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Foreword

This Survey is published on the responsibility of the Economic and Development Review Committee of the OECD, which is charged with the examination of the economic situation of member countries.

The economic situation and policies of Australia were reviewed by the Committee on 19 September 2023, with participation of representatives of the Australian authorities. The draft report was then revised in the light of the discussions and given final approval as the agreed report of the whole Committee on 11 October 2023. The Secretariat's draft report was prepared for the Committee by Ben Westmore and Álvaro Leandro under the supervision of Sebastian Barnes. Statistical research assistance was provided by Lutécia Daniel, and editorial support by Elodie Lormel. Support from the government of Australia is gratefully acknowledged. The previous Survey of Australia was issued in September 2021.

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Basic Statistics of Australia, 2022*

(Numbers in parentheses refer to the OECD average)**

LAND, PEOPLE AND ELECTORAL CYCLE					
Population	26,0		Population density per km²	3,4	(38,8)
Under 15	18,2	(17,2)	Life expectancy at birth (years, 2021)	83,3	(78,7)
Over 65	16,9	(18,0)	Men (2021)	81,3	(75,9)
International migrant stock (% of population, 2019)	30,0	(13,2)	Women (2021)	85,4	(81,7)
Latest 5-year average growth (%)	1,1	(0,4)	Latest general election	May-2022	
ECONOMY					
Gross domestic product (GDP)			Value added shares		
In current prices (billion USD)	1.702,6		Agriculture, forestry and fishing	3,4	(2,8)
In current prices (billion AUD)	2 451,1		Industry including construction	29,8	(28,3)
Latest 5-year average real growth (%)	2,3	(1,7)	Services	66,8	(68,8)
Per capita (thousand USD PPP)	66,5	(57,4)			
GENERAL GOVERNMENT Per cent of GDP					
Expenditure (OECD: 2021)	37,4	(45,9)	Gross financial debt (OECD 2021)	56,8	(106,7)
Revenue (OECD: 2021)	35,6	(38,6)	Net financial debt (OECD 2021)	2,6	(68,5)
EXTERNAL ACCOUNTS					
Exchange rate (AUD per USD)	1,44		Main exports (% of total merchandise exports)		
PPP exchange rate (USA = 1)	1,42		Mineral fuels, lubricants and related materials	42,6	
In per cent of GDP			Crude materials, inedible, except fuels	31,6	
Exports of goods and services	27,4	(33,4)	Food and live animals	9,0	
Imports of goods and services	21,6	(34,8)	Main imports (% of total merchandise imports)		
Current account balance	1,0	(-1,0)	Machinery and transport equipment	37,1	
Net international investment position	-35,1		Mineral fuels, lubricants and related materials	15,0	
			Miscellaneous manufactured articles	14,0	
LABOUR MARKET, SKILLS AND INNOVATION					
Employment rate (aged 15 and over,%)	64,2	(57,5)	Unemployment rate, Labour Force Survey (aged 15 and over, %)	3,7	(5,0)
Men	68,4	(65,4)	Youth (aged 15-24, %)	8,2	(10,9)
Women	60,0	(50,1)	Long-term unemployed (1 year and over, %, 2021, OECD 2022)	1,0	(1,2)
Participation rate (aged 15 and over, %)	66,6	(60,9)	Tertiary educational attainment (aged 25-64, %)	51,5	(40,7)
Average hours worked per year	1 707	(1 752)	Gross domestic expenditure on R&D (% of GDP, 2019, OECD: 2020)	1,8	(3,0)
ENVIRONMENT					
Total primary energy supply per capita (toe)	5,2	(3,8)	CO_2 emissions from fuel combustion per capita (tonnes, 2021)	14,7	(7.9)
Renewables (%)	8,8	(12,0)	Water abstractions per capita (1 000 m³, 2021)	0,6	
Exposure to air pollution (more than 10 µg/m³ of PM 2.5, % of population, 2019)	0,0	(61,7)	Municipal waste per capita (tonnes, 2019, OECD: 2020)	0,5	(0,5)
SOCIETY					
Income inequality (Gini coefficient, 2020, OECD: latest available)	0,318	(0,315)	Education outcomes (PISA score, 2018)		
Relative poverty rate (%, 2020, OECD: 2019)	12,6	(11,4)	Reading	503	(485)
Median disposable household income (thousand USD PPP, 2020, OECD: 2019)	35,5	(27,4)	Mathematics	491	(487)
Public and private spending (% of GDP)			Science	503	(487)
Health care	10,0	(9,3)	Share of women in parliament (%)	38,4	(32,5)
Pensions (2019)	9,0	(9,5)	Net official development assistance (% of GNI, 2017)	0,2	(0,4)
Education (% of GNI, 2021)	5,0	(4,4)			

* The year is indicated in parenthesis if it deviates from the year in the main title of this table.
**. Where the OECD aggregate is not provided in the source database, a simple OECD average of latest available data is calculated where data exist for at least 80% of member countries.
Source: Calculations based on data extracted from databases of the following organisations: OECD, International Energy Agency, International Labour Organisation, International Monetary Fund, United Nations, World Bank.

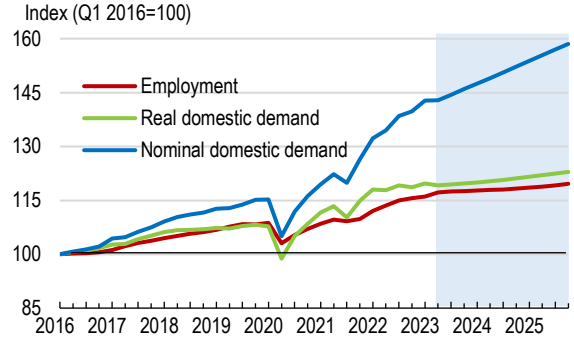
Executive summary

Growth is slowing as the economy rebalances

The economy is slowing amid tightening financial conditions, following a rapid post-pandemic recovery. To bring inflation down, monetary policy will need to remain restrictive and further windfall government revenues from elevated commodity prices saved.

The economic recovery from the pandemic was faster than in other major economies. Accommodative macroeconomic policies and higher commodity export prices helped real domestic demand rebound to its pre-pandemic trend by mid-2022 (Figure 1). However, coupled with supply constraints, the rapid demand recovery has contributed to macroeconomic imbalances, with labour shortages in key sectors. While inflation has peaked, price pressures have broadened from manufactured goods, food and energy to services.

Figure 1. Economic growth recovered strongly



Source: OECD Economic Outlook Database.

StatLink https://stat.link/9vmk5z

Monetary policy has tightened significantly in response to higher inflation. The official policy rate has increased by 4 percentage points since May 2022 and unconventional monetary policy support measures are unwinding. The banking sector is well-capitalised and appears adequately prepared for any further rise in defaults. With underlying inflation still significantly above the target band, a restrictive stance of monetary policy remains appropriate. Further tightening may be needed if inflation proves more persistent than anticipated.

The fiscal balance has improved due to a period of high commodity prices, the strong labour market and inflation. However, fiscal deficits at the federal government level are projected to re-emerge in the coming years. This partly reflects spending on the National Disability Insurance Scheme, which is expected to be a significant source of cost pressure. Some further narrowing of the fiscal deficit is warranted, which can be partly enabled through saving further windfall government revenues. Introducing tangible measures to slow growth in the costs of the National Disability Insurance Scheme would support deficit reduction.

OECD projections envisage subdued economic growth in the coming years (Table 1). High interest rates and cost of living pressures will dampen spending by households. Strong population growth and higher exports will partly offset these headwinds. The unemployment rate is projected to rise to 4.4 per cent in 2025 and inflation is expected to further moderate. A sharper than expected slowdown in China is a downside risk to economic growth.

Table 1. Macroeconomic projections

Annual average growth	2022	2023	2024	2025
Gross domestic product (GDP)	3.7	1.8	1.3	1.8
Unemployment rate	3.7	3.7	4.2	4.4
Core inflation index	5.9	5.9	3.3	2.8
Gen. gov. gross debt (% GDP)	56.8	57.8	59.3	60.6

Source: OECD.

Fiscal buffers need to be rebuilt

Public debt has increased over recent decades. Tax and spending reforms are needed, along with measures that ensure a robust fiscal framework, given substantial fiscal pressures ahead.

The public debt to GDP ratio has increased by over 30 percentage points since 2010, partly owing to weak commodity prices in the mid-2010s and the costs of the pandemic. There has been a substantial rise in the debt ratio of both the federal government and several state governments over the period. Looking forward, annual fiscal costs from health and long-term care are estimated to increase by 0.8% of GDP between 2023 and 2040. Some of these costs will fall on the states given their responsibility for funding hospitals and ambulance services. Spending pressures not yet built into budgets will also arise from the climate transition and adapting to the physical effects of climate change. Against this backdrop, there is a need to ensure the robustness of state and territory fiscal frameworks and improve mechanisms for fiscal dialogue between levels of government.

Tax reforms can allow rising fiscal costs to be accommodated. Revenue should be raised through reducing exemptions in the goods and services tax base and consideration should be given to raising the rate. To offset any regressive effects, compensation to low-income households should be provided. In addition, further reducing tax concessions on private pensions would more closely align their tax treatment with that of other forms of saving and raise revenues.

There are also potential savings on the spending side. Encouraging more patient care in primary care settings and preventive health policies can reduce public spending growth as the population ages. Designing more effective policies related to Indigenous Australians is also a priority. An important element will be implementing the changes to government under the Closing the Gap Agreement, requiring Indigenous Australians to be incorporated in decision-making processes for policies related to them.

Ongoing structural changes require an adaptable economy

As the population ages and the economy is shaped by global forces including the climate transition and digitalisation, policies must promote an adaptable labour force and business sector.

Immigration will continue to play a key role in the labour market. However, the composition of the skilled migrant intake needs to be more responsive to changes in the skill needs of industry, including through better use of timely and granular data, analysis and the views of employers.

Education policies can also ensure that the workforce has strong foundational skills that can easily adapt to structural changes. Standardised test scores for Australian students have stagnated or declined. Teaching hours are high compared to other OECD countries and administrative tasks consume a large amount of teachers' time. A straightforward improvement would be providing all teachers with access to high-quality and evidence-based curriculum resources.

Land use policies will need to be less prescriptive about the activities that can occur in each location. Greater flexibility in zoning systems would improve the ability of new businesses to enter and grow in desirable locations. They could also benefit residential housing supply through enabling an increase in the density of housing.

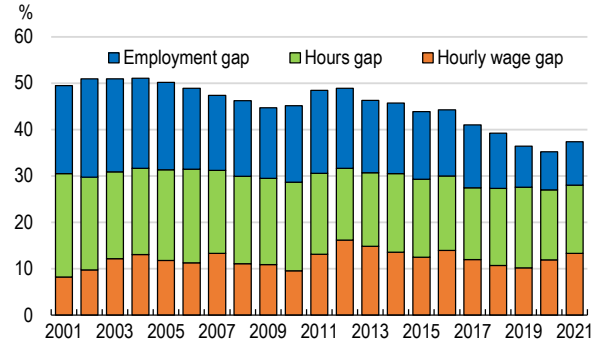
Competition policies can also support the ability of businesses to maximise the opportunities ahead. There are signs of increased market concentration in some sectors and a broad competition policy review is underway. One area to consider is more closely aligning the merger regime with other OECD countries.

Gender inequality can be further reduced

Gender inequalities have been steadily reduced. However, the talents of women can be better utilised, including through reducing barriers to their engagement in the labour market and encouraging more equal sharing of unpaid work responsibilities between genders.

There is still a significant gender gap in hours worked, owing to a high share of women in part-time work (Figure 2). One factor is high marginal effective tax rates when increasing work hours for low earners, due to benefit withdrawal as earned income rises. This is especially the case for single parents. Reducing the speed of benefit withdrawal could be financed by removing Family Tax Benefit B for couple families, which currently disincentivises second earners from working. While further increases in the JobSeeker benefit rate are warranted and would benefit many women given they comprise an increasing share of recipients, reforms that encourage those on the payment to increase working hours should also be considered.

Figure 2. The gender gaps in income persist



Source: HILDA, OECD calculations.

StatLink https://stat.link/e7jr0h

The high cost of childcare also impedes some women from working. Out-of-pocket childcare costs are elevated by OECD standards and are

especially high as a share of income for lower income households. Initiatives that further encourage supply through the private childcare sector should be coupled with those that increase the provision of non-standard hours of care.

Additional improvements to the parental leave system would support mothers staying in work and labour market re-entry after childbirth. Parental leave duration and the rate at which it is paid is low by OECD standards. The authorities are planning to extend the length of parental leave. This is welcome, but further reforms should also focus on increasing the rate at which it is paid and the share of leave reserved specifically for fathers.

There is a lack of women working in STEM and ICT jobs, two growth areas as the digital transformation further evolves. Similarly, men are underrepresented in caring roles, such as nursing and childcare. Programmes that focus on promoting work experience and mentoring arrangements for underrepresented genders in these fields should be reviewed.

Achieving the climate transition will require significant reforms

The authorities are committed to achieving net zero emissions by 2050. Australia is well-placed to become a major producer of renewable power, having plentiful wind and solar resources and a large wealth of minerals critical to the climate transition. However, further reforms are required to meet emission reduction goals, support the reallocation of workers and adapt to climate change.

Australia's renewable electricity target of 82% by 2030 is central to the net zero transition. To ensure this target is met, Australia should stand ready to provide further policy support and consider scaling up and refocusing public funding towards the development and demonstration of clean energy and energy-efficiency technologies.

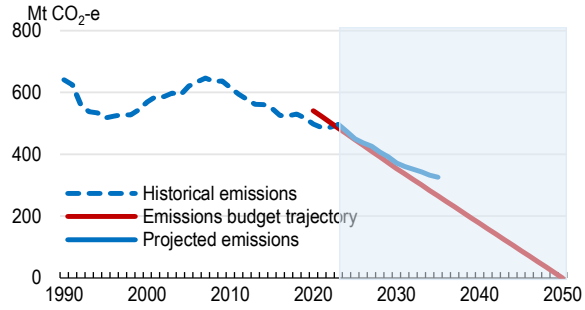
Recent reforms of the Safeguard Mechanism, which sets limits on the emissions of individual industrial facilities, have brought welcome changes to its functioning. However, further reforms may be needed after the 2026-27 review to guarantee a significant reduction in industrial emissions, including switching from baselines based on emissions intensity to limits on total emissions.

Transport is projected to become the largest source of emissions in Australia by 2035. States have introduced various policies to promote purchases of electric vehicles, which come at a high fiscal cost. These programmes should be aligned and stringent federal fuel economy standards introduced and progressively tightened to zero emissions by 2035. Fuel taxes should also be raised and existing fuel tax credits reconsidered.

Ensuring that new buildings are as energy efficient as possible will be critical to limit emissions. A priority is regularly updating the energy efficiency requirements in the National Construction Code to keep in line with international standards.

Figure 3. Large emission reductions are needed

Greenhouse gas emission projections



Source: DCCEEW (2022).

StatLink https://stat.link/eid654

As the economy decarbonises, workers will need to reallocate from high carbon to low carbon industries. Many occupations integral to the renewable energy transition face national shortages, requiring training programs focused on reallocating displaced workers and developing the skills for renewable energy jobs.

Australia is highly exposed to climate-related hazards such as wildfires, extreme heat and heavy rainfall. Adapting to climate change will require substantial investment and careful planning. Mandatory disclosure of climate-related risks in certain cases such as the sale of property will help raise awareness of these hazards and encourage more effective adaptation. In addition, incorporating climate hazard considerations in land-use planning will help reduce risks.

MAIN FINDINGS	KEY RECOMMENDATIONS
Achieving sustained economic growth	
Inflation has begun to fall but remains above target.	Maintain a restrictive stance of monetary policy until inflation is clearly on track to meet the central bank target, while maintaining a data-dependent and flexible approach.
Higher global commodity prices have boosted government receipts. The federal structural budget is in deficit and there are significant cost pressures on the horizon.	Continue to narrow the budget deficit in the years ahead and use windfall government revenues to reduce public debt. Improve mechanisms for fiscal dialogue between federal and state/territory governments.
The National Disability Insurance Scheme is exerting cost pressures on federal government finances.	Slow the growth in National Disability Insurance Scheme costs, potentially through better clarity on the eligibility and scope of support packages, as well as improved scheme administration.
The health system is already a major government expense that will increase as the populations ages.	Further encourage patient care in primary care settings and increase the focus on preventive care.
Wellbeing and economic indicators for the indigenous population suggest significantly lower living standards than for the non-indigenous population.	Make further progress on raising the living standards of indigenous Australians by implementing the Closing the Gap Agreement across all levels of government.
There is relatively little revenue raised from consumption taxes. Tax treatment across different savings vehicles differs markedly, with relatively low tax rates on private pension savings.	Broaden the base of the goods and services tax through reducing exemptions and consider increasing the rate. Further reduce tax concessions on private pensions.
A recent review of the migration system found outdated data systems and infrequently-updated occupation lists determining the composition of skilled migrants.	Make the composition of the skilled migrant intake more responsive to changes in the skill needs of industry, including through better use of timely and granular data, analysis and the views of employers.
Standardised test scores for Australian students have stagnated or declined.	Provide all teachers with access to high-quality and evidence-based curriculum resources that are regularly updated.
Land zoning systems are overly prescriptive about the types of activity that can be undertaken. Low density housing is more common than in other OECD countries.	Review planning and zoning regulations to enable an increase in the density of housing.
Some indicators of competitive intensity in product markets have weakened. Unlike in most OECD countries, pre-merger notification is not required. A competition policy review has commenced.	Consider requiring companies to give pre-merger notification to the competition authority for transactions above a defined threshold and introducing divestiture as a legislated remedy.
Improving gender equality	
The design of the tax system narrows gender income inequalities and results in low participation tax rates. However, steep benefit tapers are a barrier to some women moving from part-time to full-time work.	Introduce a more gradual tapering of benefits as household earnings rise, potentially funded through removing Family Tax Benefit Part B for couple families.
An increasing share of JobSeeker unemployment benefit recipients are now women, but the replacement rates are low.	Further increase the rate for JobSeeker benefits and consider further options to reduce disincentives for recipients to increase working hours.
Net childcare costs are high and create a significant barrier to employment for women.	Improve access and affordability of high-quality childcare by encouraging the development of the private childcare sector and improving provision for non-standard hours of care.
The payment rate of parental leave is relatively low, with low take-up by fathers. The authorities are planning to expand parental leave duration to 26 weeks in 2026.	Along with extending public parental leave duration, prioritise raising the rate at which it is paid and increasing the share of parental leave reserved specifically for fathers.
Women are underrepresented in information technology and science, technology, engineering and mathematics careers. Men are also underrepresented in caring roles, such as nursing and childcare.	Implement effective programmes that focus on promoting early work experience, apprenticeships and mentoring arrangements for females studying STEM and ICT and men studying caring professions.
Responding to climate change	
Australia's public spending on energy research, development and demonstration is significantly below the IEA average. It is also unclear whether current policies will achieve the necessary increase in renewable energy generation, storage and transmission.	Consider scaling up and refocusing public funding towards the development and demonstration of clean energy and energy-efficiency technologies. Stand ready to provide further policy support and accelerate the planning and implementation of renewable energy projects to ensure that renewable energy targets are met.
Emissions baselines (or limits) under the Safeguard Mechanism have been tightened and will decline by 4.9% per year until 2030. Facilities that reduce emissions below their baseline will earn credits.	Switch to limits on total emissions if the current Safeguard Mechanism baselines based on emissions intensity fail to deliver the desired emissions reductions and consider broadening the coverage of the mechanism.
States have introduced various policies to promote purchases of electric vehicles, including rebates and stamp duty exemptions, which come at a high fiscal cost.	Align the various state subsidy programmes for electric vehicles and introduce stringent federal fuel economy standards.
Overall public support to agriculture is low (0.2% of GDP) and extension services and agricultural education receive small amounts of funding.	Further increase support for agricultural research and development as well as extension services and agricultural education, with a particular focus on emissions reduction technologies and practices.
Further electrification and strong improvements in energy efficiency are required to significantly reduce emissions from buildings.	Regularly update energy efficiency requirements in the National Construction Code.
Australia is particularly exposed to climate-related hazards.	Consider improving the disclosure of climate and hazard-related risks in certain cases such as the sale of residential or commercial properties. Require all states and territories to consider climate and hazard risk when making land-use planning decisions for new developments.

1 Key policy insights

The economy rebounded robustly in the wake of the pandemic, but inflation rose rapidly amid supply constraints and rising global energy prices, leading to a substantial tightening in monetary policy. The public finances have also recovered quickly, but deficits are anticipated to re-emerge in the coming years and there are longer-term fiscal pressures on the horizon related to an ageing population. In response, tax and spending reforms that promote fiscal sustainability are a priority. As the population ages and the economy is shaped by global forces including the climate transition and digitalisation, policies must continue to promote an adaptable labour force and business sector. Reforms in the areas of immigration, education and the regulatory environment will be particularly important.

Introduction

Buoyed by pent-up demand, supportive macroeconomic policies and rising commodity prices, the economy rebounded robustly in the wake of the pandemic and house prices surged. However, labour shortages began to emerge and supply constraints coupled with the rising global energy prices sent inflation to its highest level since the early 1990's. Monetary policy has tightened significantly, weighing on demand.

External forces loom large over Australia's medium-term economic outlook. As an economy that benefits significantly from foreign commodity demand, rising geopolitical tensions and global fragmentation are a risk to national income. The global climate transition will impact the economy, both through the influence on demand for Australian fossil fuel exports and the reshaping of domestic industry in line with net zero commitments. Australia is highly exposed to climate-related hazards, creating challenges for businesses and communities, particularly in certain regions. At the same time, the ageing population will be a headwind to economic growth and lead to structural shifts in the economy over the coming decades.

The economy has the potential to prosper in such an environment. Australia is abundant in the critical minerals needed in a low carbon world and has the natural endowments to generate large amounts of renewable energy. Immigration is a well-established source of population growth and could lean against the natural decline in the working age population as the economy ages. There is scope for better integrating women in employment and further embracing the digital transformation that can work in the same direction. Calibrating public policies to promote an adaptable economy that manages the ongoing transitions will be key to realise this economic potential.

The government has focused on reforms to promote stronger and more inclusive economic growth. Two of the key priorities have been ensuring an effective climate transition and improving gender equality. Australia is committed to achieving net zero emissions by 2050 and more ambitious medium-term emission reduction and renewable energy targets have been announced. In promoting greater gender equality, significant reforms have already been undertaken to expand paid parental leave, improve access to childcare and roll-out gender responsive budgeting. A host of policy reviews have also been established to support this agenda.

Against this background, the three key messages from this *Economic Survey* are:

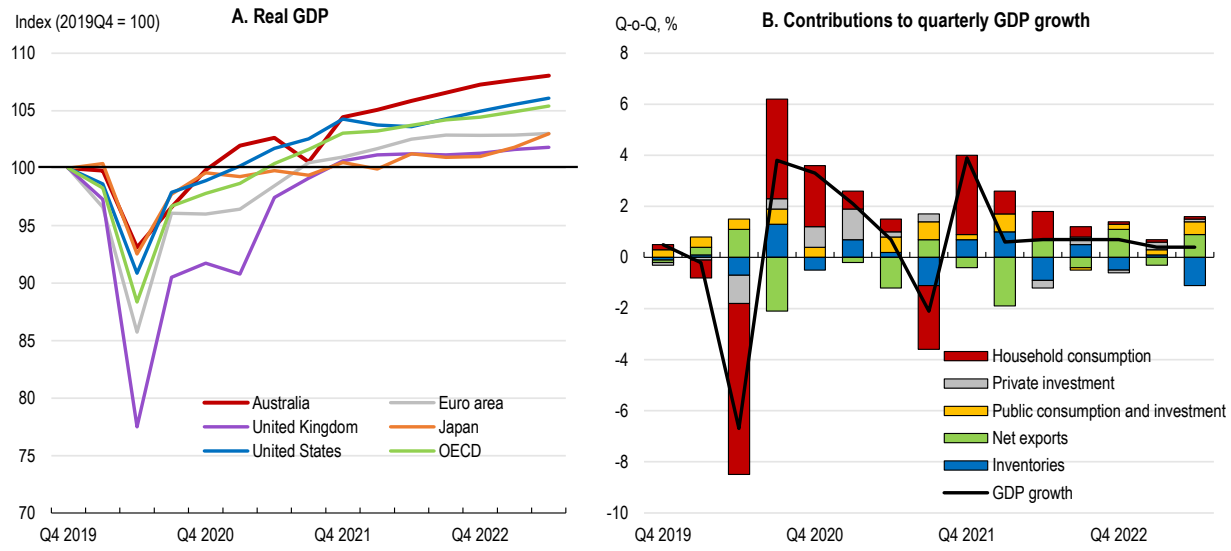
- Inflation remains high and fiscal pressures are on the horizon due to population ageing and climate change. Monetary policy should remain restrictive until underlying inflation is clearly on track to meet the central bank target. Fiscal buffers need to be rebuilt, including by better managing fluctuating revenues due to commodity-price cycles.
- Gender inequalities have steadily declined but remain visible in the labour market. However, reforms to tax, childcare, education, social benefits and parental leave can improve labour market opportunities for women, promote more equal sharing of unpaid work between genders and help more vulnerable women, notably single mothers.
- The climate transition is underway, but further policy measures are needed to meet emissions goals, support the reallocation of workers and adapt to climate change. The Safeguard Mechanism should be further strengthened if it does not deliver the expected emissions reductions. Given the abundance of renewable energy resources and a large wealth of critical minerals, Australia can secure the energy transition while remaining a key player in international energy markets.

Economic growth is slowing

The pace of economic growth in Australia continues to slow, following a more rapid recovery from pandemic lockdowns than in other major economies (Figure 1.1). Real household consumption growth has weakened after a strong pickup as the economy reopened from the Delta-variant lockdowns in late 2021.

Private investment has fallen as supply constraints, higher interest rates and falling house prices have led to a decline in housing investment, although private business investment has remained relatively resilient. Quarterly growth is projected to remain weak in 2023 as financial conditions continue to tighten and the rising cost of living affects household spending decisions, before picking up slightly through 2024 as growth slowly returns towards trend.

Figure 1.1. The economy recovered rapidly, but growth is now slowing



Source: Australian Bureau of Statistics; OECD Economic Outlook Database.

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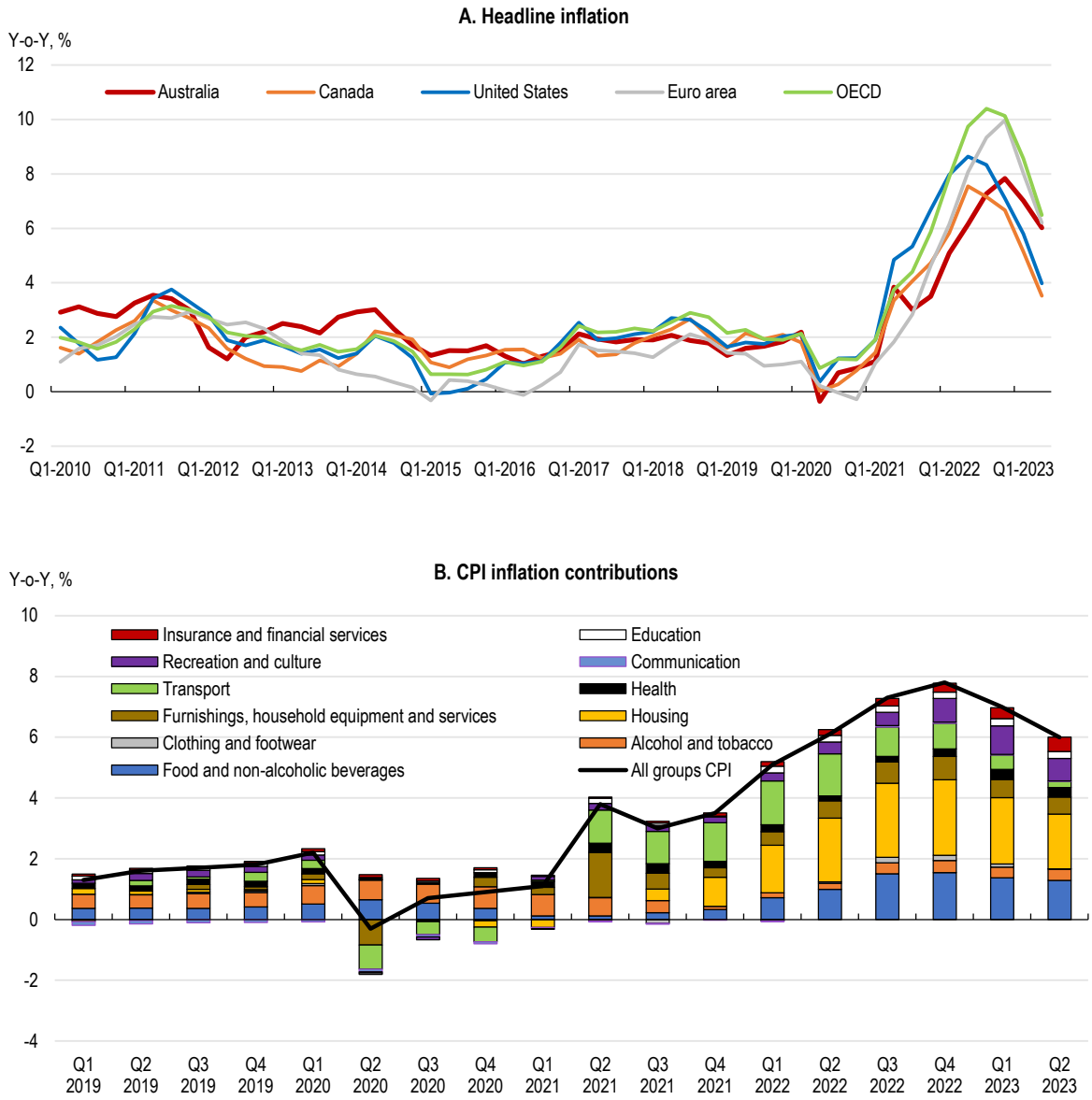
Inflation remains elevated and monetary policy has tightened in response

Inflation rose rapidly following the end of pandemic restrictions amid a surge in global commodity prices that contributed to higher domestic energy prices for consumers. It has begun to fall, but remained rapid at an annual rate of 6% in the second quarter of 2023 (Figure 1.2, Panel A). Inflationary pressures progressively broadened from manufactured goods, food and energy inflation, driven by strong demand accompanied by global supply chain bottlenecks, to services inflation. The housing component rose particularly strongly, with a sharp increase in new dwelling prices following the most acute phase of the pandemic and, more recently, rising rents (Figure 1.2, Panel B). Strong demand for travel during 2022 put upward pressure on hospitality and accommodation prices, in part also due to higher fuel prices that caused airfares to surge. Measures of underlying inflation remain elevated, with trimmed mean inflation of 5.9% in Q2 2023. The Commonwealth Government's Energy Price Relief Plan, announced in December 2022 and which set a cap on wholesale coal and gas prices and provided targeted energy bill relief, is expected to reduce headline inflation by ¾ of a percentage point by the June quarter of 2024. Until recently, Australia has only published a quarterly CPI series, unlike most other OECD countries which publish a monthly series. However, an experimental monthly series began being published in November 2022. While this is a welcome development, the series is based on incomplete data given that some prices are only collected quarterly. The monthly CPI indicator should be further developed to bring Australia in line with data dissemination standards in other OECD economies.

Figure 1.2. Inflation has peaked but remains high



Source: Australian Bureau of Statistics, OECD Statistics database and own calculations.

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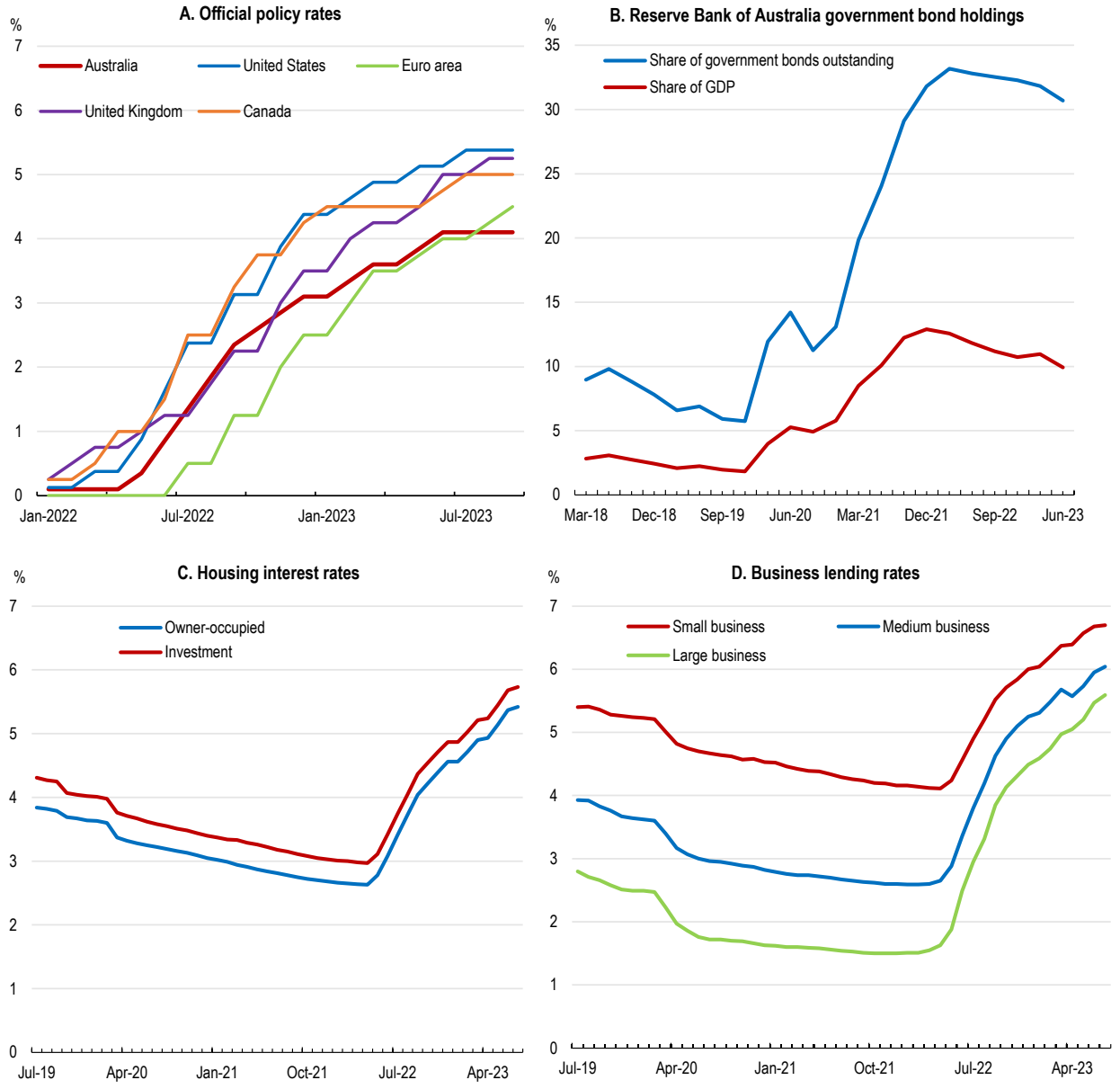
Short-term inflation expectations have decreased in recent quarters but remain above the RBA's 2-3% target band. Union officials, who participate in minimum and award wage deliberations and the negotiation of enterprise bargaining agreements, currently expect inflation of 4.3% one year ahead and 3.4% two years ahead. Longer-term inflation expectations from financial markets, such as the break-even 10-year inflation rate, remain consistent with the RBA target.

The Reserve Bank of Australia Board has significantly tightened monetary policy settings in response to the surge in inflation. The overnight cash rate has been lifted by a cumulative 4 percentage points since May 2022 (Figure 1.3, Panel A) and Central bank holdings of government bonds have been gradually maturing since mid-2022 (Figure 1.3, Panel B). The Term Funding Facility, established during the pandemic to provide low-cost fixed-rate funding to domestic banks, has begun to mature and is set to fully

unwind by mid-2024. Market interest rates have risen sharply in response to this set of measures (Figure 1.3, Panel C and D), with a high share of the outstanding loan stock on variable interest rates.

Figure 1.3. Monetary policy has tightened significantly



Source: Refinitiv, RBA.

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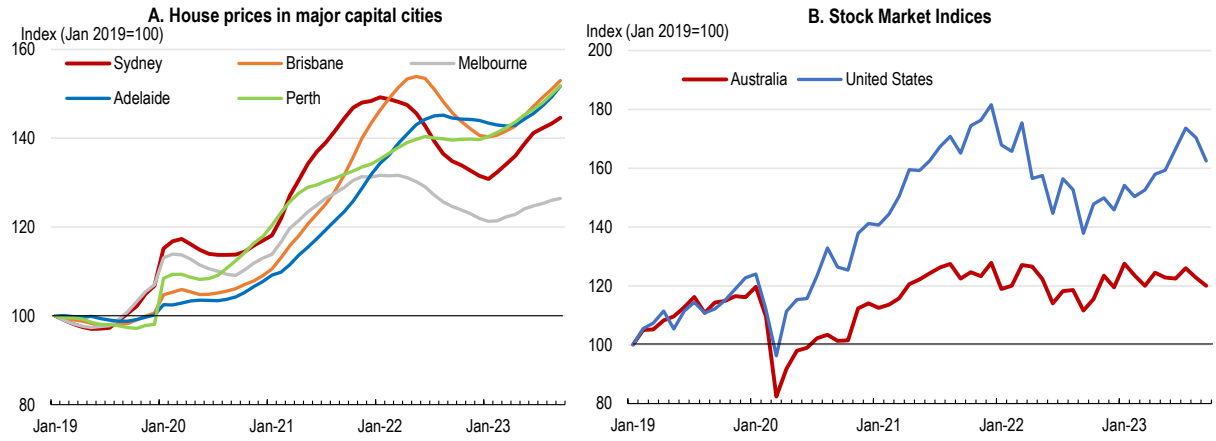
There have been some impacts of monetary policy tightening on asset prices, though declines have so far been orderly. House prices began to fall in early-to-mid-2022 but have stabilised since early 2023 (Figure 1.4, Panel A). The largest peak to trough falls were in Sydney (-13.8%), Brisbane (-11%) and Melbourne (-9.6%), with Perth and Adelaide experiencing only small price declines. As in other OECD countries, the commercial property market has weakened owing to both cyclical conditions and structural shifts such as increased working from home and online retail shopping. Vacancy rates for offices in central business districts are at the highest levels since the 1990s and falling rents have contributed to valuations

around 10% lower in the office market and 8% lower for retail and industrial property (Lim et. al., 2023). The Australian stock market has tracked broadly sideways since mid-2021 (Figure 1.4, Panel B). The rise in equity prices from the pandemic trough was less marked than in some overseas equity markets, such as the United States, partly reflecting a smaller IT sector in the Australian market.

Figure 1.4. Declines in asset prices have been orderly



Note: In Panel B, the stock market index for Australia is the S&P/ASX200 and for the United States it is the S&P500 Composite Index.
Source: Corelogic, Standard & Poors, Refinitiv.

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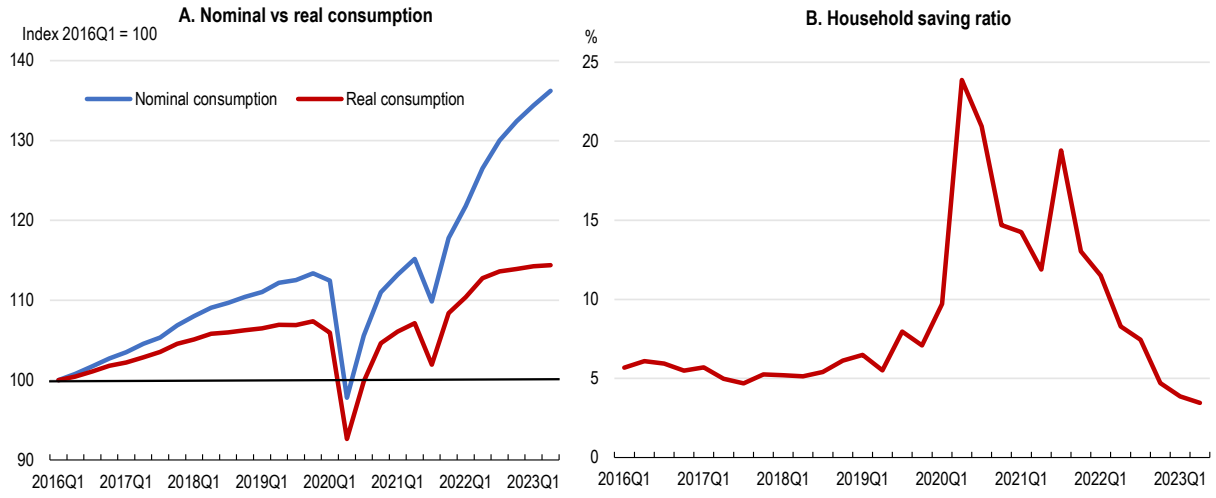
While real consumer spending growth has slowed amid rising inflation and tightening financial conditions, nominal consumption has been significantly above trend, supported by a sharp reduction in the household saving ratio and government support measures (Figure 1.5). While the saving ratio is now below pre-pandemic levels, the savings accumulated since 2020 will continue to support consumption, although there is evidence that it is concentrated among wealthier households with a lower propensity to consume. Consumer spending patterns have gradually rebalanced back from goods towards services, and from essential towards discretionary spending since the pandemic, with strong consumption of transport, hotels, cafes and restaurants, and recreation and culture.

Figure 1.5. Nominal consumption has remained strong



Source: Australian Bureau of Statistics, OECD calculations.

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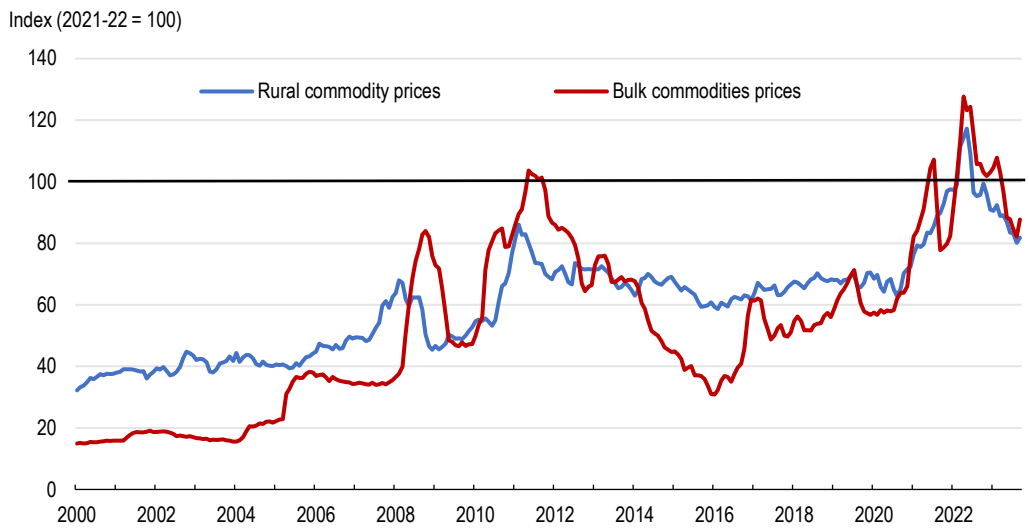
Exports have supported the economy

Exports rose for the fifth consecutive quarter in Q2 2023 with the continued return of international students and tourists to Australia in the wake of the pandemic. Rural exports have also risen strongly over this period, partly driven by record wheat crops due to favourable growing conditions over recent years and the elevated prices that resulted from dry conditions in other wheat exporting countries and Russia's war against Ukraine. Aside from its impact on global commodity prices and domestic inflation, the direct trade implications for Australia of the war and subsequent sanctions on Russia have been limited. Australian exports to Russia and Ukraine have historically been small, with combined two-way trade amounting to just 0.2% of Australia's global trade in 2020.

Australian commodity export prices remain historically elevated (Figure 1.6). Bulk commodity prices soared by 55% between December 2021 and April 2022, their most recent peak, and have since returned to close to December 2021 levels. Rural commodity prices have also eased in recent months and are now 16% below December 2021 levels. The trade surplus strongly increased during the first half of 2022 as the terms of trade improved but has since moderated with lower commodity prices and Australians increasingly travelling abroad. Notably, the sharp rise in bulk commodity prices since the pandemic has not led to a boom in investment in the mining sector, in part due to concerns about viability in the context of tightening of emissions standards globally.

Figure 1.6. Commodity prices have fallen following a surge due to the war in Ukraine

Australian commodity export prices, Index (2021-22=100)



Note: Rural commodities include wool, beef, wheat, barley, canola, sugar, cotton and lamb. Bulk commodities include iron ore, metallurgical coal and thermal coal. The indices are shown in terms of Special Drawing Rights (SDR), which are less affected by exchange rate movements.
Source: Reserve Bank of Australia.

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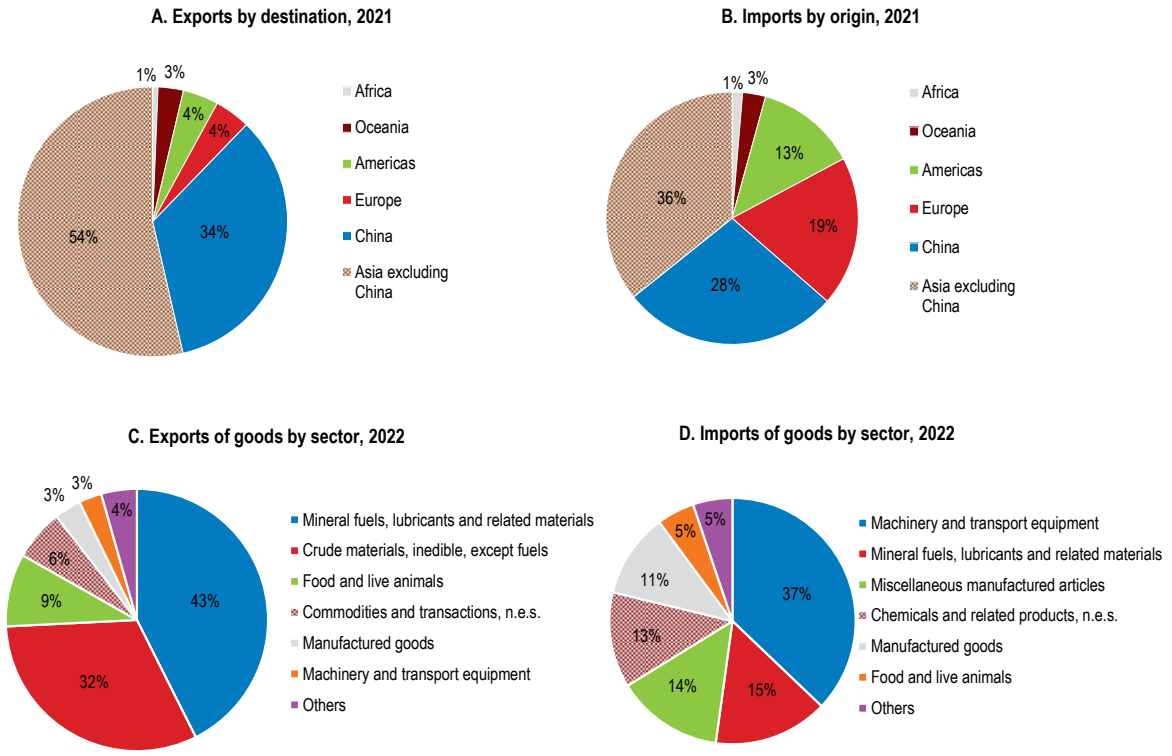
The Asia-Pacific region continues to be critical for Australian trade, accounting for almost 90% of total exports (see Figure 1.7). China is Australia's largest two-way trading partner in goods and services and remains the major export market, with iron ore accounting for 60% of bilateral exports. Over the past two decades, the share of Australia's merchandise exports destined for China has increased from 10% to around 40% and now surpasses Australia's total merchandise exports to all OECD countries combined. Trade in Value Added indicators suggest that a relatively small share of Australian exports to China are used as intermediaries in Chinese exports: China was the final destination for 94% of Australia's gross

exports to the country in 2018. Looking ahead, Australia's dependence on China may fall as export opportunities in other countries in the region and in India develop.

Figure 1.7. Asia-Pacific is the core bilateral trading region



Note: Data are for 2021. In Panel C, Others include crude materials, beverages and tobacco, animal and vegetable oils, and commodities and transactions. In Panel D, Others include insurance and pension, construction services, and other services.
Source: OECD International Trade by Commodity Statistics database.

StatLink https://stat.link/ryd02a

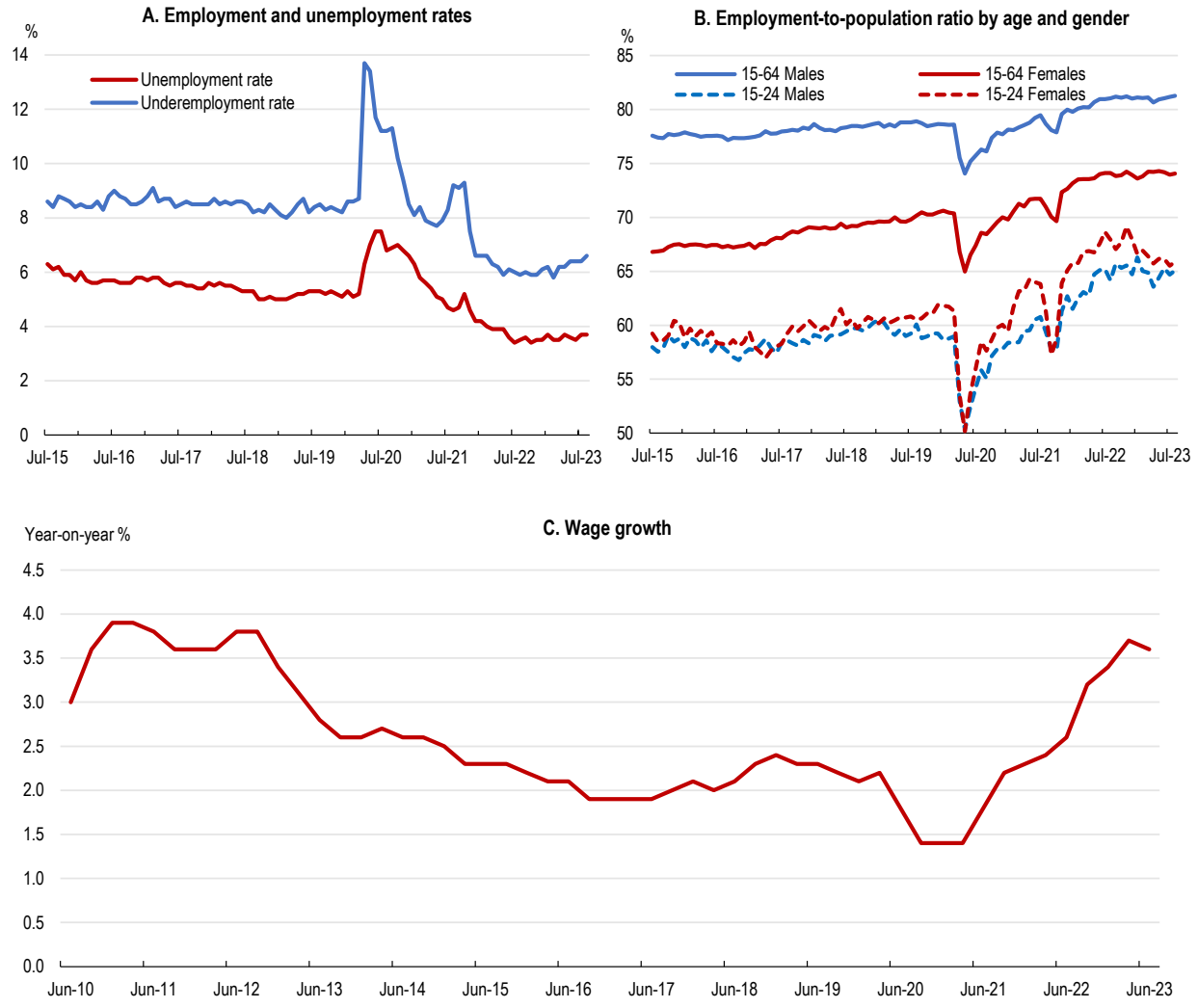
In recent years, China placed import restrictions on certain Australian commodities, including coal, barley, wine, beef and cotton. For some of these products, exporters have been successful at pivoting to other markets. For instance, coal exports to India, Brazil and Indonesia picked up notably. China started removing these restrictions on imports from Australia during the first months of 2023. The trade tensions have highlighted Australia's reliance on China as an export market. Australia has recently increased efforts to diversify its exports, notably through the Australia-India Economic Cooperation and Trade Agreement, which entered into force in late 2022. Between 2021 and 2022, exports to India, Korea and Japan grew by 42%, 43% and 84% respectively (Department of Foreign Affairs and Trade). The value of Australian exports to India are currently about 20% of those sent to China. Two thirds of bilateral exports to India are coal, with very little iron ore exported so far, partly due to India's strong domestic reserves. Australia's vast endowments of minerals critical for the climate transition, such as lithium, provide further opportunities for diversification. Lithium exports have soared in recent years, rising more than tenfold between 2021 and 2022, although the vast majority has been destined for China, which is the largest global investor in clean energy technologies and the world's main processor of lithium.

The labour market is tight despite rising labour supply

Labour demand has remained strong, despite slowing growth. The unemployment rate has hovered around 3½% since mid-2022, near a 50-year low, and the underemployment rate, which accounts for workers willing to work additional hours, is near its lowest point since 2008 as businesses have increased the hours

of existing staff (see Figure 1.8, Panel A). Strong labour demand has drawn more people into the labour force, particularly women and young workers. Employment-to-population ratios are near record highs across most cohorts (Figure 1.8, Panel B). Labour supply has also been supported by strong growth in overseas immigration since Australia's borders reopened, which notably allowed overseas students and working holiday makers to return. While these increases in labour supply have provided some relief, the labour market remains tight, and reports of labour shortages remain. The number of job vacancies have eased, but remain almost double the level reported at the onset of the pandemic according to the Job Vacancies Survey by the Australian Bureau of Statistics. One in three small-and-medium enterprises continue to identify labour shortages as a "very significant" issue, with the most affected sectors being construction, manufacturing, transport and storage and retail (NAB, 2023).

Figure 1.8. Strong labour demand has led to a tight labour market



Note: Underemployed workers are employed people who would prefer, and are available for, more hours of work than they currently have. The underemployment rate is defined as a proportion of the labour force.
Source: Australian Bureau of Statistics.

StatLink https://stat.link/pdabuq

Nominal wage growth has picked up due to the tight labour market and rising inflation, increasing to 3.6% year-on-year in Q2 2023 (Figure 1.8, Panel C). Employee earnings have risen across the income distribution, but growth has been strongest for lower-paid groups. Wage growth will be supported by the decisions of the Fair Work Commission on the minimum wage, which rose by 8.6% in July, and award

wage rates (which set out minimum pay conditions for particular industries and occupations), which rose by 5.75%. However, the minimum wage only applies to 0.7% of all employees and modern award-reliant employees account for only 11% of the wages bill. There are signs that wages under recently negotiated Enterprise Bargaining Agreements also continue to drift up. Such agreements cover around one third of Australian enterprise employees. Nonetheless, wage growth has not kept pace with inflation, and, while it has partly contributed to services inflation, the risk of a wage-price spiral appears contained.

Economic growth will remain slow before recovering

Quarterly economic growth is projected to slow further in 2023, before picking up gradually in 2024 and moving back to around trend growth by the second half of 2025 (Table 1.1). Higher interest rates and cost of living pressures will dampen spending by households with fewer accumulated savings and weigh on housing investment. Continued strong population growth and higher exports as travel further recovers will partly offset these headwinds. As GDP growth slows, the unemployment rate is projected to start rising, reaching 4.4% in 2025. Inflation will moderate, aided by abating global inflationary pressures particularly for goods, and is expected to fall to the top of the RBA target band by the end of 2024. There are both upside and downside risks to economic growth. A quicker than expected fall in inflation, which could arise if goods prices normalise to a greater extent than currently projected, could require less restrictive monetary policy. However, further declines in house prices and persistent inflation could cause households to cut back on spending more than expected. A sharper than expected slowdown in China poses an additional downside risk and could have a significant impact on exports and GDP growth.

Table 1.1. Growth and inflation are projected to ease

	2020	2021	2022	2023	2024	2025
	Current prices AUD Billion	Percentage changes, volume (2020/2021 prices)				
GDP at market prices	1 972.9	5.2	3.7	1.8	1.3	1.8
Private consumption	1 011.5	5.1	6.4	1.7	1.2	1.7
Government consumption	450.2	5.4	5.3	0.9	1.0	0.8
Gross fixed capital formation	442.1	10.6	1.1	0.1	0.8	1.2
Final domestic demand	1 903.8	6.4	4.9	1.1	1.0	1.4
Stockbuilding [1]	-2.6	0.6	0.4	-0.2	-0.1	0.0
Total domestic demand	1 901.1	7.1	5.2	0.9	0.9	1.4
Exports of goods and services	436.4	-2.1	3.4	9.2	4.2	4.3
Imports of goods and services	364.7	5.6	12.8	4.2	3.0	3.3
Net exports [1]	71.8	-1.5	-1.5	1.6	0.5	0.5
Memorandum items						
GDP deflator	_	5.5	7.9	3.6	3.0	2.7
Consumer price index	_	2.8	6.6	5.5	3.3	2.8
Core inflation index [2]	_	2.4	5.9	5.9	3.3	2.8
Unemployment rate (% of labour force)	_	5.1	3.7	3.7	4.2	4.4
Output gap (% of potential GDP)		-1.3	0.3	0.1	-0.6	-0.7
Household saving ratio net (% of disposables income)	_	14.7	8.0	3.9	4.6	5.1
General government net lending (% of GDP)	_	-4.8	-1.8	-1.1	-1.7	-1.5
Underlying general government net lending (% of potential GDP)		-4.0	-2.0	-1.2	-1.4	-1.1
General government gross debt (% of GDP)	_	64.1	56.8	57.8	59.3	60.6
Current account balance (% of GDP)	_	3.0	1.1	1.7	2.2	2.6

1. Contributions to changes in real GDP, actual amount in the first column.
2. Consumer price index excluding food and energy
Source: OECD.

Table 1.2. Events that could entail major changes to the outlook

Shock	Likely impact	Policy response options
A period of deglobalisation coupled with a rise in protectionism.	A reduction in global trade would have a significant effect on Australia as a small open economy. Export-oriented sectors such as resources and agriculture could be particularly impacted. Protectionist measures could affect Australian supply chains, impair access to critical goods and raise import prices. Productivity and technology adoption could also be impacted.	Monitor risks to supply chains and improve their resilience by increasing diversification. Improve collaboration with crucial trade partners and international bodies such as the WTO.
A wage-price spiral leading to persistently high inflation.	High economic uncertainty, significant relative price distortions, de-anchoring of inflation expectations, loss of international competitiveness, and a possible economic downturn.	A greater degree of monetary policy tightening.
A significant decline in commodity prices, perhaps due to a structural decline in fossil fuel demand in major export markets in response to energy security considerations or changes in climate policy.	A substantial fall in demand for Australian commodities would have a large impact for the mining and agriculture sectors and related industries.	Provide support to affected workers and regions. Promote further diversification and the development of other export markets such as critical minerals including lithium, which will be crucial for the climate transition.
Severe climate-related disasters.	More frequent adverse climate events such as heat waves, forest fires or floods would materially lower economic activity and would have significant costs in terms of property damage, health, wellbeing of the population, and fiscal costs. The agricultural sector is especially vulnerable. A higher frequency of such events could also lead to a lack of access to insurance in certain areas.	Improve the resilience of infrastructure to climate and natural hazards and ensure that there are mechanisms for a coordinated policy response across different levels of government. Provide targeted fiscal support to affected areas. Improve climate data collection and forecasting of climate hazards and ensure that the information is widely disseminated.

Monetary policy should remain restrictive

Monetary policy must continue to navigate a difficult path, ensuring that underlying inflationary pressures do not become embedded while closely monitoring the impact of the past rapid and globally synchronised monetary policy tightening on the real economy. If services inflation remains surprisingly persistent, long-run inflation expectations risk becoming de-anchored. At the same time, further tightening of financial conditions will occur as pandemic-era fixed rate loans further expire and the Term Funding Facility and central bank government bond holdings mature. Weighing the uncertainties, a restrictive stance of monetary policy remains appropriate until there are clear signs that underlying inflationary pressures have abated. Indeed, further monetary policy tightening may be necessary if upside risks to inflation emerge. Considerable uncertainty calls for a data dependent approach coupled by clear communication of the monetary policy reaction function.

Changes to the monetary policy framework are being implemented, following an independent review of the Reserve Bank of Australia in 2023 (Commonwealth of Australia, 2023a) that was recommended in the previous *OECD Economic Survey of Australia* (Table 1.3). The government has accepted in principle the recommendations, including the establishment of separate boards related to monetary policy decisions and the governance of the institution. It is anticipated that the monetary policy Board will comprise individuals with expertise in relevant economic fields appointed through a transparent and skills-based process. This differs from the current arrangements whereby the Board predominantly includes highly-qualified private sector leaders. The review also recommended further enhancing communication about monetary policy, including through regular press conferences and external Board members being required to publicly explain monetary policy decisions.

The RBA has been actively reflecting on the efficacy of the policy tools adopted during the pandemic. In 2022, it published reviews of its pandemic-period bond purchase programme (RBA, 2022a), the target for the yield on the three-year Australian Government bond (RBA, 2022b) and its approach to forward guidance (RBA, 2022c). These detailed assessments can benefit other central banks in their future policy considerations.

The reviews found all three measures to be successful in lowering funding costs and supporting the provision of credit to the economy. However, while the design and implementation of the bond purchase programme was found to have worked broadly as intended, this was not the case for the other two policies considered. The exit from the yield curve target in 2021 was disorderly for bond markets, as improving economic conditions led to market yields being pushed above the target. The review found that the decision-making process in implementing the policy was particularly focused on limiting bad outcomes and a greater focus on potential upside scenarios could have helped avoid the disorderly exit. On forward guidance, while a time-based element to the communication reinforced the yield curve target through emphasising that the Board did not expect to lift the cash rate until 2024, the cash rate was eventually increased much earlier. This caused the RBA to attract significant criticism and may have impacted credibility. The review concluded that future forward guidance should tend to be qualitative in nature, flexible and conditionality focused on the Board's policy objectives of inflation and unemployment. Nonetheless, neither the introduction of a yield target or a strong form of forward guidance was ruled out for the future. Looking forward, the RBA should consider maintaining a regularly updated framework for the use of unconventional monetary policy tools in case the cash rate is at the zero lower bound.

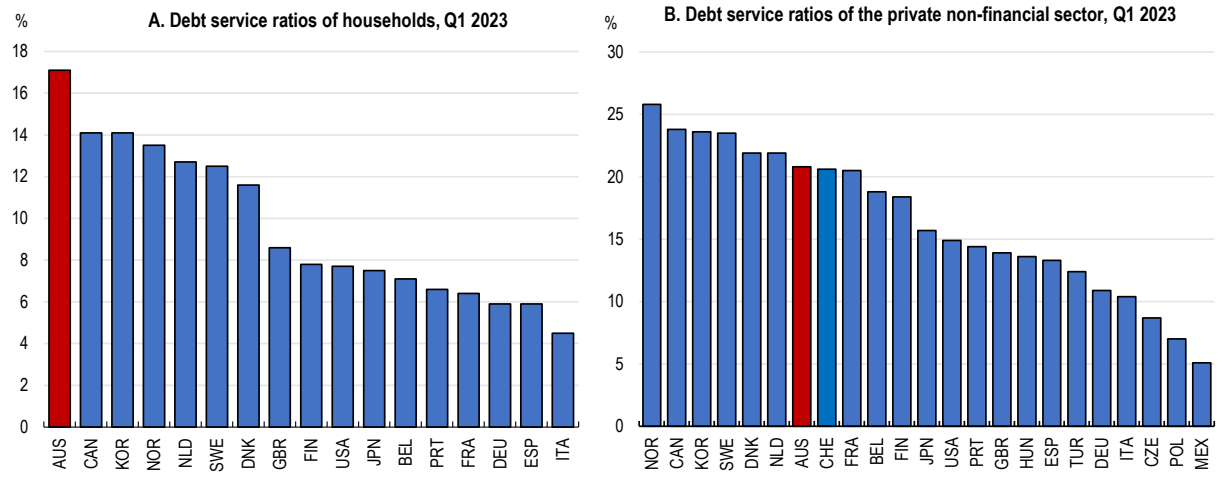
Table 1.3. Past OECD recommendations on monetary and financial policy

Recommendations in previous Survey	Action taken since September 2021
As in other OECD countries, undertake a review into the monetary policy framework that is broad in scope, transparent and involves consultation with a wide variety of relevant stakeholders.	The government enacted an independent review of the Reserve Bank of Australia in 2022. The final report was published on 20 April 2023. The review was very broad in scope, transparent and involved consultation with a wide variety of relevant stakeholders.
Overhaul the Personal Property Securities Register then increase awareness among small businesses and lenders.	In September 2023, the Government announced its response to the 2015 statutory review of the Personal Property Securities Act 2009. The response accepted 345 of the review's 394 recommendations and included draft legislation designed to streamline the process of using personal property to secure credit.
Extend open banking to facilitate switching of providers and other actions ("write access") with appropriate protections.	The federal government introduced legislation into Parliament in November 2022 to expand the Consumer Data Right to enable action initiation (or 'write access'). Further policy development is being undertaken by Treasury to identify the priority actions to bring into the Consumer Data Right and the key considerations for rules and standards to implement action initiation.
Create a roadmap for improving the consistency, comparability and quality of reporting of climate-related risks by listed companies and financial institutions.	The federal government has committed to introducing standardised, internationally-aligned reporting requirements for large businesses and financial institutions to make climate-related disclosures regarding governance, strategy, risk management, targets and metrics – including greenhouse gasses. Federal Treasury released its second consultation paper in June 2023 which proposes a broad range of companies and financial institutions be subject to mandatory disclosure requirements. This would commence with the largest listed and unlisted companies for the 2024-25 financial reporting periods, with other companies phased in over time.
Complete the implementation of the reforms arising from the Royal Commission into the financial sector	51 of the Royal Commission's 54 recommendations to government have now been implemented following passage of the Financial Accountability Regime in March 2023. The remaining three (concerning mortgage brokers and point-of-sale credit) have been overtaken by events.

