



**OXFORD  
ECONOMICS**  
AUSTRALIA

# **GROSS CUSTOMER CONNECTIONS EXPENDITURE FORECASTS TO 2030/31**

**PREPARED BY OXFORD ECONOMICS  
AUSTRALIA FOR SA POWER NETWORKS**

**FINAL REPORT NOVEMBER 2023**

## Oxford Economics Australia

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## November 2023

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# EXECUTIVE SUMMARY

Customer connection expenditure includes all expenditure required to connect or upgrade customers' connections to the distribution network. It is associated with additions, upgrades or alterations to meet increased loads from customer requests for new or additional supply.

\$83.7 Total connections expenditure increased 5.8% in 2021/22 and a further 11.5% in 2022/23 to \$81.3 million (all values in constant 2020/21 prices, i.e., real terms, on a RIN basis), with increases across most categories driven by rising construction activity (see chart 1.2 below). Further strong increases of 11.6% and 10% are forecast for 2023/24 and 2024/25 respectively to a peak of \$99.8 million, with large increases in the medium and major categories offsetting declines in the minor and URD connections, the latter driven by falling residential building activity.

**Table 0.1: Customer Connections Expenditure (Constant 2020/21 Prices)**

Year Ended June	Minor Customer Connect Expenditure (Projects <\$30k)		URD Customer Connect Expenditure		Medium Customer Connect Expenditure (1) (Projects \$30k-\$100k)		Major Customer Connect Expenditure (Projects >\$100k)		Total Customer Connect Expenditure All Projects		Large Embedded Generation	
	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH
	2008	15,359				46,549		19,974		81,883		
2009	15,726	2.4	9,609		42,007	-9.8	48,748	144.1	116,090	41.8	248	
2010	16,728	6.4	5,758	-40.1	39,071	-7.0	63,741	30.8	125,298	7.9	453	82.7
2011	13,702	-18.1	5,689	-1.2	30,344	-22.3	39,888	-37.4	89,623	-28.5	205	-54.8
2012	13,006	-5.1	4,508	-20.8	26,802	-11.7	36,892	-7.5	81,208	-9.4	161	-21.2
2013	14,009	7.7	5,428	20.4	27,124	1.2	37,434	1.5	83,995	3.4	530	229.2
2014	16,397	17.1	4,772	-12.1	23,561	-13.1	36,811	-1.7	81,542	-2.9	938	76.9
2015	15,942	-2.8	5,601	17.4	24,353	3.4	24,906	-32.3	70,803	-13.2	111	-88.2
2016	21,166	32.8	5,186	-7.4	19,547	-19.7	14,369	-42.3	60,268	-14.9	313	181.8
2017	20,321	-4.0	5,116	-1.4	20,763	6.2	15,915	10.8	62,114	3.1	2,864	815.6
2018	19,877	-2.2	5,518	7.9	28,015	34.9	18,789	18.1	72,198	16.2	12,445	334.6
2019	22,612	13.8	4,956	-10.2	26,717	-4.6	30,429	62.0	84,714	17.3	9,322	-25.1
2020	21,725	-3.9	4,617	-6.8	21,277	-20.4	27,470	-9.7	75,089	-11.4	8,850	-5.1
2021	19,267	-11.3	5,774	25.1	15,221	-28.5	28,600	4.1	68,862	-8.3	10,015	13.2
2022	19,935	3.5	6,862	18.8	19,036	25.1	27,030	-5.5	72,863	5.8	8,852	-11.6
2023	22,058	10.6	9,000	31.2	17,680	-7.1	32,516	20.3	81,253	11.5	7,984	
Forecast												
2024	18,138	-17.8	9,146	1.6	20,514	16.0	42,921	32.0	90,718	11.6	4,904	-38.6
2025	16,669	-8.1	8,370	-8.5	19,069	-7.0	55,669	29.7	99,777	10.0	6,974	42.2
2026	17,974	7.8	8,699	3.9	18,141	-4.9	49,601	-10.9	94,414	-5.4	8,865	27.1
2027	19,420	8.0	8,916	2.5	20,282	11.8	42,012	-15.3	90,629	-4.0	8,762	-1.2
2028	20,050	3.2	8,180	-8.2	21,864	7.8	42,264	0.6	92,359	1.9	9,470	8.1
2029	20,269	1.1	7,106	-13.1	22,372	2.3	44,290	4.8	94,037	1.8	9,435	-0.4
2030	20,222	-0.2	7,066	-0.6	23,176	3.6	39,988	-9.7	90,452	-3.8	10,110	7.2
2031	19,808	-2.0	6,894	-2.4	23,672	2.1	38,737	-3.1	89,111	-1.5	10,518	4.0
Period Averages												
2011-2015	14,611		5,200		26,437		35,186		81,434		389	
2016-2020	21,140		5,078		23,264		21,395		70,877		6,759	
2008-2013	14,755		6,198		35,316		41,113		96,349			
2014-2023	19,930		5,740		21,617		25,684		72,971		6,169	
Forecast												
2024-2031	19,069		8,047		21,136		44,435		92,687		8,630	
2021-2025	19,213		7,830		18,304		37,347		82,695		7,746	
2026-2030	19,587		7,993		21,167		43,631		92,378		9,328	

