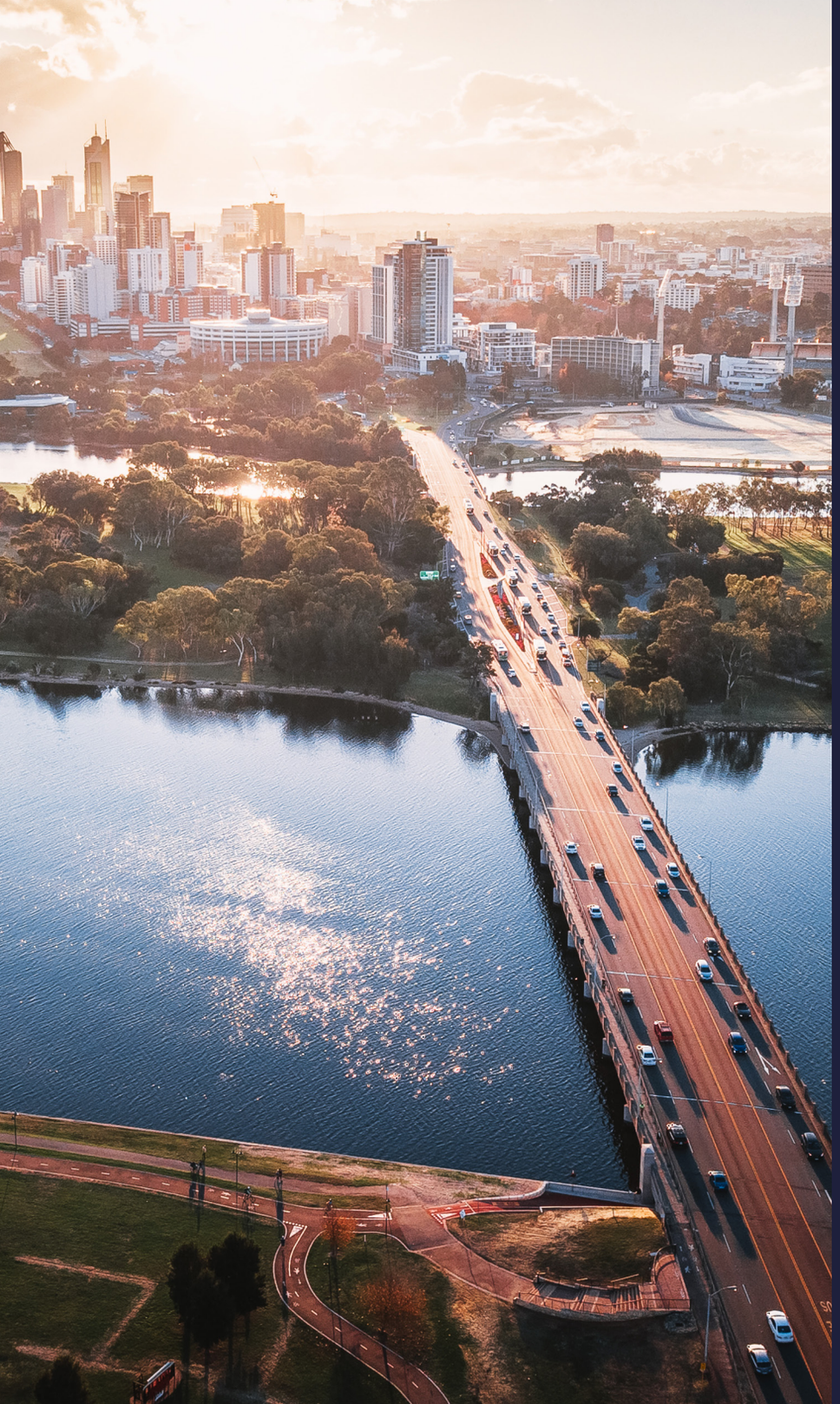


POWERING AUSTRALIA

Cyan Ventures

Deloitte.

