Cyan Ventures

Green Shoots:
Understanding the nature-positive business opportunities for Australia

October, 2024

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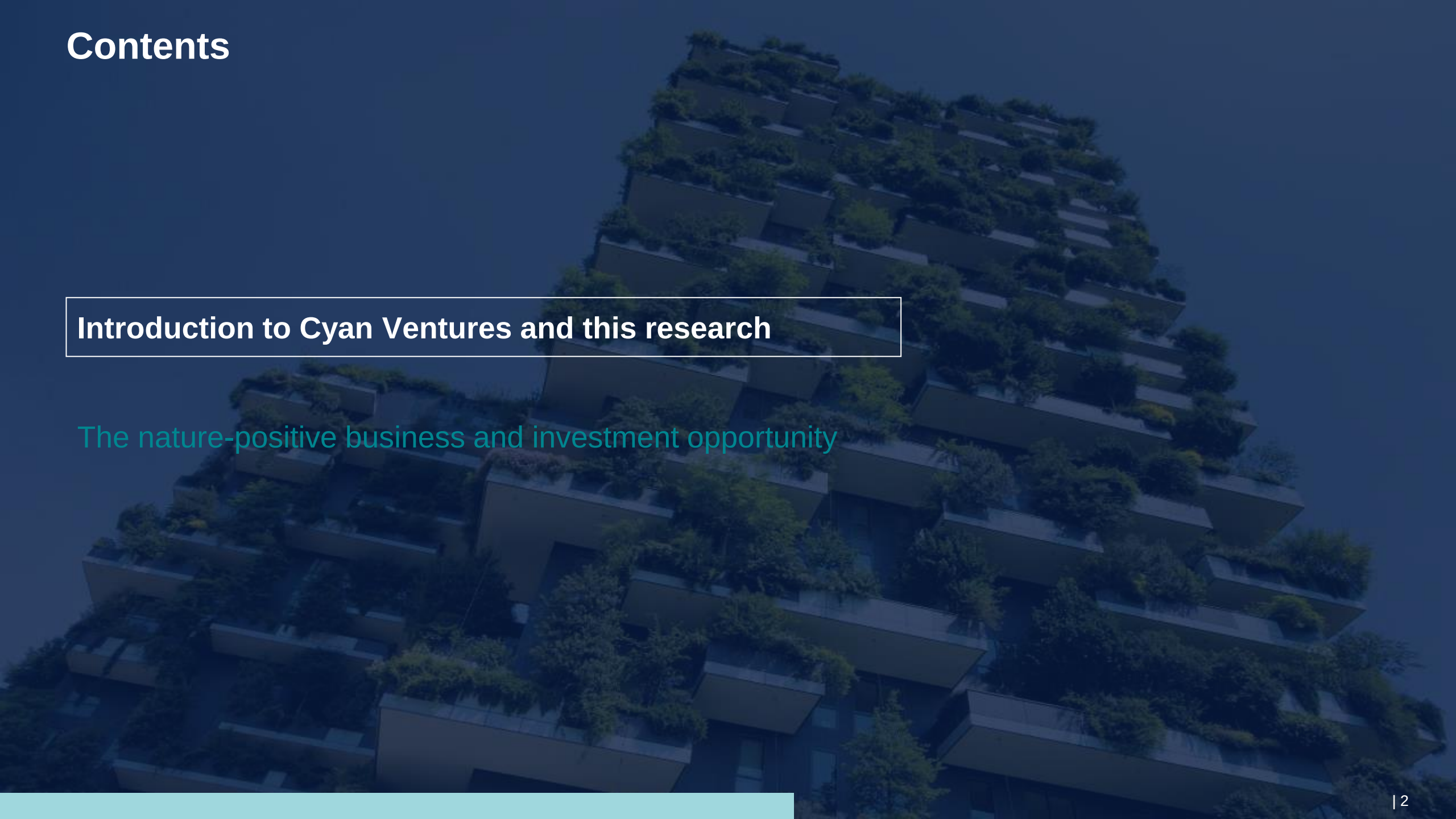


Cyan Ventures: Project development and advisory to accelerate and broaden the transition to a net zero, nature positive future

Cyan Ventures

OUR MISSION	Accelerating and broadening the transition to a low carbon, green economy. We aim to make 20 years progress on the sustainability transition in less than 10 years.
WHAT WE DO	Cyan Ventures is a specialist sustainability project development and advisory firm. We build and advise on the businesses and projects that will accelerate the shift to a green, low carbon economy.
HOW DO WE DO IT?	**Our focus.** Using our proprietary research, we look beyond the current focus areas of the sustainability transition to look at technologies and business opportunities receiving less focus. **Our approach.** We can't accelerate progress on these sustainability opportunities with a typical engineering team approach. There are often multiple market failures, gaps in supply chains, unclear price signals, etc. Tackling these challenges requires an inter-disciplinary team of leading strategists, project developers, and researchers

We are building on past research to understand what a nature-positive business opportunity looks like in Australia

Why are we doing this research?

We need to **shift the focus** from risk to opportunity and this research aims to highlight the business and investment opportunities from a nature-positive approach.

This builds on global research done with the World Economic Forum and Temasek, but adapted for Australia

What does this research cover?

The report examines business and investment opportunities in three key areas or systems of the Australian economy:

1. Food, land and ocean use
2. Infrastructure and the built environment
3. Energy and extractives

Some important points on the methodology

What do we size?

The sizing reflects the annual opportunity in 2035 (calculated in 2024 Australian dollars) using three different sizing methods:

1. Market opportunity – the total value of the market in 2035 (e.g., organic food and beverages).
2. Incremental opportunity based on productivity or efficiency measures – the difference between adoption rates today and what is possible in 2035 (e.g., value of land saved from the adoption of technologies in large scale farms).
3. Opportunity based on specific targets of reduced impact on biodiversity – the total value of the target in 2035 (e.g. reducing consumer food waste assumes Australia reaches its 50% food waste reduction target set for 2050 in 2035)

How do we price externalities?

For **opportunities** where the principal business case is linked to **carbon mitigation** (e.g., direct air capture), this has been sized based on potential revenue from the Australian Carbon Market in 2035, drawing on the pricing under the Safeguard Mechanism

For **opportunities** where the principal business case is linked to **biodiversity preservation**, given the lack of a transparent ecosystem market, these opportunities have been sized based on estimated cost to implement (e.g., cost to restore degraded land)

Contents

Main messages

1

We need to think beyond just tackling carbon emissions.
10% of GDP in Australia is highly exposed to biodiversity loss, and a further 41% with some moderate exposure.

2

There are large business and job opportunities from this nature-positive transition.
Australia could unlock A$298 billion of annual value in 2035 through 54 nature-positive opportunities, which would support 1.6 million direct jobs by 2035.

3

Capturing the opportunities requires a different approach.
A$70 billion in annual capital investment will be required to support the business opportunities identified. While over a third of opportunities have high potential returns (>12% IRR), there are challenges related to information failures, multi-sector coordination, managing potential tradeoffs, and developing targeted policy mechanisms reflecting the maturity of each opportunity.

