

CHALLENGES AND OPPORTUNITIES FOR AUSTRALIAN AGRICULTURE

PRESENTATION TO AGFORCE QUEENSLAND
AGRICULTURE INDUSTRY CONFERENCE

ROYAL INTERNATIONAL CONVENTION CENTRE, BRISBANE

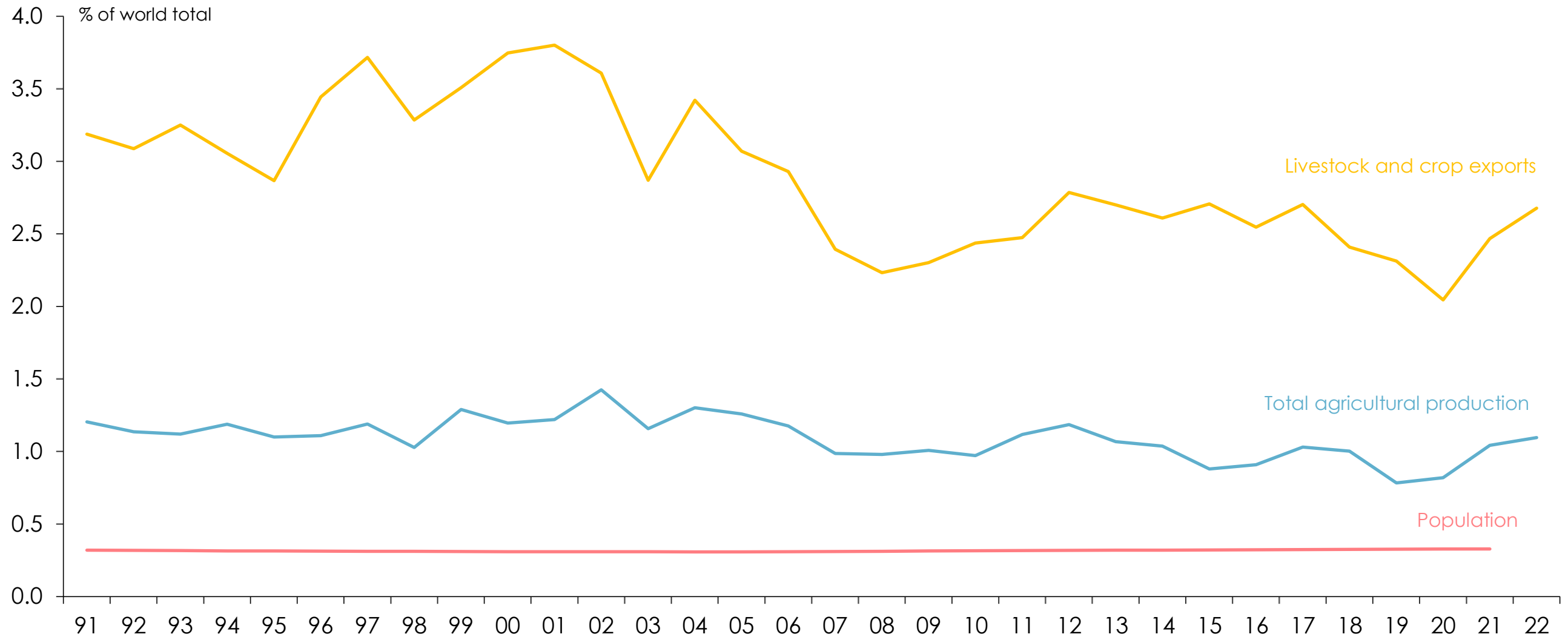
1ST OCTOBER 2024

SAUL ESLAKE

CORINNA ECONOMIC ADVISORY
INDEPENDENT ECONOMICS

Australia produces just over 1% of the world's agricultural output – and 2½% of the world's agricultural exports – with 0.3% of the world's population

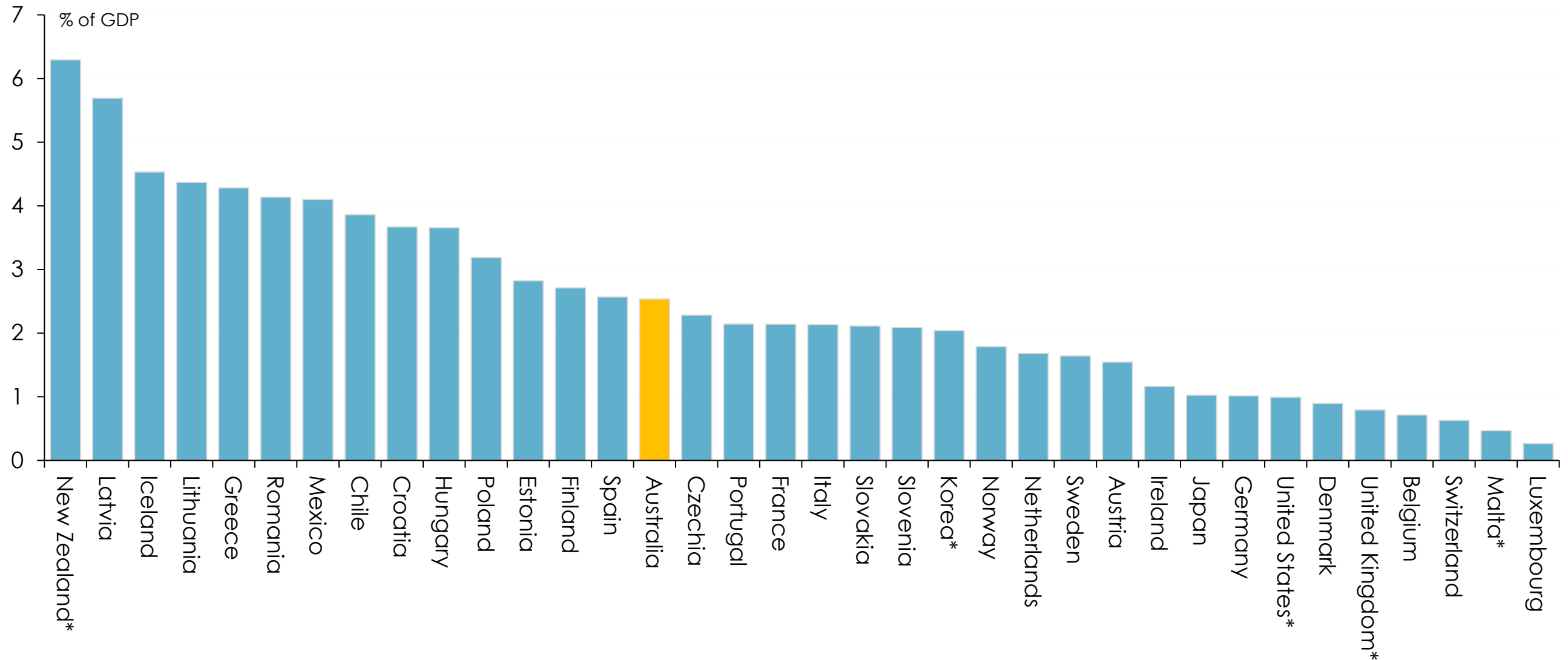
Australia's share of world agricultural production, exports and population



Source: Food and Agricultural Organization, [FAOSTAT - Value of agricultural production](#).

Agriculture accounts for a larger share of economic activity in Australia than in most other high-income 'advanced' economies ...

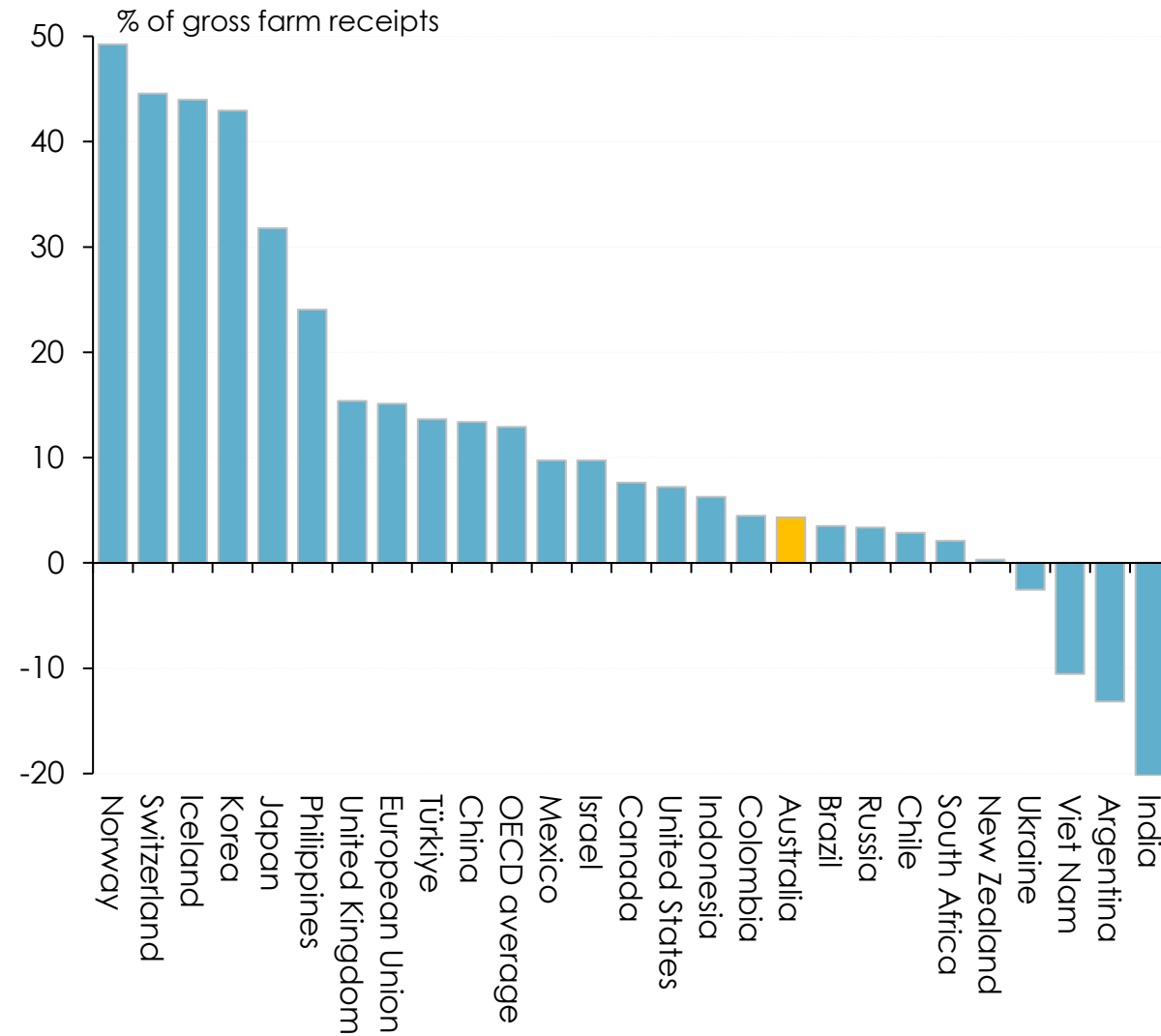
Valued added in agriculture, forestry and fishing as a pc of gross domestic product, 2022



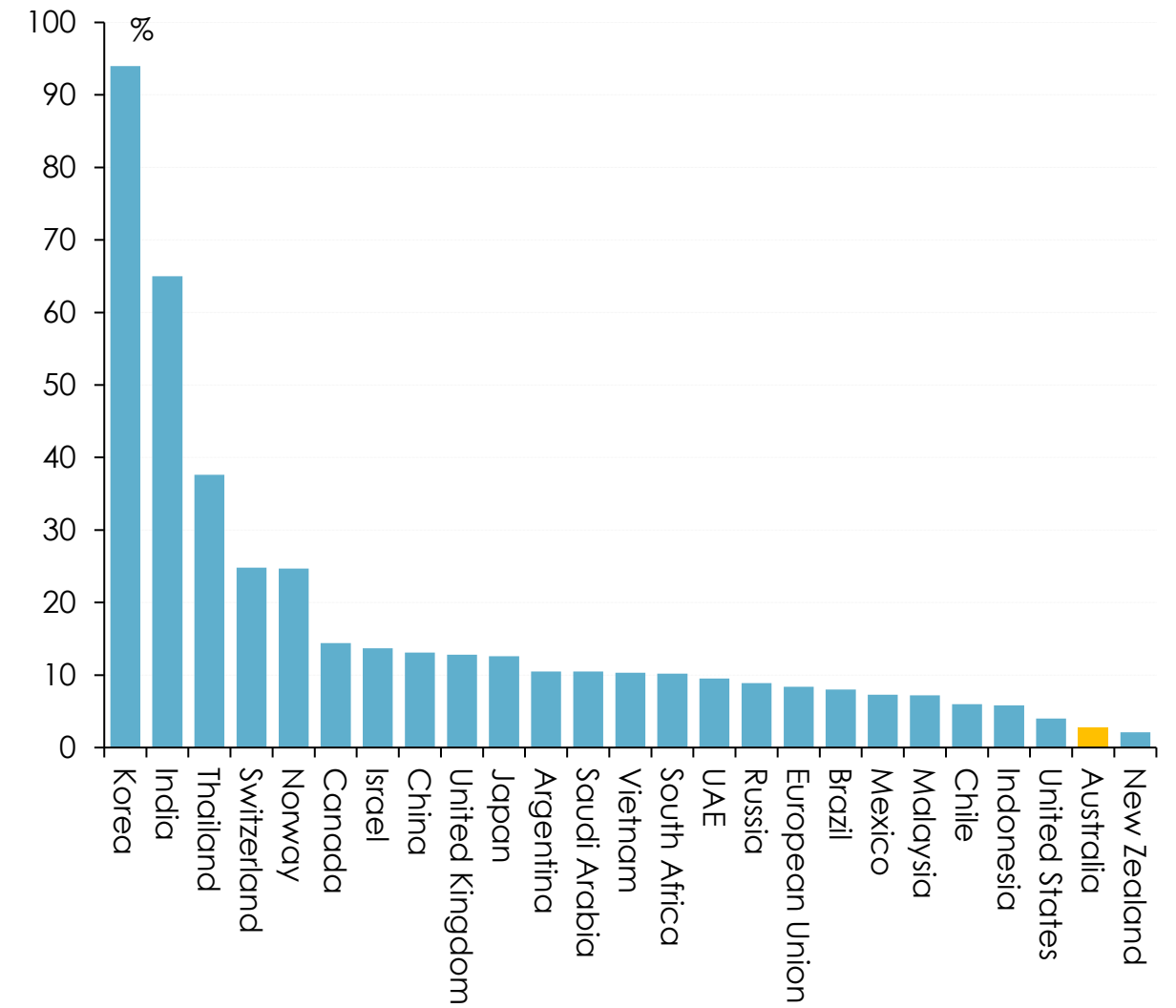
* 2021. Source: Organization for Economic Co-operation and Development, [OECD Data Explorer - Annual value added and its components by economic activity](#).

... and Australian agriculture does this without imposing large burdens on taxpayers or consumers

Agricultural producer subsidy equivalents, 2022



Average tariffs on imports of agricultural products, 2023



Source: Organization for Economic Co-operation and Development, [OECD Data Explorer - Producer Support Estimate \(PSE\)](#) and World Trade Organization, [WTO Stats](#).