Financial pressures are increasing but the banking system appears well-prepared

On aggregate, households balance sheets so far remain in good shape. While the decline in housing prices in 2022 and early 2023 impacted household wealth for some segments, housing prices in most states remain well above their pre-pandemic level and mortgage arrears are low. Nonetheless, household debt servicing costs are elevated by international standards (Figure 1.9, Panel A), reflecting high household debt levels and the large share of variable rate mortgages. Debt servicing costs are especially high for those in low-income cohorts: around 45% of low-income people with a mortgage were devoting greater than one-third of their income to servicing their housing loan in early 2023 (RBA, 2023b). Some households have experienced a sharp increase in debt servicing costs since 2022 owing to their low fixed rate housing loans resetting onto variable rates, with an estimated 20% of fixed rate mortgage holders set to make this transition in 2024. Even so, many borrowers hold substantial amounts of liquid assets, including mortgage prepayments, and so are well placed to navigate a period of tighter financial conditions. Household debt is also mostly held by higher income households: Household Income and Labour Dynamics in Australia (HILDA) Survey data highlight that around 60% of the stock of household debt was held by households in the top two equivalised income quintiles in 2021, with only 4% held by those in the lowest quintile. The strong job market is an important factor continuing to buoy household finances. Scenario analysis by the RBA suggests that, with an increase in unemployment, 40% of indebted households experiencing job loss would be at risk of depleting prepayment buffers within six months, even if they were to substantially reduce non-essential spending (RBA, 2023b).

Figure 1.9. Debt servicing ratios are high by international standards



Note: The debt servicing ratio is defined as the ratio of interest payments plus amortisation to income.
Source: Bank for International Settlements.

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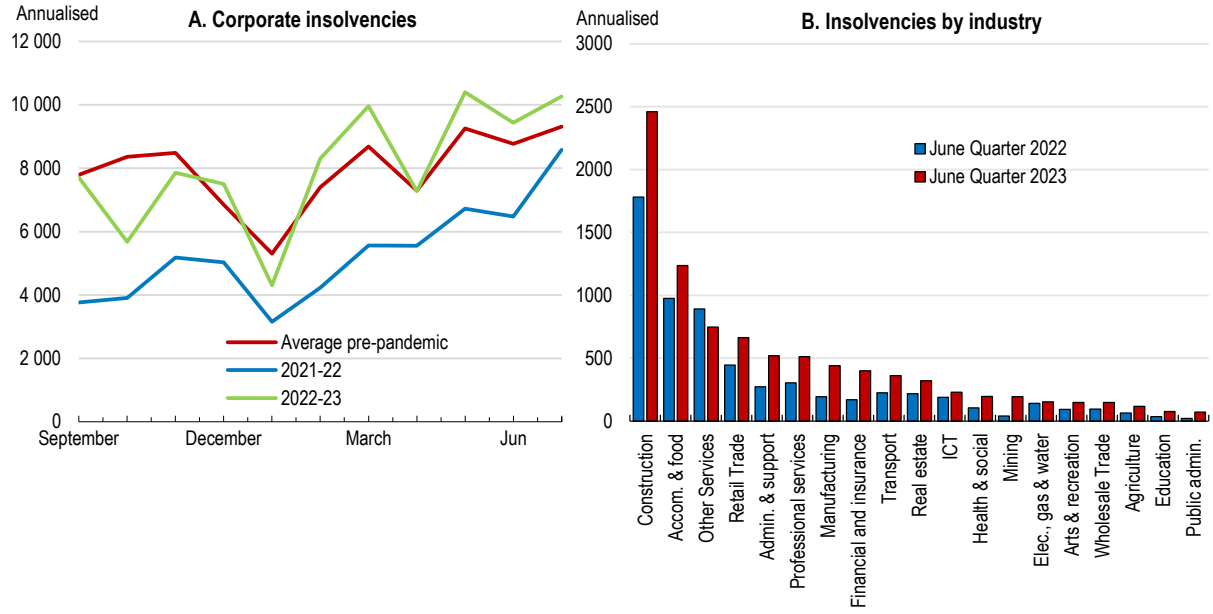
Corporate insolvencies have risen over the past year, but they remain broadly in line with pre-pandemic averages (Figure 1.10, Panel A). The construction sector accounts for around 27% of insolvencies (Figure 1.10, Panel B), reflecting margin pressures for builders tied to fixed-price contracts signed before the marked rise in input and labour costs (RBA, 2023b). The increase in insolvencies in the commercial real estate sector has been limited so far, despite high vacancy rates for office and retail properties and higher borrowing costs for landlords. Bank lending standards for commercial property have been conservative in recent years, with most loans written with loan-to-valuation ratios below 65% and a requirement that borrowers have earnings that cover twice interest expenses (an interest coverage ratio above 2; Lim et. al. 2023).

Figure 1.10. Corporate insolvencies have risen but remain below pre-pandemic levels



Note: Data are for the first time a company enters external administration or has a controller appointed. The pre-pandemic average is for each respective month during 2017-19.
Source: Australian Securities and Investments Commission.

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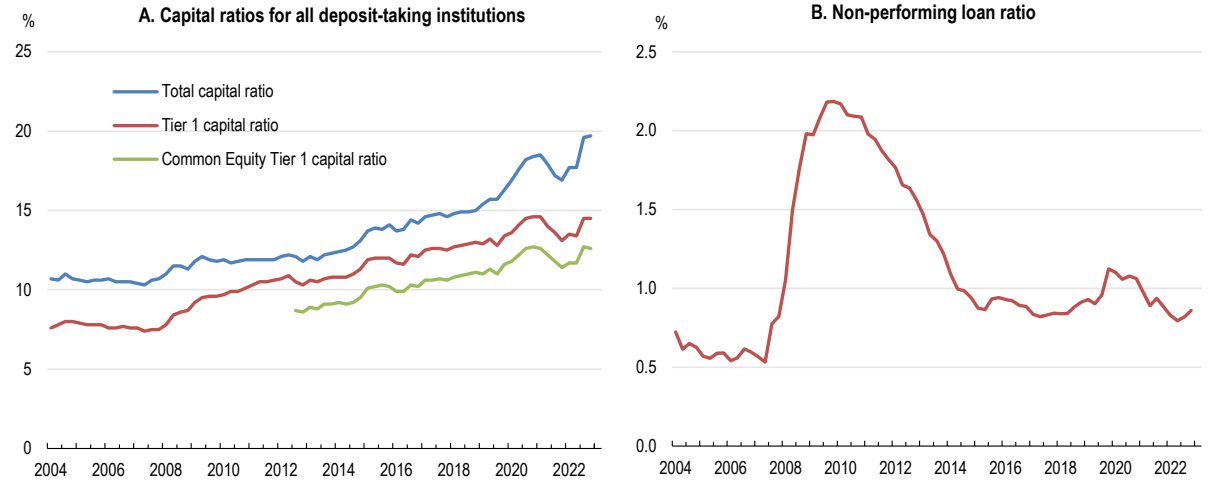
The banking sector remains well-capitalised, with capital ratios having continued to increase well above regulatory requirements through the past year (Figure 1.11, Panel A). The Australian Prudential Regulation Authority introduced a new capital framework in January 2023 that is more closely aligned with Basel III standards. The framework includes a countercyclical capital buffer currently set at 1% and a larger capital conservation buffer for large banks. The non-performing loan ratio remains at historically low levels, despite the signs of increasing household and corporate stress (Figure 1.11, Panel B). Banks are relatively well positioned against interest rate risk, as they are required to carry capital to address the risk of rising interest rates as part of their core capital requirements, incentivising them to hedge residual interest-rate exposures (Lonsdale, 2023). A high share of variable rate loans on bank balance sheets also means that many assets are repriced relatively quickly following a shock to funding costs (RBA, 2023b).

Figure 1.11. The banking sector is well capitalised and non-performing loans are low



Source: Australian Prudential Regulation Authority.

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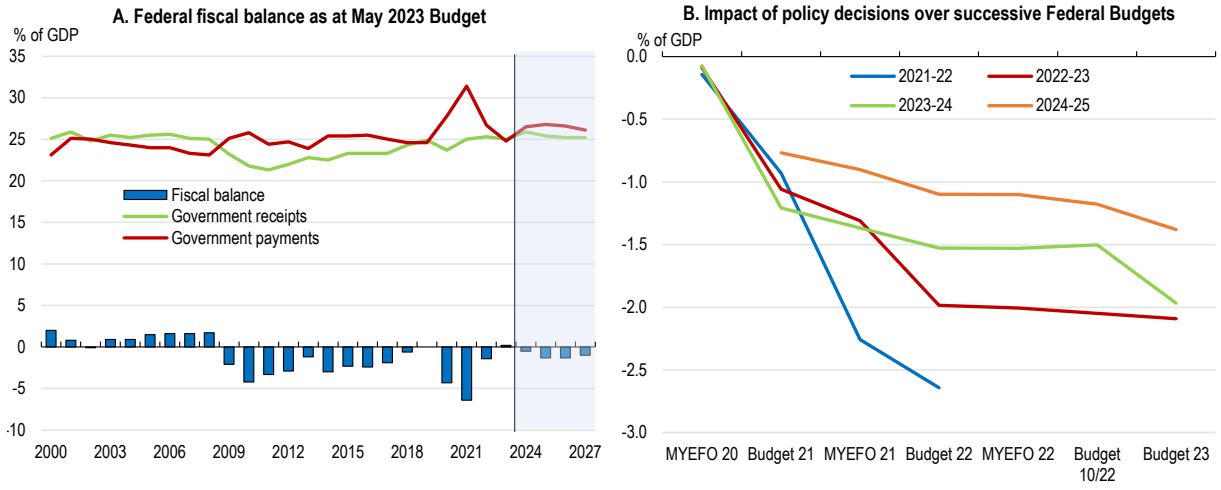
In the current environment, there does not appear to be a case for either loosening or tightening macroprudential policies. Risks for bank funding related to the maturity of the Term Funding Facility require careful monitoring by regulatory authorities. The value of bank repayments will increase markedly in the period to 2024 as the facility matures, and while banks are generally ahead in their funding plans (RBA, 2023b) a bout of volatility in global funding markets could push funding costs higher.

The budget balance has improved, but there are long-term challenges

The Federal Budget deficit peaked at -6.4% during the pandemic, as emergency supports were mobilised, but has narrowed as the economy has recovered and commodity prices have risen sharply (Figure 1.12, Panel A). Nonetheless, the federal government expects the deficit to re-emerge over the years ahead, partly due to spending increases introduced over successive recent Budgets (Figure 1.12, Panel B) and strong growth in large expenditure items such as the National Disability Insurance Scheme. The 2023/24 Federal Budget included new permanent spending equivalent to around 0.2% of GDP focused on assisting households, including funding to improve the affordability of primary healthcare, parenting payment changes which will increase benefits for single parents, increased rent assistance and working age payments.

Figure 1.12. The federal fiscal deficit is anticipated to re-emerge in coming years



Note: Panel B shows the cumulated impact of policy decisions for a given fiscal year on the headline fiscal balance. A decline signifies policy decisions in the respective budget that have loosened the fiscal stance.
Source: ABS, Parliamentary Budget Office, Commonwealth of Australia (2023b).

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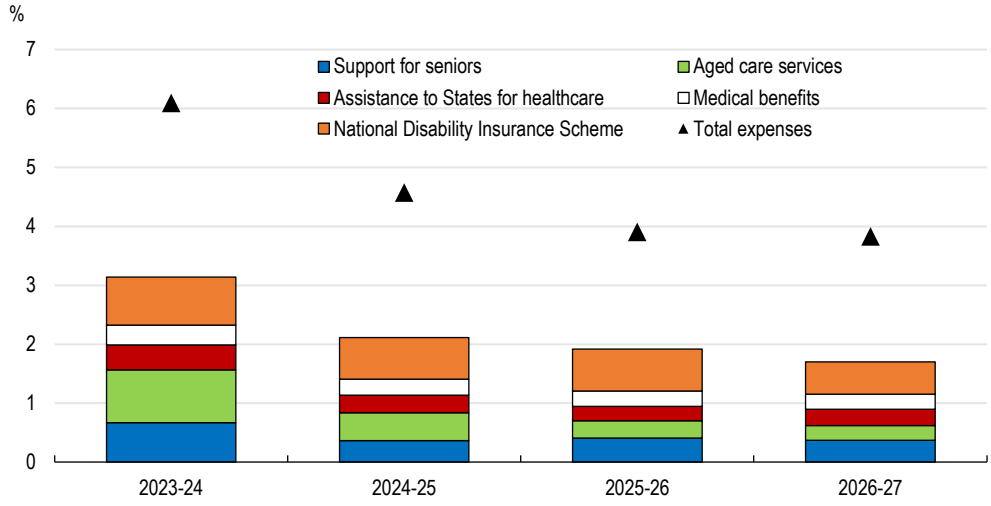
Temporary support to offset higher energy costs was also announced. Energy bill relief is being provided for pensioners, households receiving certain low-income benefits and some small businesses, costing AUD1.5 billion (0.03% of GDP) over 12 months. This measure is temporary, which is appropriate given the uncertainty, and partly targeted given the focus on welfare recipients. However, through taking the form of credits to electricity bills, it distorts price signals and reduces the incentive to lower energy use and switch to more carbon-neutral energy sources.

The National Disability Insurance Scheme (NDIS) applies insurance-based approaches to support those with a permanent and significant disability. It provides uncapped individualised funding determined by the specific needs of participants and has widespread community and political backing. However, the number of people entering the scheme with less complex disabilities has been higher than anticipated, while the rate of scheme exits has been unexpectedly low. The scheme is a large expenditure item, with federal

government spending equivalent to 1.6% of GDP in 2023/24, well over the cost of unemployment benefits and childcare subsidies combined (Commonwealth of Australia, 2023b). Although the scheme is co-financed between federal and state governments, all upward variations in costs are funded by the federal government. NDIS expenses are projected to contribute around one sixth of total federal government expenditure growth in the period to 2026-27 (Figure 1.13). However, costs could well be significantly higher. Current Budget projections assume that scheme cost growth declines from 14.4% in 2023-24 to 8% by 2026-27, as a result of National Cabinet agreement on a NDIS Financial Sustainability Framework. Achieving this outcome will require effective implementation of new cost containment measures that are yet to be announced but will be informed by a review of the scheme that is currently being undertaken.

Figure 1.13. The National Disability Insurance Scheme is pushing up federal government spending

Contributions to total federal government expenditure growth, by highest cost programmes



Source: Commonwealth of Australia, 2023b.

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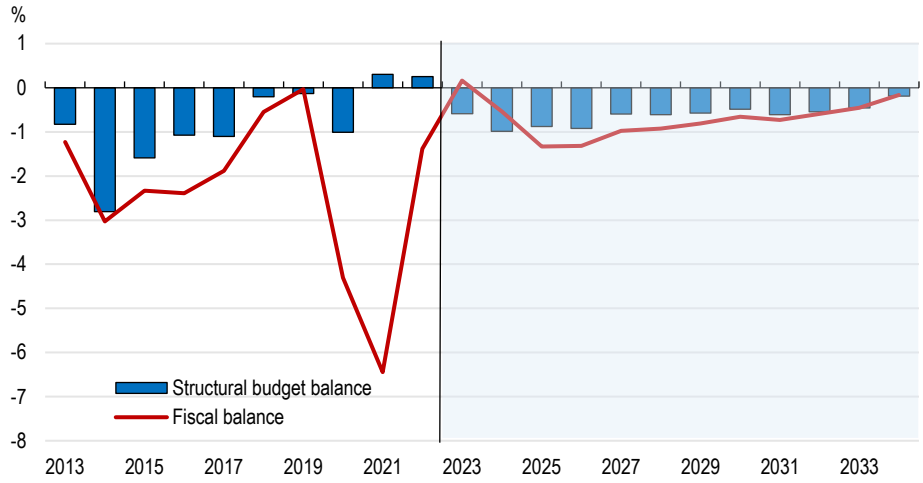
The federal government structural budget deficit, which accounts for the economic cycle, is anticipated to widen to around 1% in 2023/24 (Figure 1.14) giving some support to economic activity. The budget projections assume that commodity prices fall from the currently elevated levels to be more in line with historical norms, contributing to the persistent deficit. Nevertheless, the impact of fluctuations in commodity prices has been somewhat mitigated in recent years by the government saving the majority of revenue upgrades, in line with the current fiscal strategy (Box 1.1).

Figure 1.14. The federal government structural budget balance is anticipated to widen in the short-term

Federal government fiscal balance, % of GDP



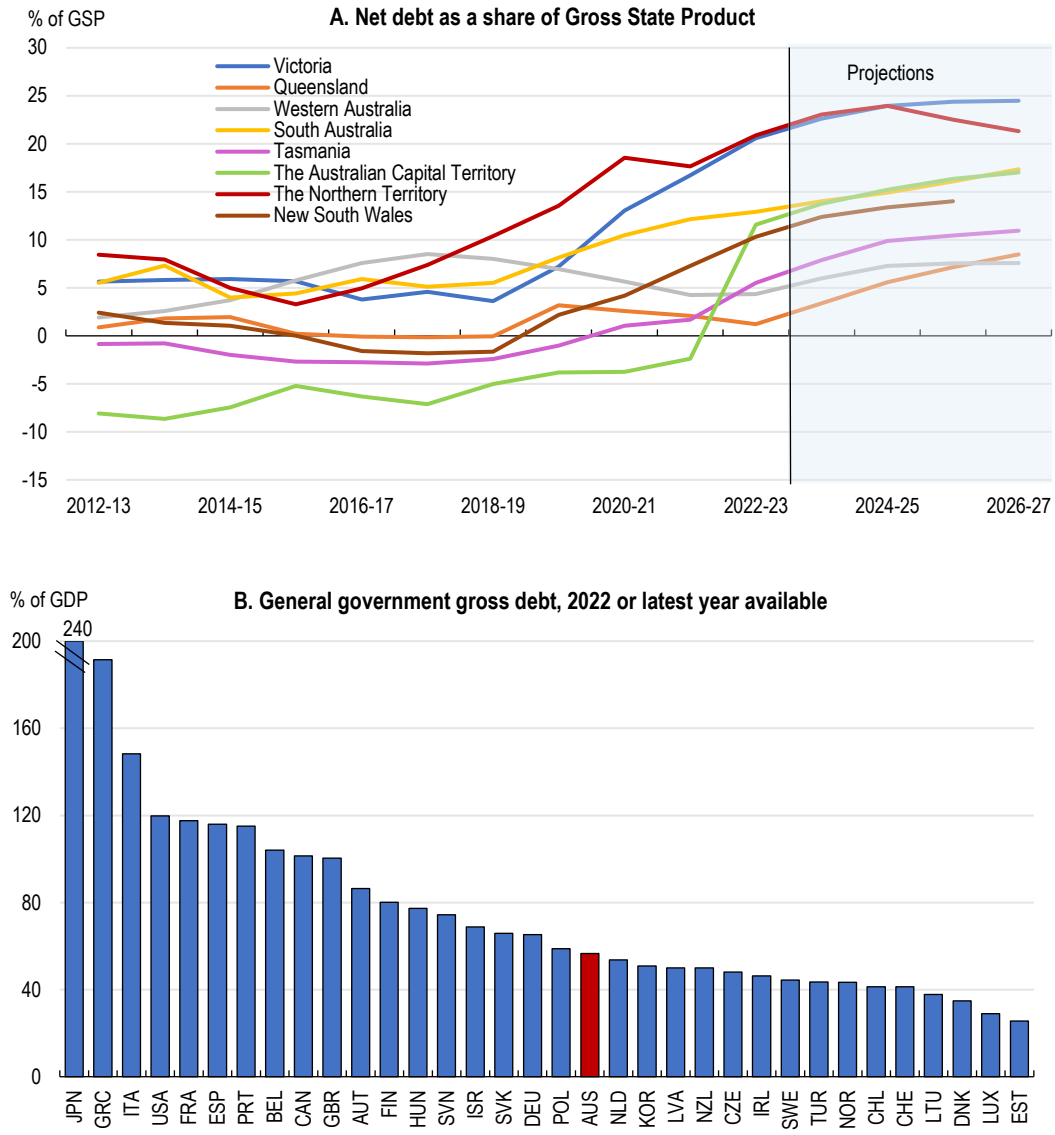
Source: Commonwealth of Australia (2023b).

StatLink https://stat.link/wheayz

Subnational governments are also running fiscal deficits in aggregate terms. In the year to March 2023, net borrowing by state and local governments was equivalent to 1.7% of national GDP. There are differences across regions. While the largest states of Victoria and New South Wales are both reporting fiscal deficits, high commodity prices are buoying the finances of the states with large mining sectors such as Queensland and Western Australia. As a result of government spending during the pandemic, and significant capital works programmes in some cases, public debt of several states has risen from very low levels (Figure 1.15, Panel A). For example, net debt as a share of gross state product in Victoria has risen from 3.6% in 2018-19 to 22.6% in 2023-24.

Consolidating across levels of government, gross general government debt to GDP is now around 57% (Figure 1.15, Panel B). However, partly due to the prefunding of public pension obligations, net public debt to GDP is 35.9% (IMF, 2023). While at similar levels to many other OECD countries, such as the Netherlands, the past decade saw a larger rise in Australia's gross public debt to GDP ratio than in most other OECD countries, despite comparatively strong nominal GDP growth. With ageing-related fiscal costs on the horizon and ongoing inflationary pressures in the economy, some fiscal tightening is warranted by unwinding temporary measures and narrowing the structural deficit. In the short term, such an approach would ensure fiscal policy is working in the same direction as monetary policy. Continuing to save windfalls from high commodity export earnings would contribute and help guard against Australia's longstanding vulnerability to excessive fiscal expansion during commodity booms, as discussed in past *Economic Surveys* (OECD, 2017a).

Figure 1.15. Public debt has risen in some states



Source: Commonwealth Treasury; OECD Economic Outlook Database.

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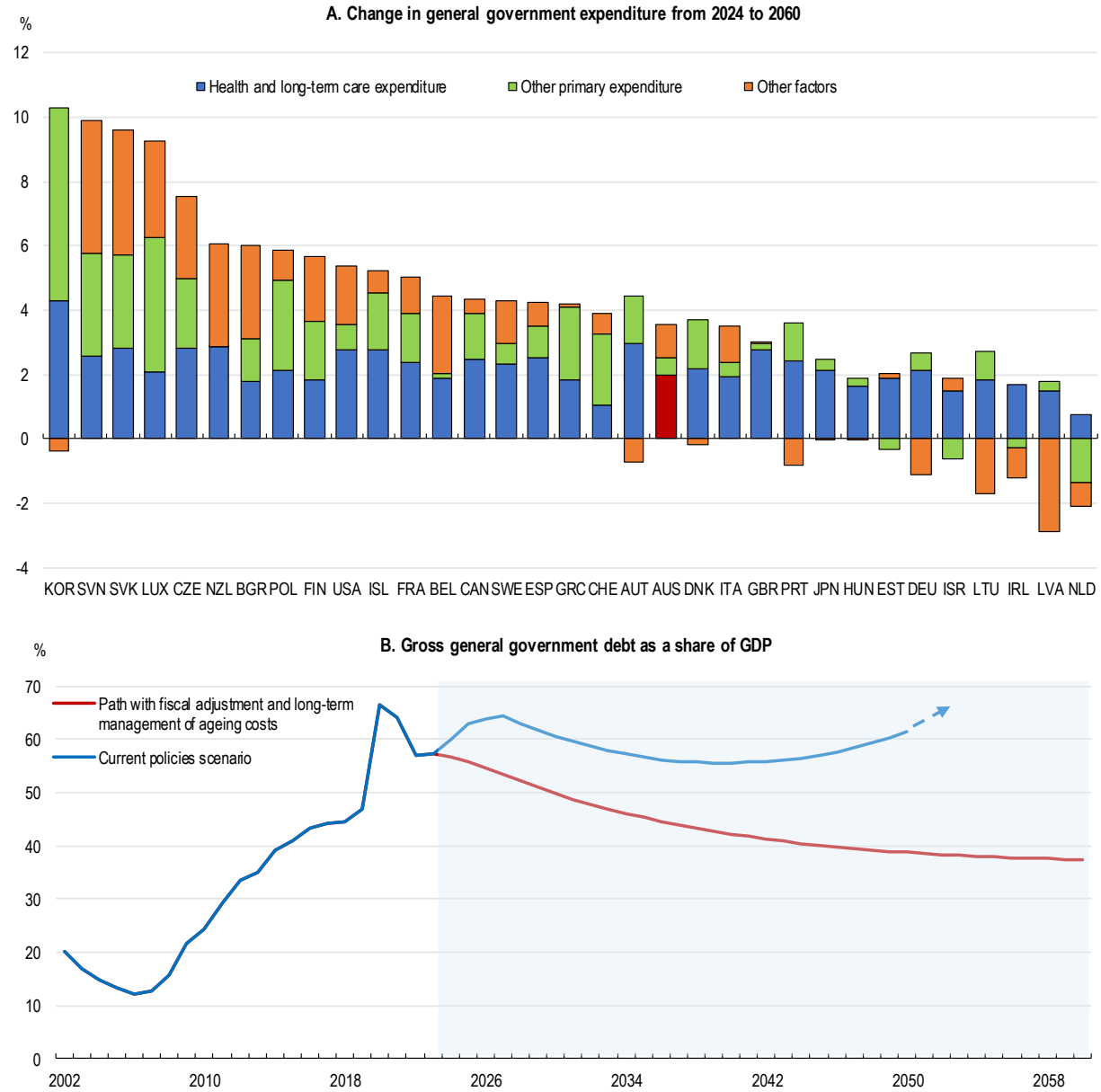
Longer-term fiscal pressures are significant

The OECD Long-term Model estimates that fiscal costs related to health and long-term care will increase in Australia as the population ages, rising by 0.8% of GDP by 2040 (Figure 1.16, Panel A). This implies that a similar reduction of spending or increase in revenue (or combination thereof) will be needed to stabilise the gross debt-to-GDP ratio from the mid-2030s. Without such measures, simulations based on the OECD Long-term Model highlight that the debt to GDP ratio will begin to rise rapidly (Figure 1.16, Panel B).

Figure 1.16. Fiscal costs will rise as the population ages



Note: In Panel A, "Other primary expenditure" is projected based on the assumption that governments will seek to provide a constant level of public spending per capita in real terms. Under some reasonable assumptions, the evolution of this expenditure category relative to GDP becomes an inverse function of the projected evolution of the employment-to-population ratio, as expenditure (numerator) follows population whereas GDP (denominator) follows employment. The "other factors" component captures anything that affects debt dynamics other than the explicit expenditure components (it mostly reflects the correction of any disequilibrium between the initial structural primary balance and the one that would stabilise the debt ratio). Pension expenditure is not included in the figure for any country because the model does not adequately capture the impact of Australia's superannuation system on public pension costs. In Panel B, the "Persistent consolidation path scenario" assumes that the primary budget balance rises to 0.3% of GDP by 2028 and then stays at that level with ageing costs fully offset by higher taxes or reductions in other spending items. The "Not offsetting ageing costs scenario" takes federal and state government fiscal projections in the period to 2027. Thereafter, the cumulative impact of healthcare costs and other primary expenditure estimated from the OECD Long-Term Model is added to the primary budget balance assumed under the persistent consolidation path.
Source: OECD Long-Term Model, OECD calculations.

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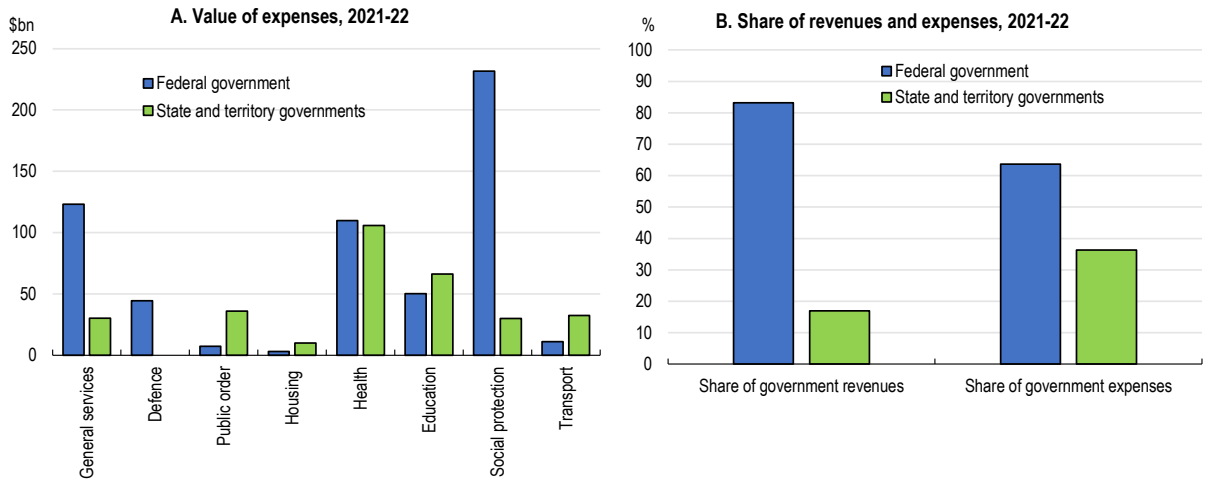
Climate change and achieving the climate transition will also bring significant additional fiscal costs that are not factored into current plans and are not fully known. As highlighted in Chapter 3 of this *Economic*

Survey, climate change has the potential to weigh on economic activity in certain parts of the country and impact certain groups of workers. The government is committed to mitigation under the goal of achieving net zero emissions by 2050. A sectoral approach to carbon mitigation is currently being pursued and some initiatives will need to be funded by the government. Further public spending on electric vehicle infrastructure, energy research and development and retraining programmes for displaced workers may all have fiscal costs. There may also be a need to compensate those adversely affected in terms of employment or their costs of living to achieve a just transition. In addition, new investments in electricity generation capacity may require public funding. OECD estimates suggest that the annual capital costs for Australia of new generation capacity will amount to 0.2% of GDP over the period to 2030 under a climate transition scenario (Guillemette and Chateau, 2023). Public infrastructure will also need to be adapted to prepare for more frequent climate hazards and there will be additional needs for agricultural R&D and extension services. At the same time, revenues may come under pressure through the loss of fuel excise and reduced corporate receipts from mining and brown industries.

Some of the fiscal pressures will be felt by state and territory governments. As a result, most states and territories are currently projecting a continued rise in the ratio of net public debt to gross state product in the period to 2026-27 (Figure 1.15, Panel A). Health is the major spending item for the states and territories, as they are responsible for the funding of hospitals and ambulance services. The states and territories also have their own emission reduction policies that may generate fiscal costs (see Chapter 3). There is significant vertical fiscal imbalance in the Australian system, with the revenues of state governments falling well short of their spending obligations (Figure 1.17, Panel B). The states are dependent on intergovernmental transfers from the Federal Budget, through the distribution of the revenues from the goods and services tax and special purpose payments. Such transfers are anticipated to amount to 7% of national GDP in 2023-24 (Commonwealth of Australia, 2023c). Rising fiscal costs of state and territory governments will thus require improvements in spending efficiency, increased transfers from the federal government or the generation of new own-source revenue from these jurisdictions.

Figure 1.17. State government finances are vulnerable to rising health costs



Source: Australian Bureau of Statistics.

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Fiscal sustainability should remain a focus

The impending fiscal pressures and exposure to commodity price cycles means a prudent approach to fiscal policy needs to be maintained over the years ahead. Australia's sound fiscal position has enabled

public financial support to play a key role in cushioning the impact of past economic shocks, such as the global financial crisis and the COVID-19 pandemic. The sustainability of public finances will benefit from ensuring the fiscal framework is robust and identifying opportunities to both improve public spending efficiency and undertake sensible tax reforms.

Ensuring a robust fiscal framework

The fiscal policy framework of the federal government is outlined in the *Charter of Budget Honesty*, legislated in 1998. It advocates a principles-based approach, with the government required to publish a series of reports each year detailing current public finances and the fiscal outlook. The transparency of public finances also benefits from well-designed medium-term budget forecasts, reporting by the Parliamentary Budget Office (an independent fiscal institution) and regular production of intergenerational reports outlining long-term fiscal challenges. In addition, the Treasurer prepares a Fiscal Strategy Statement with each annual budget. In the 2023-24 Budget, the Fiscal Strategy contained an overarching goal of "reducing gross debt as a share of the economy over time" (Box 1.1). This was underpinned by a series of high-level principles including allowing automatic stabilisers to operate, saving the majority of tax upgrades and limiting spending growth until gross debt as a share of GDP is trending down. While not detailed in the fiscal strategy, conservative commodity price assumptions which assume a rapid return to historical norms underpin the budget forecasts, so that spending plans are more closely anchored to underlying rather than current commodity prices.

Box 1.1. The Federal Government Fiscal Strategy – Budget 2023/24

The Fiscal Strategy in Australia is revised each year depending on the priorities of the government and the economic context. The 2023/24 Federal Budget includes the overarching goal of "reducing gross debt as a share of the economy over time". This is underpinned by the specified intention of:

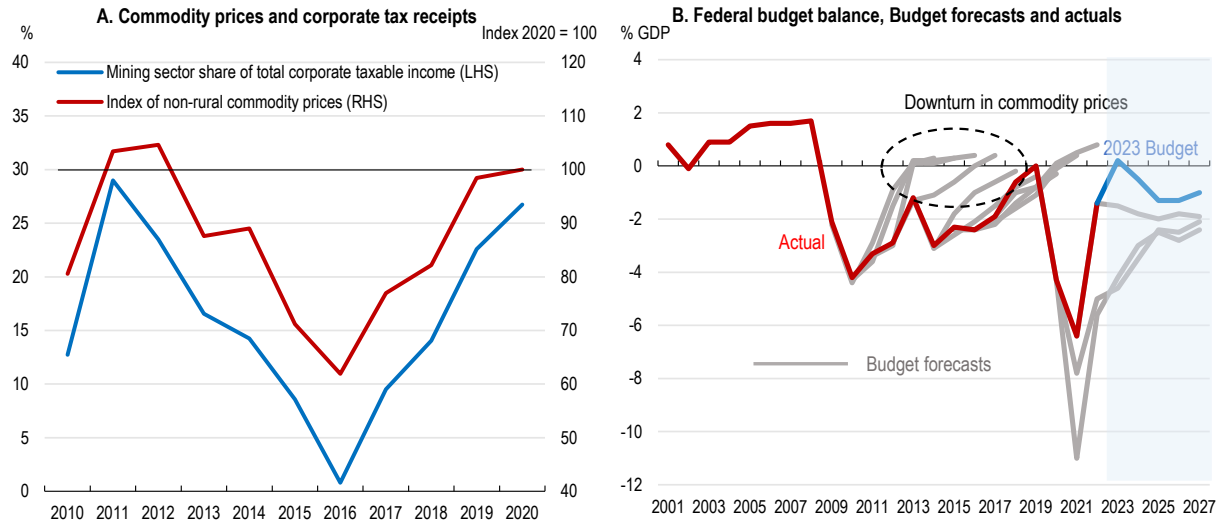
- Allowing tax receipts and income support to respond in line with changes in the economy and directing the majority of improvements in tax receipts to budget repair.
- Limiting growth in spending until gross debt as a share of GDP is on a downwards trajectory, while growth prospects are sound and unemployment is low.
- Improving the efficiency, quality and sustainability of spending.
- Focusing new spending on investments and reforms that build the capability of our people, expand the productive capacity of our economy, and support action on climate change.
- Delivering a tax system that funds government services in an efficient, fair and sustainable way.

Source: Commonwealth of Australia, 2023b.

In some other OECD countries also seeking to ensure the sustainability of the public debt-to-GDP ratio, a net spending ceiling has been used as an operational tool and approach to articulating a more explicit fiscal objective (OECD, 2022a; Cordes, 2015). Countries including Denmark, Finland, Sweden, Switzerland and the Netherlands all use some form of spending ceiling. In the Netherlands, the ceiling is set based on a measure of trend growth in revenues. Revenue shortfalls in any given year relative to the spending ceiling are fully accommodated, while revenue windfalls are automatically allocated to budget repair. Ceilings are specified in net terms, so that additional space for spending can be created by discretionary tax increases, while tax cuts need to be offset by more restrictive spending. Focusing fiscal objectives on the spending side of government can be helpful given that there is typically more control over spending than revenues (Casey and Cronin, 2023). This may be especially the case in countries such as Australia where global commodity price developments have a significant influence on tax receipts

(Figure 1.18, Panel A): repeated missing of the government's budget balance objective in the 2011 to 2015 period has been attributed to the downturn in commodity prices (OECD, 2021a;Figure 1.18, Panel B).

Figure 1.18. Commodity price fluctuations have significant implications for public finances



Source: Australian Taxation Office, RBA, Parliamentary Budget Office.

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Any further windfall federal revenues in the medium-term should be used to reduce public debt. Once the public debt to GDP ratio is on a sustainably downward path, consideration could be given to diverting windfall commodity revenues to a fund explicitly dedicated to the public sector costs anticipated ahead. Such an approach has been pursued by some other OECD commodity producing countries, such as Chile and Norway. Australia already has the Future Fund, which was initially established in 2006 to manage a pool of funds to pay for future public sector pension liabilities, with several other funds subsequently established under its guardianship (including the Medical Research Future Fund, DisabilityCare Australia Fund, the Aboriginal and Torres Strait Islander Land and Sea Future Fund, the Future Drought Fund and the Disaster Ready Fund).

The robustness of state and territory fiscal frameworks and the interaction between federal and state budgetary policies should be strengthened. Each state and territory currently have individual legislation, policies and procedures aimed at maintaining fiscal discipline and allocating resources in line with government priorities. The Council on Federal Financial Relations comprising the Federal Treasurer and all state treasurers is responsible for overseeing the financial relationship between the Commonwealth and state and territory governments. In practice, there are significant differences in the strength of fiscal institutions across states and relatively limited dialogue on fiscal policies across jurisdictions, although the federal government interacts extensively with the subnational level on funding of specific programmes. Previously, the Australian Loan Council was used to facilitate fiscal cooperation between the states and the federal government, functioning as a borrowing and deficit control mechanism (Stewart, 2023), but it is no longer in operation. In view of rising debt levels in many states and their exposure to long-term fiscal pressures, institutional arrangements for focused dialogue and coordination of fiscal policies across levels of government should be revived. This should take place through the Council of Federal Financial Relations, while respecting the autonomy of each jurisdiction. Spain is an example of a country with well-established institutional arrangements to manage general government debt and macroeconomic stabilisation across levels of government (López-Laborda et. al., 2023). To further ensure transparency and benefit public understanding, efforts to publish comparable and regularly updated data on state government finances in a single location are warranted.

Raising public spending efficiency

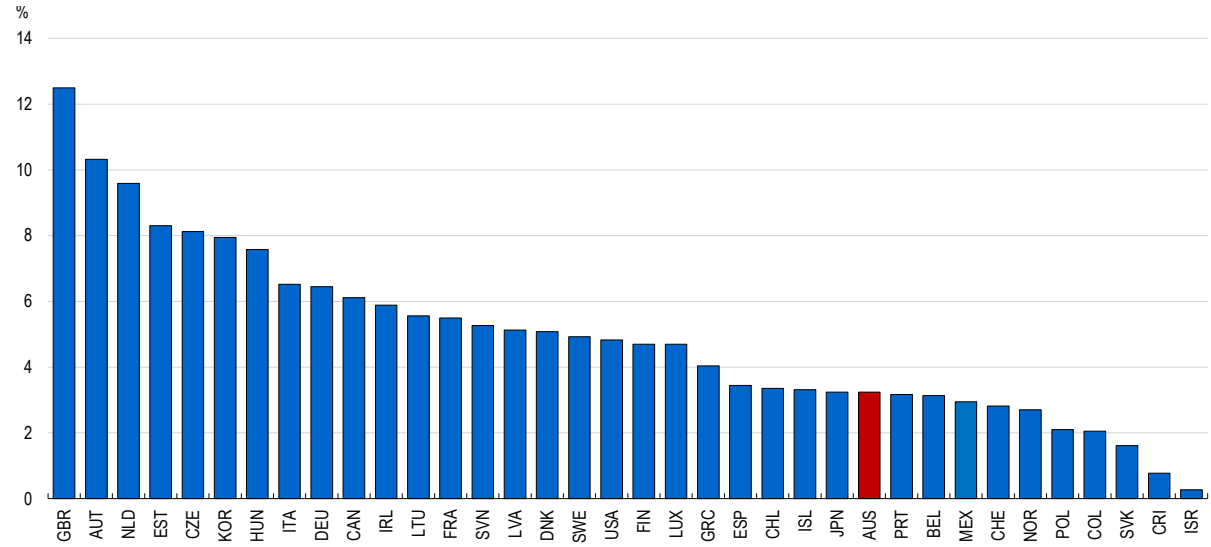
Improving the efficiency of current and future public spending can help to manage future fiscal pressures. The operation of the health and social security system will be especially important. These areas are funded through general taxation and already collectively account for half of federal government expenditure (Commonwealth of Australia, 2022a) and a large share of state spending. They will be the major sources of public spending growth as the population ages (Commonwealth of Australia, 2021a).

Australia's health system is well regarded and achieves favourable outcomes, as measured by life expectancy or self-rated health (OECD, 2021b). Even so, an ongoing challenge is the fragmentation of responsibilities across levels of government. Under the Constitution, State and territory governments manage public hospitals and community care for younger people (including child and maternity care), while the federal government is responsible for all primary care and community care for people aged over 65 and Aboriginal people aged 50 and over. These arrangements can result in poor coordination of patient care across parts of the system (OECD, 2015a; Calder et. al. 2019) and are exacerbated by patient data not being easily shared across care settings (Commonwealth of Australia, 2022b). In addition to continuing to work on effective methods of coordination between levels of government, improvements in digital health tools and processes for health data sharing will help support more effective health interventions and cost-effective public investments.

Further encouraging patient care in primary care settings and reorienting spending towards preventive care can also help contain health costs. Hospital admission rates for diseases treatable in primary care are close to the highest in the OECD (OECD, 2021b). This inflates public spending pressures given relatively high unit costs for treating a patient in hospital (OECD, 2020a). Primary care is also particularly well suited to identifying health problems early and introducing preventive measures that can limit future ill-health. Only 3.2% of current health expenditure is on preventive care (Figure 1.19). One of the challenges with preventive care spending is quantifying the often-unobserved benefits that can accrue far into the future. A good example is Victoria's Early Intervention Investment Framework, which covers policy measures in health as well as a range of other areas (Box 1.2). When introduced at the state level, preventive measures can also have benefits outside the jurisdiction that implements them. Better quantification tools along with strong national dialogue between governments would help promote the understanding of the benefits of preventive measures in reducing future fiscal costs.

Figure 1.19. Preventive health spending is low

Preventive care as a share of current health expenditure, 2022 or latest year



Source: OECD Health Expenditure and Financing Dataset.

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Box 1.2. Victoria's Early Intervention Investment Framework

The Early Intervention Investment Framework (EIIF) was introduced in the 2021-22 Victorian State Budget, amid rising spending pressures and a recognition of the high fiscal costs of intervening at later stages. The framework funds innovative early intervention initiatives across government departments. All initiatives submitted and funded under the scheme are required to quantify outcome measures and estimate the avoided cost to the government. These estimates are then verified by the Victorian Department of Treasury and Finance with an in-house model using advanced data analytics in collaboration with departmental subject matter experts.

A portion of the avoided costs (savings to the government) are set aside to be reinvested into EIIF initiatives in future budgets. This 'invest to re-invest' approach embeds early intervention into the budget process and progressively increases the amount of funding to early intervention initiatives over successive budgets, re-balancing the system towards prevention and away from increasing demand pressures in acute services.

In recognition of the challenges associated with quantification of preventive measures, funding has been allocated to enhancing shared data resources and building greater data analytical capability. This supports both ex-ante decisions about how to invest, and ex-post monitoring and evaluation. In a broader sense, the quantification helps inform the Government's understanding of the investment return of an early intervention initiative.

Source: Victorian Department of Treasury and Finance, 2022.

Reforms to the Age Pension can also offset the impending spending pressures. The Age Pension, a means-tested payment to older individuals, is a core pillar of the retirement income system. This government payment provides a safety net for retirees but can also supplement private superannuation or other savings. A 2020 government review concluded that the retirement income system in Australia is fiscally sustainable (Commonwealth of Australia, 2020). This partly reflects Australia's compulsory superannuation arrangements, whereby employers make mandatory contributions equivalent to 11% of

employee wages or salary to their superannuation fund. The stock of superannuation assets currently stands at around AUD3½ trillion (140% of GDP). Even so, publicly funded income support for seniors still accounts for about one quarter of all government spending on social welfare. In 2017, the government announced an increase in the Age Pension qualifying age to 67 by 2023-24. A further increase in the qualifying age to reach 70 by 2037 was proposed, but subsequently abandoned. In future, linking increases in the pension age to some fraction of the increase in life expectancy of older Australians should be considered.

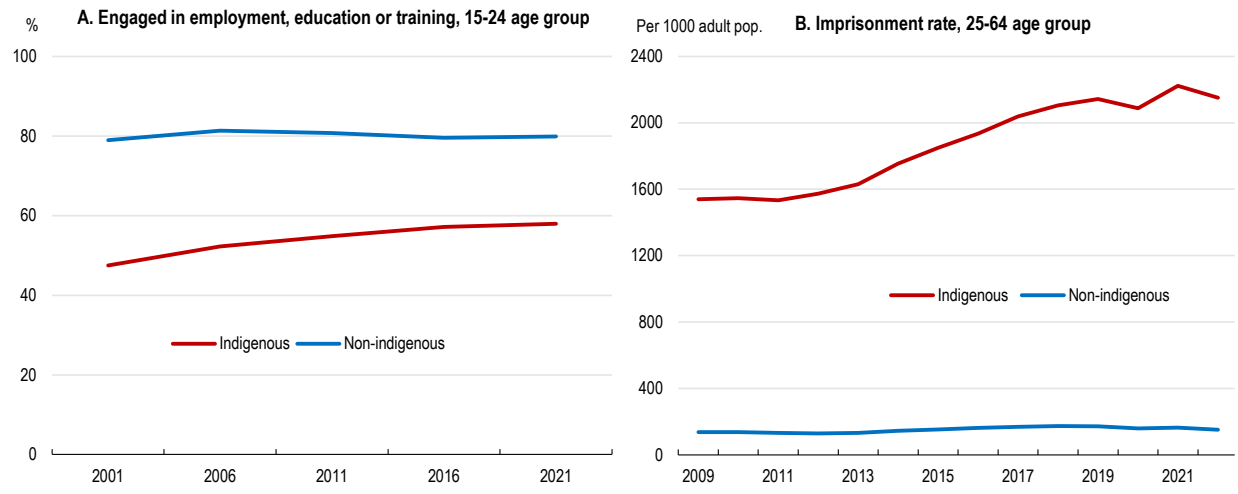
More generally, public spending efficiency can be promoted through better processes around the selection and evaluation of government projects. The Productivity Commission recently highlighted the inadequate use of rigorous cost-benefit analysis for both major infrastructure projects and in other government activities, such as defence and social services (Productivity Commission, 2023a). Credible vetting of the assumptions and inputs used in cost-benefit analysis should be considered for projects valued above a certain threshold. For infrastructure spending, Infrastructure Australia (the country's independent infrastructure advisor) would be a clear candidate to either undertake cost benefit analysis or accredit the evaluations of state independent infrastructure advisory bodies. Regarding policy evaluation, an analysis of 20 federal government programmes with costs over $200 billion highlighted that evaluation frameworks were absent or missing in 95% of cases (Winzar, et. al. 2023). The establishment of the Australian Centre for Evaluation in the Australian Treasury in the 2023-24 Budget provides a vehicle for the Government to promote the systematic use of high-quality evaluation to support evidence-based policy decisions. A key function of the centre will be to support Commonwealth entities and companies to meet the requirements and policy intent of the Commonwealth Evaluation Policy (which came into effect in December 2021), which sets out the Government's expectations in relation to evaluating government programs and activities.

Better design and evaluation of policies and programmes related to Aboriginal and Torres Strait Islander people should also be a priority. Life expectancy of Indigenous Australians born in 2015-17 is eight years below that for non-Indigenous Australians and their employment rates remain 20 percentage points lower (Figure 1.20, Panel A). Imprisonment rates for working age Indigenous Australians were 14 times higher than for non-Indigenous people in 2022 (Figure 1.20, Panel B). Despite decades of new policies and changes to existing ones, little is known about what policies focused on Indigenous Australians work and why, and there is no coordinated approach to policy evaluation across governments.

Shared decision-making authority between governments and the Aboriginal and Torres Strait Islander people in developing and implementing policies has been increasingly emphasised. This was a core commitment of the National Agreement on Closing the Gap agreed by all Australian governments along with the Coalition of Aboriginal and Torres Strait Islander Peak Organisations in 2020. However, a draft review into progress on the agreement by the Productivity Commission in July 2023 found that governments are generally not sufficiently investing in partnerships or enacting the sharing of power necessary if decisions are to be made jointly (Productivity Commission, 2023b).

The evaluation of existing policies impacting on Indigenous Australians is also underdeveloped. The Productivity Commission has proposed an Indigenous Evaluation Strategy that gives guidance for Commonwealth agencies in response (Productivity Commission, 2020a). The newly established Australian Centre for Evaluation has the potential to play a clear stewardship role in implementing the Indigenous Evaluation Strategy across the Commonwealth Government. Ongoing coordination between the Indigenous Evaluation Committee of the National Indigenous Australian's Agency with input from the Australian Centre for Evaluation will help identify future opportunities to strengthen evaluation guidance and processes in a culturally appropriate way for both Indigenous-specific and mainstream policies that affect Indigenous Australians.

Figure 1.20. Indigenous Australians continue to experience much worse outcomes in key areas



Source: Productivity Commission.

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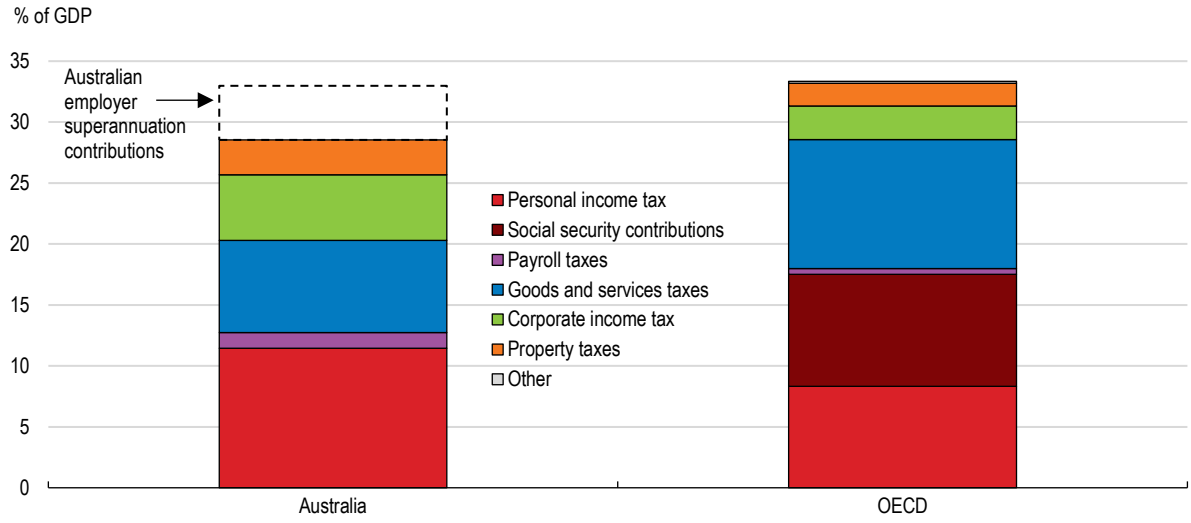
Tax reforms to address fiscal pressures

The combination of a persistent structural fiscal deficit and future spending pressures suggests the authorities will need to consider avenues for raising further revenues. On the face of it, taxation as a share of GDP is low by OECD standards: at 28.5% in 2020, compared with 33.6% on average in the OECD (Figure 1.21). However, Australia does not levy social security contributions and including compulsory superannuation payments by employers (which fund private pensions) suggests a burden only slightly below the OECD average. Examining the tax mix, Australia relies more heavily on corporate taxes and less on goods and services taxes than most other OECD countries. The sum of personal income taxation and superannuation contributions is roughly equivalent to the sum of personal income taxation and social security contributions in the average OECD country.

Personal income taxation is expected to rise as a share of total taxation in the coming years (Parliamentary Budget Office, 2022a). This partly reflects a lack of indexation of tax thresholds in a highly progressive personal taxation system, with ad hoc tax cuts only partly offsetting the impact of nominal wage growth pushing employees into higher tax brackets (Commonwealth of Australia, 2015). In 2019, the government legislated several stages of tax cuts starting from the 2018-19 financial year. The aggregate effect of these tax cuts is to return the proceeds of bracket creep to households, though they are slightly regressive because they overcompensate those in the highest income quintile (Phillips et. al. 2023). A high reliance on personal income taxation is a risk in an environment of a declining share of the population active in the labour market as the population ages (Rouzet et. al. 2019). This is especially the case given the relatively light taxation of pension income in the Australian system. In addition, high personal income taxation can have adverse impacts on economic growth, largely through weakening the attachment of below-average income earners to the labour market and reducing the marginal benefits to higher income earners of increasing labour supply (Akgun et. al., 2017). Consequently, in raising additional tax revenues, the authorities should not rely on further increases in personal taxation but should look to other tax heads that are less likely to come under pressure from an aging population and are less distortionary for economic activity.

Figure 1.21. Goods and services taxes account for a lower share of the tax mix

Tax revenues as a share of GDP, 2020



Note: Data are for 2020, the most recent comparable year. The "Australian employer superannuation contributions" includes super guarantee contributions and defined benefit contributions.
Source: OECD Revenue Statistics Database; Australian Prudential Regulation Authority.

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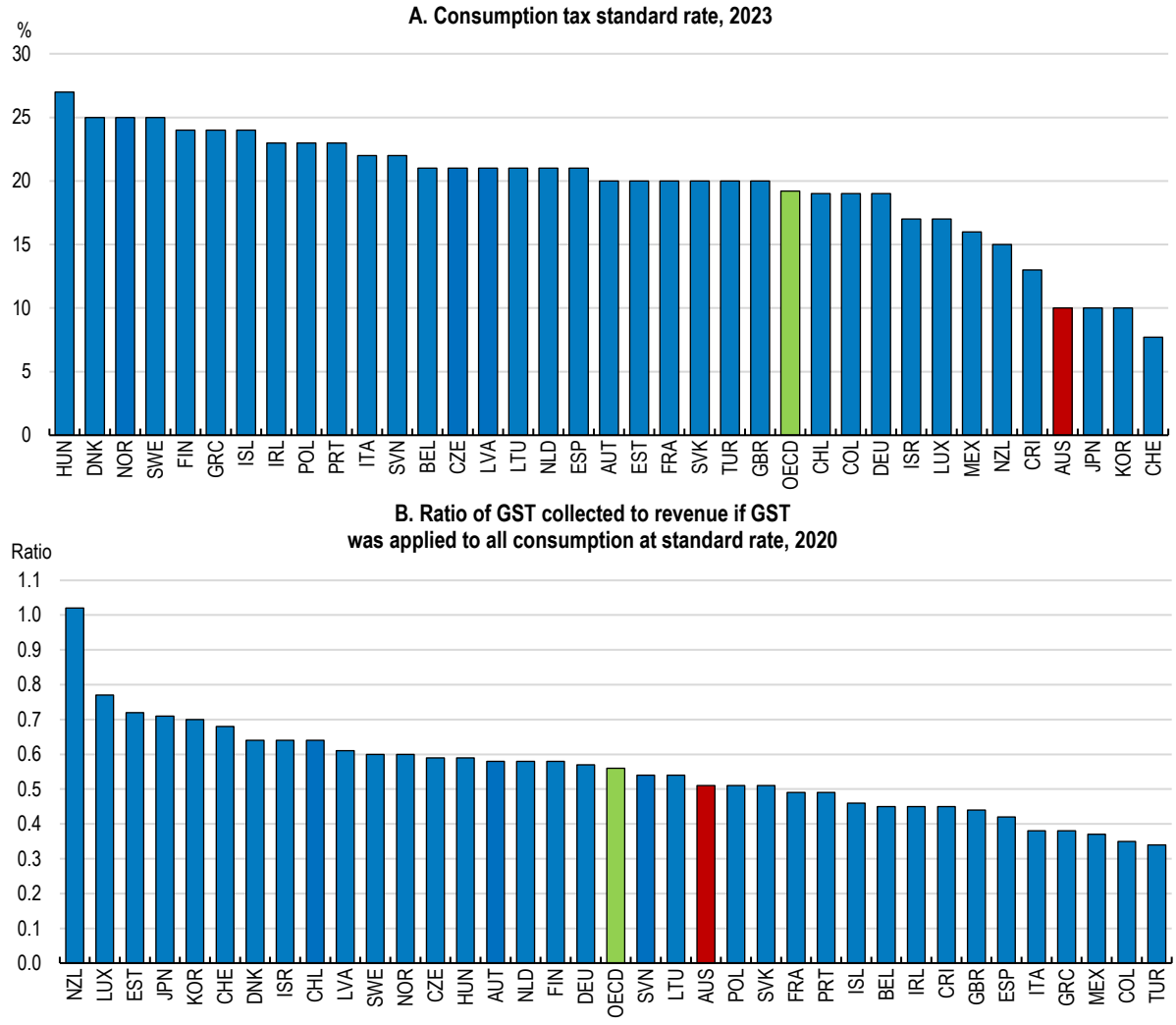
Goods and services taxes are a more resilient tax base to an ageing population (Colin and Brys, 2019) and can help rebalance the sharing of the tax burden between people in employment and the retired population. They are also more difficult to evade and have weaker disincentive effects than income taxes (Akgun et. al., 2017). Revenues from taxes on goods and services accounted for 26.5% of total taxation in Australia in 2020 compared with 32% in the average OECD country. This partly owes to the low rate of 10% for Australia's Goods and Services Tax (GST) and more exemptions than in other OECD countries (Figure 1.22). GST revenues as a share of both total taxation and GDP have been falling over the past decade and are expected to continue doing so with a rising share of GST-free items in household consumption bundles (Parliamentary Budget Office, 2020).

There are challenges to raising more revenue from the GST. As highlighted earlier, the tax is collected by the federal government and distributed to the states. Changes to the base or to the rate would require unanimous agreement of state/territory and federal governments and passage of legislation through Commonwealth Parliament. Increasing the GST could also be regressive, as it is taxed at a flat of 10% meaning it typically accounts for a larger share of income for lower income households. Even so, the value of GST exemptions in Australia are disproportionately captured by higher income households (Commonwealth of Australia, 2023d). This suggests that a base-broadening GST reform could be accompanied by a compensation mechanism for lower income households (such as increases in government benefits) while still raising revenue. Rough estimates suggest that a reform that combined closing the most significant GST exemptions with a compensation package for low-income households could still raise 0.7% of GDP in additional government receipts (Box 1.3).

Figure 1.22. The GST rate is low and there are significant exemptions



Note: Panel B is the "VAT Revenue Ratio". For Türkiye, data is 2019.
Source: OECD Consumption Tax Trends database.

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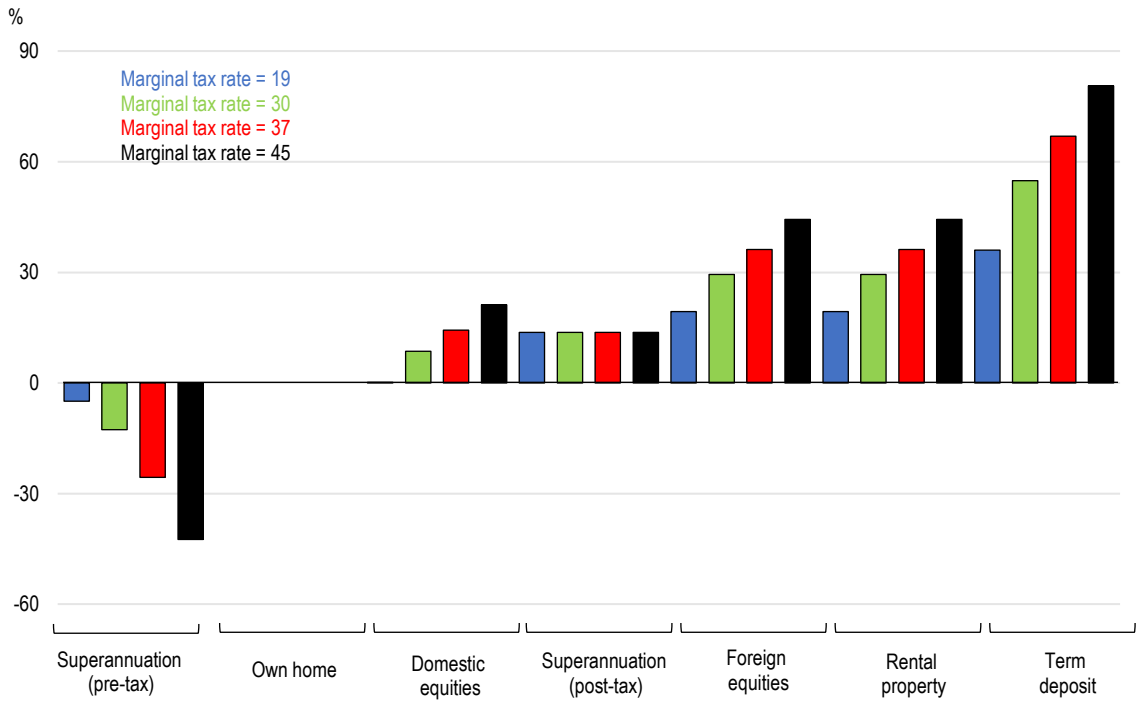
Tax treatment across different savings vehicles differs markedly (Figure 1.23). This partly reflects some saving forms, such as bank interest or rental income, being taxed as personal income at an individual's marginal rate and other saving forms being subject to special concessional tax treatment. While Australia has close to the highest marginal effective tax rate on bank deposits and rented residential property income in the OECD, the rates on private pension savings are well below average (OECD, 2018b). These differences, combined with a high level of complexity in the various tax provisions, can encourage costly tax planning schemes and distort the flow of savings (Varela et al., 2020). The fact that older and higher income households have a relatively high share of assets in those savings vehicles more lightly taxed can exacerbate both intra- and intergenerational inequalities.

Figure 1.23. Superannuation is much more lightly taxed than some other savings vehicles

Real effective marginal tax rate on long-term savings vehicles, by marginal tax rate (%)



Notes: Real effective marginal tax rates calculated against an expenditure tax benchmark (i.e. if tax were paid on income when earned and then both dividends and withdrawals were tax free).
Source: Coates and Moloney (2023).

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Further reducing tax concessions on private pensions would be a step towards greater tax neutrality across different savings vehicles and could raise further revenue. At present, most contributions and earnings in Australia's superannuation system are taxed at a flat rate of 15%, while in retirement, earnings from assets up to AUD1.9 million and withdrawals are generally untaxed (Parliamentary Budget Office, 2023). This implies that income channelled through the schemes is undertaxed over the lifecycle, particularly for richer people with high marginal tax rates. Superannuation tax concessions are projected to grow as a percentage of GDP, with the fastest growing component being earnings tax concessions (Commonwealth of Australia, 2020). In particular, the tax exemption on earnings in retirement is growing as median superannuation balances at retirement are rising as the system matures.

According with a recommendation in the previous *OECD Economic Survey of* Australia, the authorities have recently announced their intention to restrict the concessional tax rates by increasing the headline tax rate from 15% to 30% on earnings in superannuation accounts with balances exceeding AUD3 million (Table 1.4). If legislated, the increased tax will apply to earnings on amounts over AUD3 million, commencing in July 2025 and earnings under this threshold will continue to be taxed at 15%. Further reform options include reducing the annual concessional contribution cap under which individuals can make additional contributions from their pre-tax income (currently set at AUD27,500 per annum) or taxing superannuation earnings in the retirement phase. Estimates from the Grattan Institute suggest that taxing superannuation earnings in retirement at 15% coupled with capping pre-tax contributions at AUD20,000 would raise around 0.3% of GDP in additional revenue (Box 1.3). However, more stringent tax treatment of superannuation may also lead to increased use of other vehicles for tax planning purposes, such as

trusts. The number of trusts has grown rapidly over the past two decades (Sainsbury and Breunig, 2020), with these vehicles potentially used to reduce household tax liabilities by splitting income to use all beneficiaries' tax-free thresholds (De Silva et. al. 2018). Further efforts to understand and evaluate the various complex trust structures that exist and the value of income being directed through them would be worthwhile.