1 Australia is experiencing unprecedented biodiversity loss

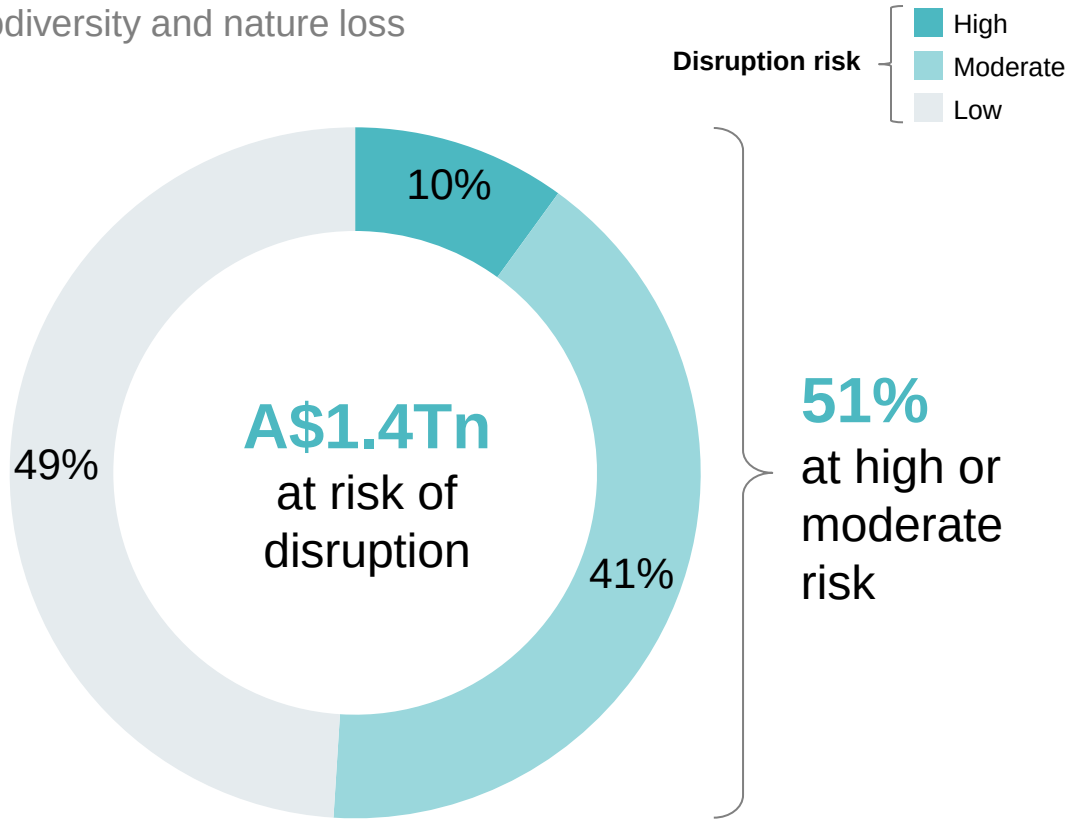
System	Facts
Land use / sea change	• In the past 20 years alone, **8 million** hectares of habitat for threatened species and ecological communities has been cleared • The health of our soils continues to decline. Australia has had the third highest cumulative loss of soil organic carbon in the world over just 250 years • The Great Barrier Reef has experienced six mass bleaching events from 2000 to 2023, 36 never previously recorded since its formation 12,000 years ago, and a seventh event is underway
Species loss	• Australia has **lost more mammal species than any other continent** and now has more foreign plant species than native ones • Most indicators of the state and trend of plants and animals show decline, and the number of terrestrial and marine threatened species has risen • Terrestrial mammals across Australia have experienced high rates of extinction, with **10% of endemic species becoming extinct over the past 200 years**. Approximately 21% are now assessed as threatened
Resource exploitation	• Prospecting for new deposits is a **significant contributor to land degradation** if the tracks, drilling sites and spoils are not rehabilitated • Agriculture, forestry and mining are **driving up land clearing rates** • Water extraction and drought left the Murray Darling basin at a record low level in 2019

SOURCE: DCCEEW (2021), Australia State of the Environment, Wentworth Group (2024), Blueprint to Repair Australia's Landscapes

1 Disruption from biodiversity and nature loss could pose large economic challenges in Australia

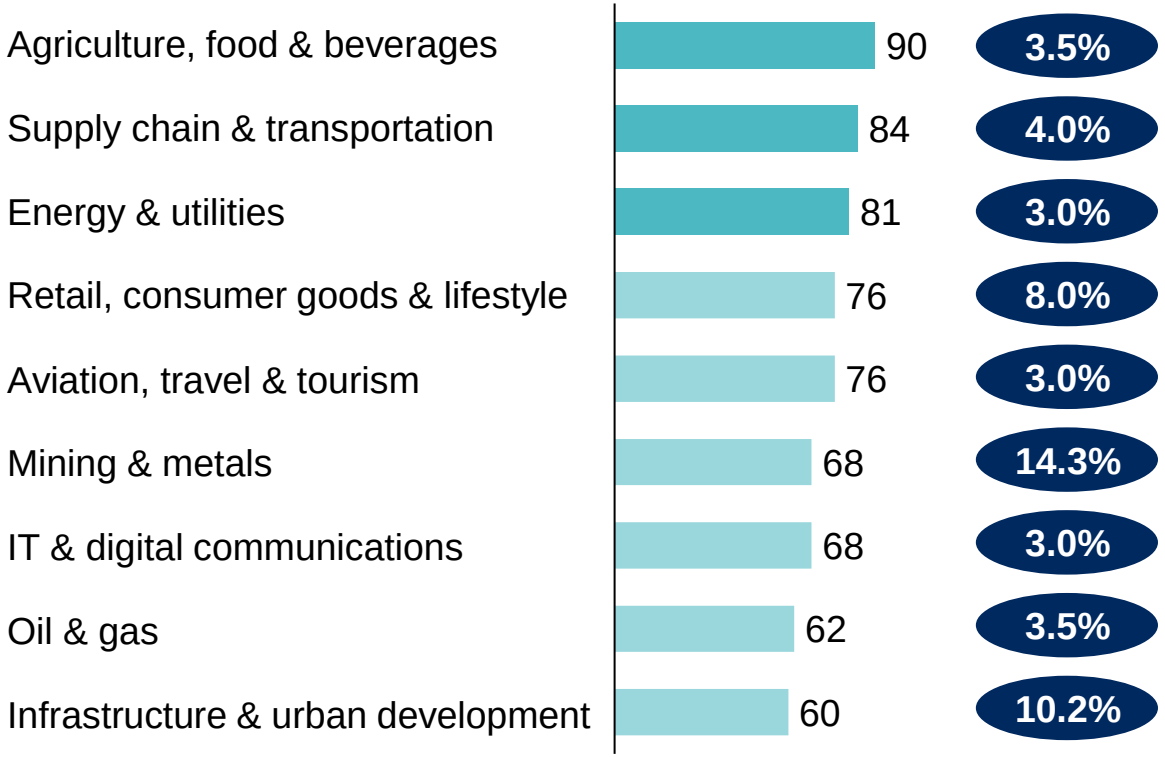
Economic value at risk in Australia

Percent of 2024 GDP by disruption risk posed by biodiversity and nature loss



Top industry sectors at risk of disruption

Disruption risk (Max = 100), percentage of Australia's GDP in bubble



NOTE: Sectors were assigned disruption risk scores out of 100 based on the average number of business operations disrupted by up to 27 drivers of environmental change through their impact on natural capital assets (through the form of up to 21 ecosystem services). A sector with over 80% of its production processes materially disrupted is considered "High" risk; a sector with over 55% of production processes disrupted is "Medium" risk; and a sector with less than 55% of production processes disrupted is "Low" risk. For further details, see the New Nature Economy: Asia's Next Wave (2021).
SOURCE: World Economic Forum, Temasek and AlphaBeta (2021), Australian Bureau of Statistics, Cyan Ventures analysis