Source: SA Power Networks, Oxford Economics Australia

<sup>(1)</sup>Embedded Generation expenditure is included for financial years 2015/16 to 2019/20

The lift in major connections expenditure in the near term is due to connections for a number of large infrastructure projects, including the substation for the northern tunnel on the Torrens to Darlington section of the North-South Corridor, the Sleaford desalination plant, other major water infrastructure, the Bolivar gas plant and some defence related projects, while connections related to major hospitals are also expected. However, it should be noted that there is some uncertainty around the timing of

some of these projects, so it's possible that the year-by-year quantum of major customer expenditure may come earlier or later.

Total connections expenditure is forecast to decline -5.4% in 2025/26 and another -4% in 2026/27, as medium connections decline and major connections fall back from very high levels, partly offset by modest rises in minor and URD connections as residential building moves back into a recovery phase. Over 2027/28 and 2028/29, OEA is forecasting total connections expenditure to increase by a modest 1.9% and 1.8% respectively to \$94m, driven by a rising residential activity pushing up minor and connections, further solid growth in medium connections and modest increases in major customer connection expenditure. URD connections expenditure is expected to decline over these two years, but remain at historically high levels.

Subsequently, total connections expenditure is expected to fall back by a cumulative -5.2% over 2029/30 and 2030/31 to \$89.1m, as construction activity falls back from a record peak in 2028/29. The 8-year average from 2023/24 to 2030/31 is predicted to be \$92.7 million, compared with an average of \$73 million over the previous ten years to 2022/23, and \$96.3 million in the six years from 2007/08 to 2012/13 (see table 1.1).

As with most forecasts, there are risks and uncertainties attached to the outlook. There is possible upside for 2023/24, which may be realised if there is still a large backlog of work in the minor connections to get through and/or the very high levels of URD connections of the January-June 2023 period are sustained all through the whole of financial year. However, it's still possible that capacity constraints in both the materials and labour markets will constrain connections activity.

