The Superpower Institute

Western Australia Green Iron Roadmap

Turning ambition into action

Western Australia's iron ore has supplied steelmakers around the world for decades. As those customers transition their facilities to reduce emissions, WA has an opportunity to process its ore here and export green iron.

The Superpower Institute's WA Green Iron Roadmap sets out how the state can develop this industry. It examines where early projects are most likely to succeed, what infrastructure and skills they will need, and how government can support private investment. Its recommendations cover getting the first projects built while preparing for larger-scale production over time.

Report fact sheet

Why green iron matters for WA

Producing green iron locally could increase the value of WA's exports by processing its ore into a product that steelmakers can use directly to meet their decarbonisation objectives. This would bring more downstream processing activity to the state, supporting regional jobs, local suppliers and manufacturing, and creating opportunities for Traditional Owner participation.

The export potential is substantial. TSI's analysis estimates that Australian green iron exports could generate up to **$386 billion a year by 2060**, in a scenario where green iron replaces iron ore as a primary export. The Roadmap examines how WA can lead in that opportunity.

It could also help WA retain customers as steelmaking changes. If the state cannot supply the products those customers need, it risks losing demand to other suppliers, with consequences for the industry and the economic value it generates.

What the Roadmap recommends

The Western Australia Green Iron Roadmap sets out how government can support industry to develop this opportunity, starting with projects most likely to succeed under current conditions.

It recommends supporting **one or two early commercial-scale Mid West projects**, where ore, proven technology and infrastructure align, while accelerating preparations for future production in the Pilbara.

Coordination, rather than technology or cost alone, is likely to be the binding constraint on getting projects built. Projects need reliable energy, water and transport infrastructure, skilled workers and customers. Government has a key role in coordinating infrastructure, approvals and workforce training, engagement with communities, partnerships with Traditional Owners and facilitating early market entry.

$386 billion a year

Potential Australian green iron export revenue by 2060.

Source: The New Energy Trade

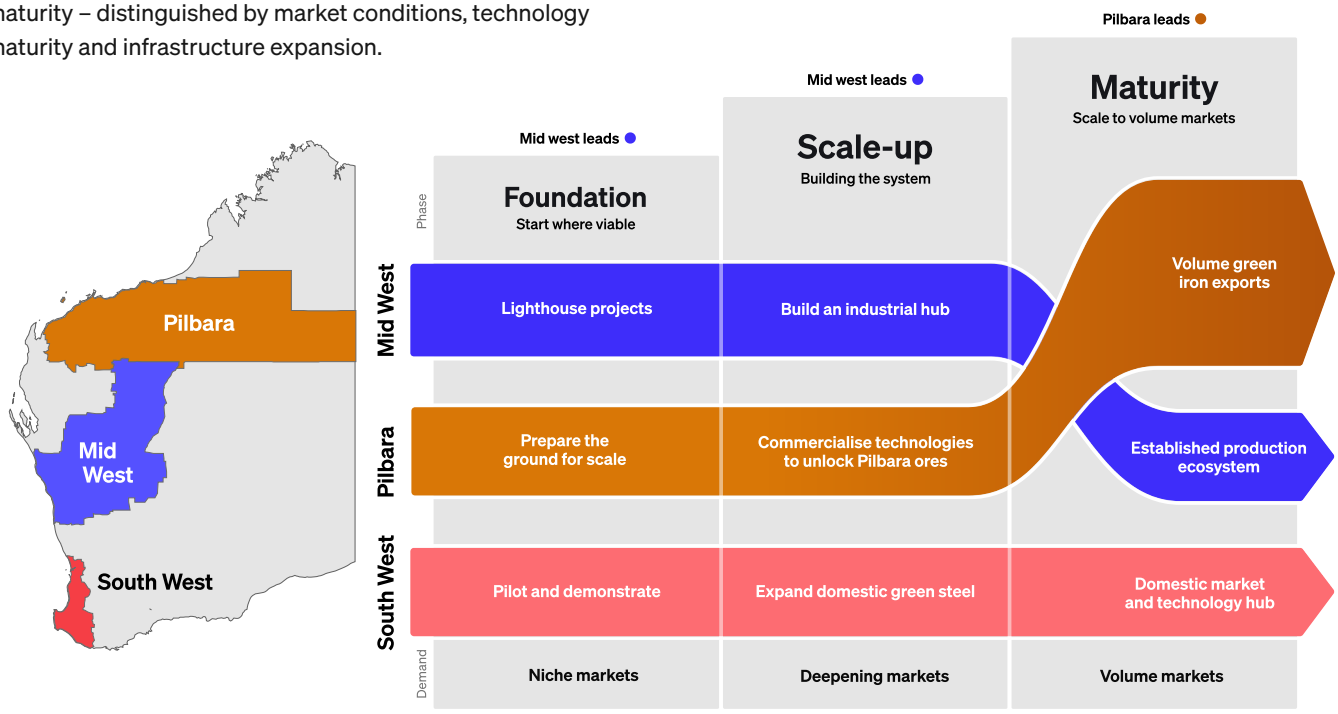
For Western Australia, the opportunity is to process more of its iron ore locally, adding value to exports, supporting regional jobs, local suppliers and manufacturing, and creating opportunities for Traditional Owner participation.