1 Biodiversity and nature loss could impact sectors in Australia in a variety of ways

Example sector	Example
Agriculture, Food, and Beverages	• 35% of Australian crops are reliant on bees for pollination (e.g. almonds, avocados, blueberries). A decline in pollinator populations could place up to **A$4.6 billion p.a.** at risk in Australia. • Australia's broadacre productivity growth has declined from 2.2% annual growth (1978-2000) to **0.4%** between 2000 and 2022.
Supply chain & Transportation	• Biodiversity loss can weaken ecosystem services such as flood regulation and soil stability. • The Murray-Darling Basin has suffered significant wetland degradation, which could have better protected it from the 2010-11 floods which caused extensive damage with total damages of **A$2.38 billion** in Queensland and Brisbane alone.
Energy & Utilities	• The loss of vegetation and forest cover increases the risk of bushfires, which can damage power lines and other electrical infrastructure. • The 'Black Summer' bushfires of 2019-2020 demonstrated the vulnerability of the energy grid to such events, causing widespread power outages.
Aviation, Travel, and Tourism	• **A$2.4 billion worth of tourism value** is at risk due to biodiversity loss and coral bleaching impacting Australia's Great Barrier Reef. • Climate change, a key driver of biodiversity and nature loss could **reduce tourism arrivals in Australia by 25% by 2063.**

SOURCE: DCCEEW, AgriFutures (2024), Deloitte Access Economics (2017), Intergenerational Report (2023)

2 Nature positive is where species and ecosystems are being repaired and regenerated (rather than being in decline) and is impacted by 8 channels

What are the channels by which nature is impacted?

1. **Land Use Changes:** Human activities like agriculture, urbanization, deforestation, and infrastructure development directly alter landscapes, reducing natural habitats. This can lead to habitat fragmentation, loss of biodiversity, and soil degradation.
2. **Direct Resource Exploitation:** Activities such as logging, mining, overfishing, and hunting extract resources from ecosystems at rates faster than they can regenerate.
3. **Pollution:** Industrial, agricultural, and urban pollutants—such as chemicals, plastics, and untreated wastewater—affect air, soil, and water quality.
4. **Climate Change:** Greenhouse gas emissions from burning fossil fuels, deforestation, and industrial processes contribute to global warming, resulting in altered weather patterns, rising sea levels, and temperature extremes. These changes affect species' migration patterns, reproductive cycles, and the availability of food and water.
5. **Invasive Species:** The introduction of non-native species, often through global trade or accidental release, can disrupt ecosystems by outcompeting or preying on native species.
6. **Water Extraction and Hydrological Changes:** Excessive extraction of water for agriculture, industry, or domestic use can lead to drying of rivers, lakes, and wetlands.
7. **Overuse of Chemicals:** The extensive use of pesticides, herbicides, and fertilizers in agriculture impacts non-target species and pollinators like bees, and can lead to the buildup of harmful substances in soil and water bodies, contributing to ecosystem degradation.
8. **Ocean Acidification and Overfishing:** Oceans are affected by increased CO2 levels, leading to acidification, which threatens marine life, especially organisms with calcium carbonate shells. Overfishing disrupts marine ecosystems, leading to the decline of fish populations and coral reef destruction.

2 Cyan Ventures has identified 54 opportunities which could enable nature-positive growth in Australia

	Food, Land, and Ocean use	Infrastructure and the built-environment	Energy and Extractives
1	Eco-tourism	Energy efficient buildings	Circular models - automotives
2	Conventional Carbon Dioxide Removal (CDR)	Residential electrification	Circular models - battery recycling
3	Novel Carbon Dioxide Removal (CDR)	C&I rooftop solar	Circular models - electronics & appliances
4	River and wetland restoration	Modular buildings	Circular models - plastics
5	Mitigation of extinction risk for threatened species	Green roofs	Circular models - renewables recycling (solar)
6	Sustainable forestry management	Circular models - construction	End-use steel efficiency
7	Organic food and beverages	Repurposing freed land from parking	Additive manufacturing
8	Bioinnovation	Smart meters	Mine rehabilitation
9	Farm technology market	Municipal water leakage	Shared extractives infrastructure
10	Microirrigation	Wastewater reuse	Resource recovery
11	Sustainable inputs	EV charging infrastructure	Water efficiency in mining
12	Technology in large holder farms	Heavy duty EV charging infrastructure	Sustainable chemicals in mining
13	Technology in small to medium holder farms	Renewable energy industrial precincts	Nature positive renewables expansion
14	Livestock intensification	Grid enhancing technologies (GET)	Nature positive energy storage expansion
15	Animal health diagnostics	Sustainable aviation fuels (PtL and bioSAF)	Cross border renewable electricity exports
16	Sustainable aquaculture	Renewable diesel	Green iron & steel
17	Alternative meats	Sustainable shipping	Methane capture
18	Plant-based dairy		
19	Reducing consumer food waste		
20	Reducing food loss and waste in the value chain		

2 Business opportunities in the three socio-economic systems could deliver A$298 billion of annual value and support 1.6 million jobs by 2035

X% Share of total

Food, Land, and Ocean use

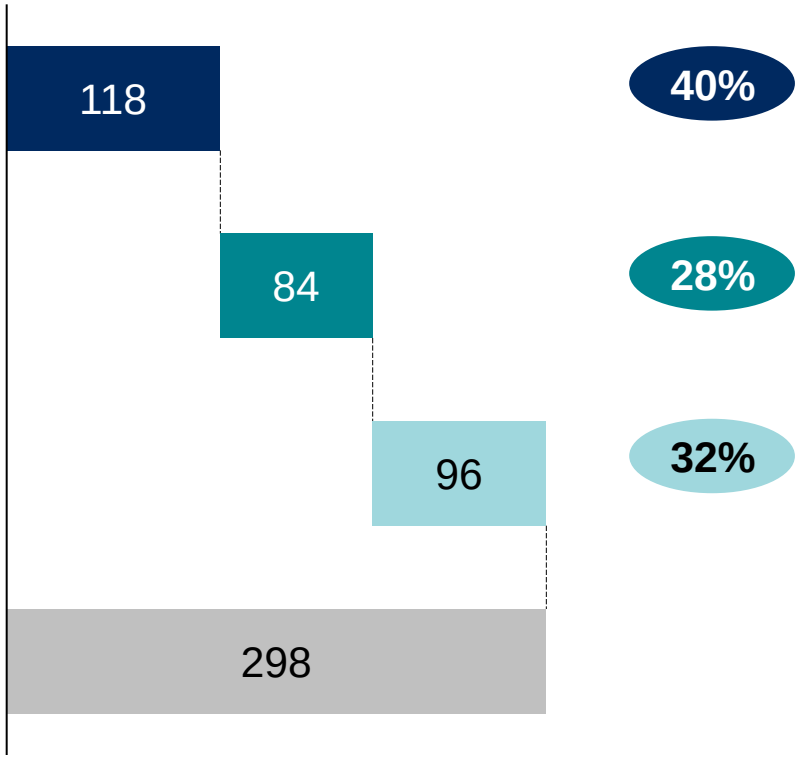
Infrastructure and the built-environment