Agriculture is more important to Queensland's economy than that of other states (aside from South Australia and Tasmania)

Agriculture, forestry and fishing share of gross valued added, states and territories, 2022-23



Agriculture, forestry and fishing share of total employment, 2023-24



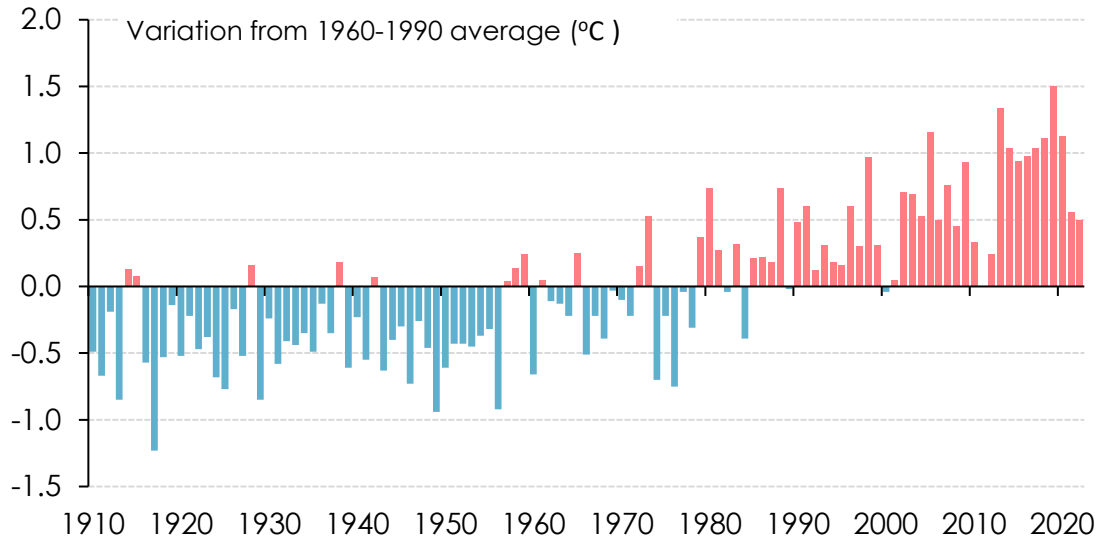
Sources: ABS, [Australian National Accounts: State Accounts](#), 2022-23; [Labour Force, Australia](#), July 2024.

Challenges for modern agriculture – everywhere, including Australia

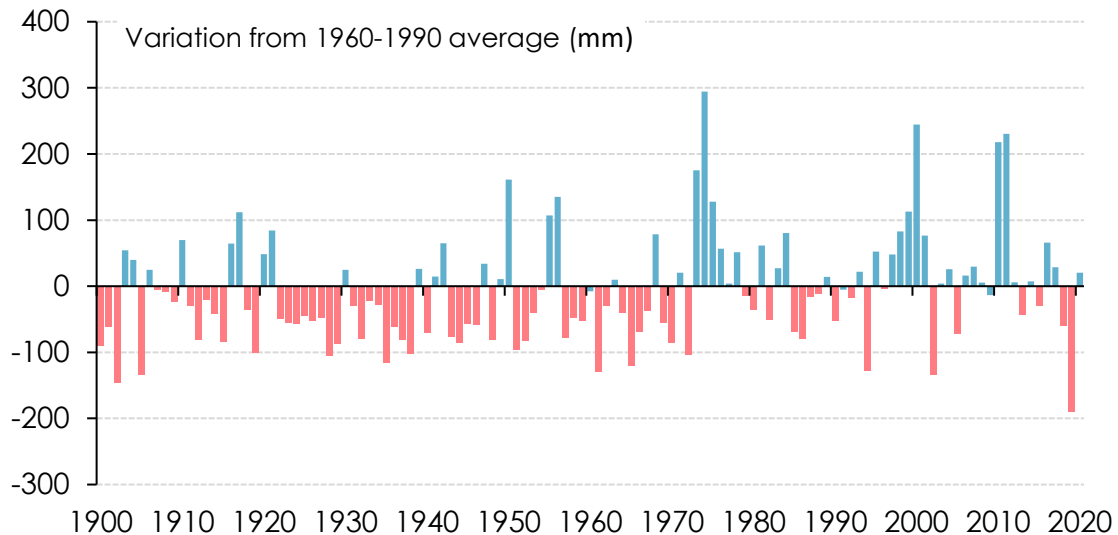
- ❑ **Climate change**
 - farmers (especially in Australia) are at the forefront of threats posed by climate change
 - but agriculture is also a significant source of carbon emissions
- ❑ **Bio-security risks**
 - Australia’s position as one of the most bio-secure nations in the world will be threatened by growing levels of travel and trade, urbanization, climate change, bio-diversity loss, antimicrobial resistance and agricultural intensification
- ❑ **Increasing demand for food from growing population and rising incomes**
 - combined with declining availability of agricultural land due to urbanization and land degradation
- ❑ **Changing consumer tastes and expectations**
 - ongoing (and sometimes unpredictable) changes in appetites
 - growing expectations for knowledge about how and where food is produced
- ❑ **Coping with heightened geo-political uncertainty and creeping protectionism**
 - a particular challenge for export-oriented agricultural nations such as Australia
- ❑ **Increasingly volatile and unpredictable product prices**
 - probably exacerbated by climate change and geo-political uncertainty
- ❑ **Importance of maintaining productivity growth**
 - and adapting new technologies
- ❑ **Attracting and retaining young people to stay in agricultural areas and become farmers**
 - also a particular challenge in a geographically large and dispersed country like Australia

Climate change is a significant threat to agricultural producers, in Australia and around the world

Australian surface temperature anomaly



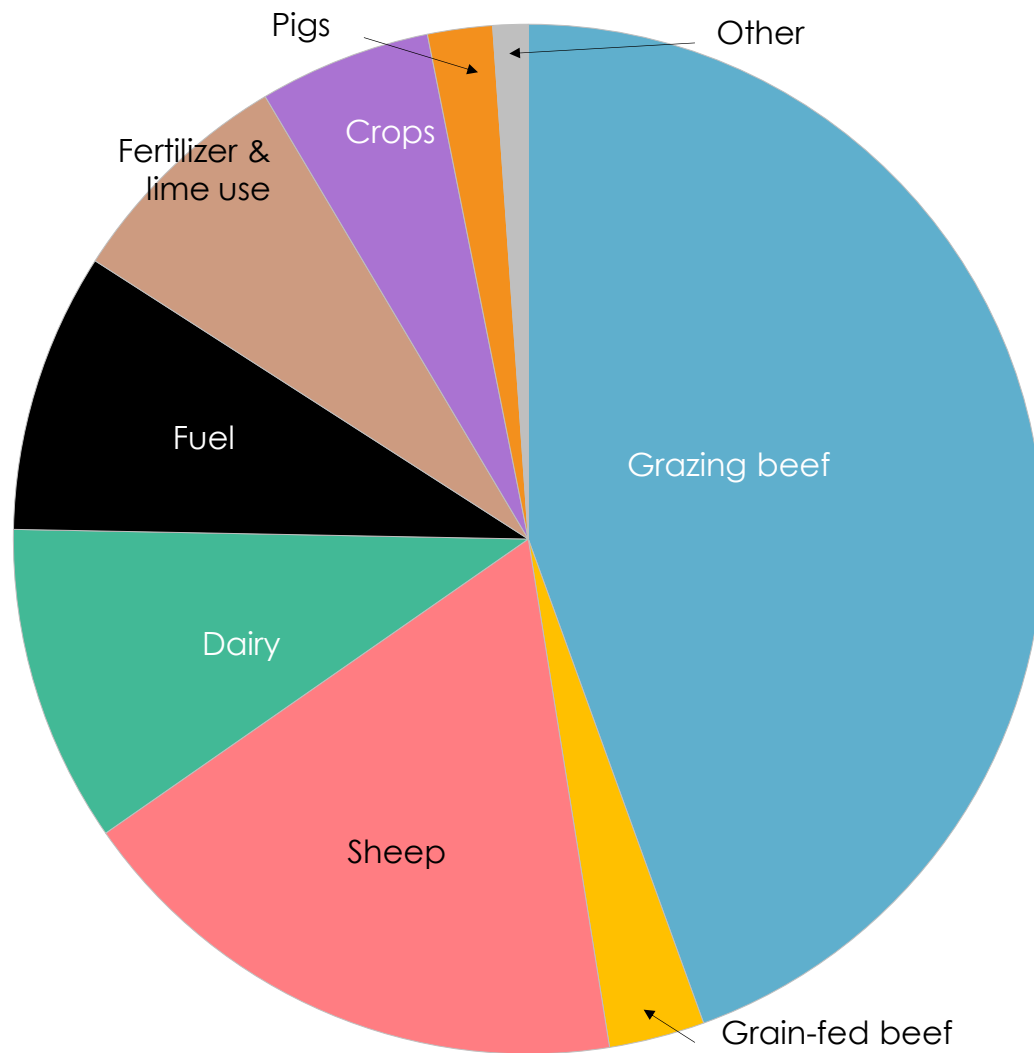
Australian rainfall anomaly



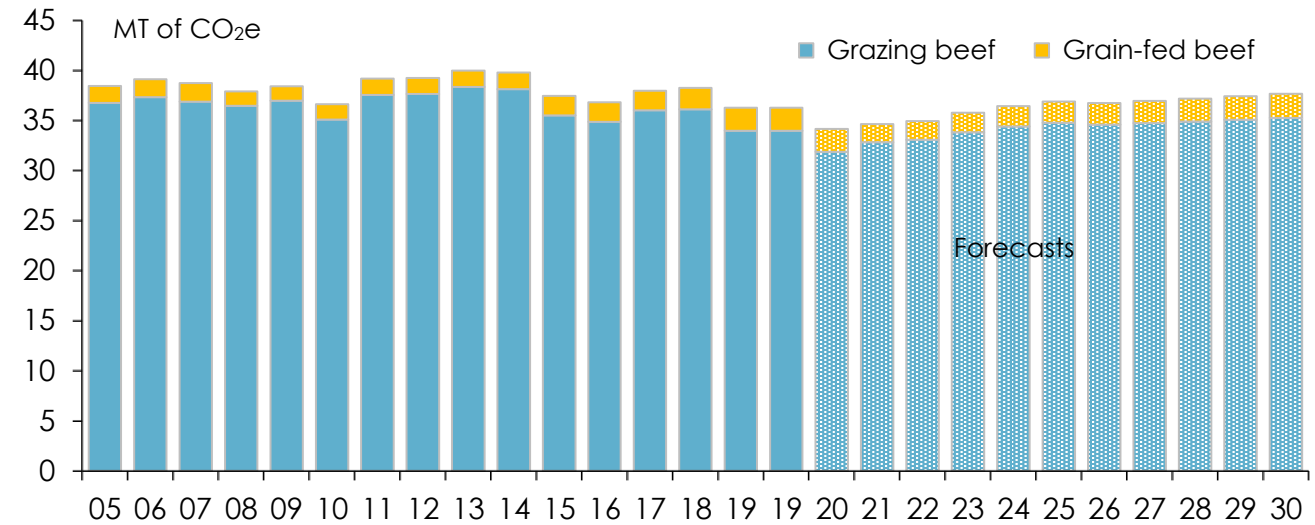
- ❑ **Climate change means, among other things,**
 - more severe, and possibly more frequent droughts
 - more severe, and more frequent flood events
 - more frequent and damaging storms and cyclones
 - greater bushfire risks
 - higher insurance costs
- ❑ **The first three of these imply greater volatility in, and greater uncertainty about, crop and livestock production**
 - and hence greater volatility in prices and farm incomes
- ❑ **Climate change also of course implies more frequent natural disasters in other countries, including Australia's principal export markets**
- ❑ **It's possible that concerns over climate change and agricultural emissions could prompt more people to give up eating meat**
 - a potentially significant risk for Australia as a major meat exporter
 - although to date there's not much hard evidence of that happening
- ❑ **Meat producers will come under growing pressure (from governments and consumers) to reduce their own emissions**
 - which may entail significant changes to production processes and increased costs

Agriculture accounts for just under 16% of Australia's carbon emissions, and 75% of those emissions come from cattle and sheep

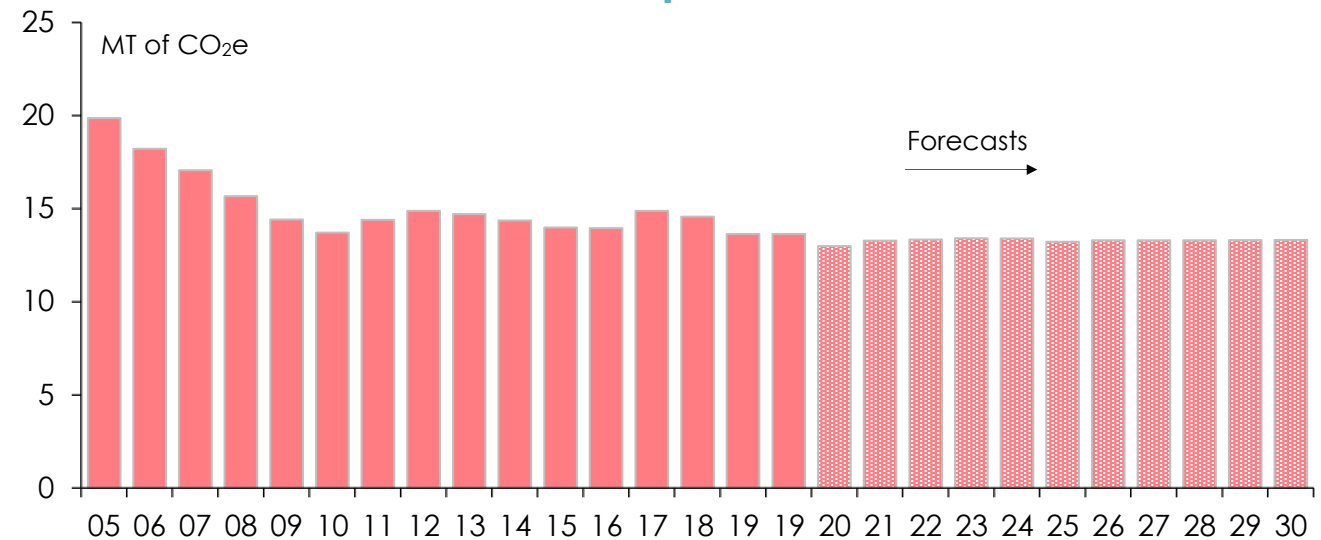
Agricultural carbon emissions



Carbon emissions from beef cattle

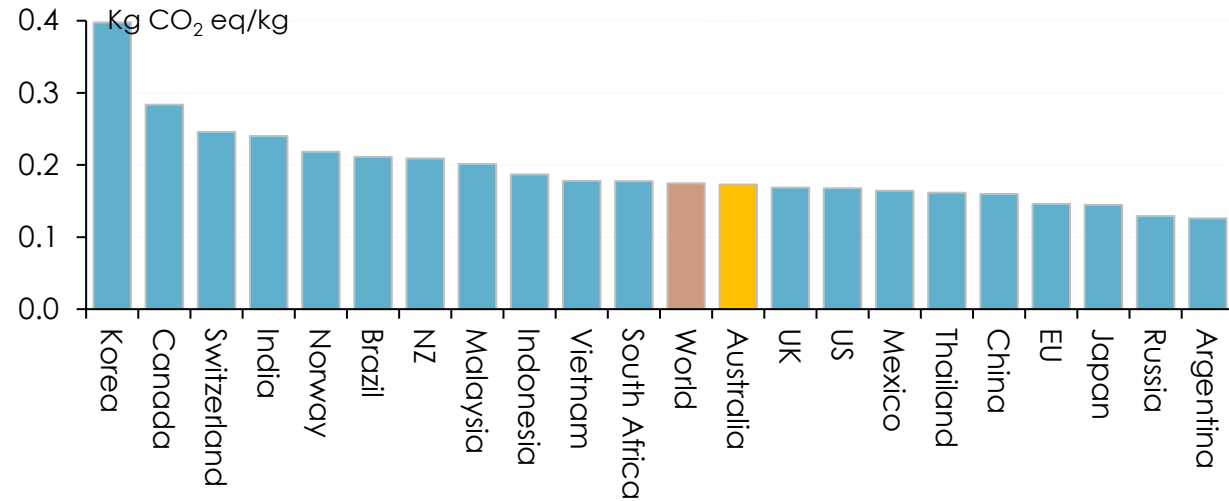


Carbon emissions from sheep

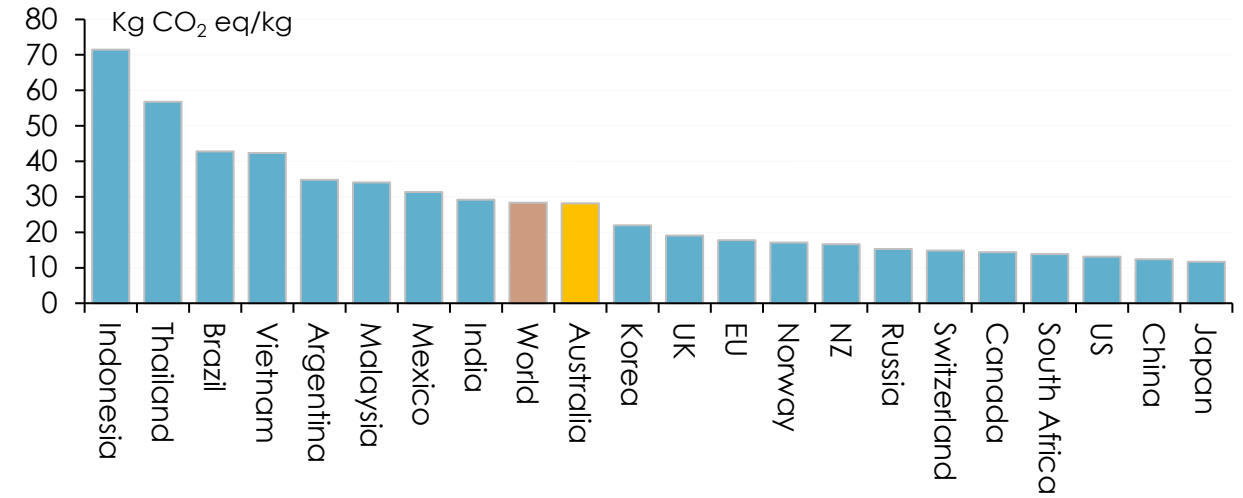


There's a clear opportunity for Australian industry to enhance its global 'image' by reducing its emissions intensity