Three regions

WA's green iron industry will develop differently across its regions

The Roadmap identifies an indicative trajectory of industry development with three phases – foundation, scale-up and maturity – distinguished by market conditions, technology maturity and infrastructure expansion.

These phases will not unfold in the same way across Western Australia's regions. Green iron industry development requires the Mid West, Pilbara and South West regions to progress in parallel, according to their comparative advantages in ore, energy and logistics infrastructure, workforce and market access. This trajectory is a guide to government coordination and investment, not a commitment to specific projects or locations.



Mid West

Early projects

The Mid West offers advantages for WA's first commercial green iron projects.

It has more than 8 billion tonnes of identified magnetite resources, some suitable for upgrading to the quality needed for a direct reduction-electric arc furnace pathway. Access to the electricity grid, existing transport and port infrastructure, and a nearby workforce could support one or two early 'lighthouse' projects, subject to targeted upgrades. Expanding beyond these projects will require coordinated investment in industrial land, water, hydrogen and transmission infrastructure and port capacity.

Pilbara

Global scale

The Pilbara's estimated 56 billion tonnes of hematite resources and established export industry make it central to WA's longer-term green iron opportunity.

Producing at scale will depend on technologies suited to Pilbara ores and the emergence of larger markets. Work on project-ready land, heritage approvals, transmission and financing arrangements should accelerate now, alongside early projects elsewhere. Small to mid-scale commercial projects may emerge as the enabling conditions develop.

South West

Technology and skills

The South West is well positioned to support the technology, skills and domestic markets that WA's green iron industry will need.

Established industrial precincts at Kwinana, Kemerton and Collie, together with local workforce, training providers and research institutions, can support pilots and demonstrations. Scrap availability and domestic steel demand also create opportunities for green steel production. As the broader industry grows, the region can supply expertise, training and technology services to projects across WA.

The modelling

What the WA modelling shows

What was modelled

TSI and Bivios modelled hypothetical facilities producing 2.5 million tonnes of green iron a year at Oakajee SIA near Geraldton in the Mid West and Boodarie SIA near Port Hedland in the Pilbara. All four scenarios use hydrogen-based direct reduction.

Oakajee scenarios connect to the South West Interconnected System with access to the Wholesale Electricity Market. Boodarie is modelled as an off-grid system.

The results are a levelised cost of iron: the average cost of producing a tonne over a project's life, including renewable energy, green hydrogen and ironmaking.

Ore grade

Direct reduction-grade (DR-grade) magnetite (over 66% Fe, under 3.5% silica + alumina) is suitable for a direct reduction to electric arc furnace (DRI-EAF) pathway. **Blast furnace-grade (BF-grade) magnetite** and **Pilbara hematite** carry more impurities, so the reduced iron also needs an electric smelting furnace step (DRI-ESF-EAF), adding cost and electricity demand.

