Green iron is Australia's largest export opportunity

The Superpower Institute

Australia's comparative advantage in green iron is built on its *abundant renewable energy*, its plentiful *iron ore* reserves, and its *industrial experience* in mining and innovation.

Overview

01. A model of green iron investment, production and costs

02. Analytical insights

03. Market failures and recommendations to overcome them

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Modelling green iron production in Australia

Five locations, chosen for:
- Access to ore
- Access to ports
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Model inputs:
- ‘Inflexible’ and ‘flexible’ technologies
- Renewable energy capacity
- Grid connection
- Capital and operating costs
- Local cost of doing business (capital cost multiplier)

We use a dynamic optimisation model to identify the lowest-cost combinations of investments and production in each location.

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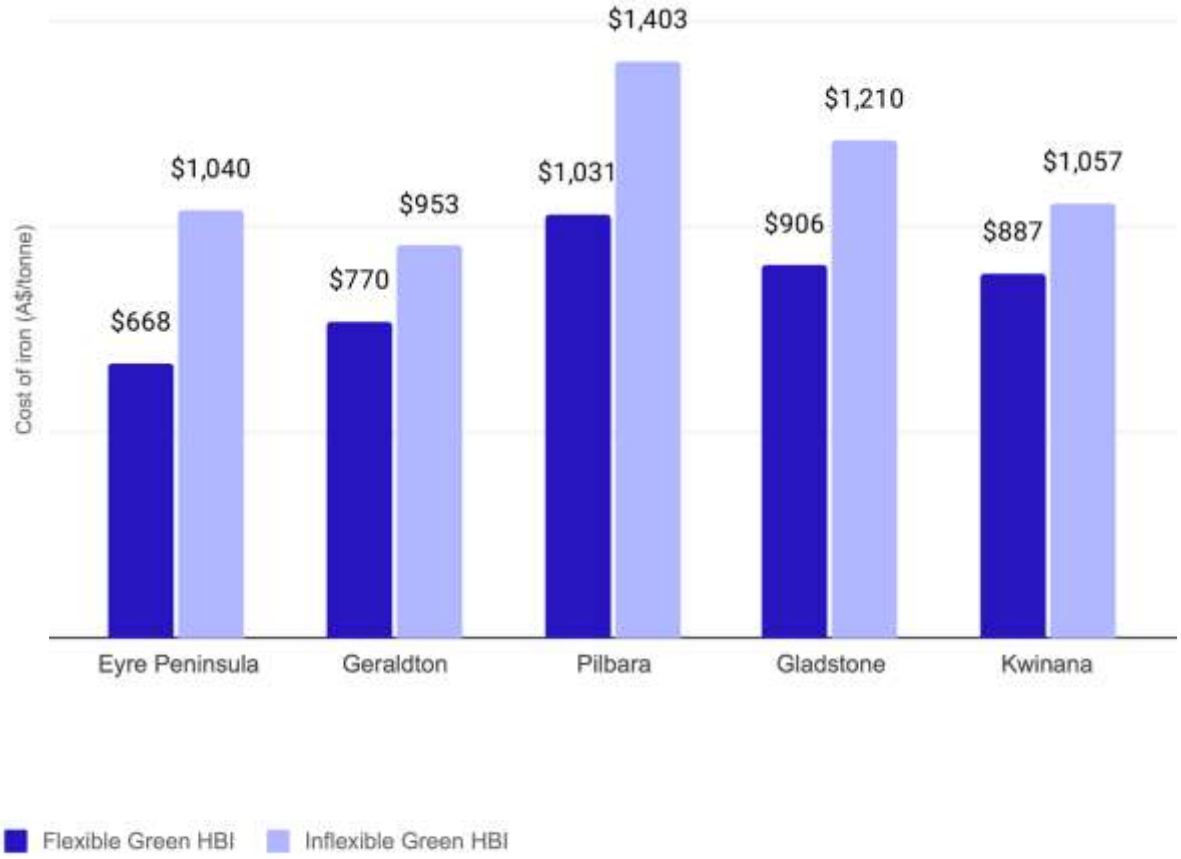
There is substantial variation in prices



Technology flexibility matters. The ability to ramp production will likely reduce the costs of production.