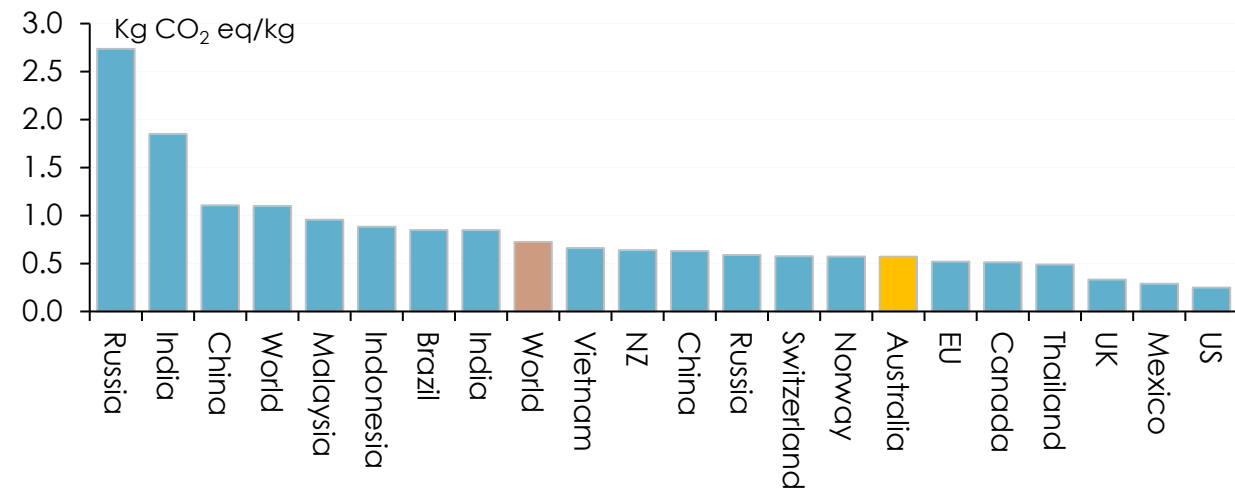
CO₂ emissions from cereals production, 2021



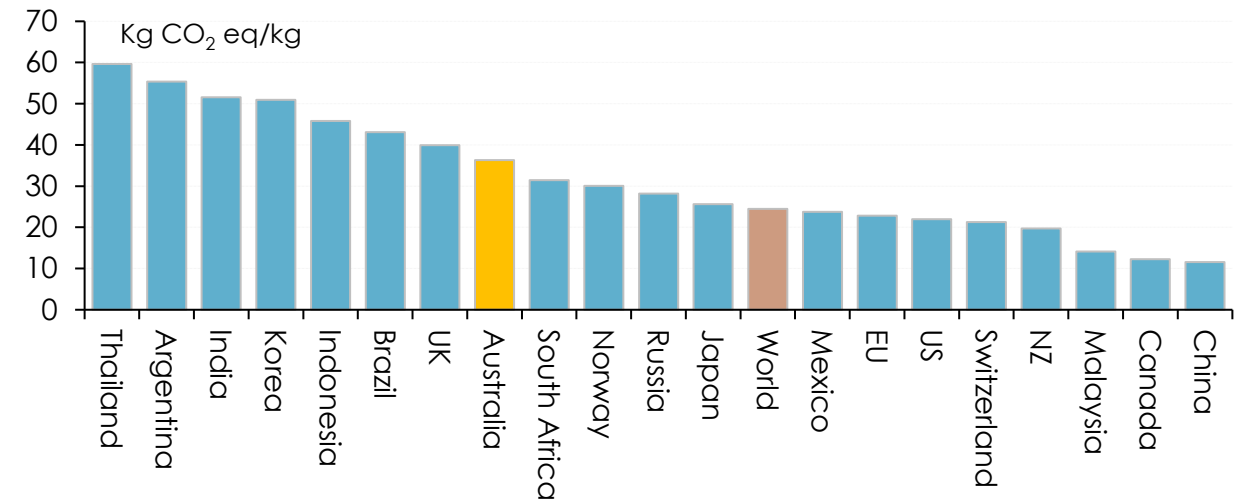
CO₂ emissions from beef production, 2021



CO₂ emissions from milk production, 2021



CO₂ emissions from sheep meat production, 2021

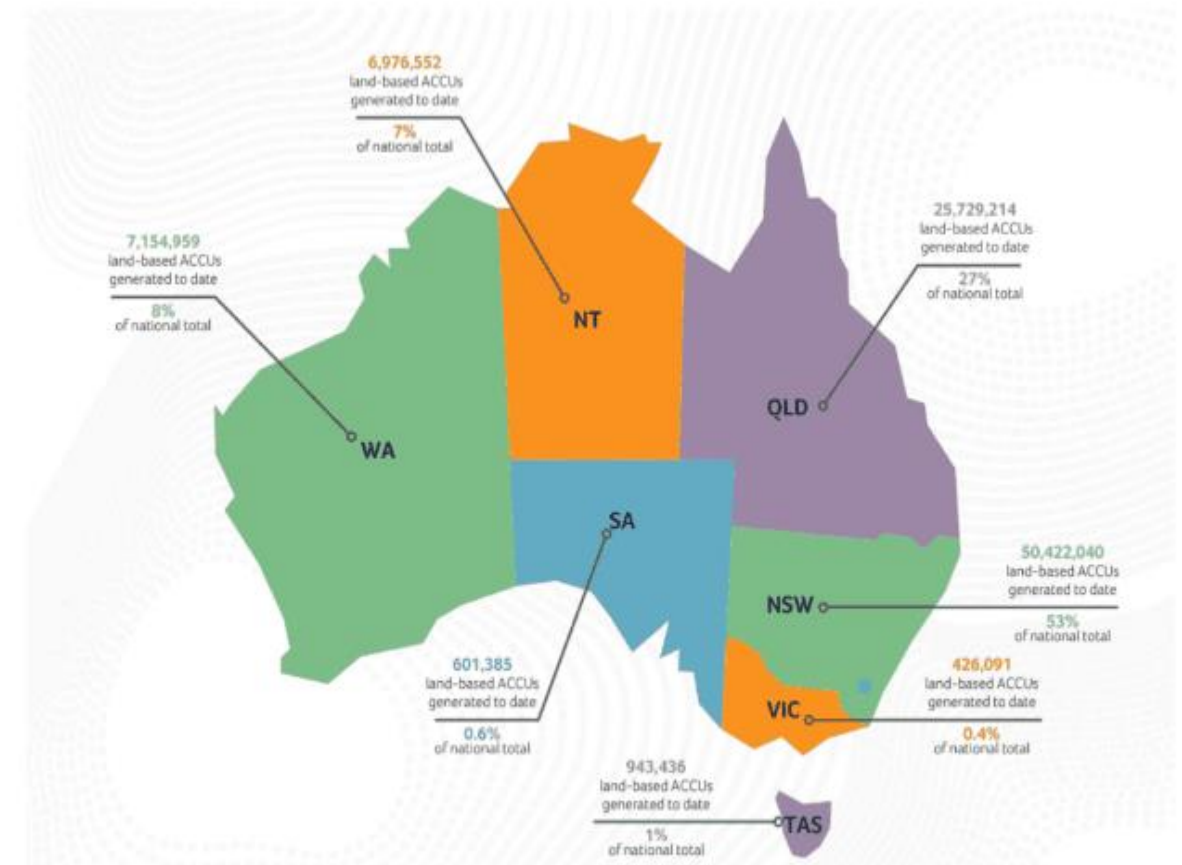


Source: Food and Agricultural Organization, [FAOSTAT - Emissions intensities](#).

There's also potential for agriculture to generate new revenue streams through 'carbon offsets'

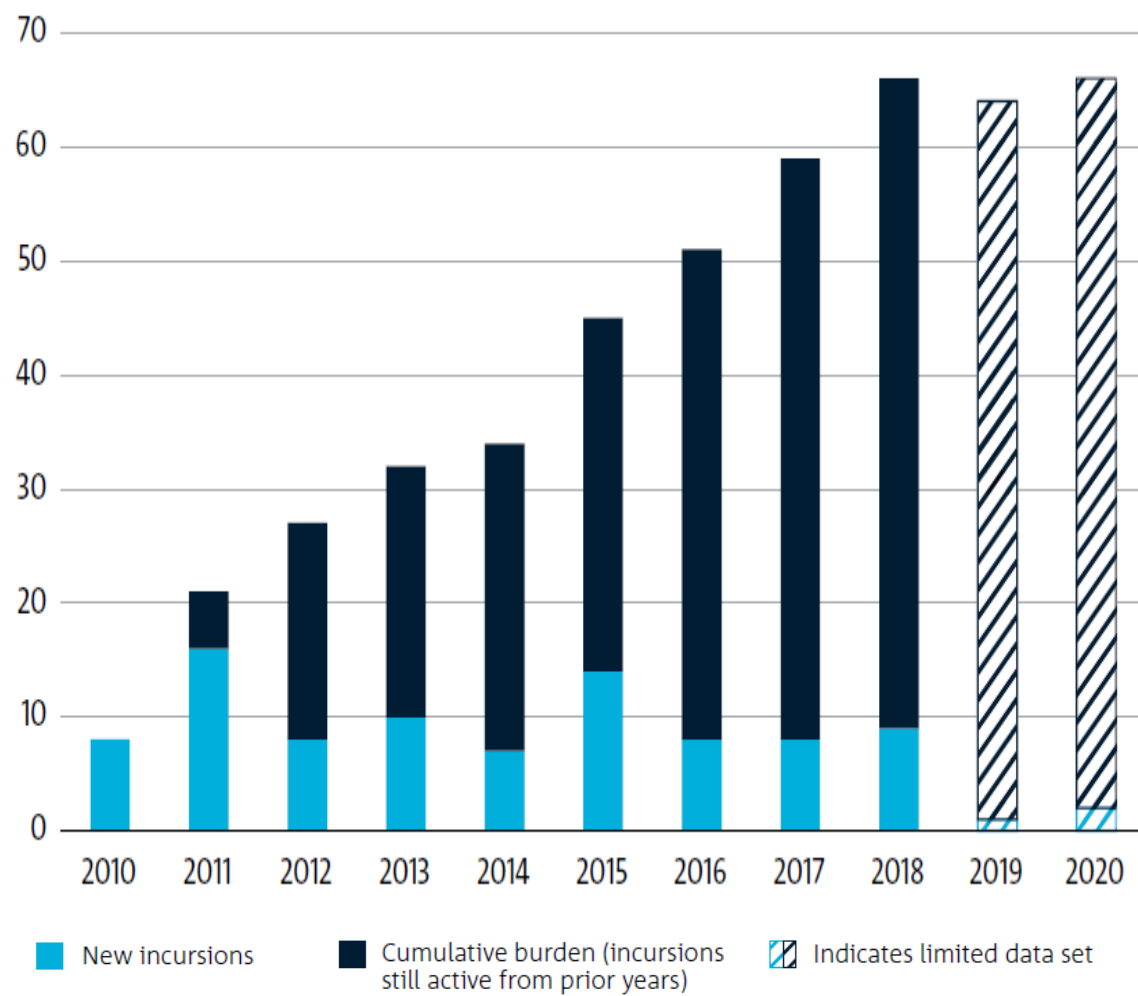
- ❑ **Storing carbon on agricultural land**
 - through changes in land use, grazing and cropping practices and water management
 - and innovations such as clay spreading and delving, compost applications etc
- ❑ **Planting native trees and shrubs to earn carbon credits**
 - requires conversion of cleared land back to forested
- ❑ **On larger farms, managing stock to allow regrowth of native forests**
 - may be appropriate for land that has been degraded over time
- ❑ **Reducing bovine methane emissions**
 - requires measurement, and changes to feed practices
- ❑ **Reducing nitrous oxide emissions from irrigated cotton**
 - entails changes in fertilizer use

Australian carbon credit units generated, up to 2024

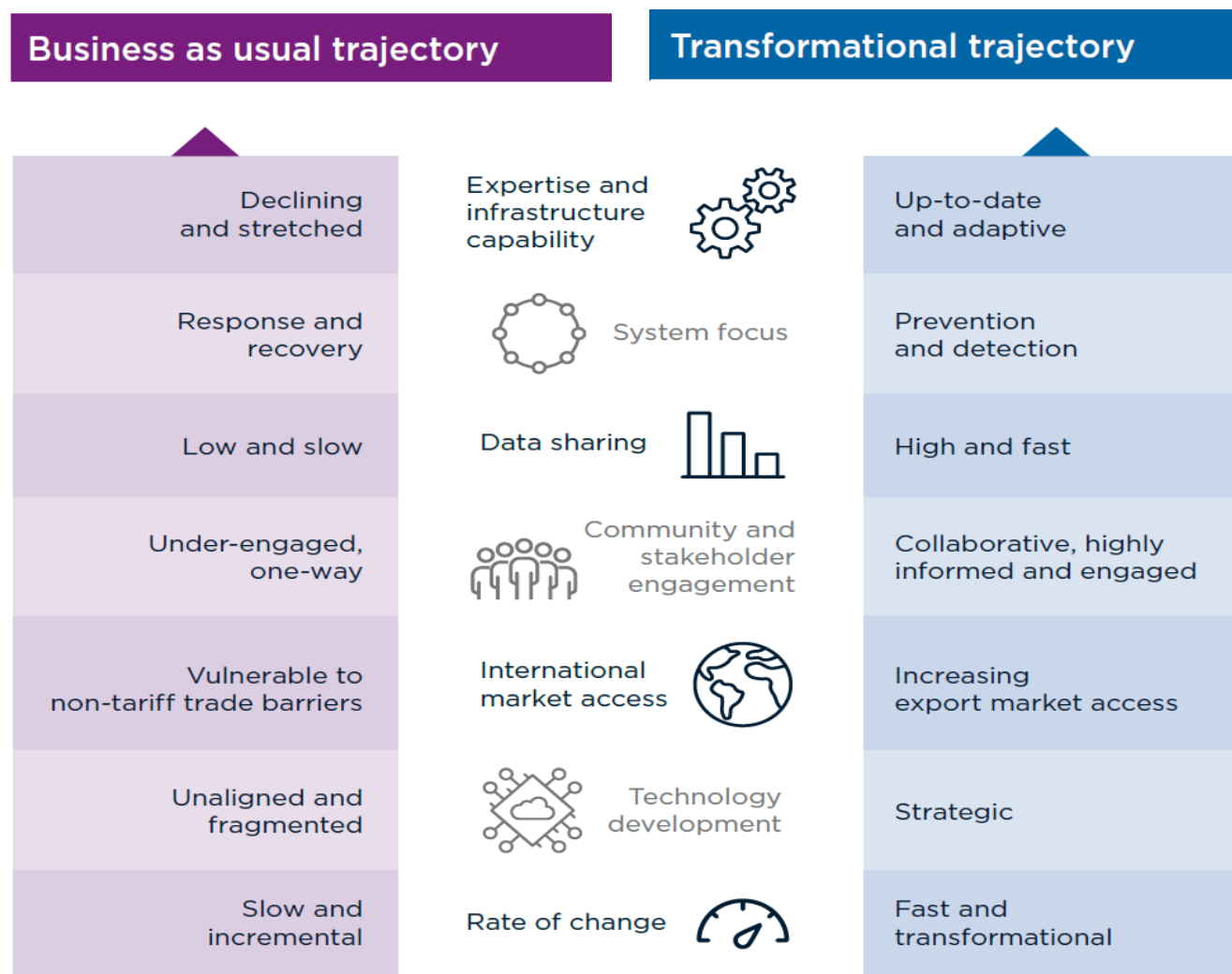


Bio-security risks to Australian agriculture are increasing – but meeting them will be a huge advantage for Australia