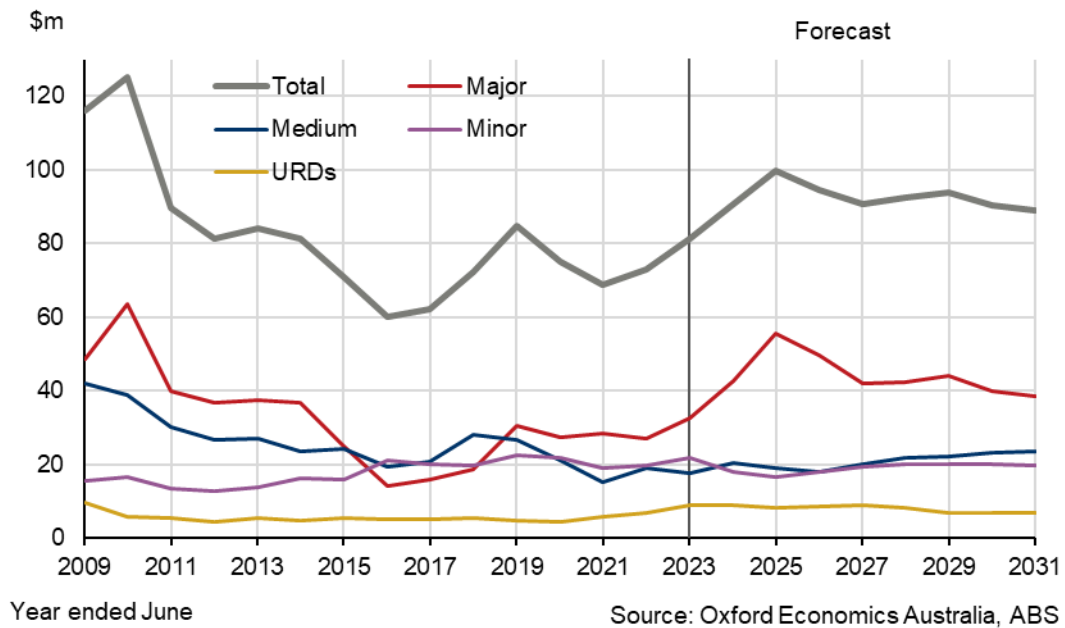
The residential building cycle will have an influence on the outlook for connections. We expect that the current dwelling stock deficiency (undersupply) in South Australia will worsen by mid-decade – made worse by the downturn in dwelling building over 2022/23 to 2024/25 - leading to a pronounced upswing in residential building which will fuel solid growth in minor and URD connections from 2025/26 to 2028/29. However, with house commencements not expected to reach the record levels of 2020/21 and 2021/22, real connections expenditure levels in the Minor category are not expected to reach the recent heights. On the other hand, URDs are expected to push higher in 2023/24, before falling back, but will remain at historically high levels as new lot supply is boosted in outer Adelaide. The main risk here is that the current dwelling downturn could be exacerbated (and maybe extended) if rates rise in mid-late 2024, in response to the July tax cuts.

The medium connections expenditure category will also be boosted over coming years by the state's dwelling undersupply. OEA expects that 'other' dwelling commencements (i.e., apartments, flats, townhouses) will recover from 2023/24 and steadily rise over the outlook period. The medium customer connections category will also be boosted by higher levels of non-residential building activity in the under \$1million to \$20million range. Non-residential buildings in this <\$20m range is entering a period of renewal and growth, with a phase of 'catch-up' needed after relatively stagnant levels of activity during the decade to 2020, and also in response to growth in the economy and population.