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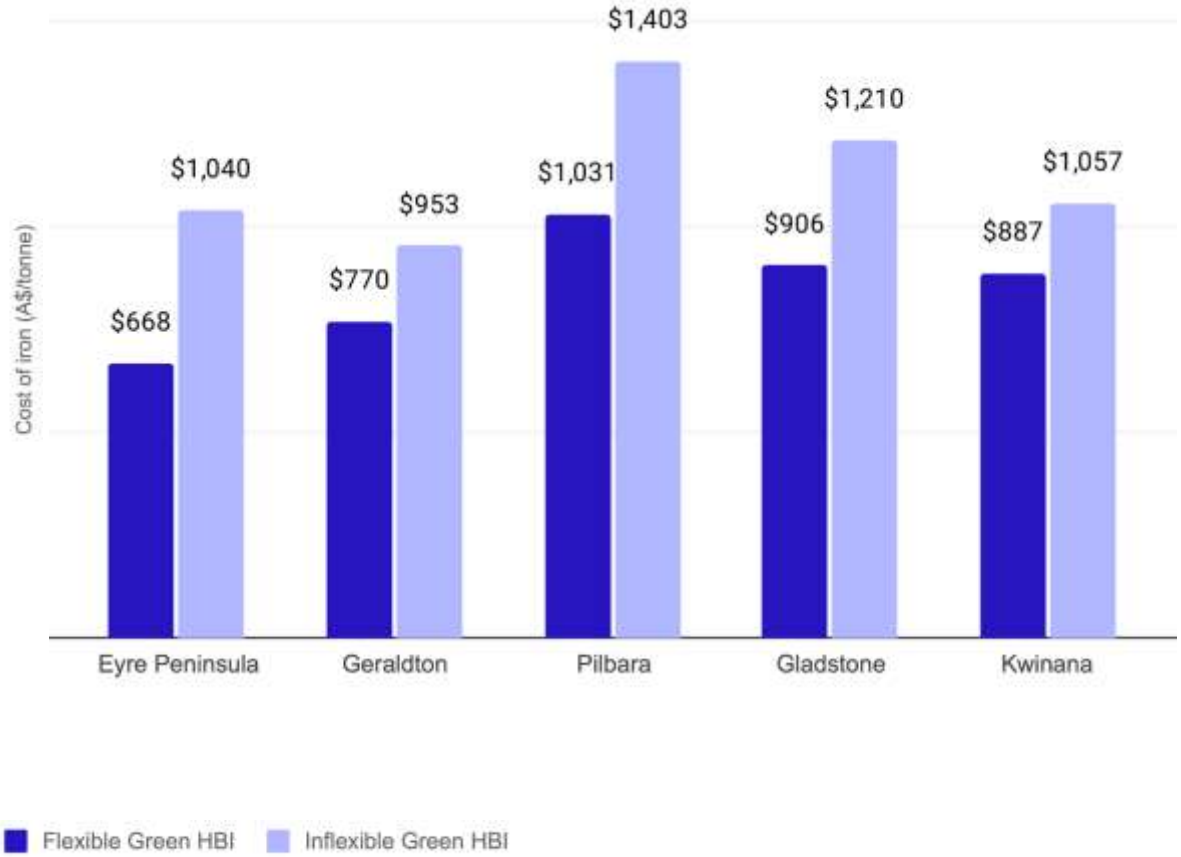

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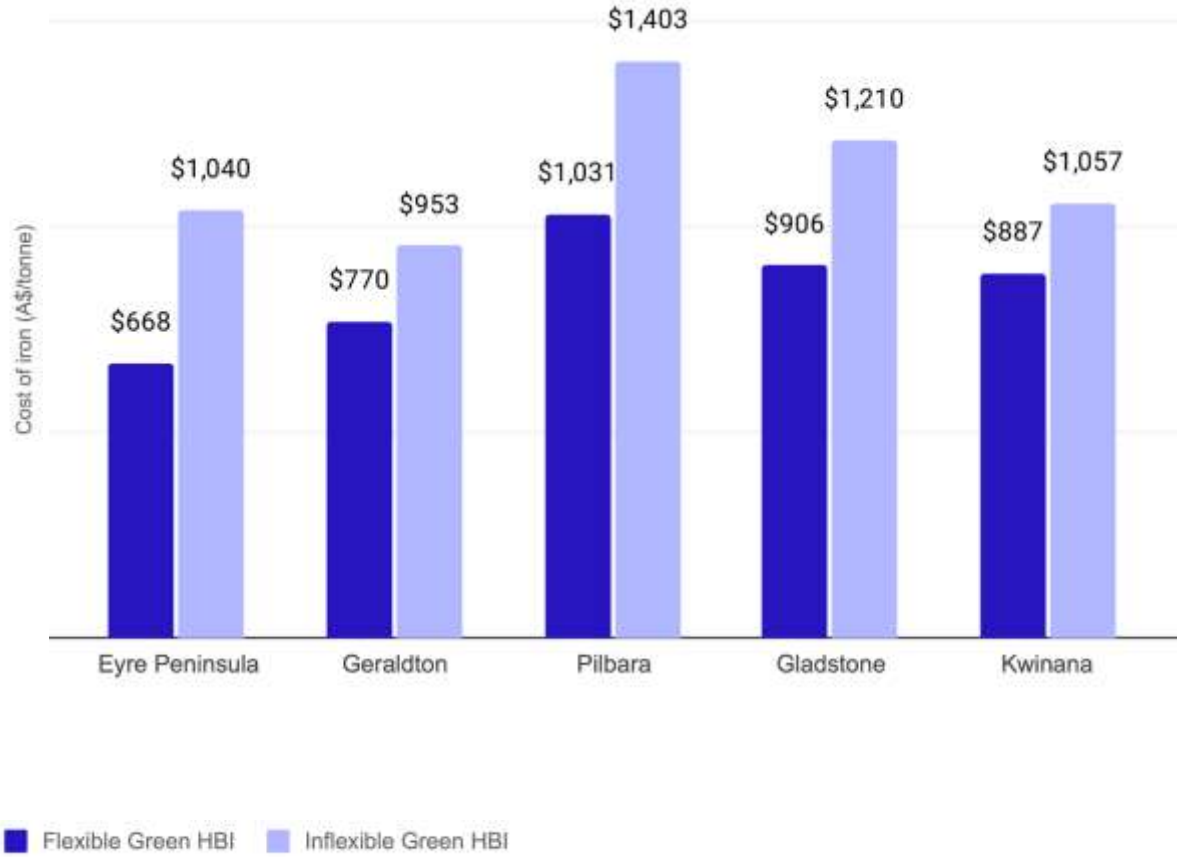