Indicative biosecurity incursions and cumulative burden in Australia



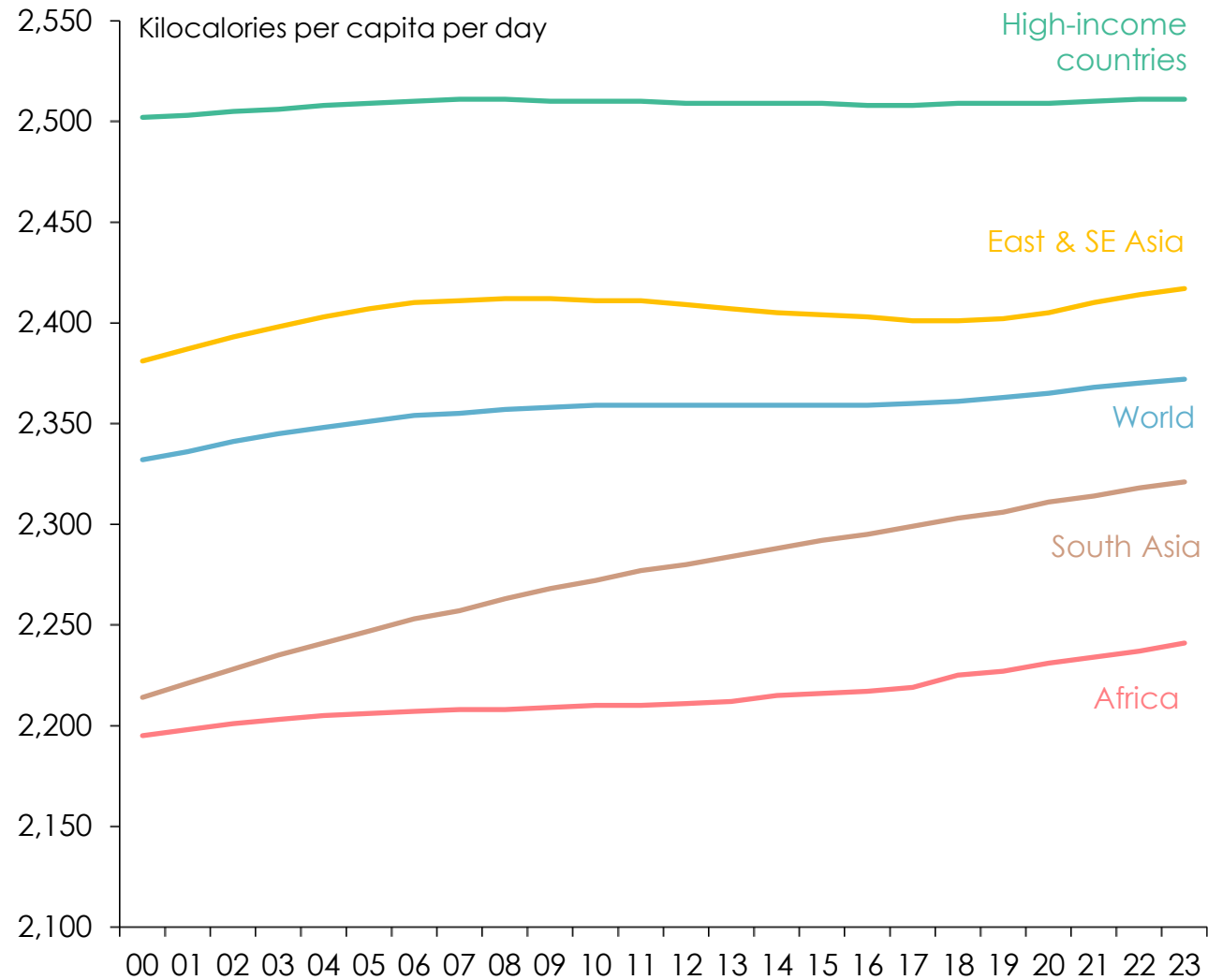
Transformational change required



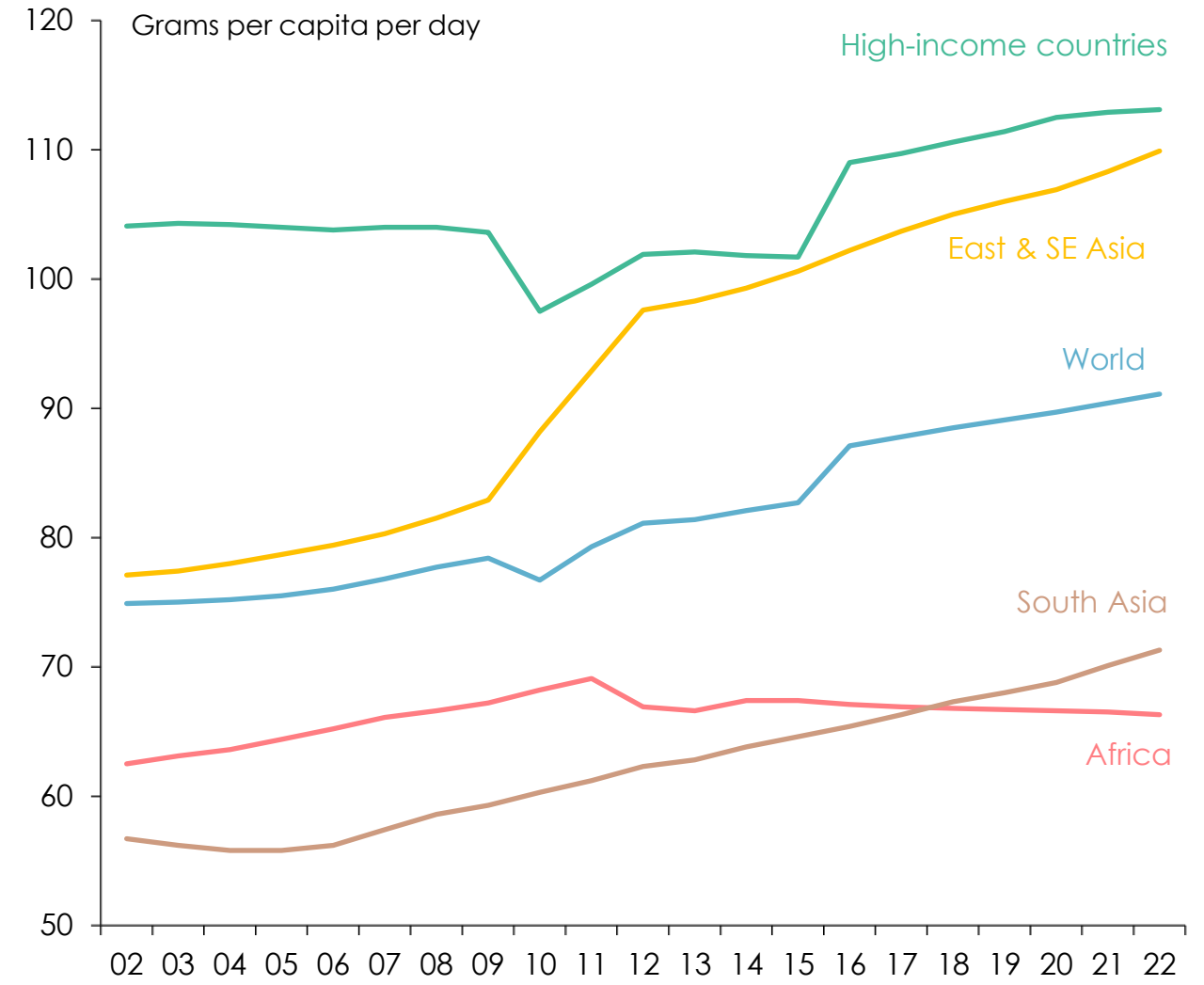
Sources: Inspector-General of Biosecurity, [Pest and disease interceptions and incursions in Australia](#), May 2019; CSIRO, [Australia's Biosecurity Future: Unlocking the next decade of resilience](#), November 2020.

Food consumption is rising and becoming more protein-intensive, especially in Asia

Average dietary energy requirements



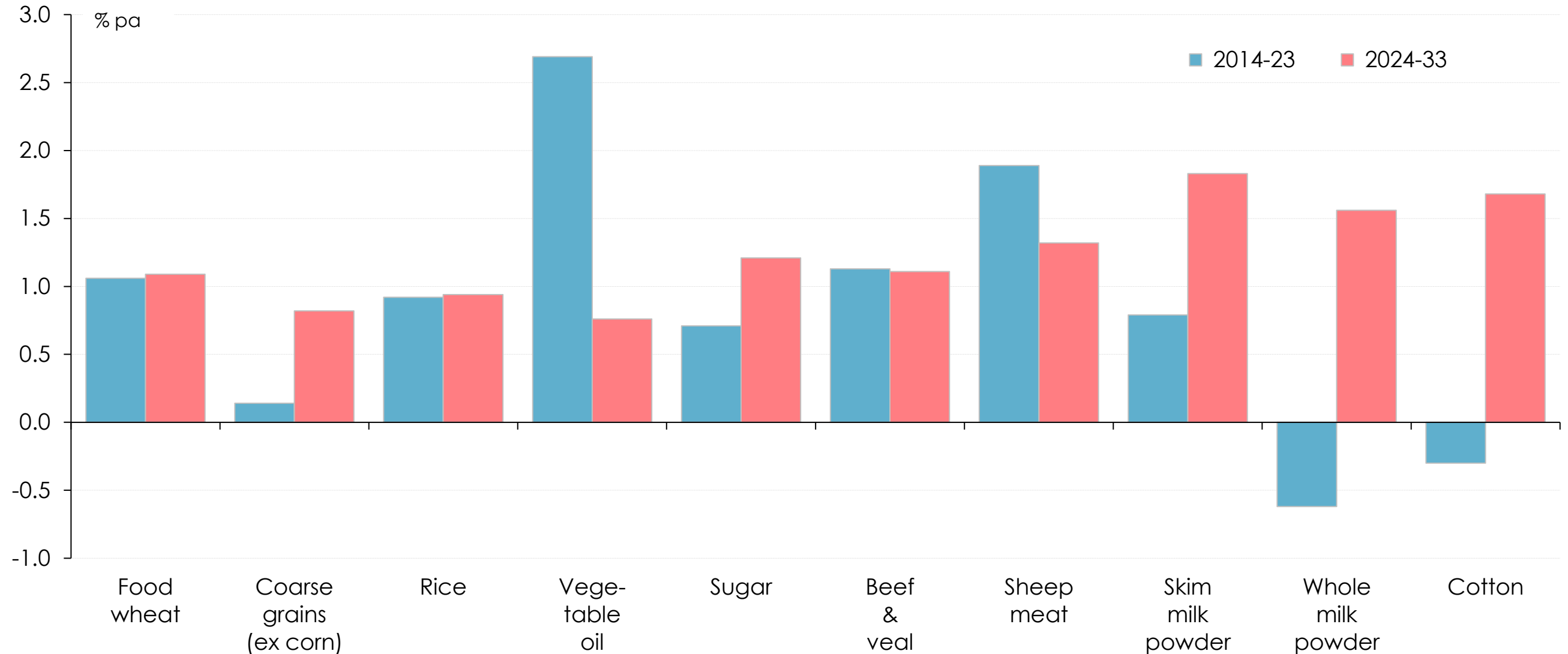
Average protein supply



Source: Food and Agricultural Organization, [FAOSTAT - Suite of Food Security Indicators](#).

Global demand for most of Australia's principal agricultural exports is expected to grow more rapidly over the next ten years than the past ten

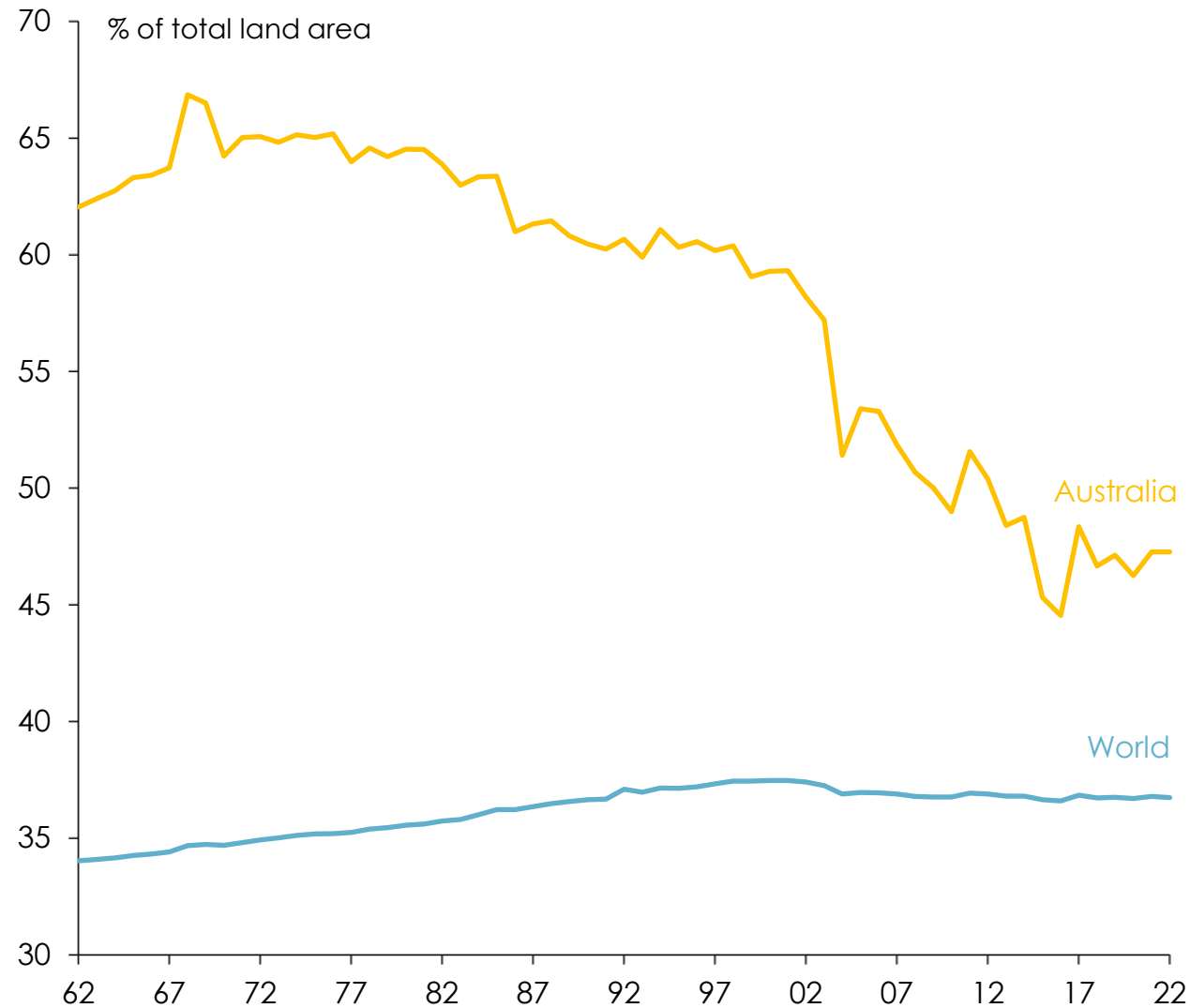
Growth in consumption of selected agricultural commodities – 2014-23 and 2024-33