HORIZON 2035

An Australian clean-tech roadmap

Executive summary

Australia's opportunity

Clean-tech manufacturing is an unprecedented opportunity. It is a competitive area, and despite strong headwinds, Australia has the foundations for growth.

In 2024 alone, the global clean-tech manufacturing market generated A$2 trillion in sales and is predicted to almost triple by 2035 (based upon Cyan Ventures and Deloitte analysis).

Australia has a long and successful track record in minerals extraction and is a world leader in renewable deployment. However our country has pursued a path of low ambition, not adding value to our minerals, nor moving up the value chain to manufacture more here in Australia.

By choosing to do less, we have forgone opportunities, exported our advantages, and enabled monopolies to form. We have opened our economy and have struggled to sustain and grow businesses in our small and fragmented domestic market. Declining productivity and a sparse manufacturing ecosystem hinders Australia from developing its full competitive potential.

Rebuilding our sovereign capability is now an urgent priority. Australian manufacturing exports have fallen to 1% of GDP (down from 2% in 2000), compared to 9% in Germany, 5% in China and Japan and 2% in the U.K.

If we keep doing what we have always done, Australia will capture just 1.5% of the global clean-tech opportunity. There is potential to deliver over A$160 billion in additional revenue per annum and over 140,000 jobs by 2035 in clean-tech manufacturing. By 2035, clean manufacturing industries could be annually contributing A$300 billion, larger than Australia's current exports of LNG, metallurgical coal, thermal coal and iron ore combined (~ A$255 billion[2]).

We need a new way of thinking to reverse the decline.

Over the last eight months, Powering Australia together with consultants from Cyan Ventures and Deloitte have developed a deep understanding of the current state of the Australian clean-tech manufacturing sector, what it could be and what it would take to get there.

The first of six reports, 'Horizon 2035 – An Australian clean-tech roadmap' provides a high level overview of the most prospective areas to play, key enablers to growth and priority policy actions for government spanning clean-tech manufacturing.

Acknowledgements

This project received grant funding from the Australian Government.

We also gratefully acknowledge the many individuals and organisations who contributed to the development of this material.

Notes/Sources: 1. Australian Bureau of Statistics (ABS) and Jobs and Skills Australia (JSA) (2024); 2. Analysis by Cyan Ventures & Deloitte (2024); 3. Office of the Chief Economist (2024)

What's on offer

There is potential to deliver over A$160 billion in additional revenue per annum and over 140,000 jobs by 2035 in clean-tech manufacturing.[1]

We could capture a greater share by leveraging our leadership in critical minerals, renewable energy resources and deployment.

First Nations could benefit from increased land-use opportunities, leadership of projects and facilities, supply of related services, and access to clean-tech.

These emerging clean-tech industries could improve Australia's economic resilience by diversifying our exports to ones with high value and growth potential in a decarbonising world.

What it will take

We have a strong starting point with unique mineral endowments, but to deliver real change and real economic benefits, concerted effort will be needed to improve Australian demand, our industrial ecosystem and industrial strategy.

Australia needs to focus on four key foundations to be globally competitive:

1. Unique endowments
2. Demand
3. Industrial ecosystem
4. Strategy

To turn comparative advantage into competitive advantage we will need to build low-cost renewables at scale, support value-adding and differentiation of our projects, and match the scale and ambition of our manufacturing rivals.

By focusing on scale-ups rather than start-ups, on later stage R&D, and supporting deployment of technologies, we can close the commercialisation gap and convert innovation into commercial success.

We can create lighthouse capabilities in concentrated clusters by attracting large, established foreign players to invest in Australia.

Exploring and adopting policies that concentrate Australian domestic buying power, could underpin a national effort to improve Australia's cost and export competitiveness.

And the time to act is now.