Technology flexibility matters.
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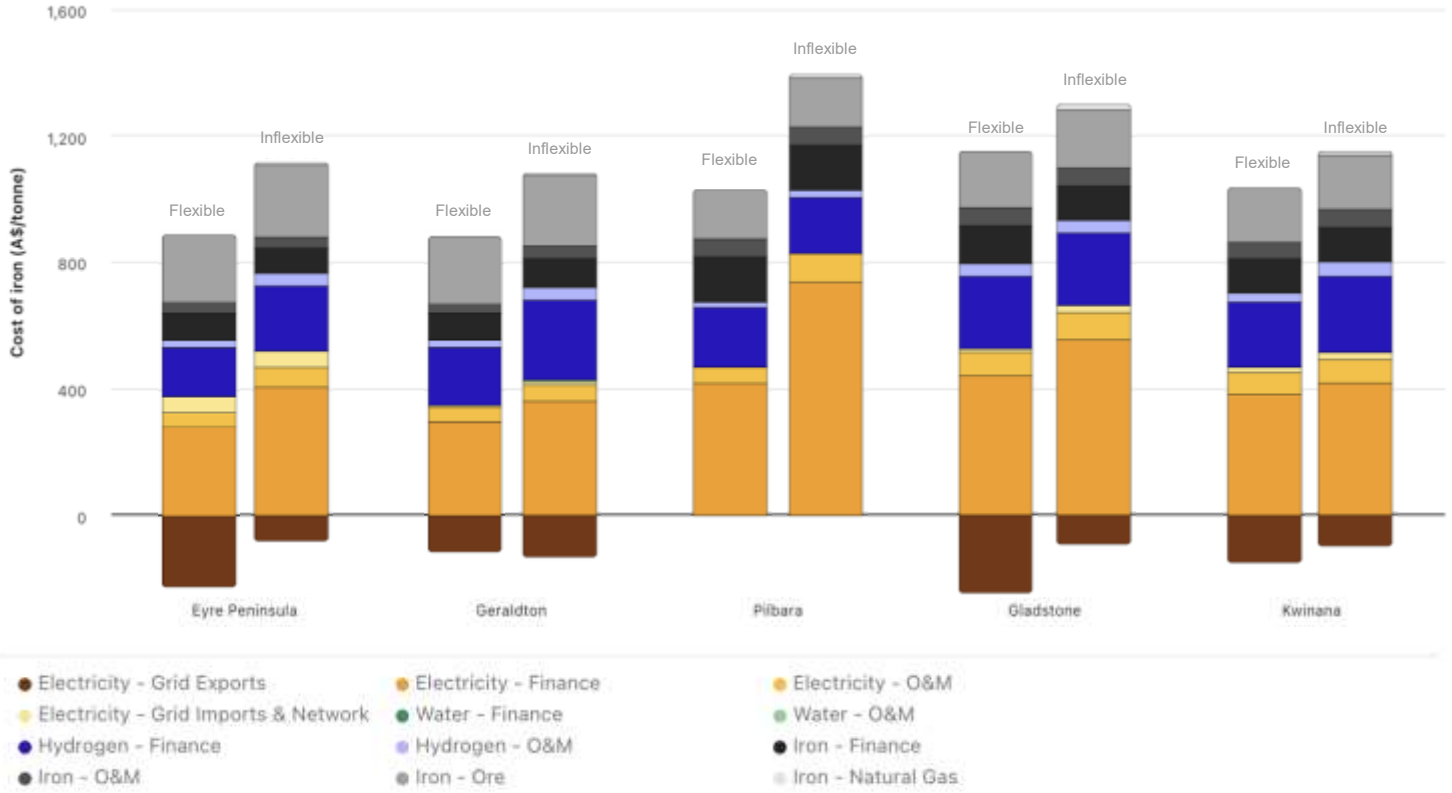
Access to an electricity market can reduce the cost of green iron.

Location is critical.
Existing infrastructure, ore type, renewable energy resources, and lower capital costs give some regions a cost advantage.

…. but all locations require large investments in renewable energy



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The market failures holding back Australian green iron

01.

Unpriced emissions from fossil fuel-based production

Green iron can’t compete on a level playing field when carbon-intensive producers don’t pay for their emissions.

02.

