Chinese giants, limiting their bargaining power and scale against coordinated supply chains
- **Example:** Australian miners export raw spodumene at $800/tonne to China then import processed lithium hydroxide at $17,000/tonne, while Chinese manufacturers exploit industrial clusters for lower costs

The Efficiency Gap: Wasting What We Can't Afford

- Operating independently, manufacturers miss opportunities for joint infrastructure or pooled purchasing that could dramatically lower operational costs, mainly energy bills
- **Example**: Tomago Aluminium and Port Kembla Copper Smelter have seen energy costs increase 50% since 2019, using 10-12% of NSW's electricity while unable to access shared infrastructure savings

Technology Trap: Stuck in Yesterday's Factory

- Manufacturers can't afford individual technology upgrades and lack insights into how existing assets are performing, creating uncertainty about modernisation decisions
- **Example:** Whyalla Steelworks' $1 billion upgrade faced delays due to uncertainty about which improvements would deliver the best returns, leaving companies stuck with outdated equipment

Solution Vision

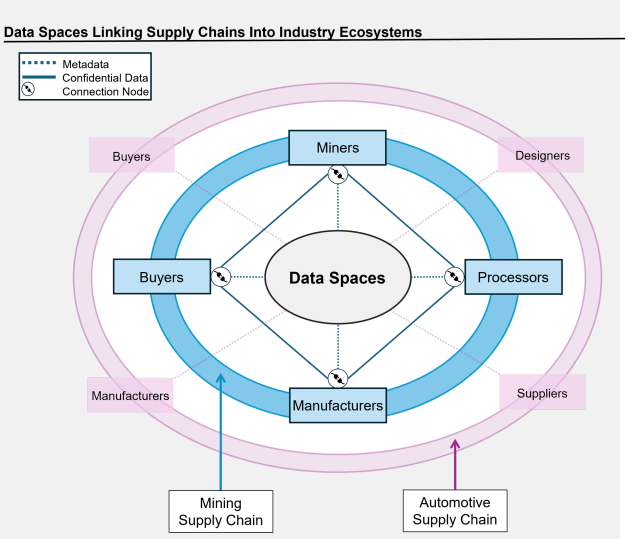
Creating Australia's Connected Industrial Ecosystem

1. The Solution: Data Spaces Platform for Industrial Ecosystems

What Are Industrial Data Spaces?

Industrial data spaces are federated networks that connect entire supply chains within and across industries. They act as a central coordination layer, enabling secure information sharing between industry ecosystems such as mining and automotive.

Core Concept: Instead of isolated manufacturers competing with incomplete information, data spaces create transparent ecosystems where companies voluntarily share specific operational metadata to unlock collective benefits. Think of it as a secure industrial internet where manufacturers can coordinate supply chains across entire industries without exposing competitive secrets.



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Cross-Industry Connectivity

Data spaces don't just connect companies within one industry. They enable coordination between mining and automotive ecosystems, creating opportunities for domestic value chains that previously didn't exist.

Controlled Sharing

Companies decide exactly what operational information to share, maintaining competitive advantage while enabling collective coordination.

Solution Vision

Creating Australia's Connected Industrial Ecosystem

2. Setting Up Data Spaces

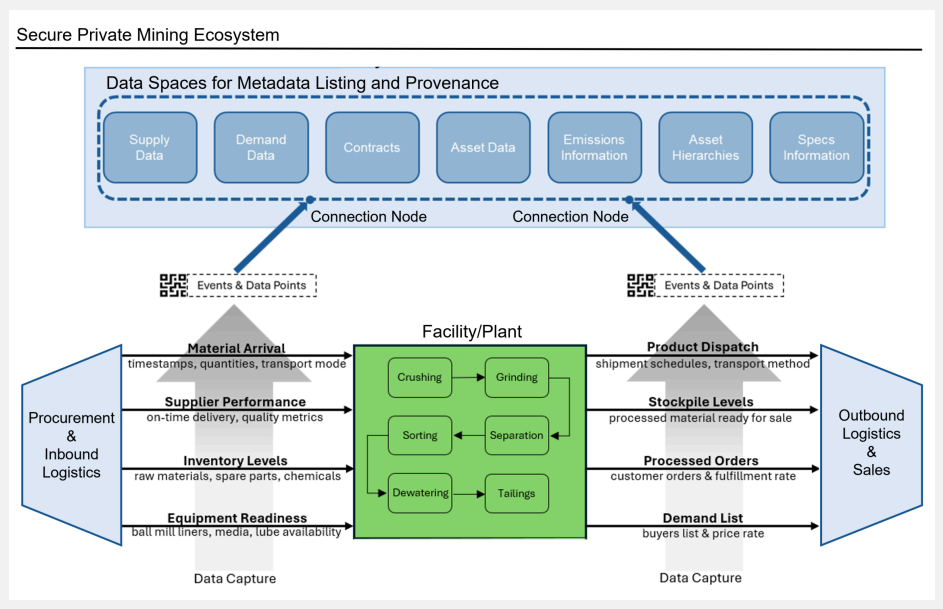
The Mining Industry Example: End-to-End Visibility