Notes/Sources: 1. Australian Bureau of Statistics (ABS) and Jobs and Skills Australia (JSA) (2024); 2. Analysis by Cyan Ventures & Deloitte (2024); 3. Office of the Chief Economist (2024)

1. Unique endowments

Achieve a competitive advantage by leveraging our minerals, land, and renewable resources to compete with lower input costs.

2. Demand

Aggregate existing demand to support scale and leverage sophisticated buyers to develop unique high value products that suit their needs.

3. Industrial ecosystem

Create clusters of supporting industries, competitors, skills, infrastructure, and technology to reduce input costs and foster innovation.

4. Strategy

Establish a dynamic industrial environment that supports market entry, innovation and collaboration between market participants.

“There is potential to deliver over **A$160 billion** in additional revenue per annum and over 140,000 additional jobs by 2035 in clean-tech manufacturing.”

Australia's current position

Australia already competes at the start and end of clean-tech value-chains but has a missing middle, struggling to compete in value-adding steps.

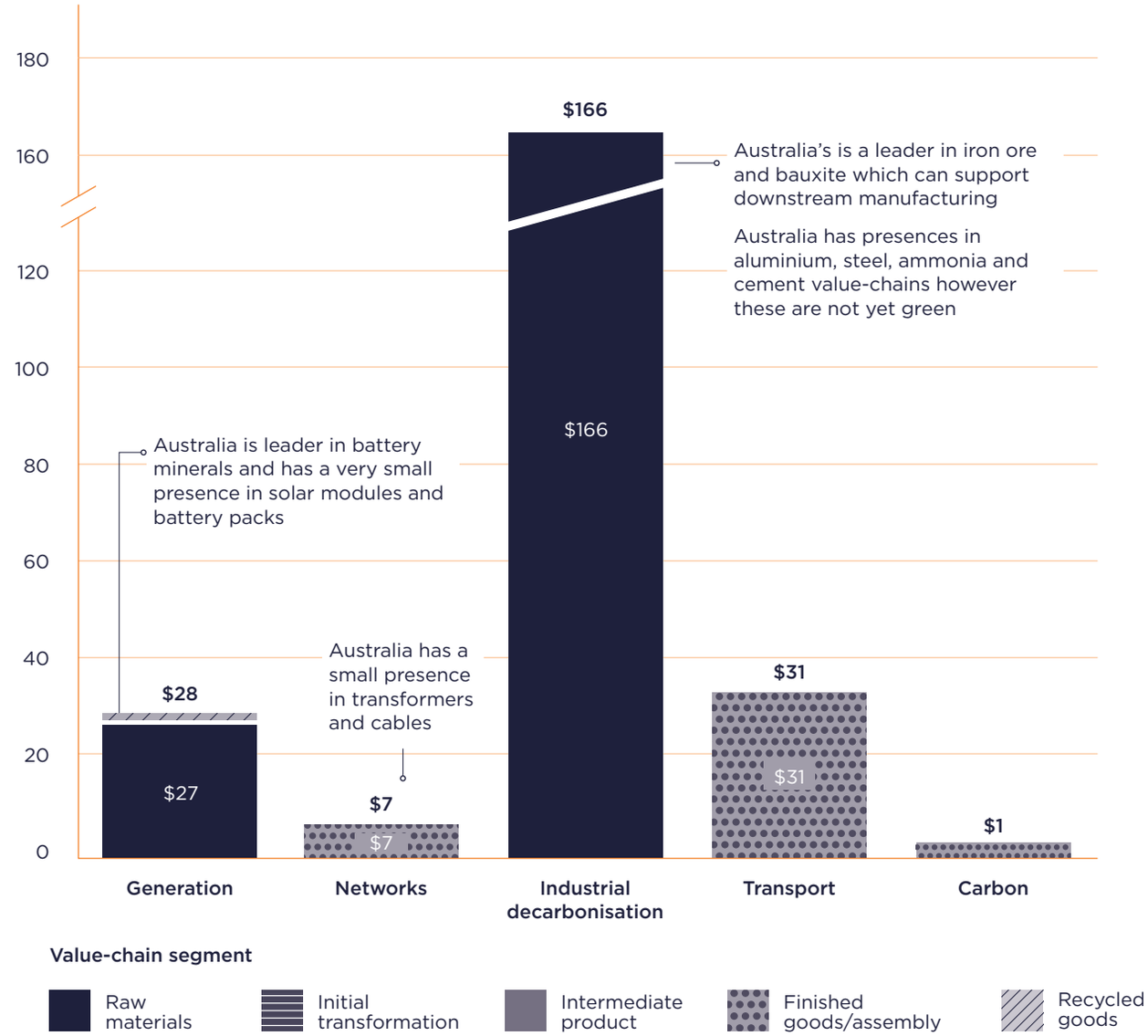
Our raw material abundance positions us at the start of key decarbonisation value chains, including batteries, steel, and aluminium. And our renewable resource abundance places at the end of value chains with a small presence in assembly and certain niche equipment. But we have far less developed presence in the middle of the value chain where most value is added.