Table 1.4. Past OECD recommendations on fiscal policy

Recommendations in previous Survey	Action taken since September 2021
Further shift the tax mix away from income taxes (especially personal income tax) and inefficient taxes (including real-estate stamp duty) and towards the Goods and Services Tax and recurrent land taxes. Reduce some of the concessions for the taxation of private pensions, particularly those that favour high income earners. Reduce the capital gains tax discount. Assess the distortionary impact of the current two-tier corporate tax system.	On 28 February 2023, the federal government announced it would reduce the superannuation tax concessions for individuals with total superannuation balances above AUD3 million. From 1 July 2025, the Better targeted superannuation concessions reform will bring the headline tax rate to 30 per cent, up from 15 per cent, for earnings corresponding to the proportion of an individual's superannuation balance above $3 million.
Further increase the unemployment benefit rate and consider indexing the rate to wage inflation.	In May 2023, the government announced a modest increase in the base rate for JobSeeker and other working age and student payments of base rate by AUD40 per fortnight and extended eligibility for the existing higher single JobSeeker payment rate to those in the 55-60 age bracket. There was also a 15% increase in the maximum rate of Commonwealth Rent Assistance.
Embed the Productivity Commission Indigenous Evaluation Strategy in the policy design and evaluation process of all Australian Government agencies for both Indigenous-specific and mainstream policies that affect the Indigenous population.	No action taken
Implement a medium-term fiscal strategy with targets that are associated with specific timeframes or conditional on measurable economic outcomes.	No action taken
Task an independent fiscal institution, such as the Parliamentary Budget Office, with both formal evaluation and monitoring of the government's fiscal strategy	No action taken

There are other changes to the tax system that can benefit fiscal sustainability, including by spurring economic growth. Replacing state-level transaction taxes on real estate with a recurrent land tax would promote labour mobility and the transfer of assets for more appropriate uses. The Australian Capital Territory has already begun making this transition and the Victorian government recently announced such a shift for commercial properties. Further avenues for increasing the taxation of natural resources should also be considered. As discussed in previous *OECD Economic Surveys*, a move towards taxing resource rents, rather than royalties could improve the climate for resource-sector investment and exploration (OECD, 2018c). In Australia, natural-resource taxation is primarily a state-level responsibility, with the federal government only having taxing rights on offshore natural resources. There was previously a Minerals Resource Rent Tax levied on 30% of the profits of mining companies once they exceed a dollar value threshold. However, this was repealed in 2014, two years after being introduced. There could also be consideration given to introducing an inheritance and estate tax, which are levied in most other OECD countries (OECD, 2021c), as these are less distortive to growth than labour taxes and can help address intergenerational inequality. Australia does not have an inheritance tax, after such levies were removed at both the state and federal level four decades ago.

Box 1.3. Budgetary impact of recommendations

The following estimates are taken from a variety of sources and quantify the fiscal impact of selected medium-term reforms with long-term fiscal impacts. There is significant uncertainty around these estimates.

Table 1.5. Illustrative fiscal impact of selected reforms

Policy	Scenario	Additional annual fiscal cost (-) or revenue (+), percentage points of GDP
Spending measures		
Further raising unemployment benefits	Unemployment benefits are increased to the point where the minimum amount a JobSeeker Payment recipient receives through private income and government payments equals the OECD relative measure of poverty.[1]	-0.4%
Raising parental leave	Increasing public expenditure on maternity and parental leaves per live birth to the OECD average.	-0.3%
More efficient health spending	Encourage patient care in primary care settings and increase the focus on preventive care.	+
Revenue measures		
Reduce superannuation tax concessions	A package of changes including taxing superannuation earnings in retirement at 15% and cap pre-tax contributions at AUD20,000.[2]	+0.3%
Broaden the Goods and Services Tax base	Eliminate Goods and Services Tax exemptions for education, healthcare, food, water, sewerage and drainage and introduce compensation for low-income households equivalent to 0.3% of GDP. [3]	+0.7%

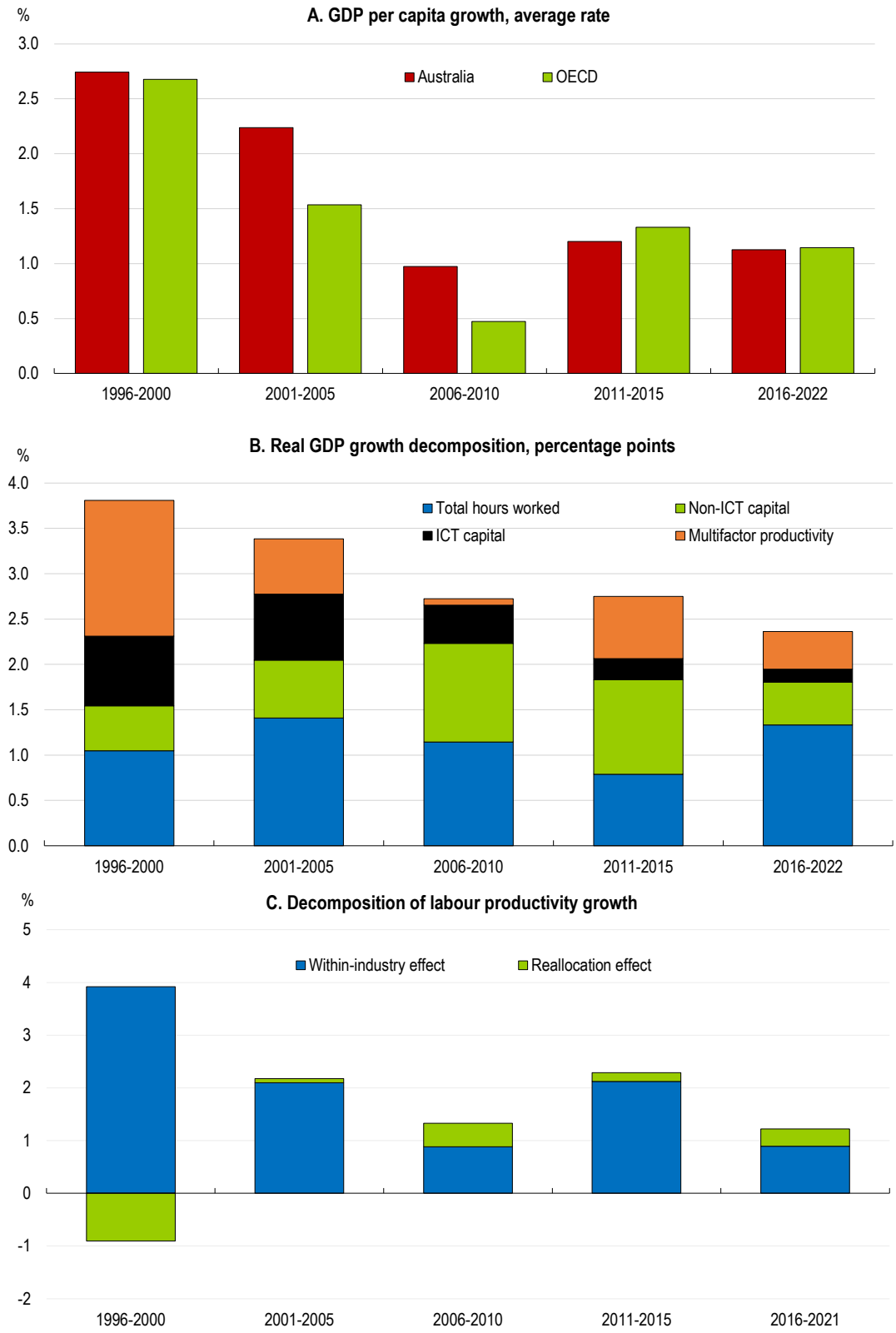
Note: Behavioural changes in response to a tax or spending change are not taken into account. Reform recommendations with fiscal impacts of less than 0.1% of GDP are not included. The savings associated with the key recommendation to reduce National Disability Insurance Scheme Costs are already factored into the government's central budget projections. The key recommendation to further encourage patient care in primary care settings and increase the focus on preventive care would also be expected to bring budgetary savings, but no reliable estimates exist for estimating the impact (reflected with the "+" sign in the table).
Source: 1. Partially based on calculation from Parliamentary Budget Office (2020). 2. Based on estimates from Coates and Moloney (2023). 3. Based on Commonwealth of Australia (2023d).

Raising medium-term economic prospects

Strong and sustainable economic growth is needed to maintain and continue to improve living standards as the population ages and the climate transition takes place. Significant economic opportunities will arise in the medium term as decarbonisation and digitalisation further transforms economies. Nevertheless, Australian GDP per capita growth has slowed since the early 2000's and while Australia once outperformed OECD counterparts, GDP per capita growth has been comparatively weak through the past decade (Figure 1.24, Panel A).

Lower productivity growth and a slowdown in ICT investment have both played a role in more modest economic growth, at least compared with the period of reform through the 1990's (Figure 1.24, Panel B). The decline in labour productivity growth has primarily reflected weaker within-industry dynamics rather than resources shifting from more productive to less productive industries (Figure 1.24, Panel C). There have been various underlying drivers identified for the productivity slowdown, including slower gains in educational attainment and labour quality, declining business dynamism and weaker business investment (Commonwealth of Australia, 2021a).

Figure 1.24. GDP per capita growth has slowed



Source: OECD Compendium of Productivity Indicators; OECD Growth in GDP per capita, productivity and ULC Dataset.

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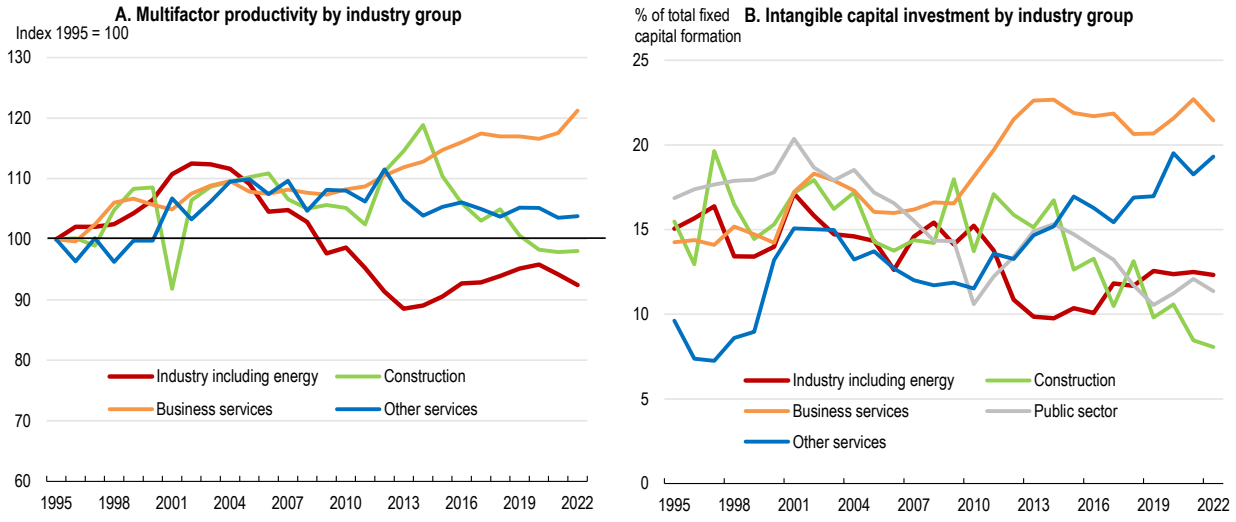
Weakening intangible capital investment has been observed in many of the industries experiencing slower productivity improvements. The complementarities between intangible capital, ICT investment and productivity growth are well established (Corrado et. al. 2021; Gal, et. al. 2019). Construction and industry have observed both weak multifactor productivity growth and declining intangible capital intensity (Figure 1.25, Panel A and Panel B). In contrast, the productivity performance of market services has been relatively strong. This is especially the case for business services, with a notable rise in productivity at the same time as intangible capital investment has picked up.

Although official multifactor productivity estimates for the non-market sector do not exist, labour productivity growth for industries such as education and healthcare has slowed along with the share of intangible capital they employ (Figure 1.25, Panel B). This is concerning given that education and health currently account for around one quarter of total employment and the employment share of both is projected to rise further in the years ahead as the population ages (NSC, 2021).

Figure 1.25. Slower productivity growth has coincided with weakening intangible investment



Note: Intangible capital includes software, research and development, exploration and artistic works. Sectoral aggregates follow standard definitions in the OECD Structural Analysis Database: industry including energy (mining, manufacturing, electricity, gas and water), business services (wholesale trade, retail trade, transportation and storage, accommodation and food service activities, information and communication, financial and insurance activities, real estate activities, professional services and administrative and support services) and other services (arts and recreation and other services).
Source: ABS, OECD calculations.

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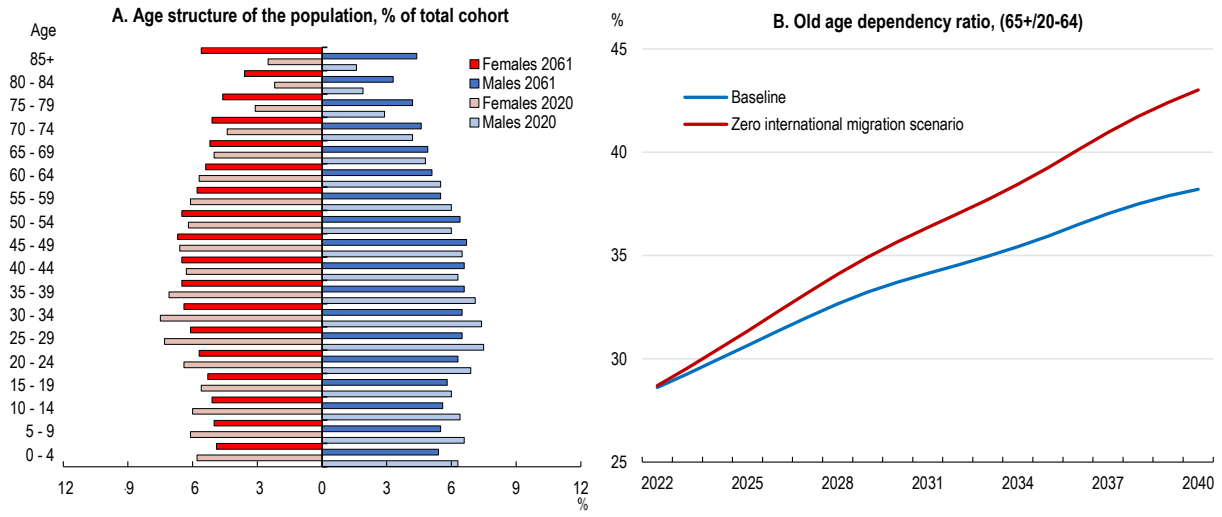
The ageing population will be a headwind to medium-term economic growth through the impact on the labour market. The proportion of the population aged over 65 is anticipated to rise from around 17% in 2020 to 24% in 2061 for females and from 15% to 21% for males (Figure 1.26, Panel A). The ratio of those aged over 65 to those aged 20-64 will increase steeply, offset somewhat by assumed net international migration flows (Figure 1.26, Panel B). The authorities estimate that the labour force participation rate will decline by around 3 percentage points by 2062-63 (Commonwealth of Australia, 2023e). Such pressures could be somewhat assuaged by increased labour force participation for women, as discussed in Chapter 2 of this *Economic Survey*.

Against a backdrop of a trend weakening in GDP per capita growth, significant structural changes related to population ageing, geopolitical developments, digitalisation and climate change are in prospect for the Australian economy. To support medium-term economic growth, public policies will need to further attract labour resources and ensure those in jobs are equipped with strong and flexible skills. At the same time,

policy measures will need to support an adaptable and innovative business sector, through reducing barriers to labour mobility and impediments to new businesses entering markets and growing.

Figure 1.26. The share of the working age population will decline



Source: Commonwealth Treasury, United Nations World Population Prospects 2022.

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Maintaining an effective migration system

Immigration will continue to play a key role in the Australian labour market of the future. Migration has accounted for over half of Australia's population growth since 2000 (Andrews, et. al. 2023) and overseas-born individuals now make up about 30% of the domestic population (Figure 1.27, Panel A). Australia's migration system has been successful at facilitating a highly skilled stock of migrants that contribute positively to the domestic economy. The system is characterised by frequent evaluations and policy monitoring, with ongoing reforms to address impending challenges (OECD, 2018d). Overseas arrivals can help flatten the age structure of the population, as a relatively high share are early in their working lives (Figure 1.27, Panel B). However, the employment rate of those in Australia who were born overseas has been below that of the native-born population, partly reflecting the very low labour force participation rate of overseas-born women (see Chapter 2; OECD, 2023c).

Box 1.4. The Australian immigration system

Australia's immigration system comprises:

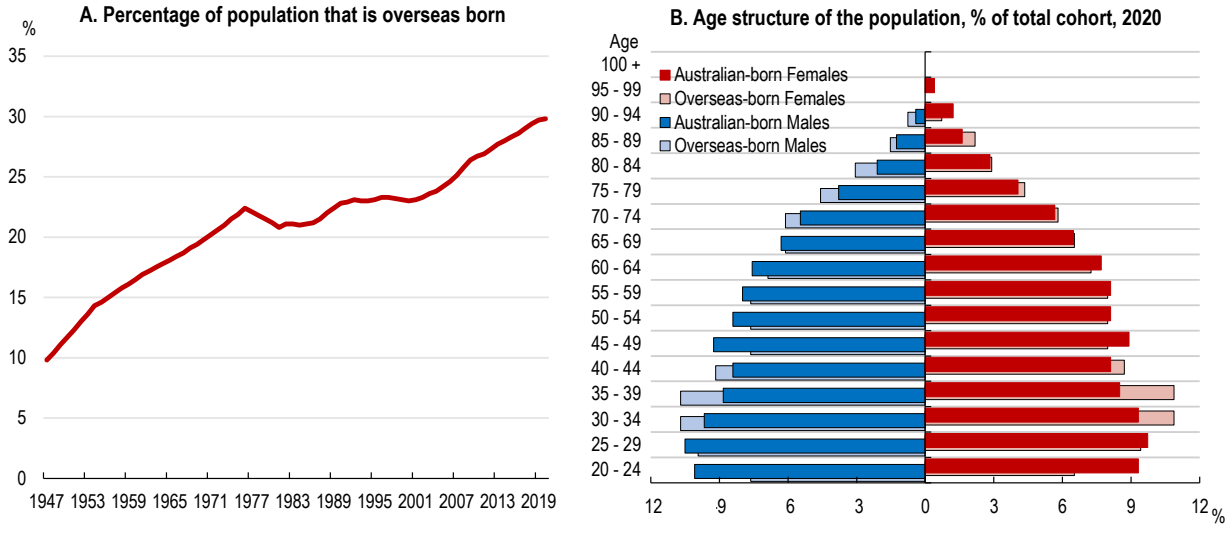
1. A demand-driven temporary program - for tourists, students, temporary skilled migrants and a special category reserved for citizens of New Zealand.
2. A capped permanent program – for permanent skilled migrants, family members and humanitarian entrants.

There were approximately 4.11 million visa holders in Australia as at October 2022 (compared with a population of around 26 million). Of these, 46% were permanent migrants, 46% were temporary migrants and 8% were on visitor and transit visas. While the caps under the permanent migration program are closely managed by governments, the temporary migrant cohort has risen sharply, roughly doubling in size since 2007.

Source: Commonwealth of Australia, 2023f.

A review of the migration system was published in March 2023 (Commonwealth of Australia, 2023f). It highlighted significant administrative complexity in the current system that may deter potential migrants. While some complexity in migration systems is inevitable, and simplifying the policy framework may not always be feasible, the system can continue to be made easier to navigate through robust and well-designed data and ICT systems. However, the review found current data systems to be outdated and poorly integrated with data related to other government services. This can contribute to slow processing times and administrative complexity for new arrivals.

Figure 1.27. The migrant share has steadily risen



Source: ABS, OECD.

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Improving the skilled migration system can provide better access to young migrants with the skills needed for the future. Skilled visas (both permanent and temporary) account for around 500 thousand of the 4.11 million visas on issue in Australia in October 2022 (Commonwealth of Australia, 2023f; Box 1.4). While migrants in Australia positively impact local labour productivity (Box 1.5), firm level analysis suggests that a positive relationship between the migrant worker share and firm productivity growth is only apparent for workers on skilled migrant visas (Andrews, et. al. 2023). The current skilled migration system has been

based on employer sponsored migration that requires the post to fit with occupation lists that are slow to be updated and may not adequately reflect the skill needs of industry. It also requires labour market testing, whereby an employer must advertise a vacant position domestically to demonstrate it cannot be filled by an Australian worker before being able to sponsor a migrant. This process can cause significant delays in recruitment.

Looking forward, the skilled migration system should continue to be updated to support a steady flow of well-skilled migrants that can add to the working age population and boost productivity growth. A clear long-term strategy for the overall migration system should be outlined, as suggested by the government's migration review, and strong consideration given to further streamlining and better targeting the skilled-based system. If occupation lists continue to form the basis for skilled migration, such lists should be dynamic and well informed by timely and granular data, analysis and the views of employers. At the same time, the authorities should consider either removing labour market testing for permanent migrants or implementing significant steps to streamline the system.

Box 1.5. Contribution of migrants to local productivity in Australia

Migrants have been an essential driver of population and economic growth in Australia. As of 2019, Australia had the second highest proportion of the population born abroad among all OECD countries. What distinguishes Australia is its highly educated and well-integrated migrant population, which actively engages in the labour market. In fact, migrants' educational attainment exceeds that of the native population (OECD, 2023c).

Recent OECD research that uses individual-level administrative panel data covering all Australian residents (the Multi-Agency Data Integration Project) suggests that migrants have a positive impact on local labour productivity in Australia (OECD, 2023c). A 10% increase in the local share of migrants (e.g., from 30% to 33%) was associated with a 1.3% increase in the labour productivity of native workers in the 2011-18 period.

The analysis reveals that natives with less than tertiary education benefit slightly more from migration compared to their counterparts with tertiary education. This diverges from findings for other OECD countries (Kemeny and Cooke, 2018) and may reflect the comparatively high skilled nature of Australian migrants with skills that are complementary to those of lower skilled natives. Additionally, the skill levels of migrants themselves have an impact on the productivity of native labour, with a 10% increase in the proportion of high-skilled migrants within the migrant population associated with a 3.3% increase in native labour productivity.

Source: OECD (2023d), "The impact of migration on local productivity in Australia", OECD Regional Development Papers, forthcoming, OECD Publishing, Paris.

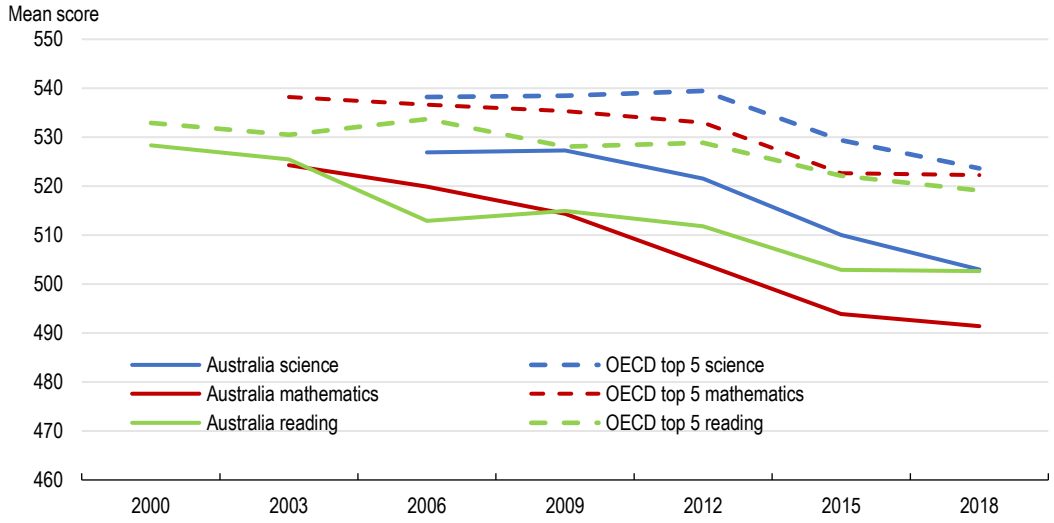
Improving the effectiveness of the education system

To prosper amid ongoing structural change, the workforce needs to have strong foundational skills that are well aligned with the needs of industry in the future. Australia has strong human capital overall, but challenges are emerging. The National Skills Commission projects that over 90% of jobs created in the next five years in Australia will require post-secondary education (NSC, 2022). By field, they expect strong demand from occupations requiring skills in science, technology, engineering and maths (STEM) and related to the care sector (NSC, 2021). A strong basis of foundational skills is an important enabler for moving into higher levels of education and developing new skills later in life (OECD, 2019a). Amid uncertain structural change, an education system that entrenches strong general capabilities is imperative. However, one in five Australians have low basic skills, according to the most recent OECD Programme for the International Assessment of Adult Competencies (OECD, 2017b). The performance of students in science,

reading and maths has slipped compared with top performing OECD countries in the Programme for International Student Assessment (Figure 1.28). This may partly reflect an increased share of 15-year-olds in Australia being in low grade levels (Productivity Commission, 2022a), but student achievement in Australia's National Assessment Program – Literacy and Numeracy (NAPLAN) has also stagnated, despite an increase in school funding (Productivity Commission, 2023c).

Figure 1.28. The relative performance of Australian students has slipped

Australian mean score in the Programme for International Student Assessment, by competency



Note: "OECD top 5" corresponds to the average of the five countries with the highest scores in the particular discipline at any given point in time.
Source: OECD.

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Updating school teaching practices

At school level, a major challenge is the increasing demands being placed on teachers. With increased community expectations of personalised learning and more diverse classrooms, workloads have risen (Productivity Commission, 2023c). Australian teachers have high teaching hours compared to their counterparts in other OECD countries (OECD, 2023b) and administrative tasks are consuming large amounts of teachers' time: a higher proportion of Australian teachers report too many administrative tasks as a significant source of stress than in most other OECD countries (OECD, 2020b). However, there is also a perceived need to reduce unnecessary tasks in core teaching work (Hunter and Sonnemann, 2022). Fewer than one in seven teachers in 2022 reported their workload being manageable (Longmuir et al. 2022), leaving the majority reporting an inability to adequately prepare for class (Hunter and Sonnemann, 2022). Federal and state education ministers agreed to a National Teacher Workforce Action plan in December 2023. The plan consists of 27 actions to address the national issue of teacher shortages, including exploring initiatives to reduce teacher workload.

Providing all teachers with high-quality curriculum guidance and instructional materials would support the spread of evidence-based teaching practices and relieve the workload on teachers. The Australian and state curriculums only provide high-level guidance, requiring teachers to develop the curriculum for the classroom. A Grattan Institute Survey of 2,243 teachers in 2022 found that around half were the main person responsible for selecting and developing class materials (Hunter, et. al., 2022). According to the survey, teachers reported spending six hours per week on average sourcing and creating materials and a quarter of teachers spent 10 hours per week or more. Just 15% reported having access to a common bank

of high-quality curriculum materials for their classes, with teachers in disadvantaged schools only half as likely as those in advantaged schools to have access to such resources. While teachers need to tailor lesson plans to reflect individual student needs, there are core aspects of the curriculum that could be regularly provided to teachers by state authorities, with close reference to the evidence base developed by the recently-established Australian Education Research Organisation. This can support a more harmonised level of education across schools and reduce the workloads of teachers.

The Australian Productivity Commission has also highlighted the potential for digital technology to improve the operation of schools and learning outcomes (Productivity Commission, 2023c). This could be through applications enabling better identification of struggling students, personalised learning paths and assistance to teachers with assessment and lesson planning. In the United States, new digital personalised tools such as the Spatial-Temporal Math Curriculum have been effective in improving scores on standardised assessments (Wendt et. al., 2019; Rutherford et. al., 2010). However, experience across OECD countries highlight that simply applying new technologies to schooling is not sufficient for improving student performance (OECD, 2021d). For new digital tools to be impactful, teachers need the requisite skills to use them effectively. Other OECD countries such as Portugal and Slovenia have encouraged digital skill development through teacher peer learning networks (OECD, 2023b; Marrone et. al., 2021). Efforts should also be made to create an environment where teachers engage in the design of new digital learning tools, so innovations reflect the evolving challenges faced in Australian classrooms (OECD, 2021d). Such efforts may need to particularly focus on schools in disadvantaged areas. Australia has less social diversity between schools than most other OECD countries (OECD, 2023b) and there is a larger divide in access to IT between those in advantaged and disadvantaged schools (OECD, 2021e). Alongside promoting the diffusion of new digital tools, effective interventions such as counselling and home visits for highly disadvantaged and low-performing students should continue to be pursued.

Improving adult skills

Learning opportunities later in life are also critical for developing the higher-level skills required in a technologically rich environment. The federal government is in the process of updating estimates of basic skills in Australian adults, with a view to providing new support measures to improve basic adult skills including in digital literacy.

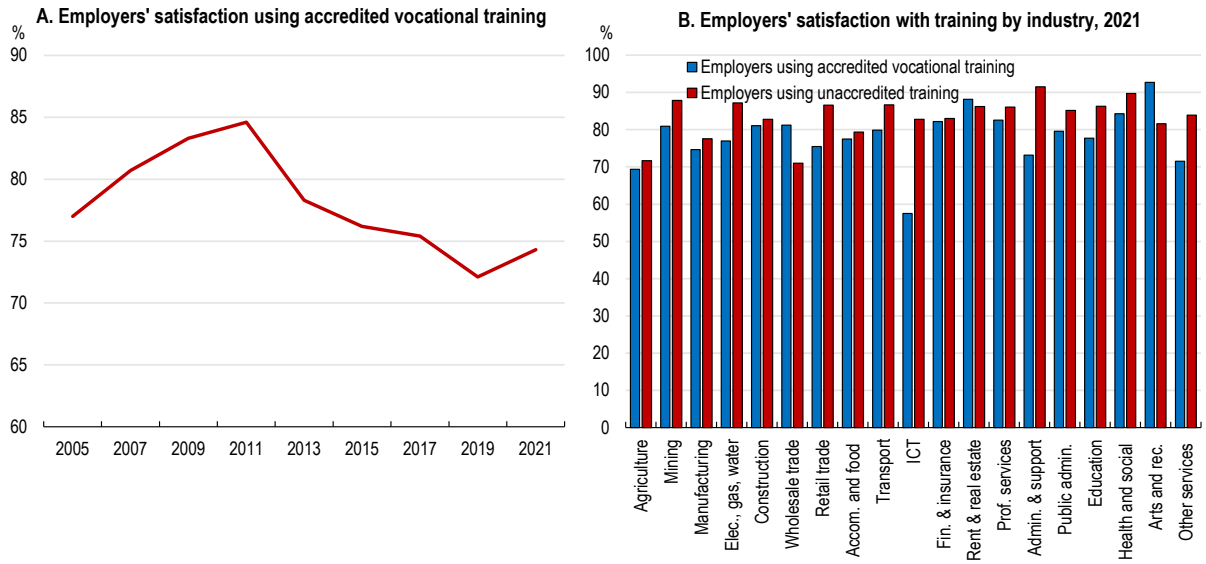
A key challenge across OECD countries in upskilling adults with low basic skills is that they tend to be less likely to recognise their learning needs and seek out training opportunities (OECD, 2019b). Germany and Portugal have implemented public awareness campaigns communicating the benefits of skill accumulation, though evaluations suggest limited success in reaching the low-skilled. In some OECD countries, such as Austria and Belgium, skills programmes are being administered via those local institutions which target groups already encounter in their day-to-day life, such as schools or recreation facilities. Leveraging such existing relationships may also be beneficial in reducing the stigma around adult learning that can be a barrier to participation.

Vocational education is a key pathway for skill development. This is the case for buttressing basic skills as well as reskilling adults in response to the changing structural demands of the economy. Responsibility for the Australian vocational education system is shared between the federal and state and territory governments. Most courses are provided through private training providers and are work-based with hands-on training. The system is well regarded in its ability to provide tailored courses to individual needs (Commonwealth of Australia, 2019). Enrolment rates are high by OECD standards (Kis, 2020), with the number of Australians in vocational courses outweighing those in higher education by a factor of four (National Skills Commission, 2021). However, there has been a broad-based decline in employer's level of satisfaction with vocational education courses over the past decade (Figure 1.29, Panel A). Satisfaction in nationally accredited vocational training is lower than that for unaccredited training courses. The gap is

especially large for employers in the information media and telecommunications industry (Figure 1.29, Panel B), which may suggest the system is underperforming in equipping graduates with digital skills.

The most common reasons for employers being unsatisfied with the vocational education system is that relevant skills are not taught, or training is of poor quality or courses do not focus enough on practical skills (National Centre for Vocational Education Research, 2021). Shortcomings of the system have been highlighted by the Expert Review of Australia's Vocational Education and Training System (i.e. the "Joyce Review") and by the Productivity Commission National Agreement for Skills and Workforce Development Review (Productivity Commission, 2020).

Figure 1.29. Employer's satisfaction with vocational education courses has fallen



Note: The point estimates should be treated with caution given they have relatively large confidence intervals for 2021. Nonetheless, the conclusions are unchanged when using data from earlier years that are measured with greater precision. The data in Panel A and in the blue bars of Panel B are for employers where vocational qualifications as a job requirement.
Source: NCVER "Employers' use and view of the VET system 2021".

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Training packages are developed very slowly and do not sufficiently reflect future skill needs. The Joyce Review suggested that this reflected overly fragmented and bureaucratic decision-making processes and that employers have become less involved over time in the content and development of qualifications (Commonwealth of Australia, 2019). In response, the federal government has established 10 Jobs and Skills Councils with the aim of identifying skills and workforce needs for their sectors and appropriate policy measures. The councils could play a role in developing vocational training products and supporting collaboration between industry and training providers to improve training and assessment. The efficacy of these councils should be carefully monitored and complemented with regular evaluation of training outcomes to ensure that graduates are developing adaptable skills that better reflect the future skills identified by employers. Having a more adaptable skill base can promote job mobility and create pathways for further learning in the tertiary sector. The latter has recently been a policy priority in vocational education systems in various European OECD countries, such as Austria and Switzerland (OECD, 2022b).

Regulatory reforms to promote productivity

Productivity growth has been held back by slowing dynamism, with the regulatory environment in need of reform. The design and implementation of regulations and administrative procedures are a key determinant

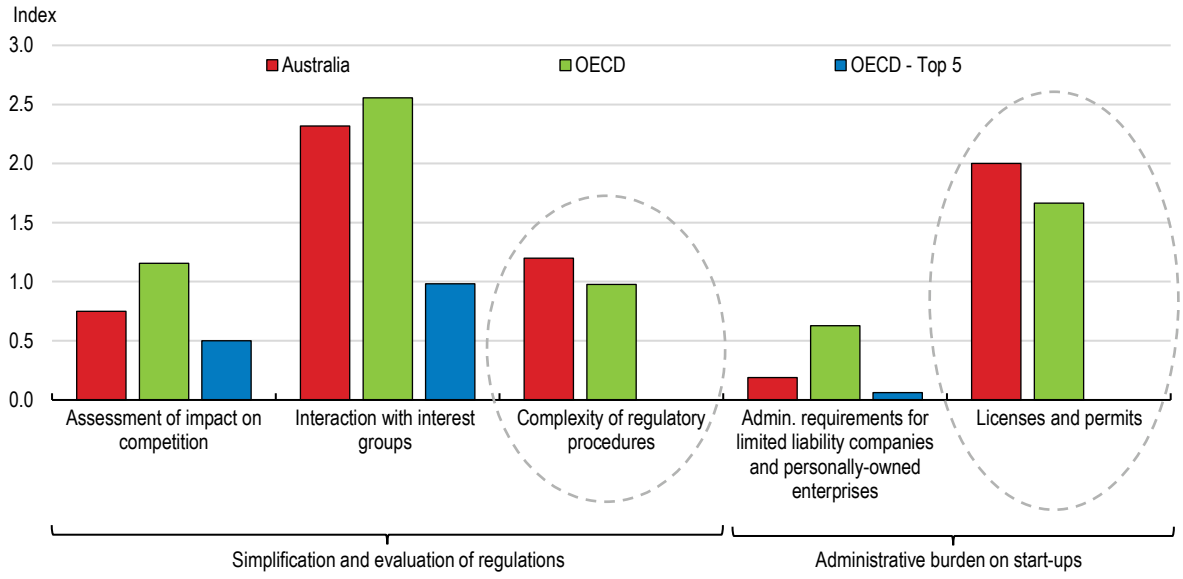
of the capacity for bright ideas to be converted into businesses that can expand and thrive (OECD, 2015b). The productivity slowdown in Australia has been accompanied by some signs of declining business dynamism. Firm entry rates of employing businesses have trended lower, though there was a jump during the pandemic, and firm exit rates have also fallen. This has been coupled with a slowing in the pace of productivity-enhancing labour reallocation (Andrews and Hansell, 2019) and the trend weakening in ICT investment. The federal system in Australia requires a coordinated effort to drive regulatory reform and this is an ongoing focus of the Council on Federal Financial Relations.

Licensing reforms could go further

Product market regulation settings are generally favourable. Australia is in the lowest quartile of member countries for the overall restrictiveness of product market regulations. Even so, the licensing and permit system and the complexity of regulatory procedures have been identified as relatively cumbersome (Figure 1.30). Estimates based on the OECD Long-Term Model suggest that significant reforms in these areas could lead to GDP being 1.4% higher by 2035 (Box 1.6).

Figure 1.30. There is scope for further reform of licensing and reducing regulatory complexity

Product Market Regulation Indicator subcategories.



Note: Data are for the most recent vintage.in 2018.
Source: OECD.

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Reforms to occupational licensing have been a focus in recent years. Licensing can be important to ensure consumer and worker safety but can stifle business dynamism by protecting incumbents and the reallocation of workers (Bambalaite et. al. 2020). The reduced job mobility tends to be particularly damaging for groups with low labour market experience, such as young and low-skilled workers (Haltiwanger et. al., 2018). As services become an increasing share of the Australia economy, reducing frictions in the occupational licensing system will become increasingly important.

Around one fifth of Australian workers currently require an occupational license or registration (Commonwealth of Australia, 2021b), though there remain notable differences in licensing conditions across states (Productivity Commission, 2023d). Work by the Committee for Economic Development of Australia highlighted that occupational regulations are stringent for personal services in New South Wales and Queensland compared with many other OECD countries and that there is a notable gap in the

administrative burden of licensing in professional services between the two states (Barker, 2022; Figure 1.31). Recent reforms have focused on automatic mutual recognition of occupational licenses across states and territories. According with a recommendation in the previous *OECD Economic Survey of Australia*, all states have now joined the scheme other than Queensland (Table 1.7).

Box 1.6. Estimated GDP impact of selected structural reforms

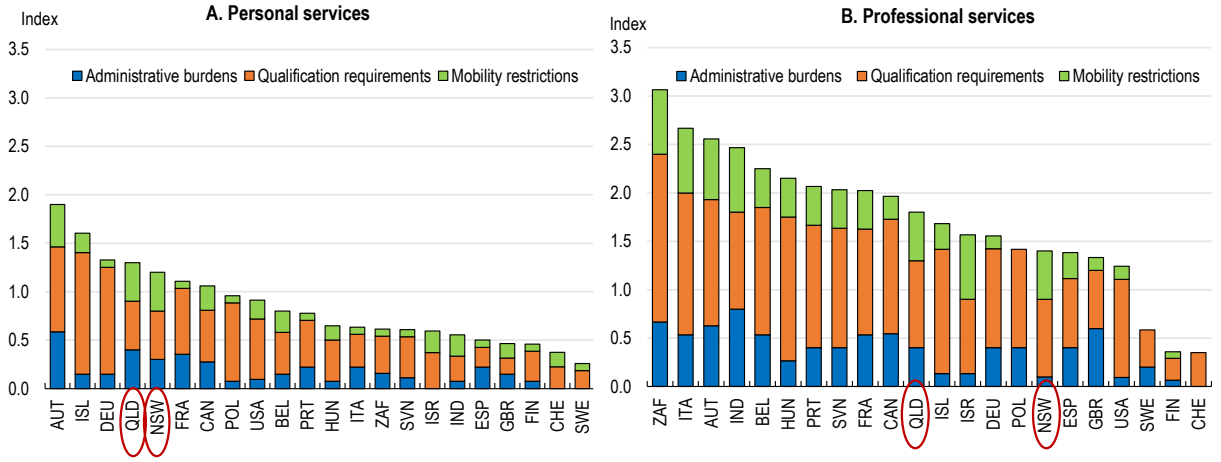
The following estimates quantify the cumulative GDP impact of reform scenarios as at 2035 and are illustrative.

Table 1.6. Illustrative GDP impact of selected recommendations

Policy	Scenario	GDP impact
Licensing and permit system	Licensing and permit procedures are reformed to be equivalent to those in Denmark.	+1%
Complexity of regulatory procedures	The complexity of regulatory procedures are reformed to be equivalent to those in the Netherlands.	+0.4%
Legal pensionable age	Statutory pension age increases by six months every two years from 2025 to reach 70 by 2037.	+0.3%
Parental leave	Maternity leave is increased from 18 weeks to 26 weeks in 2026.	+0.4%
Active labour market policies	Public spending on active labour market policies per unemployed increase to around OECD average (15% of GDP per capita).	+0.6%

Note: In the first two rows, Denmark and Netherlands are chosen as they are top performers as proxied by the OECD Product Market Regulation Indicators in these two areas.
Source: OECD Long-term Model.

Figure 1.31. Licensing of personal services is relatively strict but less so for professional services



Note: Personal services included in the index are aestheticians, bakers, butchers, driving instructors, electricians, hairdressers, painters, plumbers and taxi drivers. Professional services included in the index are accountants, architects, civil engineers, lawyers and real-state agents.
Source: Barker (2022), OECD.

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Table 1.7. Past OECD recommendations on regulatory reform

Recommendations in previous Survey	Action taken since September 2021
Legislate automatic mutual recognition of occupational licenses. Further investigate occupational licensing requirements from systemic and sectoral perspectives, considering the avenues for further harmonisation across jurisdictions and the extent to which new technologies are making existing licenses obsolete. Improve data collection about occupational licensing regimes across the country and information exchange systems between jurisdictions.	All states other than Queensland have now entered into the scheme for automatic mutual recognition of occupational licensing.
Allow local authorities to raise more of their own-source revenue, at the same time as reallocating the minimum Financial Assistance Grant from wealthier local authorities to those in more disadvantaged areas.	No action taken
Establish a Commonwealth Integrity Commission and more closely align the mandate of the Public Sector Division with that currently proposed for the Law Enforcement Division.	The National Anti-Corruption Commission (NACC) commenced operations on 1 July 2023. The mandate of the Public Sector Division was more closely aligned with that proposed for the Law Enforcement Division before the institution was established.
Consider changes to merger review legislation that better take into account the competitive dynamics in digital markets. Consider the introduction of an unfair practices provision to eliminate various practices that are a clear abuse of market power but are currently not illegal.	In August 2023, the government announced a competition policy review. The review will last 2 years and produce a series of reports examining competition laws, policies and institutions.

Looking forward, the authorities should consider a deeper review of the licensing system that investigates the welfare benefits of particular licenses, the avenues for further harmonisation across jurisdictions and the extent to which new technologies are making existing licenses obsolete. Policymakers should seize opportunities to shift regulations from inputs to outputs, ensuring certain quality standards for goods and services provided rather than reserving activities or setting standards for the professionals providing them (Bambalaite, et. al., 2020). Negative licensing, which involves no prior approval but businesses that breach certain standards can be prohibited from trading, could be one such approach to explore. This approach is already being undertaken in some Australian jurisdictions, such as for debt collection and finance broking in Victoria and land valuation in South Australia (New South Wales Productivity Commission, 2021). A review should also consider the potential for recognising the occupational licenses of overseas migrants to ensure they are fully able to contribute their skills to the domestic economy. Nonetheless, better data will be needed to undertake such a review. At present, information on the licensing system is highly fragmented, currently spanning multiple regulatory agencies in each state and territory with limited national coordination.

Stringent land use permitting systems are holding the economy back

The stringency and complexity of land use regulations across different locations create obstacles to business by restricting the activities they can undertake and influencing the stock of housing in desirable locations. Each state and territory government currently controls their zoning legislation, leading to the number of zones and the allowable activities within each varying considerably between jurisdictions. Local governments then decide how to allocate land under the zoning system and may add further development criteria such as building-height restrictions. In some states, local governments have discretion to vary or tailor zone types (Productivity Commission, 2021). When these diverge from state level planning policies, there is often little consequence (Productivity Commission, 2021). Contrasting with the rules-based systems more common in Europe, development control is discretionary in Australia, meaning that every planning application is subject to review by local governments and can be opposed by local residents.

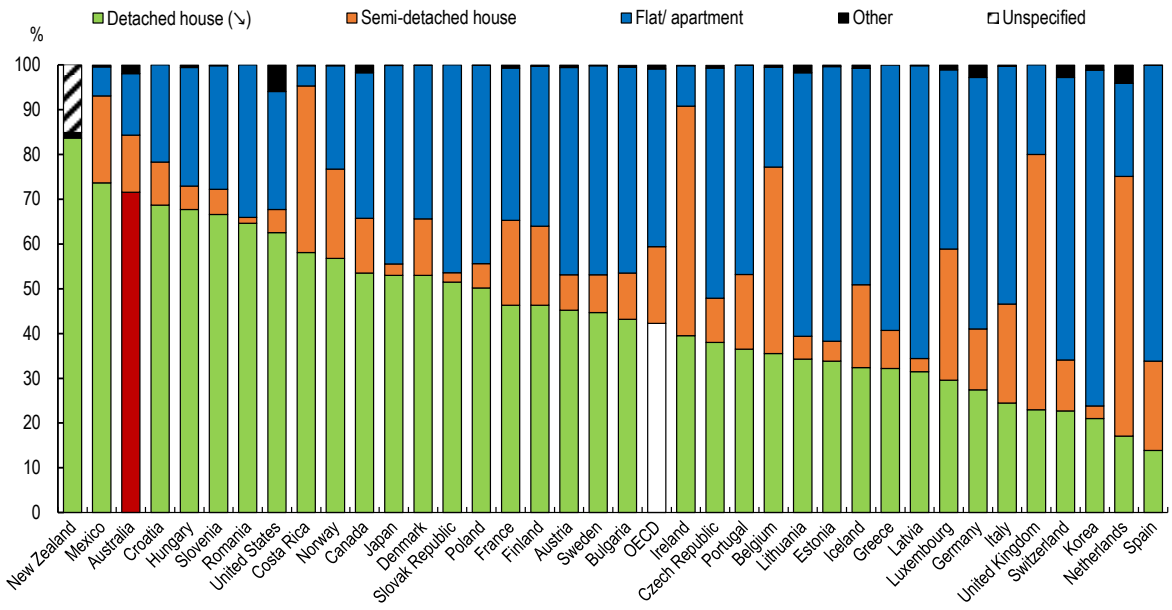
State governments could implement greater flexibility in zoning systems, moving to fewer zone types which are less prescriptive about the types of activities that can be undertaken. This would help accommodate the ongoing structural changes in the economy, allowing businesses more opportunities to enter and experiment in new markets (Productivity Commission, 2023e). Some progress has been made. Queensland now has minimal prohibited uses enshrined in zone definitions, while Victoria has moved to

fewer commercial and industrial zone types. Nevertheless, the Productivity Commission has noted that zoning regulations remain very prescriptive rather than outcome oriented in their specification or implementation (Productivity Commission, 2023e).

Land use policies related to residential housing can also impact productivity growth through the influence on commuting times, labour market matching (Adalet McGowan and Andrews, 2015) and the knowledge spillovers that can derive from agglomeration (OECD, 2015c). Housing supply has become an increasingly prominent issue in Australia. The stock of dwellings per person is low by OECD standards and there are concerns that housing affordability has diminished. Furthermore, future strong immigration will exert upward pressure on demand for well-located housing. In August 2023, National Cabinet agreed to a new national target to build 1.2 million well-located homes over five years from 1 July 2023. To help achieve the target, all levels of government have agreed to a range of actions including a commitment to improve zoning, planning and land release. As part of the agreement, the federal government has committed AUD3 billion in incentive payments to states and territories that achieve more than their share of the housing target and AUD500 million in competitive funding for local and state government projects that enable new housing supply, such as improving essential infrastructure connections and amenities in well-located areas.

Figure 1.32. Detached housing is more common than in most other countries

Occupied residential dwelling types, % of the total occupied residential dwelling stock, 2020 or latest available year



Source: OECD Affordable Housing Database.

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Further efforts should be made to review zoning provisions that restrict residential development to single-detached residential housing. Low density housing is more common in Australia than in most other OECD countries, with detached houses accounting for over 70% of the residential dwelling stock (Figure 1.32). In addition to constraining new housing supply, zoning that restricts residential development to single-detached residential housing can prevent land use from adapting to social and economic changes and create urban sprawl (OECD, 2017c). Melbourne, Sydney and Brisbane all have such zoning restrictions (Productivity Commission, 2022b). It will also be important to ensure that the incentives faced by local governments align with state government development plans. This could be through state governments

creating individual housing targets for each local government area based on the state planning strategy, with financial incentives for jurisdictions that meet their targets.

Ensuring competition policy keeps up with the changing economy

A growing body of evidence in Australia and internationally links excessive concentration and market power with a range of poor economic outcomes, including reduced innovation and dynamism, higher prices due to mark-ups and poor productivity. A number of sectors in Australia are highly concentrated with limited entry of new firms and high prices. The average firm mark-up (the ratio of price to marginal cost of production) has increased, accompanied by a rise in the average share of sales accruing to the largest four firms in an industry and a decline in the probability of such firms being displaced (Hambur, 2021). While rising market power is not automatically a cause for concern, it may require a competition policy response if it is durable, difficult to contest, or defended through anticompetitive conduct. In August 2023, the government announced a competition policy review. The review will last 2 years and produce a series of reports examining competition laws, policies and institutions. Both national and subnational policies impact upon the competitive environment. Consequently, the review should carefully evaluate the best coordinating mechanisms related to relevant policies across levels of government.

The broad scope of the review is welcome. A potential initial focus area is to better understand the competitive environment in the growth areas of the economy. For example, methods to promote competitive dynamics in health and long-term care would be worth reviewing given the role of government in these markets and broader objectives for consumer outcomes than in some more market-oriented sectors. Similarly, the increased role of data and the digital economy, and the implications for competition and public policies in certain markets should be a focus.

One challenge to competition is to ensure that there are enough players or potential entrants in a market of Australia's size and distance from other large markets. Australia's current laws prohibit mergers likely to substantially lessen competition. However, they do not require parties to notify the ACCC of planned mergers or to wait for clearance from the regulator before completing the merger (Cass-Gottlieb, 2023). In circumstances where the ACCC considers a merger to be anti-competitive, it does not have the legislated power to block or unwind it. Such a remedy must be sought through an application to the Federal Court. Competition authorities in most other OECD countries require pre-merger notification of mergers that reach specified thresholds and can block mergers and impose divestiture remedies as a condition of clearing a merger. In respect of notification requirements, Australia is one of only three OECD countries that still has a voluntary regime.

Competition from foreign entrants or suppliers can also be held back by Australia having different regulatory standards compared to other larger international markets. Australian Design Rules have been identified as creating barriers to the diffusion of some new products from abroad, such as technologies that improve the efficiency and lower the cost of motor vehicles (Productivity Commission, 2020). Further recognising standards of relevant foreign jurisdictions, such as the European Union, where these exceed domestic requirements, could help to boost competition and lower prices.

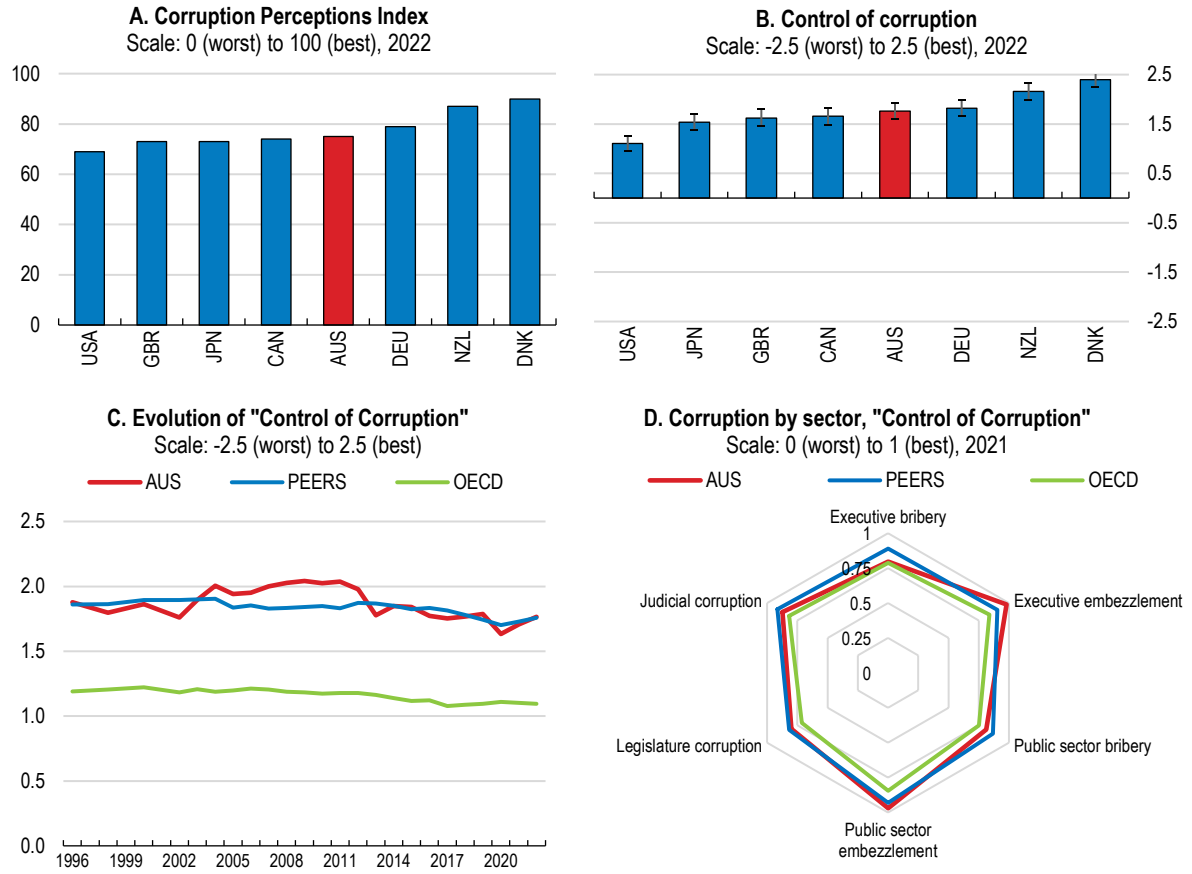
Enhanced anti-corruption institutions will improve the business environment

A more effective anti-corruption framework will support a strong business environment. Corruption – the abuse of public office for private gain – discourages business dynamism, reducing investment and innovation, and weighs on growth prospects (Jin, 2021). It also undermines equality of opportunity and erodes trust in government. In doing so, it makes the structural reforms that are necessary to drive the economic recovery more difficult to implement.

Australia scores on par with other major high-income countries in international indicators of domestic corruption (Figure 1.33). Recent improvements in perceptions of corruption have been partly attributed to

the establishment of a National Anti-Corruption Commission. This new institution will be independent and able to investigate allegations of serious or systemic corrupt conduct in the Commonwealth public sector. The definition of corruption will be extended to any person (whether or not a public official) that adversely affects the honest or impartial exercise of a public official's powers or duties. Investigations will be able to be initiated based on public referrals and reports and findings of corrupt conduct will be made available to the public. Most hearings will be private, but there will be the capacity to undertake public hearings in exceptional circumstances and where it is in the public interest to do so. The establishment of the institution is welcome and accords with a recommendation from the previous *OECD Economic Survey of Australia* (Table 1.7). As the institution develops, regular reviews to ensure that it is adequately resourced and has sufficient legislated powers will be important.

Figure 1.33. Australia ranks among peer countries in indicators of corruption



Note: Panel B shows the point estimate and the margin of error. Panel D shows sector-based subcomponents of the "Control of Corruption" indicator by the Varieties of Democracy Project.
Source: Panel A: Transparency International; Panels B & C: World Bank, Worldwide Governance Indicators; Panel D: Varieties of Democracy Project, V-Dem Dataset v12.

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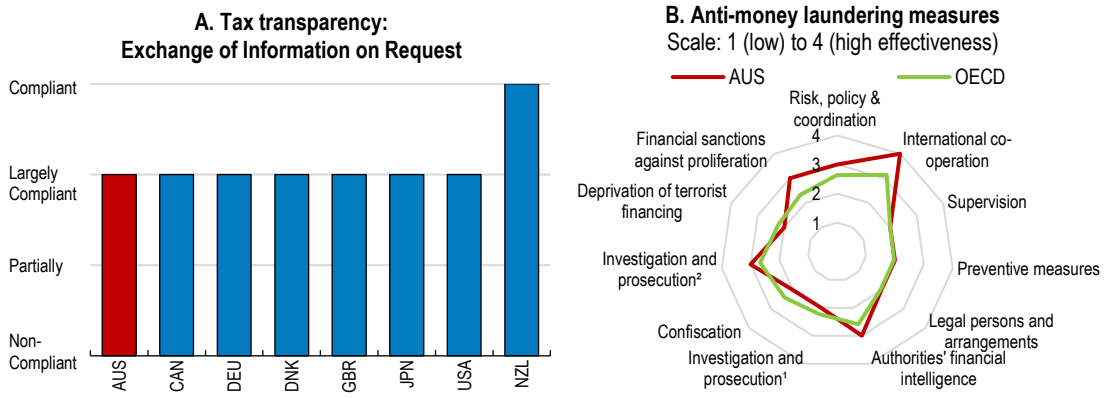
In terms of tax transparency, which reduces the scope for tax evasion, Australia is largely compliant and similar to other comparable countries (Figure 1.34). On anti-money laundering measures, Australia performs better or at least equivalent to its peers. Australia remains technically non-compliant in five areas of the International Standards on Combating Money Laundering and the Financing of Terrorism and Proliferation: reporting of suspicious transactions, internal controls and foreign branches and subsidiaries, regulation and supervision of financial institutions, guidance and feedback and powers of law enforcement and investigative authorities. In addition, there are several areas of the OECD Anti-Bribery Convention

where Australia remains non-compliant (OECD, 2019c). The OECD Working Group on Bribery is also concerned about the continued low level of foreign bribery enforcement. Since the Australian foreign bribery legislation was enacted 20 years ago, just two corporate entities and six individuals have been sanctioned in two cases (OECD, 2019c).

Figure 1.34. Australia is in line with comparable countries on tax transparency



Note: Panel A summarises the overall assessment on the exchange of information in practice from peer reviews by the Global Forum on Transparency and Exchange of Information for Tax Purposes. Peer reviews assess member jurisdictions' ability to ensure the transparency of their legal entities and arrangements and to co-operate with other tax administrations in accordance with the internationally agreed standard. The figure shows results from the ongoing second round when available, otherwise first round results are displayed. Panel B shows ratings from the FATF peer reviews of each member to assess levels of implementation of the FATF Recommendations. The ratings reflect the extent to which a country's measures are effective against 11 immediate outcomes. "Investigation and prosecution¹" refers to money laundering. "Investigation and prosecution²" refers to terrorist financing.

Source: OECD Secretariat's own calculation based on the materials from the Global Forum on Transparency and Exchange of Information for Tax Purposes; and OECD, Financial Action Task Force (FATF).

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Key Policy Insights recommendations

MAIN FINDINGS	RECOMMENDATIONS (Key recommendations in bold)
Enabling a sustained economic recovery	
Inflation has begun to fall but remains above target. The statistical authority has begun publishing a monthly Consumer Price Index, but it is based on incomplete data as some prices are only collected quarterly.	**Maintain a restrictive stance of monetary policy until underlying inflation is clearly on track to meet the central bank target, while maintaining a data-dependent and flexible approach.** Further develop the monthly Consumer Price Index to bring it in line with published measures in other OECD countries.
The value of bank repayments will increase markedly in the period to 2024 as the Term Funding Facility matures.	Monitor risks to bank funding as the Term Funding Facility matures.
Higher global commodity prices have boosted government receipts. The federal structural budget deficit is in deficit and there are significant cost pressures on the horizon.	**Continue to narrow the budget deficit in the years ahead and use windfall government revenues to reduce public debt.** **Improve mechanisms for fiscal dialogue between federal and state/territory governments.**
The National Disability Insurance Scheme is exerting cost pressures on federal government finances. The Federal Budget projects a sharp slowing in the growth of scheme costs, but new measures need to be devised and implemented to achieve this.	**Slow the growth in National Disability Insurance Scheme costs, potentially through better clarity on the eligibility and scope of support packages, as well as improved scheme administration.**
The health system is already a major government expense that will increase as the populations ages. Responsibility for the health system is fragmented across levels of government and patient data could be more effectively shared across care settings.	**Further encourage patient care in primary care settings and increase the focus on preventive care.** Improve digital health tools and processes for health data sharing. Consider linking the qualifying age for the Age Pension to a fraction of increases in life expectancy.
There is a lack of consistent, high-quality evaluation of government spending programmes.	Strengthen requirements for evaluating federal government projects valued above a threshold, including through an increase in the use of cost-benefit analysis.
Wellbeing and economic indicators for the indigenous population suggest significantly lower living standards than for the non-indigenous population. There is no coordinated approach across federal government agencies for evaluating the many policies aimed at improving the welfare of the indigenous population.	**Make further progress on raising the living standards of indigenous Australians by implementing the Closing the Gap agreement across all levels of government.** Embed the principles and guidance outlined in the Productivity Commission's Indigenous Evaluation Strategy in the policy design and evaluation process of all federal government agencies for both Indigenous-specific and mainstream policies that affect the Indigenous population.
There is a heavy reliance on the direct taxation of labour and business income and relatively little raised from consumption taxes. Tax treatment across different savings vehicles differs markedly, with relatively low tax rates on private pension savings.	**Broaden the base of the goods and services tax through reducing exemptions and consider increasing the tax rate.** **Further reduce tax concessions on private pensions.** Continue to replace state-based transaction taxes on real estate with a recurrent land tax.
Medium term priorities for boosting living standards	
Standardised test scores for Australian students have stagnated or declined. Teaching hours are high compared to other OECD countries and administrative tasks are consuming a relatively large amount of teachers' time.	Encourage the effective use of digital tools and evidence-based strategies in schools. **Provide all teachers with access to high-quality and evidence-based curriculum resources that are regularly updated.**
Enrolment rates in vocational education are high, but employer's satisfaction in the system has been declining. Training packages are developed slowly and do not sufficiently reflect future skill needs.	Better engage the business sector in designing vocational education courses.
Higher skilled migrants are associated with stronger productivity growth. However, a recent review of the migration system found outdated data systems and infrequently-updated occupation lists determining the composition of skilled migrants.	**Make the composition of the skilled migrant intake more responsive to changes in the skill needs of industry, including through better use of timely and granular data, analysis and the views of employers.**
Occupational licensing is stringent in some states and there remain notable differences in licensing conditions across jurisdictions.	Undertake a comprehensive review of the occupational licensing system. Improve data collection on occupational licensing regimes across the country and information exchange systems between jurisdictions.
Land use policy is complex, with zoning systems in most states being overly prescriptive about the types of activity that can be undertaken. Low density housing is more common than in most other OECD countries.	**Review planning and zoning regulations to enable an increase in the density of housing.** Introduce greater flexibility in zoning systems, moving to fewer zone types which are less prescriptive about the types of activities that can be

	undertaken. Ensure the incentives faced by local government encourage land development processes and decisions that are consistent with state development plans.
Some indicators of competitive intensity in product markets have weakened. Unlike in most OECD countries, pre-merger notification to the competition regulator is not required. The government has commenced a competition policy review.	**Consider requiring companies to give pre-merger notification to the competition authority for transactions above a defined threshold and introducing divestiture as a legislated remedy.** Explore pathways to further align product standards with those agreed in other advanced economies.
The National Anti-Corruption Commission has recently been established to detect, investigate and report on serious or systemic corrupt conduct in the Australian Government public sector.	Undertake regular reviews of the National Anti-Corruption Commission to ensure it is adequately resourced and has sufficient legislated powers.

References

Adalet McGowan, M., and D. Andrews (2015), "Skill mismatch and public policy in OECD countries", *OECD Economics Department Working Papers,* No. 1210, OECD Publishing, Paris.

Akgun, O. et. al. (2017), "The effects of tax mix on inequality and growth", *OECD Economics Department Working Paper*, No. 1447, OECD Publishing, Paris.

Andrews, D. et. al. (2023), "Immigration and firm productivity in Australia", *Research Note*, e61 Institute.

Andrews, D., and D. Hansell (2019), "Productivity-enhancing labour reallocation in Australia", Treasury Working Paper, 2019-06.

Bambalaite, I. et. al. (2020), "Occupational entry regulations and their effects on productivity in services: Firm-level evidence", OECD Economics Department Working Papers, No. 1605, OECD Publishing, Paris

Barker, A. (2022), "Skills recognition", Committee for Economic Development of Australia, Employment White Paper Submission.

Calder, R. et. al. (2019), *Australian Health Services : too complex to navigate*, Policy Issues Paper No. 2-2019, Australian Health Policy Collaboration.