Traditional mining supply chains operate in silos with limited cross-company visibility. Data spaces transform this through building an interconnected network:

Single QR Code = Complete Visibility

- Upstream (Procurement to Plant): One QR code captures all operational events and instantly organises metadata - contracts, demand forecasts, supply schedules, asset specs, emissions data, equipment hierarchies
- Downstream (Plant to Market): Another QR code aggregates facility-to-sales metadata, creating an end-to-end digital trail

Secure **Connection Nodes** channel this organised metadata into the data spaces platform without exposing sensitive company data.



Implementation Steps

1. **Start Small - Community First:** A trusted group of 3-5 companies that already collaborate in the supply chain forms the initial community. Mining operators, key suppliers and primary customers test and refine the system together.

2. **Implement Data Capture:** Simple capture methods like QR codes are deployed at critical handoff points - goods receipt, processing milestones, shipment dispatch. Each scan logs operational events and timestamps automatically.

3. **Configure Metadata Display:** Dashboards display relevant metadata for each community member contract status, inventory levels, quality specifications, delivery schedules. Companies control what information is visible to whom.

Solution Vision

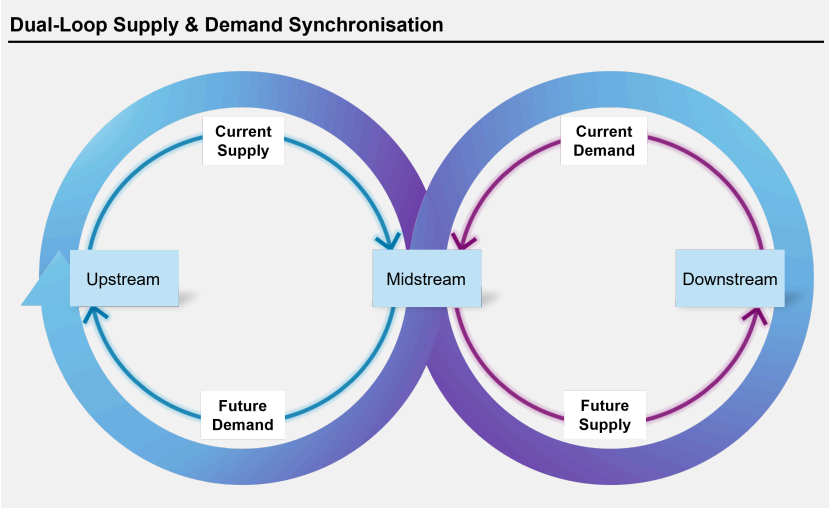
Creating Australia's Connected Industrial Ecosystem

3. Continuous Intelligence: From Data to Decisions

Data spaces connect Australian businesses into intelligent networks that share real-time information. These connections create two powerful feedback loops: one that manage supply chains proactively and another that provides reliable market forecasting. Together, these loops give isolated Australian businesses the same supply and demand intelligence that integrated international competitors use to stay ahead.

The Dual Intelligence System

This intelligence network operates through two interconnected feedback loops that process information in opposite directions. This dual-direction approach ensures midstream actors such as manufacturers have complete visibility across their value chain and connected supply chain.



Upstream Loop

Suppliers receive advance visibility into future demand based on actual facility/plant capacity and inventory levels. This eliminates costly over-ordering and supply shortages that hurt isolated manufacturers.

Downstream Loop

Customers receive reliable forecasts of product availability based on real supply and production data. This reduces uncertainty and prevents buyers from switching to overseas suppliers.