Energy and extractives

Total

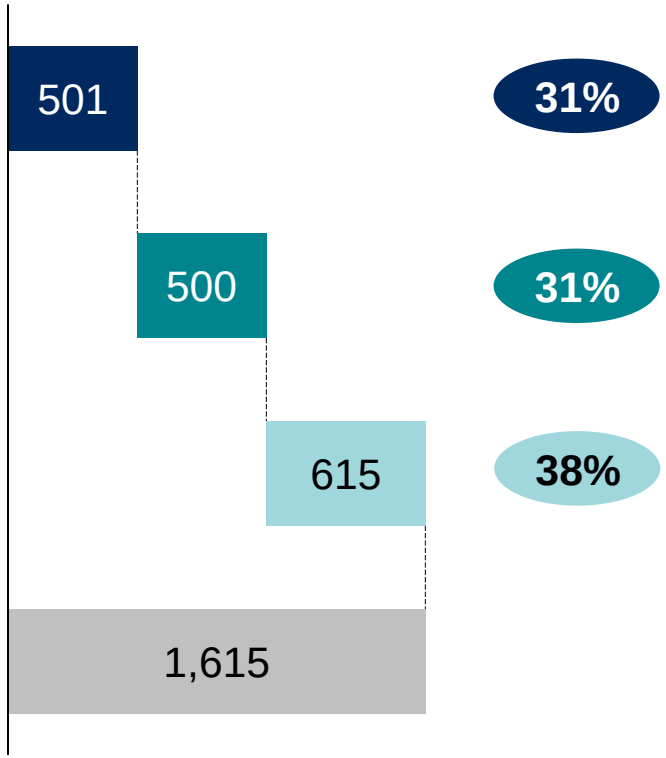
Total business opportunities by system in 2035

A$ billions



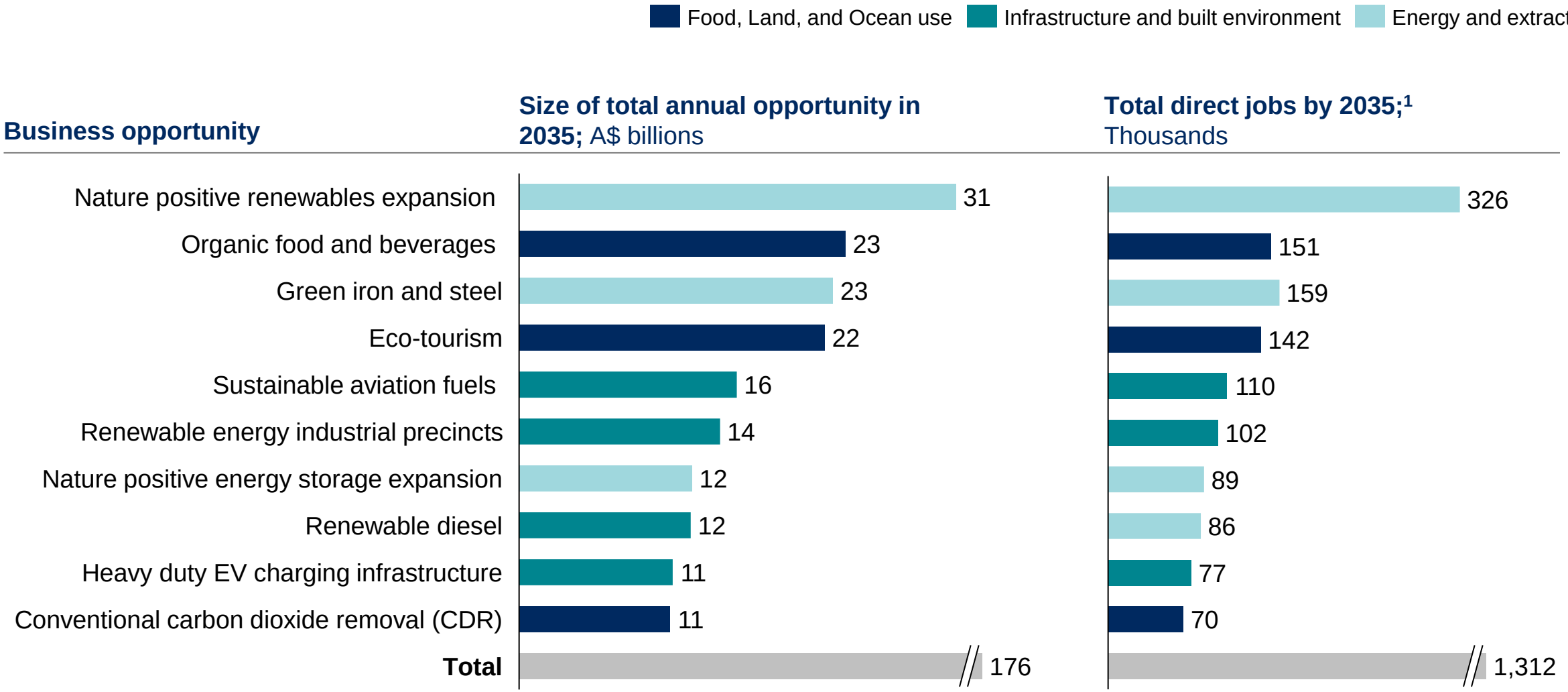
Total direct jobs by system by 2035[1]

Thousands



NOTES: 1. Only includes jobs for opportunities that have been sized based on total market size and therefore does not include opportunities that have been sized based on operational/ efficiency improvements or based on targets of reduced impact on biodiversity (the majority which lie in food land and ocean use). SOURCE: Cyan Ventures analysis

2 The top 10 opportunities across the three systems account for A$176 billion or nearly 60% of the overall opportunity



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2 Food, Land, and Ocean use: Nature and sustainability trends impact every aspect of the value chain

Value chain	GVA in Australia (A$ billion)	Trend	Example
Inputs	6-8	Feedstock and disease control in aquaculture	White spot disease in Queensland cost prawn farmers across the region more than **A$40 million**
		Environmental impacts traditional fertilizers	Chemical pollutants from agriculture are suspected of causing **8%** of fish deaths in coastal and inland catchments in NSW over the past 20 years
		Threats to pollinators, such as bees	The value of the honeybee pollination services to Australian agriculture are estimated at between **A$0.6** and **A$1.2 billion**
Production	60-65	CO_2 pricing and subsidy reform	Farm subsides and import barriers overseas lower Australia's net farm incomes by **15%** and its farm exports by **29%**
		Environmental degradation	Australia's broadacre productivity growth has declined from 2.2% annual growth (1978-2000) to **0.4%** between 2000 and 2022
		Access to new land	To meet Australia's 30 by 30 target, an additional **60 million** hectares (almost 3x Victoria in land area) will need to be protected or conserved
Food processing and logistics	40-45	Resource footprint of food processing	Food processing in Australia accounts for around **16%** of industrial energy use, **4%** of Australia's GHG emissions and consumes 180 gigaliters annually
Retail & disposal	20-25	Increased focus on waste	Food waste currently costs Australian households **A$2,000 - A$2,500** per year
		Consumer focus on sustainable products	A survey by the Australian Food and Grocery Council found that **67%** of Australian consumers prioritize sustainability in their food choices, with **55%** willing to pay more for sustainably produced food

SOURCE: Food and Land Use Coalition; Literature review; Cyan Ventures analysis

2 Three nature-positive transitions are needed in the food, land and ocean use system

Protecting and restoring nature

What is it? Protecting and restoring nature to prevent critical ecosystems from being converted for farming or fishing.

Business opportunities:
Annual, A$ billions (2035)

- Eco-tourism: $22
- Conventional carbon dioxide removal: $8
- Sustainable forestry management: $4
- Novel carbon dioxide removal: $3
- River and wetland restoration: $3
- Mitigation of extinction risk for threatened species: $1

Productive and regenerative agriculture

What is it? Transforming agricultural landscapes and farming principles and practices to improve yields while enhancing the health of the surrounding natural ecosystem.