Casey, E. and B. Cronin (2023), "Ireland's spending rule and the third wave of the EU's fiscal rules", *Analytical Note*, No. 20. Irish Fiscal Advisory Council.

Cass-Gottlieb, G. (2023), *The role of the ACCC and competition in a transitioning economy*, Address to the National Press Club, 12 April 2023.

Coates, B. and J. Moloney (2023), *Super savings: Practical policies for fairer superannuation and a stronger budget*, Grattan Institute.

Commonwealth of Australia (2023a), *An RBA fit for the future*, March 2023.

Commonwealth of Australia (2023b), *Budget Strategy and Outlook*, Budget Paper No. 1, May 2023.

Commonwealth of Australia (2023c), *Federal Financial Relations*, Budget Paper No. 3, May 2023.

Commonwealth of Australia (2023d), *Tax Expenditures and Insights Statement,* February 2023.

Commonwealth of Australia (2023e), Intergenerational Report 2023, August 2023.

Commonwealth of Australia (2023e), *Review of the Migration System*, Final Report, March 2023.

Commonwealth of Australia (2022a), *Budget Strategy and Outlook*, Budget Paper No. 1, October 2022.

Commonwealth of Australia (2022b), *Strengthening Medicare Taskforce Report*, December 2022.

Commonwealth of Australia (2021a), *Intergenerational Report 2021*, June 2021.

Commonwealth of Australia (2021b), *Mutual Recognition Amendment Bill*, Second Reading, House of Representatives Hansard, 18 March 2021.

Commonwealth of Australia (2020), *Retirement Income Review*, Final Report, July 2020.

Commonwealth of Australia (2019), *Strengthening Skills: Expert Review of Australia's Vocational Education and Training System*, Department of the Prime Minister and Cabinet.

Commonwealth of Australia (2015), *Re:think*, Tax discussion paper, March 2015.

Cordes, T. et. al. (2015), "Expenditure rules: effective tools for sound fiscal policy", *IMF Working Paper*, No. 15/29, Fiscal Affairs Department.

Corrado, C. et. al. (2021), "New evidence on intangibles, diffusion and productivity", *OECD Science,* Technology and Industry Working Papers, No. 2021/10, OECD Publishing, Paris.

Daley, J. and B. Coates (2018), *Housing Affordability: Re-imagining the Australian Dream*, Grattan Institute, March 2018.

De Silva, A. et. al. (2018), "Current issues with trusts and the tax system", Australian Tax Office.

Debrun, X. (2014), "How expenditure rules can help get public spending right", IMF Public Financial Management, 30 June 2014.

Gal, P. et. al. (2019), "Digitalisation and productivity: in search of the holy grail – firm-level empirical evidence from European countries", Economics Department Working Papers, No. 1533.

Haltiwanger, J. et. al. (2018), "Who Moves Up the Job Ladder?", *Journal of Labor Economics*, Vol. 36/S1.

Hambur, J. (2021), "Product market power and its implications for the Australian economy", Treasury Working Paper, 28 June 2021.

Hunter, J. and J. Sonnemann (2022), *Making time for great teaching: how better government policy can help*, Grattan Institute, January 2022.

Hunter, J. et. al. (2022), *Ending the lesson lottery: how to improve curriculum planning in schools*, Grattan Institute, October 2022.

IMF (2023), *Fiscal Monitor: On the path to policy normalization*, International Monetary Fund, Washington D.C.

Interim Economic Inclusion Advisory Committee, *2023-24 Report to the Australian Government*, Commonwealth of Australia.

Jin, Y. (2021), "Framework to discuss corruption in OECD Economic Surveys", *OECD Economics Department Working Paper*, No. 1666, OECD Publishing, Paris.

Kemeny, T. and A. Cooke (2018), "Spillovers from immigrant diversity in cities", *Journal of Economic Geography*, Vol. 18, No. 1.

Kis, V. (2020), "Improving evidence on VET: comparative data and indicators", OECD Social, Employment and Migration Working Papers, No. 250, OECD Publishing, Paris.

Lane, P.R (2021), "The future of the EU fiscal governance framework: a macroeconomic perspective", *Panel intervention by Philip R. Lane, Member of the Executive Board of the ECB, at the European Commission webinar on "The future of the EU fiscal governance framework"*, 12 November 2021.

Lim, J. et. al. (2023), "Financial stability risks from commercial real estate", *RBA Bulletin*, September 2023, Reserve Bank of Australia.

Longmuir, F. et. al. (2022), *Australian teacher's perceptions of their work in 2022*, Monash University, October 2022.

Lonsdale, J. (2023), Speech to AFR Banking Summit 2023, 28 March 2023.

López-Laborda, J. et. al. (2023), "Spain", In: Tremblay, J.F. (eds) *The Forum of Federations Handbook of Fiscal Federalism*, Palgrave Macmillan.

Marrone, R. et. al. (2021), *Digital technology in education systems around the world: Practices and policies*, The Centre for Change and Complexity in Learning, University of South Australia.

NAB (2023), NAB SME Business Insights: Labour shortages Q4 2022, National Australia Bank.

National Centre for Vocational Education Research (2021), *Employers' Use and Views of the VET System*, Australian Vocational Education and Training Statistics.

New South Wales Productivity Commission (2021), Productivity Commission White Paper 2021, 31 May 2021.

NSC (2021), *State of Australia's Skills 2021: now and into the future*, National Skills Commission, Australian Government.

NSC (2022), *Employment outlook: industry and occupation trends over the five years to November 2026*, National Skills Commission, Australian Government.

OECD (2023a), *Economic Outlook, June 2023*. OECD Publishing, Paris.

OECD (2023b), *Education Policy Outlook in Australia*, OECD Education Policy Perspectives, OECD Publishing, Paris.

OECD (2023c), *"Regional productivity, local labour markets, and migration in Australia"*, *OECD Regional Development Papers,* No. 39, OECD Publishing, Paris.

OECD (2023d), "The impact of migration on local productivity in Australia", OECD Regional Development Papers, forthcoming, OECD Publishing, Paris.

OECD (2022a), *"The past and future of subnational fiscal rules: an analysis of fiscal rules over time"*, *OECD Working Papers on Fiscal Federalism*, No. 41, OECD Publishing, Paris.

OECD (2022b), *The Contribution of Migration to Regional Development*, OECD Regional Development Studies, OECD Publishing, Paris.

OECD (2021a), *OECD Economic Surveys: Australia 2021*, OECD Publishing, Paris.

OECD (2021b), *Health at a Glance 2021: Highlights for Australia*, OECD Publishing, Paris.

OECD (2021c), "Inheritance Taxation in OECD Countries", *OECD Tax Policy Studies*, No. 28, OECD Publishing, Paris.

OECD (2021d), *OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots*, OECD Publishing, Paris.

OECD (2021e), *21st-Century Readers: Developing Literacy Skills in a Digital World,* PISA, OECD Publishing, Paris.

OECD (2020a), *Realising the Potential of Primary Health Care*, OECD Health Policy Studies, OECD Publishing, Paris.

OECD (2020b), *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals,* TALIS, OECD Publishing, Paris.

OECD (2020c), "Start ups, killer acquisitions and merger control", *Directorate for Financial and Enterprise Affairs Competition Committee*, Background Note.

OECD (2019a), *OECD Skills Outlook 2019: Thriving in a Digital World,* OECD Publishing, Paris.

OECD (2019b), *Getting Skills Right: Engaging low-skilled adults in learning*, OECD Publishing, Paris.

OECD (2019c), *Phase 4 Two-Year Follow-up Report: Australia*, Implementing the OECD Anti-Bribery Convention, OECD Working Group on Bribery.

OECD, (2018b), *Taxation of Household Savings*, OECD Tax Policy Studies, No. 25, OECD Publishing, Paris.

OECD (2018c), *OECD Economic Surveys: Australia 2018*, OECD Publishing, Paris.

OECD (2018d), Recruiting Immigrant Workers: Australia 2018, Recruiting Immigrant Workers, OECD Publishing, Paris.

OECD (2017a), *OECD Economic Surveys: Australia 2017*, OECD Publishing, Paris.

OECD (2017b), *Building Skills for All in Australia: Policy insights from the Survey of Adult Skills*, OECD Publishing, Paris.

OECD (2017c), *The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations*, OECD Publishing, Paris.

OECD (2015a), *OECD Reviews of Health Care Quality: Australia 2015: Raising Standards*, OECD Publishing, Paris.

OECD (2015b), *The Future of Productivity*, OECD Publishing, Paris.

OECD (2015c), *The Metropolitan Century: Understanding Urbanisation and its Consequences*, OECD Publishing, Paris.

Parliamentary Budget Office (2023), *How is super taxed?,* Budget Explainer, 27 April 2023.

Parliamentary Budget Office (2022a), *National Fiscal Outlook,* 5 October 2022.

Parliamentary Budget Office (2022b), *Beyond the Budget 2022-23: Fiscal Outlook and Scenarios,* 8 December 2022.

Parliamentary Budget Office (2020), Structural Trends in GST, Report No. 02/2020.

Phillips, B. et. al. (2023), *Budget 2023 Distributional Analysis,* Research Note, ANU Centre for Social Research and Methods.

Productivity Commission (2023a), *Volume 1: Advancing Prosperity*, Advancing Prosperity, 5-year Productivity Inquiry report.

Productivity Commission (2023b), *Review of the National Agreement on Closing the Gap*, Draft report.

Productivity Commission (2023c), *Volume 8: From learning to growth*, Advancing Prosperity, 5-year Productivity Inquiry report.

Productivity Commission (2023d), *Volume 7: A more productive labour market*, Advancing Prosperity, 5-year Productivity Inquiry report.

Productivity Commission (2023e), *Volume 3: A competitive, dynamic and sustainable future*, Advancing Prosperity, 5-year Productivity Inquiry report.

Productivity Commission (2022a), *Review of the National School Reform Agreement*, Study Report, December 2022.

Productivity Commission (2022b), *In need of repair: The National Housing and Homelessness Agreement*, Study Report.

Productivity Commission (2021), *Plan to identify planning and zoning reforms*, Information Paper, March 2021, Commonwealth of Australia.

Productivity Commission (2020a), *National Agreement for Skills and Workforce Development Review*, Productivity Commission Study Report, December 2020.

Productivity Commission (2020b), National Transport Regulatory Reform, Productivity Commission Inquiry Report, No. 94, 7 April 2020.

RBA (2023a), *Statement on Monetary Policy – May 2023*. Reserve Bank of Australia, Sydney.

RBA (2023b), *Financial Stability Review,* April 2023.

RBA (2022a), *Review of the Bond Purchase Program*, Reserve Bank of Australia, Sydney.

RBA (2022b), *Review of the RBA's Approach to Forward Guidance*, Reserve Bank of Australia, Sydney.

RBA (2022c), *Review of the Bond Purchase Program*, Reserve Bank of Australia, Sydney.

Rouzet, D. et. al. (2019), "Fiscal challenges and inclusive growth in ageing societies", *Economic Policy Paper*, No. 27, OECD Publishing, Paris. Rutherford, T. et. al. (2010), *Spatial-temporal mathematics at scale: an innovative and fully developed paradigm to boost math achievement among all learners*, paper presented at the Annual Meeting of the American Educational Research Association.

Sainsbury, T. and R. Breunig (2020), "Tax planning in Australia's income tax system", A Journal of Policy Analysis and Reform, Vol. 27, No. 1.

Sorbe, S., et. al. (2018), "Can productivity still grow in service-based economies? Literature overview and preliminary evidence from OECD countries", *OECD Economics Department Working Paper*, No. 1531, OECD Publishing, Paris.

Stewart, M (2023), "Australia", In: Tremblay, J.F. (eds) *The Forum of Federations Handbook of Fiscal Federalism*, Palgrave Macmillan.

Thomas, A. (2020), "Reassessing the regressivity of the VAT", *OECD Taxation Working Papers*, No. 49, OECD Publishing, Paris.

Victorian Department of Treasury and Finance (2022), *The Early Intervention Investment Framework*, Victorian Government, Melbourne.

Wendt, S. et. al. (2019), *A cross-state evaluation of MIND Research Institute's ST Math program and math performance*, San Francisco, WestEd.

Winzar, C. et. al. (2023), *Disrupting Disadvantage 3: Finding What Works*, Committee for Economic Development of Australia.

World Government Summit (2018), *Embracing Innovation in Government: Global Trends 2018*, in collaboration with the Organisation for Economic Cooperation and Development, OECD Publishing, Paris.

2 Fully realising the economic potential of women in Australia

Ben Westmore

Gender inequalities have steadily declined, but remain particularly visible in the labour market. Australian women have lower employment rates, hourly wages and hours worked than their male counterparts. Childbirth is particularly disruptive for the labour market experience of women in Australia. Reforms to the tax and benefits system, childcare and parental leave arrangements are all needed to reduce the barriers to female labour participation of mothers. At the same time, ensuring the adequacy of unemployment benefits will support the living standards of many low-income women given that they have become an increasing share of recipients. Single mothers face particularly high poverty risk and would also benefit from more robust arrangements around child support payments from non-custodial parents.

Introduction

Gender equality is not only a fundamental human right, but also a keystone of a prosperous, modern economy that delivers sustainable inclusive growth. It is essential for ensuring that men and women contribute fully at home, at work and in public life, for the betterment of societies and economies at large. Equal and fair treatment allows everyone to fulfil their potential. However, gender inequalities persist across OECD countries in social and economic life. Achieving gender equality is one of the United Nations Sustainable Development Goals and the objective of the 2013 OECD Council Recommendation on Gender Equality in Education, Employment and Entrepreneurship (OECD, 2017) and the 2015 OECD Council Recommendation on Gender Equality in Public Life (OECD, 2016).

There has been steady progress in improving gender equality in Australia over recent decades, though gender gaps persist that are symptomatic of women not being able to fully realise their potential. Making further improvements on gender equality is a key objective of the Australian government. A National Strategy to Achieve Gender Equality is under development and will consider the advice of the recently released report by the Women's Economic Equality Taskforce (Women's Economic Equality Taskforce, 2023). Reforms have been undertaken to expand Paid Parental Leave and improve access to childcare, with the Australian Competition and Consumer Commission and Productivity Commission currently undertaking further reviews into the childcare sector. The government's Employment White Paper, which explores the policies needed for Australia's future labour market, has a strong emphasis on improving women's economic participation and equality. In addition, gender responsive budgeting has been further expanded, with key steps and processes for gender assessment and gender impact analysis incorporated into formal budget and Cabinet processes.

There would be substantial benefits to the economy from raising opportunities for women, in addition to the direct benefits for women in Australia and their families. Amid an ageing population, boosting labour force participation for working aged women can be a key source of future economic growth. In addition, improved gender equality can better enable people to be matched with activities where their abilities and interests lie. This can be a key channel for increasing productivity and economic growth (Hsieh et. al. 2019), as well as overall wellbeing. There is also evidence that a more gender diverse workforce, at both the worker and management level, is more productive (Criscuolo et al., 2021).

The current state of gender equality

The wellbeing of women in Australia exceeds that of men in areas such as health (as measured by life expectancy), risk of death from homicide, suicide, alcohol or drugs (Figure 2.1). Women in Australia are now also more likely to be highly educated, following a significant increase over the past decade in the share of women holding post-secondary qualifications (Figure 2.2, Panel A). This is especially the case for the younger graduate cohorts (Figure 2.2, Panel B): the proportion of women in the 25-44 age group with a bachelor's degree or higher was over 10 percentage points above that for their male counterparts in 2022.

Figure 2.1. Gender differences in wellbeing outcomes exist along many dimensions

Gender ratios (distance from parity) for selected indicators of current well-being (higher numbers indicate a better outcome), 2019 or latest available year

Source: OECD.

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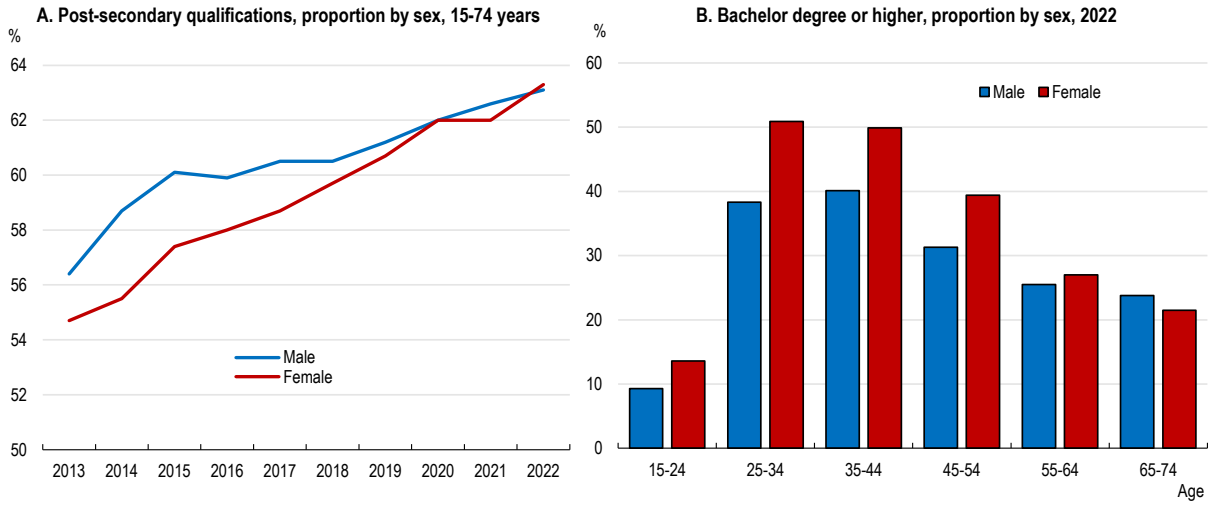
Figure 2.2. Women in Australia are highly educated



Source: Australian Bureau of Statistics.

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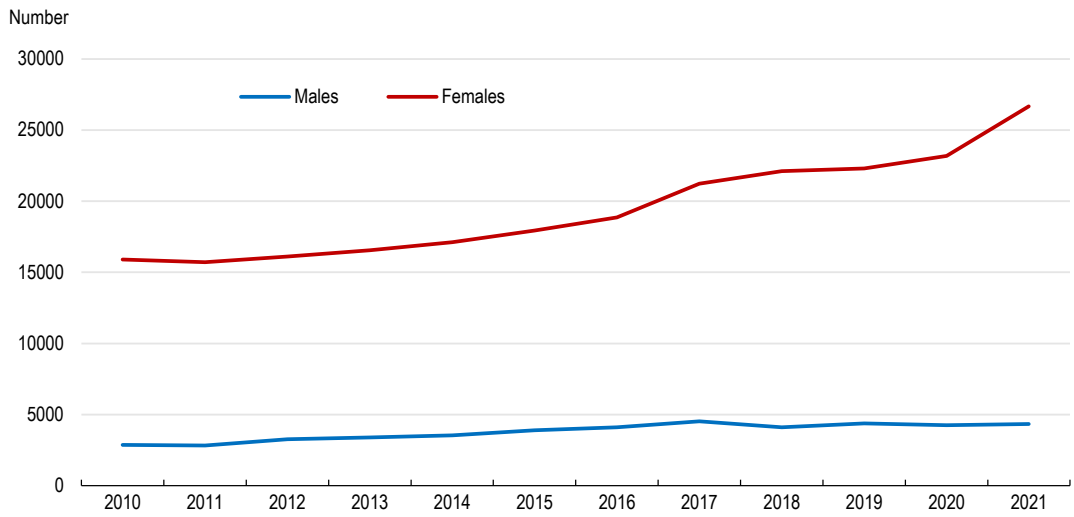
Women in Australia are still behind their male counterparts in other dimensions. Safety of women is a concern, with surveys suggesting that the gender gap in perceived safety is large compared to other OECD countries. Feelings of unsafety can fundamentally reduce quality of life and narrow women's choice of economic activities to domains where they feel safe. In much the same way, the existence of sexual

harassment can have pervasive economic effects. In recent years, reports of sexual harassment made by women in Australia have increased, while those for men have remained largely stable (Figure 2.3). This may be a welcome development to the extent that it reflects greater confidence of women reporting harassment, but the volume of such cases - and gap with those reported by men - remains large. In the workplace, national surveys report that 41% of women and 26% of men have been sexually harassed in the past five years (Australian Human Rights Commission, 2022). Furthermore, some more economically disadvantaged cohorts such as those with a disability and Aboriginal and Torres Strait Islanders disproportionately report workplace sexual harassment.

Figure 2.3. Women are more likely than men to report being sexually harassed

Reported cases of sexual harassment, by gender



Source: Australian Bureau of Statistics.

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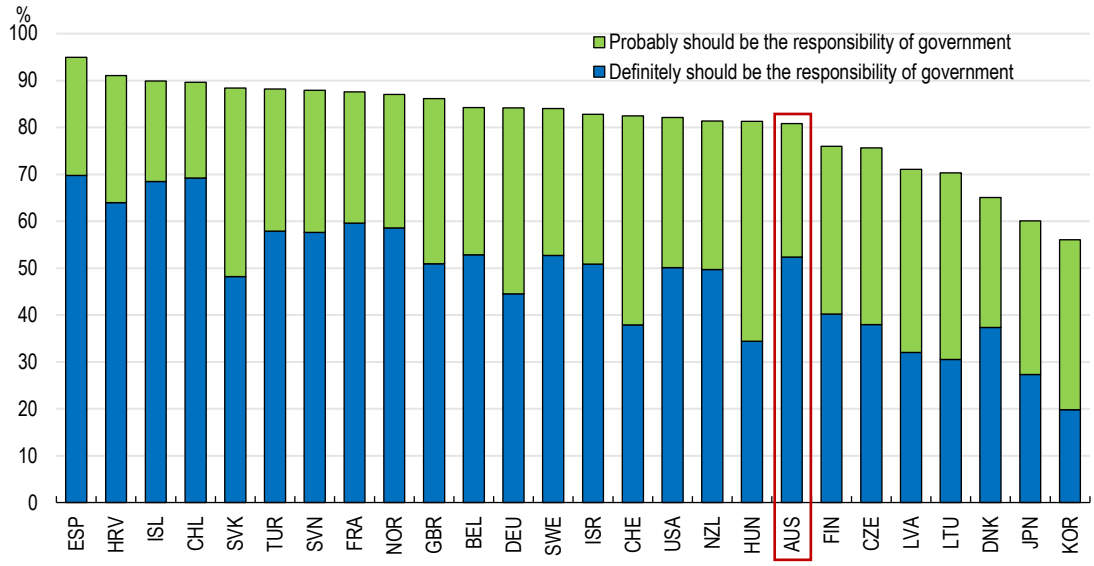
At work, women are less likely to experience job strain or be subjected to long working hours than men. However, this reflects their weaker integration into the labour market. Women in Australia have lower employment rates, lower hours worked, lower earnings and a higher long-term unemployment rate. Entrepreneurship rates are notably lower for women and less than one in six Australian inventors is female. While significant progress has been made in these dimensions over past decades, gaps remain wide. Consequently, further efforts at achieving the potential of women should focus primarily on improving their labour market experience and it is this dimension that will be the focus of much of the discussion of this Chapter.

Figure 2.4. Most Australians believe the government has a responsibility to promote gender equality

Share of respondents that believe it should be the responsibility of government to promote gender equality



Note: Data are for latest available year.
Source: International Social Survey Programme.

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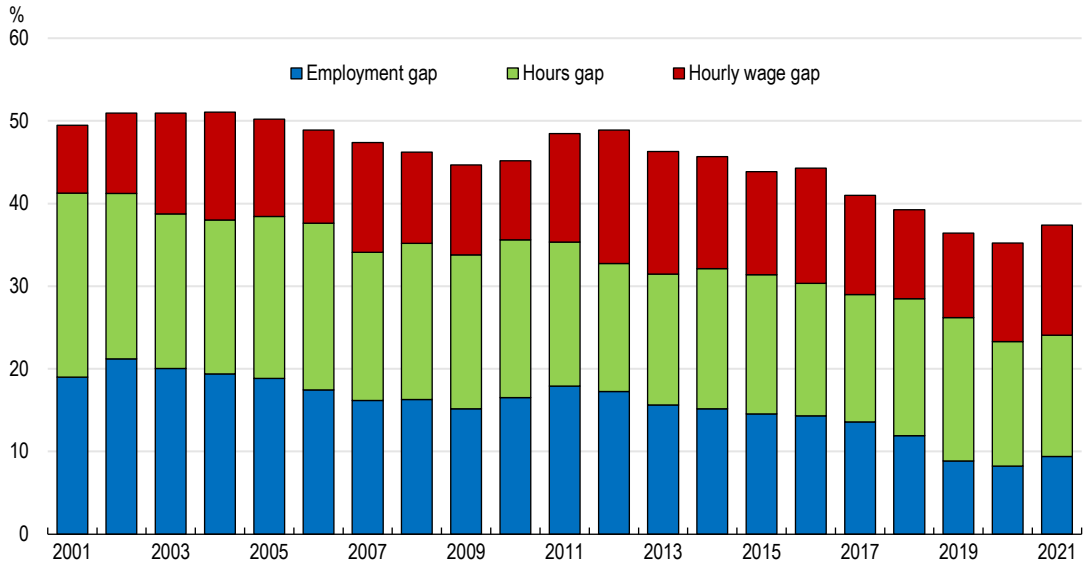
There is a role for government in reducing gender inequality. Around 80% of the surveyed population see it as at least the partial responsibility of the government to promote gender equality (Figure 2.4). Nonetheless, only around half the surveyed population see it as definitely the responsibility of the government, lower than in many other OECD countries. This highlights the need for the authorities to actively engage social partners and other stakeholders. The government should have a leading role in setting objectives and the overall strategy for improving gender equality, but this should be done in close consultation with key stakeholders. The National Strategy to Achieve Gender Equality, developed in consultation with diverse voices across Australia, will be an important mechanism to elevate and prioritise actions that will improve gender equality. An ongoing challenge is collecting representative, timely and regularly updated data on specific cohorts of diverse women, including women with a disability, Indigenous Australian women and those living in remote areas. Better data will enable a closer examination of the intersections between the different dimensions of diversity, which may have implications for policymakers.

Gender inequality in the labour market

Gender inequality in the labour market can be observed in differences between men and women in employment rates (employment gap), the intensity of work (hours gap) and the amount workers are paid per hour (hourly wage gap). Overall, women's labour income is 40% lower than for men on average. Decomposing the gender gap in labour income highlights that all three factors play a role in the Australian context (Figure 2.5), though the aggregates mask significant differences across population cohorts. Overall, the labour income gap has declined over the past few decades, mostly driven by an increase in the share of women in employment.

Figure 2.5. The gender labour income gap arises from the extent, intensity and rewards from work

Decomposition of the gender gap in labour income



Note: The decomposition follows the methodology outlined in Chapter 6 of OECD (2018).
Source: HILDA; OECD.

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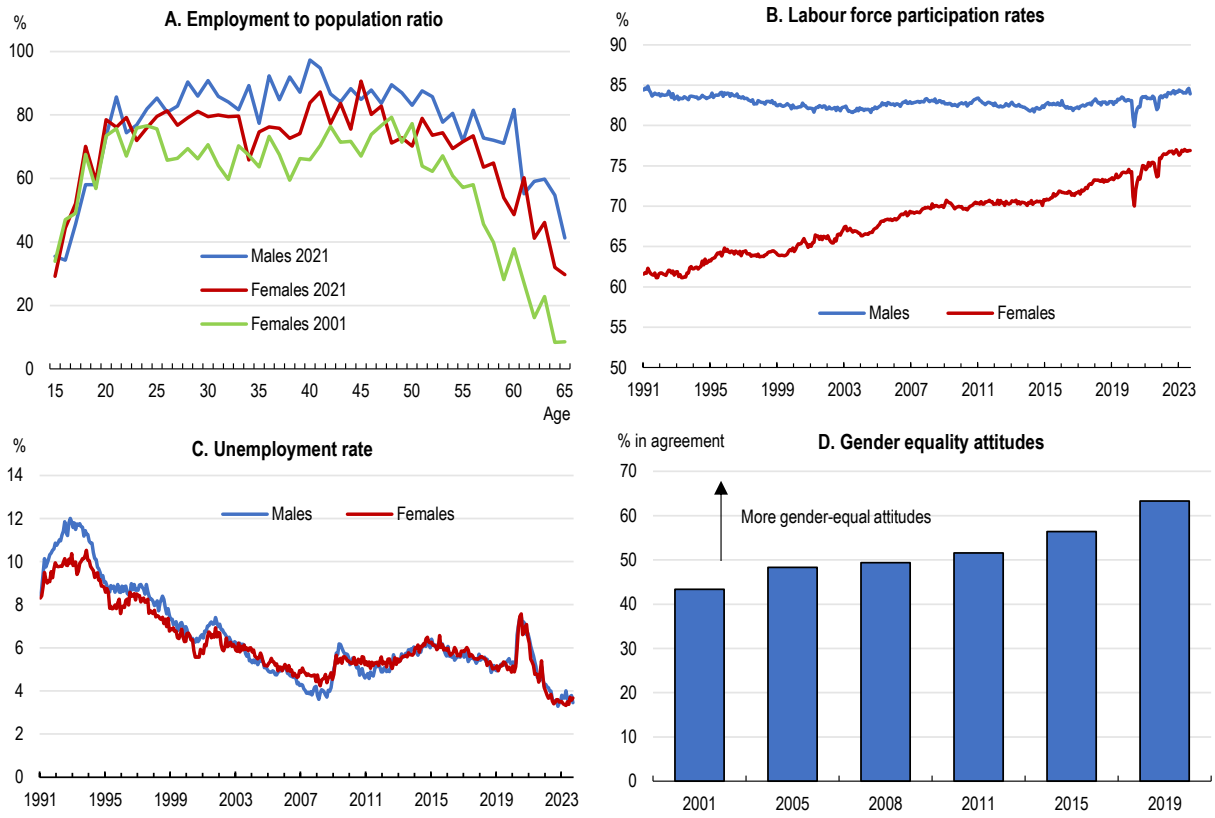
Gender gaps in the employment rate

The increase in the employment rate of women in Australia has occurred across age cohorts (Figure 2.6, Panel A). This has largely reflected a steady increase in the female labour force participation rate (Figure 2.6, Panel B), as the unemployment rate of women has been broadly aligned with that of men (Figure 2.6, Panel C). There have been various factors contributing to the rise in women's participation, including rising educational attainment of women (National Skills Commission, 2021), changing social attitudes to women working (Churchill and Craig, 2022; Figure 2.6, Panel D), the introduction of paid parental and caregivers leave and subsidised child care (United Nations Expert Group Meeting on Policy Responses to Low Fertility, 2015) and the growth of more flexible work arrangements (Heath, 2018).

Figure 2.6. Female labour participation has increased substantially



Note: In Panel B, participation rates are for the population aged 15-64. In Panel D, the measure is calculated as the share of the surveyed population that disagreed with the statement that "it is better for everyone involved if the man earns the money and the women takes care of the home and children" in the Household, Income and Labour Dynamics in Australia (HILDA) Survey.
Source: OECD Short-term Labour Market Statistics Database, HILDA, OECD.

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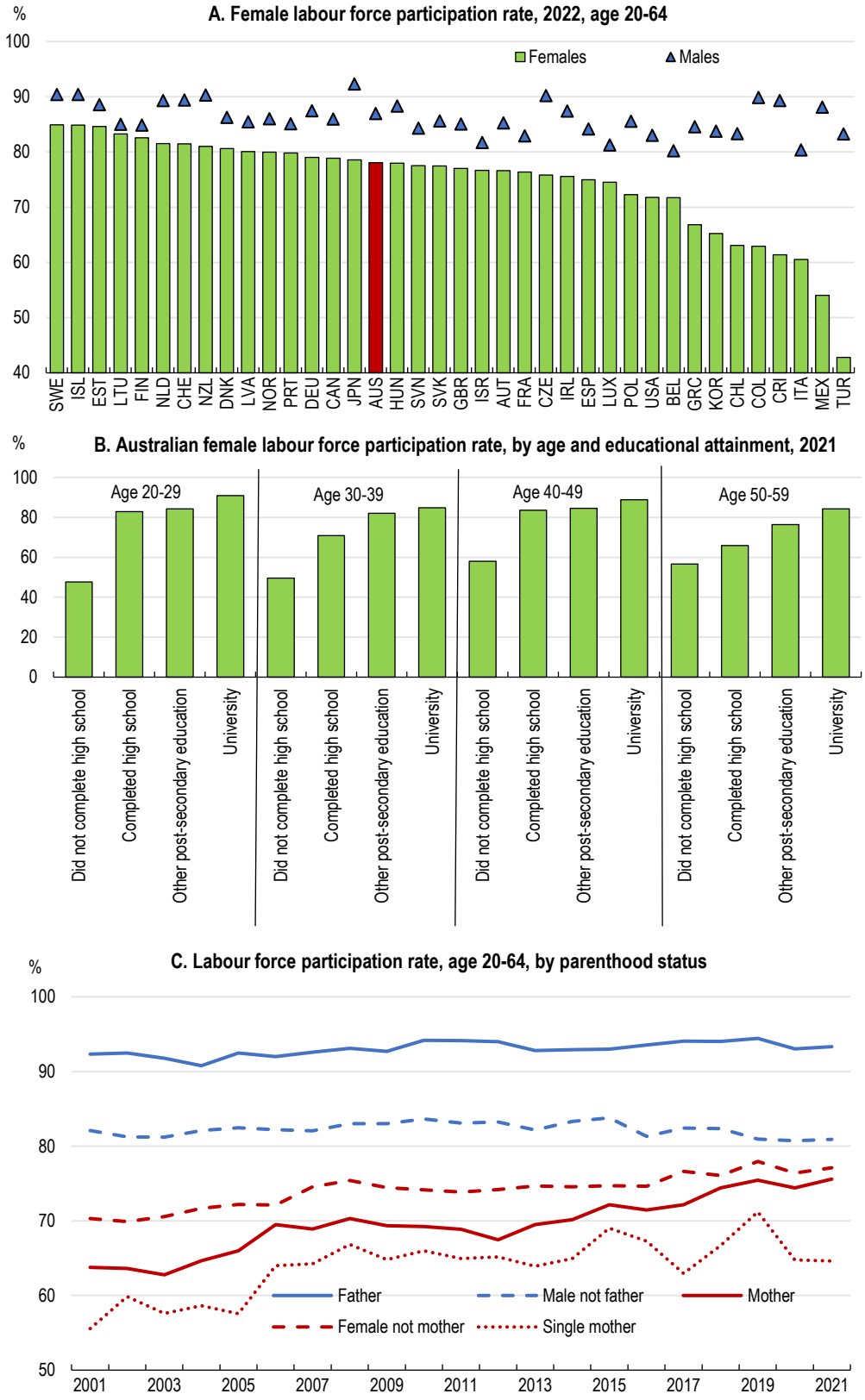
Despite the progress made, the labour force participation rate remains lower, and the gap to the participation rate of males larger, than in some peer OECD countries (Figure 2.7, Panel A). Women who did not finish high school have particularly low participation rates (Figure 2.7, Panel B). The participation rate of Aboriginal and Torres Strait Islander women aged 15-64 was around 17 percentage points lower than for non-indigenous women at the time of the 2021 Census. There is also evidence that women born overseas have a lower participation rate than those in the native-born population (Box 2.1), which accords with the fact that they are more likely to undertake unpaid childcare than Australian women (Commonwealth of Australia, 2023a). For those women who have completed high school or higher education, participation rates are typically lower for those in the 50-59 age group and in the age group with the highest fertility rate (30-39). The latter is consistent with lower participation of mothers than women without children (Figure 2.7, Panel C). In contrast, fathers are much more likely to participate in the labour force than men without children.

Figure 2.7. There remains scope to further increase female participation



Source: OECD, HILDA.

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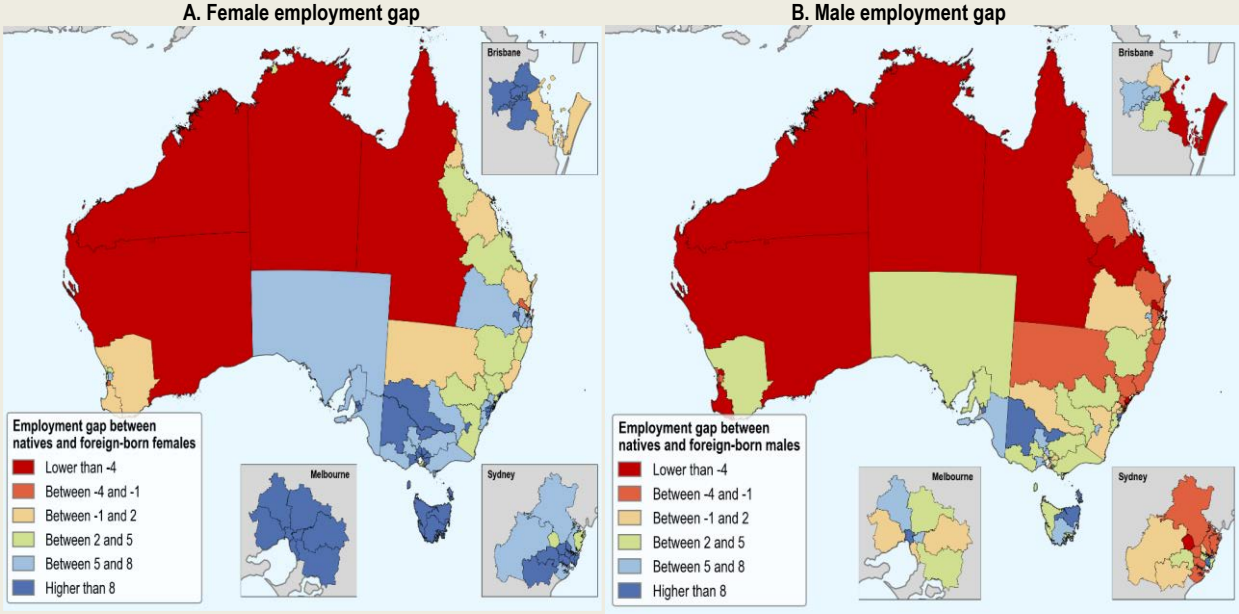
Box 2.1. Employment rates of women born overseas

In Australia, migrants are less likely to be employed compared to native-born individuals. This partly reflects the lower employment rates of migrant women. Like most other OECD countries, the difference in the employment rate between native-born and migrants is significantly larger for women than for men (OECD, 2022). In 2019, the native-migrant gap for men was negligible at only 0.5 percentage points, while the difference in employment rates between women born overseas and native-born women exceeded eight percentage points. The primary factor explaining the employment rate gap between women born overseas and native-born individuals is relatively low labour force participation, rather than higher unemployment rates. Examining employment gaps separately for women (Figure 2.8, Panel A) and men (Figure 2.8, Panel B) highlights the spatial dimension of these gaps. However, in all SA4 regions except for the Wheat Belt in the south of Western Australia and the Outback in Queensland, the employment gap between natives and those born overseas is more pronounced for women than men.

Figure 2.8. The gap in employment rates with the native-born population is larger for women born overseas

Employment gap between native-born and migrants by gender, SA4 regions



Note: The figure presents the percentage point difference in the employment rate of native-born and foreign-born among the working-age population (15-64 years) in Australia disaggregated by SA4. A positive value indicates a higher employment rate among the native-born. Panel A presents the female working-age population. Panel B presents the male working-age population. Data are for 2016.
Source: Australian Census of Population and Housing.

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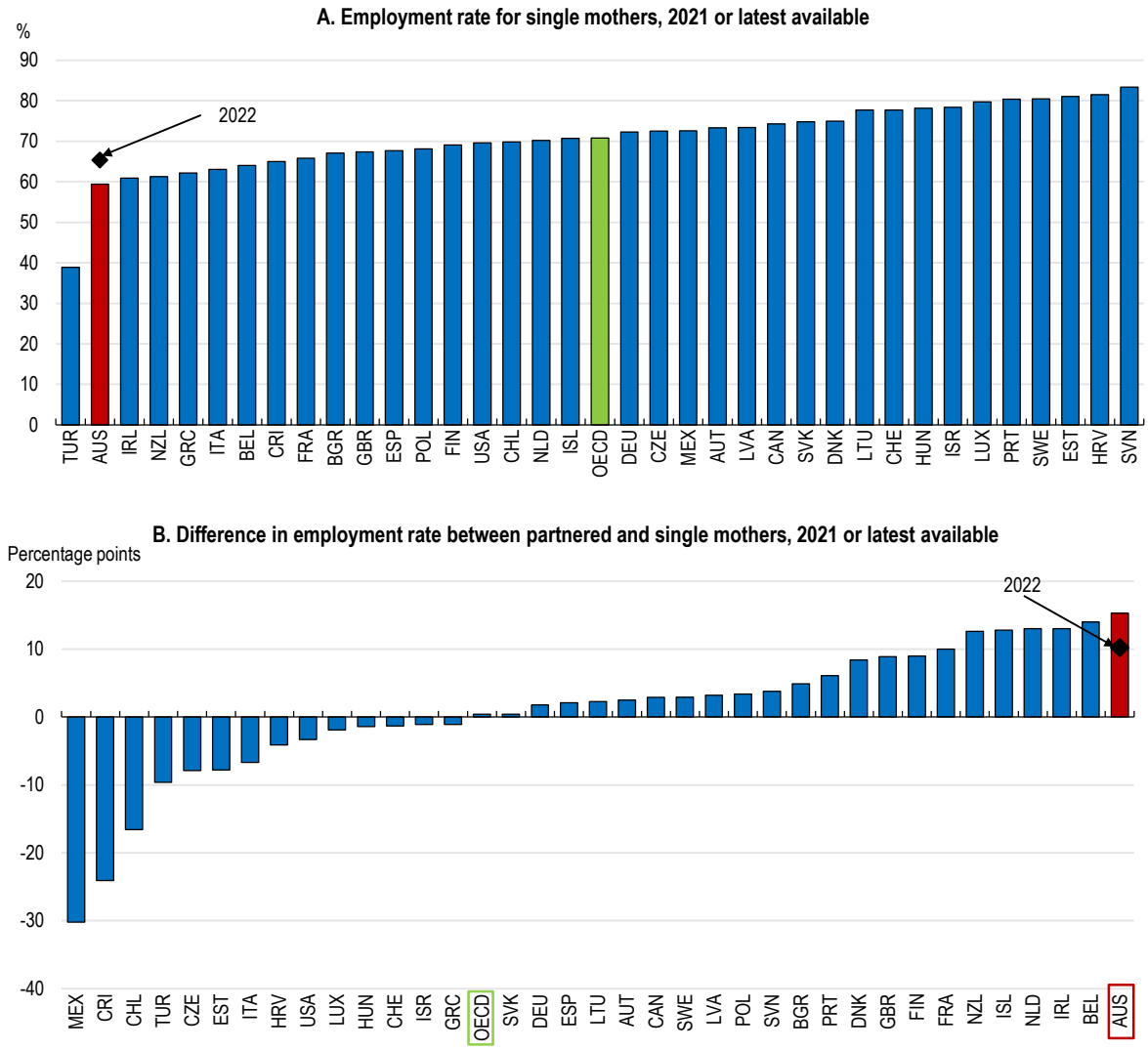
Source: OECD (2023d), "Regional productivity, local labour markets, and migration in Australia", *OECD Regional Development Papers,* No. 39, OECD Publishing, Paris.

Employment rates are especially weak for single mothers. In 2022, around 11% of Australian families were single mother families. Less than 50% of single mothers with a child aged 0-4 were employed, compared with over two thirds of coupled mothers with children in the same age bracket. While the employment rate

of single mothers in Australia has increased notably over the past few years, it remains low compared with other OECD countries (Figure 2.9, Panel A), even those with lower aggregate female participation rates. The gap with employment rates of coupled mothers is comparatively large (Figure 2.9, Panel B). According to HILDA data, around 35% of Australian single mothers were not in the labour force and 3% were unemployed in 2021.

Figure 2.9. Employment rates are especially low for single mothers



Note: Employment rates are for women with at least one child aged 0-14.
Source: OECD Family Database.

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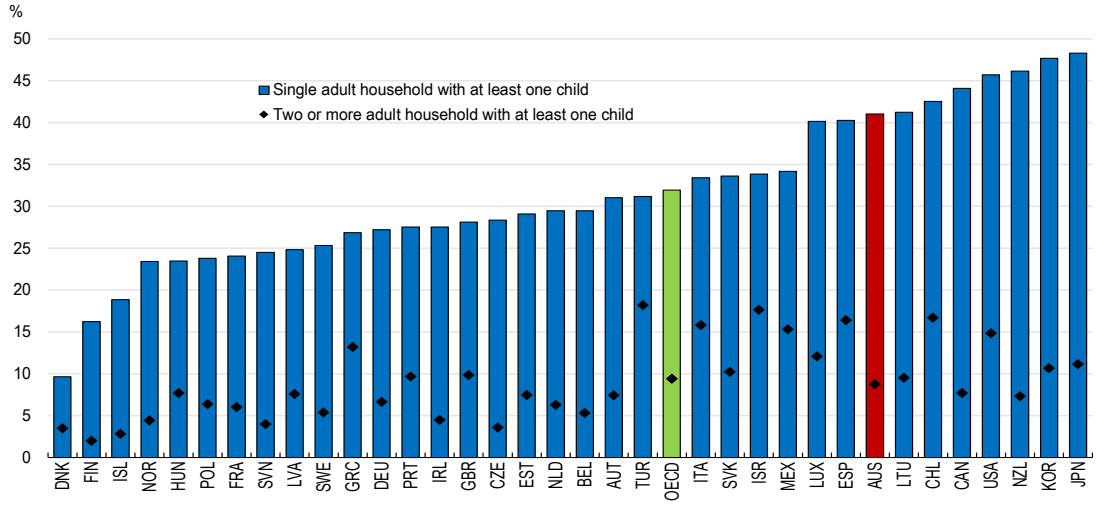
Many of those single mothers who are not in employment experience poverty. Pooling across waves of the HILDA Survey, about 45% of single mothers who were not employed found themselves in relative poverty (based on an evolving 50% of median disposable income poverty line). The poverty rate for single parents is high in Australia compared with other OECD countries (Figure 2.10) and around 80% of single parents in Australia are mothers. There is also a larger than average gap in Australia between the poverty rate of coupled and single parents than elsewhere (Figure 2.10). Analysis of data from the Australian Bureau of Statistics for 2017 highlighted that 37% of people in single parent families where the main earner

was female lived in poverty compared with 13.6% living in poverty in the population overall. HILDA data suggest that the poverty rate for single mothers has remained broadly stable between 2017 and 2021.

Figure 2.10. Poverty rates are very high in single parent households

Relative income poverty rates, individuals in working age households with at least one child, by household type



Note: Data are based on equivalised household disposable income, i.e. income after taxes and transfers adjusted for household size. The poverty threshold is set at 50% of median disposable income in each country. Working-age adults are defined as 18-64 year-olds. Children are defined as 0-17 year-olds. Data refer to 2018 for all countries except Canada, Latvia, Sweden and the United Kingdom (2019); Chile, Denmark, Iceland and the United States (2017); Netherlands (2016); New Zealand (2014).
Source: OECD Income Distribution Database.

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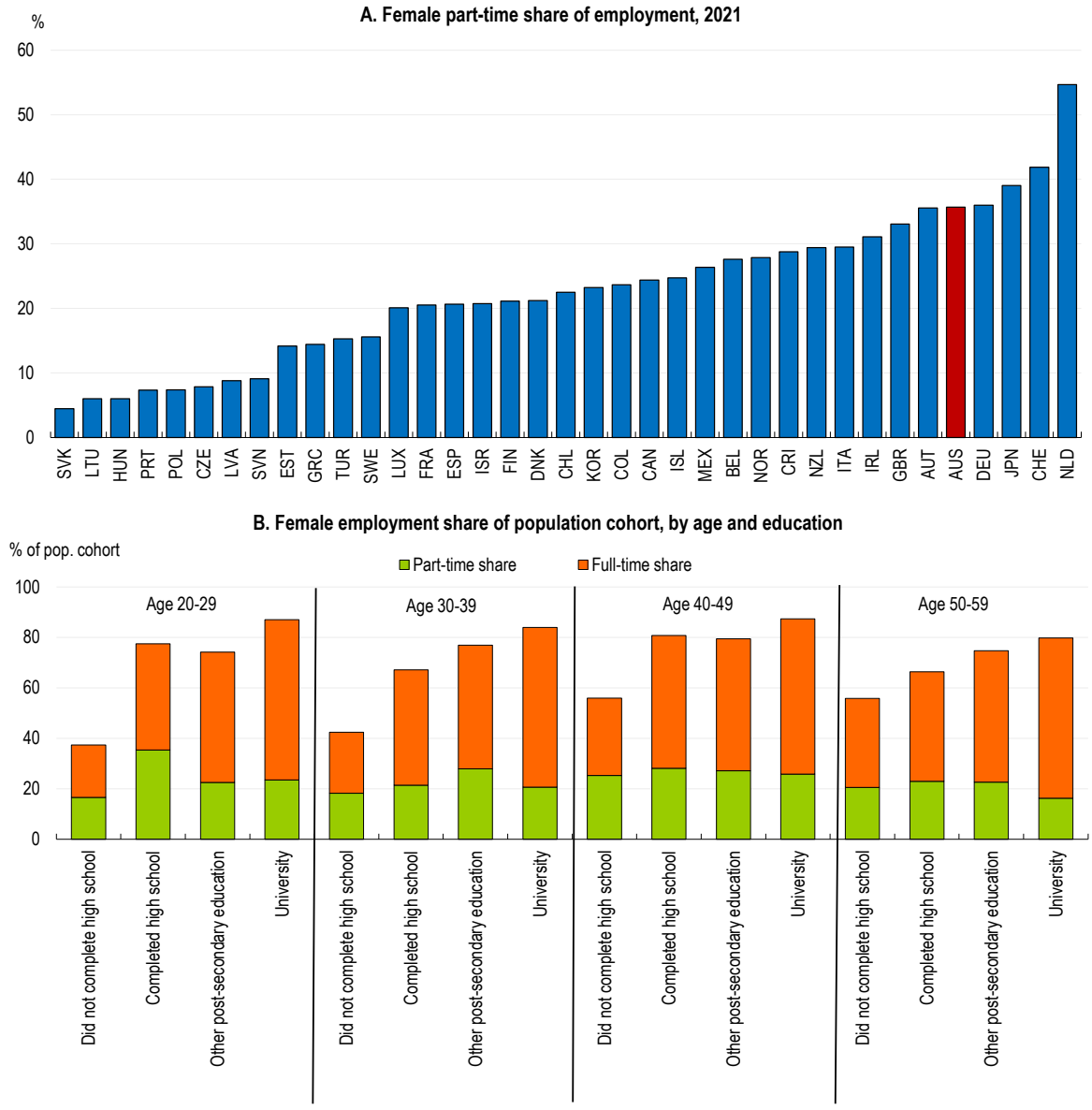
Gender gaps in hours worked

Many women in Australia who are employed work shorter hours than their male counterparts. While only 10% fewer women than men are in employment, they contribute 40% less hours worked. This reflects many women working part-time. Over one third of Australian women who are currently employed work less than 30 hours per week, a high proportion by OECD standards (Figure 2.11, Panel A). While this partly reflects a high proportion of part-time work in Australia (for both men and women) relative to other OECD countries, the gap between the share of women and men employed part-time is high by OECD standards. There tends to be a higher share of women undertaking part-time work in worker cohorts that have lower education levels (Figure 2.11, Panel B).

Figure 2.11. Many women in Australia work part-time



Note: Part-time employment is defined as people in employment (whether employees or self-employed) who usually work less than 30 hours per week in their main job. Panel A is calculated for those aged over 15.
Source: OECD Labour Market Statistics, HILDA, OECD calculations.

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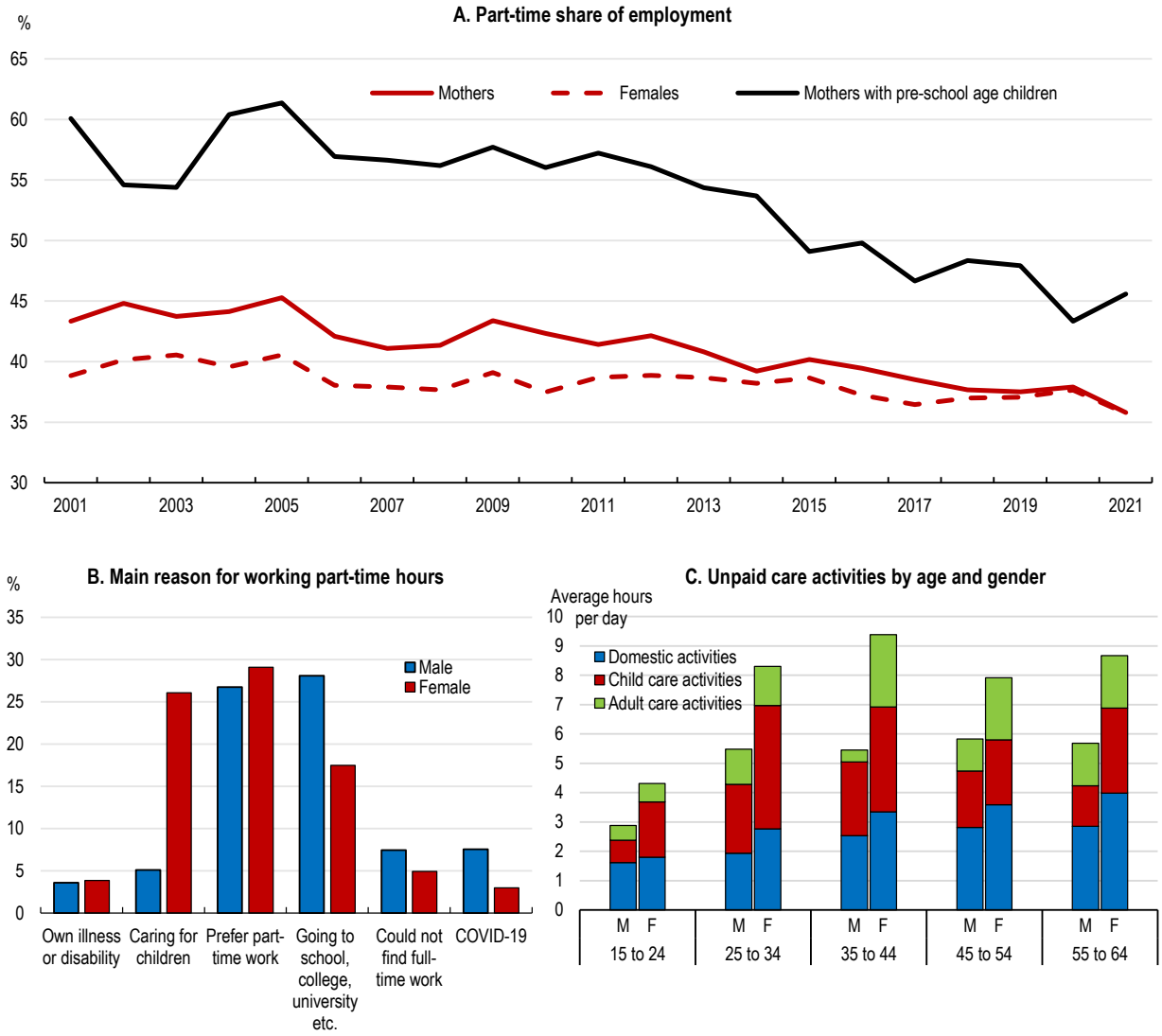
The incidence of part-time work is higher for mothers with children at pre-school age (Figure 2.12, Panel A). When asked in the HILDA Survey for the reasons for working-part time, around one quarter of women cite caring for children compared with 5% of men (Figure 2.12, Panel B). Even so, the part-time share for mothers with pre-school age children has declined by around 10 percentage points over the past decade. For mothers with children of any age, the part-time employment share had converged to that of women without children by 2021. This suggests flexibility in the system in that mothers increase their take-up of full-time work once their children are at school age, a feature that is less apparent in some other high income OECD countries such as Germany, Netherlands and Switzerland.

The lower participation rate of mothers (highlighted earlier in Figure 2.7, Panel C) and the high part-time share of mothers with young children reflects women being much more likely to reduce engagement in the

labour market after childbirth. Bahar et. al. (2022) estimate a 55% decline in female earnings following the arrival of children that is the combined result of a sharp drop in hours worked and employment rate. At the same time, that study showed little discernable impact on the earnings of men once they became fathers. This accords with time use surveys that show that women undertake a higher share of care activities (Figure 2.12, Panel C). This is both the case for child and adult care activities. The gender gap in unpaid care work is high in Australia compared with other OECD countries (OECD, 2021a). In addition, women in Australia are much less satisfied than men with the division of housework and childcare tasks (Wilkins and Lass, 2018).

Figure 2.12. Childcare is a significant reason for women working part-time



Note: Part-time employment is defined as people in employment (whether employees or self-employed) who usually work less than 30 hours per week in their main job.
Source: ABS, HILDA, OECD calculations.

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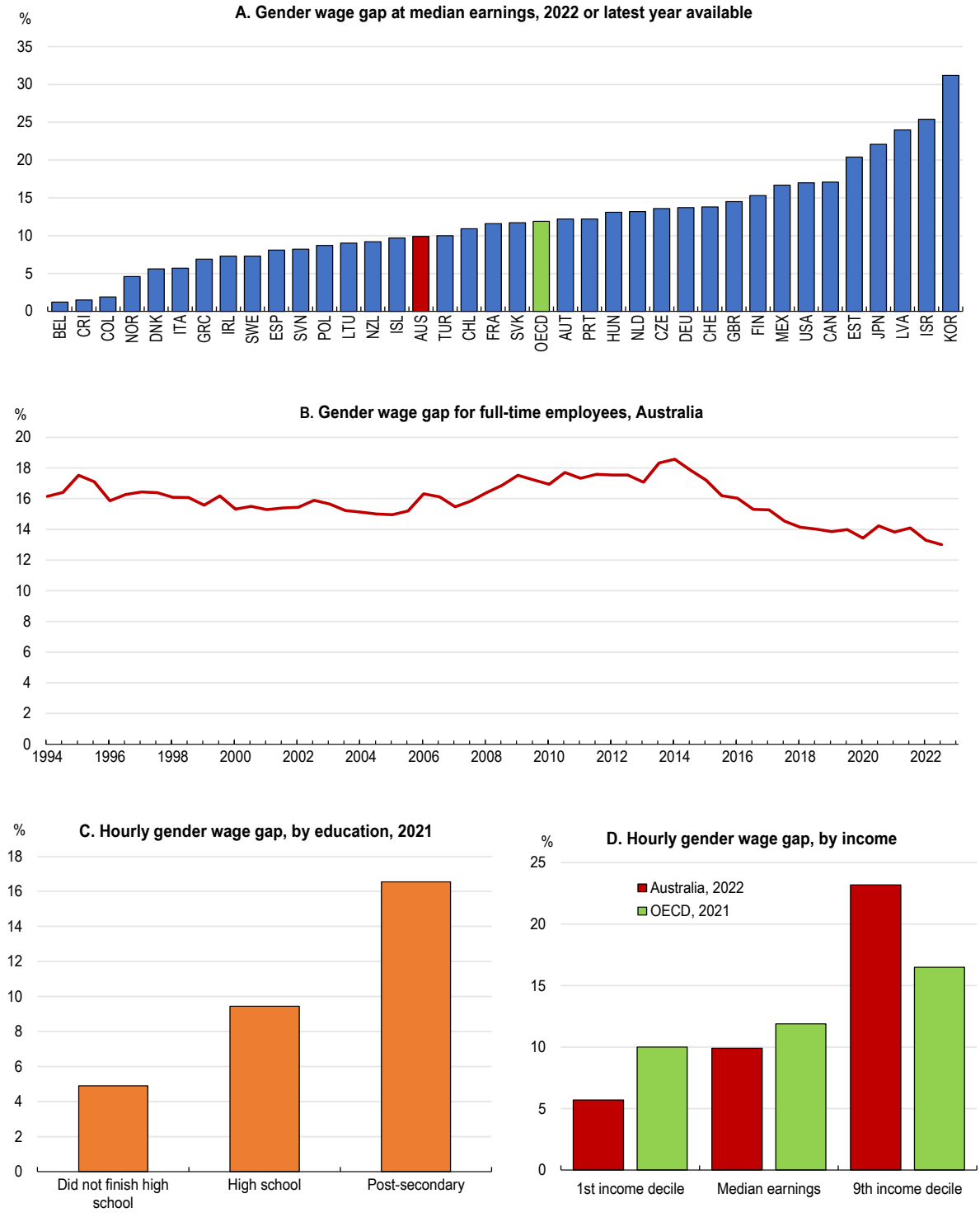
Gender gaps in wages

A full-time female worker earns around 13% less than her male counterparts on average. The gap narrowed over the past decade, but progress has slowed (Figure 2.13, Panel B). At median earnings, the gender wage gap is slightly below the average across OECD countries (Figure 2.13, Panel A). Gender

differences in hourly wages are most pronounced for workers with higher levels of education (Figure 2.13, Panel C) and those in the highest income quintile (Figure 2.13, Panel D).

Figure 2.13. The narrowing in the gender wage gap has slowed



Note: In Panel A, the gender wage gap is defined as the difference between median wages of full-time male and female employees relative to the median wage of males. In Panel B, the gender wage gap is based on full-time adult ordinary time earnings.
Source: ABS, HILDA, OECD.

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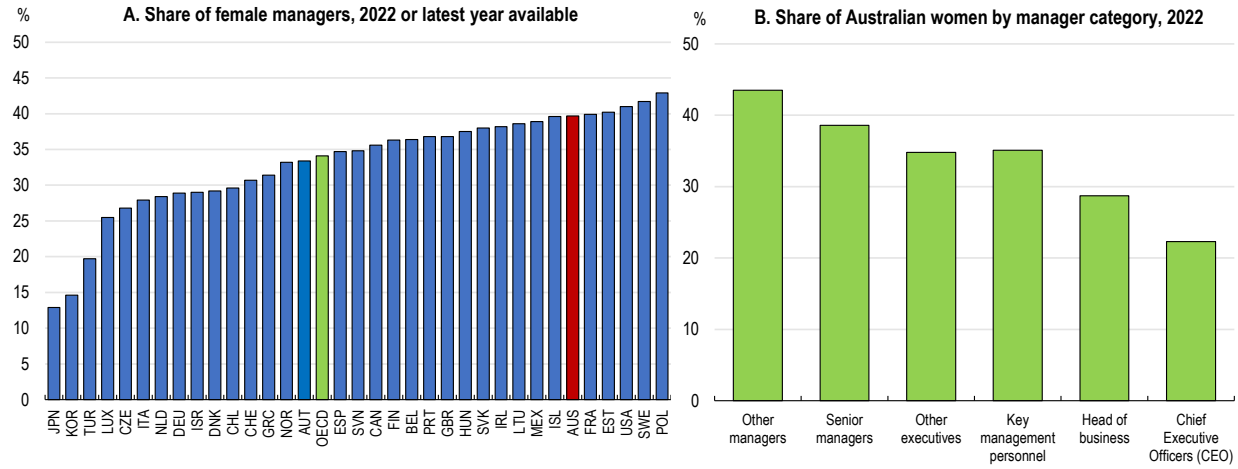
Gender wage gaps often reflect the same firm paying men more than women despite having similar skills (OECD, 2021b). This is mainly due to differences in tasks and responsibilities rather than differences in pay for work of equal value. While Australia has a high share of female managers compared with other OECD countries (Figure 2.14, Panel A), there is still a significant gap with the proportion of males in managerial positions. Gaps become more pronounced at higher levels of managerial seniority (Figure 2.14, Panel B). For instance, less than one in four Australian Chief Executive Officers are women.

Figure 2.14. Women are still underrepresented at the most senior ranks



Note: In Panel A, data for Australia are for 2021, but for most other countries they are for 2022, with the exception of Canada, Israel and Turkey (2021) and the United Kingdom (2019).
Source: OECD, Workplace Gender Equality Agency.

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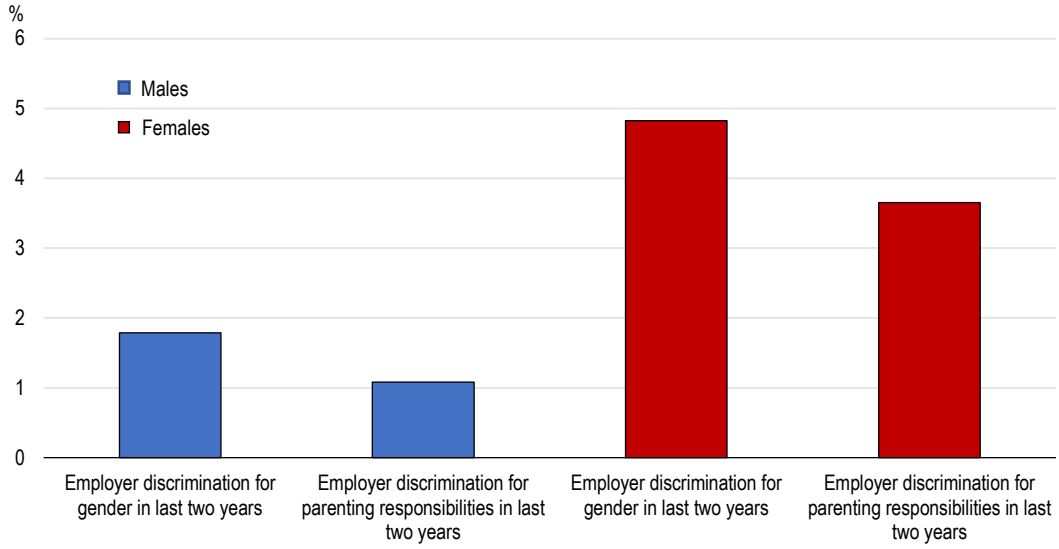
Figure 2.15. Women are more likely to experience discrimination by employers

Share experiencing discrimination in the last two years, by gender, 2018



Source: HILDA, OECD calculations.