The Intelligence Multiplier Effect

These loops create a **self-reinforcing cycle** - each loop **continuously** feeds the other as predictions improve based on real-time data flowing through the facility/plant as the central intelligence hub. Australian manufacturers shift from reactive crisis management to proactive strategic planning.

Solving Critical Industry Problems

- Supply Chain Blindness → Real-time visibility across the entire network
- Scale Disadvantage → Coordinated planning that matches integrated competitors
- Cost Crisis → Bulk purchasing and shared infrastructure through predictive planning
- Technology Trap → Data-driven investment decisions with clear ROI visibility

The Government's Role

Government has a critical but focused role: create the conditions for connection, then step back and let industry lead. This isn't about picking winners or providing endless subsidies - it's about removing barriers and providing the foundation for companies to coordinate effectively.

Targeted Investment: Infrastructure, Not Industry

Instead of rescuing individual facilities, invest in the digital infrastructure that connects them. The $135 million in recent smelter bailouts could have funded data spaces platforms for entire industries. Rather than reactive bailouts, provide proactive connectivity. Strategic investments:

- Co-fund initial data spaces pilot programs across 3-5 critical industries
- Invest in secure connection nodes and digital infrastructure
- Support skills development for data coordination and supply chain analytics

Special Economic Zones: Manufacturing Clusters

Establish Special Economic Zones (SEZ) designed specifically for connected manufacturing. Unlike traditional SEZs focused on tax breaks, these zones prioritise digital connectivity, shared infrastructure and coordinated operations between companies. SEZ design principles:

- Shared energy infrastructure to address the 50% cost increases
- Coordinated logistics and supplier networks
- Joint R&D facilities for technology upgrades

Companies in these zones can pool resources for energy procurement, share logistics infrastructure and coordinate production schedules, directly addressing the scale disadvantage that makes Australian manufacturers uncompetitive.

Measurement and Accountability

Set clear metrics for success: increased domestic supply chain utilisation, reduced rescue package requirements, improved manufacturing productivity. Track coordination levels between companies, not just individual company performance.
Success indicators:

- Percentage of critical materials processed domestically before export
- Reduction in emergency manufacturing facility funding
- Growth in cross-company operational coordination
- Increase in manufacturing employment and productivity

The Return on Investment

Every dollar invested in connection infrastructure saves multiple dollars in future bailouts. The Catena-X platform cost European governments roughly €100 million to establish but has generated billions in efficiency gains and prevented countless facility closures.

For Australia, the math is clear: invest in creating connected ecosystems or continue spending billions rescuing isolated failures. Government's role is to make the choice obvious and the path clear.

Looking Ahead

We don't have to accept decline as inevitable. Other nations found ways forward - not through bailouts but by restructuring how industries connect.

The path starts small. Mining companies, suppliers and customers share operational data through secure connections. They coordinate deliveries, production schedules, demand forecasts. Costs drop, efficiency rises. Word spreads. More companies join.

Within five years, mining coordination spans every state and territory. WA lithium miners work with battery makers in VIC and SA for local EVs. Steel from NSW and WA supports construction in QLD. NT mining links with renewable hydrogen projects. TAS, QLD and VIC food processors connect farmers and retailers nationwide, cutting waste and boosting supply resilience.

This isn't theoretical. Europe's Catena-X connected 130+ automotive companies sharing production data in real-time. America's OSDU coordinates energy data across major oil companies. These are industry-led initiatives recognising a truth: isolated companies can't compete with connected ecosystems.

Australia has unique advantages. Resource wealth provides the foundation. Stable institutions enable essential trust for data sharing. Our position connects Asian supply chains with Indo-Pacific markets. But delay makes this harder. The $135 million Nyrstar rescue won't be the last if we keep treating symptoms instead of causes. Unless we change how industries connect, expect more emergency funding, closures, exported jobs.

The choice isn't government intervention versus free markets. It's coordination versus decline. The infrastructure exists. Technology works. Will we use it before it's too late?

Some say this is too ambitious, risky. These voices led us into isolated decline while others built connected prosperity. The real risk is doing nothing while our industrial base disappears one rescue at a time.

Companies moving first gain compounding advantages. Industries that connect survive and thrive. Nations that act control their destiny instead of watching it slip away.

Australia can lead or follow. Build connected supply chains or keep paying for disconnected failures. The choice is ours - now.

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