Australia could capture more value from emerging supply chains, by leveraging our low-cost renewable energy, potentially overcoming a historical lack of value-add competitiveness.

Australia currently captures only 1.5% of the global clean-tech market, compared to 1.6% of global GDP and ~20% of global LNG trade.

We have far less of a presence in the middle of the value chain where most value is added.

Graph 1 - Revenue in 2023



Size of the prize - revenue and jobs

Australia could add A$160b compared to current revenue trajectory.

Potential revenue

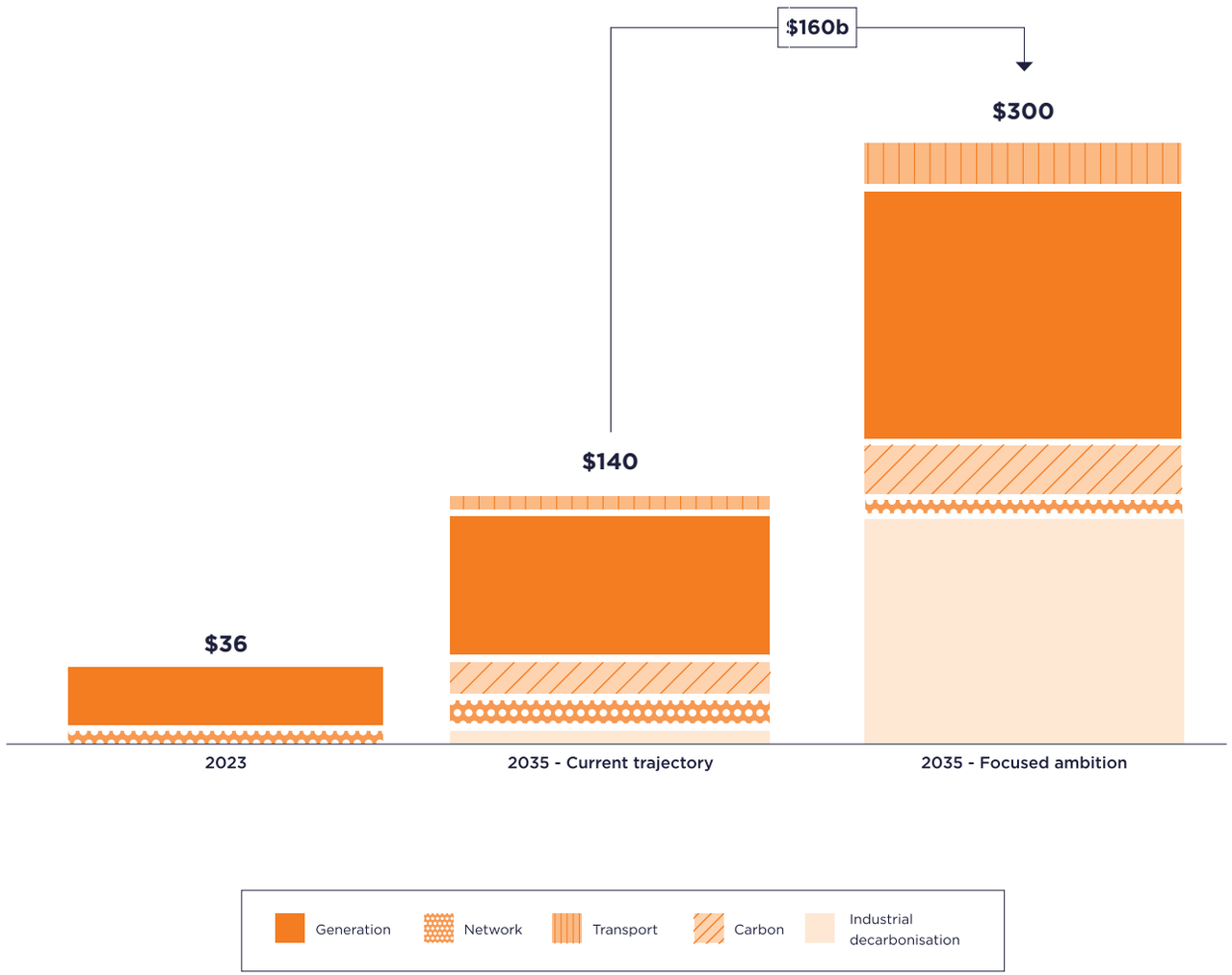
If Australia maintains the status quo, retaining current market shares in the industries it is already active in, it could reach A$140 billion by 2035 based on the expected growth in demand for these products in a net-zero world.