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Discrimination can also lead to within-firm gender wage gaps. Women in Australia report notably higher levels of gender-based discrimination by employers than men. According to successive waves of the HILDA Survey, around 8% of females reported employer discrimination in the past two years related to either their gender or parenting responsibilities, compared with less than 3% of men (Figure 2.15). Nonetheless, estimates based on microdata suggest that it has played less of a role in Australia than in many other OECD countries (Box 2.2).

Box 2.2. Decomposing Australia's gender wage gap using HILDA

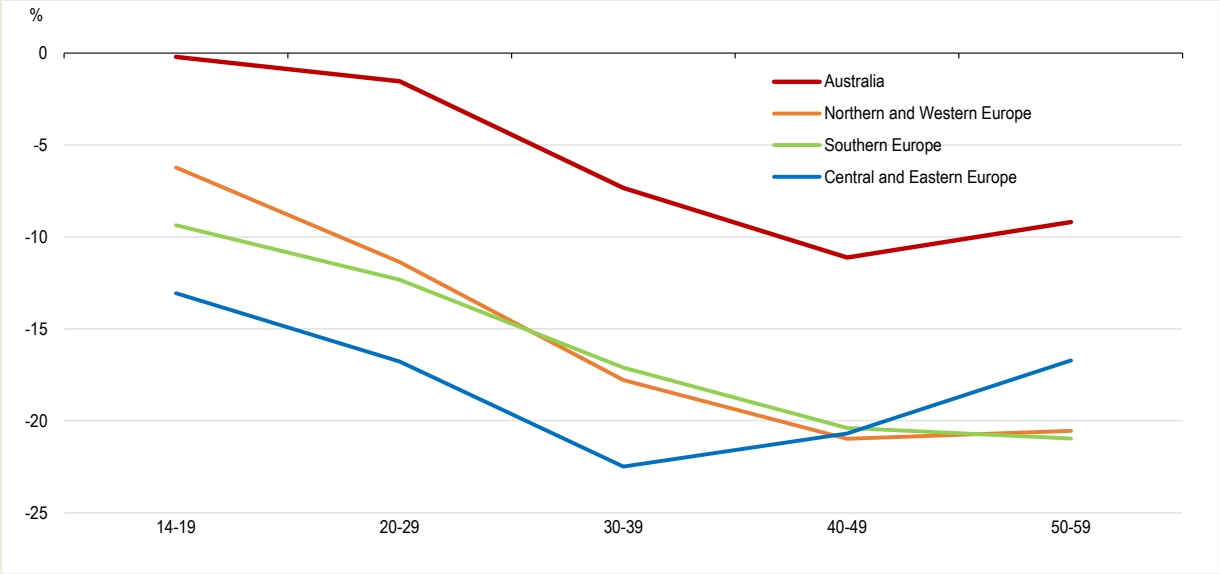
Following the work of Ciminelli et. al. (2021) for 25 European countries, a gender wage gap decomposition is undertaken for Australia using HILDA data. This approach draws out the drivers of the gender wage gap based on how it evolves through the life cycle.

The focus is on the gender gap in hourly earnings between women and men with similar levels of educational attainment and labour market experience, and on three deep drivers that have been emphasised in previous research.

- **Compensating wage differentials** – women may take up jobs with lower wages but with specific non-wage characteristics, such as higher working time flexibility or shorter commuting times, that allow them to spend more time in unpaid home work.
- **Slower human capital accumulation** – female career paths may not allow them to accumulate human capital at the same rate as men. This may be because they interrupt their careers after childbirth, spend less time at the workplace than their male peers or forego promotions.
- **Gender discrimination** – employers discriminate against women because of conscious or unconscious biases, or because they perceive the average woman to be less productive than the average man.

Figure 2.16. The gender wage gap increases over the life cycle

Estimated difference in hourly earnings (women-men)



Note: Regressions control for educational attainment and tenure in the firm and include dummy variables for apprentices, casual workers, as well as a cohort dummy that enters the estimating equation independently and as an interaction with the female dummy in order to control for cohort effects in wages and the gender wage gap.

Source: OECD.

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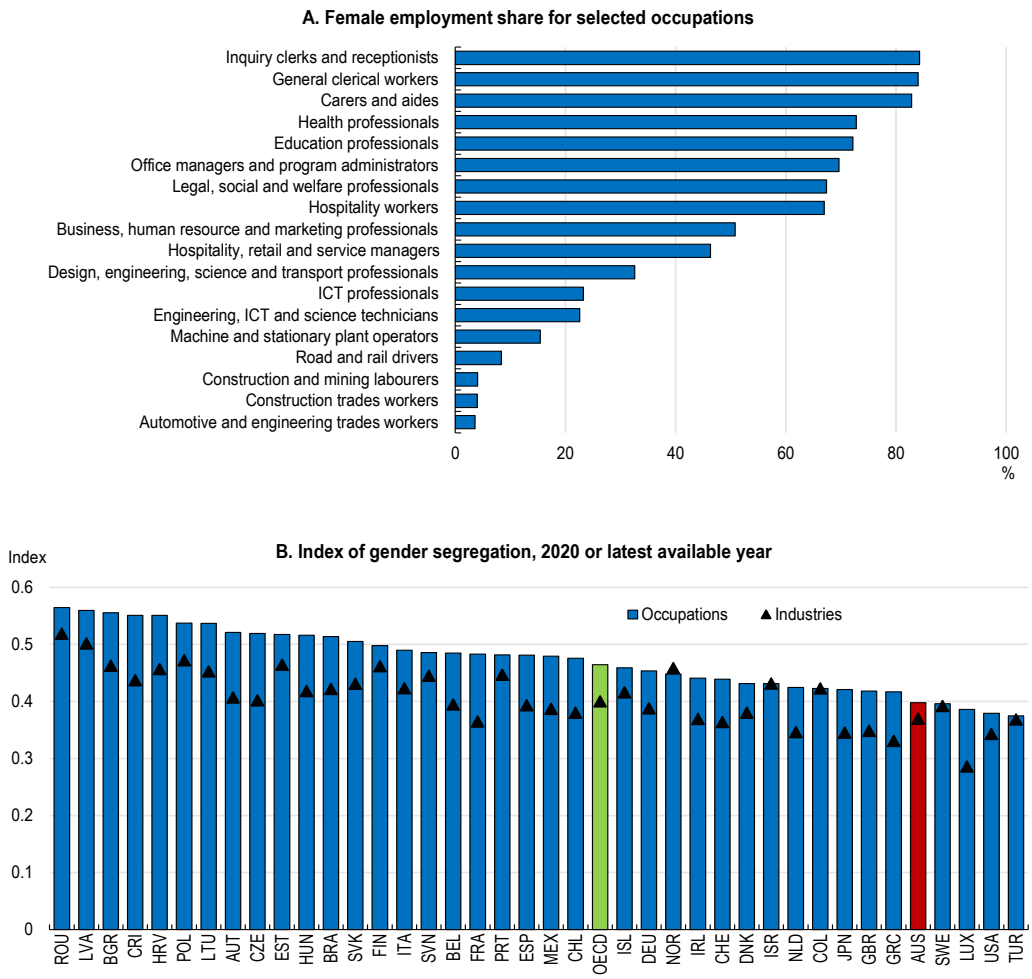
The results for Australia highlight that the gender wage gap is very small for those in younger age brackets, when controlling for level of educational attainment and other labour market factors such as tenure in firm and whether the individual is an apprentice or casual worker (Figure 2.16). This contrasts with the aggregate results for European countries, which have a larger estimated gender wage gap in the earlier age groups. Assuming factors related to having children play a more limited role in explaining wage gaps in the youngest cohorts, the results suggest that other factors such as gender discrimination play a greater role in explaining gender wage gaps in these other countries than in Australia. The widening of the gender wage gap in Australia through the life cycle (in the 30-39 and 40-49 age groups) suggests that the child penalty plays a more important role in explaining the aggregate gender wage gap in Australia, through compensating wage differentials and slower human capital accumulation of women.

Figure 2.17. Gender segregation is apparent across occupations and industries



Note: In Panel B, the index of dissimilarity, or Duncan index, measures the sum of the absolute difference in the distribution of female and male employment across occupations or industries. It assumes that segregation implies a different distribution of women and men across occupations/industries: the less equal the distribution, the higher the level of segregation. It ranges from 0 to 1, from the lowest to the highest level of segregation. Here it was calculated using the ISCO-08 classification of occupations and the ISIC-4 classification of industries, both at 2-digit levels. For Australia, data refer to the previous ISCO-88 classification of occupations and the ISIC-3 classification of industries. For Israel and Italy, data refer to 2017. For the United Kingdom, data refer to 2019.
Source: ABS, OECD (2023c).

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Large gender wage gaps are spread across occupations. Of the 87 occupations reported by the Australian Bureau of Statistics (ABS) in May 2021, 60% had a per hour gender wage gap for full-time non-managerial

employees exceeding 5%. It may be that women accept jobs within a given occupation that have lower wages in return for the non-monetary benefits of flexible working arrangements, allowing them to spend more time in unpaid home work (Ciminelli et. al. 2022). Consistent with this, gender wage gaps in Australia tend to be largest in those occupations that have a high share of inflexible and demanding jobs (Sobeck, 2022). Men are disproportionately employed in these occupations and the women who do work in them tend to opt for the more flexible jobs and work fewer hours per week.

Gender segregation in employment can add to wage gaps through men and women sorting across industries and occupations. More flexible work arrangements or societal norms may steer women towards certain professions with lower pay. For example, women account for over 80% of clerical workers and carers and aides, but less than one quarter of workers in engineering, ICT and science (Figure 2.17, Panel A). Risse (2023) estimates that male-concentrated occupations in Australia are associated with 6.5% higher wages and male-concentrated industries with 3.1% higher wages. One indicator of gender segregation across industries and occupations, the Duncan Dissimilarity Index, suggests that segregation is relatively low in Australia compared with other OECD countries (Figure 2.17, Panel B). Nonetheless, based on these results, around 40% of Australian workers would need to change occupations and industries to achieve perfect gender integration (meaning the share of women in each industry or occupation would mimic the share in total employment).

Policies to improve gender equality

A range of policies, including taxation, childcare, labour market policies and education can contribute to narrowing gender inequalities. This can be through reducing barriers to female employment, allowing men to take on more caring responsibilities and helping to breakdown gender norms. Mainstreaming considerations of gender impacts into all policy fields would help (Box 2.3). This includes expanding the scope of gender impact assessments to cover all new policy and budget proposals with a significant impact on gender equality. In addition, there is a need for robust evaluation into the effectiveness of existing policies on achieving stated gender goals.

Box 2.3. OECD Review of Gender Mainstreaming and Budgeting in Australia

The Australian government recently tasked the OECD Public Governance Directorate to undertake a Review of Gender Mainstreaming and Budgeting in Australia. The Review assesses the institutional structures in place and the recent work that has been undertaken to introduce gender impact assessments and gender budgeting as tools to support better-targeted policy and budget decisions.

The Review identifies six key actions to boost Australia's efforts to improve gender equality:

- Ensuring that gender impact assessment and gender budgeting have legal foundations so that the practices are sustained over time.
- Establishing a Gender Budgeting Steering Group to guide and oversee gender budgeting efforts.
- Enhancing the quality of gender analysis to ensure that it has the necessary impact on policies.
- Building institutional capacity to broaden and deepen the understanding of gender equality issues across the Australian Public Service.
- Developing a Gender Data Action Plan to strengthen the availability, awareness and analysis of gender-disaggregated data collected by the government.
- Strengthening the Office for Women to better reflect the government's heightened commitment to gender equality and ensure that the Office has the capacity to deliver required reforms.

Source: OECD (2023a).

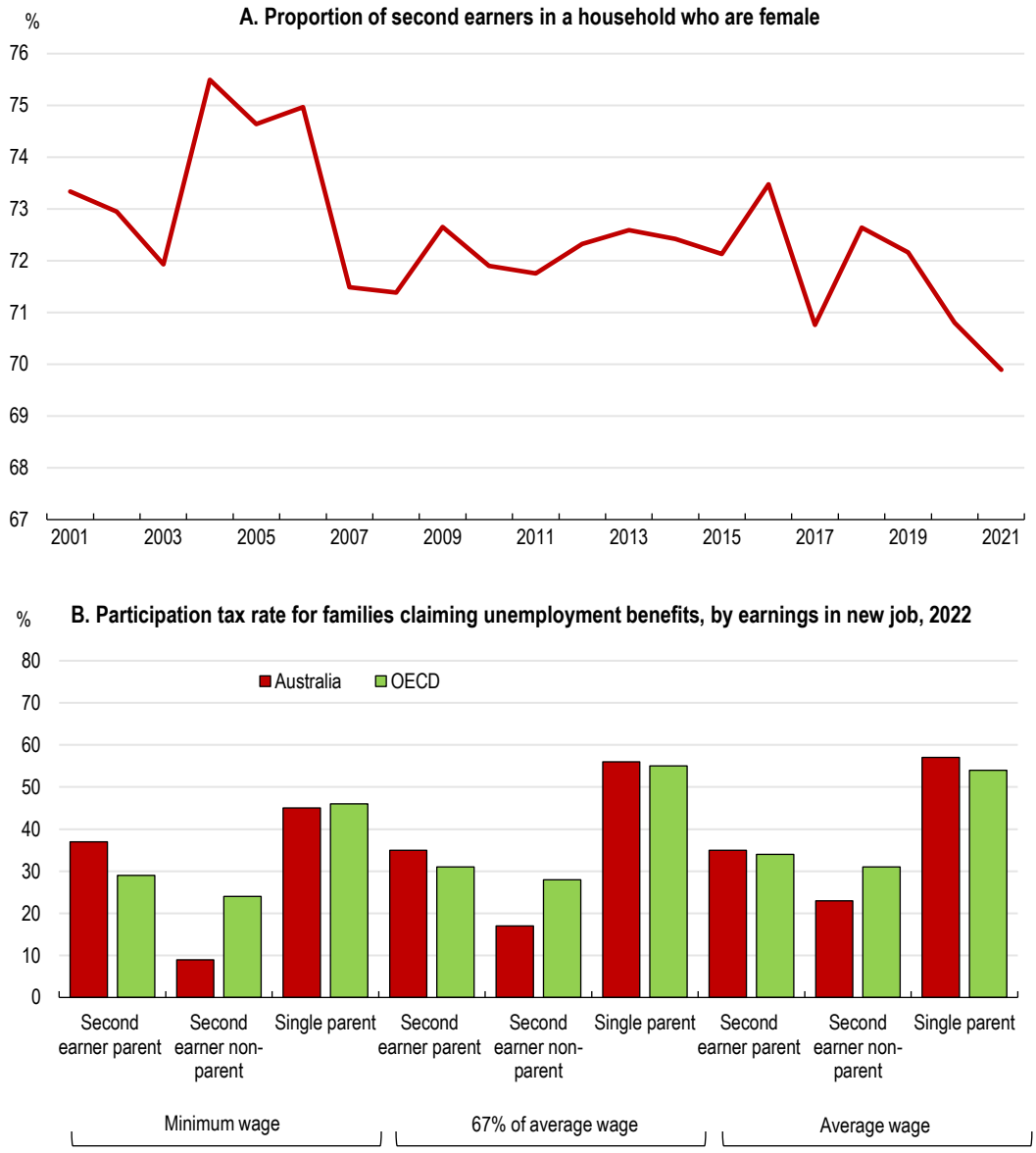
The tax and transfer system

The tax and transfer system does not differentiate tax provisions based on gender as an explicit criterion. However, the system may affect men and women differently as it interacts with prevailing differences in underlying economic characteristics and behaviours. Given scope for increasing both women's participation in the Australian labour market and the number of hours that women tend to work, the role of labour taxation and transfers in influencing the employment decisions are particularly relevant.

Reducing marginal effective tax rates

Australia has a highly progressive income tax schedule, which reduces aggregate gender inequality in post-tax earnings because women tend to be at the lower end of the wage distribution. The system of income taxation is based on individual rather than household income, meaning that second earners in a household have access to the tax-free threshold when moving into work or increasing hours. This helps the participation of women in lower paid and part-time work, given that around 70% of second earners in Australian households are female (Figure 2.18, Panel A). Participation tax rates for a women in a family currently receiving minimum income benefits are mostly around OECD average level, though they are comparatively low for second earners without children (Figure 2.18, Panel B).

Figure 2.18. Second earners in a household are usually female



Note: In Panel B, the partner in the couple is assumed to earn the average wage. The calculations are for families receiving unemployment benefits and include social assistance and housing benefits. This calculation does not include childcare costs.
Source: HILDA, OECD Tax and Benefits Model, OECD calculations.

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On the benefits side, most payments are means tested and taper as earnings rise. There is the capacity to earn modest weekly labour income (for example, AUD150 per fortnight for unemployment benefits) before benefits begin to taper and a system of working credits for those transitioning from earning no income to becoming wage earners. Above the income free area, unemployment benefits taper at a rate of 50 cents for each additional dollar earned, increasing to 60 cents beyond a threshold. Parents have access to a parenting payment (the benefit taper on Parenting Payment Single is 40 cents for each additional dollar earned, but higher for a member of a couple) and two types of family tax benefits (Table 2.1). In contrast to the tax system, benefit eligibility depends on household income rather than just individual income. This means a female second earner entering employment or increasing hours worked can lose access to benefits relatively quickly depending on the income of their partner. There are no “in-work benefit”

schemes, whereby workers with low wages can receive income supports and eligibility is conditional on being employed. Such schemes are used in many other OECD countries to support low-earners in work and these can be designed so that supports are tapered out gradually as people increase their working hours, providing better incentives to work (OECD, 2023b).

Table 2.1. Main Australian government benefit payments

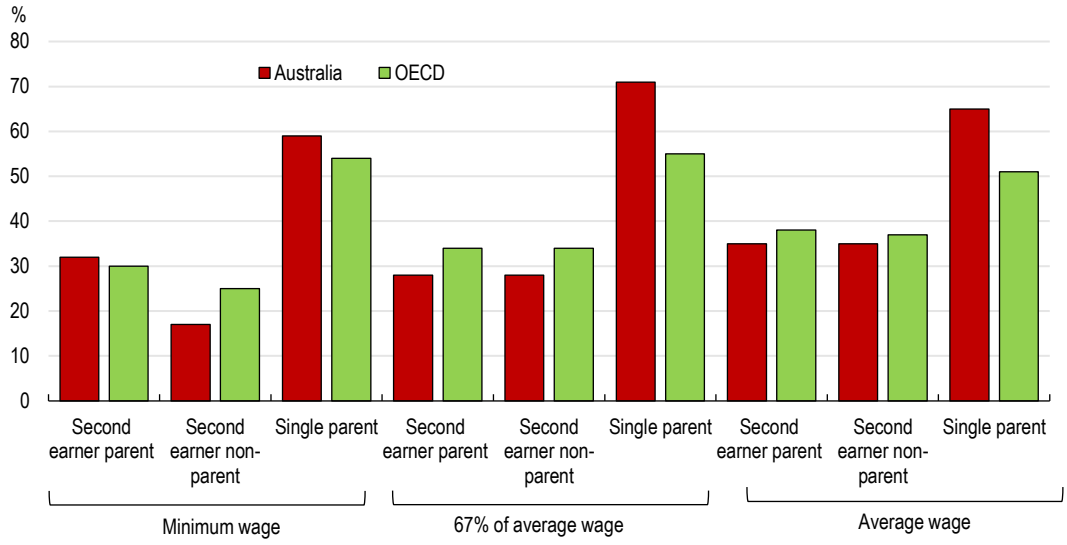
Benefit name	Eligibility	Factors impacting payment	Other characteristics
Parenting Payment	Principal carer of a dependent child aged under six for partnered recipients or aged under eight for single recipients.	Dependent on partnered status and subject to personal and partner income testing. An assets test also applies.	
Family Tax Benefit Part A	Families with care of a child aged under 16 and secondary students aged 16 to 19 years.	Subject to an income test on family income. Payment taper at a rate of 20 cents per each additional dollar earned above an income free area, increasing to 30 cents per each additional dollar beyond a threshold.	Paid per child
Family Tax Benefit Part B	Single parents and carers with care of a child up to 18 years old and some couple families with one main income and care of a child up to 13 years (18 years if a grandparent).	Primary and secondary earners' income must be below certain thresholds.	Paid per family
Carer Payment	For people providing constant care for someone who has a disability, a severe medical condition or is frail aged.		Can engage in employment or study for up to 25 hours per week and remain eligible.
JobSeeker Payment	Paid to unemployed people aged 22 or over and under eligibility age for the Age pension.	Must satisfy mutual obligation requirements of actively seeking work or undertaking an activity to improve their employment prospect. Rates of payment are dependent on age, partnered status and presence of dependent children.	A non-contributory benefit that is paid at a flat rate not time limited.
Disability Support Payment	Claimant must meet eligibility criteria around the diagnosis, treatment and stabilisation of their condition. They must also be unable to work for at least 15 hours per week within the next 2 years because of the impairment.	Subject to income and asset test. Once on the payment, a recipient may work up to 29 hours per week before the payment is suspended.	
Youth Allowance (other)	Paid to unemployed people aged 16 to 21.	In addition to age, partnered status and presence of dependent children, payments also depend whether they live with and/or are dependent on parents.	
Commonwealth Rent Assistance	A person must be eligible for a primary benefit such as JobSeeker, Youth Allowance, Family Tax Benefit Part A, or income support supplements.	The maximum rates and minimum rent thresholds vary according to a person's family situation, i.e. single or couple and the number of children they have and, for singles without children, whether accommodation is shared with other adults.	Paid at the rate of 75 cents for every dollar of rent paid above the specified minimum rent threshold until the maximum rate is reached.
Age Pension	Means tested on income and assets. In addition to an income free area, there is a work bonus allowing pensioners to earn up to AUD250 per fortnight.	Payable from age 65 and six months for men and women.	Flat rate payment funded through general taxation revenue.

Benefit tapering contributes to high marginal effective tax rates on increasing work hours for some households (Figure 2.19). The effective tax rates when moving from 50% to 100% of full-time working hours are especially high for single parents, as they are more likely to receive benefits when working which

are withdrawn as incomes rise. The calculations do not consider the additional effect of childcare costs when increasing work, though these create additional barriers (discussed further below). The high marginal effective tax rates of increasing work hours for some women is consistent with Australia having a relatively high share of females working part-time.

Figure 2.19. The tax and transfer system imposes very high marginal effective tax rates on single parents

Effective tax rate on increasing working hours, individual with two children at different wage rates, 2022



Note: The tax rates are based on increasing work hours from 50% to 100%. For the couple, the partner is assumed to earn the average wage. The calculations include social assistance benefits and housing benefits. This calculation does not include childcare costs.
Source: OECD Tax and Benefits Model.

StatLink https://stat.link/3zsml8

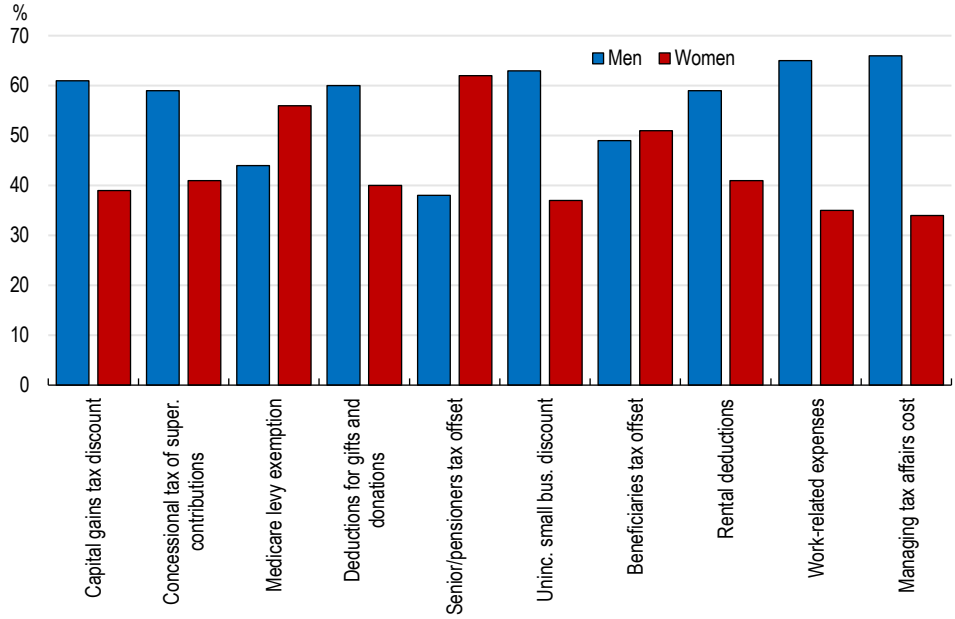
The authorities could reduce marginal effective tax rates on additional hours through a slower tapering of benefits. For example, the sudden loss of Family Tax Benefit Part A end of year supplement when family income reaches AUD80,000 could be made more gradual. While this would entail a fiscal cost, it could be partly financed by removing the Family Tax Benefit B for couple families. At present, a couple family must have a second earner with income below AUD6,497 per year to receive the full rate of Family Tax Benefit Part B and income below AUD32,303 per year (with a youngest child aged 0 to 4 years) to attract an income test reduced rate of payment. While Family Tax Benefit B partly aims to compensate single earner families for paying more tax than a two-earner family (as the latter has access to two tax free thresholds), the income test raises disincentives to work for second earners. In addition, the authorities could consider other opportunities to reduce disincentives to work in the tax-transfer system, for instance combining Family Tax Benefit Part A and Family Tax Benefit Part B to avoid the stacking of withdrawal rates and reduce complexity in the system (Commonwealth of Australia, 2010).

There are other ways the tax system impacts upon gender equality by having distinct effects on the incomes of women and men. For example, women receive a lower share of the benefits from many government tax expenditures (Figure 2.20). The economic justification for some of these expenditures is contested irrespective of the impact on gender inequality. For example, the generous private pension tax concessions in Australia may displace other forms of saving (Commonwealth of Australia, 2020) and the size of the capital gains tax discount may exceed that needed to compensate investors for inflation (OECD, 2021c). The government recently reintroduced gender impact assessment for selected budget measures and gender analysis for all proposals, but there is scope for this to be undertaken on a broader range of

proposed measures in a more systematic way. As recommended by the upcoming OECD Review of Gender Mainstreaming and Budgeting in Australia, providing a legal basis for gender impact assessment and gender budgeting would benefit this aim (Box 2.3).

Figure 2.20. Women receive a lower share of the benefits from many tax expenditures

Share of tax expenditure received by gender, 2019-20



Source: Commonwealth of Australia (2023b).

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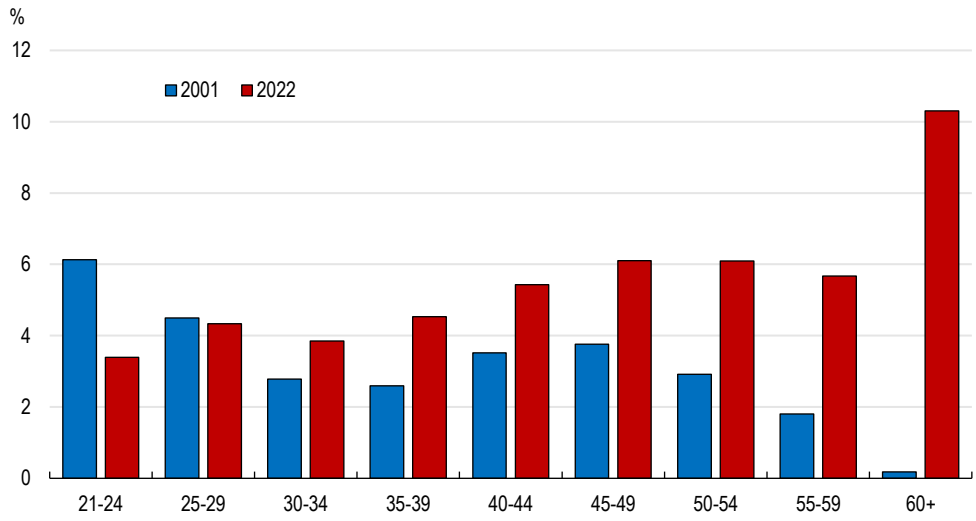
Providing adequate income support to Australian women

Government payments also have an important role in ensuring a minimum level of income for some women in Australia. For example, most recipients of carer payments and parenting payments are women. They have also become increasingly likely to be recipients of JobSeeker, which is Australia's working-age unemployment benefit. While women accounted for around 30% of JobSeeker recipients in 2000, the share had risen to roughly 50% by 2022. In particular, older women now account for a significant share of these payments (Figure 2.21). The rising share of female recipients partly reflects the increased labour market participation of females. However, it is also due to an increase in the Age Pension qualifying age and changes in other income support payments (i.e. parenting payments, partner payments, partner allowance and wife pension) that have caused more women to move onto JobSeeker.

Figure 2.21. Women now account for a much larger share of JobSeeker recipients

Female share of total JobSeeker payment recipients by age group



Source: Parliamentary Budget Office.

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As discussed in the last *OECD Economic Survey of Australia* (OECD, 2021c), the replacement rate of Jobseeker payments is very low compared with unemployment benefits in other OECD countries. This is partly due to JobSeeker being an unlimited payment that is funded through general taxation rather than a contribution-based unemployment insurance programme like in many other OECD countries. Recent analysis found that consumption spending drops by over 10% when an individual moves onto JobSeeker (Clarke et. al. 2023). The Australian government established an Economic Inclusion Advisory Committee in December 2022, which found JobSeeker payments to be inadequate, whether measured relative to the National Minimum Wage, pensions or a range of income poverty measures (Interim Economic Inclusion Advisory Committee, 2023). In response, the government announced a modest increase in the base rate for JobSeeker and other working age and student payments of AUD40 per fortnight and extended eligibility for the existing higher single JobSeeker payment rate to those in the 55-60 age bracket. There was also a 15% increase in the maximum rate of Commonwealth Rent Assistance. Nonetheless, minimum income benefits in Australia remain well below the relative poverty line of 50% of the median wage.

The government also recently expanded the Parenting Payment for single parents. This will mean that single mothers who are unemployed will be able to stay on the payment until their youngest qualifying child turns 14 (rather than 8) before being moved onto the less-generous JobSeeker payment. Given the high poverty risk of single mothers discussed earlier, such measures that provide adequate income support are important. There are unlikely to be discernible disincentive effects from providing this more generous support, as the parenting payment remains markedly lower than the minimum wage and is withdrawn at a slower rate than JobSeeker payments for non-principal carers.

Institutional arrangements to support the incomes of separated parents

Single mothers are often impacted by Australia's child support scheme arrangements, whereby separated parents are required to provide financial support to help with the costs of raising children. Receipt of these payments has been shown to reduce the poverty rate in Australian single mother households by over 20% (Skinner et. al. 2017). However, unpaid liabilities under the scheme have been increasing, with most of those liabilities not subject to a payment plan (Interim Economic Inclusion Advisory Committee, 2023). While the authorities have made efforts to reclaim unpaid debts, through measures such as issuing

Departure Prohibition Bans (i.e. travel bans) on individuals with an unpaid liability, further measures may be needed.

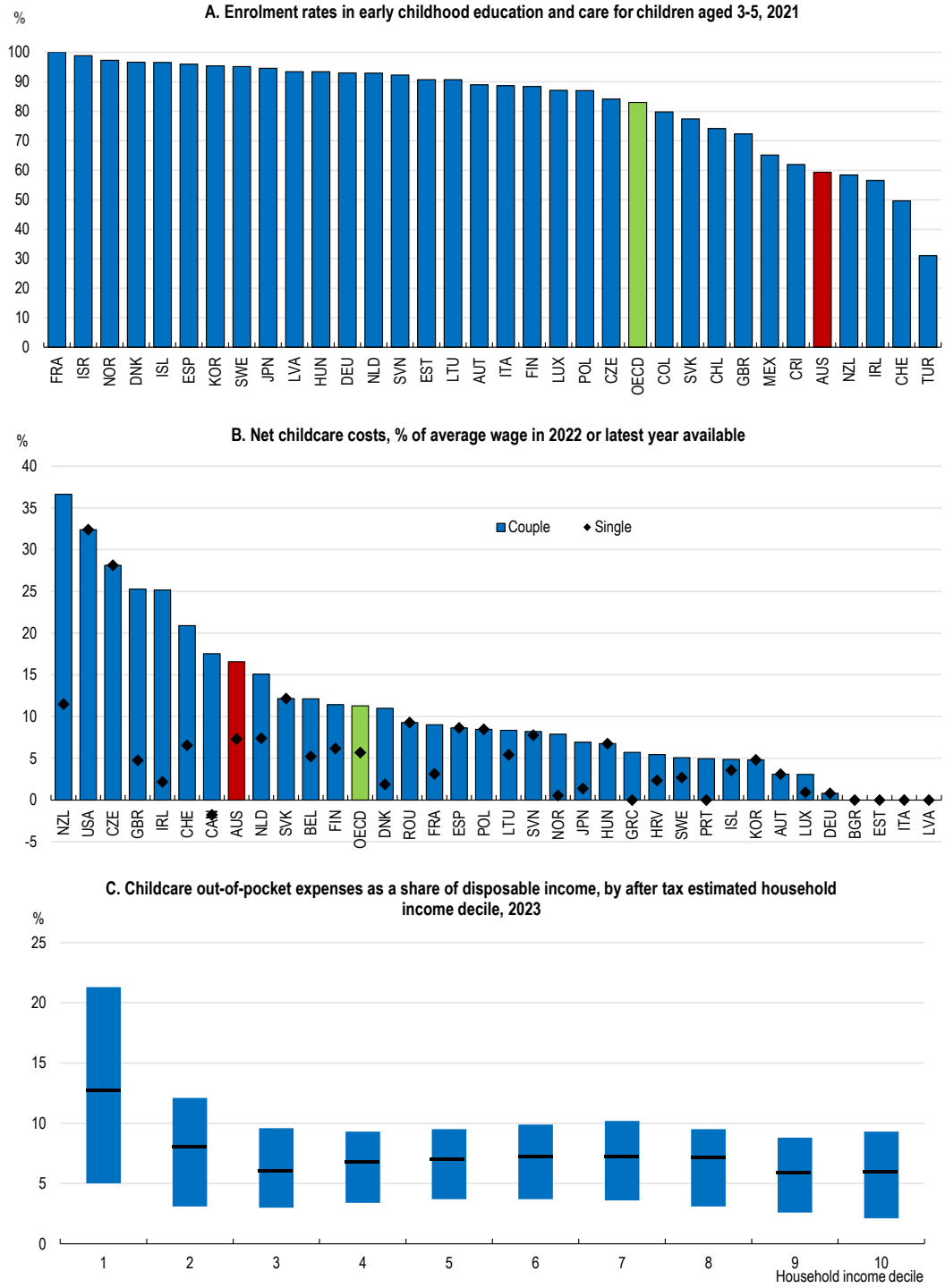
There are a variety of approaches taken to non-payment of child support across OECD countries. Salary deductions, seizure of assets and bank accounts, withholding of other public support payments and, in some countries, imprisonment, are all used elsewhere (Miho and Thévenon, 2020). In many jurisdictions, the government or another responsible authority provides a backstop for child support. For example, the Estonian *Family Benefits Act* in 2016 introduced a provision whereby child supports were paid by the government if a non-custodial parent does not fulfil their payment obligations. The government will then claim back the support from the debtor parent, with the potential use of administrative measures such as rescinding a driving license or restricting entrepreneurial support. Given that pursuing non-payment through the courts can be costly for a custodial parent, considering a greater role for the government in guaranteeing payments should be considered in Australia. At the same time, continued supports that help non-custodial parents to be self-sufficient are important. For instance, providing employment and social supports conditional on the payment of child support can reduce the risk of non-payment (Miho and Thévenon, 2020).

Retirement incomes of single mothers can also be threatened when divorce settlement decisions do not include superannuation (private pension) assets (Commonwealth of Australia, 2020). In 2018, the government announced that the Australian Taxation Office would provide accurate and timely superannuation data to courts to increase the visibility of superannuation assets in family law proceedings. The establishment of this directive in the April 2022 Visibility of Superannuation Law is welcome.

Supporting affordable childcare

Ability to access high quality and affordable childcare makes it easier for parents to return to work after childbirth and provides the option for both to take on full-time work. However, enrolment rates in early childhood education and care are slightly below most OECD countries. This is due to a low share of 3-5 year olds being enrolled in childcare compared with elsewhere in the OECD (Figure 2.22,Panel A). The availability of childcare can be an impediment to accessing childcare, a recent study found 35% of the Australian population live in childcare deserts (Hurley et. al., 2022), but cost is also a key factor. Out-of-pocket childcare costs for a couple are high relative to most other OECD countries, constituting over 15% of the average wage (Figure 2.22, Panel C).

Figure 2.22. Low childcare enrolment rates partly reflect high out-of-pocket childcare costs



Note: In Panel B, estimates are based on either a couple or single earning 67% of the average wage. Net childcare cost are equal to gross fees less childcare benefits/rebates and tax deductions, plus any resulting changes in other taxes and benefits following the use of childcare. Calculations are for full-time care in a typical childcare centre for a two-child family (children aged 2 and 3), where both parents are in full-time employment and the children are aged two and three. Full-time care is defined as care for at least 40 hours per week. For couples, both parents earn 67% of the average wage. In countries where local authorities regulate childcare fees, childcare settings for a specific municipality or region are modelled. For more details see the OECD Tax-Benefit model methodology. In Panel C, each box represents the middle 50% of households in each income decile. The median is represented by the black line.

Source: OECD Family Database, OECD Tax-Benefit data portal, Australian Competition and Consumer Commission.

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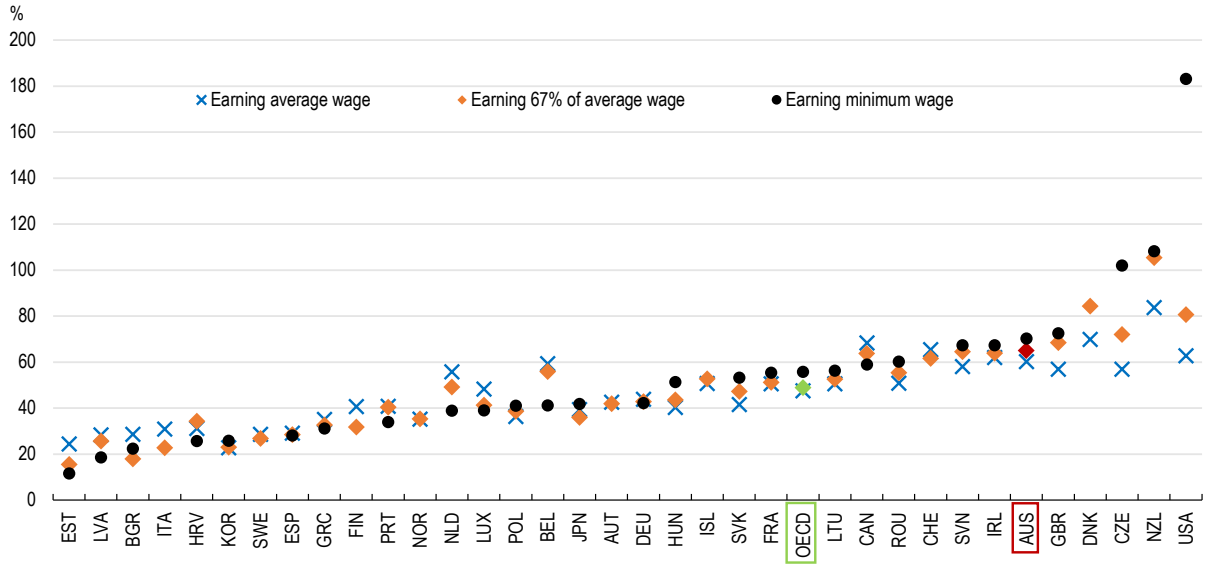
The high cost of childcare adds significantly to the work disincentives for second earners. The OECD *Faces of Joblessness* project identified high disincentive rates as a barrier to employment for over one third of Australian mothers with care responsibilities (Immervoll, et. al., 2019). Australia has a largely market-based early childhood care system, with the government providing a subsidy for approved childcare that decreases as family income rises. The subsidy is subject to an activity test, with the hours of subsidised childcare increasing with the hours of activity (defined as work, education, starting a business, volunteering and actively looking for work). Overlaying out-of-pocket childcare costs on the impacts from the tax and transfer system highlights that 65% of additional earnings are lost for a second earner taking a job that pays 67% of the average wage, rising to 70% for someone taking a job at the minimum wage (Figure 2.23). This, along with problems meeting the activity test, may be a factor behind the low participation rates of some women in Australia, especially those with low educational attainment. There are also large financial disincentives to second earners taking on the fifth day of work per week (Kennedy, 2022). This partly owes to the steep tapering of the government childcare subsidy as household incomes rise (Wood, 2020).

Figure 2.23. High childcare costs contribute to a high disincentive rate for second earners

Per cent of earnings lost when entering employment and using childcare, 2022



Note: This indicator measures the percentage of earnings lost to either higher taxes or lower benefits when a parent of two children takes up full-time employment and uses centre-based childcare. Calculations refer to a couple with two children aged 2 and 3 where the other parent works full-time at 67% of the average wage.
Source: OECD.

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Public funding for early childhood education and care has typically been lower than in other OECD countries. However, in response to high childcare costs, both Federal and some State governments have been increasing childcare subsidies. The Federal government has raised the maximum amount of the childcare subsidy from 85% to 90% and reduced the speed at which the subsidy is withdrawn as family incomes increase. The subsidy is based on a maximum hourly rate that the government subsidises, though over 20% of centre-based childcare services charged above this maximum rate in 2022 (Department of Education, 2023). Access to subsidised care for Aboriginal and Torres Strait Islander Children has also recently been increased, through the provision of 36 hours of subsidy per fortnight regardless of their family's income or activity level.

An important question is how to ensure that increased public subsidies translate into more affordable and available childcare. A risk in a market-based childcare system, such as Australia, is that weak government control over the fees charged to parents results in higher subsidies translating into higher childcare prices. At the same time, market-based systems can prove more agile, with an ability to quickly expand supply to meet demand (OECD, 2020). For example, a rapid expansion of childcare in Korea was built largely on growth in private services (OECD, 2019a). To investigate the market dynamics in the sector, the Australian government has commissioned inquiries by the Australian Competition and Consumer Commission (ACCC) into childcare costs and the Productivity Commission into the childcare sector overall (reports are due in December 2023 and June 2024 respectively). If the ACCC inquiry concludes that prices for childcare have been increasing materially faster than provider costs, the government should consider enlisting the ACCC to actively monitor prices, costs and profits in the sector going forward.

One of the constraints to future childcare supply is retaining and growing the workforce. There has been high turnover, with a recent survey of educators finding that over one third did not intend to stay in the sector in the long-term (United Workers Union, 2021). The primary reasons for this were low pay, overwork and feeling undervalued. Job vacancy rates for early childhood teachers increased by 30% over the year to May 2023, with shortages most acute outside of major metropolitan areas (Department of Education, 2023). In collaboration with the childcare sector and other key stakeholders, Federal and State governments have published a ten-year strategy to ensure a sustainable, high-quality children's education and care workforce (Australian Children's Education and Care Quality Authority, 2021).

Improving pay and working conditions, including through providing better access to professional development and mentoring activities, will be key. Doing so would overwhelmingly benefit female workers, given they account for 97% of workers in the sector. At the same time, there is scope to streamline the application and approval process to attract overseas-trained childcare workers. At present, an application for a qualification levelling assessment needs to be made, from which point it takes several months before the applicant receives a response. There is also scope to attract more males to the occupation. While improving pay and conditions would be beneficial in this regard, there is also value in further working to break down gendered stereotypes relating to childcare work.

Faced with similar challenges around childcare resourcing, Germany has had the "More Men in Early Childhood Education and Care" programme since 2011. Initiatives include a series of programmes to promote childcare as a career option to school-age boys and the establishment of a coordination centre that provides a resource for men wanting a career change later in life (Hoenisch, 2016). Such career changes require further training, highlighting the need for established pathways into lifelong learning programmes for adults who want to move into the sector. The existing Recognition of Prior Learning programme in Australia is important in this regard. The programme recognises existing skills, knowledge and experience gained through working and prior learning, so that students looking to attain a vocational early childhood education and care qualification do not need to demonstrate the same competencies again during their course. Other OECD countries such as Denmark and Belgium have used marketing campaigns to foster the public image of male childcare workers (OECD, 2019b).

Flexible childcare offerings can also be important for allowing parents to integrate into the labour market. However, very few services currently offer childcare during non-standard hours: only 1.7% of services were offered after 6.30pm on weekdays and around 2% on weekends in 2022. In addition, services typically only offer session lengths of 10-12 hours (Department of Education, 2023) and parents are charged for the full session duration regardless of how many hours are attended. This has implications for parents wanting childcare on the fifth day of the week, given that the Child Care Subsidy generally subsidies costs for a maximum of 50 hours of weekly care.

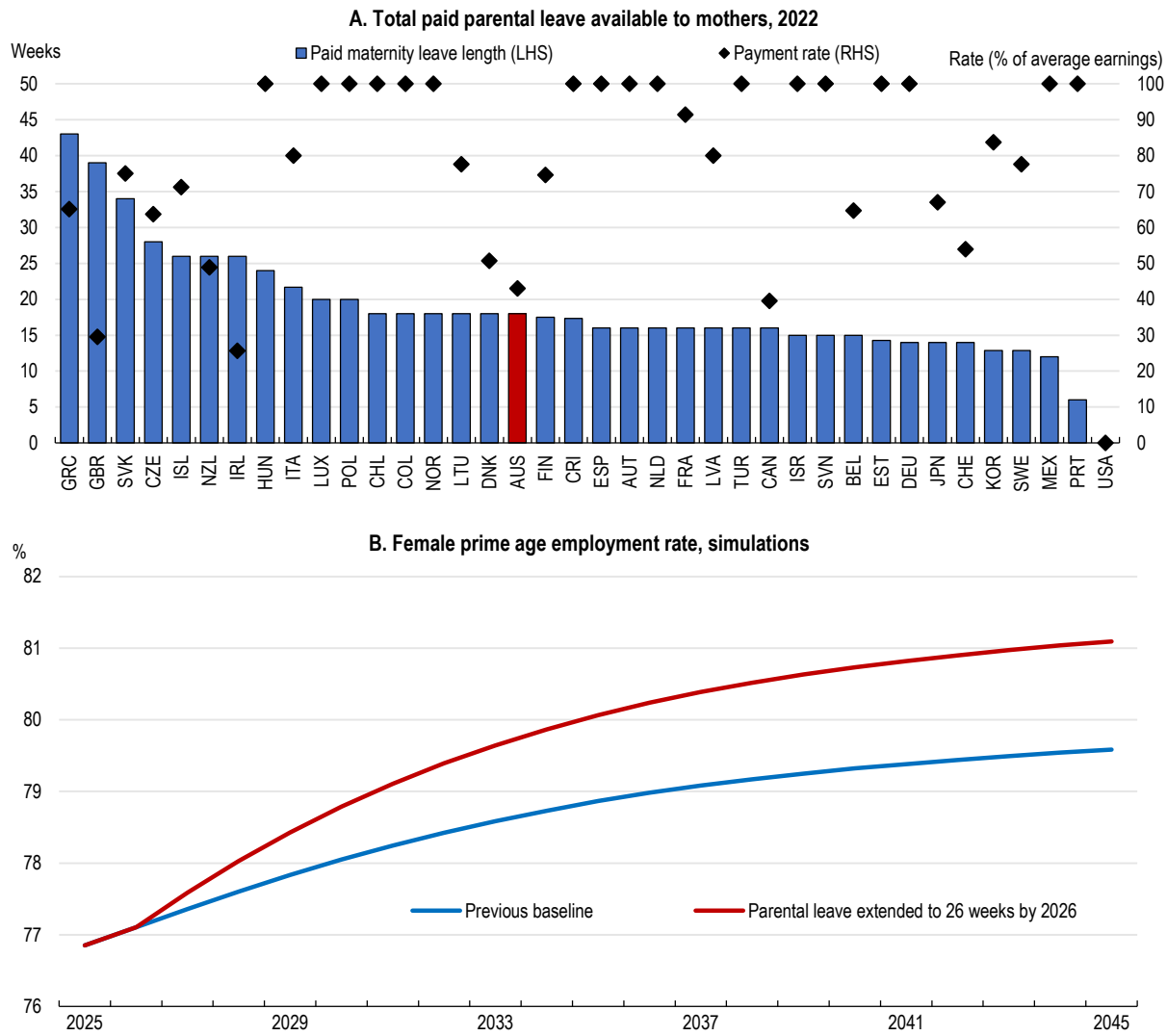
Improving the parental leave system

Parental leave systems support mothers staying in work and labour market re-entry after childbirth. Well-designed parental policies can also help shape gender norms around childcare and contribute to reducing stereotypes that contribute to gender segregation in occupations and industries. This is especially relevant in the Australian context given the sustained decline in the female employment rate after childbirth. Decisions around childcare are an inherently personal one for a family. However, government parental leave policies can be designed so that they do not create barriers to gender equality in caring responsibilities. Fathers taking a more equal share of unpaid work can reduce the labour market dislocation women may experience after childbirth. At the same time, there is a relationship between the participation of fathers in early year childcare and the cognitive, emotional and physical outcomes of their children. Fathers who engage more with their children also tend to report greater life satisfaction and better physical and mental health than those who care for and interact less with their children (OECD, 2016b).

The public parental leave system in Australia is relatively young compared to systems in most other OECD countries, having first been introduced in 2011. Until recently, the scheme consisted of two payments; Parental Leave Pay (up to 18 weeks) and Dad and Partner Pay (up to 2 weeks), both paid at the rate of the national minimum wage. In addition, some employers offer extra parental leave: data from the Workplace Gender Equality Agency suggest that 60% of large private companies (over 100 employees) offer some paid parental leave for primary carers on top of the government scheme. Compared to most other OECD countries, the duration of publicly provided leave and the rate at which it is paid is relatively low (Figure 2.24, Panel A). In July 2023, the two public payments were combined, meaning that partners can now claim up to 20 weeks paid parental leave between them. Single parents are eligible for the full 20 weeks. Increased flexibility is also being introduced, with parents able to receive Parental Leave Pay concurrently for up to 10 days and in blocks as small as one day at a time. The government plans to introduce further legislation to progressively increase the duration of the leave entitlement to 26 weeks in 2026. Simulations using the OECD Long-Term Model suggest that this would increase the female prime-age employment rate by 1¼ percentage points within 10 years (Figure 2.24, Panel B).

Providing parental leave specifically for fathers can help reduce the barriers to men undertaking a higher share of unpaid care work within the household. This ensures a father taking leave does not affect his partner's entitlement and can help legitimise the idea of fathers taking parental leave. In Iceland and Sweden, such a quota led to a doubling in the number of parental leave days taken by men. Some OECD countries offer "bonus periods", where a couple may qualify for some extra weeks of paid leave if the father uses a certain portion of sharable leave (OECD, 2023c). With recent changes, Australian fathers will be able to access government-funded Paid Parental Leave at the same time as that funded by employers. In 2021, less than 30% of new Australian fathers used publicly administered paternity leave, so further efforts are needed to promote take up. An ongoing barrier is that leave is paid at the minimum wage (Figure 2.25). This has also been a factor in low utilisation of parental leave by fathers in other OECD countries such as France, Japan and Korea, despite very generous entitlements in leave duration (OECD, 2016).

Figure 2.24. The duration and rate of leave for mothers is low



Source: OECD Family Database, OECD Long-Term Model.

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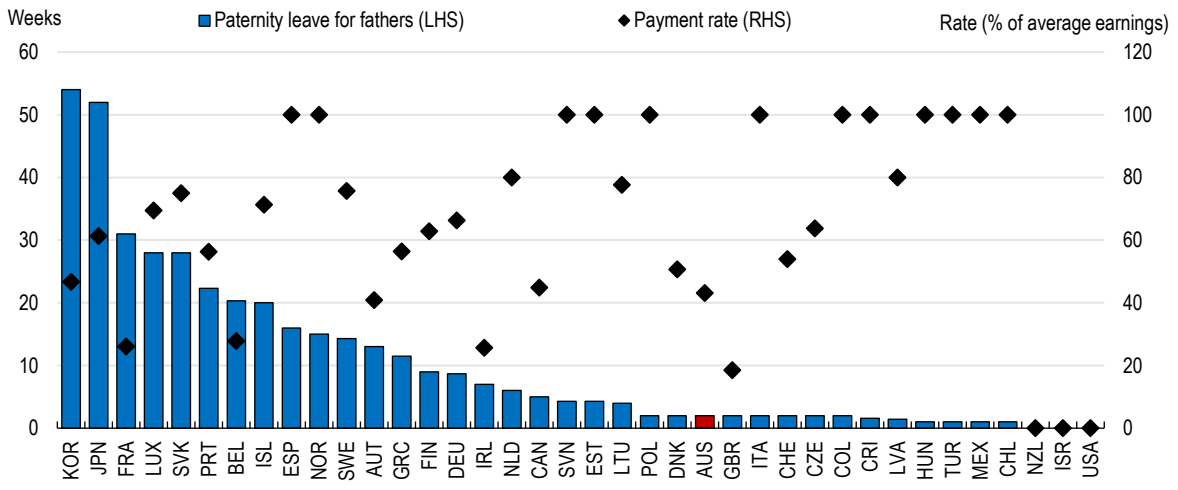
A balance is needed between the number of weeks of parental leave available and the rate at which it is paid. Past work suggests that the impact of maternity leave duration on female labour force participation tends to be positive but exhibits diminishing returns beyond a certain threshold (Thévenon and Solaz, 2012). Taking leave for longer than a year can impact adversely on future earnings prospects and make it more likely that people leave the labour force (OECD, 2016). Further investigation into the impacts of different designs of parental leave policy in the Australian context should help inform future policy changes. Further duration extensions of parental leave are likely needed in the Australian context, especially while challenges regarding affordable high-quality childcare persist. However, a focus also needs to be the rate at which public parental leave is paid and increasing the share of parental leave reserved specifically for fathers.

Figure 2.25. The duration and rate of father-specific parental leave is low

Paid paternity leave and paid father-specific parental and home care leave in weeks, 2022



Source: OECD Family Database.

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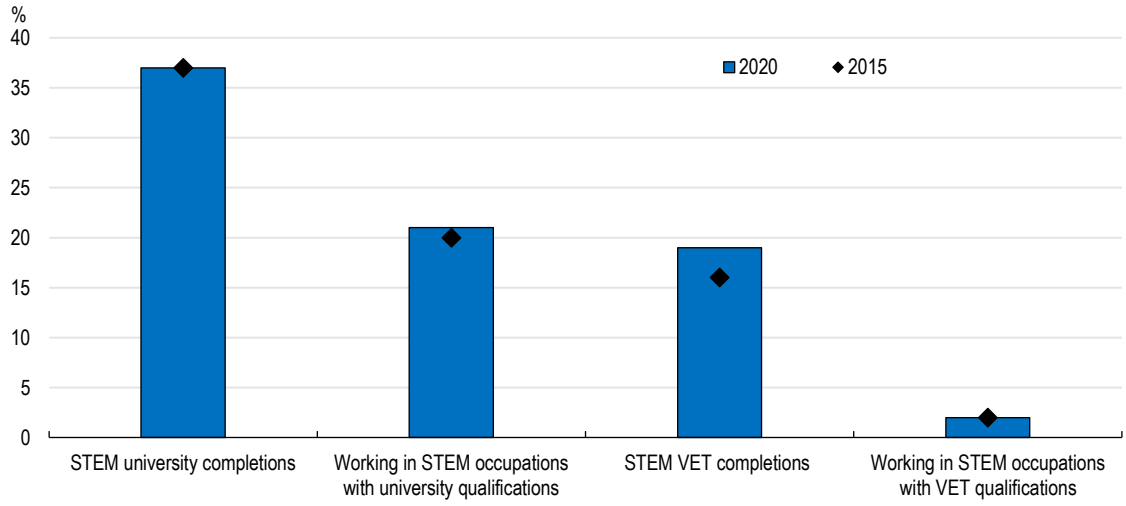
Australia is one of the few OECD countries where contributions to private pensions stop during periods of maternity or paternity leave. This exacerbates gender inequality in retirement earnings given that parental leave is disproportionately taken by women. Employers can make voluntary contributions to private pensions and there is also a tax incentive for making contributions to a non-working or low-earning spouse. In other OECD countries, there are a variety of approaches taken to continuing pension contributions during the period of parental leave. In most countries, employees and employers keep contributing at the same rate during such periods. However, there are differences in the earnings base used to calculate contributions, with some countries using past earnings and others, such as Estonia, making contributions based on the minimum wage (OECD, 2021d). One approach could be for some mandatory cost sharing arrangement between the government and employers to pay private pension contributions during parental leave.

Skills policies that improve gender equality

Women's position in the labour market is influenced by the skills they learn in the education system. A lack of women studying STEM (science, technology, engineering and mathematics) and ICT (information and communication technologies) is likely to contribute to the gender pay gap, given many associated jobs are comparatively well paid. The skills learnt in these programmes are especially important for workers to benefit amid the ongoing digital and green transformations (OECD, 2019c). Among high-performing students in mathematics or science in the OECD Programme for International Student Assessment, one in three boys in Australia expect to work as an engineer or science professional at the age of 30, while only one in five girls expect to do so (OECD, 2019c). This translates into patterns in higher education and work: women accounted for 37% of completions of STEM university courses and only 21% of university graduates working in STEM occupations in 2020, with the proportions even lower for women in vocational education and training (VET) courses (Figure 2.26). These proportions have changed little in recent years. Similarly, the share of women studying and working in ICT has remained very low: just 3% of female tertiary education graduates had a degree in ICT compared with 12% of male graduates in 2020.

Figure 2.26. Relatively few women are studying and working in STEM fields

Share of women studying and working in STEM fields



Source: Department of Education, Skills and Employment.

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Reducing the gender education gap in fields such as STEM and ICT requires society-wide changes, with parents, teachers and employers all becoming more aware of their own conscious or unconscious biases. Indeed, results from PISA highlight that parents are more likely to expect their sons rather than daughters to work in a STEM field (Schleicher, 2019). The fact that a significant proportion of female STEM graduates in Australia do not work in STEM occupations suggests government programmes that focus on promoting early work experience, apprenticeships and mentoring arrangements for women studying these disciplines need to be reviewed. Despite a variety of Federal Government programmes to encourage gender equality in STEM and ICT, some have noted the lack of a long-term strategy that is well-coordinated across the stages of education and employment and accompanied by a rigorous evaluation framework (CEDA, 2023). The government is currently undertaking a “Diversity in STEM” review that will make recommendations on how the government can support women, and other underrepresented groups, to participate in STEM education, careers and industries.

Adult education and training systems can also have an important impact on the employability and wages of women, especially in a context of rapidly changing skill needs. The OECD Survey of Adult Skills highlights that the gender gap in adult learning participation is modest in Australia, as in most other OECD countries. A focus on improving the engagement of women with low existing skill accumulation would seem beneficial given the low labour force participation rate and hours worked of this cohort. Nonetheless, low-qualified women tend to be less likely to participate in training than their male counterparts (OECD, 2023c). Family responsibilities and costs are identified as particular barriers. In response, policymakers should consider promoting short modular courses that provide learners with greater flexibility and have a strong emphasis on recognising prior learning. "Micro-credentials” are short courses that can be taken online and are recognised across training providers. These allow for individuals to tailor their learning programme and may also come with curriculums that are easier to adapt to the changing skill demands in the labour market.

The Federal Government is in the process of updating estimates of basic skills in Australian adults, with a view to providing new support measures. To alleviate barriers to female participation, consideration should be given to measures that reduce the impediments to an individual undertaking training. The government has already been active in introducing targeted apprenticeship support programmes for women seeking a career in trade occupations. As part of current negotiations on the National Skills Agreement with states and territories, women’s participation in skills acquisition and gender equality is one of the identified reform

areas. Across OECD countries, the cost and availability of childcare is often a key impediment. While child care subsidies are available in Australia to individuals undertaking study to improve work skills, the traditionally high cost of care discussed earlier is likely to be a constraint.

Labour market laws

Work conditions can also play an important role in encouraging female labour force participation and ongoing skill development. Private enterprise has a key role in creating a supportive environment, but public policies that create complementary institutional structures and laws are fundamental.

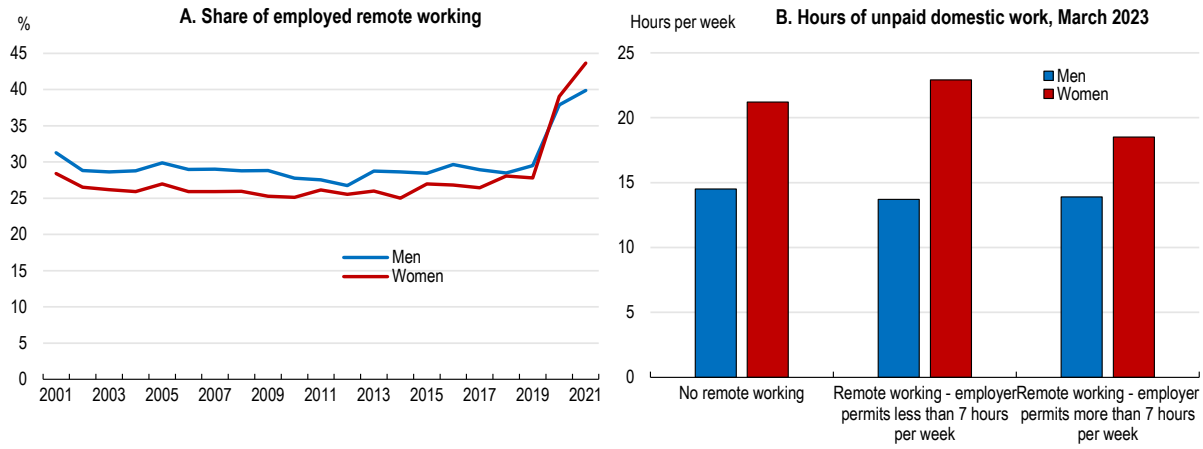
Promoting workplace flexibility

Measures that promote workplace flexibility for both men and women can be important for promoting better sharing of domestic tasks and breaking down occupational and gender segregation (Goldin and Katz 2011). However, this is only the case if flexibility is available to both genders and workers are not penalised for pursuing them. Recent changes to industrial relations laws have provided further clarity around the process for an employee requesting flexible work arrangements and for disputing the refusal of a request. Such measures should create opportunities for those who desire more work flexibility if well implemented.

The pandemic was the catalyst for an increase in flexible work arrangements. The share of Australian firms promoting flexible work rose from 15% to 68% between 2017 and 2021 (Duncan, et. al., 2022). The increase in remote working was more pronounced for females than for males in Australia (Figure 2.27, Panel A). This same pattern across genders was observed in the United States and European Union (Touzet, 2023). Recent surveys suggest women have a stronger preference for remote working, and often work in occupations that are more conducive to it, both in Australia (Lass et. al., 2023) and elsewhere (Touzet, 2023). As well as improving the gender balance in domestic duties, remote working may promote female employment, given lower commute times tend to have a larger positive impact on female labour force participation (Farré et. al. 2020).

The risk is that a bigger increase by women in the take up of more flexible working amplifies the existing inequalities in unpaid work, impairs women's career progression and compounds existing gender segregation in employment. Indeed, men whose employer permitted them to work from home in 2023 did not report any greater hours of unpaid domestic work per week than those who were not able to work remotely (Figure 2.27, Panel B). Some evidence suggests that a key to making more flexible work practices gender friendly is having other policies in place that breakdown prevailing gender norms. These include improved provision of childcare (Song and Gao, 2020) and more equal use of parental leave between mothers and fathers (Wanger and Zapf, 2021).

Figure 2.27. Remote working has increased more for women



Note: Panel B is based on employed respondents and unpaid domestic work includes grocery shopping, food preparation, laundry, grounds care and gardening, home and vehicle maintenance, caring for children, caring for an adult, paying bills.
Source: HILDA; Dahmann and Gupta (2023); OECD calculations.

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Improving pay transparency

Gender pay inequalities are being tackled in Australia through reforms that increase pay transparency. Such measures have been recently pursued in other OECD countries, with the intention of supporting underpaid female workers negotiate up their wage by raising awareness of pay differences within firms. This may be particularly important for higher educated women in Australia, given that it is in this group where gender pay gaps are most apparent. Studies of pay transparency reforms in the UK (Blundell, 2021), Canada (Baker, et. al., 2021) and Denmark (Bennedsen, et. al., 2020) suggest pay transparency measures contribute to shrinking gender pay gaps, though in several cases this has been through slower pay increases for men than faster pay increases for women. Some evaluations suggest more modest benefits when enforcement mechanisms or wage gap visibility are weaker (Böheim and Gust, 2020; Gulyas et. al., 2020). Given such regulations impose administrative costs on firms, the Australian authorities should closely monitor the impact of new pay transparency laws on improving gender equality and adjust the provisions accordingly.

In 2022, the Federal government prohibited pay secrecy clauses in employment contracts. Then, earlier this year, introduced new legislation that requires firms with more than 100 employees to publicly report on a range of areas including gender pay gaps, gender composition of the workforce and governing bodies, conditions and practices related to flexible working arrangements for employees (Commonwealth of Australia, 2023b).