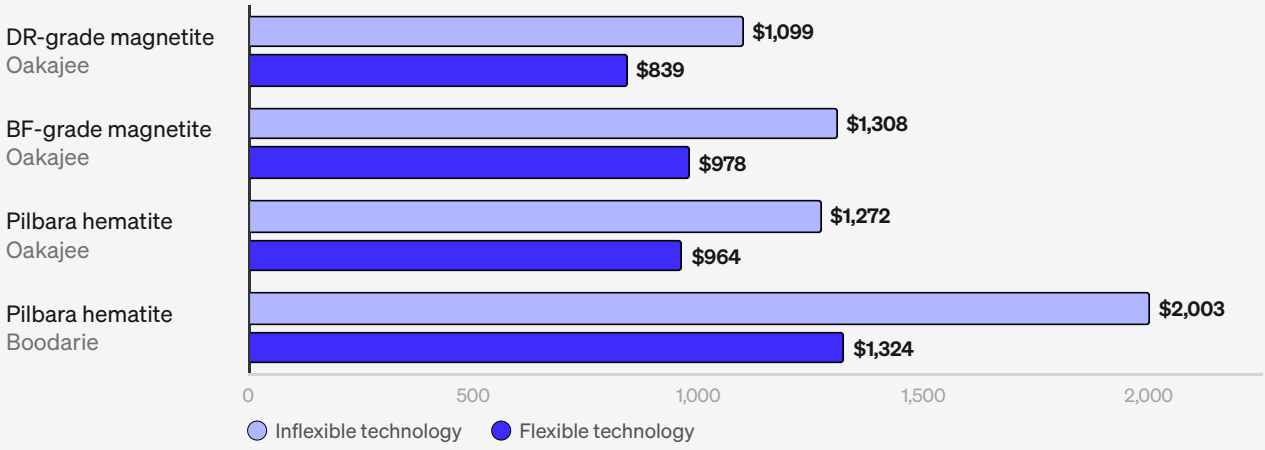
Technology

Inflexible technology runs continuously at a steady rate, so it relies on storage or grid power when renewable output is low. Inflexible technologies are commercially proven.

Flexible technology can ramp output up and down to respond to variable solar and wind supply. Flexible technologies are at demonstration stage.

Ore grade and location affect production costs

Levelised cost of iron, A$ per tonne



Source: Bivios and The Superpower Institute analysis; Western Australia Green Iron Roadmap, Table 4; Digging Deeper, Appendix D, Tables D.1–D.4.

Key cost drivers

DR-grade

Ore and processing

In the model, upgrading magnetite to DR-grade costs less than adding an electric smelting furnace and the electricity supply it needs. Whether a deposit can be upgraded must be assessed project by project.

>$80/t

Grid connection

For inflexible technology, a connection of around 300 MW reduces the modelled cost by more than $80 per tonne. Most of the benefit comes from supplying power when renewable energy output is low. The appropriate connection size depends on the technology and operating profile.

$360–731/t

Location

Processing Pilbara hematite at Oakajee costs $731 per tonne less than processing at Boodarie for the inflexible technology, and around $360 per tonne less for the flexible technology. These savings reflect the off-grid configuration and high locational cost factor assumed for the Pilbara.

Recommendations

What governments should do

The Roadmap makes six recommendations for the WA and Commonwealth governments.

1 **Act now on one or two commercial-scale lighthouse projects, likely in the Mid West.**

Early development is most likely where energy, water, port access, workforce and approvals can be aligned at lower risk and cost, and the Mid West currently holds notable advantages. Government effort should support projects using proven direct reduction technology, local ore, existing infrastructure and access to the Wholesale Electricity Market. It should scope enabling infrastructure and utilise market-revealing processes to test costs and demand, with early-stage demand most likely to emerge from high-value, low-volume niche markets.

2 **Accelerate long-lead enabling work in the Pilbara in parallel.**

The Pilbara holds the greatest potential for volume production, but that potential depends on two developments outside the state's control. Technologies suited to Pilbara ores must mature, and high-volume green iron markets must emerge as China transitions its steel industry and ageing blast furnace assets. Some of this work is underway, but coordinating project-ready land, heritage approvals, transmission and finance models with greater pace will allow the region to move quickly when both conditions are met.

3 **Rebuild the State's coordination capability.**

Coordination, rather than technology or cost alone, is likely to be the binding constraint on delivery. Much of the institutional 'muscle memory' that delivered past resource and energy developments has atrophied. Rebuilding it requires a clear mandate, authority to convene and escalate, resourcing matched to the task and sustained senior leadership. The state will also need to work closely with the Commonwealth (see recommendation 6).

4 **Enable private investment rather than replace it.**

Public investment should focus on common-user infrastructure with strong public-good characteristics and should not underwrite project-specific commercial risk. Large-scale and location-specific commitments should remain conditional on what market processes reveal, preserving optionality and avoiding premature lock-in.

5 **Prioritise green hydrogen and other near-zero pathways.**

Public support, coordination and policy facilitation should be directed to electricity and/or hydrogen-based iron-making, not gas-based iron-making. Hydrogen availability is a key constraint. Where a project chooses to start on gas, that is a commercial decision and should be commercially funded.

6 **Establish an effective Commonwealth–State partnership early.**

Many key levers sit with the Commonwealth, including the Green Iron Investment Fund and hydrogen support mechanisms. In the near term, the state and Commonwealth should establish coordination mechanisms, develop joint infrastructure investment proposals, and align on access to the Hydrogen Production Tax Incentive, standards and certification, and workforce strategy.

Immediate priorities

Resource the coordination function.	Test proposals through expressions of interest, tenders and the Scorecard.	Scope infrastructure for early Mid West projects, coordinate hydrogen supply, and accelerate Pilbara preparation.	Begin workforce planning and engagement with communities and Traditional Owners ahead of project approvals.

FAQs

Frequently asked questions

What is green iron?