Innovation spillovers and early-mover risk

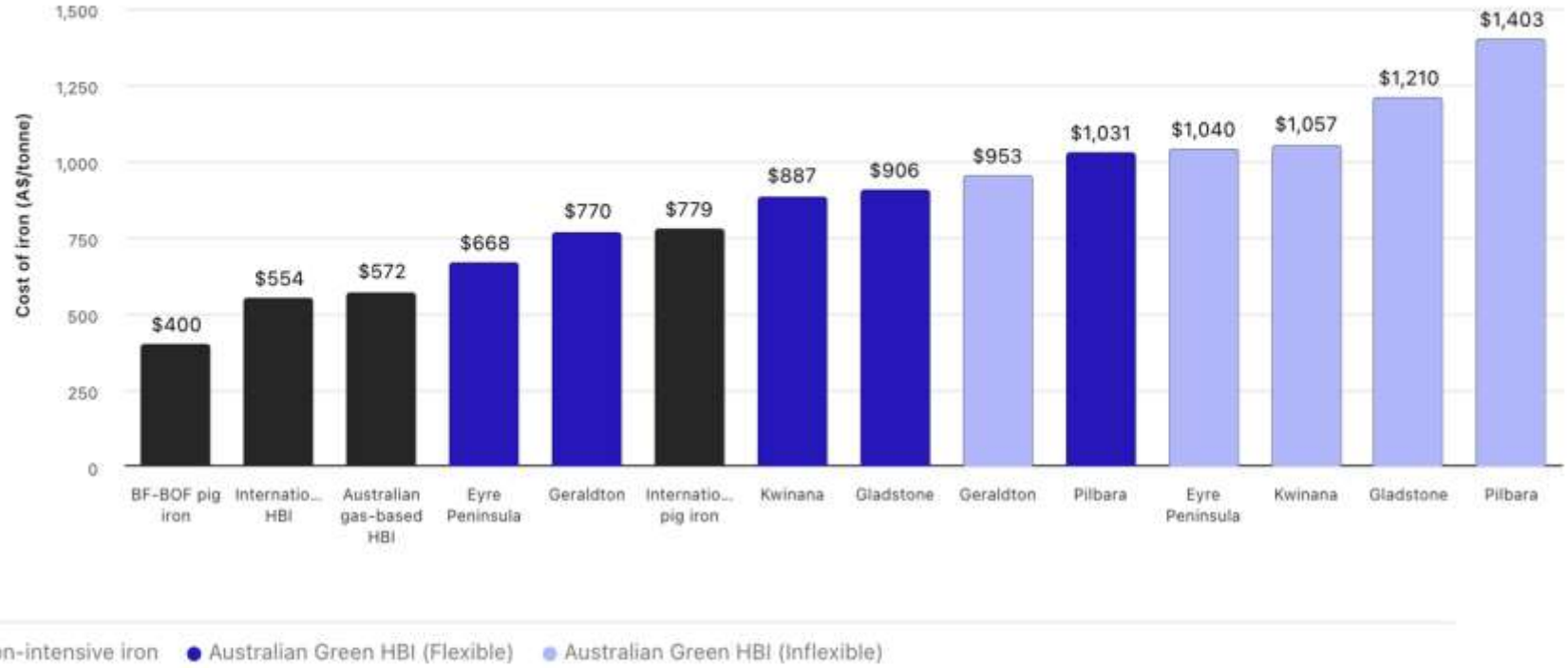
Early producers bear the costs of innovation and learning, which benefits later producers.

03.

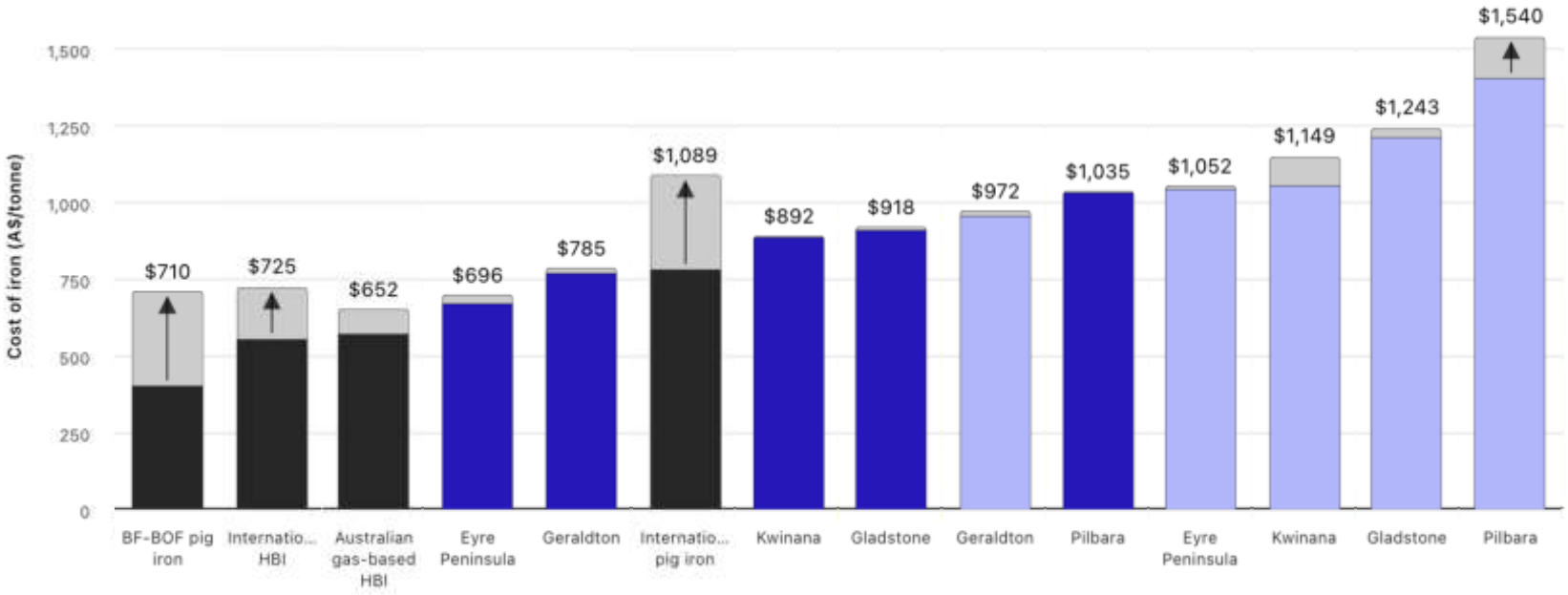
Under-provision of common-user infrastructure