Business opportunities:
Annual, A$ billions (2035)

- Organic food and beverages: $23
- Technology in small to medium holder farms: $10
- Technology in large holder farms: $8
- Livestock intensification: $6
- Sustainable aquaculture: $3
- Sustainable inputs: $2
- Microirrigation: $2
- Bioinnovation: $2
- Farm technology market: $2
- Animal health diagnostics: $0.4

Planet-compatible food and consumption

What is it? Transforming what and how we consume as well as addressing consumer and value chain waste.

Business opportunities:
Annual, A$ billions (2035)

- Reducing consumer food waste: $7
- Reducing food loss and waste in the value chain: $7
- Plant based dairy: $2
- Plant based alternative meats: $2

SOURCE: Cyan Ventures analysis

2 Case study: Technology in small to medium holder farms

What is it & how has it been sized?

- Technological advancements in farming have become increasingly accessible and impactful, helping farmers to enhance productivity and efficiency, resulting in significant cost savings.
- Some of these technologies include; precision agriculture tools (soil sensors, drones), farm management software and automated irrigation controllers.
- Current yield rates in Australia are between 1-2%, and globally, they have decreased due to land degradation. This means it is becoming increasingly difficult for farmers to maintain the same quality of output as the land quality diminishes.
- The opportunity has been sized based on cost savings from reduced land use and yield improvements driven by the increased adoption of these agricultural technologies on small to medium-sized farms

Size of the opportunity and drivers

Size of total annual opportunity in 2035;
A$ billion

Key opportunity drivers:

- **Increased yield rates:** estimates suggest that yield rates could increase by 20-40% with agricultural technology advancements[1] (incremental above the baseline of 1-2%) for small farms.
- **Increased technology adoption rates:** roughly 30% of Australian farmers are not currently using any form of agricultural technologies.[2]

Example companies

AgriWebb enablers data-driven decision-making by turning daily farm records into detailed reports like cost of production, livestock reconciliation and stocking rates, helping farmers make better decisions. It also enables farmers to digitally map their farms, track livestock movements and production outcomes. AgriWebb currently helps manage 10,000,000 animals over 30,000,000 hectares.

SOURCE: New precision- agriculture technologies could improve large-scale farm yields by up to 40 percent over the next 20 year. See McKinsey Global Institute (2011), 2. Roy Morgan (2024)

2 Food, Land, and Ocean use: Examples of business opportunities

Business models	Description
Eco-tourism	• The global eco-tourism market is projected to grow at a compounded annual growth rate of 12%, driven by increasing environmental awareness, rising demand for sustainable travel options and policies, programs certifications such as Sustainable Tourism Certifications in Australia[1] • In countries like Costa Rica, where ecotourism is a major industry, studies have shown that ecotourists can spend up to **twice** as much as regular tourists over the course of their trip.
Technology in large holder farms	• New precision-agriculture technologies such as farm-management software and big data analytics to improve planting and harvest cycles, have the potential to increase yield rates in large holder farms by **up to 30%**[2] • The Netherlands has integrated precision agriculture technologies extensively. Innovations like greenhouse automation, drone monitoring, and advanced irrigation systems have contributed to higher crop yields.
Sustainable aquaculture	• Demand for foods sourced from oceans, seas, rivers and lakes is expected to **double** by 2050, with aquaculture production playing a vital role in augmenting supplies.[3] • Norway is one of the world's largest producers of farmed salmon, and it has made significant strides in implementing sustainable practices within its aquaculture industry through closed containment systems, environmental regulations and certifications such as the Aquaculture Stewardship Council

SOURCE:1. Ecotourism Australia (2023), 2. McKinsey Global Institute (2011), 3. WEF (2023)

2 Built environment: Nature and sustainability trends impact every aspect of the value chain

Value chain	GVA in Australia (A$ billion)	Trend	Example
Mobility	37-45 (automotive)	Congestion costs	Avoidable social costs of metropolitan congestion in Australia could rise to **A$30 billion** by 2030
		Unused infrastructure	In Melbourne, a study identified nearly **50%** of on-street car spaces as being redundant
Transport and water infrastructure	45-60	Balancing transport infrastructure and biodiversity	The cost for maintaining and monitoring wildlife corridors and habitat restoration can be up to **A$1 million** per kilometre of road
		Flooding risks for infrastructure	Almost a **quarter of a million** properties in Australia are exposed to a 1-in-20-year flood event risk
		Urban sprawl rising costs	Urban sprawl can increase costs of providing utilities by **10-30%**, and increase motor travel costs by **20-50%**
Non-residential buildings	30-40	Rising focus on waste	**10-15%** of building material wasted during construction
		Focus on optimizing use	**14%** of CBD office space across Australia remains vacant
Residential buildings	60-70	Biodiversity tradeoffs with affordable housing	In areas with stringent biodiversity offset requirements, housing prices can increase by an estimated **5-15%** due to the added costs of compliance and land acquisition
		Outsized environmental impact	**67%** percent of urban places across Australia will face moderate to very high challenges to maintain or grow green cover over the next decade

SOURCE: Literature review; Cyan Ventures analysis

2 Three nature-positive transitions are needed in the built environment

Nature-positive built environment

What is it? Locating infrastructure to avoid or minimise ecosystem destruction, designing infrastructure that is energy and resource efficient and including design elements that benefit both humans and nature.

Business opportunities:
Annual, A$ billions (2035)

- Residential electrification: $5
- C&I rooftop solar: $5
- Modular buildings: $4
- Circular models – construction: $3
- Energy efficient buildings: $2
- Repurposing freed land from parking: $1
- Green roofs: $0.3

Planet-compatible urban utilities

What is it? Smarter and cleaner utilities that provide cleaner air, safer water, more efficient sanitation, modern energy, and comprehensive waste and recycling services.

Business opportunities:
Annual, A$ billions (2035)

- Smart meters: $2
- Municipal water leakage: $1
- Wastewater reuse: $1

Nature-positive transportation, logistics and infrastructure

What is it? Infrastructure and transport developed in ways that minimise the disruption of habitats, support the reduction of GHG emissions and enhance biodiversity outcomes.

Business opportunities:
Annual, A$ billions (2035)

- Sustainable aviation fuels: $16
- Renewable energy industrial precincts: $14
- Renewable diesel: $12
- Heavy duty EV charging infrastructure: $11
- Sustainable shipping: $4
- EV charging infrastructure: $3
- Grid enhancing technologies (GET): $0.3

SOURCE: Cyan Ventures analysis

2 Built environment: Examples of business opportunities

Business models	Description
Modular buildings	• The addressable market for modular construction is estimated at roughly **25%** of new residential and commercial buildings in Europe and the United States, with the cost savings in the order of **10%** of traditional construction costs.[1] • Singapore's Housing Development Board is building **20,000 to 30,000** units a year using offsite manufacturing, driven by a desire to speed construction and lower costs.
Repurposing car parking	• In Melbourne, a study identified nearly **50%** of on-street car spaces were redundant. With car sharing, and better public transport, this number could increase.[2] • The Barcelona Superblocks initiative aims to reduce car traffic in certain areas by grouping several city blocks into a "superblock" where through-traffic is restricted. Inside these superblocks, streets previously dedicated to cars and parking are repurposed for pedestrians, cyclists, green spaces, and community activities.
EV charging	• Large-scale adoption of EVs hinges on the simultaneous roll-out of accessible and affordable charging with global public charging points needing to increase by **six-fold** relative to 2023 in the IEA's Announced Pledges Scenario.[3] • The Netherlands is at the forefront of EV charging innovation, with over **80,000** public charging points as of 2023, making it the country with the highest density of EV chargers per capita in the world.