Iron produced with near-zero emissions using renewable electricity and green hydrogen, or direct electrical processes. It can be supplied to steelmakers as hot briquetted iron or pig iron.

Why process ore in WA?

WA has the iron ore, renewable energy resources and export relationships needed to develop green iron production. Processing more ore here could increase export earnings, support regional jobs and local suppliers, and create opportunities for Traditional Owner participation. It could also help WA retain customers as steelmakers seek lower-emissions materials. Iron ore exports can continue alongside this developing industry.

Does WA have the right ore?

Different ores require different processes. Some Mid West magnetite can be upgraded to DR-grade. Pilbara hematite is harder to upgrade and may require emerging reduction technologies and electric smelting. Suitability must be assessed for each deposit.

Who would buy WA's green iron?

The Roadmap expects early customers to include steelmakers in Europe, Japan and Korea supplying markets such as automotive and advanced manufacturing, where demand for lower-emissions steel is emerging. China represents a larger, longer-term market as its steel industry changes. Projects will need credible customer commitments, including agreements to purchase future production, known as offtake agreements, to help secure investment.

Why focus early effort on the Mid West?

Its ore, grid access and existing infrastructure offer advantages for early projects. Modelled costs are $839–$1,099 per tonne for Oakajee DR-grade magnetite, compared with $1,324–$2,003 for Boodarie hematite.

What does flexible technology mean?

Flexible plants can vary output with renewable electricity supply. Inflexible plants operate at a steady rate and need more firming. Flexible technologies cost less in the model but remain at demonstration stage.

Why does a grid connection matter?

It supplies power when local wind and solar output is low, 'firming' energy supply to the project and reducing the need for additional generation and storage. For inflexible technology, around 300 MW reduces modelled costs by more than $80 per tonne.

Can WA's green iron compete on cost with conventional iron?

TSI's analysis finds that Australian green iron can compete with appropriate policy support. The Roadmap identifies inadequate carbon pricing, innovation spillovers and shared infrastructure as reasons for government involvement.

What about starting on gas?

Where proponents choose to start on gas, or to use gas as a transitional input, that is a commercial decision for them to make and fund. Government should not allocate public support to the use of gas in iron production in Western Australia.

How much should government spend?

The Roadmap does not set a total funding allocation. It recommends coordination, project assessment and infrastructure scoping first, with major commitments dependent on the evidence that emerges.

How should green iron projects be prioritised?

TSI's Green Iron Project Assessment Scorecard considers prospective projects across 15 criteria in three domains. It is designed to inform priorities for coordination and support, alongside government judgement. It does not replace regulatory approvals or prevent privately funded projects proceeding.

Where does the South West fit?

It supports technology demonstrations, skills and domestic green steel markets. The Roadmap sees this capability supporting the industry across WA.

Find out more

The work behind the Roadmap

WA's Industrial 'Muscle Memory'

What can WA learn from building its iron ore and gas industries?

This work examines how government coordination of infrastructure, approvals and investment helped develop the Pilbara's iron ore and North West Shelf's gas resources into major export industries. It draws out the lessons for building Australia's next great industries.

Digging Deeper

What would it cost to produce green iron in WA?

Modelling by TSI and Bivios examines how ore quality, technology, energy system design and specific regional factors affect green iron production costs in the Mid West and Pilbara. It compares hypothetical plants at the Oakajee and Boodarie Strategic Industrial Areas (SIAs) to identify the main cost differences and what drives them.

The Green Iron Project Assessment Scorecard

How should government decide which projects to support?

A framework for assessing projects against 15 criteria, covering project fundamentals, strategic value and delivery capability. It helps government decide where to focus coordination and support, while leaving room for judgement on individual proposals and broader industry development goals.

About The Superpower Institute

The Superpower Institute is a not-for-profit organisation dedicated to helping Australia seize the extraordinary economic opportunities of the post-carbon world. Our focus is on developing the regulatory frameworks, market incentives and practical knowledge necessary for Australia to become a major exporter of renewable energy and green industrial products.

By leveraging the nation's comparative advantage, we aim to elevate Australia's economic and climate ambition and secure our place as a leader in a decarbonised global economy.

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Further information

The full Roadmap sets out the strategic framework, regional evidence, modelling, project assessment Scorecard and recommendations for government action.

Read the full Roadmap

superpowerinstitute.com.au/work/western-australia-green-iron-roadmap

Sources

The Superpower Institute, *Western Australia Green Iron Roadmap: Turning Ambition into Action*, November 2026. The Superpower Institute and Bivios, *Digging Deeper: Modelling green iron in Western Australia.* Regions figure (page 2): indicative development trajectory by region, The Superpower Institute analysis; region boundaries, DPIRD (CC BY 4.0).