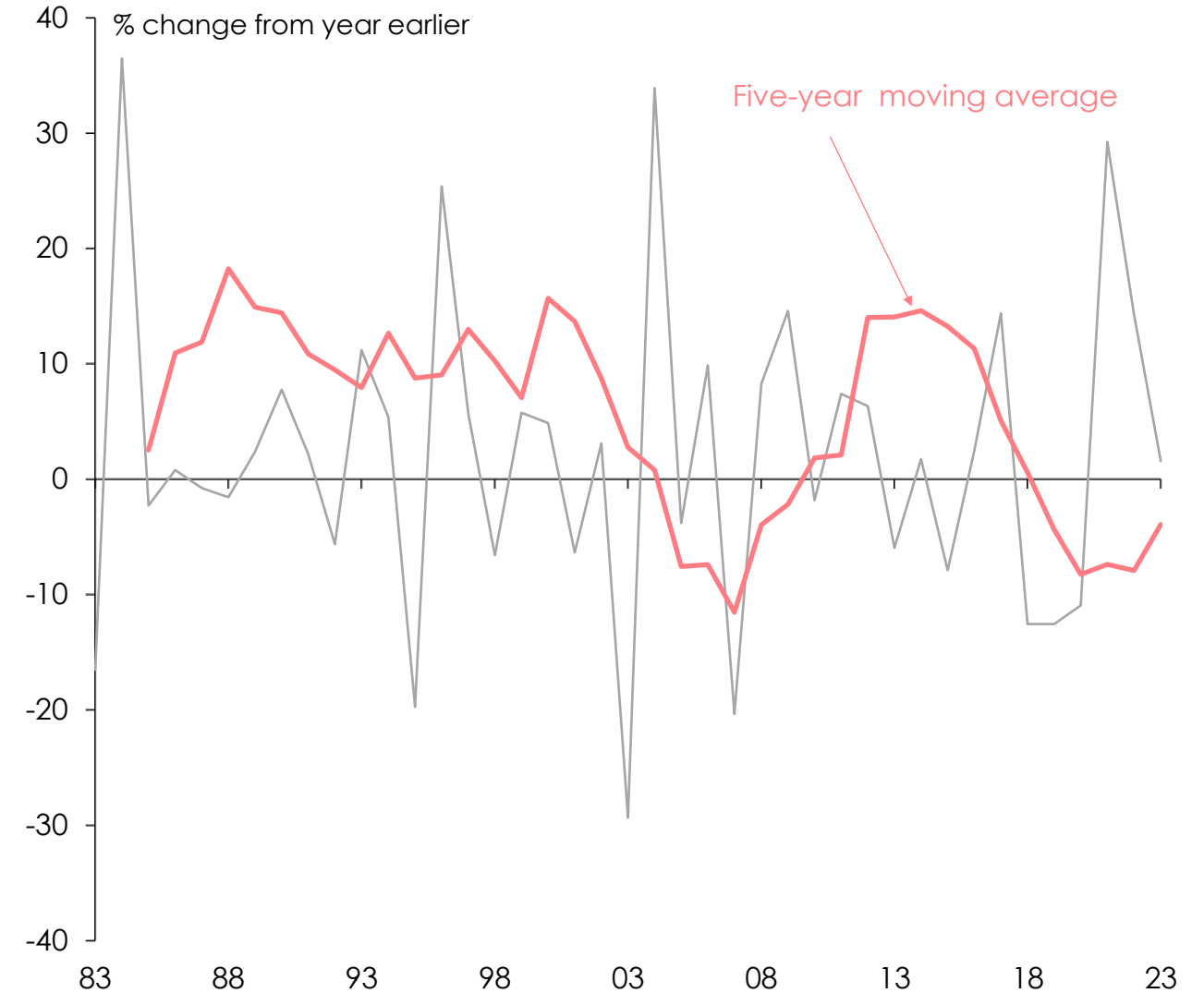
Source: Organization for Economic Co-operation & Development and Food & Agricultural Organization, [OECD-FAO Agricultural Outlook 2024-2033](#), Annex C, 2nd July 2024. Note: this publication does not include wool.

Given declining availability of land, productivity in agriculture will need to improve if Australian farmers are going to capture these opportunities

Agricultural land as a percentage of total land area



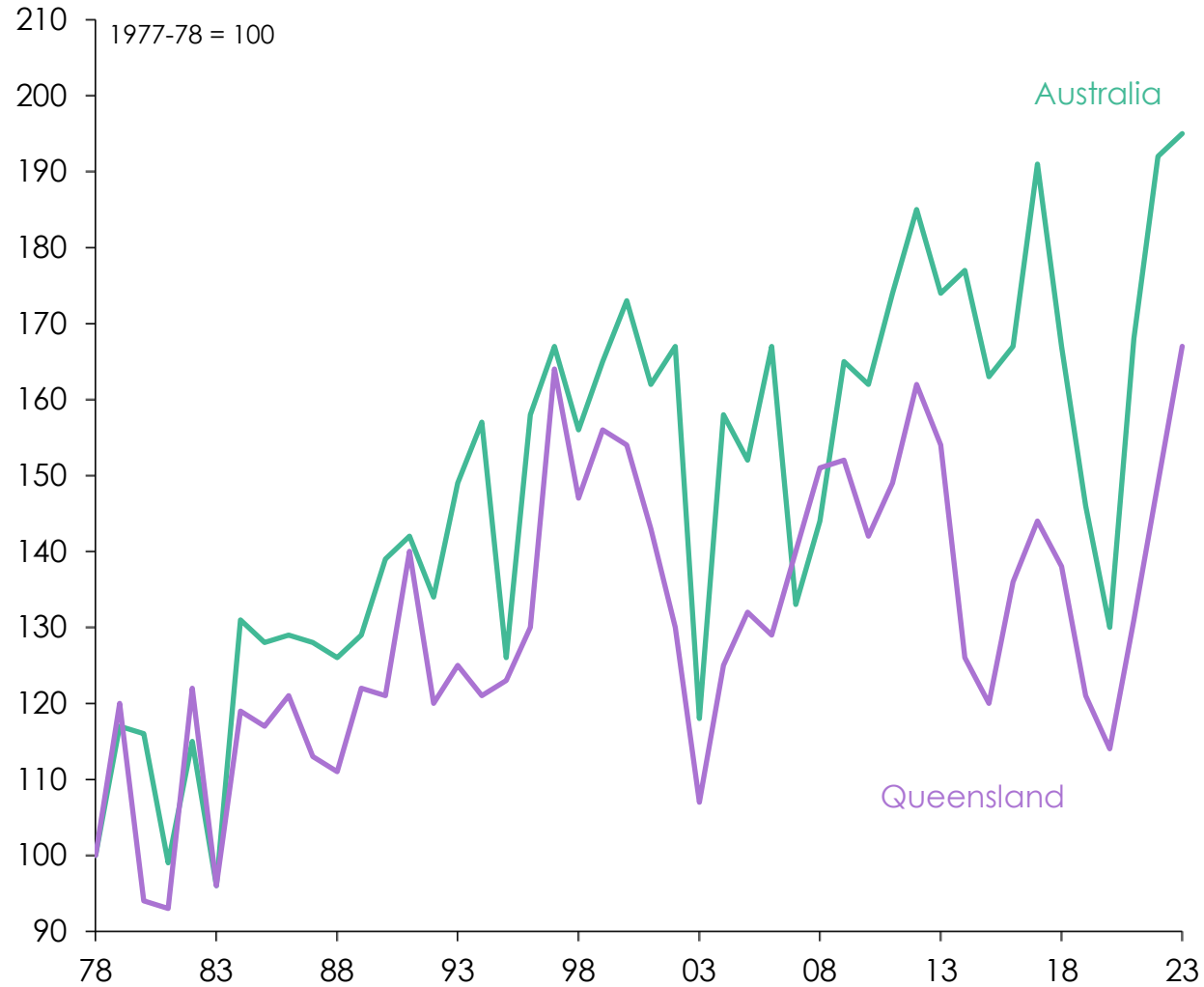
Australian broadacre total factor productivity growth



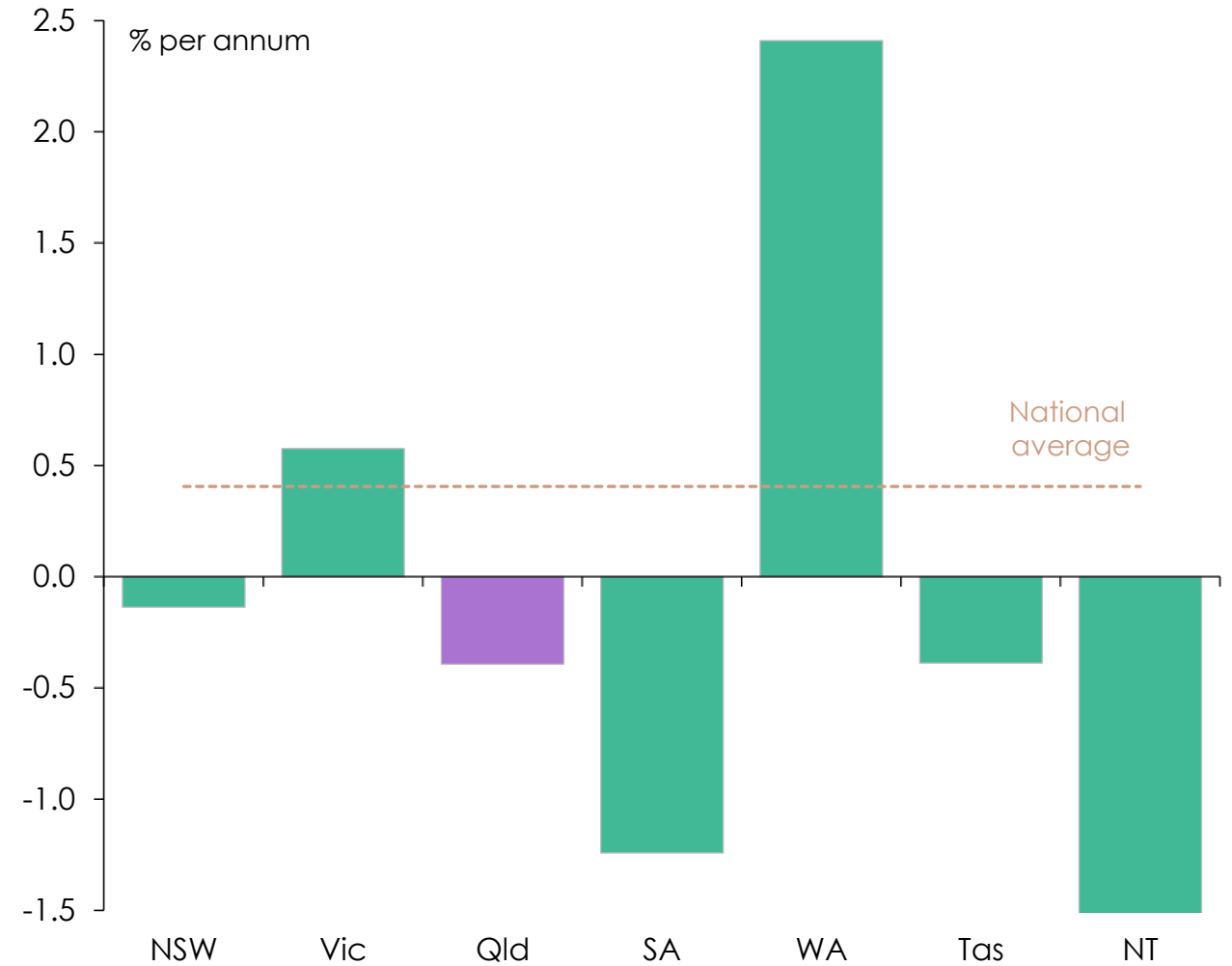
Source: Food and Agricultural Organization, [FAOSTAT - Value of agricultural production](#); Australian Bureau of Agricultural and Resources Economics and Sciences (ABARES), [Australian Farm Productivity - Broadacre and Dairy Estimates](#), 28th June 2024. 'Total factor productivity' is output (of crops, wool and livestock products) per unit of inputs (labour, capital, land, materials and services).

Productivity in Queensland agriculture has lagged behind the national average

Agriculture total factor productivity, Queensland and Australia, 1977-78 to 2022-23



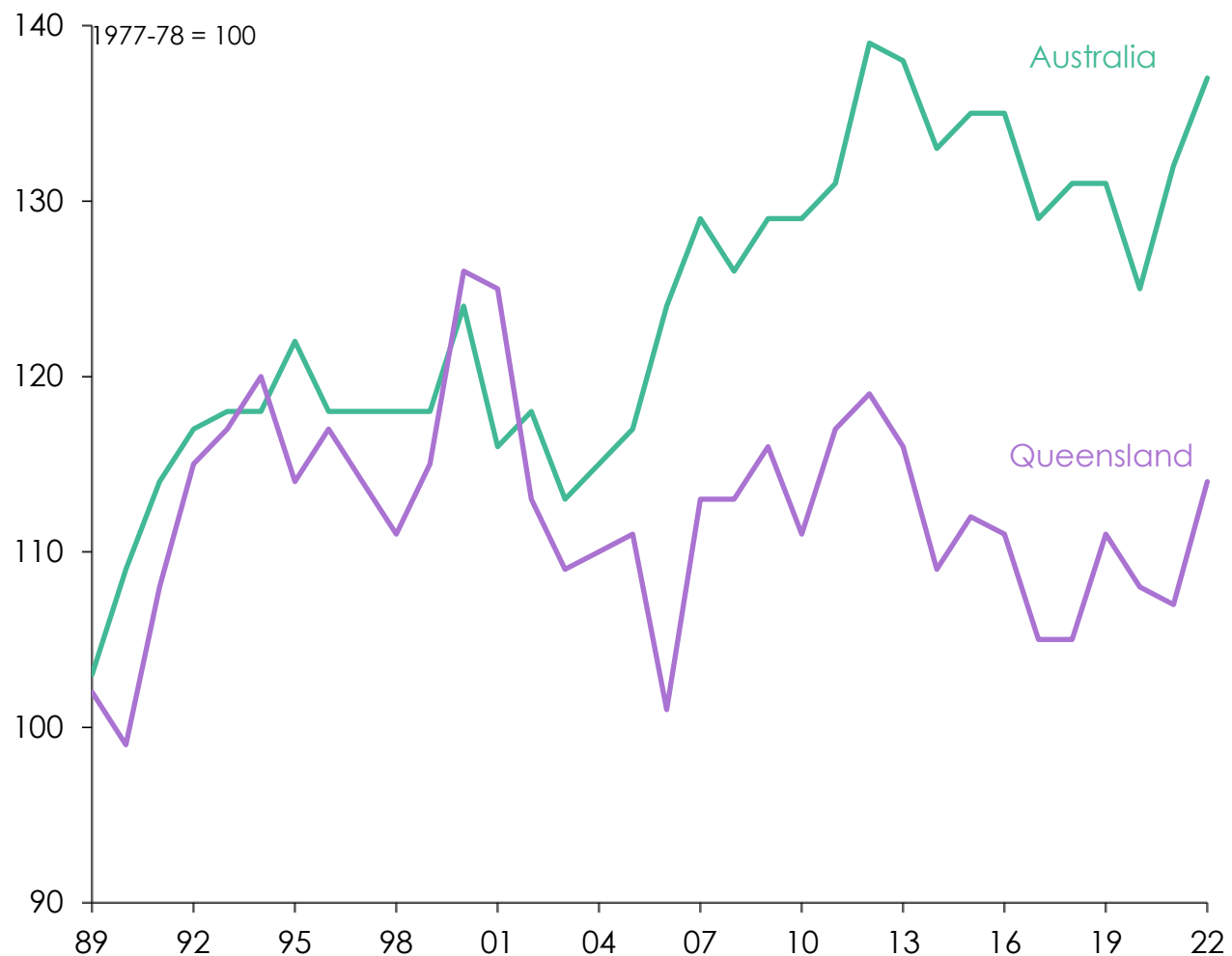
Agriculture total factor productivity growth rates, 2012-13 to 2022-23



Note: 'Total factor productivity' is output (of crops, wool and livestock products) per unit of inputs (labour, capital, land, materials and services). Productivity growth is over the period between the three years ended 2012-13 and the three years ended 2022-23. Source: Australian Bureau of Agricultural and Resources Economics and Sciences (ABARES), [Australian Farm Productivity - Broadacre and Dairy Estimates](#), 28th June 2024.