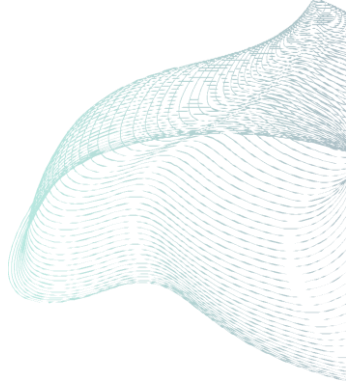
SOURCE: 1. Mckinsey & Company (2019), 2. Croeser, T. et. Al (2022), 3. IEA (2024)

2 Energy and Extractives: Nature and sustainability trends impact every aspect of the value chain

Value chain	GVA in Australia (A$ billion)	Trend	Example
Extraction	160-180 (mining)	Regulatory risk from carbon border adjustment mechanisms (CBAM)	64% of aluminium (as well as **40%** of Australia's steel) was exported to countries where carbon prices are in place or under consideration.
		Moving towards peak demand for fossil fuel exports	Currently, **39%** of Australia's total commodity exports are fossil fuels.
		Environmental pressure on inputs	Australia's mining industry faces increasing risks to production from heat stress - the Pilbara could face over **100** forty degree+ days
Processing	30-40	Processing challenges for reducing CO2 emissions	Hematite accounts for **96%** of Australia's iron ore exports but is not compatible with current predominant DRI production pathways.
Generation	15-20	Public burden of subsidies prompting reform	Australia's subsidies to fossil fuel producers and major users from all governments totaled **A$14.5b** in 2023–24
Retail	10-12	Consumer focus on CO2 emissions	In Australia, approximately 27% of energy consumers consider CO2 emissions a key factor when choosing an energy retailer.
Disposal & recovery	2-3	Rising concern on waste	Solar waste predicted to reach **100,000 tonnes** annually by the end of the decade.

SOURCE: Literature review; Cyan Ventures analysis

2 Three nature-positive transitions are needed in the energy and extractives system



Circular and resource efficient models for materials

What is it? Systems that design out waste and pollution, keep products and materials in use for as long as possible and regenerate natural systems by returning valuable inputs to natural ecosystems.

Business opportunities:
Annual, A$ billions (2035)

- End-use steel efficiency: $5
- Additive manufacturing: $2
- Circular models – plastics: $1
- Circular models – automotives: $1
- Circular models – electronics & appliances: $1
- Circular models – battery recycling: $0.3
- Circular models – renewables recycling (solar): $0.2

Nature positive mineral and metals extraction

What is it? Minimising destructive land management practices and enhancing conservation efforts to offset biodiversity impacts that cannot be either avoided or mitigated.

Business opportunities:
Annual, A$ billions (2035)

- Resource recovery: $9
- Mine rehabilitation: $5
- Sustainable chemicals in mining: $2
- Shared extractives infrastructure: $1
- Water efficiency in mining: $0.2

Nature positive energy transition

What is it? Supporting decarbonisation of the energy system in a way that protects or enhances nature.

Business opportunities:
Annual, A$ billions (2035)

- Nature positive renewables expansion: $31
- Green iron and steel: $23
- Nature positive energy storage expansion: $12
- Cross-border renewable electricity exports: $2
- Methane capture: $0.5

SOURCE: Cyan Ventures analysis

2 Case study: Nature positive renewables expansion

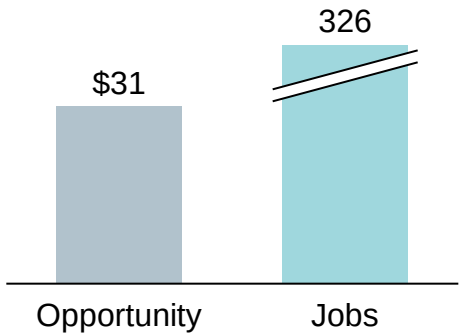
What is it & how has it been sized?

- The acceleration of renewable energy development is crucial to decarbonisation, however, there are potentially negative impacts on nature largely due to the increased use of land.
- A nature positive renewables expansion means a carefully planned renewable development, which actively contributes to the conservation and restoration of biodiversity and ecosystems.
- The opportunity has been sized based on the amount of additional renewables capacity (between 2024 to 2035) under the Australian Energy Market Operator's (AEMO) most ambitious 'Green Exports' scenario[1] and the value of this on the electricity wholesale market in real terms.

Size of the opportunity and drivers

Size of total annual opportunity and total jobs by 2035

A$ billions, thousands of jobs



Key opportunity drivers:

- **Biodiversity and Environmental Regulations:** E.g. Environmental Protection laws such as the Environment Protection and Biodiversity Conservation Act
- **Government targets:** E.g. Australia's Renewable Energy Target (RET) aims to generate 82% of electricity from renewable sources by 2030

Example companies

VATTENFALL

In the Netherlands, developer **Vattenfall** has incorporated openings in offshore wind turbine foundations to allow fish movement and added rocks that serve as habitat and promote marine biodiversity. Researchers are experimenting with painting wind turbine blades black to reduce bird collisions.

In France and the U.S., **solar farms have been co-located with vineyards**, where the shade provided by the panels helps reduce water evaporation and protect crops from extreme weather

NOTE:1. AEMO's Green Energy Exports scenario, which reflects a very rapid decarbonisation rate, including strong electrification and a strong green exports economy. SOURCE: AEMO ISP (2024)

2 Energy and Extractives: Examples of business opportunities

Business models	Description
Circular models – plastics	• In the U.S., recycling company Advanced Environmental Recycling Technologies, Inc. develops and commercialises technologies to recycle waste polyethylene plastics; and develops, manufactures, and markets value added **green building products** such as decking planks and accessories and recycled plastic resin compounds • In the UK, Recycling Technologies have developed a recycling technology which uses a process called "hydrothermal liquefaction" to convert mixed plastic waste into a chemical feedstock for producing **new plastics or fuels**
Mine rehabilitation	• The Mount Lyell copper mine in Tasmania has undergone a significant rehabilitation effort after its closure in 2014 with a focus on treating acidic mine drainage, stabilising rock and restoring native vegetation as well as creating **new wetlands** to manage water quality and support local biodiversity • Canada's Meadowbank gold mine has involved the community and traditional knowledge of the land within rehabilitation efforts such as re-vegetation of disturbed areas and the creation of artificial wetlands to support local wildlife.
Nature-positive renewable development	• In the Netherlands, developer Vattenfall has incorporated openings in offshore wind turbine foundations to **allow fish movement** and added **rocks that serve as habitat** and promote marine biodiversity. Researchers are experimenting with painting wind turbine blades black to reduce bird collisions. • In France and the U.S., solar farms have been co-located with vineyards, where the **shade provided by the panels helps reduce water evaporation** and protect crops from extreme weather