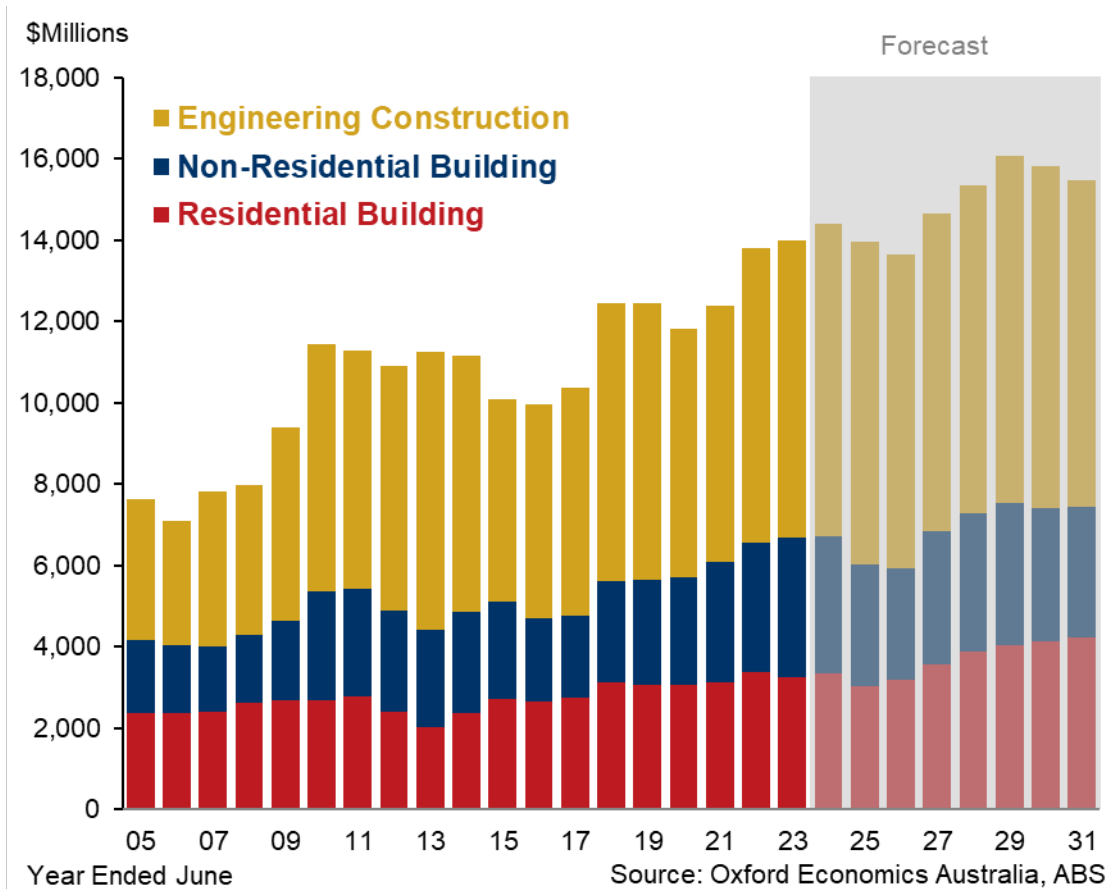
In the major customer connections category, higher levels of civil engineering construction activity and some large non-residential projects are expected to boost connections. As mentioned above, the main large projects relate to specific state government and defence projects. Other notable contributors include EV chargers' infrastructure. The forecasts in this category are largely based on information provided by SAPN.

The final category - Large Embedded Generation – that was added in the March-April 2023 iteration (but not included in the Totals for Connections), is expected to fall a further -39% in 2023/24, before rebounding strongly and sustaining high levels over the remainder of the period. This will add around \$8.6 million on average over the 2023/24-2030/31 period.

**Figure 0.1 Customer Connections Expenditure (2020/21 prices)**



**Figure 1.2 Construction Activity in South Australia (work done, 2020/21 prices)**



# 1. INTRODUCTION

In July 2021, BIS Oxford Economics was engaged by SA Power Networks to provide an expert opinion regarding the outlook for the company's gross customer connections expenditure forecasts over a ten-year period from 2021/22 to 2030/31 (i.e., from 1 July 2021 to 30 June 2031). This October 2023 report and forecasts represent an update to the May-June 2022 and March-April 2023 forecasts. The customer connect expenditure forecasts are to be used by SA Power Networks to develop their capital expenditure forecasts for inclusion in their next revenue proposal to the Australian Energy Regulator.

In keeping with my instructions, I (Richard Robinson) confirm that I have undertaken this engagement having regard to the Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia and the requisite statement to this effect can be provided upon request. I have been assisted in the preparation of this report by my colleagues including Luka Belobrajdic (Economic Analyst) and Chad Gardner (Economist). Notwithstanding the assistance from the other economists, the opinions in this report are my own and I take full responsibility for them.

The Australian Bureau of Statistics (ABS) is the primary data source for the population, building (Cat No 8752.0), and engineering construction (Cat No 8762.0), building approvals (Cat No 8731.0) data and for a range of other economic variables. The June 2023 quarter was the latest available data for real gross value added (at the Australian level only), investment, detailed engineering construction data (by state and by category) and indeed most of the economic variables. At the time of production of the forecasts, the latest building activity data was for the March 2023 quarter, while the latest building approvals data was for the month of August 2023. Historical lot production in Adelaide was sourced from the Department of Planning, Transport and Infrastructure South Australia, up to 2020 (lot production data not available after the December quarter, 2020).

Historical gross customer connect expenditure data was provided by SA Power Networks.