Productivity in Queensland agriculture has lagged behind the national average – even after allowing for more frequent adverse climate events

Climate-adjusted agriculture total factor productivity, Queensland and Australia, 1977-78 to 2021-22



Climate-adjusted agriculture total factor productivity growth rates, 2011-12 to 2022-23



Note: 'Climate adjusted' productivity is how productivity would look without fluctuations in short term weather and long-term climate – in other words, average long-term weather every year, derived using a machine learning simulation model developed by ABARES. Productivity growth is over the period between the three years ended 2011-12 and the three years ended 2021-22. Source: ABARES, [Australian Farm Productivity - Broadacre and Dairy Estimates](#), 28th June 2024.

Why is productivity important? And how can productivity improvements in agriculture be achieved?

“Productivity growth is essential for maintaining and improving international competitiveness and has been a means of offsetting declining real prices received for farm commodities on global markets. This is particularly important for Australian farmers, because an average of 70% of the value of Australian agricultural products are exported. Productivity growth in agriculture can also mitigate the adverse effect of other long-term challenges such as population ageing, increased competition for resources such as land and water and climate change”

– ABARES, [Productivity introduction](#), 24th May 2024

How to generate productivity growth -

❑ Innovation and technology adaptation

- to reduce labour inputs, minimize input waste and maximize output

❑ Management skill and capacity

- a comprehensive understanding of risk and reward
- an array of strategies to cope with different events
- making full use of all information available to ‘fine-tune’ farm operations continuously

❑ Farm size

- generating ‘economies of scale’ by spreading fixed costs such as management skill & machinery ownership

❑ Government policy

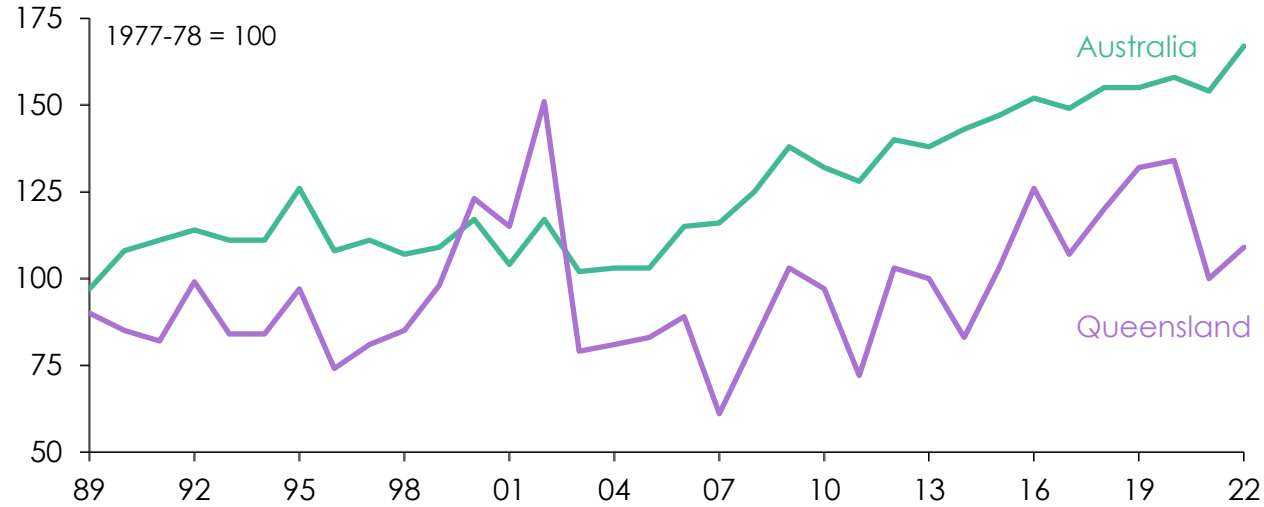
- international advocacy to open foreign markets and remove distorting subsidies
- domestic reforms to encourage the reallocation of resources from less efficient farms to more efficient ones

❑ Research and development

- ideally a blend of both private and public investment

Cropping appears to offer the greatest opportunities for productivity improvements in Queensland farming

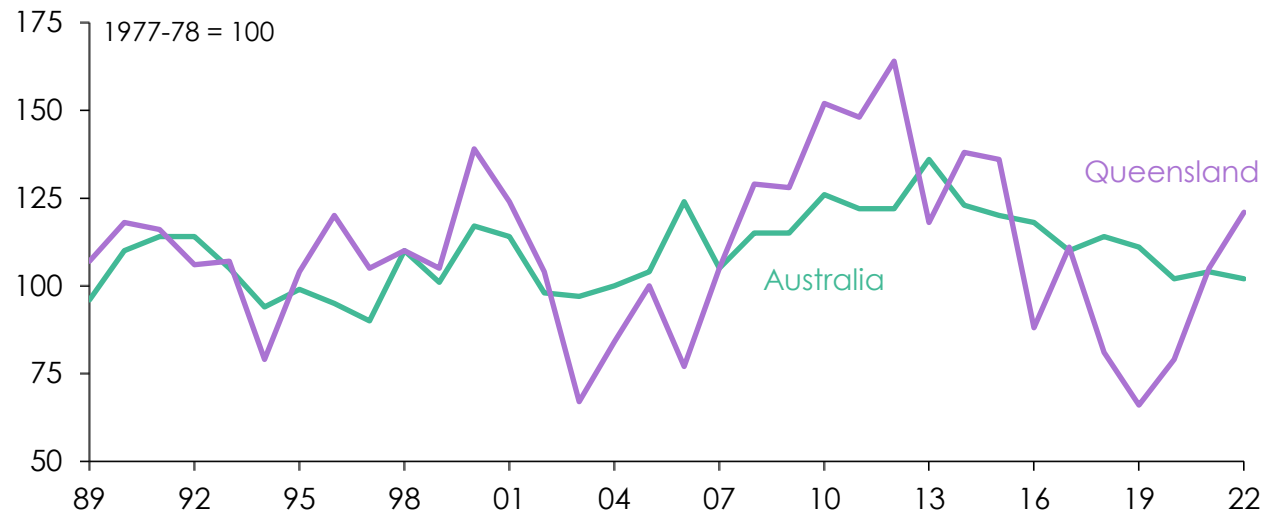
Total factor productivity - crops



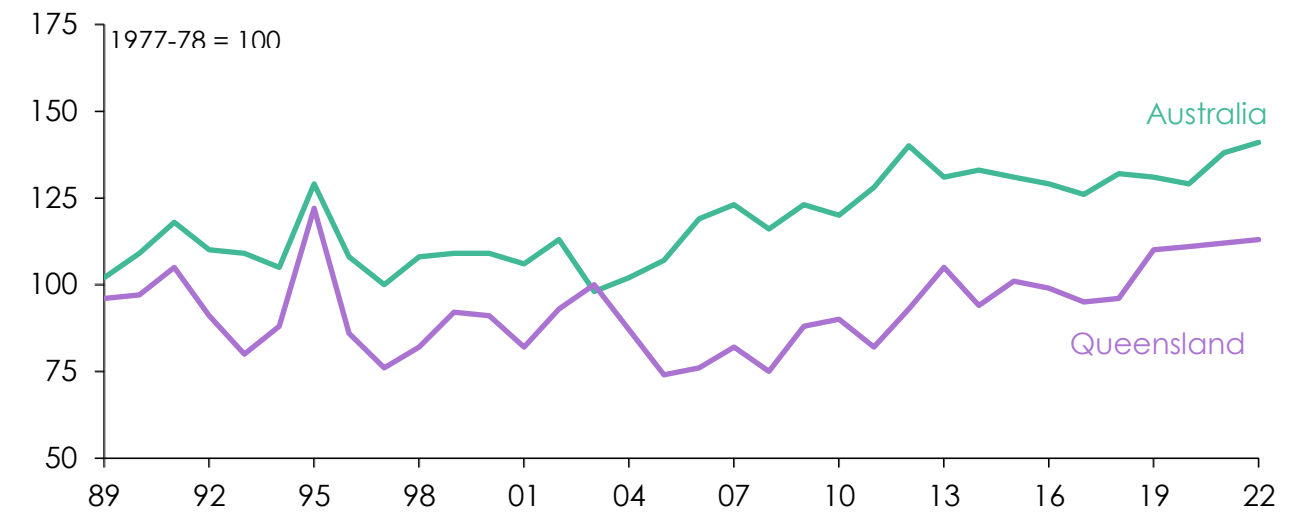
Total factor productivity – beef



Total factor productivity – sheep



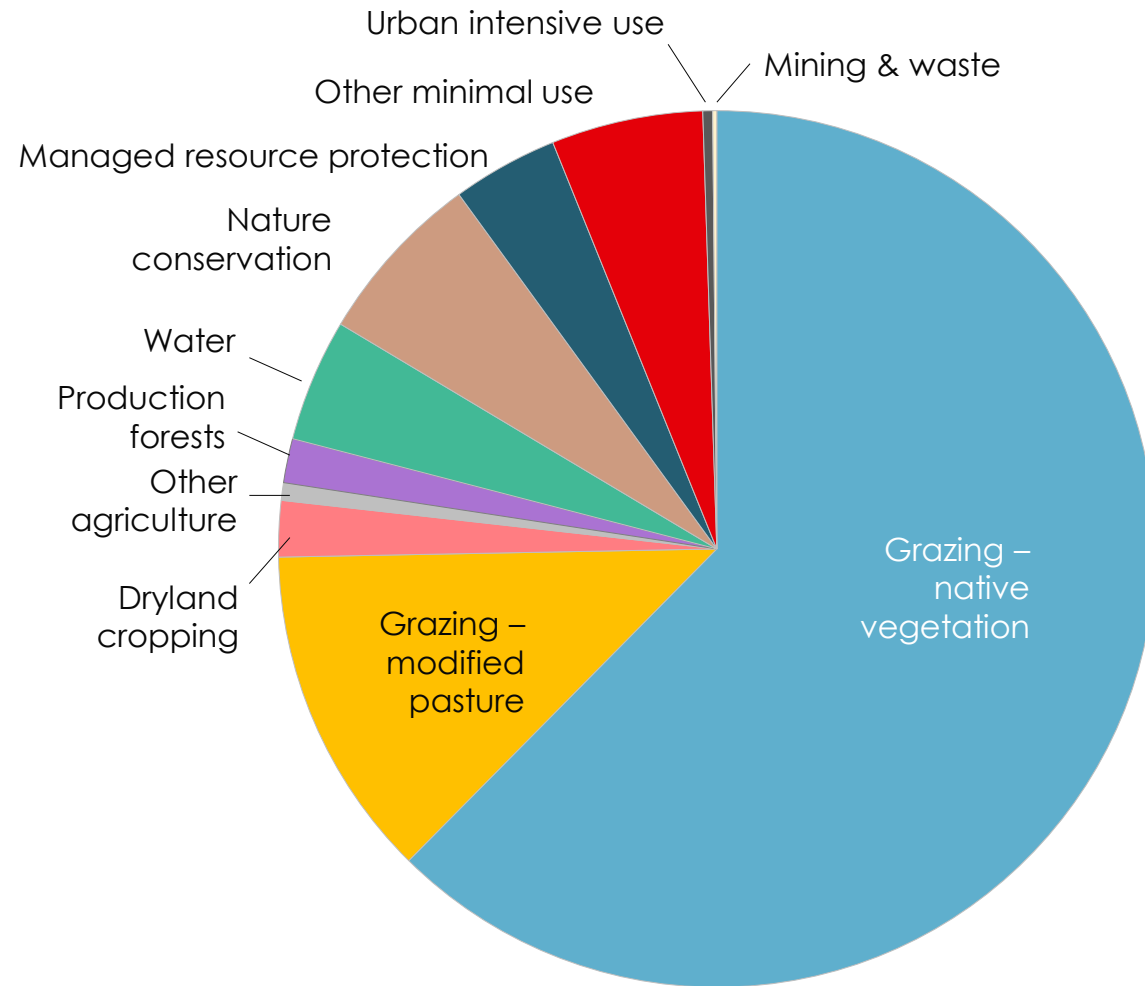
Total factor productivity – mixed crops & livestock



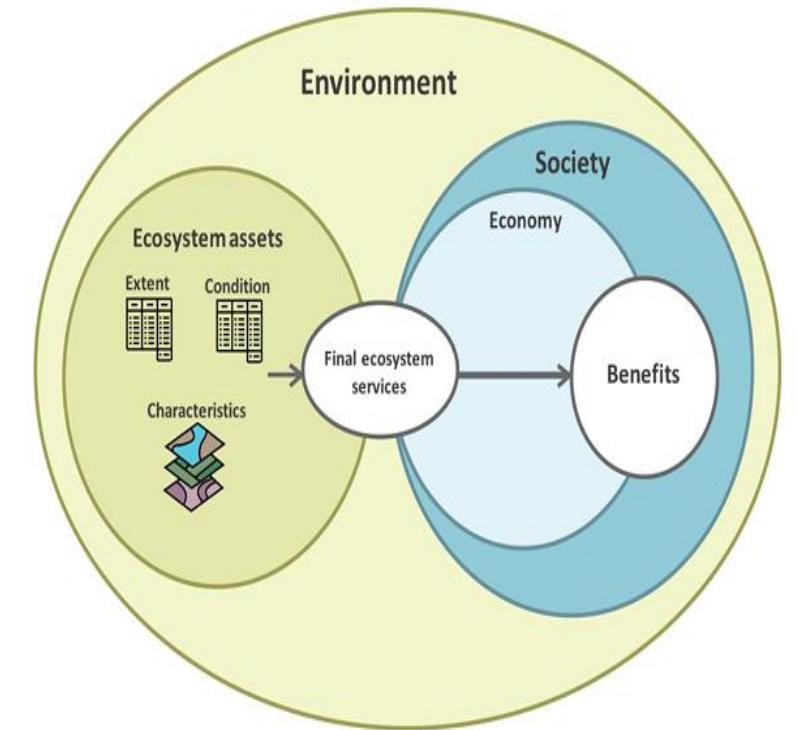
Note: Total factor productivity measures are 'Climate adjusted' as per slide 14. Source: ABARES, [Australian Farm Productivity - Broadacre and Dairy Estimates](#), 28th June 2024.