There is another, more ambitious path. If we leveraged our natural strengths and built on adjacent market opportunities, we could become a market leader. This path sees Australia adding an additional A$160 billion by 2035.

These figures include battery minerals mining, which account for almost 19% of the total focused ambition scenario value in 2035.

By 2035, clean manufacturing industries could be annually contributing A$300 billion, larger than Australia's current exports of LNG, metallurgical coal, thermal coal and iron ore combined (~ A$255 billion[2]).

Graph 2: Potential revenue



Notes/Sources: 2. Analysis by Cyan Ventures & Deloitte (2024).

Potential jobs

In the status quo, clean-tech manufacturing will transform Australia's workforce, directly employing 230,000 full time equivalent workers by 2035 based on expected growth in existing industries.

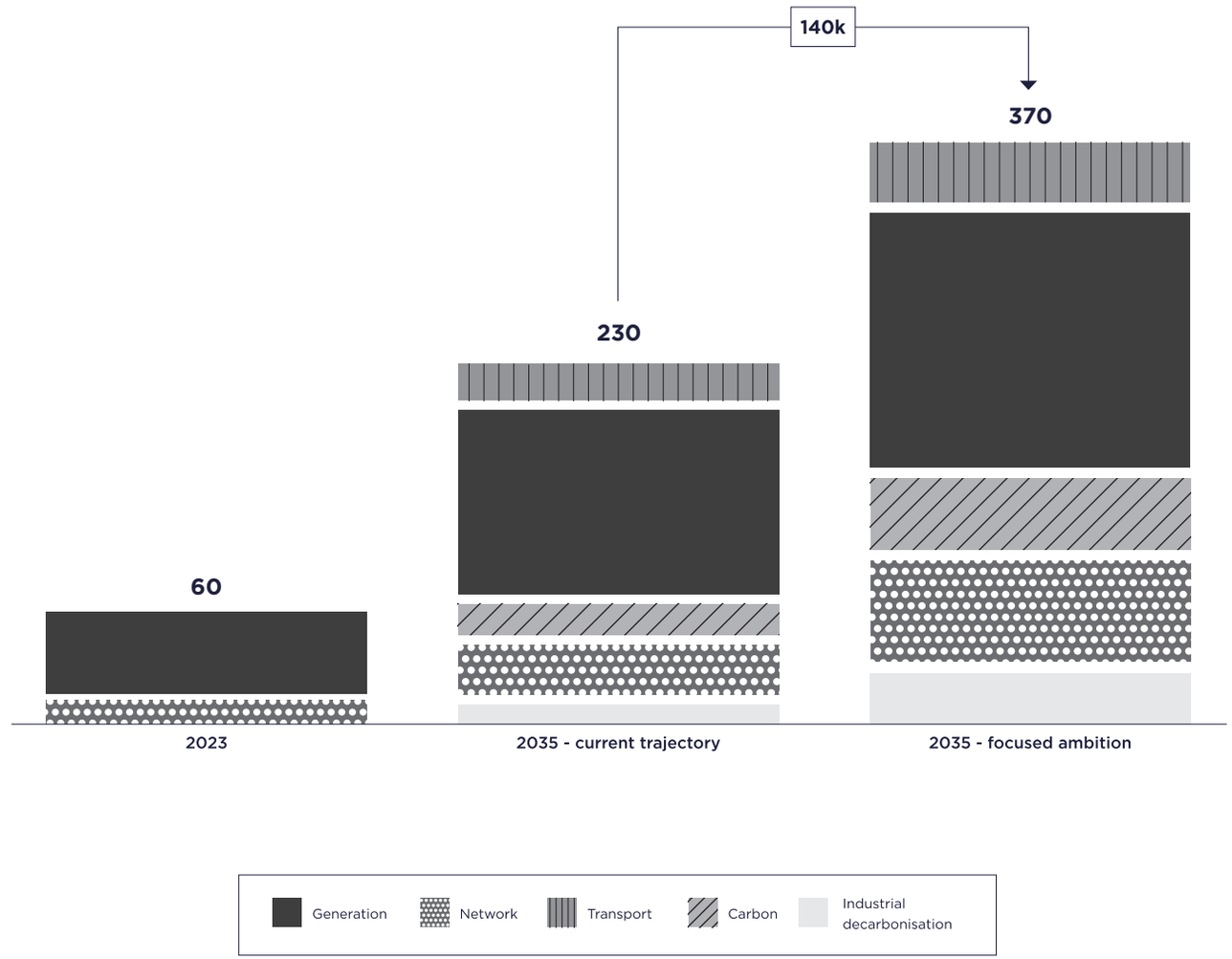
With focused ambition and action, clean-tech manufacturing could employ an additional 140,000 full time equivalent workers by 2035, resulting in a total employment of 370,000 or ~3% of Australia's projected 16.5 million workforce.

Critical minerals mining remains a core focus area and could account for one third of that total.

And to meet that demand, Australia needs to begin preparation for a significant industry skills ramp up, now.

"With focused ambition and action, clean-tech manufacturing sectors could employ up to 140,000 workers by 2035."

Graph 3: Potential jobs



> “We need to tackle the underlying causes of fragmentation. Just as a Labour Accord transformed Australia in the 1980’s, we believe there is scope for an interstate Accord to shape the federal environment towards cooperation, not just competition.”

Industry structure

Michael Porter, noted economist and author, developed a framework to explain why certain industries within a nation become internationally competitive. Porter’s ‘Theory of National Advantage’ identifies four key factors that contribute to a nation’s competitive advantage and which we have applied to the development of Horizon 2035.

Industries don’t thrive without competitive advantage. Competitive advantage is created and sustained through highly localised processes. Several elements must come together and reinforce each other to create a favourable business environment - these are unique resources endowments, concentrations of demand, supporting industries and strategy (the competitive environment). Building clean-tech industries needs a holistic approach.