Private investors won’t build shared infrastructure to an efficient scale.

When carbon emissions are free, carbon-intensive iron outcompetes green iron



If carbon emissions were priced,
green iron would be better able to compete with carbon-intensive iron



Carbon priced at $155/tonne (based on forecast for 2030 EU ETS)

● Carbon-intensive iron ● Australian Green HBI (Flexible) ● Australian Green HBI (Inflexible) ● $155/tCO2e carbon price

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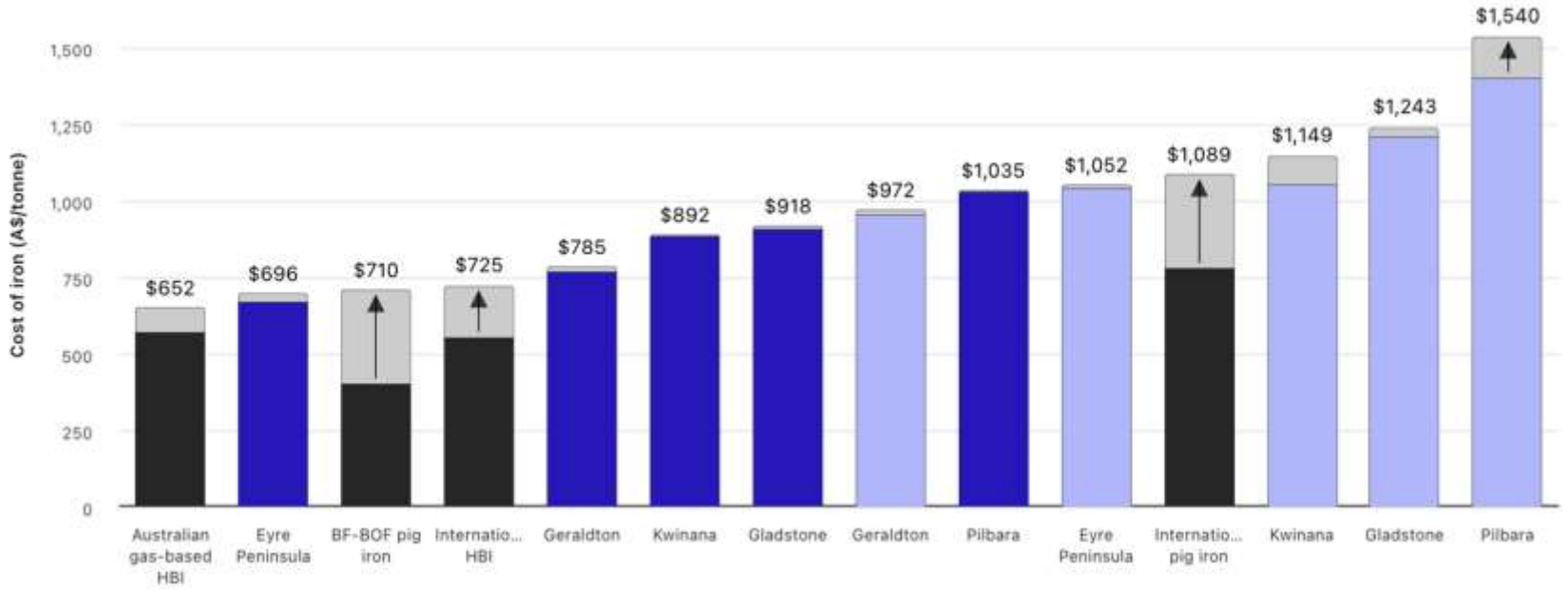
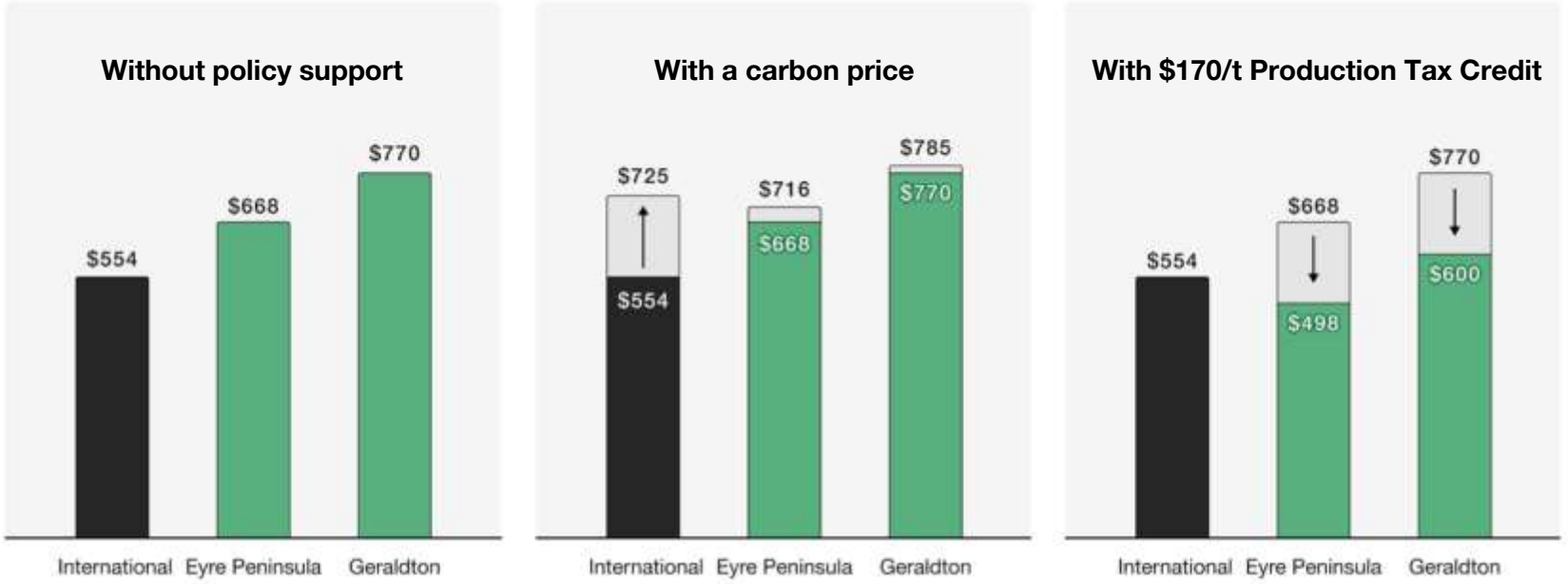