SOURCE: Cyan Ventures analysis

2 These opportunities have four different types of benefits to nature

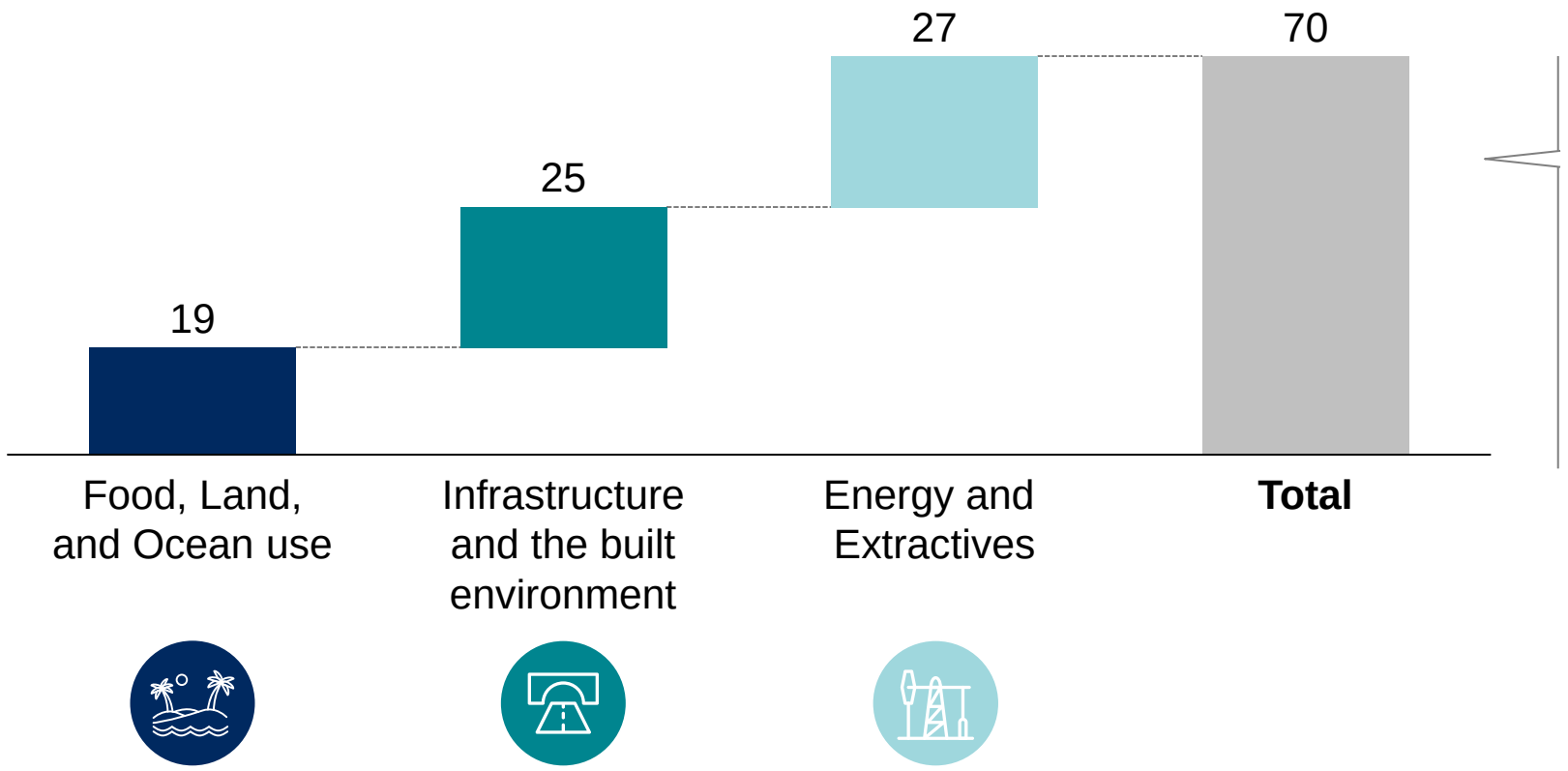
Impact	% of opportunities by key benefit area to nature: Primary benefit	% of opportunities by key benefit area to nature: Secondary benefits[1]	Example
1. Land use / sea use change	11%	41%	**Repurposing freed land from parking** could involve converting freed land into parks, community gardens or green spaces having a direct impact on the way in which land is used in our cities
2. Climate change	37%	63%	**Increasing energy efficient buildings** will reduce energy consumption and greenhouse gas emissions through measures such as energy efficient lighting (e.g. LED), appliances and improved insulation
3. Natural resource use & exploitation	46%	44%	**Reducing municipal water leakage** will improve water management and reduce water waste, conserving vital water resources and minimising the need for additional infrastructure
4. Other (pollution, invasive species)	6%	44%	**Increasing the use of sustainable inputs** in farming such as biopesticides and organic fertilisers will reduce pollution and improve soil health through the reduction of chemical runoff and harmful chemical residues

NOTE: 1. Business opportunities can have multiple secondary benefits to nature beyond their primary benefit. Therefore, the percentage sum of secondary benefits does not equal 100%. SOURCE: Cyan Ventures analysis

3 Capital investment required to capture opportunities in the three systems in Australia is around A$70 billion annually

Annualised investment costs (2025-35)

A$ billions; 2024 values



This is roughly equivalent to **12%** of Australia's current gross fixed capital investment[1]

NOTE: Capital investment costs have been sized applying one of four methods: 1. Global opportunity to capex ratio: where business opportunities do not relate to sales/revenues and there was not a specific source detailing capex requirements, global opportunity to capex ratios have been applied 2. Net capex to sales ratios: where business opportunities relate to sales/revenues, net capex to sales ratios have been used based on relevant industries 3.Specific sources: where there are sources detailing capex requirements for an opportunity, these have been applied and adjusted if needed to 2035 4. Total cost annualised: where business opportunities have been sized at cost (mainly infrastructure projects) these costs have been annualised (either by dividing by 11 or by the useful life of a project/technology).

1 Gross fixed capital formation includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. SOURCE: Cyan Ventures analysis.

3 Over one-third of opportunities could have an IRR of greater than 12%

Examples

x Share of total opportunities

Capex requirements (A$b)

	Low returns (IRR <7%)	Medium returns (IRR 7-12%)	High returns (IRR >12%)
Large capex (>$500m p.a.)	7% • *Mine rehabilitation* • *Mitigation of extinction risk for threatened species*	31% • *Technology in large holder farms* • *Circular models - automotives*	11% • *C&I rooftop solar* • *Energy efficient buildings*
Medium capex ($100-500m p.a.)	4% • *Green roofs* • *Waste water reuse*	11% • *Repurposing freed land from parking* • *Novel carbon dioxide removal (CDR)*	11% • *Bio-innovation* • *Farm technology market*
Low capex (<$100m p.a.)	0%	11% • *Sustainable chemicals in mining* • *Water efficiency in mining*	13% • *Circular models - Batteries recycling* • *Circular models - Electronics and appliances*

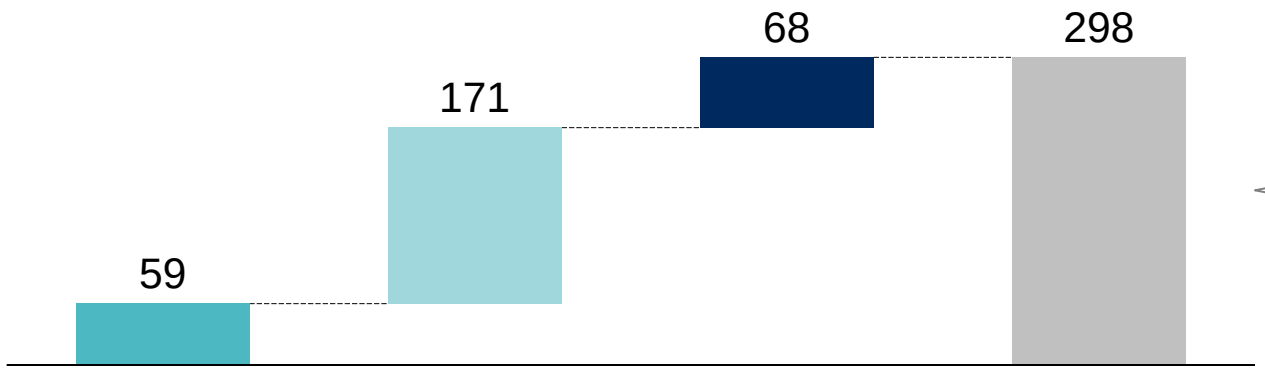
Return on investment

NOTES: Note: Returns are based on AI searching of case studies of project returns in each area, as well as Cyan Ventures market intelligence. It is based on expected real returns for a project operational in 2035 (not today), and accounts for expected shifts in technology learning curves, customer buyer premiums, etc. SOURCE: Cyan Ventures Analysis