Improved information about the value of 'natural capital' will assist in making better decisions in agriculture

Land use in Queensland, 2015-16

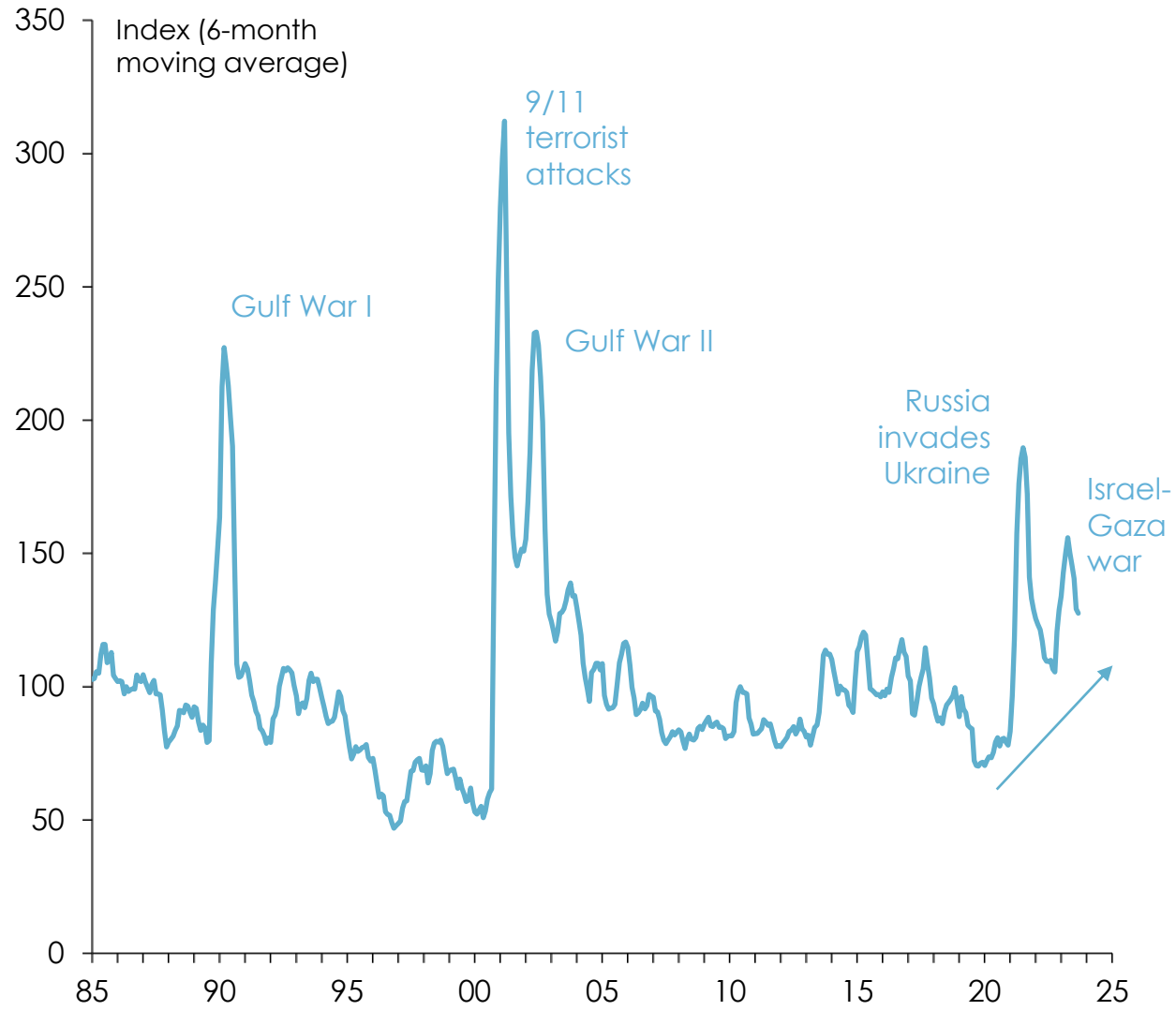


- ❑ Land is the most important 'factor of production' in agriculture
 - But we actually have very little data on the economic value of that land
- ❑ Early next year the ABS will publish Australia's first set of National Ecosystem Accounts
 - these accounts will help farmers and investors in agriculture make decisions on how to balance environmental outcomes with the need for food production
 - they will be particularly helpful in establishing the value of 'natural capital'
 - they will complement the work undertaken by AgCarE

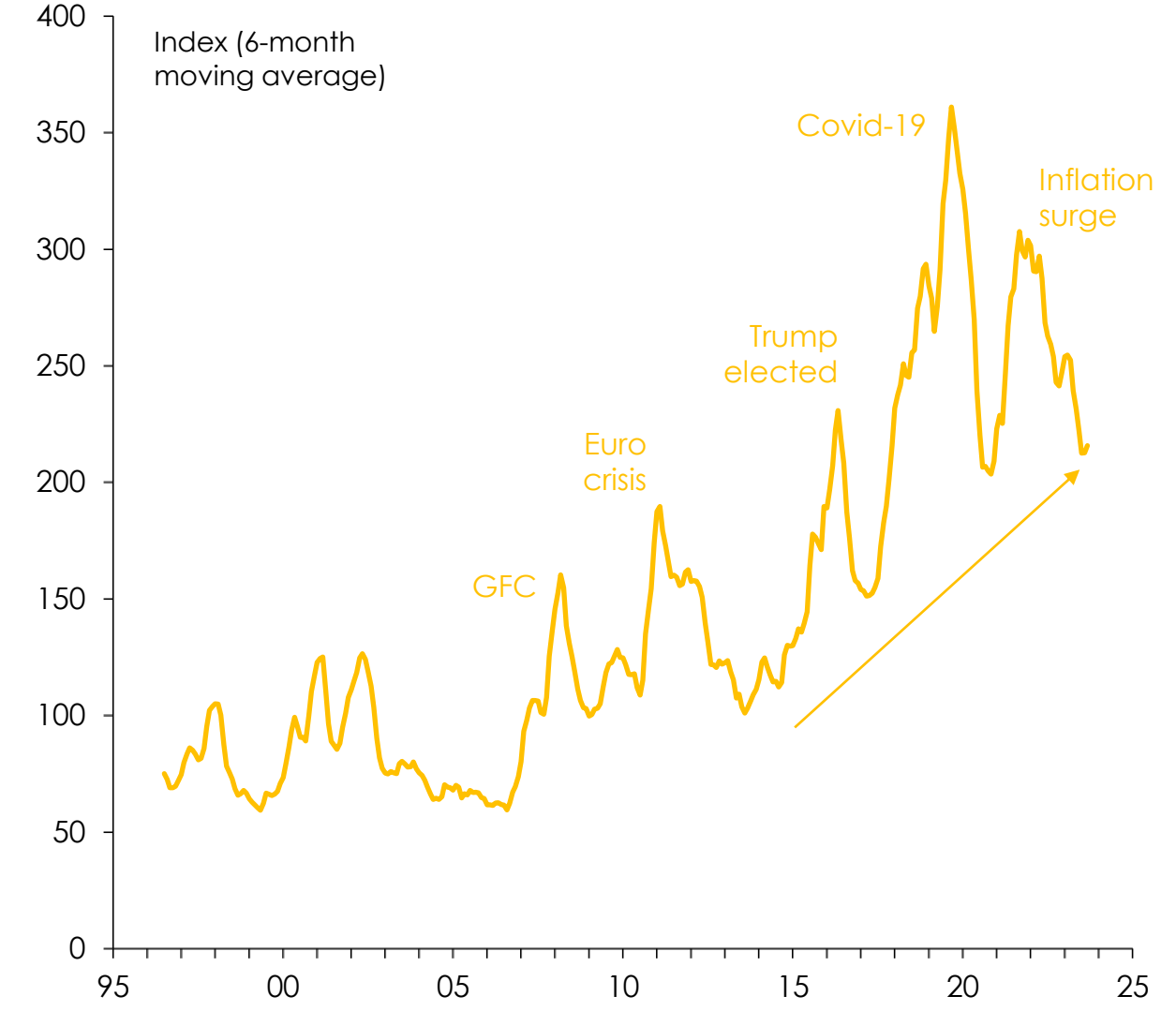


Geo-political uncertainty seems to be increasing – and that's leading to heightened uncertainty about economic policies

Geo-political risk index



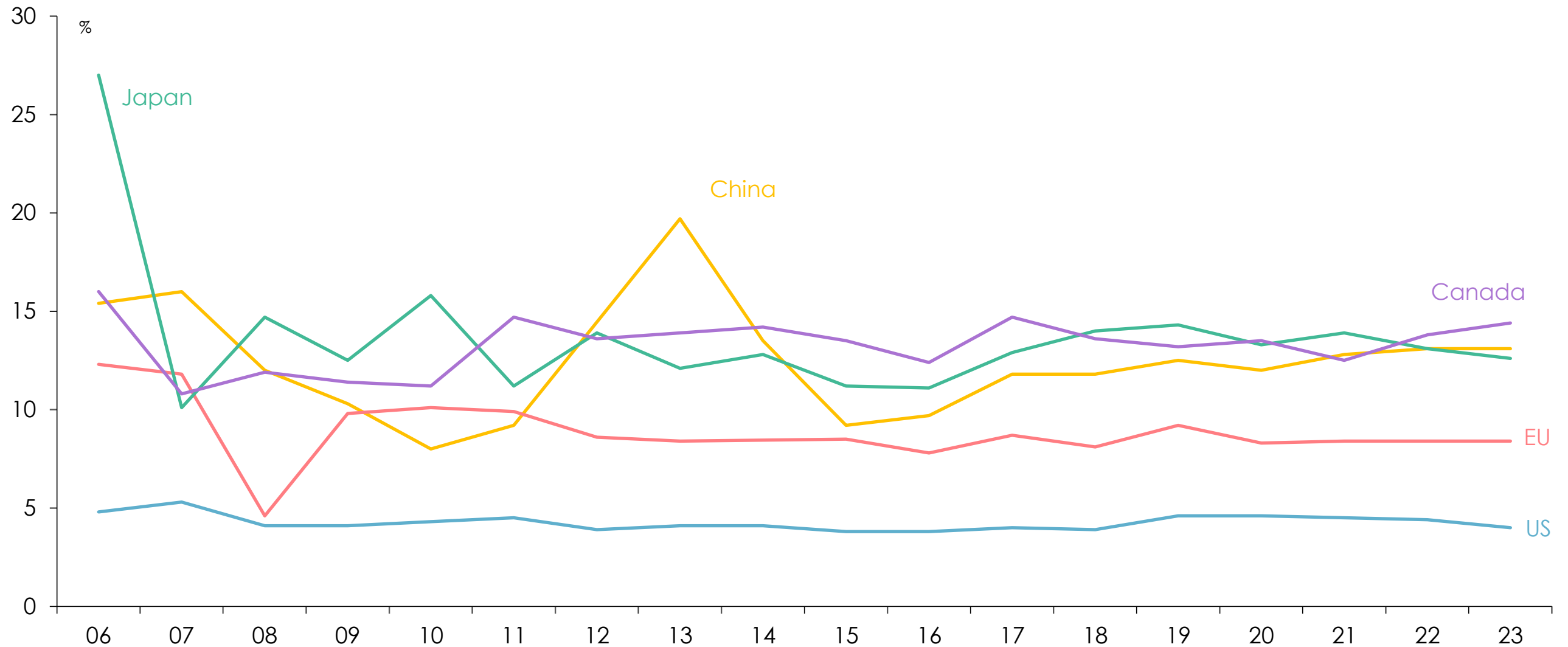
Economic policy uncertainty index



Note: The Geopolitical Risk Index is derived from text-search results of the electronic archives of ten (English-language) newspapers for mentions of eight different categories of adverse geo-political events. The Economic Policy Uncertainty Index is a GDP-weighted average of indices for 21 countries derived from newspaper articles mentioning the economy, policy and uncertainty. Sources: Dario Caldara and Matteo Iacoviello, [Geopolitical Risk Index](#) and [Global Economic Policy Uncertainty Index](#).

Tariffs on Australia's agricultural exports have begun to creep up – and could rise a lot further if Donald Trump returns to the White House

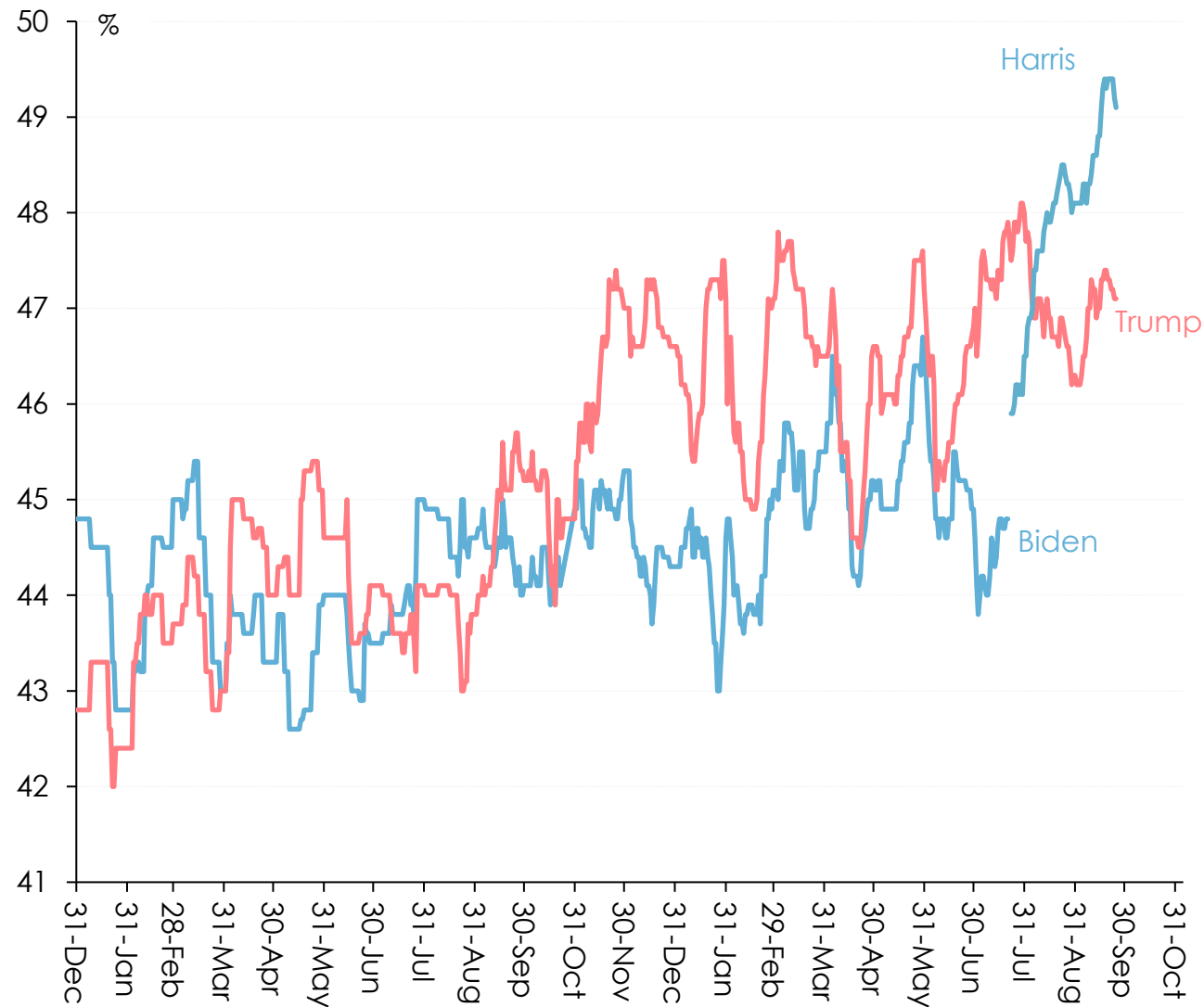
Trade-weighted average tariffs on Australian agricultural exports



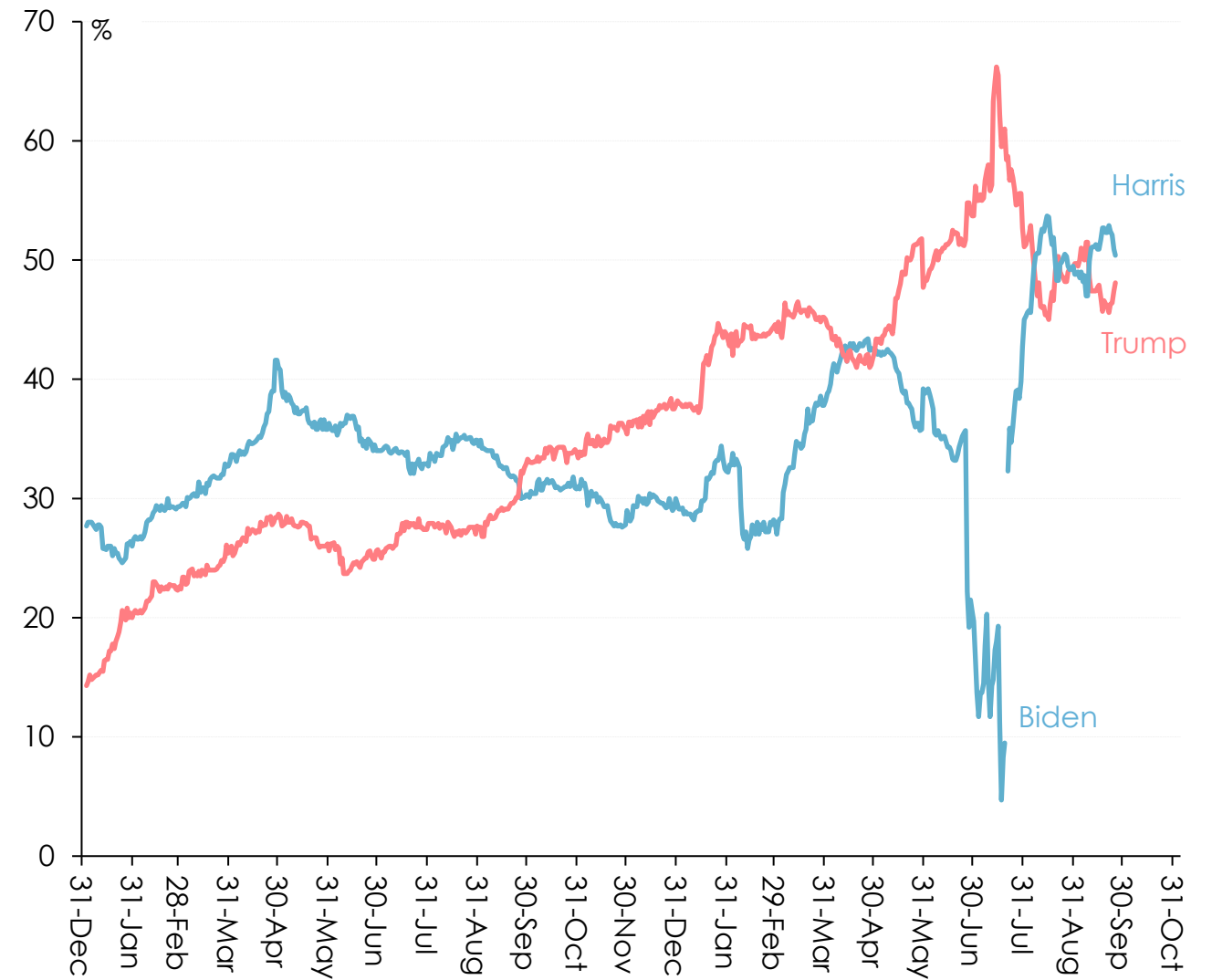
Note: Products included are animal products, dairy products, cereals and preparations, sugars and confectionary, cotton and other agricultural products.
Source: World Trade Organization, [WTO Stats](#).