Carbon priced at $155/tonne (based on forecast for 2030 EU ETS)

Recommendations

***Address* the missing international carbon price:** $170 PTC for green iron, inclusive of the Government's HPTI for hydrogen-based production and equivalent support for other technologies.

A $170/tonne Production Tax Credit simulates the effect of a carbon price



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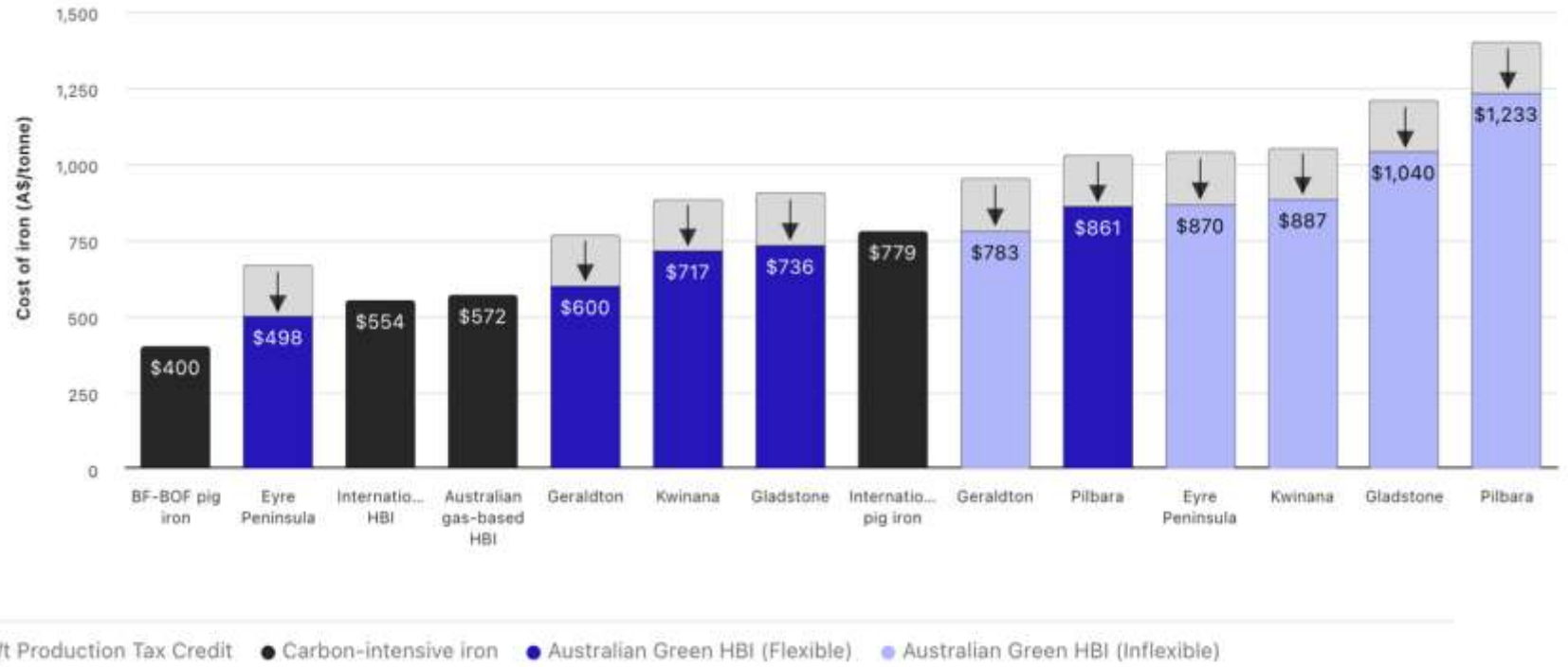