There are other types of pay transparency measures used that could potentially contribute to narrowing gender pay gaps. For example, the European Commission directive on pay transparency laws gives workers in all companies (not just those above a headcount threshold) the right to request information disaggregated by gender about the average pay level of workers doing a similar job. The directive also places the burden of proof in discrimination cases on employers and strict sanctions including fines and back pay for workers who experienced discrimination. Further encouraging the use of clear job classification systems (standardise pay and make it transparent across men and women within specific job categories) in both the public and private sectors can improve transparency around what is required for a promotion, which can contribute to more objective recruitment and promotion rounds. This can reduce discrimination and contribute to more women receiving promotions to better-paid roles and responsibilities within firms. Such measures can be complemented by targets and quotas to help address gender gaps in

the short and medium term, but these are not a sustainable solution in themselves. The key to sustainable success is the development of a gender-balanced cohort of competent employees for promotions into senior positions within companies and across sectors.

Creating more women-friendly workplaces

Ensuring all workplaces are welcoming to females can encourage female participation, lower barriers to the efficient allocation of labour and reduce the gender segregation in occupation and industries. Policy measures that reduce workplace sexual harassment of women can help achieve these aims. A burgeoning international literature is highlighting the adverse economic impacts of sexual harassment. For example, Folke and Rickne (2022) use data from Sweden to show that women who reported harassment were 25% more likely to leave their job and tended to move to workplaces with a lower share of men and to earn less in their new post. Indeed, the survey results suggest that women are willing to give up 10% of their salaries to avoid harassment.

Reducing sexual harassment has recently been a priority for the Federal government. In November 2022, the government legislated the Anti-Discrimination and Human Rights Legislation (Respect at Work) Bill. This introduces a positive duty on employers to take steps to eliminate sexual harassment in the workplace, with the Australian Human Rights Commission enlisted to monitor and assess compliance. The Bill also allows the Australian Human Rights Commission to self-initiate an inquiry into unlawful discrimination and remove existing procedural barriers to a representative body (like a worker union) initiating a federal court action on behalf of the group. In addition, *The Fair Work Act* (which defines workplace rights) was amended in March 2023 to prohibit sexual harassment in connection with work, so that a person who experiences sexual harassment will be able to seek compensation and penalties through the Fair Work Commission.

A barrier to women pursuing sexual harassment claims is the cost risk associated with litigation. Since 2001, applicants have been ordered to pay the respondent's costs in over half of cases where the applicant was unsuccessful and sometimes (around 10% of cases) even when the applicant was successful (Thornton, et. al. 2022). The government planned to introduce new arrangements whereby parties bear their own costs with the court retaining discretion to award costs. However, some advocates for sexual harassment claimants favour an "equal access" asymmetrical costs model. Such an approach would protect a complainant from an adverse costs order, unless they have acted vexatiously or unreasonably, but enable them to recover costs should they succeed. Under this approach, a respondent would not be able to recover their legal fees even if successful, which may impact legal practitioners' ability to offer services on a conditional cost basis as it means that respondents would need to be certain they could cover their own costs (Commonwealth of Australia, 2023d). The government is currently consulting on the best approach to adopt.

Recommendations for fully realising the economic potential of women in Australia

MAIN FINDINGS	RECOMMENDATIONS (Key recommendations in bold)
Ensuring the tax and transfer system promotes gender equality	
The design of the tax system narrows gender income inequalities and results in low participation tax rates. However, steep benefit tapers are a barrier to some women moving from part-time to full-time work.	**Introduce a more gradual tapering of benefits as household earnings rise, potentially funded through removing Family Tax Benefit Part B for couple families.**
An increasing share of "JobSeeker" unemployment benefit recipients are now women, but the replacement rates are low.	**Further increase the rate for JobSeeker benefits and consider further options to reduce disincentives for recipients to increase working hours**.
Tax expenditures, such as the capital gains tax discount and on superannuation contributions, disproportionately benefit men.	Provide legal underpinning for gender budgeting to strengthen gender impact assessment in the budget process. Undertake robust evaluation of the impact of existing policies that are aimed at improving gender equality.
Unpaid liabilities under the Child Support Scheme have been increasing, with most of those liabilities not subject to a payment plan.	Prioritise the timely and full payment of child support liabilities through the establishment of a government guarantee and by making the receipt of government payments such as social benefits conditional on the payment of child support.
Reducing childcare costs and improving the parental leave system	
Net childcare costs are high and create a significant barrier to employment for women. Higher childcare subsidies could translate to higher prices with constraints on the availability of childcare workers.	**Improve access and affordability of high-quality childcare by encouraging the development of the private childcare sector and improving provision for non-standard hours of care.** Undertake ongoing monitoring of prices, costs and profits in the childcare sector. Streamline the application and approval process to attract overseas-trained childcare workers.
The payment rate of parental leave is relatively low, with low take-up by fathers. The authorities are planning to expand parental leave duration to 26 weeks in 2026.	**Along with extending public parental leave duration, prioritise raising the rate at which it is paid and increasing the share of parental leave reserved specifically for fathers.** Introduce contributions to private pensions during periods of parental leave.
Improving gender equality in the labour market	
New legislation improves pay transparency, through prohibiting pay secrecy clauses in employment contracts and requiring large firms to publicly report gender indicators.	Closely monitor the impact of new pay transparency laws on reducing gender inequality and adjust the provisions accordingly.
Women are underrepresented in information technology (ICT) and science, technology, engineering and mathematics (STEM). Men are also underrepresented in caring roles, such as nursing, teaching and child care.	Implement effective programmes that focus on promoting early work experience, apprenticeships and mentoring arrangements for women studying STEM and ICT and men studying caring professions.

References

Australian Children's Education and Care Quality Authority (2021), *A ten-year strategy to ensure a sustainable, high-quality children's education and care workforce 2022-2031*, Education Services Australia.

Australian Competition and Consumer Commission (2023), *Childcare Inquiry*, Interim Report, June 2023.

Australian Human Rights Commission (2022), *Time For Respect: Fifth National Survey on Sexual Harassment in Australian Workplaces*, November 2022.

Bahar, E. et. al. (2023), "Children and the gender earnings gap: evidence for Australia", *Treasury Working Paper,* No. 2023-02.

Baker, M. et. al. (2021), "Pay transparency and the gender gap", NBER Working Paper, No. 25834.

Belkar, R. et. al. (2007), "Labour force participation and household debt", *Research Discussion Paper,* No. 2007-05.

Bennedsen, M (2020), "Do firms respond to gender pay gap transparency", *NBER Working Paper*, No. 25435.

Blundell, J. (2021), "Wage responses to gender pay gap reporting requirements", *Centre for Economic Performance*, No. 1750.

Borland, J. (2022), "The persistence of occupational segregation in Australia", *Labour market snapshot*, No. 94.

Burchell, et. al. (2014), "New method to understand occupational gender segregation in European labour markets", European Commission, Directorate-General for Justice.

Broadway, B. et. al. (2022), *From Partnered to Single: Financial Security Over a Lifetime, Breaking Down Barriers*, June 2022.

CEDA (2023), *Occupational Gender Segregation*, Committee for Economic Development of Australia.

Churchill, B. and L. Craig (2022), "Men's and women's changing attitudes towards fatherhood and working fathers in Australia", *Current Sociology*, Vol. 70, No. 6.

Ciminelli, G. et. al. (2021), "Sticky floors or glass ceilings? The role of human capital, working time flexibility and discrimination in the gender wage gap", *OECD Economics Department Working Papers*, No. 1668. OECD Publishing, Paris.

Clarke, E. et. al. (2023), "Does JobSeeker target those who need it", *e61 Research Note*, No. 7.

Commonwealth of Australia (2010), *Australia's Future Tax System*, Report to the Treasurer, December 2009.

Commonwealth of Australia (2020), *Retirement Income Review*, Final Report, July 2020.

Commonwealth of Australia (2023a), *Review of the Migration System*, Final Report, March 2023.

Commonwealth of Australia (2023b), *Tax Expenditures and Insights Statement*, February 2023.

Commonwealth of Australia (2023c), *Workplace Gender Equality Amendment (Closing the Gender Pay Gap) Bill 2023*, Explanatory Memorandum.

Commonwealth of Australia (2023d), Consultation paper: Review into an appropriate cost model for Commonwealth anti-discrimination laws, Attorney-General's Department, February 2023.

Criscuolo, C. et. al. (2021), "The human side of productivity: uncovering the role of skills and diversity for firm productivity", OECD Productivity Working Papers, No. 29.

Dahmann, S.C. and T. Gupta (2023), *Taking the Pulse of the Nation*, Melbourne Institute and Roy Morgan, April 2023.

Department of Education (2023), *Productivity Commission Inquiry into Early Childhood Education and Care*, Australian Government Department of Education Submission, May 2023.

Duncan, A. et. al. (2022), *Gender Equity Insights 2022: The State of Inequality in Australia*, BCEC/WGEA Gender Equity Series, Issue No. 7, October 2022.

European Commission (2022), "Commission welcomes the political agreement on new EU rules for pay transparency", Press Release, 15 December, Brussels.

Evers, M. et. al. (2008), "The wage elasticity of labour supply: a synthesis of empirical estimates", *De Economist*, No. 156.

Farré, L. et. al. (2020), "Commuting time and the gender gap in labor market participation", IZA Discussion Paper, No. 13213.

Folke, O. and J. Rickne (2022), *"Sexual harassment and gender inequality in the labor market"*, The Quarterly Journal of Economics, Vol. 137, No. 4.

Heath, A. (2018), "The evolving Australian labour market", Business Educators Australasia 2018 Biennial Conference, Speech, 5 October 2018.

Hurley, P. et. al. (2022), "Deserts and oases: how accessible is childcare?", *Mitchell Institute*, Victoria University.

Hsieh, C et al. (2019), "The allocation of talent and U.S. economic growth", *Econometrica*, Vol. 87, No. 5.

Immervoll, H. et. al. (2019), "Faces of joblessness in Australia: an anatomy of employment barriers using household data", OECD Social, Employment and Migration Working Papers, No. 226.

Interim Economic Inclusion Advisory Committee, *2023-24 Report to the Australian Government*, Commonwealth of Australia.

Kennedy, S. (2023), *Employment White Paper – incentives for secondary earners and income support recipients*, Address to the Policy Research Conference, April 2023.

KPMG, Diversity Council of Australia and Workplace Gender Equality Agency (2022), *She's Price(d)less: The economics of the gender pay gap*, KPMG Australia.

Lass, I. et. al. (2023), "Working from home, COVID-19 and job satisfaction", Working Paper, No. 04/23, Melbourne Institute.

Miho, A., and O. Thévenon, "Treating all children equally? Why policies should adapt to evolving family living arrangements", *OECD Social, Employment and Migration Working Papers*, No. 240, OECD Publishing, Paris.

National Skills Commission (2022), *Employment Outlook: industry and occupation trends over the five years to November 2026*, Australian Government.

OECD (2023a), *OECD Review of Gender Mainstreaming and Budgeting in Australia*, forthcoming, OECD Publishing, Paris.

OECD (2023b), *Income support for jobseekers: Trade-offs and current reforms*, OECD Publishing, Paris.

OECD (2023c), *Joining Forces for Gender Equality: What is Holding us Back?*, OECD Publishing, Paris.

OECD (2023d), "Regional productivity, local labour markets, and migration in Australia", OECD Regional Development Papers, No. 39, OECD Publishing, Paris.

OECD (2022), *The Contribution of Migration to Regional Development*, OECD Regional Development Studies, OECD Publishing, Paris.

OECD (2021a), "Caregiving in crisis: gender inequality in paid and unpaid work during COVID-19", OECD Policy Responses to Coronavirus, OECD Publishing.

OECD (2021b), *The Role of Firms in Wage Inequality: policy lessons from a large scale cross-country study*, OECD Publishing, Paris.

OECD (2021c), *OECD Economic Surveys: Australia 2021*, OECD Publishing, Paris.

OECD (2021d), *Towards Improvement Retirement Savings Outcomes for Women*, OECD Publishing, Paris.

OECD (2020), *Is Childcare Affordable?*, Policy Brief on Employment, Labour and Social Affairs, OECD Publishing, Paris.

OECD (2019a), *Rejuvenating Korea: Policies for a Changing Society*, OECD Publishing, Paris.

OECD (2019b), *Good Practice for Good Jobs in Early Childhood Education and Care*, OECD Publishing, Paris.

OECD (2019c), *Programme for International Student Assessment (PISA): Results from PISA 2018: Australia*, Country Note, OECD Publishing, Paris.

OECD (2018), *OECD Employment Outlook 2018*, OECD Publishing, Paris.

OECD (2017), *2013 OECD Recommendation of the Council on Gender Equality in Education, Employment and Entrepreneurship*, OECD Publishing, Paris.

OECD (2016a), *2015 OECD Recommendation of the Council on Gender Equality in Public Life*, OECD Publishing, Paris.

OECD (2016b), *Parental leave: where are the fathers?*, Policy Brief, OECD Publishing, Paris.

Schleicher, A. (2019), *PISA 2018: Insights and Interpretations*, OECD Publishing, Paris.

Sobeck, K. (2022), "Greedy jobs, labour market institutions, and the gender pay gap", Tax and Transfer Policy Institute, Australian National University.

Song, Y. and J. Gao (2020), "Does telework stress employees out? A study on working at home and subjective well-being for wage/salary workers", Journal of Happiness Studies, No. 21.

Thévenon, O., and A. Solaz (2012), "Labour market effects of parental leave policies in OECD countries", *OECD Social, Employment and Migration Working Papers*, No. 141.

Thornton, M. (2022), "Damages and costs in sexual harassment litigation", Conducted for the Respect@Work Secretariat, Australian National University.

Touzet, C. (2023), "Teleworking through the gender looking glass: facts and gaps", *OECD Social, Employment and Migration Working Papers*, No. 285.

United Nations Expert Group Meeting on Policy Responses to Low Fertility (2015), "Fertility in Australia has remained steady despite policy swings", Policy Brief No. 2, United Nations Department of Economic and Social Affairs.

United Workers Union (2021), *Exhausted, undervalued and leaving: the crisis in early education*, New South Wales.

Wanger, S. and I. Zapf (2022), "For better or worse: How more flexibility in working time arrangements and parental leave experiences affect fathers' working and childcare hours in Germany", *Journal of Family Research*, Vol. 34, No. 2.

Wiswall, M. and B. Zafar (2018), "Preference for the workplace, investment in human capital and gender", *The Quarterly Journal of Economics,* Vol. 133, No. 1.

Women's Economic Equality Taskforce (2023), *A 10-year plan to unleash the full capacity and contribution of women to the Australian economy,* Department of the Prime Minister and Cabinet.

Wood, D. et. al. (2020), *Cheaper Childcare: a practical plan to boost female workforce participation*, Grattan Institute, August 2020.

Wood, D. et. al. (2023), *Back in black? A menu of measures to repair the budget*, Grattan Institute. April 2023.

3 Achieving the transition to net zero in Australia

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Australia has committed to achieving net zero greenhouse gas emissions by 2050 and more recently outlined a more ambitious intermediate target for emission reductions by 2030. However, achieving these targets will be challenging given a historical reliance on coal generation and the presence of significant mining and agriculture sectors. It will require a rapid transformation of the electricity grid, significant emissions reductions in highly-polluting sectors such as industry and agriculture, and sufficient offsets generated by “negative emissions” technologies and practices to counterbalance any emissions that cannot be fully eliminated. At the same time, Australia is particularly vulnerable to the physical impacts of climate change, as the driest inhabited continent on the planet with the majority of the population living on the coasts. Further significant reforms are required to meet the emission reduction goals, support the reallocation of workers and adapt to climate change.

Introduction

Australia has committed to reduce net greenhouse gas (GHG) emissions to zero by 2050, with an intermediate target to reduce GHG emissions by 43% below 2005 levels by 2030. Achieving these targets will be challenging given a historical reliance on coal generation and the presence of significant mining and agriculture sectors. It will require a rapid transformation of the electricity sector, the reduction of GHG emissions across sectors in an efficient way, and sufficient offsets generated by "negative emissions" technologies and practices to counterbalance any emissions that cannot be fully eliminated. Achieving net zero emissions will entail deep structural changes and require the reallocation of economic activity and labour across sectors.

The green transition will provide benefits for Australia in addition to contributing to global efforts to reduce carbon emissions. Co-benefits include improved health and biodiversity. Australia is well-placed to become a major producer of renewable power given its large land mass, ocean access, some of the best wind and solar resources in the world (Wood and Dundas, 2020), and its abundance of minerals critical to the green transition, representing significant opportunities in terms of job creation and new trade activities.

As the driest inhabited continent on the planet and with the majority of the population living on the coasts, Australia is highly vulnerable to climate change and related extreme events, such as extreme heat, heavy rainfall, coastal inundation, fire weather and drought. Australia will have to prepare and adapt for further global warming, which is already "locked-in" (Zhou et al., 2021), regardless of future actions to reduce global emissions.

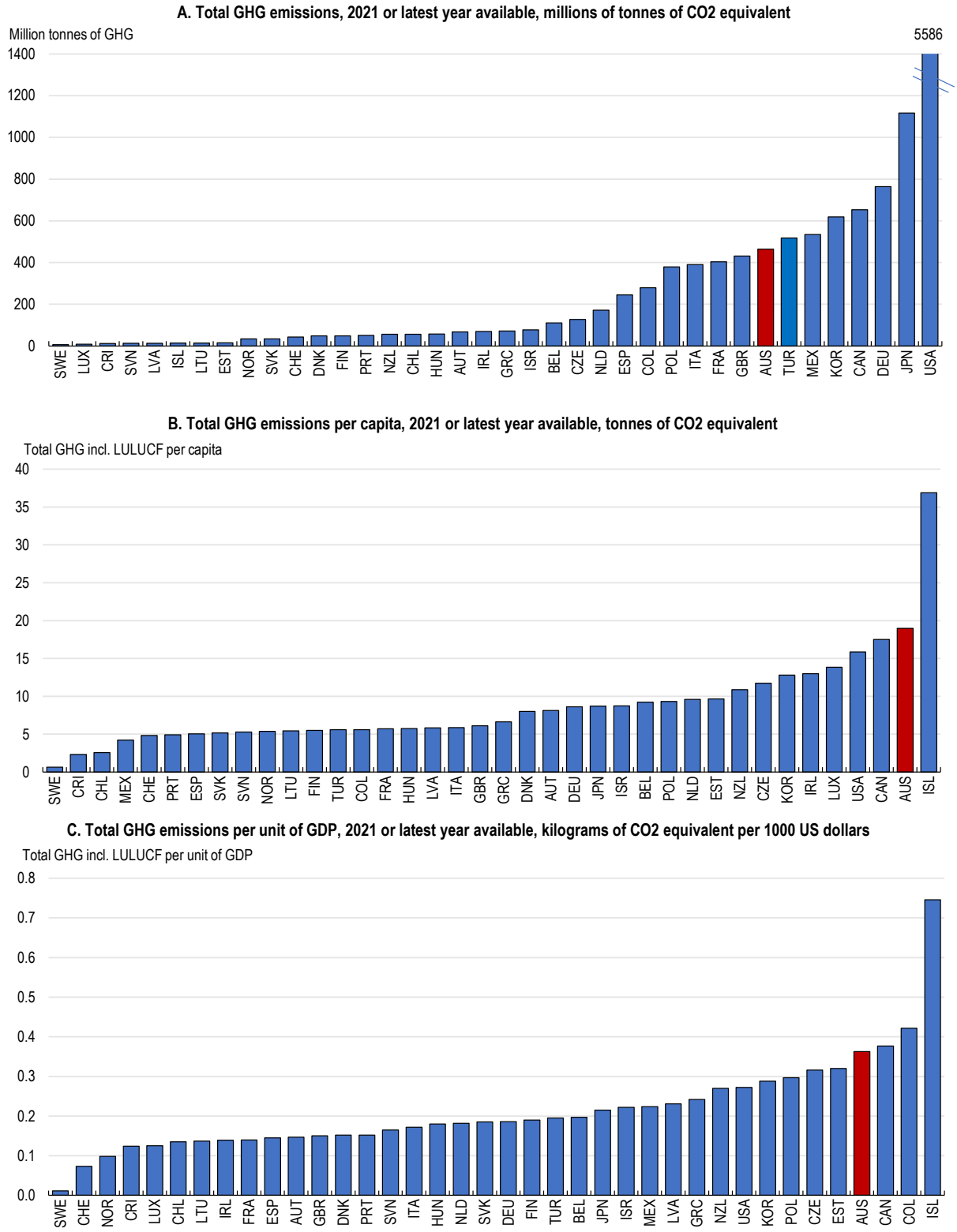
Net emissions have fallen over the past decade, but this has been in large part due to negative emissions from land use, land-use change and forestry (LULUCF), while total emissions excluding LULUCF only started falling in 2019. Achieving emissions targets will require significant further efforts. Under current policies, the electricity sector is the only sector where emissions are projected to fall significantly by 2030 from current levels, as renewable electricity replaces coal and gas-fired generation. Recent reforms have put Australia on the path to achieving its emissions reduction targets. As recommended in the previous Economic Survey, the Safeguard Mechanism, which regulates the emissions of Australia's largest emitters, has recently been reformed and is set to materially contribute to the decarbonisation of the economy. The government also announced a target to increase the share of low-carbon power generation by 2030, with 82% to come from renewable energy. These reforms have the potential to bring emissions reductions by 2030 close to the 43% reduction target (DCCEEW, 2022), but further policies may be needed to ensure that targets are met.

The current state of the transition to net zero emissions

Greenhouse gas emissions in Australia

Despite recent progress, Australia is currently among the highest emitters of greenhouse gases (GHG) in the OECD, due to a historical reliance on coal generation, its role as a major global supplier of energy commodities (including thermal and metallurgical coal), and the presence of significant industrial and agriculture sectors. In terms of total emissions, Australia ranks seventh in the OECD (Figure 3.1, Panel A). After accounting for its population, Australia ranks second in GHG emissions, with 19 tonnes of GHG emissions per capita in 2020 (Figure 3.1, Panel B). While Australia has made progress in decoupling emissions from economic activity, total GHG emissions per unit of GDP also remain well above the OECD average (Figure 3.1, Panel C).

Figure 3.1. Australia is among the highest emitters of greenhouse gases in the OECD



Note: Including land-use, land-use change and forestry (LULUCF).
Source: OECD Environment Statistics database.

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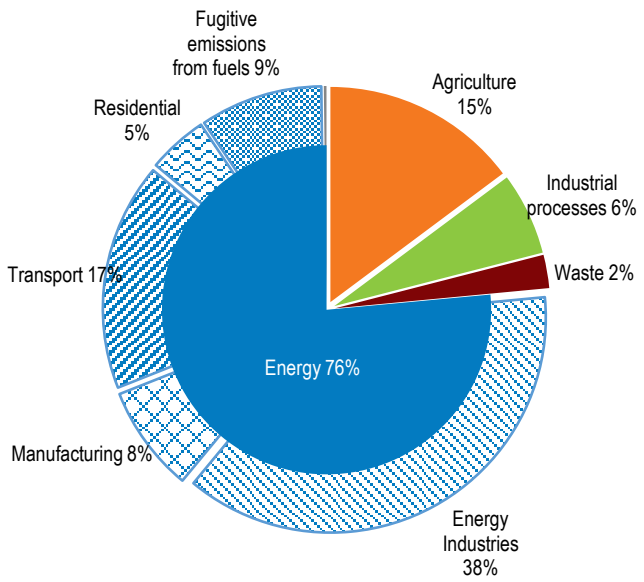
The energy sector is the main source of GHG emissions in Australia. In 2021, emissions from energy accounted for 76% of total emissions, followed by agriculture (15%), industrial processes (6%) and waste (2%) (Figure 3.2). Within the energy sector, electricity and heat generation account for the largest share of emissions (49%), followed by transport (22%), industry (22%) and buildings (6%). Emissions from electricity generation have fallen after a peak in 2016 as coal-based electricity generation has decreased (IEA 2023). Despite this decrease, almost half of GHG emissions from fuel combustion were due to coal in 2021 (45%), although this share has been decreasing since its peak in 2010 (IEA, 2023). GHG emissions from oil and gas, on the other hand, have been increasing, driven by rising energy consumption in the transport sector and the increasing role of gas in electricity generation.

Figure 3.2. Energy, transport and agriculture account for a large share of emissions

Share of emissions by sector, 2021 (%)



Source: OECD Environment Statistics.

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Australia's net GHG emissions have steadily declined since 2005, but the vast majority of Australia's decline in GHG emissions has been due to emission reductions in the land use sector as other emissions continued to rise. Between 2005 and 2020, annual emissions from land use, land use change and forestry declined by 123 million tonnes of CO_2 equivalent, and the sector has become a net sink since 2015. This reflected reductions in native forest harvesting and primary forest clearing, improved soil carbon management, the fostering of native vegetation growth and retention and improved fire management in Australia's Top End savannas.

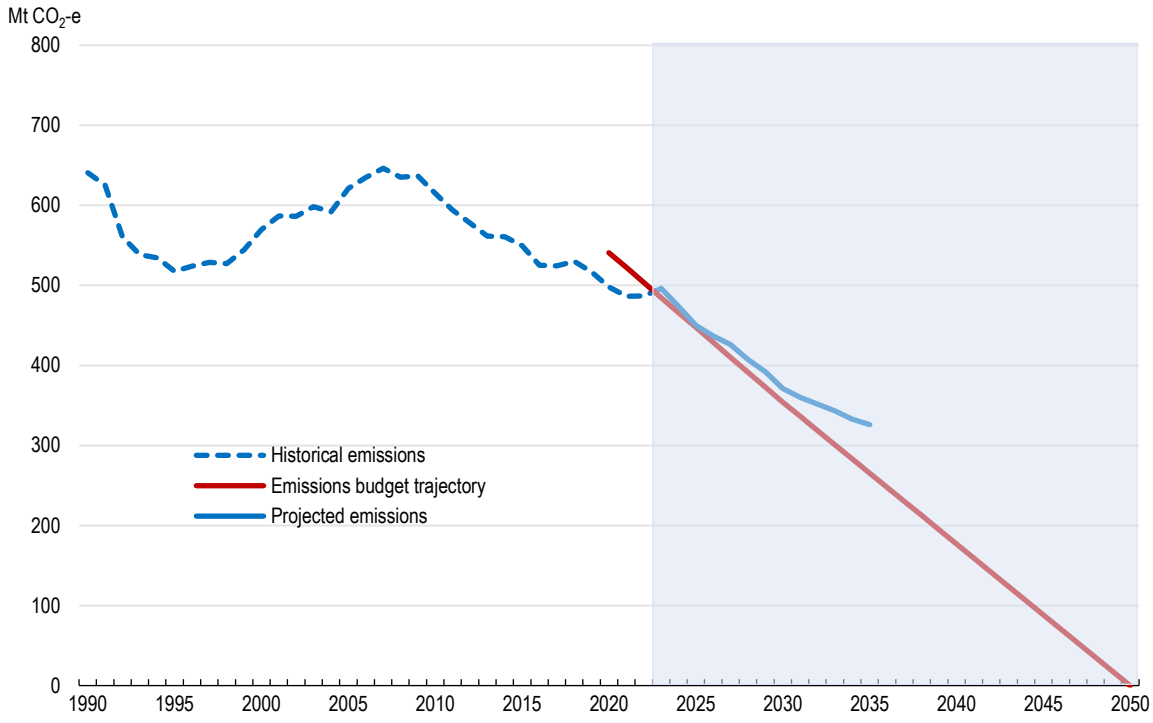
Declines in emissions from other sectors have been more limited. There have been increases in emissions from the transport sector and from fugitive emissions from fuels (largely deriving from the production of liquefied natural gas and coal for export) over the period. Emissions from agriculture declined by 13 million tonnes of CO_2 equivalent during the same period, mainly due to declining cattle stocks induced by extreme heat, while emissions from waste have declined by around 3 million tonnes.

To achieve the emissions targets, net emissions will have to decline at a quick pace over the next 20 years, and significant reductions will be required in all sectors. However, under current projections and policies, Australia is expected to fall short of its targets and therefore additional policy measures will be needed. Agriculture emissions are expected to rise as cattle stocks recover after their recent decline due to extreme

heat. Only emissions from electricity, industrial processes and waste are projected to significantly decline between 2020 and 2030 under current policies. Overall, the Department of Climate Change, Energy, the Environment and Water projects net GHG emissions to fall to 371 million tonnes of CO2-e by 2030 under current policies and assuming that the renewable electricity target of 82% by 2030 is met[1], falling short of the 2030 target to reduce emissions by 43% below 2005 levels by 2030, which would require emissions to fall to 354 million tonnes by 2030 (Figure 3.3).

Figure 3.3. Projected net emissions fall short of reduction targets

Historical and projected GHG emissions, Mt CO2-e



Note: including land-use, land-use change and forestry (LULUCF).
Source: DCCEEW (2022).

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Climate mitigation policies in Australia

Australia adopted the Climate Change Act in September 2022, which legislates a target of a 43% reduction in GHG emissions from 2005 levels by 2030, and net zero by 2050. These new targets are more ambitious than the previous emissions reduction target of 26%-28% between 2005 and 2030. The legislation also requires the Minister for Climate Change and Energy to prepare an Annual Climate Change Statement, informing the Parliament of progress on achieving emissions reductions, recent climate change policies, their effectiveness and their impacts, and the risks of climate change to Australia. These Statements must also take into account the advice of the Climate Change Authority, an independent body established in 2011 to provide expert advice to the government and conduct reviews and climate change research, which was given additional funding in the 2022-23 Budget. Finally, the Climate Change Act also provides for periodic reviews of the operation of the Act. The Department of Climate Change, Energy, the Environment

[1] This refers to the Department of Climate Change, Energy, the Environment and Water's "additional measures" scenario which takes into account the proposed reforms of the Safeguard Mechanism and a national renewable electricity target of 82% by 2030.

and Water (DCCEEW) was established in July 2022 to deliver the climate change and energy agenda and protect Australia's environment. This new department took over the energy functions from the Department of Industry, Science, and Resources.

Australia's climate mitigation policies are chiefly organised under the Powering Australia plan. The main components of this plan include: an 82% Renewable Electricity Target by 2030, the reform of the Safeguard Mechanism which regulates the emissions of the country's major industrial polluters (see Box 3.1 in the following section), the Powering the Regions Fund offering financial support for the decarbonisation in industry, the National Electric Vehicle Strategy aiming to encourage the uptake of Electric Vehicles (EVs), and the National Energy Performance Strategy, which focuses on increasing the energy efficiency and performance of the economy. The National Energy Transformation Partnership sets out how the government will collaborate with Australian jurisdictions, industry, communities, and unions.

The government announced in July 2023 that it will update Australia's Net Zero 2050 plan and underpin it with sectoral decarbonisation plans for the transport, agriculture and land, resources, industry, built environment and electricity and energy sectors. Such a long-term national strategy will provide greater certainty, with interim and sectoral emissions reduction targets, milestones and concrete actions. This will help Australians and Australian businesses make long-term decisions and could propel innovation in low carbon technologies and incentivise their adoption (Berestycki et al, 2022). Importantly, the updated Net Zero 2050 plan will also have to carefully consider the optimal sequencing of sectoral transition paths. For example, the decarbonisation and scaling up of the electricity network will need to be rapid enough to manage the pace of electrification of other sectors such as buildings and transportation, ensuring that network capacity and reliability are sufficient and that overall emissions fall in line with national targets.

Table 3.1. All states and territories have adopted climate targets

State or territory	Net zero commitments	Emissions reduction targets	Renewable energy targets
Australian Capital Territory	By 2045	50-60% by 2025 65-75% by 2030 90-95% by 2040 compared to 1990 levels	100% electricity since 2020 Transition away from gas by 2045
New South Wales	By 2050	50% by 2030 compared to 2005 levels	12 GW of renewable energy by 2030
Northern Territory	By 2050	No interim targets	50% by 2030 70% renewable electricity for Indigenous Essential Services communities by 2030
Queensland	By 2050	30% by 2030 compared to 2005 levels	50% by 2030 70% by 2032 80% by 2050
South Australia	By 2050	50% by 2030 compared to 2005 levels	100% by 2030 500% by 2050
Tasmania	By 2030	No interim targets	100% renewable electricity since 2020 150% by 2030 200% by 2040
Victoria	By 2045	28-33% by 2025 45-50% by 2030 75-80% by 2035 compared to 2005 levels	65% and 2.6 GW of storage planned by 2030 90% and 6.3 GW of storage planned by 2025
Western Australia	By 2050	80% emissions reduction target below 2020 levels for government operations No state-wide interim targets	State-owned coal-fired power stations, under Synergy, will be retired by 2030

Source: Department of Climate Change, Energy, the Environment and Water (2022).

Australian states and territories also set their own emissions reduction targets and policies. All states and territories currently have net zero commitments, ranging from 2030 in Tasmania to 2050 in New South Wales, the Northern Territory, Queensland, South Australia and Western Australia. All but the Northern Territory, Tasmania and Western Australia also have interim emissions reduction targets, and most states and territories have announced complementary renewable energy targets of differing ambitions (Table 3.1). In Tasmania, electricity generation is already 100% renewable and the state plans to further increase capacity in order to export electricity to the mainland. While state-level targets ultimately raise the level of ambition, the variety of emissions reduction targets and policies at the state and territory level implies different costs of emissions abatement. Strong coordination between the federal government and states and territories would help: the National Cabinet, established in response to the COVID-19 pandemic and composed of the prime minister and state and territory premiers and chief ministers, could be an appropriate setting for this coordination to occur.

Achieving Australia's emissions reduction targets

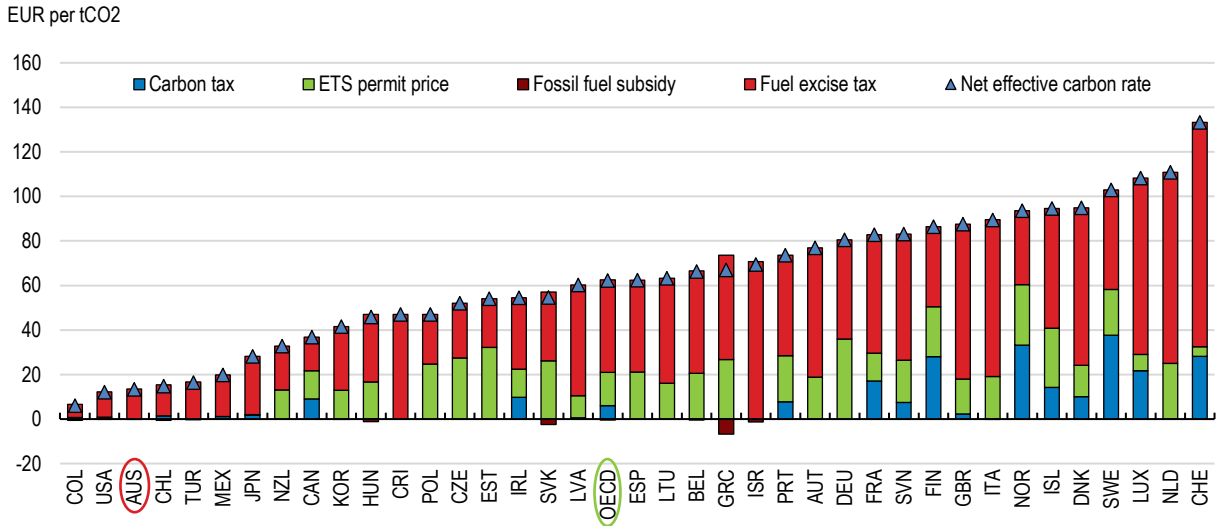
Meeting Australia's emissions reduction targets will be challenging, and additional measures are needed to achieve them according to the Department of Climate Change, Energy, the Environment and Water's current projections. A comprehensive policy mix will be required to achieve the transition in the most effective way, including emission pricing instruments, standards and regulations, and complementary policies to facilitate the reallocation of capital and labour towards low-carbon activities, to spur innovation and to offset any adverse distributional effects (D'Arcangelo et al., 2022). The current approach in Australia is based on limited carbon pricing, particularly through the taxation of fuels, and a comprehensive set of regulations, standards, and public investment tailored to specific sectors. One major tool to reduce emissions is the Safeguard Mechanism, which regulates the emissions of large emitters particularly in the industrial sector and which was recently reformed.

Cross-sectoral abatement policies

Carbon pricing can be an effective cross-sectoral measure to reduce GHG emissions by making low- or zero-carbon energy more competitive compared to high-carbon activities, incentivising shifts in production and consumption towards lower-carbon options, reducing demand for carbon-intensive fuels (D'Arcangelo et al., 2022; Arlinghaus, 2015; Martin et al., 2016), and mobilising private investment in low-emissions technologies (IMF/OECD, 2021). Effective carbon pricing can arise from fuel excise taxes, direct carbon taxes, or the use of tradeable carbon emission permits. Australia's carbon emissions were priced lower than in most other OECD countries in 2021, but similar to some other commodity exporters such as Chile, with the totality of carbon pricing arising from the fuel excise tax (Figure 3.4). The recent reforms of the Safeguard Mechanism, however, which introduce the possibility to generate tradeable carbon credits (see below and Box 3.2 for details), will effectively introduce further pricing of emissions in the covered sectors.

While economy-wide carbon prices can be a cost-effective tool to reduce emissions, effective decarbonisation strategies must balance cost-effectiveness with fairness and public acceptability. Carbon pricing has proven politically unpopular in Australia, although a cross-country OECD survey suggests that support for a carbon tax crucially depends on how revenues are used, with a majority of survey respondents (58-60%) supporting a carbon tax if revenue were used to subsidise low-carbon technology or to fund environmental infrastructure (Box 3.1). A carbon pricing mechanism was introduced in Australia in 2012, covering emissions from electricity generation, stationary energy, landfills, wastewater, industrial processes and fugitive emissions. Under the mechanism, liable entities were required to surrender one emissions unit for every tonne of carbon dioxide equivalent (CO_2-e) that they produced. The carbon pricing mechanism was repealed in 2014, and successive governments have ruled out further use of carbon pricing, opting for sectoral policies. In the absence of carbon pricing, sectoral policies should target the lowest-cost abatement opportunities in each sector to maximise their efficiency.

Figure 3.4. Carbon pricing has been limited in Australia



Note: Data are for 2021. Net effective average carbon rates are calculated as weighted average carbon prices across sectors net of fossil fuel support.
Source: OECD Net Effective Carbon Rates database.

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Box 3.1. Australian attitudes towards Climate Policies

The OECD led a survey in 2022 on the acceptability of climate policies, surveying over 40,000 respondents across twenty countries, including Australia. The survey sample includes 1,978 respondents from Australia and was designed to be nationally representative along the dimensions of gender, age, income, region, and area of residence (urban versus rural). Overall, the survey found that support for climate policies in the twenty covered countries is very dependent on their perceived distributional impacts and their perceived effectiveness. It also shows that information that specifically addresses these key concerns can substantially increase the support for climate policies in many countries.

In Australia, 77% of respondents agreed (somewhat to strongly) that “climate change is an important problem”, and 76% agreed that Australia “should take measures to fight climate change”. These proportions are only somewhat lower than in other high-income countries covered in the survey, where the average corresponding proportions were 84% and 81% respectively.

Survey results suggest that support for climate policies in Australia is generally lower than the average of high-income countries covered in the survey, and that support varies considerably depending on the climate policies considered. For example, Australians show relatively strong support for subsidies to low-carbon technologies (62% of respondents support it somewhat to strongly), mandatory and subsidised buildings insulation (70%), bans on polluting cars in city centres (53%), and green infrastructure programs (49%). On the other hand, they strongly oppose high taxes on cattle products (24% somewhat to strong support), taxing fossil fuels without revenue earmarking (36%), and a carbon tax with lump-sum cash transfers to all households (34%).

In Australia as in other countries in the survey, support for carbon taxes without revenue earmarking is low compared to other climate policies, but support rises depending on the proposed use of revenue. While only 29-34% of respondents support carbon taxes with revenue used to reduce corporate income taxes or provide equal cash transfers to all households, support for carbon taxes increases to 58-60% if revenue is

used to subsidise low-carbon technology or to fund environmental infrastructure. Majority support also exists in Australia for a carbon tax with revenues being recycled to low-income households or to lower personal income tax.

Figure 3.5. Support for different climate policies varies greatly

Share of respondents who support climate change policies (somewhat to strongly)

	High-income													Middle-income								
	Australia	Canada	Denmark	France	Germany	Italy	Japan	Poland	South Korea	Spain	United Kingdom	United States		Brazil	China	India	Indonesia	Mexico	South Africa	Turkey	Ukraine
Main Policies Studied																					
Green infrastructure program	57	49	56	53	57	42	78	48	58	68	71	54	50	78	77	82	80	80	84	73	76	69
Ban on combustion-engine cars	43	35	47	41	28	32	54	41	44	52	54	45	39	65	60	72	77	65	67	53	62	58
Carbon tax with cash transfers	37	34	41	30	29	28	47	35	36	53	44	34	33	59	47	80	71	67	55	52	55	39
Transportation Policies																					
Ban on polluting cars in city centers	60	53	60	66	57	50	76	64	61	52	64	65	49	71	65	73	74	85	72	66	60	67
Ban on combustion-engine vehicles w. alternatives available	48	38	47	42	42	41	58	51	48	58	57	52	44	68	60	78	77	72	66	62	64	63
Tax on flying (+20%)	45	35	44	60	46	53	41	47	44	42	44	46	33	52	39	61	64	68	51	43	45	36
Energy Policies																					
Subsidies to low-carbon technologies	67	62	65	67	56	64	79	69	75	71	73	65	57	73	77	75	68	79	66	75	75	68
Mandatory and subsidized insulation of buildings	66	70	64	70	64	60	73	59	72	72	71	70	53	75		80				73	75	75
Funding clean energy in low-income countries	54	49	50	53	48	48	76	53	55	57	65	51	50	73	63	71	75	81	74	76	66	78
Tax on fossil fuels ($45/tCO2)	36	36	40	43	31	31	38	35	27	42	39	38	34	48	35	58	64	58	41	38	52	28
Food Policies																					
Subsidies on organic and local vegetables	56	42	50	59	52	56	71	46	73	62	65	49	43	68	62	79		77	58	59	80	58
Ban of intensive cattle farming	42	32	41	31	55	49	64	17	44	44	43	50	36	39	38	50		45	46	28	32	25
Removal of subsidies for cattle farming	34	31	33	32	28	38	42	16	34	31	42	37	38	39	43	47		51	47	27	31	22
A high tax on cattle products, doubling beef prices	30	24	27	31	29	40	37	19	30	26	31	31	31	36	33	48		49	37	30	26	24
Support for Carbon Tax With:																					
Funding environmental infrastructures	63	60	48	60	65	60	76	56	68	78	69	63	56	75	78	76	71	81	73	79	73	69
Subsidies to low-carbon tech.	63	58	49	52	57	66	76	68	71	79	69	59	53	73	74	79	68	79	71	78	66	65
Reduction in personal income taxes	57	52	48	38	62	54	72	64	69	62	67	52	49	69	69	74	68	74	69	68	66	64
Cash transfers to the poorest households	53	51	48	41	55	47	68	54	50	59	63	57	46	73	67	82	69	86	66	65	82	62
Cash transfers to constrained households	50	50	42	36	55	47	62	47	39	62	61	52	44	64	59	69	63	74	59	60	65	61
Tax rebates for the most affected firms	48	41	41	38	52	34	66	49	61	59	55	41	43	62	59	72	65	68	54	63	55	56
Reduction in the public deficit	48	40	39	34	49	39	66	50	56	48	62	44	48	63	62	72	65	70	61	62	57	52
Equal cash transfers to all households	38	37	38	27	45	31	42	43	37	42	44	33	38	61	45	70	64	76	62	57	59	53
Reduction in corporate income taxes	37	29	32	24	37	25	55	38	48	48	50	26	29	58	54	67	60	67	61	50	60	42

Source: Dechezleprêtre, A. et al. (2022), "Fighting climate change: International attitudes toward climate policies", OECD Economics Department Working Papers, No. 1714, OECD Publishing, Paris, https://doi.org/10.1787/3406f29a-en.

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The main policy tool in Australia to reduce GHG emissions from large industrial facilities is the Safeguard Mechanism. The Mechanism sets limits (called baselines) on the emissions intensity of industrial facilities that emit more than 100,000 tonnes of CO_2-e per year, of which there are more than 200 and which are responsible for close to 28% of Australia's total emissions. In comparison, the European Union's Emissions Trading System covers facilities emitting more than 25,000 tonnes of CO_2-e per year. The Safeguard Mechanism covers facilities in the extractive industries sector, such as coal and iron ore mines, and in the industrial processes sector, including manufacturing and chemical plants. It also applies to the electricity sector, although a single baseline is set for the whole sector (as opposed to individual generators).

The Safeguard Mechanism was recently reformed to be more consistent with Australia's revised emission reduction targets (see Box 3.2 for details on this reform). This reform introduces a number of fundamental changes. First, it introduces below-baseline crediting, so that firms that do not use their full allowance earn a Safeguard Mechanism Credit that can be traded with other members of the scheme or used in later years to exceed baselines. This incentivises the reduction of emissions beyond site-specific baselines and helps to equalise marginal abatement costs with other producers. Second, the reform has reset the baselines, eliminating all the current headroom under them, which in many cases had been set well above facilities' emissions intensities. These baselines will now decline steadily each year. Finally, the reforms also

introduced special considerations for new facilities entering the Safeguard Mechanism, which will be treated at a higher standard than existing facilities, and for facilities that are both highly emissions-intensive and trade-exposed, which will be able to apply for slower baseline decline rates. These reforms are welcome and could deliver significant emissions reductions. DCCEEW projections estimate that they will deliver around 46 Mt CO_2-e in additional emissions reductions by 2030 compared to the baseline scenario.

Box 3.2. The 2023 reform of the Safeguard Mechanism

The Safeguard Mechanism is a set of regulations that apply to all industrial facilities in Australia that emit more than 100,000 tonnes of CO2-e per year. It sets individual limits, known as baselines, on the net emissions of the more than 200 industrial facilities that it covers, which together emit close to 28% of Australia's total GHG emissions. It covers a broad range of industrial sectors, including electricity generation, mining, oil and gas extraction, manufacturing, transport, and waste. The Safeguard Mechanism was legislated in 2014 and has been in place since 2016. It was recently reformed following a period of consultation, culminating in the passage of *The Safeguard Mechanism (Crediting) Amendment Bill 2023* in March 2023. The reforms became effective in July 2023.

How the Safeguard Mechanism works

The Safeguard Mechanism limits industrial emissions by establishing emissions baselines (or ceilings) for every individual facility it covers. Baselines are set in terms of facilities' emissions intensities (emissions per unit of output), therefore on any given year the effective ceiling on an individual facility's absolute emissions is calculated as the emissions intensity baseline (or ceiling) multiplied by the facility's output. This means that covered facilities can raise their emissions by producing a larger volume, as long as the emissions intensity of the product is below the baseline.

Facilities that exceed their baselines must purchase and surrender domestic carbon offsets – Australian Carbon Credit Units (ACCUs) generated by Australia's carbon crediting scheme (ACCU Scheme)– for the exceeding amount.

To date, baselines set by the Clean Energy Regulator have generally been set higher than facilities' emissions and have therefore had little effect on emissions.

The electricity sector is treated differently than other sectors covered by the Safeguard Mechanism. Because electricity production is centrally coordinated, the Safeguard Mechanism applies a common baseline for the whole electricity sector.

The reformed Safeguard Mechanism

The *Safeguard Mechanism (Crediting) Amendment Bill 2023* enacted a number of reforms to the Safeguard Mechanism, which have been in place since 1 July 2023. These reforms were made with the objective of requiring the large industrial facilities covered under the Safeguard Mechanism to deliver a proportional share of Australia's new emissions reduction targets.

New baselines

The reform of the Safeguard Mechanism retains the current framework of emissions intensity baselines for each covered facility, as opposed to absolute emissions baselines.

Baselines for existing facilities will initially be set using site-specific emissions intensity values, which will eliminate the current headroom in the system. The emissions intensity values used to calculate site-specific baselines will then gradually transition towards industry average emissions intensity values by 2030. This is meant to incentivise production to occur in facilities with below-average emissions intensity.

Baselines will decline at a rate of 4.9% each year to 2030. A reserve has also been built into baseline decline rate calculations to ensure the 2030 target is met. The reserve accounts for any higher-than-expected production growth at new and existing facilities and any higher-than-expected use of the trade exposed baseline adjustments.

Post-2030 decline rates would be set in predictable five-year blocks, after updates to Australia's Nationally Determined Contribution (NDC) under the Paris Agreement. Periodic baseline setting would involve consultation and take advice from the CCA and the latest Annual Climate Change Statements to Parliament.

Safeguard Mechanism Credits (SMCs)

The reform introduces Safeguard Mechanism Credits (SMCs), which facilities will automatically generate when their emissions are below their baseline. These new credits can be held, sold, or used to offset above-baseline emissions under the Safeguard Mechanism. They come in addition to the already-existing Australian Carbon Credit Units generated by the ACCU Scheme which remain eligible under the Safeguard Mechanism

If a facility uses ACCUs equal to more than 30% of its baseline, it must submit a statement to the Clean Energy Regulator setting out why onsite abatement hasn't been undertaken.

Facilities will also be able to bank and borrow SMCs until 2030 in order to provide flexibility on the speed of abatement.

Treatment of new facilities

The baselines for new industrial facilities will be set at international best practice levels and will decline at the same rate as existing facilities. This is meant to take into account that new facilities will have access to the latest technologies and can achieve higher levels of emissions performance than existing facilities using legacy technologies.

Treatment of emissions-intensive, trade-exposed (EITE) facilities

Facilities that are both highly emissions-intensive and trade-exposed will be eligible to access the AUD 1.9 billion Powering the Regions Fund (PRF). Within the PRF, the Government will support trade-exposed Safeguard facilities to invest in low emissions technology through the AUD 600 million Safeguard Transformation Stream, and will also support industries providing critical inputs to clean energy industries (including steel, cement, lime, aluminium and alumina) through the AUD 400 million Critical Inputs Fund.

Trade-exposed facilities facing an especially elevated risk of carbon leakage will be able to apply for a slower baseline decline rate.

Review in 2026-2027

The policy settings of the Safeguard Mechanism will be reviewed in 2026-27. The review will consider a number of issues including the setting of baselines and their decline rates, the suitability of the differential treatment of emissions-intensive, trade-exposed activities, and the suitability of the various flexibility mechanisms in the system. The CCA will be required to advise the Government on the impact of the reforms on abatement and whether additional changes are required.

Source: Department of Climate Change, Energy, the Environment and Water.

While these reforms go in the right direction, further reforms to the Safeguard Mechanism may be needed to achieve emission reduction targets. First, the 2023 reform maintained baselines in terms of emissions intensity as opposed to total emissions. This means that covered facilities can raise their total emissions if they produce a larger volume, as long as the emissions intensity of the product is below the baseline.

Industrial emissions are therefore not guaranteed to fall in line with national emissions reduction targets, which are set in terms of the absolute quantity of emissions, although regular reviews might lead to a tightening of the baselines if required. Second, baselines set in terms of emissions intensity combined with below-baseline crediting could also provide incentives for facilities with below-baselines emissions intensity to increase their production to generate Safeguard Mechanism Credits, which could eventually lead to an over-supply of these Credits.

The *Safeguard Mechanism (Crediting) Amendment Bill* 2023 provides for another review of the functioning of the Mechanism in 2026-27. This would be an appropriate time to further assess the impact of recent reforms. In particular, if industrial emissions do not fall in line with emissions reduction targets and Australia's commitments under the Paris Agreement, baselines under the Safeguard Mechanism should be switched to baselines defined in terms of absolute emissions (as opposed to emissions intensity), which combined with below-baseline crediting, would bring the Safeguard Mechanism closer to a cap-and-trade system and be better aligned to policy objectives set in terms of the overall level of emissions. This review could also consider whether to set a floor on the price of ACCUs and Safeguard Mechanism Credits, as in the United Kingdom, which could reinforce incentives and increase certainty, and whether to broaden the coverage of the Safeguard Mechanism to other sectors. It will also be important to assess whether the baseline decline rates are appropriate, and whether the special treatment of emissions-intensive, trade-exposed activities and new facilities should not be tightened. It is important to ensure that the Safeguard Mechanism requirements are properly enforced and that penalties for exceeding baselines provide a sufficient deterrent.

Given that industrial facilities under the Safeguard Mechanism can meet their baselines by using carbon offsets (Box 3.2), it is imperative to ensure their credibility, integrity and additionality. In addition to Safeguard Mechanism Credits generated by industrial facilities that overachieve their Safeguard Mechanism emissions baselines, projects in other sectors that generate abatement with methodologies recognised by Australia's Clean Energy Regulator can earn Australian Carbon Credit Units (ACCUs). ACCU prices have increased somewhat since the Safeguard Mechanism was reformed, and traded at around AUD 32 in August 2023, roughly in line with carbon credit prices in California but around a third of the price of European Union Carbon Permits. There has been criticism of the ACCU generation process as regards to the effectiveness and additionality (that is, whether projects result in carbon abatement that is unlikely to occur in the ordinary course of events) of the abatement projects it credits (Australian National University, 2022; Macintosh, 2022). A recent independent Review of Australian Carbon Credit Units highlighted these issues and produced a list of 16 recommendations to improve the integrity of the scheme, which the government has supported in principle. These include recommendations to improve transparency and remove restrictions on data sharing, and to improve the process of defining new methods that would be eligible for carbon credits. While the recent reform of the Safeguard Mechanism included 3 amendments to the ACCU scheme, the government should proceed with the full implementation of the recommendations in the Review of ACCUs. This should strengthen confidence in the transparency and integrity of ACCUs. In the latest Federal Budget, the government provided AUD 18.1 million over two years to implement priority reforms to the ACCU, including the establishment of the Carbon Abatement Integrity Committee to ensure the integrity of methods covered by the system.

The rest of this section covers policies to reduce emissions in Australia's main polluting sectors: electricity generation, extractive industries, industrial processes, transport, agriculture and buildings. In the case of the extractive industries and industrial processes sectors, the Safeguard Mechanism already discussed in this section is the main policy tool to reduce emissions from large facilities, but further policies will be needed to achieve emissions reductions in smaller facilities not covered by the mechanism.

Electricity generation

Australia's energy sector is at the heart of the transition to net zero. Energy production is responsible for the majority of Australia's GHG emissions, and the power sector will be key to reduce emissions in other sectors such as transport and industry through electrification. Achieving the transition to net zero will require increasing total electricity generation capacity to satisfy increased demand from the electrification of certain sectors, large investments in transmission infrastructure, and a quick transition towards a majority of renewable electricity generation. The scale and urgency of these transformations will require careful planning and coordination across policymakers and levels of government, strong policies in the energy sector and large investments in electricity generation capacity and transmission to manage higher electricity use and more variable output from renewables. The abundance of sun, wind and land means Australia can generate large volumes of renewable electricity. The abundance of critical minerals also provides an opportunity for Australia to play a key role in supply chains for net zero technologies like batteries.

Table 3.2. Australia's state and territory renewable energy targets and policies up to 2030

State	% of demand	Renewable energy target	Policy measure(s)
New South Wales		24 600 GWh by 2030	Net Zero Plan Stage 1: 2020-2030 Electricity Infrastructure Roadmap
Queensland (large-scale)	18% of electricity generated by renewables	70% of renewables by 2032 and 80% by 2035 (announced in September 2022)	Climate Action Plan 2020-2030 Plans to convert coal-fired power plants to renewable hubs by 2035 under a AUD 62 billion clean energy plan, including through reverse auctions.
Victoria	26% of electricity generated by renewables	25% by 2020, 40% by 2025 (committed in 2017) 50% by 2030 (committed in 2019) 65% by 2030, 95% by 2035 (announced in 2022)	Climate Change Strategy Reverse auction to fund renewable energy generation projects (>900 MW in total) and successful bidders enter into contracts for the difference.
South Australia	Demand covered 100% by renewables on 180 days in 2021	100% net renewables by 2030 500% by 2050 (become exporter	Climate Change Action Plan 2021-2025 No market mechanism. Government funding for renewables and storage
Northern Territory		50% by 2030 announced in 2017	Climate Change Response: Towards 2050 In January 2019, the Northern Territory Government entered into power purchase agreements to buy electricity from two new solar farms.
Australian Capital Territory	Achieved 100% renewables in 2020	100% by 2020 (committed in 2016)	Climate Change Strategy 2019-2025 Reverse auction to fund renewable energy generation projects (650 MW in total) and successful bidders enter into contracts for the difference.
Tasmania	Achieved 100% renewables in 2020	15 750 GWh by 2030, 21 000 GWh by 2040 =200% announced in 2020	Climate Change Action Plan 2017-2021 No market mechanism. A range of complementary measures, including government investment in existing hydropower assets.
Western Australia		None (80% of emissions reductions by 2030, coal retirements by 2030, AUD 3.8 billion investment plan in renewable power)	Climate Change Policy

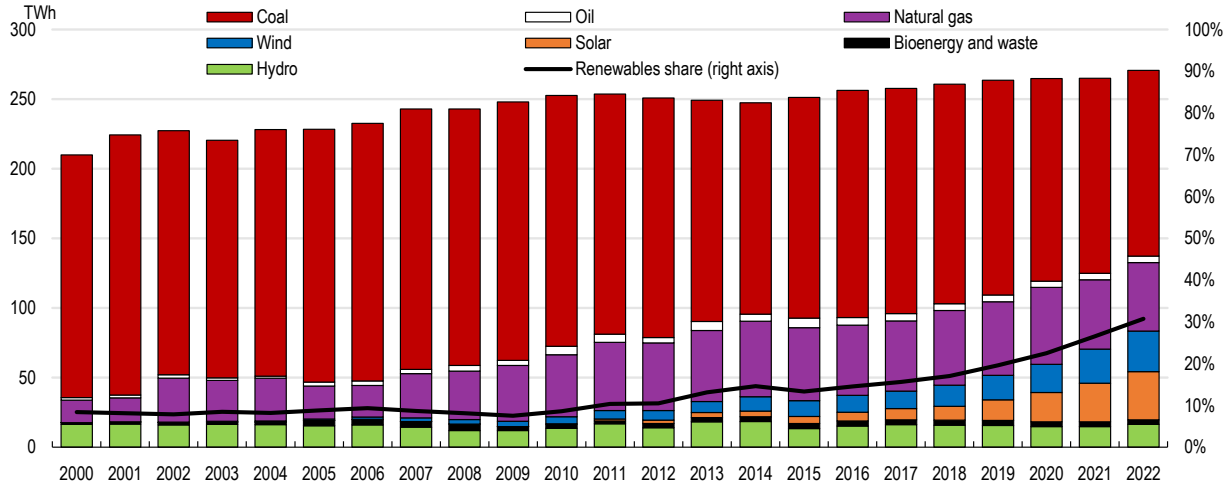
Note: GWH = gigawatt hour; MW = megawatt.
Source: CCA, (2020) IEA updates.

The Australian government has announced a target of 82% renewable electricity generation by 2030. In addition, state and territory renewable energy targets and related policy measures including reverse auctions, feed-in premiums and power purchase agreements have been upgraded in recent years and have been an important driver of increased renewable generation (see Table 3.2). In August 2022, federal, state and territory energy ministers established a National Energy Transformation Partnership (NETP) to coordinate action and identify priorities for the transformation of the Australian energy sector. A first action of the NETP will be to introduce an emissions reduction objective into the national energy objectives, which will serve as a basis for further policies and regulations by Australia's three energy market bodies – the Australian Energy Market Commission (AEMC), the Australian Energy Market Operator (AEMO) and the Australian Energy Regulator (AER). The NETP also aims to help speed up the deployment of transmission lines by identifying critical transmission projects to speed up their delivery and ensure community consultation.

Renewable electricity generation has greatly increased in recent years, quadrupling between 2000 and 2021 (albeit from low levels), mainly driven by strong increases in solar and wind electricity generation, which in 2022 accounted for 12.8% and 10.7% of total electricity generation respectively (Figure 3.6; IEA, 2023). One in three households in Australia have rooftop solar photovoltaic installations, the highest share in the world, and these households can receive feed-in tariffs for any unused electricity sent back to the grid. Nevertheless, the share of all renewables in total electricity generation remains below the OECD average, at 30.8%. Achieving the national target of 82% renewable electricity generation by 2030 and managing the fluctuations in renewable generation will require further reforms in the National Energy Market, one of the largest interconnected electricity markets in the world which connects the six eastern and southern states and territories and delivers around 80% of all electricity consumption in Australia. Given that states have constitutional power with regard to the electricity generation mix, strong cooperation and coordination of federal, state and territory policies will be essential. State-based investment schemes and incentives programmes should be carefully coordinated, informed by a national plan providing greater clarity on the timing of capacity additions and the retirement of coal generation.

Figure 3.6. The share of renewable electricity generation has risen but more progress is needed

Electricity generation in Australia by source, TWh



Note: data for 2022 are provisional.
Source: IEA World Energy Statistics.

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Despite its potential, offshore wind electricity generation remains a nascent industry in Australia, with costs remaining high (IEA, 2023). Both Victoria and South Australia are currently promoting offshore wind areas, and Victoria has set offshore wind capacity targets (2 GW by 2032, 4 GW by 2035 and 9 GW by 2040).

The government has put in place a number of policies to fast-track the development of the offshore wind industry including the Offshore Electricity Infrastructure Act 2021, which provides the legal framework to enable the construction, installation, commissioning, operation, maintenance and decommissioning of offshore electricity infrastructure, and the Offshore Electricity Infrastructure Regulations 2022. The experience of countries that have achieved significant offshore wind capacity, such as Denmark, where 18% of electricity demand is met by offshore wind generation, suggest that careful spatial planning, including of grid connections, and a streamlined licensing system are important for the development of the offshore wind industry (Box 3.3).

Box 3.3. The development of offshore wind capacity in Denmark

The world's first offshore wind farm was commissioned in Denmark in 1991, but it took three decades of sustained support to get to the point where it met 18% of Danish electricity demand in 2019. Policy measures have been central in increasing deployment and bringing down costs.

- Sustained support for wind research, development and deployment, with significant subsidies in the late 1970s and 1980s and increasing funding throughout the 2000s, peaking at DKK 618 million in 2013.
- Quantitative targets for wind energy in energy plans for 2000, 2005 and 2020, all exceeded.
- A spatial planning committee for offshore wind was established in 1995 to ensure coordinated development. Grid connection for large offshore wind farms is planned, procured, operated and paid for by the transmission system operator and can contribute to the broader network and interconnection.
- The Danish Energy Agency is the single body responsible for issuing all required licenses. The average consent processing time of 16 months is considerably shorter than in the Netherlands, Spain or Germany.
- Feed-in tariffs determined by competitive tender, which peaked at DKK 1.05/kWh for the Anholt wind farm in 2013, falling to DKK 0.372/kWh for the Kriegers Flak project scheduled to be operational in 2021.
- Development sites for government-run tenders are de-risked: prior to tender there is a fully approved Environmental Impact Assessment of the offshore area and possible grid solutions.

Source: OECD (2021c).

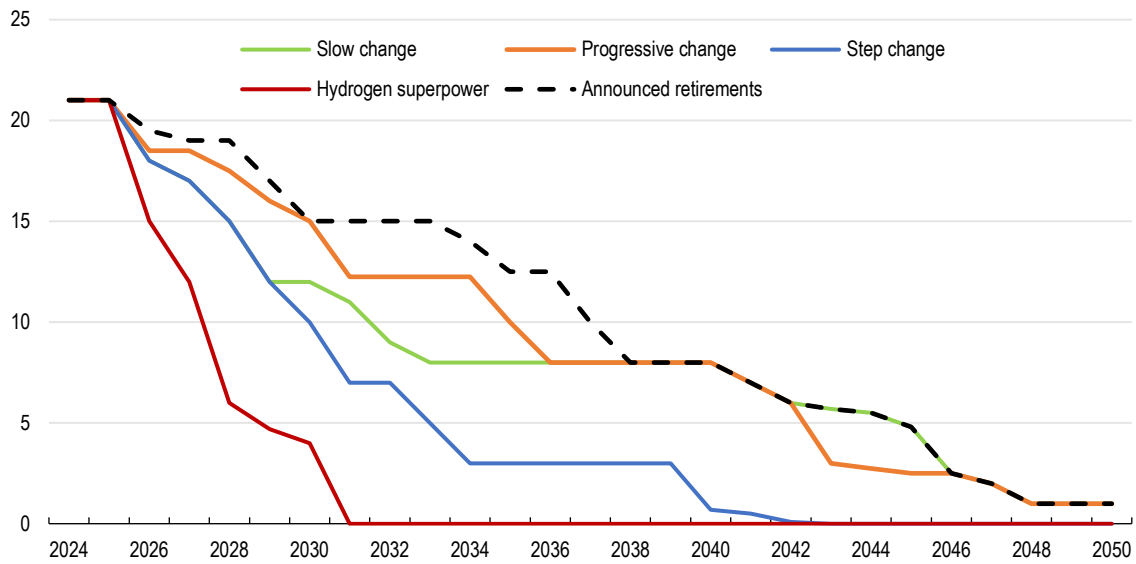
Australian authorities have in recent years enacted a series of reforms to support electricity security and the integration of rising shares of variable renewables into the electricity system (IEA, 2023). These include the introduction of an integrated system plan with renewable energy zones and transmission priority projects, adjustments to short-term trading, the introduction of the five-minute settlement (which allows for changes to metering, settlement and bidding processes), and a formal demand response at the wholesale level. The deployment of batteries has also reinforced the stability of the National Energy Market, and additional 1 700 MW of battery capacity is committed to enter the NEM by 2025. Pumped hydro storage is also expected to play an important role, and the Snowy Hydro scheme is set to be expanded over the next few years. The 2016 South Australia blackout and the June 2022 electricity crisis illustrate the need for system stabilisation mechanisms. The Australian Energy Market Operator forecasts that more than 300% of additional investment in utility-scale storage will be required to manage real-time power system stabilisation more efficiently and support cost-effective load shifting compared to current levels.