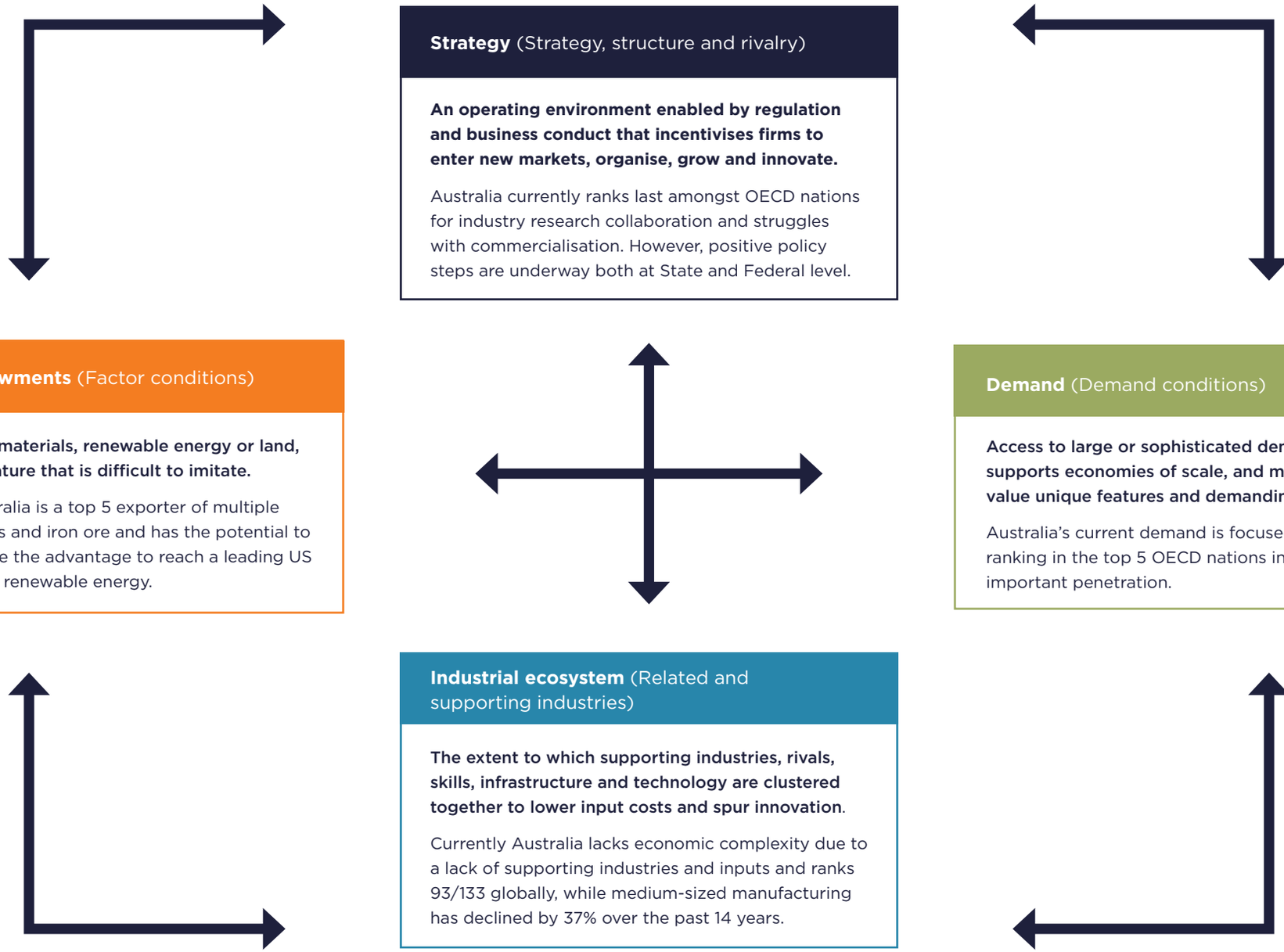
The solution starts at the top. We need to tackle the underlying causes of fragmentation. Just as a Labour Accord transformed Australia in the 1980’s, we believe there is scope for an interstate Accord to shape the federal environment towards cooperation, not just competition.