With *efficient support*, more Australian green iron producers would be able to compete in more segments of the iron market.

The market failures holding back Australian green iron

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02.

Innovation spillovers and early-mover risk

Early producers bear the costs of innovation and learning, which benefits later producers.

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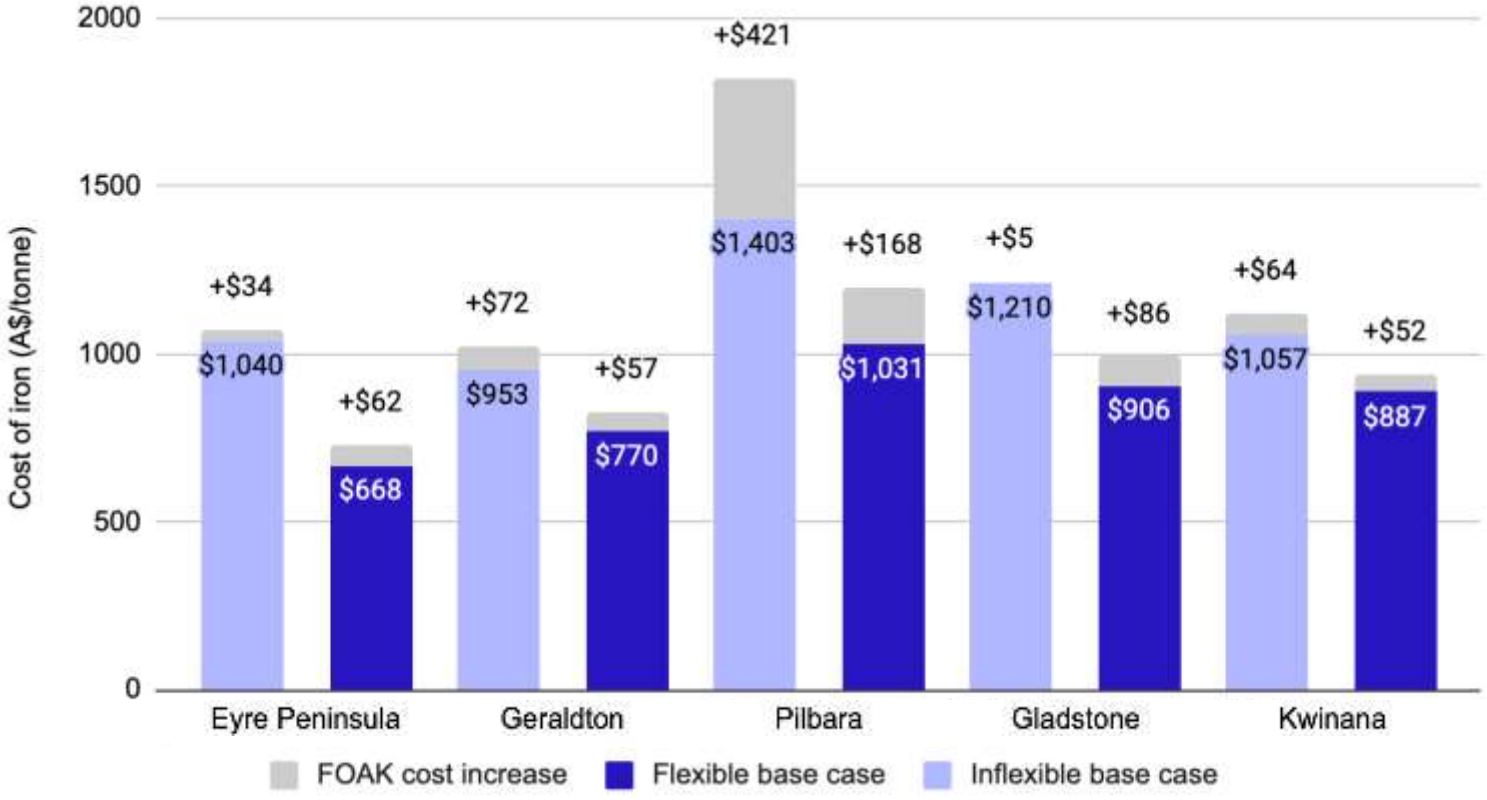
Under-provision of common-user infrastructure

Private investors won’t build shared infrastructure to an efficient scale.