3 Unfortunately, only 20% of these opportunities have a strong focus by businesses and investors today

Breakdown of opportunity value by extent of existing development focus

A$ billions



	Strong focus	Limited focus	Low focus
Share of total (%)	20%	57%	23%
Example	Technology in large holder farms	Green iron and steel	Sustainable aviation fuels

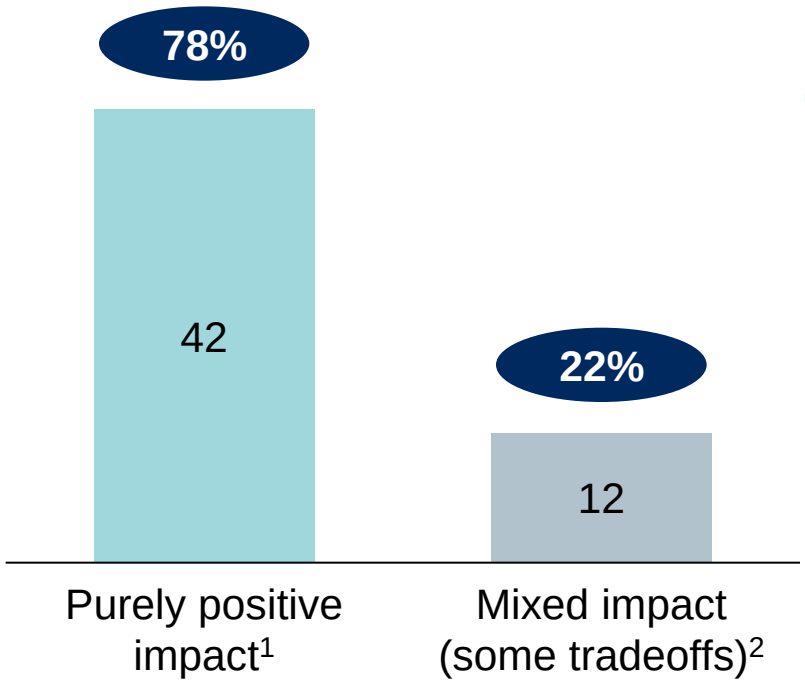
The limited focus is being driven by two main factors:

1. **Information failures** – lack of good investment bank research covering this sector
2. **Execution** – most of these opportunities with limited focus are "pre-engineering" – i.e., they have multiple barriers, including regulatory, commercial and supply chain which make a typical engineering approach difficult; they often require coordination across multiple stakeholders

NOTE: Focus was based on understanding internet searches in Australia for these business opportunities, and then adjusted based on Cyan Ventures understanding of existing ecosystem. Strong focus = well developed ecosystem with regulatory support, customers and financing. Limited focus = early stage activities and investments, but lacking regulatory, financing and/or customer ecosystem. Low focus = very little activity in Australia, limited to a small pool of firms. SOURCE: Cyan Ventures Analysis.

3 78% of opportunities have a purely positive impact on nature while 22% have some trade-offs

Level of nature impact of Australian business opportunities



Example opportunities

Purely positive impact

Circular models opportunities: batteries recycling, and solar panel recycling

Opportunities focused on protecting and restoring nature: restoration of native vegetation and reparation of agricultural soils

Planet compatible food and consumption opportunities: reducing consumer food waste and reducing food loss and waste in the value chain

Mixed impact

Green iron and steel: tradeoffs given there is still extensive natural resource use within green iron and steelmaking

Sustainable aviation fuel (SAF): tradeoffs related to feedstock use, land use and potential impacts on food production

EV charging infrastructure: tradeoffs due to increased land use and resource use

NOTES: 1. Purely positive impact implies the opportunity results in only beneficial outcomes to nature e.g. restorative enhancement of ecosystems or natural resources 2. Mixed impact implies the opportunity has some nature benefits as well as some potential negative impacts on nature e.g. increased use of resources. SOURCE: Cyan Ventures Analysis.

3 Multi-sector collaboration is crucial to unlocking these nature-positive transitions

Sector role in transition: Principal[1] Enabling[2]

Sectors \ Transition	Food, land and ocean use			Infrastructure and the built environment			Energy & extractives		
	Protecting and restoring nature	Productive & regenerative agriculture & aquaculture	Planet-compatible food and consumption	Nature positive built environment	Planet-compatible urban utilities	Nature positive transportation, logistics & infrastructure	Circular and resource efficient models for materials	Nature positive mineral and metals extraction	Nature positive energy transition
Advanced manufacturing			Enabling	Enabling	Enabling	Enabling	Principal		Enabling
Aerospace						Enabling	Enabling		Enabling
Agriculture, food and beverages	Principal	Principal	Principal				Principal		Enabling
Automotive							Principal		Principal
Aviation, travel & tourism	Principal	Enabling		Principal	Principal	Principal			Enabling
Banking & investors	Enabling	Enabling	Enabling	Enabling		Enabling	Enabling	Enabling	Enabling
Chemicals & advanced materials	Enabling	Principal				Enabling	Principal	Principal	Enabling
Electronics							Principal		Enabling
Energy & utilities		Enabling		Principal	Principal	Enabling		Enabling	Principal
Health & healthcare		Enabling	Enabling				Enabling		Enabling
IT & digital communications	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling
Infrastructure & urban development		Enabling		Principal	Principal	Principal	Principal	Enabling	Enabling
Insurance & asset management		Enabling		Enabling	Enabling	Enabling	Enabling		Enabling
Media, entertainment & information			Enabling				Enabling		Enabling
Mining & metals							Principal	Principal	Principal
Oil & gas		Enabling		Enabling	Enabling		Principal	Enabling	Enabling
Professional services	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling	Enabling
Retail, consumer goods & lifestyle		Principal	Principal			Principal	Principal		Enabling
Supply chain & transportation		Principal			Enabling				

NOTES: 1. Principal role implies that the sector is directly involved in capturing the opportunity. 2. Enabling role implies sector is needed to support some activities associated with capturing the opportunity but does not have a lead / principal role. SOURCE: Cyan Ventures Analysis

3 The nature-positive opportunities are at different stages of maturity, requiring different supporting actions

Phase of maturity	Description	Share of opportunities (%)	Example of opportunity	Examples of supporting actions
Inception	Bring tech. to commercial readiness & transition planning	**15%**	• Novel Carbon Dioxide Removal (CDR) • Sustainable Aviation Fuel	• RD&D support • Advanced market commitments • VC funding
Formation	Establish long-term business case for nature-positive	**37%**	• Mine rehabilitation • Reducing consumer food waste	• Financial incentives (e.g. biodiversity offsets pricing, subsidies) • Regulatory measures (e.g. green mandates, grey bans) • Infrastructure planning and build-up • Initial product standards / certifications
Acceleration	Accelerate the scale and pace of transactions	**26%**	• Nature positive renewables expansion • Technology in small to medium holder farms	• Creating a marketplace (i.e. connecting supply and demand at scale) • Unlocking green premium (e.g., segment identification) • De-risking transactions • Facilitating transactions with standardised tools
Maturation	Increase liquidity of markets; convince the bulk of the market to buy product	**22%**	• Farm technology market • Energy efficient buildings	• Standards and certification • Standardising procurement

SOURCE: Mission Possible Partnership; Cyan Ventures analysis

Cyan Ventures

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