Australia’s small, sparse and fragmented industries make it difficult to compete in a globalised world. We have a uniquely high number of micro-companies (94% of businesses have 1-9 people), high import penetration, and hyper-competition between the states. Australia must grow the missing middle by turning start-ups to scale-ups through policies that encourage focus, not fragmentation.

We must attract new large businesses to Australia, who have the balance sheet, technologies, and access to international markets. These large businesses form lighthouses that underpin business ecosystems.

Australia has built major new industries in the past and we can do it again by leveraging our unique resources, aggregating our national demand, building geographic focus in our supporting industries, and fostering an environment that has both collaboration and competition.

Porter's 'Theory of National Advantage'



Strategy (Strategy, structure and rivalry)

An operating environment enabled by regulation and business conduct that incentivises firms to enter new markets, organise, grow and innovate.

Australia currently ranks last amongst OECD nations for industry research collaboration and struggles with commercialisation. However, positive policy steps are underway both at State and Federal level.

Unique endowments (Factor conditions)

Access to raw materials, renewable energy or land, or a unique feature that is difficult to imitate.

Currently Australia is a top 5 exporter of multiple critical minerals and iron ore and has the potential to further leverage the advantage to reach a leading US 4cents/kWh in renewable energy.

Demand (Demand conditions)

Access to large or sophisticated demand that supports economies of scale, and markets which value unique features and demanding innovation.

Australia's current demand is focused overseas, ranking in the top 5 OECD nations in terms of important penetration.

Industrial ecosystem (Related and supporting industries)

The extent to which supporting industries, rivals, skills, infrastructure and technology are clustered together to lower input costs and spur innovation.

Currently Australia lacks economic complexity due to a lack of supporting industries and inputs and ranks 93/133 globally, while medium-sized manufacturing has declined by 37% over the past 14 years.

Where should we play

There are three generic ways to compete:

1. Cost
2. Differentiation
3. Focus

In clean-tech markets, most products compete on **cost**. Fewer compete through **differentiation** by delivering unique quality or performance. And fewer still compete through a **focus** on specific market needs that could support national resilience.

Australia should start from areas where we already have competitive strength.

Australian industry can compete on cost by leveraging our unique resources or by expanding to adjacent industries (e.g. critical mineral processing, energy exports). We can differentiate our products by developing features that suit our, and similar overseas markets (e.g. hot climate batteries, heavy road freight). And we must build supply chain resilience in certain products.

But none of this will be possible unless we resolve the deficiencies in our industry structure, including fragmented demand, our sparse industrial ecosystem and improve the balance of interstate cooperation and competition.

Across all of these, we must build strong foundations, by delivering low cost inputs into our industries. This includes but is not limited to low-cost energy, chemicals, carbon and logistics costs.

What's next

Sector specific plans

Horizon 2035 has assessed the clean-tech manufacturing opportunities currently on offer that Australia could capitalise on with targeted, timely investments and interventions.

The next phase of our research will produce a deep dive assessment across five key clean-tech sectors, viewed through the lens of competitiveness and resilience.

Our clean-tech industry sectors are:

- Generation
- Networks
- Industry
- Carbon
- Transport

First Nations report

An additional report will summarise First Nations business opportunities.

We believe First Nations can be enablers to the energy transition, and with this mindset, have identified a range of industrial opportunities and entry pathways.

Acknowledgement

Powering Australia wishes to acknowledge the First Nations peoples of Australia and recognise their enduring connection to Country through culture, people, place and story. We honour the knowledge systems that have sustained these lands and waters for thousands of generations and recognise the vital role of First Nations leadership and self-determination in shaping a just and sustainable future. As Australia undergoes a significant clean energy and industrial transition, we acknowledge the importance of respectful partnership, cultural integrity, and shared purpose to realise the full opportunity of the Clean Energy Transition.