Early producers incur additional costs



Recommendations

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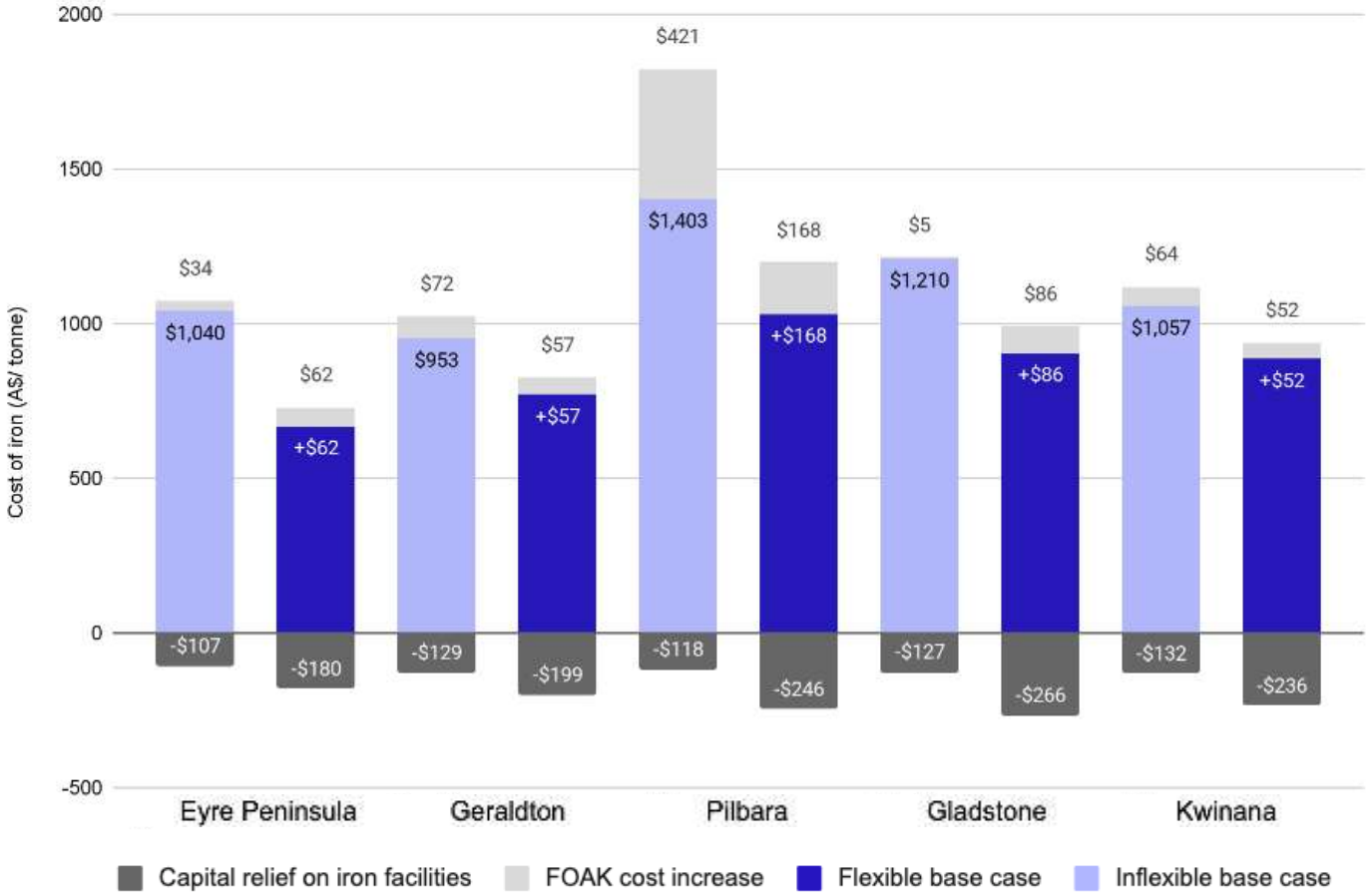
***Provide* capital support for early producers**, worth up to 30 per cent of capital costs and capped at $500m per project.

Capital relief supports efficient levels and timing of knowledge production



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***Provide* capital support for early producers**, worth up to 30 per cent of capital costs and capped at $500m per project.

***Support* shared infrastructure** to ensure it is provided at an efficient scale and to unlock private investment.

***Create* an Australian green hydrogen certification scheme** to support green production in low-cost location.

***Engage* in international diplomatic efforts** that create demand for Australia's green iron.

We cannot expect markets to
fix themselves.

With *efficient policy supports*, Australia can enjoy an era of *productivity and growth* on the back of its comparative advantage in green iron.


Thank you

Modelling green iron production in Australia

	Eyre Peninsula	Geraldton	Gladstone	Kwinana	Pilbara
Electricity grid	NEM	SWIS	NEM	SWIS	None
Ore source	Eyre Peninsula	Central WA	Pilbara	Pilbara	Pilbara
Iron ore grade	68% Fe	70% Fe	62% Fe	62% Fe	62% Fe
Capital cost multiplier	1.08	1.24	1.36	1.1	1.12