Australia's renewable electricity targets also imply a fast decline in coal power generation. However, uncertainty remains over the speed of retirement of coal generation. Announced coal plant retirements by coal plant owners are currently not in line with the Australian Energy Market Operator's (AEMO) ambitious

step change scenario under the Integrated System Plan 2022, under which 16 GW of thermal coal generation would be retired over the next two decades (Figure 3.7). Australia has also not joined more than 40 other countries committing to phase out coal power at the 2021 COP26 summit, including large coal power using countries such as South Korea, Indonesia, Vietnam, and Poland, Greater certainty is required to plan for the retirement of thermal coal generation, address its impact on the reliability of the power sector, and spur investment in power generation from other sources. The Australian government currently requires a 3.5-year notice period for coal-fired power plant owners to notify the government of a plant closure. Greater coordination between states, the AEMO and power plant operators will be necessary to ensure an orderly retirement of coal power generation.

Figure 3.7. Announced retirements of coal-fired generators are not consistent with climate goals

Scheduled closure profile of coal-fired generators in Australia by scenario, available coal capacity (GW)



Source: AEMO (2022).

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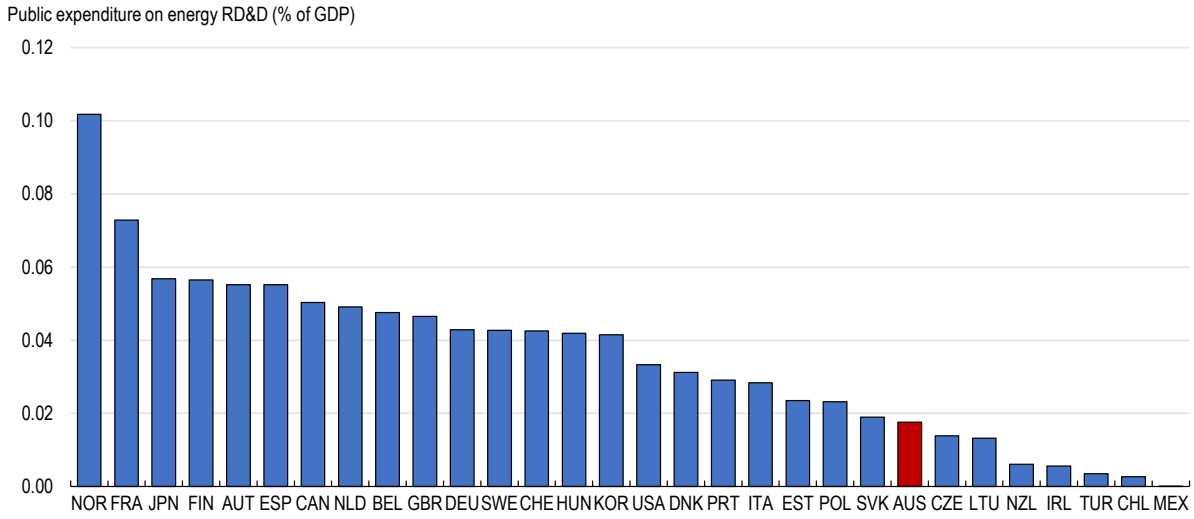
The Australian Government has committed around AUD 23 billion (1% of GDP) until the end of 2025 towards transforming the country's energy system, including AUD 20 billion for the Rewiring the Nation programme to increase renewable energy capacity and to invest in key transmission projects through the Clean Energy Finance Corporation. Under the program, the government will provide AUD 1.5 billion in concessional financing for renewable projects in Renewable Energy Zones, with fast-track regulatory processes to support their quick deployment. The government also recently announced a Capacity Investment Scheme, a guarantee scheme to support the development of renewable generation and storage which is expected to unlock AUD 10 billion in investment. Increased clean energy funding, the use of power purchase agreements and projects announced in Renewable Energy Zones could expand Australia's renewable energy capacity by at least 85% according to the IEA (2023). Australia should stand ready to provide further policy support and accelerate the planning and implementation of renewable energy projects to ensure that renewable energy targets are met.

The government has identified the development of clean energy technologies as a key component of the transition to net zero. One important aspect is the development and deployment of carbon capture, utilisation and storage to reduce emissions from coal power generation. Strong institutions are already in place to support these aims. The Australian Renewable Energy Agency provides grants for research, development, demonstration, deployment and early-stage commercialisation of renewables technology. The Clean Energy Finance Corporation facilitates the financing of clean energy projects through a variety

of instruments including co-financing, project finance, corporate loans, climate bonds and equities. However, Australia's public spending on energy RD&D, at 0.018% of GDP in 2023, is significantly smaller than the IEA average (Figure 3.8). Most of this public expenditure was on commercialisation (72%), while only 23% was on R&D and 6% for demonstration (IEA, 2023c). To date, carbon capture and storage technologies have received the highest amount of public support but have yet to demonstrate their effectiveness in reducing emissions at scale (Browne and Swann, 2017; Productivity Commission, 2023). Australia also provides a volume-based R&D tax credit to incentivise private investment in R&D (not only energy-related), for which there is significant uptake by SMEs (OECD, 2021). Despite this tax relief measure, total government support to business R&D in Australia, at 0.15% of GDP, is below the OECD average. According to the IEA, energy R&D funding in Australia does not yet match the ambition for reaching net zero by 2050 (IEA, 2023). In the absence of wider carbon pricing, more investment is needed in the development and demonstration of critical net zero technologies, particularly in hard-to-abate sectors. The government should consider scaling up and refocussing its RD&D funding programs towards the development and demonstration of clean energy and energy-efficiency technologies.

Figure 3.8. Public spending on energy RD&D is low in Australia



Note: 2023 or latest year available.
Source: IEA Energy Technology RD&D Budgets database.

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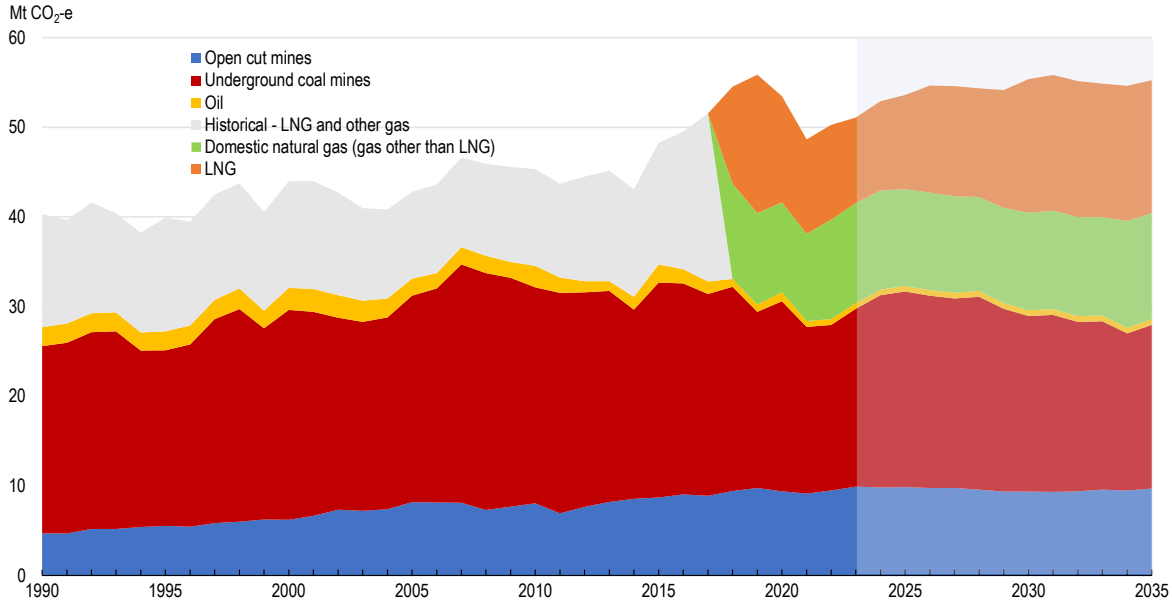
Extractive industries

After combining direct and indirect GHG emissions from purchased electricity, mining is by far the economic sector with the largest percentage increase in emissions since 1990. Combined emissions from mining rose steadily by 138% between 1990 and 2020. According to DCCEEW's baseline projections, these mining emissions are expected to decline by 8% between 2020 and 2030 as coal production falls, mining equipment is electrified (displacing diesel) and the electric power grid is greened. Fugitive emissions are released during the extraction, processing, and transport of fossil fuels. These emissions have steadily increased since the 1990s to reach 53 Mt CO_2-e in 2020, and mainly arise from coal, which accounted for 57% of all fugitive emissions (Figure 3.9). Fugitive emissions from coal are driven by coal production, mining emissions intensity and the quantity of methane capture: in 2020, 52% of the methane generated from underground coal mines was captured for flaring and electricity generation (Department of Industry, Science Energy and Resources, 2022). Fugitive emissions from oil and gas extraction are the second major source of fugitive emissions in Australia, accounting for 22.9 Mt CO2-e in 2020, or 43% of

fugitive emissions. Fugitive emissions associated with LNG production have grown strongly in the last two decades as the LNG export industry has expanded.

Figure 3.9. Fugitive emissions are projected to rise



Note: Projections under the DCCEEW's baseline scenario.
Source: DCCEEW (2022).

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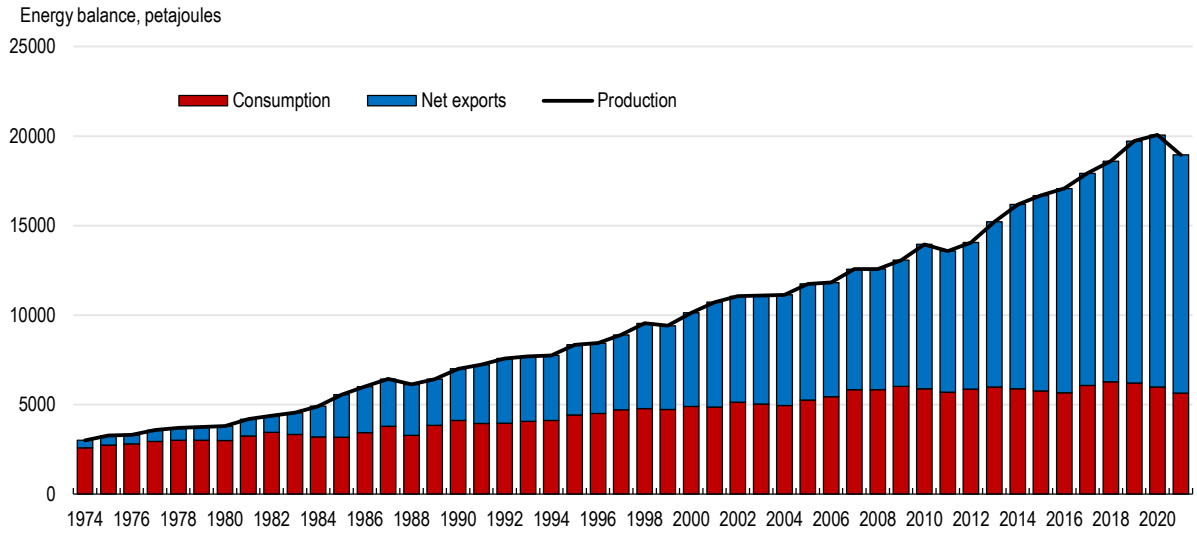
As a major energy exporter, emissions generated in the production of energy exports account for a very significant part of Australian GHG emissions. Energy exports, which are dominated by coal, have more than doubled since 2000, with natural gas exports growing almost tenfold during that period. Total energy production in Australia is currently more than three times higher than the country's energy needs (Figure 3.10). In particular, domestic coal production is almost 8 times higher than the country's needs, and natural gas production is more than 3 times larger than the country's use of natural gas. Part of the natural gas produced in Australia is consumed domestically in the residential, commercial and industrial sectors, while liquid natural gas (LNG) is exported. As a result, export-oriented sectors were responsible for 41% of Australia's total GHG emissions in 2021 (which does not account for the emissions arising from the use of these exports in destination countries, such as the burning of thermal coal exports). Japan was the main destination of coal exports between 2000 and 2010, when exports to Japan accounted for more than half of Australian coal exports. Since then, China has grown into a major destination of Australian coal exports, accounting for roughly 26% of coal exports in 2020 (coal exports to China dropped significantly in 2021 following trade restrictions). Exports to Korea, India and Chinese Taipei also grew steadily during this period, but exports to Japan remain significant despite a decline in their share of total coal exports. Natural gas exports have also grown rapidly. Japan was virtually the sole destination of natural gas exports between 2000 and 2010, but China's share had grown rapidly to around 41% by 2021. Natural gas exports to Korea and Chinese Taipei have also grown significantly since 2010, but their total share remains small.

Figure 3.10. Australia is a major energy exporter



Source: DCCEW (2022).

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Emissions from natural gas production are set to become a major driver of emissions in the future, most of which will be driven by export demand as domestic demand for gas diminishes through electrification. Future emissions from natural gas production will therefore depend greatly on transition policies abroad. In 2020, 85% of LNG exports went to countries with net zero commitments (Grattan Institute, 2021b).

Under the IEA's net zero scenario, Australia's fossil fuel exports would shrink dramatically, especially coal exports given that global coal demand would fall by 45% to 2030 and by 90% to 2050, initially driven by declining coal use in the power sector, followed by reductions in coal use in industry (IEA, 2022g). While the government expects coal exports to continue through to 2050, it will be important to develop a roadmap for this sector that takes into account the emissions reduction commitments of Australia's main trading partners and the likely significant fall in demand for coal. Such a roadmap would provide greater clarity for actors in this sector on where to focus efforts and resources.

If this scenario does not materialise, however, significant reductions in emissions intensity will be necessary to meaningfully reduce emissions from this sector, combined with the use of offsets to compensate for unabatable emissions. Emissions intensity in the extractive industries can be improved through the use of renewables, improvements in combustion efficiency, and carbon capture and storage, which will require significant improvements in available technology. The reformed Safeguard Mechanism (explained in Table 3.2) is Australia's main policy tool to reduce emissions from extractive industries. To comply with the Mechanism, mining facilities will have to reduce their emissions intensity every year in line with their baselines, or purchase Safeguard Mechanism Credits or ACCUs if they exceed them. Additionally, new mining facilities, which could include new mines for critical minerals such as lithium and cobalt, will face stricter baselines than already-existing mining facilities. The recent reforms of the Safeguard Mechanism provide that baselines for these new facilities will be set according to "international best practice levels", which will have to be carefully defined.

Given the abundance of renewable energy resources and a large wealth of critical minerals, Australia has the opportunity to secure the energy transition while remaining a key player in international energy markets. As the global energy system shifts to clean energy, demand for critical minerals is set to hugely increase, quadrupling by 2050 (IEA, 2022). Lithium, nickel, cobalt, manganese and graphite are crucial to battery performance, longevity and energy density (IEA, 2021). Rare earth elements are essential for permanent magnets that are vital for wind turbines and EV motors. Electricity networks need a large amount of copper and aluminium. Australia has particularly large reserves of some of these critical minerals, with 27% of the

world's estimated lithium reserves located in Australia, 22% of the world's nickel reserves, 21% of cobalt, 11% of copper and 10% of manganese ore (Grattan, 2023). Australia is already a dominant producer of some of these minerals: In 2021, it retained its position as the world's top lithium producer (53%) and was also a top five producer for antimony (3%), cobalt (3%), magnesite (3%), manganese ore (11%), rare earths (8%), rutile (26%), tantalum (5%), and zircon (30%) (Hughes et al., 2023).

While critical minerals provide an opportunity for Australia to remain a critical player in energy markets, it will be crucial to ensure that the environmental impacts resulting from their extraction, processing and manufacturing are minimised. Environmental damages can include air pollution, the destruction of habitats such as forests, or pollution of water sources. As part of the Critical Minerals Strategy 2023-30, Australia is working on further developing international standards in this sector, including by participating in technical standard-setting committees and advocacy for internationally aligned critical minerals standards. Work is also underway on a Certification and Life Cycle Analysis for Australian Battery Materials and a Battery Material Provenance Authentication pilot, which will help improve the traceability of minerals provenance. Additionally, the government is also pursuing a reform agenda to strengthen its cultural heritage and environmental protection legislation to ensure that First Nation Peoples can also benefit from the opportunities provided by critical minerals, the deposits of which are often located on land covered by a Native Title claim or determination. In particular, a National Environmental Standard for First Nations Engagement and Participation in Decision-Making is being developed through a co-design process with First Nations peoples.

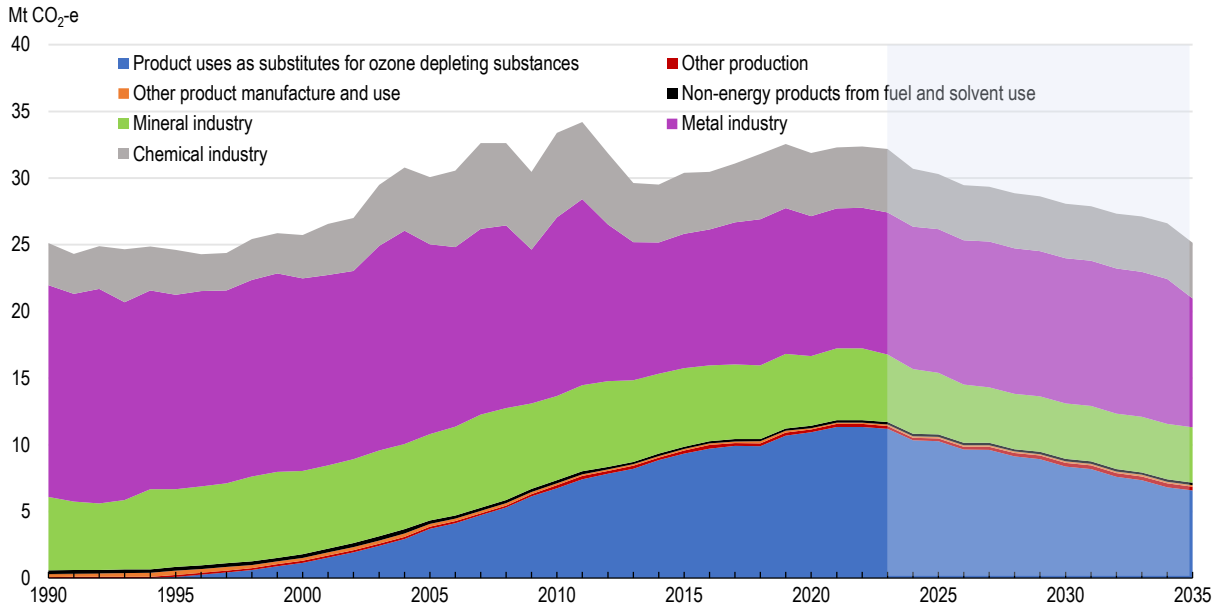
In addition to producing these critical minerals, Australia also has the opportunity to move up the value chain and participate in the production of end-products, such as batteries for EVs and energy storage, and address supply chain bottlenecks in these technologies. While Australia is a major producer of the input materials, most battery manufacturing occurs overseas. The government has recently conducted a consultation to establish a National Battery Strategy to support a competitive battery industry in Australia. The Strategy will build on AUD 100 million in equity funding to deliver a Battery Manufacturing Precinct in partnership with the Queensland government. Further ramping up the production of critical minerals and downstream processing and manufacturing will require streamlining permitting procedures to reduce lead times and increasing government support through grants to early- and mid-stage projects such as the Modern Manufacturing Initiative. Promoting high environmental, social and governance standards (ESG) in this sector will also be crucial to ensure that the production and processing of critical minerals does not result in higher emissions and other environmental damage.

Industrial processes

Australia's manufacturing sector accounts for 8% of value added, with greatest contributions from primary metal and metal product manufacturing, and basic chemical and chemical product manufacturing. Direct emissions from industrial processes arise from process emissions and emissions from combustion. As in other sectors, indirect emissions also arise from the use of electricity in industry. Emissions from industrial processes and product use, which arise from production processes such as iron and steel production, accounted for 6.4% of total net emissions in Australia in 2020, two-thirds of which from the metal, mineral, and chemical industries (Figure 3.11). Under the DCCEEW's baseline projections, only HFC emissions (refrigerants) are set to significantly decline over the next decade, as a result of the implementation of the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*, while emissions from metal, mineral and chemical industries are projected to decrease only slightly. Additionally, these projections do not take into account a possible significant increase in mining and processing of critical minerals in Australia, or the production of batteries, which would entail a ramp-up in emissions from these sources unless technologies are developed and implemented to significantly limit these emissions, which is unlikely in the near term.

Figure 3.11. Emissions from industrial processes will remain high

Industrial processes and product use emissions in the baseline scenario, 1990 to 2035, Mt CO2-e



Note: Projections under the DCCEEW's baseline scenario.
Source: DCCEEW (2022).

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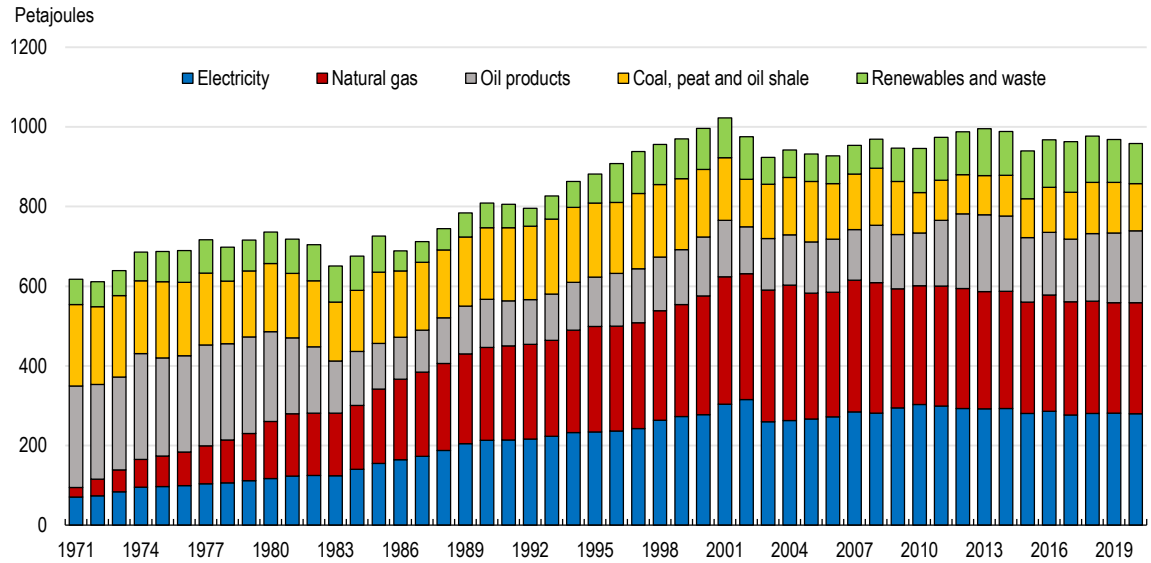
The industrial sector is also responsible for emissions from the generation of the energy it uses, either directly by fuel combustion (or stationary energy) or indirectly by the use of electricity. Manufacturing was responsible for 29 Mt CO_2-e in stationary energy emissions in 2020, most of which are related to the manufacture of non-ferrous metals such as alumina, and chemicals manufacturing. Industry is the sector with the second-highest share of Total Final Consumption of energy in Australia, at 28%, below transport (39%) (IEA World Energy Balances 2022). While there was growing electrification in the sector between 1970 and 2000, the share of electricity in energy consumption has remained broadly constant since then. In 2020, the main sources of energy in industry were electricity (29%) and natural gas (29%), followed by oil (19%), coal (12%), and bioenergy and waste (11%) (Figure 3.12). Combined emissions from manufacturing peaked in 2008 and were 17% below 1990 levels in 2020. They are projected to fall further by 25% between 2020 and 2030, largely driven by lower indirect emissions from electricity use, but also lower direct emissions from the take-up of cleaner fuels and technologies.

While large facilities in the industrial processes industry will be covered by the Safeguard Mechanism, there are many smaller facilities in Australia that together are responsible for about 30 Mt CO_2-e in emissions, most of which arising from fuel combustion and production processes (Grattan Institute, 2021b). Emissions from these smaller facilities are currently unregulated and will have to fall to contribute to the national emissions reduction goals. Existing energy efficiency certificates, such as the New South Wales Energy Savings Scheme, have seen little take up from industry (IPART, 2021). This is in part due to the fact that plant-specific efficiency measures are difficult to standardise and compare across facilities (as opposed to household efficiency measures based on replacing standard equipment, for example). Energy savings schemes in industry could therefore focus on energy savings from common industrial equipment (Grattan Institute, 2021b). Existing state energy savings schemes could be expanded along these lines, or a new federal energy savings scheme could be introduced.

Figure 3.12. Electricity and natural gas dominate energy consumption in industry

Total Final Consumption of Energy in Industry by source (PJ)



Source: IEA World Energy Balances 2022 database.

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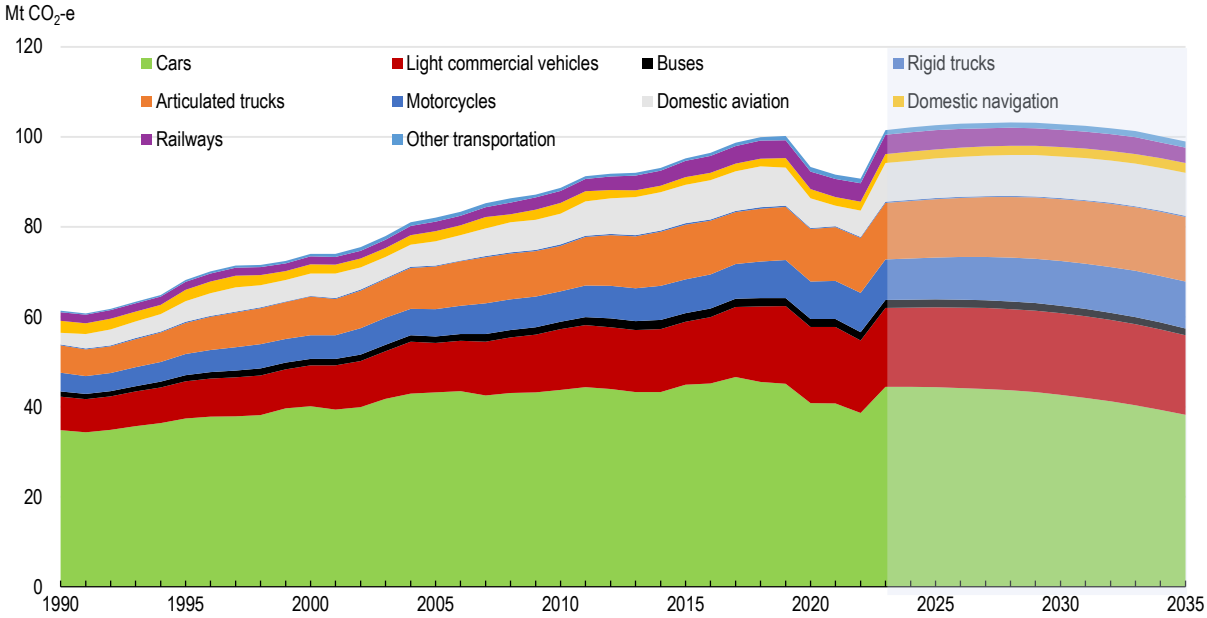
Transport

The transport sector is responsible for roughly 19% of total net GHG emissions in Australia, mostly arising from the combustion of oil products (mostly diesel and gasoline). Road transport plays a large role, accounting for 85% of transport emissions. Light duty vehicles, which include passenger cars and light commercial vehicles such as vans, accounted for 62% of transport emissions in 2020, with freight transport accounting for a further 28%, and domestic aviation accounting for 6% (Figure 3.13). Transport emissions are projected by the DCCEEW to recover from the pandemic, grow in line with population, and start declining around 2027 as the uptake of electric and hybrid vehicles increases. By 2035, transport is projected to become the largest source of emissions in Australia under current policies. To date, fossil fuels account for more than 95% of total final consumption of energy in transport, with electricity accounting for just 1.7% of consumption, up from 1.1% in 2005 (IEA, 2023). Electricity is currently used mainly in rail transport (where it accounts for 20% of energy demand), whereas the electricity share in road transport is still very small at 0.008% despite a tenfold increase since 2013. Natural gas accounts for 1.5% of energy consumption in the sector, and biofuels account for another 0.3%.

The average fuel efficiency of passenger cars is very low in Australia compared with many other OECD countries (Figure 3.14 Panels A and B), partly due to the prevalence of large cars such as utility vehicles and SUVs. With road transport accounting for 85% of transport emissions in Australia, significantly increasing vehicle fuel efficiency and a quick transition to electric vehicles (EVs) will be necessary to materially reduce transport emissions. The number of EVs has risen strongly in recent years (EV sales tripled from 2020 to 2021), but EV market penetration in Australia still lags other large western countries. The total EV fleet was close to 50,000 in 2021 (Figure 3.14 Panel C), compared to Australia's almost 20 million vehicles, of which 15 million are passenger cars and 3.5 million light commercial vehicles. EV sales were 3.8% of total car sales in 2022, below the IEA average of 9% (IEA, 2023; Federal Chamber of Automotive Industries, 2023). EV charging points have also risen in number in recent years, reaching more than 3000 in 2021.

Figure 3.13. Transport is projected to be the largest source of emissions in Australia by 2035

Transport emissions by source, Mt CO_2-e



Note: Projections under the DCCEEW's baseline scenario.
Source: DCCEEW (2022).

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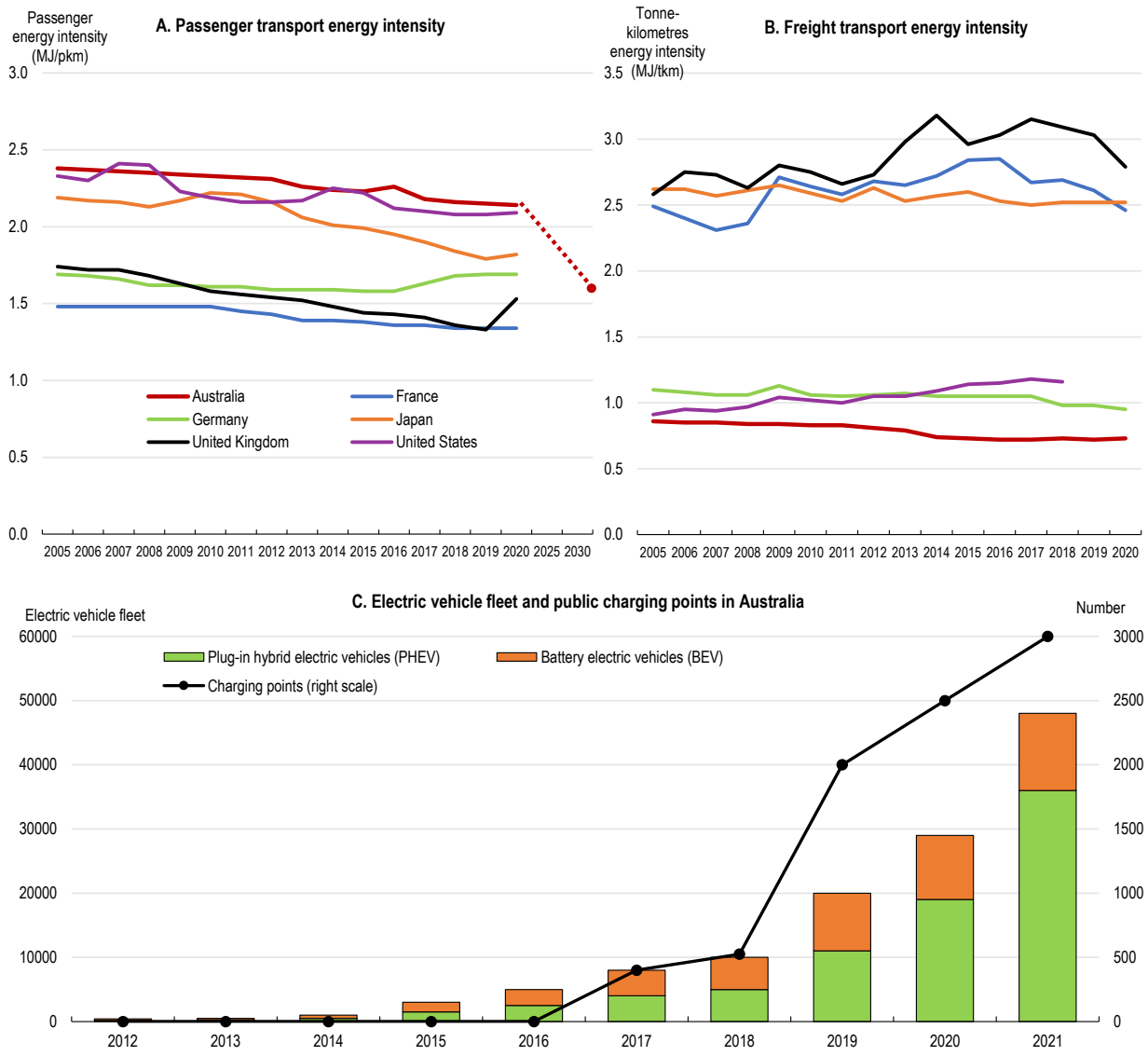
The federal and state governments have put in place a number of policies to incentivise the up-take of EVs. Several states have set electric vehicle targets, either on the proportion of EV sales by a specified date or on government fleets. Some of these states have also introduced policies to incentivise EV purchases, including rebates, stamp duty exemptions, and free registrations, among other policies (see details on these state targets and policies in Table 3.3). Under the Powering Australia plan, the federal government has introduced a government fleet target to ensure its fleet purchases and leases will be 75% electric by 2025. It has also provided AUD 500 million over 6 years for the Driving the Nation Fund, to fund EV charging infrastructure and hydrogen highways, and passed the Electric Car Discount Bill, exempting eligible electric cars from fringe benefits tax (FBT) and the 5% import tariff. Finally, the federal government is developing a National Electric Vehicle Strategy to scale up efforts to increase demand and supply of EVs by 2030, including by considering the introduction of a federal fuel economy standard.

Figure 3.14. The energy intensity of Australian vehicles needs to come down significantly to achieve climate targets



Note: The dashed red line illustrates the reduction needed to achieve global net zero emissions target. BEV = battery electric vehicles; PHEV = plug-in hybrid electric vehicles. Charging points include fast and slow chargers.
Source: IEA (2022).

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Table 3.3. Australia's electric vehicle targets by state

State	Strategy	% of electric vehicles in vehicle sales (2022)	Electric vehicle targets	Incentives	COP26 declaration pledge
New South Wales	NSW Electric Vehicle Strategy (2021)	3.7%	52% of sales will be electric vehicles (EVs) by 2030-31	AUD 3 000 rebates for first 25 000 EVs purchased for less than AUD 68 750 Stamp duty exemptions for EVs purchased for under AUD 78 000	Yes
Australian Capital Territory	Parliamentary and Governing Agreement 2020	9.5%	No official target but going toward all new sales are zero emissions by 2030	Free vehicle registration for two years Stamp duty exemption AUD 15 000 interest-free loan	Yes
Tasmania	No strategy	3.3%	100% EV fleet by 2030 for the government	Stamp duty exemption for EVs for the next two years Free registration for car rental companies and coach operators for two years	No
Victoria	Zero Emissions Vehicle Roadmap	3.4%	50% of sales will be EVs by 2030	AUD 3 000 rebates for first 4 000 EVs purchased for less than AUD 68 740 Incentive amount for 20 000 additional EVs remains to be determined	Yes
Queensland	Queensland's Zero Emissions Vehicle Strategy and Action Plan 2022-2032	3.3%	50% of sales will be EVs by 2030 and 100% by 2036	AUD 3 000 incentive for 15 000 cars under AUD 58 000 EVs are registered in the lowest fee segment (min. saving approximately AUD 70)	No
Western Australia	Electric Vehicle Strategy	2.8%	No target	EVs are exempt from the On-demand Passenger Transport Levy	No
South Australia	Electric Vehicle Action Plan	2.3%	50% of sales will be EVs by 2030 100% of sales will be EVs by 2035	AUD 3 000 subsidies for 7 000 new battery electric vehicle sales under AUD 68 750 Three-year registration fee exemption for new BEVs until 1 July 2025	Yes
Northern Territory	The Northern Territory Electric Vehicle and Implementation Plan 2021-2026	0.8%	No target	Free registration for five years from 2022 AUD 1 500 stamp duty reduction for five years from 2022	No

Source: Electric Vehicle Council (2022), State of EVs 2022.

Demand subsidies can be effective in increasing demand for EVs, but they can come at a high fiscal cost and impose a high implicit carbon price, especially while the decarbonisation of the electricity grid is still ongoing (Productivity Commission, 2023). While fuel taxes can be more efficient (for example, they impose a price on marginal miles driven), fuel economy standards appear to be more acceptable to the public in many countries (Anderson et al, 2011). Aligning the various uncoordinated state subsidy programmes and introducing stringent federal fuel economy standards, which Australia is currently considering, would provide strong incentives to reduce emissions in personal transport at a lower implicit carbon cost. Stringent fuel economy standards would also increase the supply of EVs in Australia, which appears to have limited EV take-up according to widespread reports of extended waiting times for EVs (Productivity Commission, 2023). A relaxation of import restrictions on low- and zero-emissions vehicles would also be desirable to increase the potential supply. While the government is currently considering fuel economy standards for light vehicles, it should also consider introducing standards for trucks and other heavy vehicles, which are responsible for more than 4% of total GHG emissions in Australia.

Existing fuel tax credits are expensive and limit incentives to reduce fuel use. On-road heavy vehicles are currently eligible for a reduced fuel tax in Australia, and businesses pay no fuel tax on fuels used for off-road vehicles, such as trucks in mining sites or for heavy machinery, industrial heating and cooling. These fuel tax credits and exemptions currently cost the government AUD 8 billion per year in lost fuel tax revenues (Terrill, 2023). Fuel taxes for on-road heavy vehicles should be brought in line with fuel taxes on other on-road vehicles such as cars and vans, and the government should consider reducing the generosity of fuel tax credits for off-road vehicles and machinery.

While EV charging needs are currently mostly met by home charging, further increasing demand for EVs will require drastically increasing the number of public charging points. As part of the Driving the Nation Fund, the government will provide AUD 40 million to deliver 117 EV chargers on key highway routes and AUD 130 million to co-fund other charging initiatives through the Australian Renewable Energy Agency. While this additional public funding for charging infrastructure is welcome, further measures will be needed. Despite the low number of EVs currently owned by Australians, Australia has among the lowest amount of charging points per EV compared to other countries covered in the IEA's Global EV Outlook (IEA 2023b). Given the importance of home charging, the National Construction Code could also be updated to require all new buildings to be pre-wired so that they are ready for charging EVs.

The shift to EVs could have revenue consequences for the federal government. As of July 2023, motorists with internal combustion engine (ICE) cars pay 47.7 cents in fuel excise per litre of petroleum, which amounted to AUD 18.3 billion in public revenue in 2021-22 (3.1% of total 2021-22 Budget revenue). As vehicles become more fuel efficient and the take-up of EVs rises, revenues from the fuel excise will fall significantly. Road user charges could provide an alternative source of public revenues and could be charged on EVs and ICE vehicles alike. While such road user charges would somewhat blunt the incentives to purchase EVs over ICE vehicles, they would provide revenues towards maintaining road safety and maintenance and well-funded transport systems. Road user charges could be defined as a function of distance travelled, which similarly to the fuel excise would discourage travelling by road for longer distances, which even with a 100% EV fleet would increase demand for energy. The state of Victoria was the first state to introduce a distance-based road user charge for EVs in 2021, which the High Court ruled unconstitutional in October 2023, arguing that states do not have the power to impose excise taxes on consumption.

While important, electrification and fuel efficiency improvements in vehicles will be insufficient to meet Australia's emission reduction targets. Widespread adoption of sustainable modes of transport, a shift from car dependency, and travel reductions can also contribute to reduce transport emissions. Investing in public transportation can encourage its adoption and reduce the use of greenhouse gas-emitting cars. However, public transport is generally a realistic alternative to cars only in compact urban areas with a high density of infrastructure services and shorter trip distances. Therefore, land use management and

regulations can be an important tool to reduce transportation emissions by encouraging higher population density and building near public sector routes, avoiding urban sprawl.

Agriculture

Climate change is a significant challenge for agriculture, particularly in Australia. Australian farms are vulnerable to the effects of climate change, and they are already facing a greater frequency of extreme weather events and higher volatility in rainfall and temperatures. Agriculture is also a sector where it is technically difficult to achieve large reductions in emissions through abatement In particular, methane emissions from livestock, which are high in Australia given its extensive production of beef and sheep meat, are especially hard to eliminate.

Australia has included the agricultural sector in its economy-wide emissions targets, as opposed to many other countries who exclude agriculture on the grounds that abatement in the sector is too challenging. The inclusion of agricultural emissions is welcome. Australia, however, does not have a specific emissions reduction target for the agriculture sector, unlike many other OECD countries including France, Germany, Denmark, Portugal, Belgium, the United Kingdom, Japan, Korea and New Zealand (OECD, 2022). Such a target can be helpful to focus mitigation efforts, measure progress and send an important signal to the industry. The upcoming sectoral decarbonisation plan announced in July 2023 will provide an opportunity to send such a signal. Australia also joined the Global Methane Pledge in October 2022, a voluntary commitment by 123 countries to collectively reduce global methane emissions across all sectors by at least 30% below 2020 levels by 2030. While this is a welcome signal, this pledge is non-binding and achieving Australia's contribution will require strong policies and planning.

The agriculture sector was directly responsible for 72.6 Mt CO2-e of GHG emissions in 2020, or 14.7% of total Australian GHG emissions. More than two-thirds of these direct emissions from agriculture are due to enteric fermentation (OECD, 2022), a digestive process of cattle, sheep, goats and other ruminant livestock which generates methane. Australia's large beef grazing industry is primarily responsible for emissions from enteric fermentation, with another sizeable contribution from sheep. Agricultural soils, a principal driver of nitrous oxide emissions, are another major source of agricultural emissions, accounting for 18% of direct emissions from agriculture in Australia, while manure management accounted for 9%. Fuel combustion in agriculture, used for transportation/traction, power, and heating, is responsible for an additional 5.6 Mt CO2-e of GHG emissions, 99% of which arise from the combustion of oil (mostly diesel), and 1% from natural gas (IEA, 2022). In addition to these direct GHG emissions, agriculture is also indirectly responsible for the emissions arising from the generation of the energy used in the sector, which accounts for 7% of total final consumption of energy (IEA, 2023).

Given the preponderance of methane emissions from livestock, total emissions from agriculture are closely linked to livestock numbers. Methane emissions from enteric fermentation have fallen substantially from 64.3 Mt CO2-e in 1990 to 51.8 Mt CO2-e in 2020. Recently, declines in cattle numbers due to drought conditions drove a fall in GHG emissions between 2017 and 2020 (Figure 3.15). However, cattle numbers have started to recover and emissions from agriculture are projected to remain broadly constant until 2030 under current policies (DCCEEW, 2022b).

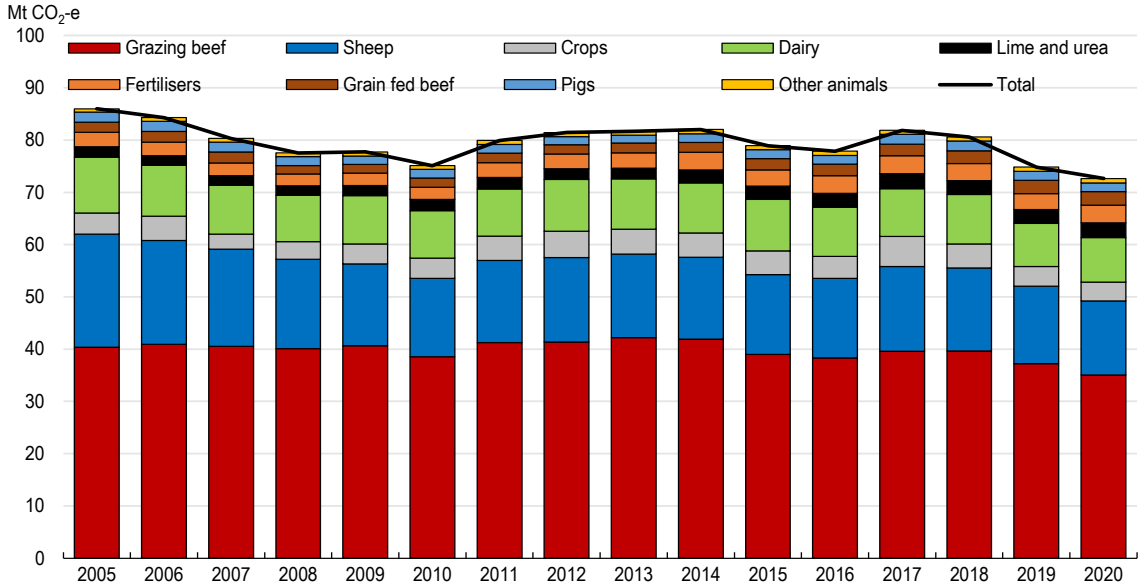
It is especially challenging to tax emissions or establish emissions trading schemes in the agriculture sector, in particular given the difficulty of measuring emissions that do not arise from fossil fuel use, such as methane emissions from livestock. For this reason, countries have excluded agriculture from existing carbon taxing or emissions trading schemes (OECD, 2022), although New Zealand has been considering the introduction of emissions pricing in the sector. Australia is among a small number of countries with a voluntary scheme to issue carbon credits for emissions reduction and carbon sequestration projects in agriculture, through the ACCU Scheme. Japan also introduced a similar scheme in 2013 to provide certified carbon credits for emissions reductions and carbon sequestration activities. In Korea, while agriculture is

not covered by the Korean Emissions Trading Scheme, farmers can obtain certified offset credits for emissions reduction projects and sell these in the emissions trading market.

Reducing GHG emissions in agriculture will require investment in emissions-reducing technologies and their deployment, outreach programs to advise farmers on best practices to practically reduce farm emissions, and the expansion of carbon-offsetting projects in farming. Existing emissions-reducing technologies and abatement practices include improving soil carbon, changing grazing practices, using livestock feed to reduce methane, and changing nitrogen application in cropping systems. In many cases, abatement practices can provide benefits to farmers, including by raising productivity and competitiveness and improving climate resilience (McDonald et al., 2021). In other cases, however, abatement practices can be costly and affect profitability. Reducing these costs and barriers to abatement will be crucial to reduce agricultural emissions.

Figure 3.15. Agricultural emissions are largely driven by livestock methane emissions

GHG emissions from Agriculture by source, Mt CO_2-e



Source: DCCEW (2022).

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Properly designed public support for agriculture can help reduce emissions in the sector. Overall public fiscal support to agriculture is low in Australia (Box 3.4) and is characterised by a strong emphasis on market openness, building climate resilience, and investments in public goods, including R&D, hydrological infrastructure and biosecurity (OECD, 2022). Agricultural producer support in Australia focuses on disaster relief payments, income support and income-smoothing programmes such as the Farm Management Deposits and income tax averaging arrangements. Australia has an extensive agricultural knowledge and innovation system, with approximately one-quarter of total public expenditure for agriculture directed to support for R&D, innovation and extension services (compared with just 6% in the OECD). Notable examples of such support include the Future Drought Fund, established in 2020, which invests AUD 5 billion in drought resilience initiatives, including developing better farming and land management practices that improve drought resilience and helping farmers plan for droughts. More recently, the government announced the commitment of up to AUD 3 billion from the AUD 15 billion National Reconstruction Fund to support investment in low emissions technologies and component manufacturing and agricultural methane reduction. The Government has also committed AUD 8 million for the seaweed industry to support commercialisation of the low-emissions livestock feed supplement called Asparagopsis. The second and third stages of the Methane Emissions Reduction in Livestock (MERiL) Program will provide a total of AUD

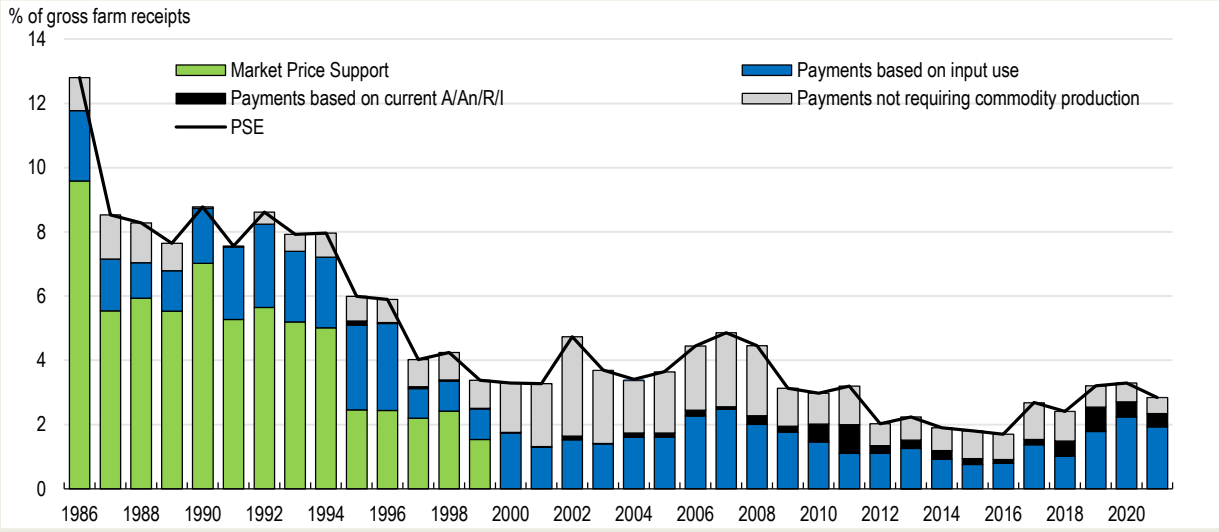
20 million in funding to develop technologies to deliver low emission feed supplements to grazing animals and determine their technical viability and commercial potential.

Given its current low level, there is scope to further increase support to agriculture through policies that encourage further emissions reduction in the sector, including support for agricultural R&D and innovation but also extension services and agricultural education which receive smaller amounts of funding. Support for technology should focus on areas with the highest potential impact on agricultural emissions, such as reducing the emissions intensity of livestock and electrifying farming machinery. Other policies that could provide additional support to agricultural producers include concessional loans for investments to reduce emissions, such as electric or hydrogen-powered machinery which have with high upfront costs, or income-contingent loans where required repayments depend on project revenue (Grattan, 2021).

Box 3.4. Support to agriculture in Australia

Australia's financial support to agricultural producers is among the lowest in the OECD, estimated at 3.1% of gross farm receipts for 2019-21, with total support to agriculture representing 0.2% of GDP (OECD, 2022). More than half of support to producers in 2019-21 was input subsidies. Much of these went to on-farm investments, including in response to adverse events. The bulk of remaining producer support went to disaster relief payments, income support, and income-smoothing programmes that address cash flow fluctuations, such as the Farm Management Deposits and income tax averaging arrangements.

Figure 3.16. Composition of the Australia's agriculture producer support estimate



Notes: A/An/R/I: Area planted/Animal numbers/Receipts/Income
Source: OECD Producer and Consumer Support Estimates, OECD Agriculture Statistics

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During 2019-21, the general services support estimate (GSSE) averaged 2.6% of the value of agricultural production, substantially higher than in the late-1980s (0.7%) and early 2000s (1.9%), but below the OECD average. Australia has an extensive agricultural knowledge and innovation system, with approximately one-quarter of total public expenditure for agriculture directed to support for R&D, innovation and extension services (compared with just 6% in the OECD). Public expenditure on biosecurity inspection and control services, and to develop and upgrade infrastructure (mostly hydrological) represents the bulk of the remaining expenditure on general services.

Research and development are a major component of general services for the sector, while extension services and agricultural education receive smaller funding. The Future Drought Fund and the National Agricultural Innovation Agenda encompass innovation generation and adoption.

Source: OECD (2022).

Through the ACCU Scheme, which was established in 2015, farmers and landholders can earn Australian Carbon Credit Units (ACCUs) by implementing projects that reduce or avoid the release of GHG emissions or remove and sequester carbon from the atmosphere. To date, agricultural projects account for only 1.65% of ACCU issuance, not including vegetation projects which are often undertaken on agricultural land. Policies that cap net emissions in other sectors, such as the Safeguard Mechanism for the industrial sector, could raise demand for ACCUs, which will result in a higher value and could incentivise more farmers to invest in carbon credit generation. In the absence of strong demand for ACCUs from other sectors, efforts to scale up the ACCU Scheme, which so far has had a limited impact on agricultural emissions, could strengthen progress on emissions abatement in the agriculture sector.

The Climate Change Authority conducted a review of the ACCU Scheme in 2020, which highlighted several recommendations for the government's consideration, including allowing for a broader set of methods to be eligible under the Scheme. In this regard, the government established a new process for stakeholders to propose new emission reduction activities and provide evidence and information to support the potential development of a new method. Given the low take-up in the agricultural sector, special consideration should be given to adding new agricultural methods that could be eligible under the ACCU Scheme. The Scheme currently accepts 7 agricultural methods (Box 3.5). Ensuring that the process to consider new emissions reduction methods in agriculture is effective, robust and expeditious while ensuring the integrity and additionality (ensuring that the credited abatement would not have happened under a business-as-usual scenario) of the newly eligible projects will be key. The administrative costs of submitting projects under the Scheme can be high, especially for relatively smaller businesses. Given that more than 80% of farming businesses are relatively small operations receiving less than AUD1 million in revenues (Grattan, 2021), streamlining administrative processes and reducing transaction costs, while ensuring the integrity of the scheme, could spur greater participation in the Scheme. Capacity building programmes such as the Carbon Farming Outreach Program that provide direct support to potential scheme participants are welcome, particularly for rural and remote communities, including First Nation Australians.

Data collection practices to track emissions from agriculture could be improved to better account for agricultural emissions in national emissions reporting and to assess the impact of emissions reduction policies and technology take-up in the sector. For example, auditing may be necessary to assess the impact of the use of feed supplements on emissions (Grattan Institute, 2021). Farm-level data will also be required if a low-emissions certification scheme is introduced.

Overall, while policies discussed in this section can all contribute to reducing emissions in agriculture, it will be difficult to reach net zero emissions in this sector while maintaining current livestock herd sizes, barring significant advances in emissions-reducing technologies such as low-emissions livestock feed supplements. This raises the question of whether, in the absence of emissions pricing in agriculture, policies should be considered to limit herd sizes or incentivise their reduction and the diversification of production towards other commodities. A number of OECD countries, including Ireland, are currently considering policies to encourage farmers to reduce the average age of slaughter.

Box 3.5. Agricultural methods eligible under the ACCU Scheme

List of available agricultural methods

- To be eligible under the ACCU Scheme and receive Australian Carbon Credit Units, emissions reduction projects in agriculture must follow one of the following finalised methods:
- Animal effluent management method
- Beef cattle herd management method
- Estimating sequestration of carbon in soil using default values method
- Estimation of soil organic carbon sequestration using measurement and models method
- Fertiliser use efficiency in irrigated cotton method
- Reducing GHG emissions in beef cattle through feeding nitrate containing supplements method
- Reducing GHG emissions in milking cows through feeding dietary additives method

Expanding the list of available methods

- The list of finalised methods can be expanded under a process involving the Minister for Climate Change and Energy, the Clean Energy Regulator, the Emissions Reduction Assurance Committee, the Department for Climate Change, Energy, the Environment and Water, and consultation with industry, potential end-users and experts.
- The Minister decides which activities to prioritise for new carbon crediting method development based on these criteria:
- the potential uptake of the method and the likely volume of reduced emissions
- whether the volume of emissions reduced can be estimated at an acceptable cost and to a reasonable degree of certainty
- whether it could have an adverse impact on society, the environment or the economy
- whether it could be better supported by other government measures
- alignment with broader government priorities
- The method prioritisation process is currently under review following the outcomes of the ACCU Review, which proposed a proponent-led method development process.

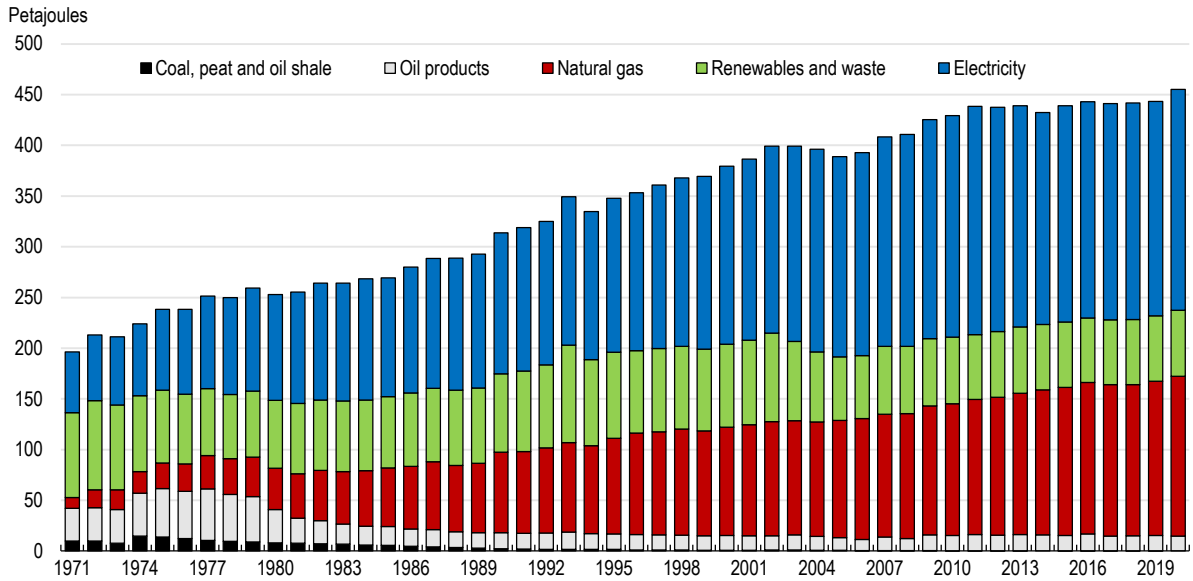
Source: DCCEEW.

Buildings

Buildings directly and indirectly produce GHG emissions from fuel combustion (stationary energy) and electricity use. Buildings account for more than 23% of energy demand in Australia. Residential buildings were responsible for 61% of total energy demand from buildings in 2020, with the remainder of energy demand coming from buildings in the service sector (IEA, 2023). Energy demand from the residential sector grew significantly since the 1970s before plateauing around 2010 (Figure 3.17). In 2020, 48% of energy demand from residential buildings was covered by electricity, followed by natural gas (35%), bioenergy and waste (14%), and oil (3%). The dwelling stock in Australia currently stands at almost 11 million dwellings, 71% of which are houses, 16% apartments, and 13% are townhouses (semi-detached, row or terrace houses).

Figure 3.17. The residential sector needs to be further electrified

Total Final Consumption of Energy in the Residential sector by source (PJ)



Source: IEA World Energy Balances 2022 database.

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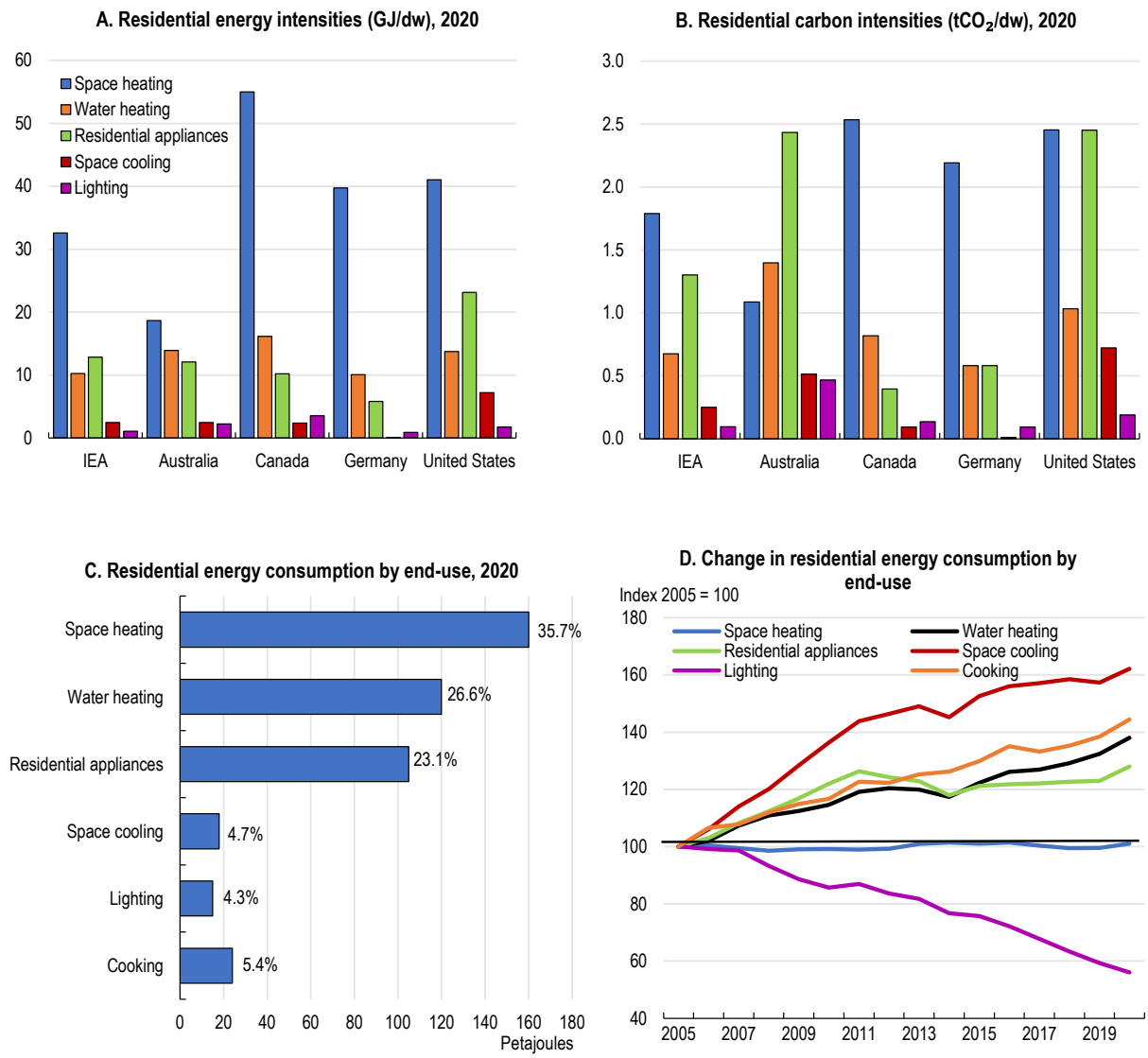
Emissions from fuel combustion amounted to 11 Mt CO_2−e in residential buildings in 2020, and 6 Mt CO_2−e in commercial buildings. These combined emissions are projected by the DCCEEW to remain broadly constant until 2030 under existing policies, before falling to 14 Mt CO_2−e by 2035 as existing buildings are electrified and newer more electrified buildings are built. To further reduce building emissions, further electrification (coupled with decarbonising electricity generation) and strong improvements in energy efficiency will be required. The IEA estimates that a 5% improvement in residential energy efficiency per year will be required to reach net zero under the IEA Net Zero Roadmap (IEA 2021, 2022b), which is significantly higher than the energy efficiency gains in recent years (less than 1% per year on average between 2015 and 2020).

According to the IEA's Energy Efficiency Indicators database, space heating (36%) is the largest source of energy consumption in Australian residential buildings, followed by water heating (27%), appliances (23%), and cooking, lighting and cooling (around 5% each) (Figure 3.18, Panel C). Space heating is mainly fuelled by natural gas (58%), followed by bioenergy (29%) and electricity (12%). While cooling has been a relatively smaller source of energy use in residential buildings, it has grown significantly in recent years (by almost 70% since 2005) and has become a major contributor to peak electricity demand and a driver for investment in electricity generation and network capacity (Figure 3.18, Panel D). Residential energy intensities in Australia are comparable to the IEA average and those of Canada, Germany or the United States, except for the exceptionally low energy intensity in space heating. However, after accounting for fuel use and the electricity generation mix, the resulting residential carbon intensities are relatively high in Australia, especially in water heating and residential appliances.

Figure 3.18. Residential energy consumption by end-use



Source: IEA Energy Efficiency Indicators database.

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While pricing carbon is an efficient way to internalise climate externalities and spur innovation, the buildings sector is not as responsive to price signals as other sectors, in part due to long renovation cycles (Hoeller et al., 2023; D'Arcangelo et al., 2022). Net effective carbon rates on buildings are close to zero in Australia, and only a few countries have achieved net effective carbon rates above EUR 60 per tonne of CO_2, a mid-range estimate of current carbon costs (OECD, 2021b). Standards and regulations can also help overcome market failures in the building sector. However, they are not cost-minimising and can increase the cost of decarbonisation by blurring price signals and blunting economy-wide incentives (D'Arcangelo et al., 2022).