Opinion polls and betting markets put Kamala Harris ahead of Donald Trump – but not by a big enough margin to win in the Electoral College

Opinion poll averages for 2024 Presidential election



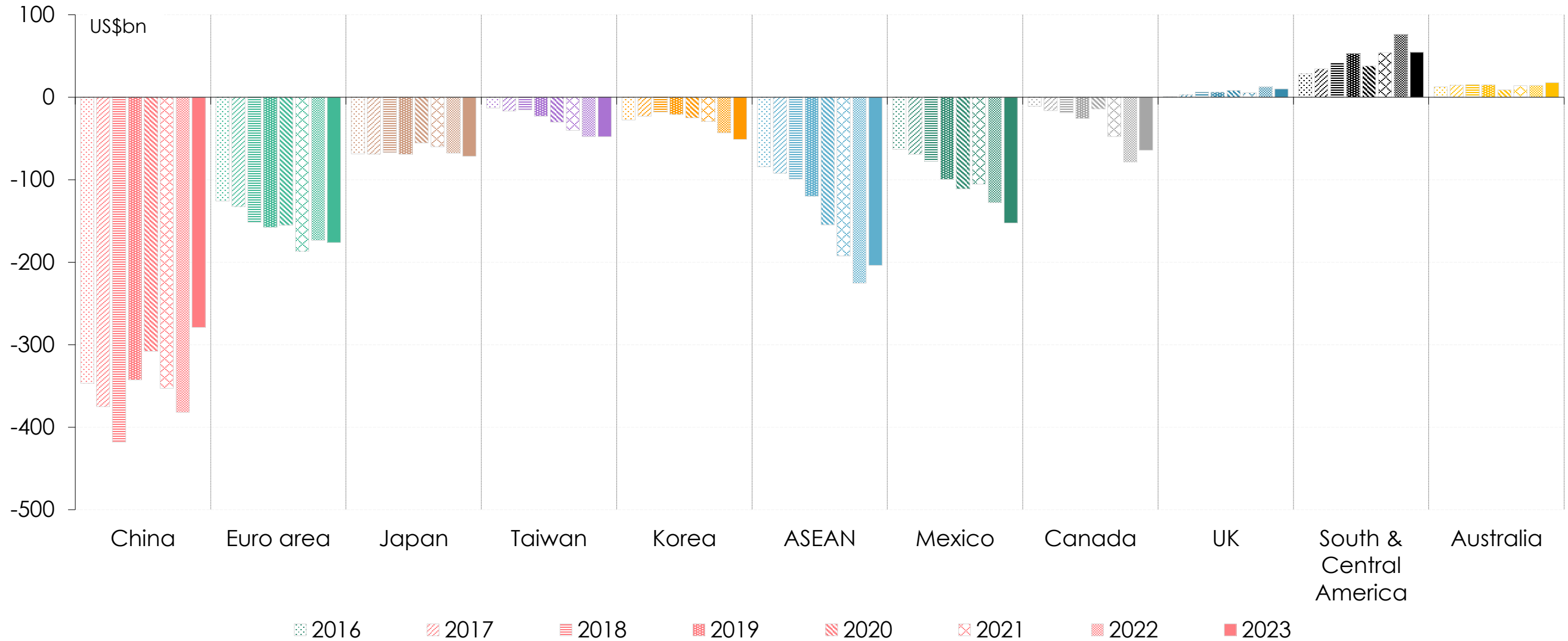
Betting odds for 2024 Presidential election



Source: [Real Clear Politics](#).

Trump's and Biden's anti-China tariffs have redistributed rather than reduced the US trade deficit – but the US still runs trade surpluses with Australia

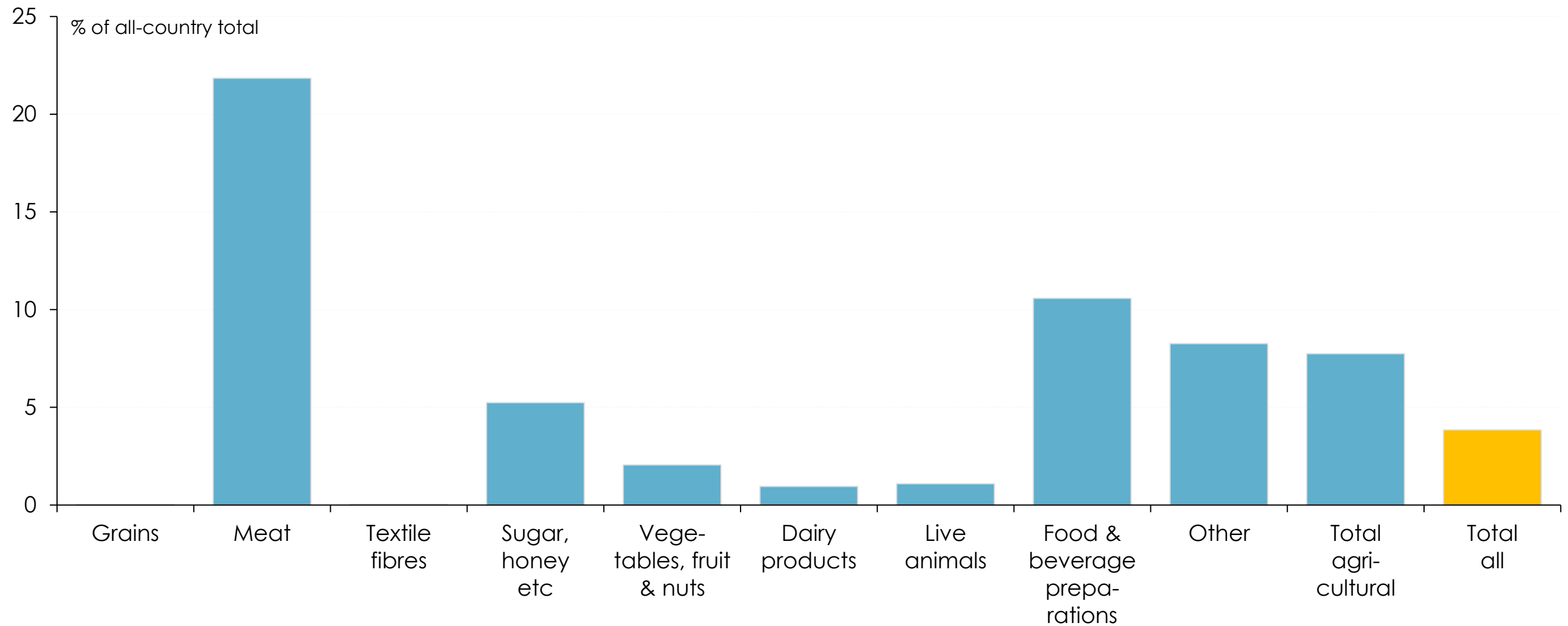
US trade balances with selected trading partners, 2016-2023



Source: US Census Bureau, [USA Trade Online](https://www.usa-trade.com/).

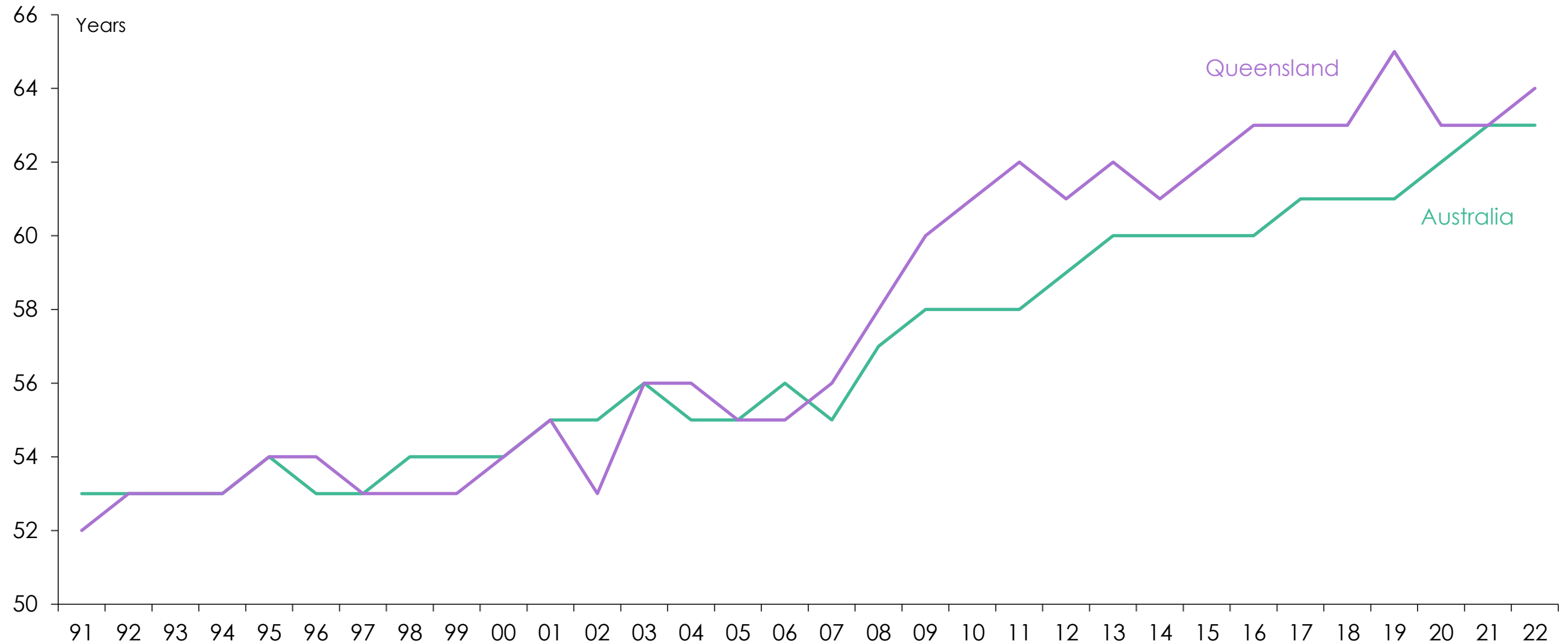
Despite US trade barriers to imports of some products, the US remains an important market for Australian agricultural exports (in particular meat)

Exports to the US as a pc of total Australian exports, 2023



Farmers are getting older – more so in Queensland than in other states – at a faster rate than the population as a whole

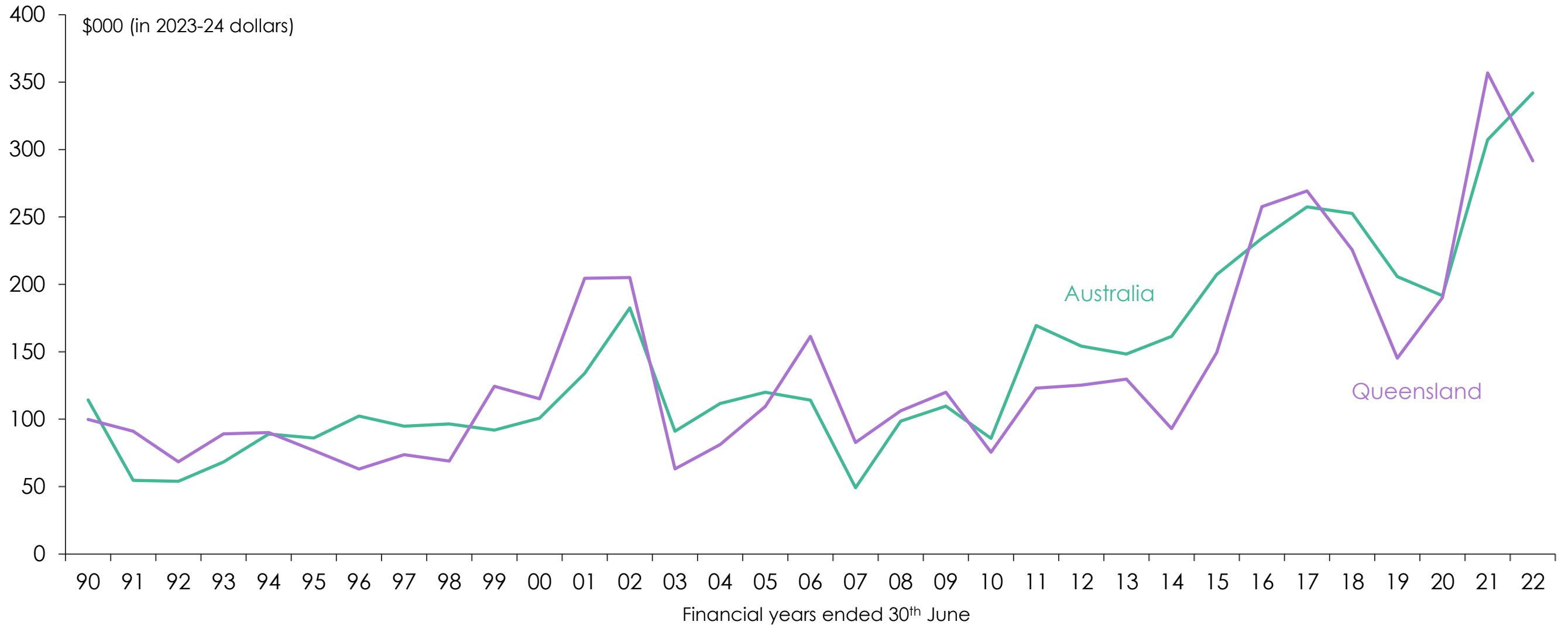
Average age of Australian and Queensland farm owner-operators



Source: Australian Bureau of Agricultural and Resources Economics and Sciences (ABARES), [Farm Data Portal](#).

For all the challenges and tribulations farmers face, they are making good (albeit volatile) incomes

Average cash income of Australian and Queensland farms



Source: Australian Bureau of Agricultural and Resources Economics and Sciences (ABARES), [Farm Data Portal](#).

Conclusion

- ❑ **There's a bright future for agriculture in Australia, and in Queensland**
 - global demand for Australia's and Queensland's agricultural products is likely to continue growing
 - Australia, and Queensland, have some significant comparative advantages in meeting that demand

- ❑ **But that future won't be realized without hard work**
 - reducing emissions
 - managing bio-security risks
 - meeting consumer expectations for product authenticity and environmental standards
 - improving productivity
 - overcoming potentially adverse geo-political trends
 - coping with volatile prices
 - attracting new generations into the industry

Important information

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