Given the long average lifespan of new homes, design, and construction decisions such as heating systems, building material, and housing size and type are crucial for the decarbonisation of the housing stock. Updated building energy codes accompanied by the relaxation of regulatory deterrents to new housing can ensure that the housing stock becomes progressively more energy efficient. Land-use policies that limit development in inner and middle-ring suburbs (Coates and Moloney, 2023) should also be reviewed given that they also play an important role in reducing urban sprawl, which has direct as well as indirect environmental implications. Australia's growing population will require an expansion in the housing

stock, and ensuring that the new buildings are as energy efficient as possible will be crucial. However, it will also be important to increase the energy efficiency of existing buildings, through retrofitting, better isolation, and the installation of more efficient appliances.

Further increasing the energy efficiency of residential buildings will be important in helping Australia meet the economy-wide emission targets. There have been significant improvements in the energy efficiency of commercial buildings in recent years, in part due to disclosure and labelling mandates (IEA, 2023; Lee, Gumulya and Bangura, 2022). However, energy efficiency gains in residential buildings have stalled. To address this, the authorities have outlined the *Trajectory for Low Energy Buildings* strategy, which will consider a range of policies, including mandatory disclosure of energy performance, minimum energy efficiency standards for rental properties, improving heating, ventilation, and cooling systems, and appliance standards and labelling. It will also consider specific measures for vulnerable households to overcome barriers to adopt energy productivity measures and services.

A recent change to the National Construction Code will increase the minimum energy performance standards for new residential buildings, which will be mandatory by October 2023, and work has begun on the following triennial update to the Code, which will focus on commercial buildings. Minimum energy performance standards in the building code should continue to be updated periodically. The Nationwide House Energy Rating System (NatHERS) rates the energy performance of newly constructed or renovated homes, including the energy performance of appliances, the use of solar panels, and the efficiency of the building shell. However, the rating and its disclosure are voluntary and does not cover existing housing and rental properties. A disclosure obligation of the NatHERS rating should be implemented, especially for rental properties. Minimum energy efficiency requirements for rental properties could also be considered (for example, France has outlawed the rental of extremely energy-inefficient housing starting in 2025 and plans to outlaw the rental of housing rated F or G according to its energy efficiency rating system starting in 2028). Energy efficiency ratings are required for commercial office space of 1000 square meters or higher, under the National Australian Built Environment Rating System (NABERS). Given the effectiveness of this program, the requirement for ratings could be expanded to other commercial sectors, such as hotels, and especially to high-energy buildings such as data centers.

Retrofitting the existing housing stock (for example by electrifying heating and cooling, improving insulation, and incorporating on-site renewable energy) is a crucial priority to achieve decarbonisation targets in the buildings sector. It is also increasingly relevant in terms of easing energy security concerns and adapting to climate change (IEA, 2022d). Many existing homes were built before energy performance standards were introduced. Covering existing housing under the NatHERS energy efficiency ratings could provide incentives for retrofitting the existing building stock. In its 2023-24 Budget, the government announced it would provide AUD 1.3 billion to the Household Energy Upgrades Fund, which includes AUD1.0 billion of low-cost loans to support energy efficiency upgrades for households and $300 million to support upgrades for social housing in collaboration with states and territories. Several other energy saving schemes currently exist at the state and territory level, providing market mechanisms to incentivise improved energy efficiency. Aligning these schemes and reducing administrative costs would improve their effectiveness. Addressing labour shortages in the construction sector would also be crucial given the size of the retrofitting challenge. To do so, authorities should consider increasing funding for training and upskilling schemes, which is low in Australia compared to other OECD countries (see the following section).

Energy efficiency standards can imply large costs, which can weigh particularly on lower-income households. Regulatory approaches to decarbonisation are generally more regressive than carbon taxes (Fullerton and Muehlegger, 2017; Brucal and McCoy, forthcoming). There is a case for providing bridging loans and subsidies, as the subsequent annual energy savings can be low compared with the cost of renovation. However, subsidies for emissions reductions can bring large benefits to high-income homeowners, as energy-efficiency improvements have been shown to become capitalised in house prices (Reusens, Vastmans and Damen, 2022). Australia could consider targeting subsidies to lower-income households through income-based eligibility criteria and refundable tax credits for energy efficiency

improvements and renovations. The MaPrimeRénov in France, for example, offers higher grants for retrofitting projects performed by lower-income households (up to EUR 10 000 per project) and an advance payment to undertake the renovations for the lowest income households who may struggle to finance the renovations up-front (OECD, 2022c).

Managing the impact of the climate transition

The transition to net zero emissions presents a number of opportunities for the Australian labour force, but also a number of challenges. The renewable energy sector, for example, has the potential to be a major source of jobs in Australia. However, Australia's labour market faces three distinct challenges from the transition to net zero: First, workers in highly emitting industries such as coal mining that face rapid declines in activity will face unemployment or have to re-train or find a job elsewhere. Second, as a result of carbon mitigation policies, employment will have to be reallocated from more carbon-intensive activities towards greener activities. Finally, as businesses adapt their production processes and adopt greener technologies to reduce their GHG emissions, workers who will not lose their jobs will nevertheless have to re-train and upgrade their skills as their occupations become greener (Hummels et al., 2012; Becker, Ekholm and Muendler, 2013). Public policies can help surmount these three challenges by supporting workers facing unemployment due to the transition to net zero, encouraging the reallocation of labour across sectors and regions, identifying and addressing worker shortages and encouraging the re-training of the workforce, thus minimising the costs of the transition.

Workers in carbon-intensive industries may face considerable adjustment costs such as losing their wage income, having to search for a new job, learning new skills, and having to move to other locations given that green jobs may not be created in the same locations (Grundke and Arnold, 2022). For example, renewable power generation facilities have to be placed near the natural resource they exploit, unlike fossil fuel power plants (OECD, 2017b). Prolonged unemployment could also lead older workers to leave the labour force altogether (Hyman, 2018). Carbon-intensive jobs also tend to be geographically concentrated (Box 3.6), and the climate transition will therefore have outsized impacts on particular regions heavily dependent on these jobs and industries for income, revenue and investment (Morris, Kaufman and Doshi, 2019; Elgouacem et al., 2020). Mass layoffs tend to cause local recessions and have long lasting effects on communities (Hanson, 2023).

As both Australian and global energy consumption shifts away from coal, and as alternatives for metallurgical coal are developed, there will be less demand for Australian coal both domestically and from abroad. While the transition will take long and the government still expects coal exports to continue through to 2050, coal production and employment will have to fall in order to achieve the emissions reduction targets. According to the 2021 Census, there are roughly 50,000 workers in the coal mining industry in Australia, representing slightly more than 0.4% of total employment. These are fewer workers than those employed in the Australian automotive industry at the turn of the century, around 80,000 (Stanford, 2020), before the sector collapsed and all automotive plants were shut down. Other countries have experienced coal transitions involving much larger numbers of coal mining workers. For example, mine closures in the Limburg region of the Netherlands led to a loss of 75,000 coal mining jobs between 1965 and 1990; coal mining jobs declined by 160,000 in the Appalachian and Powder River Basin in the United States between the 1970s and 2015; and the closure and consolidation of mines in Poland resulted in a loss of roughly 230,000 jobs between 1990 and 1999 (Caldecott, Sartor and Spencer; 2017). Today in Australia, coal mining is highly capital intensive with fewer workers required to operate the large machinery used to extract coal deposits. The age structure of the coal mining workforce in Australia also implies that a significant part of the workforce will retire naturally between now and 2030, as around 20% of the current coal mining workforce under 60 years old will be 60 or older in 2030 according to the 2021 Census.

While the absolute number of coal mining jobs in Australia is not very high, coal mining jobs are highly concentrated geographically in regional parts of Queensland and New South Wales, and in Collie in

Western Australia. According to the 2021 Census, there are 10 regions (at the Statistical Areas Level 3) in which coal mining accounts for more than 5% of total employment, and 7 regions where the share of employment is 10% or higher: Bowen Basin North (in Queensland, 21% coal mining employment share), Central Highlands (in Queensland, 20%), Upper Hunter (in New South Wales, 15%), Biloela (in Queensland, 12%), Lithgow-Mudgee (in New South Wales, 11%), Lower Hunter (in New South Wales, 11%) and Mackay (in Queensland, 10%). Together, these 7 regions account for almost half of all coal mining jobs in Australia. These regions that are heavily reliant on coal mining demand specific policy measures to transform their industrial specialisation and enable the geographical relocation of a significant number of workers (D'Arcangelo et al., 2022). Place-based policies combined with policies aiming to remove obstacles to geographical mobility can help with this transformation. Place-based policies include early-stage reskilling and up-skilling, public investment programs, and improvements in social conditions through higher quality healthcare and transport policies in the region (Botta, 2019; Causa, Abendschein and Cavalleri, 2021).

While renewable energy cannot replace all coal mining jobs, it can play a meaningful role in a wider regional industry development plan that creates employment across a range of sectors. Renewable energy will be a major source of jobs in Australia in the medium-term. Employment in this sector is already higher than in the thermal coal mining sector, and it is set to become larger than total employment in all coal mining (thermal and metallurgical) as Australia ramps up renewable capacity to fulfil its renewable electricity targets (Briggs et al., 2020). According to Accenture (2023), the transition to renewable energy will create jobs for almost 200,000 workers by 2050 and will require an additional 60,000 workers before 2030. Renewables will create employment across a wide range of occupations, especially for trades and technicians, labourers and professionals. After the initial construction and installation phase of renewables deployment, the number of jobs in operations and maintenance will increase and is projected to account for more than half of renewable energy jobs by 2030. In terms of occupations, there are a number of overlaps that could make renewable energy a source of alternative employment for coal mining workers. Renewable energy will employ more workers than currently employed in coal mining across a range of occupations, including construction and project managers, engineers, electricians, mechanical trades, office managers and contract administrators and drivers. However, there is no direct correspondence in renewable energy for drillers, miners and shot firers, which are the largest category of coal mining jobs. There is also some overlap between coal mining regions and the Renewable energy zones identified by the government as having the greatest potential for renewable energy (e.g. Isaac and Fitzroy in Queensland; North-West REZ and Central West REZ near the Hunter Valley in New South Wales).

The renewable energy transition will require significant efforts in terms of skilling and training the Australian workforce. Some green jobs require high levels of education, work experience and on-the-job training, and use high levels of cognitive and interpersonal skills (Consoli et al, 2016; Vona et al., 2018; Saussay et al., 2022). According to certain estimates, around half of the workers needed for the renewable energy transition are needed in an occupation currently facing national shortages, such as electricians and engineering professionals (Infrastructure Australia, 2021). Importantly, many of these occupations are high-skilled occupations, requiring formal education and training at TAFE (vocational education) or university. Significantly increasing the number of candidates for these high-skilled occupations will therefore take time, careful planning and investment. Surveying the needs of the energy industry will help anticipate the needs for workers and guide the structural adaptation of the education system.

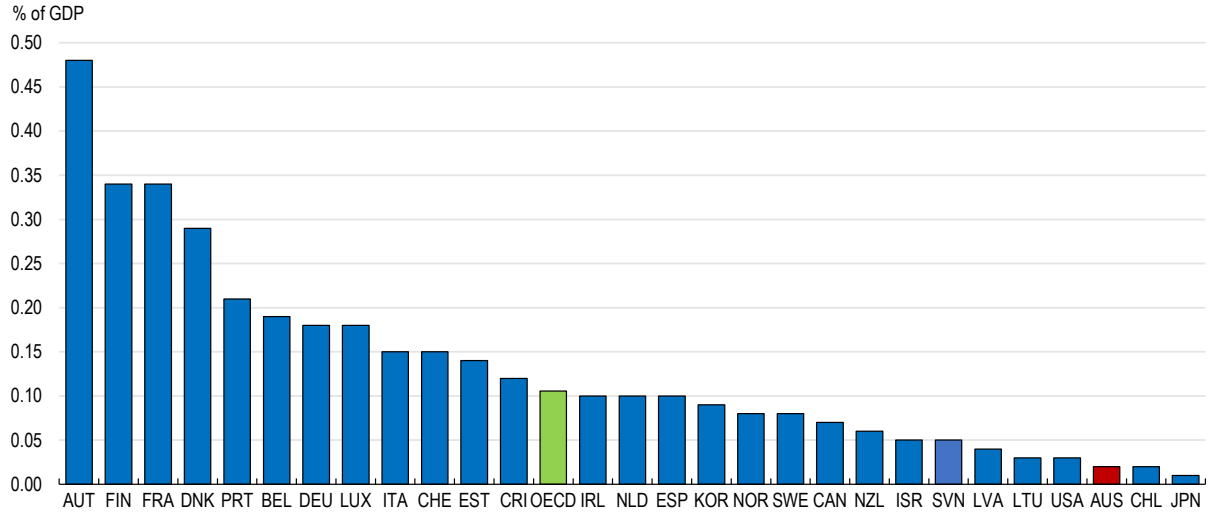
Part of the shortage of renewable energy workers could be addressed by increasing the representation of women in these occupations. For example, women accounted for just 2.1% of the electrician workforce and 13.1% of the engineering workforce according to the 2021 Census. Many occupations with very low participation by women are currently facing national worker shortages, including electricians, engineers, mechanical engineering trades workers, mobile plant operators, construction and mining labourers and truck drivers. Policies that promote greater enrolment of women in education or vocational training for these occupations are welcome, such as the Growing our Clean Energy Workforce initiative in Victoria

which subsidises 50% of the cost of new apprenticeships to support more women entering the industry and offers free or low-cost training by professional organisations to women currently working in related energy industries.

The federal government has announced a number of policies to address the jobs and skills shortage. It established a AUD 1 billion JobTrainer fund from 2020-22, to offer free or low fee training in priority certifications, with matched contributions from state and territory governments, and committed AUD 105 million to the New Energy Apprenticeships and New Energy Skills programs to deliver 10,000 energy apprentices and tailor skills training to the specific needs of new energy industries. The 2022-23 federal budget included AUD 922 million in funding over the next five years towards 480,000 fee-free TAFE places, and to establish the TAFE Technology Fund to modernise training facilities. The 2023-24 federal budget included funds to establish the Net Zero Authority to support workers in emissions-intensive sectors and to coordinate programs and policies across government supporting regions and communities through the net zero transition. As part of this, Jobs and Skills Australia is currently conducting a capacity study on the workforce needs for the transition to a clean energy economy. Despite these actions, there is still scope to ramp up active labour market programs in Australia. Job-search and training schemes can help reallocate workers from highly-polluting industries and address skill mismatches (D'Arcangelo et al., 2022). Public spending on training programs in Australia amounted to 0.03% of GDP in 2020, compared to the OECD average of 0.11% of GDP (Figure 3.19).

Figure 3.19. Spending on training policies is low

Public expenditure on training-related labour market programs (% of GDP), 2021



Source: OECD Labour Market Programmes database.

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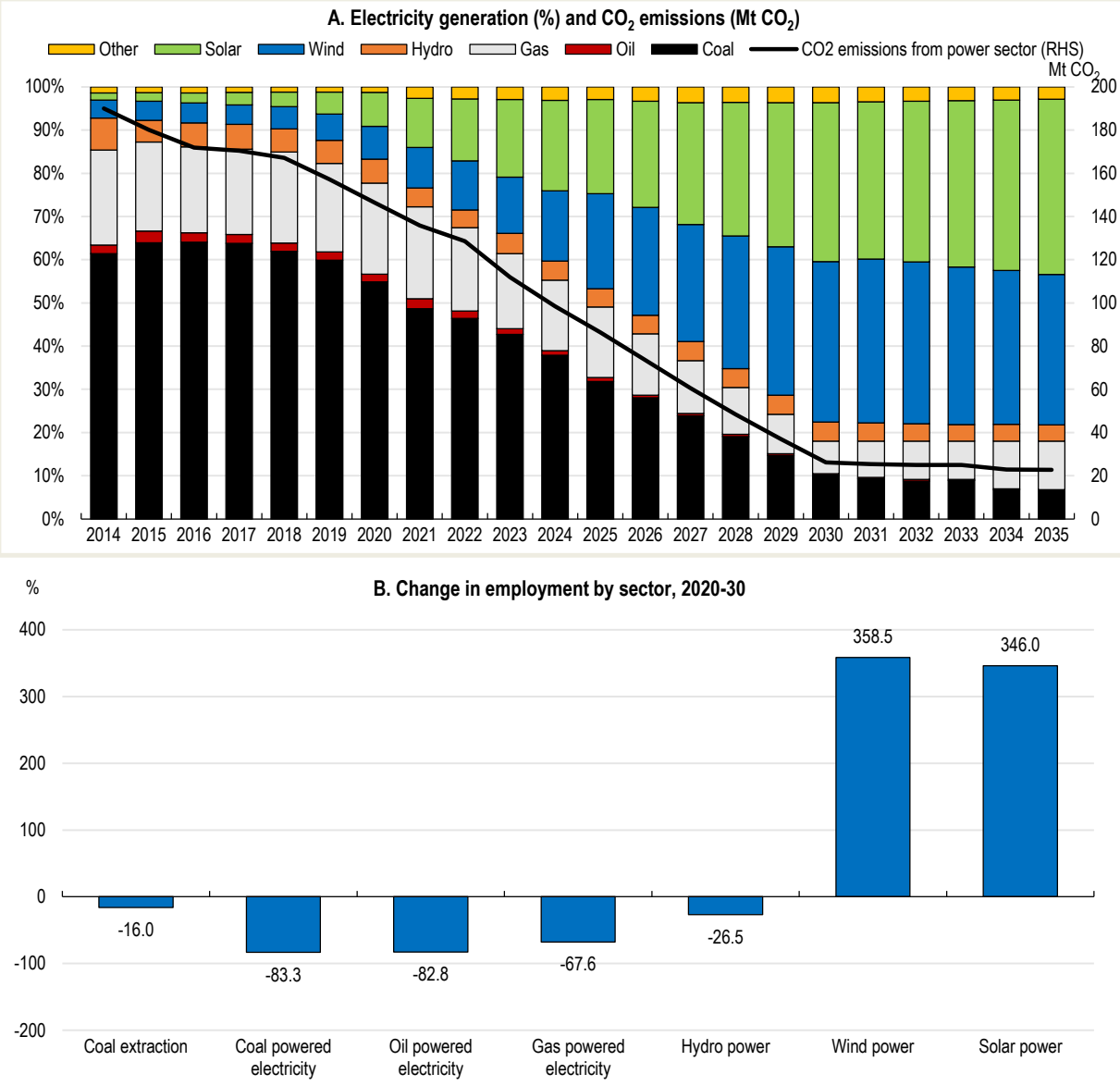
Box 3.6. Labour market reallocation under the transition to net zero

The OECD ENV-Linkages model, a dynamic global Computational General Equilibrium (CGE) model, is used to illustrate the labour market effects of Australia's current climate policies, including the latest reforms to the Safeguard Mechanism and the 82% renewable electricity target by 2030 (Château, Dellink and Lanzi, 2014). The model was calibrated to match the emissions projections of the Department of Climate Change, Energy, the Environment and Water, in which GHG emissions fall by 31% between 2020 and 2035, a significant reduction but still short of Australia's target to reduce emissions by 43% between 2005 and 2030. The model also assumes that the government's 82% renewable electricity target is met by 2030.

Figure 3.20. As electricity generation shifts to renewables, employment in renewable energy will soar, while it will fall significantly in coal, oil and gas-powered electricity generation



Note: This model is calibrated to match the DCCEEW's "additional measures" scenario which takes into account current policies, the latest reforms of the Safeguard Mechanism and the 82% renewable electricity target by 2030.
Source: OECD ENV-Linkages model.

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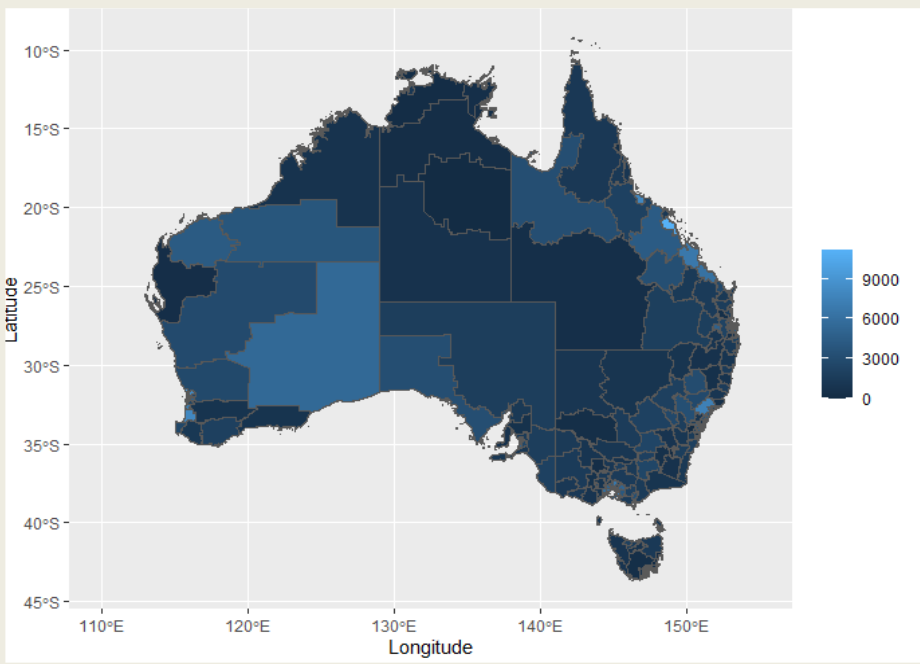
As the power mix dramatically shifts towards renewables, employment in renewable energy is estimated to soar between 2020 and 2030, rising more than three-fold in wind and solar power (Figure 3.20). On the other hand, employment in coal extraction and coal, oil and gas-powered electricity generation is projected to fall significantly as renewable targets are met.

Data from the 2021 Census, the Labour Account and the Household, Income and Labour Dynamics (HILDA) Survey provide information about workers in highly-polluting "brown industries", defined as the 7 ANZSIC subdivision sectors with the highest emissions per worker (similarly to Causa and Soldani, forthcoming) and including coal mining, oil and gas extraction, petroleum and coal product manufacturing. These jobs are highly concentrated geographically in certain specific regions (Figure 3.21). These sectors are also highly gender-segregated, with 80% of male employment, compared to 52.3% for the overall economy. Workers in brown industries also tend to be relatively highly paid and more likely to have received technical education. According to the 2021 Census, the average age of coal miners is slightly higher than Australia's labour force, at 42 years compared to 41 years. By 2030, 20% of the current coal mining workforce under 60 years old will be 60 or older.

Figure 3.21. Employment in brown industries is highly concentrated geographically

Number of employed workers in brown industries, by SA3 region



Note: Brown industries include coal mining, oil and gas extraction, petroleum and coal product manufacturing, non-metallic mineral product manufacturing, primary metal and metal product manufacturing, electricity supply and gas supply.
Source: 2021 Australian Census.

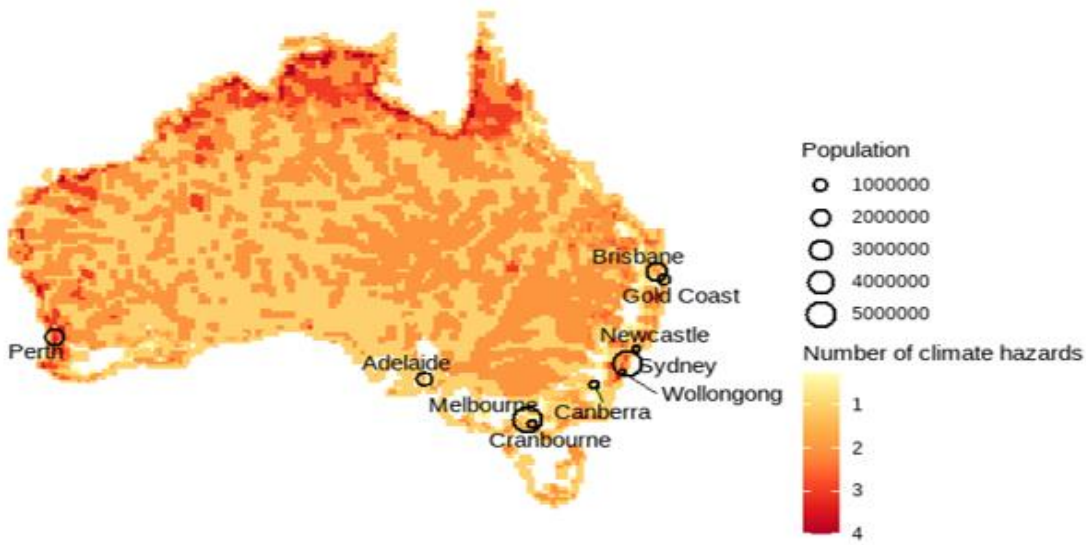
StatLink https://stat.link/0lpfmy

Adapting to climate change

Climate change and higher climate variability increase the risks of climate hazards, affecting the frequency, intensity, extent and duration of extreme weather and climate events (OECD, 2022b; IPCC, 2022; Spinoni, Naumann and Vogt, 2017). This can result in loss of life and property damage and impact biodiversity and ecosystems around the world, with significant economic costs (CRED, 2019).

Australia is particularly exposed to climate-related hazards according to OECD (2022b). Exposure to heat stress and fires is high and rising (Canadell et al., 2021), and droughts have worsened. Australia ranks 2nd and 5th in the world in population and forest exposure to wildfires, 3rd in cropland exposure to drought, and 6th in terms of population exposure to extreme temperatures (OECD Climate-related hazards database). Extreme heat in Australia has already been responsible for more deaths in Australia than any other natural hazard (Productivity Commission, 2023). Heavy rainfall events and tropical cyclones are expected to become more intense (IEA, 2022). Physical capital is also at risk, with Mallon et al. (2019) estimating that the number of properties at high risk from river flooding, coastal inundation, bushfire and wind risk will rise from 383,000 to 736,000 between 2020 and 2100. Importantly, further global warming and related higher climate risks are already "locked in" and will occur regardless of global emissions reductions.

Figure 3.22. North Australia is especially exposed to climate hazards



Note: The multi-hazard map considers only five climate-related hazards: extreme heat, wildfire, wind threats, coastal flooding and river flooding. Areas exposed to extreme heat experience more than 14 days of very hot days (daily maximum temperature exceeding 35 °C). Wildfire risk refers to regions where the Canadian Fire Weather Index, adjusted for biomass availability, indicates very high or extreme fire danger. Regions exposed to wind threats experience violent storms with a sustained gust speed of at least 28.6 m/s (Beaufort class 11). River and coastal flooding refer to areas that are exposed to flooding with a return period of 100 years.
Source: Maes et al. 2022.

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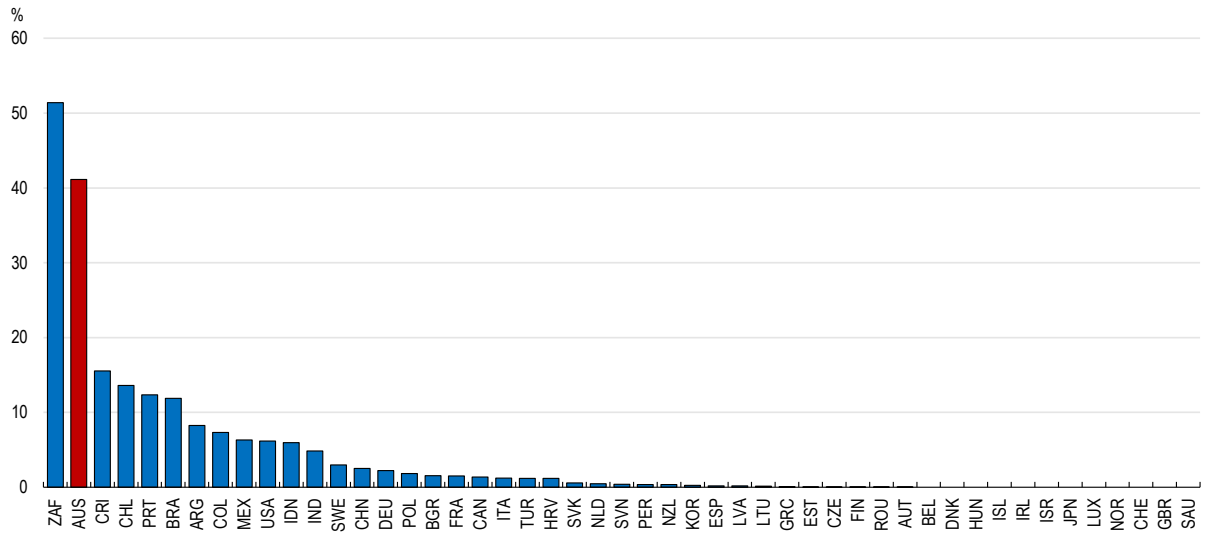
Figure 3.23. Australia is among the countries with the highest exposure to wildfire risks

Percentage of population exposed to very high or extreme wildfire danger, annual average over 2017-2021



Source: IEA/OECD Climate-related hazards: Wildfire, Environment Statistics database.

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Some of these climate-related hazards are already impacting Australia. Severe bushfires in many parts of the country during the Black Summer of 2019-20 burnt an estimated 24.3 million hectares, destroyed 3,000 buildings, and drove some endangered species into extinction, with economic costs approaching AUD 100 billion (Royal Commission, 2020; Binskin, Bennett and Macintosh, 2020; Slezak, 2020; Daley, 2020). In early 2022, Australia experienced one of the country's most severe flood disasters with a series of floods in the states of Queensland and New South Wales causing hundreds of school closures, evacuations and food shortages. According to Insurance Council of Australia, these floods incurred almost AUD 6 billion in insurance claims as of April 2023.

As set out in Australia's National Climate Resilience and Adaptation Strategy 2021-2025, the National Adaptation Policy Office coordinates climate resilience and adaptation policies across all governments and acts as a point of contact for businesses and communities. Key principles of the Strategy include coordination between different levels of government and businesses and communities to drive action and investments, and delivering climate information and services to help businesses and communities adapt. The 2022-23 Budget provided AUD 9.3 million to the Climate Risk and Opportunity Management Program, tasked with developing a National Climate Risk Assessment to assess the climate change risks and inform plans for adaptation and resilience. All states and territories have also developed adaptation plans.

To date, public policies in Australia have focused on emergency response and disaster recovery. In September 2022, a new National Emergency Management Agency (NEMA) was created by merging two previously existing agencies to deliver a more coordinated approach to emergencies and prepare for future hazards. The Disaster Recovery Funding Arrangements (DRFA), managed by NEMA, provides financial support to the state and territory governments to assist individuals and communities to recover from disasters. As part of the DRFA, states and territories are encouraged to incorporate resilience-building programs into the overall recovery. For instance, in May 2022, the Queensland Government announced the AUD 741 million Resilient Homes Fund, which is jointly funded with the Australian Government and is designed to help homeowners affected by flooding to raise, repair, retrofit or have their home voluntarily bought back. A similar AUD 700 million fund was announced in New South Wales. Also, in September 2022, the Australian Government committed AUD 200 million annually through the Emergency Response Fund for disaster prevention and resilience. There has been a similar focus on strengthening emergency preparedness and response capacities in other countries (OECD, 2023; Rodrigues et al., 2022; Verkerk,

Martinez de Arano and Palahí, 2018). In the United States, for example, public funding for wildfire suppression quadrupled from 1985-99 to 2000-19 (Roman, Verzoni and Sutherland, 2020), while it doubled in Greece between 1998 and 2008. However, the growing frequency and severity of wildfires have strained emergency response resources. For example, preparedness spending is estimated to have to double by 2071-2100 in the Canadian provinces of Alberta, British Columbia and Ontario to keep the current levels of success in wildfire response (OECD, 2023; Hope et al., 2016). In Australia, wildfire suppression has also become more costly, with the 2009 Black Saturday wildfires requiring more than one month of suppression to extinguish (Swiss Re, 2015). For these reasons, while emergency response and disaster recovery will need to remain well-funded, adaptation and risk prevention efforts that reduce the exposure of people and economic activities to natural disasters will have to take a more important role in improving resilience to climate change. In the last two decades, Australia has increasingly shifted to a resilience-based policy approach that considers broader factors relating to vulnerability and adaptation, starting with a National Strategy for Disaster Resilience in 2011 with further progress through the Natural Disaster Risk Reduction Framework which was released in April 2019.

Combining natural hazard information and land-use planning policies can be an effective adaptation policy. Land-use planning can limit development in more hazard-prone areas and mandate specific risk-prevention measures for new and existing constructions. For example, regulating building height and zoning density can reduce the spread of fire and increase fire resilience (Ganteaume and Long-Fournel, 2015). In Portugal, construction is forbidden in areas characterised by “high” and “very high” wildfire hazard (OECD, 2023; Presidency of the Council of Ministers, Portugal, 2021), but there can be exceptions if certain risk reduction measures are adopted. In certain countries like Greece and the United States, the lack of land-use regulations informed by wildfire risk assessments led to strong population growth in at-risk areas, contributing to higher wildfire impacts in recent years (Radeloff et al., 2018; Blandford, 2019; Triantis, 2022). In Australia, most buildings were built before the inclusion of wildfire risk consideration in planning and building regulations, and settlement patterns have resulted in low-density urban sprawl and rural-residential developments that encroach into fire-prone areas (Gonzalez-Mathiesen, Ruane and March, 2021). Spatial planning systems are the responsibility of states in Australia, and the degree to which land-use planning acts to mitigate risk varies across jurisdictions. In Victoria, the Planning Policy Framework ensures that the existence of bushfire hazard triggers planning and building permit requirements and that bushfire is considered in decision making. In New South Wales, appropriate consideration of bush fire hazards at the strategic planning phase is required under The Environmental Planning and Assessment Act. In ACT, bushfire risk is considered at all levels of land-use planning, particularly for areas susceptible to bushfires and areas proposed for urban development (ACT Government, 2019). However, all states currently permit homes to be built in bushfire and flood prone areas (Royal Commission, 2020). The consideration of natural disaster risk should be a requirement in all states and territories when making land-use planning decisions for new developments. There is also significant scope for hazard mapping data to be improved. In 2022, National Cabinet tasked Planning Ministers with developing a national standard for considering disaster and climate risk as part of land use planning and building reform processes.

Public policies can help to adapt the Australian economy to climate change by inducing reductions in vulnerability and exposure to climate hazards. Incomplete information or lack of public awareness of climate-related risks can lead to sub-optimal preparation and uninformed adaptation decisions by households and businesses (Economides et al., 2018). While recent climate-related disasters and public initiatives have heightened awareness, further efforts can be made to inform the public and encourage individuals and businesses to take protective measures and adapt to climate change more effectively. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Bureau of Meteorology publish a State of the Climate Report providing climate projections every two years, and also provide this information on the Climate Change in Australia website along with various projections tools designed to help with planning for climate-related risk. The disclosure of climate-related risks could be made compulsory in certain cases such as the sale of residential or commercial properties, where sellers might

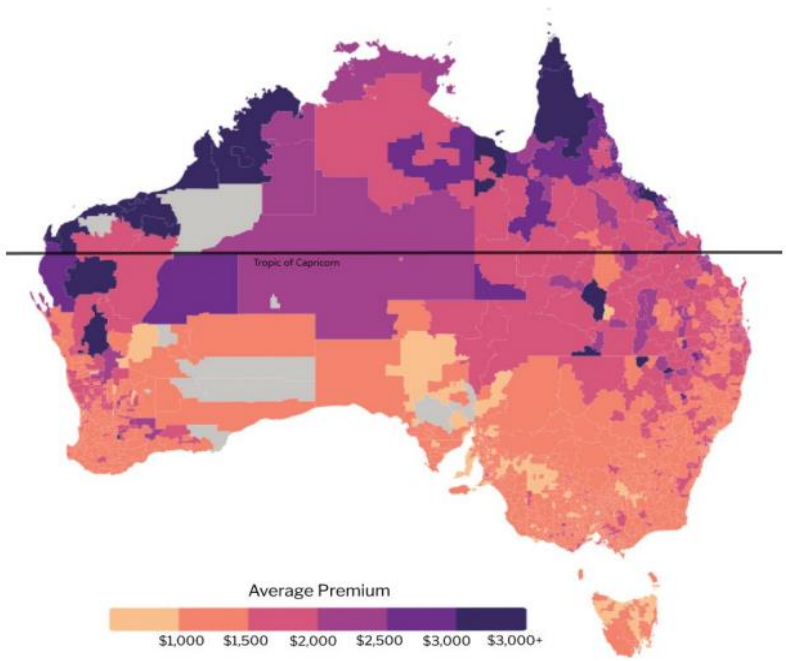
not have incentives to disclose this information. The Treasury has recently released a consultation paper proposing a broad range of companies and financial institutions be subject to the mandatory disclosure requirements. This would commence with the largest listed and unlisted companies for the 2024-25 financial reporting periods, with other companies phased in over time. These rules should cover as many types of entities as possible, which will require increased climate reporting capability.

Insurance premiums that better reflect climate and hazard risks provide an important price signal that can help households and businesses understand the risks they face and make better investment decisions. Wider dissemination of information on climate and hazard-related risks would also improve the insurance industry's assessment of climate risks and its ability to price these accurately (Productivity Commission, 2023), as well as help avoid the risk of insurers not providing insurance at all in certain regions given their inability to judge the risks. Disaster-related insurance claims have risen strongly, doubling from around AUD 1.5 billion per year in 2005 to AUD 3 billion in 2022 (Lefebvre and Reinhard, 2022). Expanding private insurance coverage can also limit the extent to which the government becomes the insurer of last resort, which can have high potential fiscal costs. Between 2010-11 and 2022-23, the Commonwealth Government has paid out more than AUD 16 billion to the states and territories through Disaster Recovery Funding Arrangements, and fiscal costs are projected to rise further. Private actors who expect the government to cover losses from large natural disasters have fewer incentives to minimize risks and invest in protection and resilient infrastructure. Clearer risk-sharing rules can reduce uncertainty over recovery from disasters and incentivise better private behaviour.

More elevated climate-related risks in northern Australia are driving considerably higher insurance premiums compared to the rest of the country (Figure 3.24), leading to higher rates of non-insurance in the region (ACCC, 2022). According to the Northern Australia insurance inquiry (ACCC, 2020), rates of non-insurance in northern Australia appear to be significant and rising, with estimates of home non-insurance rates of around 20% using Census 2016 data, higher than the estimated non-insurance rate for Australia overall, at around 11%. As a result, a public Cyclone Reinsurance Pool was established in July 2021, backed by a AUD 10 billion government guarantee and covering damages from extreme cyclonic winds, cyclone related flooding and storm surge. This Pool was introduced to improve insurance accessibility and affordability for households and small businesses faced with high insurance premiums. It includes incentives for residential risk mitigation by offering discounts for properties that undertake certain measures such as tying down their roofs or adding window protection. The Australian Competition and Consumer Commission (ACCC) is tasked with annually monitoring the impact of the Reinsurance Pool. It will be important to monitor whether savings from the reinsurance pool are being passed on from insurance companies to policyholders. Monitoring competition in the insurance sector and ensuring that there is public and transparent information on insurance costs will help ensure that insurance premiums are competitive. A national home insurance comparison website, as recommended by the ACCC, could improve competition in the insurance sector and provide households with better information (ACCC, 2020). Public reinsurance subsidises insurance premiums and risks distorting investment decisions (Productivity Commissions, 2023), and improved affordability of catastrophe insurance may disincentivise risk reduction and adaptation measures. Alternative policies include making climate disaster-related insurance coverage mandatory, as it is in Lichtenstein, which can help to improve insurability in high-risk areas via mutualisation (ECB and EIOPA, 2023).

Figure 3.24. Insurance premiums are particularly high in the hazard-prone North

Average premiums for residential combined building and contents insurance, 2021-22



Source: ACCC.

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Improving the resilience of infrastructure to extreme climate events will further reduce vulnerabilities to climate change. This is particularly important for new infrastructure given that it will last for many years. In the case of public infrastructure, fully incorporating adaptation concerns in the procurement process could establish a level playing field given that integrating climate resilience in procurement offers can be costly (OECD, 2018).

Agriculture will be particularly impacted by climate change through greater variability of rainfall and temperatures and a greater frequency of droughts, floods, wildfires and other extreme natural disasters. Recent studies suggest that farm profitability has already been impacted. For example, Hochman, Gobbett and Horan (2017) estimate that climate change has reduced wheat yields by 27% since 1990, and Hughes et al. (2022) estimate that it has reduced Australian farm profits by 23% in the last 20 years. Drought preparedness has been a focus of the Australian government's interventions in the agricultural sector (OECD, 2023). The *On-farm Emergency Water Infrastructure Rebate Scheme* was launched in December 2018 and includes AUD 100 million in funding for farmers to improve drought preparedness through the installation of on-farm water infrastructure. The *Future Drought Fund* provides AUD 100 million each year to help farmers and communities build drought resilience, and has allocated a total of AUD 420 million to drought resilience initiatives focused on improving climate information in the agricultural sector, improving the planning capacity of farmers, and promoting better practices. As a result of the focus on drought preparedness, wheat yield drought risk has shown a strong improvement since 2007-2008 as new practices have improved crop yields under dry conditions (ABARES, 2021). Rural Research and Development Corporations (RDCs) have been important vehicles for the government to support rural innovation. These constitute partnerships between the government and industry share funding and strategic direction-setting for R&D. Further prioritisation of R&D on adaptation technologies in agriculture could be considered.

Due to its central role in the transition to net zero, climate change adaptation in the energy sector is key. Rising temperatures and the increasing frequency of extreme heat not only affect energy demand (for cooling) but also energy supply by reducing the thermal capacity of transmission lines, reducing the efficiency of power plants, and causing failures (Ke et al., 2016). While the Electricity Sector Climate Information Project provides important information on climate risks for the electricity sector, including climate projections at a granular location level, Australia has not undertaken a fully comprehensive assessment of the impacts of climate change on the energy sector (IEA, 2023). A National Adaptation Plan, announced in the 2023-24 Budget, is currently under development. This should include plans specifically for the energy sector, to identify priorities and co-ordinate further action.

Recommendations for achieving the transition to net zero in Australia

MAIN FINDINGS	RECOMMENDATIONS (Key recommendations in bold)
Establishing a long-term national emissions reduction strategy	
Diverse emission reduction targets and policies at the state and territory level imply different costs of emission abatement across states and will come at a higher cost than a nationally coordinated strategy.	Improve coordination of climate transition policies between federal, state and territory governments.
Achieving emissions reductions in Electricity, Mining, Industry, Transport, Agriculture and Buildings	
The development and deployment of clean energy technologies and electricity transmission infrastructure is a key component of the transition to net zero. Australia's public spending on energy research, development and demonstration is significantly below the IEA average. It is also unclear whether current policies will achieve the necessary increase in renewable energy generation, storage and transmission.	**Consider scaling up and refocusing public funding towards the development and demonstration of clean energy and energy-efficiency technologies.** **Stand ready to provide further policy support and accelerate the planning and implementation of renewable energy projects to ensure that renewable energy targets are met.**
Emissions baselines (or limits) under the Safeguard Mechanism have been tightened and will decline by 4.9% per year until 2030. Facilities that reduce their emissions below their baseline will earn credits. Facilities that are both highly emissions-intensive and trade-exposed will be able to apply for slower baseline decline rates.	**Switch to limits on total emissions if the current Safeguard Mechanism baselines based on emissions intensity fail to deliver the desired emissions reductions, and consider broadening the coverage of the mechanism.** Regularly review whether the baseline decline rates under the Safeguard Mechanism are appropriate, along with the special treatment of emissions-intensive, trade-exposed facilities.
Given that industrial facilities under the Safeguard Mechanism can meet their baselines by using carbon offsets, it is imperative to ensure their credibility and integrity. A recent independent Review of Australian Carbon Credit Units produced a list of 16 recommendations to improve their integrity, which the government has supported in principle.	Fully implement the recommendations in the Review of Australian Carbon Credit Units.
Existing energy efficiency certificates, such as the New South Wales Energy Savings Scheme, have seen little take up from small industrial facilities. This is in part due to the fact that plant-specific efficiency measures are difficult to standardize and compare across facilities.	Focus energy savings schemes in industry on energy savings from common industrial equipment. Consider establishing a federal energy savings scheme.
Transport is projected to become the largest source of emissions in Australia by 2035. Vehicle fuel efficiency is low in Australia and will need to increase rapidly to achieve emissions targets, along with a quick take-up of electric vehicles. Fuel economy standards for light vehicles are currently under elaboration. States have introduced various policies to promote purchases of electric vehicles, including rebates, stamp duty exemptions, and free registrations, which come at a high fiscal cost.	**Align the various state subsidy programmes for electric vehicles and introduce stringent federal fuel economy standards.** Relax import restrictions on low- and zero-emissions vehicles. Consider introducing fuel economy standards for trucks and other heavy vehicles.
On-road heavy vehicles are currently eligible for a reduced fuel tax in Australia, and businesses pay no fuel tax on fuels used for off-road vehicles.	Reduce or eliminate fuel tax exemptions for heavy vehicles and machinery.
Australia currently has a very low amount of charging points per electric vehicle. Further increasing demand for electric vehicles will require drastically increasing the number of public charging points.	Further increase public funding of electric vehicle charging infrastructure.
Public revenues from the fuel excise will collapse if internal combustion engine vehicles are replaced by electric vehicles.	Consider extending the use of distance-based road user charging.
There is no specific emissions reduction target for the agriculture sector. Such a target could be helpful to focus mitigation efforts, measure progress and send an important signal to the industry.	Consider introducing a specific emissions reduction target for agriculture.
Overall public support to agriculture is low (0.2% of GDP), with a focus on market openness, building climate resilience, and investments in public goods, including research and development, hydrological infrastructure and biosecurity. Extension services and agricultural education receive smaller amounts of funding.	**Further increase support for agricultural research and development as well as extension services and agricultural education, with a particular focus on emissions reduction technologies and practices.**
Agriculture has the potential to become an important source of carbon offsets but there have been very few agricultural projects that have generated Australian Carbon Credit Units to date. There are few eligible agricultural methods under the Australian Carbon Credit Units Scheme and the administrative costs of submitting projects can be high for smaller farms.	Expand the list of agricultural methods eligible under the Australian Carbon Credit Units Scheme while ensuring their additionality and effectiveness in reducing emissions. Streamline administrative processes to participate in the Scheme and provide direct support to potential scheme participants through capacity building programmes.

Further electrification and strong improvements in energy efficiency are required to significantly reduce emissions from buildings. The Nationwide House Energy Rating System (NatHERS) is voluntary and does not cover existing housing and rental properties.	**Regularly update energy efficiency requirements in the National Construction Code.** Implement a disclosure obligation of the NatHERS rating, especially for rental properties.
Retrofitting the existing housing stock to make it more energy efficient is a crucial priority to achieve decarbonisation targets. However, energy efficiency standards can imply large costs, which can weigh particularly on lower-income households.	Consider introducing targeted support at state level for low-income households to improve the energy efficiency of existing housing.
Addressing the challenges and opportunities of the labour market transition	
Although the absolute number of workers in coal mining is not large, jobs are highly concentrated geographically in regional parts of Queensland, New South Wales, and Western Australia.	Target place-based policies such as re-training, up-skilling and public investment programs in the regions most dependent on employment in fossil fuel industries.
Renewable energy will be a major source of jobs in Australia. However, half of the workers needed for the renewable energy transition are needed in an occupation currently facing national shortages and requiring formal education and training. Participation by women in some of these occupations (e.g. electricians and engineers) is very low. Public spending on training programs in Australia is also low compared to other OECD countries.	Establish a comprehensive survey of future employment needs in the energy sector. Consider policies to promote greater enrolment of women in education or vocational training for key energy sector occupations, such as apprenticeship subsidies and free or low-cost training programmes. Consider increasing funding for active labour market policies including job-search and training schemes.
Adapting to climate change	
Australia is particularly exposed to climate-related hazards. Informing the public and raising awareness can encourage individuals and businesses to take protective measures and adapt to climate change more effectively.	**Consider improving the disclosure of climate and hazard-related risks in certain cases such as the sale of residential or commercial properties.**
Land-use planning is the responsibility of states and territories in Australia, and the degree to which climate hazard information is used for spatial planning varies. Land-use planning can limit development in more hazard-prone areas and mandate specific risk-prevention measures for new and existing constructions.	**Require all states and territories to consider climate and hazard risk when making land-use planning decisions for new developments**.
Agriculture will be particularly impacted by climate change through greater variability of rainfall and temperatures and a greater frequency of droughts, floods, wildfires and other extreme natural disasters. The Australian government's adaptation interventions in the agricultural sector have focused on drought preparedness, with less of a focus on R&D and extension services.	Further prioritisation of R&D on adaptation technologies in agriculture could be considered.
Rising temperatures and the increasing frequency of extreme heat constitute a key risk for the energy system. Australia has not undertaken a fully comprehensive assessment of the impacts of climate change on the energy sector to date.	Develop a national adaptation plan specifically for the energy sector to identify priorities and co-ordinate further action.

References

ABARES (2021), ABARES Insights: Analysis of Climate change impacts and adaptation on Australian farms.

ACCC (2020), Northern Australia insurance inquiry – final report

ACCC (2022), ACCC Insurance monitoring report, December 2022.

Accenture (2023), Skilling Australian industry for the energy transition, Australian Industry Energy Transitions Initiative.

ACT Government (2019), Strategic Bushfire Management Plan 2019-2024.

Anderson, Soren T., Ian W. H. Parry, James M. Sallee and Carolyn Fischer (2011), Automobile Fuel Economy Standards: Impacts, Efficiency, and Alternatives, Review of Environmental Economics and Policy, Volume 5, Issue 1, Winter 2011, pages 1-194

Arlinghaus, J. (2015), "Impacts of Carbon Prices on Indicators of Competitiveness: A Review of Empirical Findings", OECD Environment Working Papers, No. 87, OECD Publishing, Paris

Australian National University (2022), Australia's carbon market a 'fraud on the environment', 24 March 2022.

Becker, S., K. Ekholm and M. Muendler (2013), "Offshoring and the onshore composition of tasks and skills", Journal of International Economics, Vol. 90/1, pp. 91-106.

Berestycki, C., S. Carattini, A. Dechezleprêtre and T. Kruse (2022), Measuring and assessing the effects of climate policy uncertainty, OECD Economic Department Working Papers No. 1724, Paris.

Binskin, Mark; Bennett, Annabelle; Macintosh, Andrew (2020). Royal Commission into Natural Disaster Arrangements, Commonwealth of Australia. p. 115.

Blandford, D. (2019), ""Burn baby burn" – Controlling the risk of wildfires in Greece", Discussion paper prepared for the annual meetings of the Agricultural Economics Society at Warwick University, UK,, 15-17 April 2019.

Botta, E. (2019), "A review of "Transition Management" strategies: Lessons for advancing the green low-carbon transition", OECD Green Growth Papers, No. 2019/04, OECD Publishing, Paris.

Briggs, C., Rutovitz, J., Dominish, E., Nagrath, K. 2020. Renewable Energy Jobs in Australia – Stage One. Prepared for the Clean Energy Council by the Institute for Sustainable Futures, University of Technology Sydney

Browne, B. and Swann, T. 2017, Money for nothing, May 2017, The Australia Institute, Canberra.

Brucal, A. and D. McCoy (forthcoming), "Social and distributional impacts of residential energy efficiency policies", OECD Environment Working Papers.

Caldecott, B., O. Sartor and T. Spencer (2017), Lessons from previous coal transitions, High-level summary for decision makers, IDDRI and Climate Strategies.

Canadell, J. et al. (2021), "Multi-decadal increase of forest burned area in Australia is linked to climate change", Nature Communications, Vol. 12/1, p. 6921, https://doi.org/10.1038/s41467- 021-27225-4.

Causa, O. and E. Soldani (forthcoming), Lost in transition? Labour market effects of greening the economy.

Causa, O., M. Abendschein and M. Cavalleri (2021), The laws of attraction: Economic drivers of inter-regional migration, housing costs and the role of policies, OECD Economics Department Working Papers No. 1678.

Chateau, J., R. Bibas and E. Lanzi (2018), "Impacts of Green Growth Policies on Labour Markets and Wage Income Distribution: A General Equilibrium Application to Climate and Energy Policies", OECD Environment Working Papers, No. 137, OECD Publishing, Paris.

Climate Change Authority (2015) Special Review second draft report: Australia's climate policy options, November 2015.

Coates, B. and J. Moloney (2023), Housing policy needs a game-changer, Published in The Guardian, 24 April 2023.

Consoli, D., G. Marin, A. Marzucchi and F. Vona (2016), Do green jobs differ from non-green jobs in terms of skills and human capital?, Research Policy, 2016, vol. 45, issue 5, 1046-1060

CRED (2019), Natural Disasters 2019, Centre for Research on the Epidemiology of Disasters, Brussels.

CSIRO/BOM (2022), State of Climate Report 2022, The Commonwealth Scientific and Industrial Research Organisation and the Bureau of Meteorology.

D'Arcangelo, F., et al. (2022), "Estimating the CO2 emission and revenue effects of carbon pricing: New evidence from a large cross-country dataset", OECD Economics Department Working Papers, No. 1732, OECD Publishing, Paris.

Daley, Beth (2020). "With costs approaching $100 billion, the fires are Australia's costliest natural disaster", Published by The Conversation, 17 January 2020.

DCCEEW (2022), Australia's Emissions Projections 2022, Department of Climate Change, Energy, the Environment and Water, December 2022.

Dechezleprêtre, A. et al. (2022), "Fighting climate change: International attitudes toward climate policies", OECD Economics Department Working Papers, No. 1714, OECD Publishing, Paris.

Department of Climate Change, Energy, the Environment and Water (2022a), "Australian Energy Update 2022", September 2022, Australia.

Department of Climate Change, Energy, the Environment and Water (2022b), "Australia's emissions projections 2022", December 2022, Australia.

Department of Industry, Science Energy and Resources (2022), National Inventory Report 2020, May 2022.

ECB and EIOPA (2023), Policy options to reduce the climate insurance protection gap, European Central Bank and European Insurance and Occupational Pensions Authority Discussion Paper, April 2023.

Economides, G., A. Papandreou, E. Sartzetakis and A. Xepapadeas (2018), The Economics of Climate Change, Climate Change Impacts Study Committee, June 2018.

Federal Chamber of Automotive Industries (2023), FCAI releases 2022 new car sales data, 5 January 2023.

Fullerton, D. and E. Muehlegger (2017), Who Bears the Economic Costs of Environmental Regulations?, National Bureau of Economic Research, Cambridge, MA.

Ganteaume, A. and M. Long-Fournel (2015), "Driving factors of fire density can spatially vary at the local scale in south-eastern France", International Journal of Wildland Fire, Vol. 24/5, pp. 650-664.

Gonzalez-Mathiesen, C., S. Ruane, A. March (2021), Integrating wildfire risk management and spatial planning – A historical review of two Australian planning systems, International Journal of Disaster Risk Reduction, Volume 53, 2021.

Grattan Institute (2021), Towards net zero: Practical policies to reduce agricultural emissions.

Grattan Institute (2021b), Towards net zero: Practical policies to reduce industrial emissions.

Grundke, R. and J. Arnold (2022), "Mastering the transition: A synthetic literature review of trade adaptation policies", OECD Economics Department Working Papers, No. 1719, OECD Publishing, Paris.

Hanson, G. H. (2023), Local Labor Market Impacts of the Energy Transition: Prospects and Policies, NBER Working Paper 30871.

Hochman, Z., D. Gobbett and H. Horan (2017), Climate trends account for stalled wheat yields since 1990, Global Change Biology, Volume 23, Issue 5, p. 2071-2081.

Hoeller, P., V. Ziemann, B. Cournede and M. Bétin (2023), Home, green home: policies to decarbonize housing, OECD Economics Department Working Papers No. 1751

Hope, E. S., D. W. McKenney, J. H. Pedlar, B. J. Stocks, S. Gauthier (2016), "Wildfire suppression costs for Canada under a changing climate", PLoS ONE 11(8).

Hughes, A., Britt, A., Pheeney, J., Summerfield, D., Senior, A., Hitchman, A., Cross, A., Sexton, M., Colclough, H., Hill, J. 2023. Australia's Identified Mineral Resources 2022. Geoscience Australia, Canberra.

Hughes, N., M. Lu, W.Y. Soh and K. Lawson (2022), Modelling the effects of climate change on the profitability of Australian farms, Climatic Change, vol. 172, no. 1.

Hummels, D. et al. (2012), "Offshoring, Transition, and Training: Evidence from Danish Matched Worker-Firm Data", American Economic Review: Papers & Proceedings, Vol. 102/3, pp. 424– 428.

Hyman, B. (2018), "Can Displaced Labor Be Retrained? Evidence from Quasi-Random Assignment to Trade Adjustment Assistance", SSRN network.

IEA (2021), Net Zero by 2050: A roadmap for the global energy sector, International Energy Agency, May 2021.

IEA (2022a), Greenhouse Gas Emissions from Energy database, International Energy Agency, July 2023.

IEA (2022b), Tracking Clean Energy Progress, International Energy Agency.

IEA (2022d), Renovation of near 20% of existing building stock to zero-carbon-ready by 2030 is ambitious but necessary, International Energy Agency, September 2022, Paris.

IEA (2022e), Australia's climate resilience policy indicator, International Energy Agency, June 2022, Paris.

IEA (2022f), World Energy Outlook 2022, International Energy Agency, October 2022, Paris.

IEA (2022g), Coal in Net Zero Transitions: Strategies for rapid, secure and people-centred change, International Energy Agency, November 2022, Paris

IEA (2023), Australia 2023: Energy Policy Review, International Energy Agency, April 2023, Paris.

IEA (2023b), Global EV Outlook 2023, International Energy Agency, April 2023, Paris

IEA (2023c), Energy Technology RD&D Budgets database, International Energy Agency, October 2023, Paris.

IMF/OECD (2021), Tax Policy and Climate Change, IMF/OECD Report for the G20 Finance Ministers and Central Bank Governors, April 2021.

Infrastructure Australia (2021), Infrastructure workforce and skills supply: A report from Infrastructure Australia's Market Capacity Program. October 2021

IPART (2021), ESS Registry, NSW Government.

IPCC (2022), Climate Change 2022: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press, Cambridge, UK and New York, NY, USA, 3056 pp.

Ke, X., D. Wu, J. Rice, M. Kintner-Meyer, N. Lu (2016), Quantifying impacts of heat waves on power grid operation, Applied Energy, Volume 183, 2016, Pages 504-512,

Lee, Chyi Lin, Nicholas Gumulya, and Mustapha Bangura. 2022. "The Role of Mandatory Building Efficiency Disclosure on Green Building Price Premium: Evidence from Australia" Buildings 12, no. 3: 297.

Macintosh, A. 2022, The Emissions Reduction Fund's Landfill Gas Method: An Assessment of its Integrity, 16 March, The Australian National University, Canberra.

Macintosh, A. Butler, D., Ansell, D and Waschka, M. 2022, Integrity Problems with the ERF's 2022 Plantation Forestry Method, 12 August, The Australian National University, Canberra.

Macintosh, A. Butler, D., Ansell, D Larraondo, P.R., and Gibbons, P. 2022, The ERF's Human-induced Regeneration (HIR): What the Beare and Chambers Report Really Found and a Critique of its Method, 16 March, The Australian National University, Canberra.

Macintosh, A. Butler, D., Ansell, D, Waschka, M. and Evans, M.C. 2022, 'We blew the whistle on Australia's central climate policy. Here's what a new federal government probe must fix', published by The Conversation, 30 June 2022.

Macintosh, A. Butler, D. and Ansell, D. 2022, Measurement Error in the Emissions Reduction Fund's Human-induced Regeneration (HIR) Method, 14 March, The Australian National University, Canberra.

Maes M. J. A., et al. (2022), "Monitoring exposure to climate-related hazards: Indicator methodology and key results", OECD Environment Working Papers, No. 201, OECD Publishing, Paris.

Mallon, K., M. McKinlay, N. Haughton, R. Hamdenm R. Tedder and J. Lamb (2019), Climate Change Risk to Australia's Built Environment, October, XDI.

Marin, G. and F. Vona (2019), "Climate policies and skill-biased employment dynamics: Evidence from EU countries", Journal of Environmental Economics and Management, Vol. 98, p. 102253.

Martin, R., M. Muûls and U. Wagner (2016), "The Impact of the European Union Emissions Trading Scheme on Regulated Firms: What Is the Evidence after Ten Years?", Review of Environmental Economics and Policy, Vol. 10/1, pp. 129-148.

McDonald, H., A. Frelih-Larsen, A. Lóránt, L. Duin, S. Pyndt Andersen, G. Costa and H. Bradley (2021), Carbon farming: making agriculture fit for 2030, European Parliament.

Morris, A. C., N. Kaufman and S. Doshi (2019), The risk of fiscal collapse in coal-reliant communities, Columbia University

OECD (2018), "Climate-resilient infrastructure", OECD Environment Policy Paper No. 14.

OECD (2021). "R&D Tax Incentives: Australia, 2021", Directorate for Science, Technology and Innovation, December 2021.

OECD (2021b), Effective Carbon Rates 2021: Pricing Carbon Emissions through Taxes and Emissions Trading, OECD Publishing, Paris.

OECD (2021c), OECD Economic Surveys: Denmark 2021, OECD Publishing, Paris.

OECD (2022), Agricultural Policy Monitoring and Evaluation 2022: Reforming Agricultural Policies for Climate Change Mitigation, OECD Publishing, Paris.

OECD (2022b), Monitoring exposure to climate-related hazards, OECD Environment Working Papers.

OECD (2022c), Housing Taxation in OECD Countries, OECD Tax Policy Studies, No. 29, OECD Publishing, Paris.

OECD (2023), Agricultural Policy Monitoring and Evaluation 2023, forthcoming.

OECD (2023b), OECD Inventory of Support Measures for Fossil Fuels.

OECD (2023c), Taming Wildfires in the Context of Climate Change, OECD Publishing, Paris.

Presidency of the Council of Ministers, Portugal (2021), Decree-Law No. 82/2021 of 13 October 2021.

Productivity Commission (2023), 5-year Productivity Inquiry: Managing the climate transition, Inquiry report – volume 6, Report no. 100, 7 February 2023.

Radeloff, V. et al. (2018), "Rapid growth of the US wildland-urban interface raises wildfire risk", Proceedings of the National Academy of Sciences, Vol. 115/13, pp. 3314-3319.

Reusens, P., F. Vastmans and S. Damen (2022), "The impact of changes in dwelling characteristics", Working Paper Research.

Rodrigues, M. et al. (2022), "Integrating geospatial wildfire models to delineate landscape management zones and inform decision-making in Mediterranean areas", Safety Science, Vol. 147, p. 105616.

Roman, J., A. Verzoni and S. Sutherland (2020), "Greetings from the 2020 wildfire season", NFPA Journal.

Royal Commission (2020), Royal Commission into National Natural Disaster Arrangements, Canberra.

Saussay, A., M. Sato, F. Vona and L. O'Kane (2022), Who's fit for the low-carbon transition? Emerging skills and wage gaps in job ad data, Grantham Research Institute on Climate Change and the Environment.

Slezak, Michael (2020), "'Almost inconceivable': 3 billion animals believed killed or displaced in Australia's summer fires", published by ABC News, 28 July 2020.

Spinoni, J., G. Naumann and J. Vogt (2017), "Pan-European seasonal trends and recent changes of drought frequency and severity", Global and Planetary Change, Vol. 148, pp. 113- 130.

Stanford, J. (2020), Employment aspects of the transition from fossil fuels, The Center for Future Work at the Australia Institute.

Swiss Re (2015), Fueling Resilience: Climate and Wildfire Risk in the United States, Swiss Reinsurance Company Ltd., Zurich.

Terrill, M. (2023), "Overhall fuel tax credits to put a price on burning diesel", Published in The Australian Financial Review, 6 February 2023.

Triantis, L. (2022), "Normalising spatial vulnerability in the era of climate crisis? Private property, informality, and post-disaster planning in peri-urban east Attica/Greece", Planning Theory, Vol. 22/1.

Verkerk, P., I. Martinez de Arano and M. Palahí (2018), "The bio-economy as an opportunity to tackle wildfires in Mediterranean forest ecosystems", Forest Policy and Economics, Vol. 1- 3/86.

Vona, F., G. Marin, D. Consoli and D. Popp (2018), "Environmental Regulation and Green Skills: An Empirical Exploration", Journal of the Association of Environmental and Resource Economists, Volume 5, Number 4, October 2018.

Wood, T. and G. Dundas (2020), Start with steel: a practical plan to support carbon workers and cut emissions, Grattan Institute, May 2020.

Zhou, C., M. D. Zelinka, A.E. Dessler, M. Wang (2021), Greater committed warming after accounting for the pattern effect, Nature Publishing Group, Nature Climate Change, vol. 11, no. 2, pp. 132-136.

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AUSTRALIA

The Australian economy rebounded robustly in the wake of the pandemic. However, inflation has risen and fiscal pressures are on the horizon due to population ageing and climate change. Monetary policy should remain restrictive until underlying inflation is clearly on track to meet the central bank target, while fiscal buffers need to be rebuilt through reducing tax exemptions and improving public spending efficiency in areas such as health. In the medium-term, achieving inclusive and sustainable economic growth requires an ongoing focus on key social objectives such as reducing gender inequality and achieving the climate transition. Gender inequalities have steadily declined but remain visible in the labour market. Further reforms to tax, childcare, education, social benefits and parental leave can improve labour market opportunities for women, promote more equal sharing of unpaid work between genders and help more vulnerable women, notably single mothers. The climate transition is also underway, but further policy measures are needed to meet emissions goals, support the reallocation of workers and adapt to climate change. Given the abundance of renewable energy resources and a large wealth of critical minerals, Australia can secure the energy transition while remaining a key player in international energy markets.

SPECIAL FEATURES: FULLY REALISING THE ECONOMIC POTENTIAL OF WOMEN; ACHIEVING THE TRANSITION TO NET ZERO.

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