Forecasts of the economic variables in this report were mostly sourced from Oxford Economics Australia reports, including *Australian Macro Service, Long Term Forecasts: 2023-2036* report, *Engineering Construction: 2023 to 2036* and *Building in Australia: 2023-2036*, plus other unpublished forecasts and from Oxford Economics Australia internal research. We also incorporated SA Power Networks' opinions of customer connect expenditures over the near term.

The structure of this report is as follows:

- An **Executive Summary** section is included as a 'front end' of the report and it has a table that summarises the customer connect expenditure forecasts differentiated by the four categories of expenditures including minor, medium and major customer connections and underground residential development projects, plus Large Embedded Generation.
- **Section 2** provides an overview of the macroeconomic outlook for Australia and South Australia, including a brief commentary of the logic and key drivers, plus forecasts of key economic variables. The state macroeconomic outlook provides a context for the underlying drivers of expenditure forecasts.
- **Section 3** provides detailed forecasts of SA Power Networks customer connections expenditure forecasts by category i.e. for minor, underground residential development, medium and major connections, along with projects related to large embedded generation.
- Appendices, including CVs, Terms of Reference and Statement of Compliance.

## 2. OVERVIEW OF THE MACROECONOMIC OUTLOOK

### 2.1 AUSTRALIAN ECONOMIC OVERVIEW AND OUTLOOK

#### **Australian economy now slowing, but recession not expected in the near-term**

Real Gross Domestic Product (GDP) has recovered well from the COVID-related slump in 2020, posting growth of 2.2%, 3.7% and 3.4% over FY21, FY22 and FY23 respectively, with Gross National Expenditure (GNE: domestic demand plus change in stocks) experiencing faster growth of 3.7%, 5% and 3.6% respectively in those years.

GDP growth has slowed, falling back from 0.7% q/q in each of the September and December quarters 2022 to 0.4% q/q in each of the March and June quarters 2023, with through-the year (y/y) at 2.1% in the June quarter (Q2), compared to 2.6% y/y in the December quarter and 6% y/y in the September quarter 2022. In the June quarter 2023, activity was well supported by investment and net exports. An improvement in weather conditions and a drawdown of inventories boosted mining exports. Meanwhile, the recovery in the services balance gained pace in Q2 due to strong inward tourist and student flows. However, consumption growth remains meagre, with high inflation and the drag from higher interest rates weighing heavily on discretionary spending.

Household consumption increased by just 0.1% q/q in Q2. The divergent trends between discretionary and essential spending continued to widen, with the recent contraction in discretionary spending worsened in Q2 to a 0.5% q/q decline despite a pickup in vehicle sales. The savings rate has fallen below its pre-pandemic level, meaning the scope for households to fund consumption by saving less is becoming more limited. However, the tight labour market, rising wage growth, and strong population growth will all support spending over the next year.

Private business investment activity was relatively strong over the first half of 2023, increasing by 4.6%. Some of this strong performance reflects the clearing of some supply bottlenecks. Machinery and equipment investment was particularly strong in Q2 due to businesses taking delivery of new vehicles. Moreover, the cessation of tax incentives for equipment spending has brought forward some activity and will make momentum over the second half of 2023 patchier. Mining investment picked up over FY21 and FY22, and into FY23. With prices for a number of commodities expected to remain at healthy levels over the medium term and strong demand for renewable energy related minerals, we expect further investments to get underway and mining investment to continue to rise and remain strong through most of this decade. Overall, new business investment increased 6% in each of FY22 and FY23, with around 4% growth expected in each of FY24 and FY25, before growth eases. The recovery in business investment will not only drive near term demand but will increase the economy's productive capacity in the long run.

Public investment is still being well supported by transport infrastructure and health projects, although some commitments have been wound back. Despite the considerable backlog of work still to be done, dwelling investment continues to falter, contracting by a further 0.2% q/q in Q2, although this was driven by another sharp fall in alterations and additions activity. There remains a substantial backlog of work to be done in new dwellings, but the realisation of these projects remains constrained by stretched capacity, compounded by a spate of recent insolvencies in the construction sector.

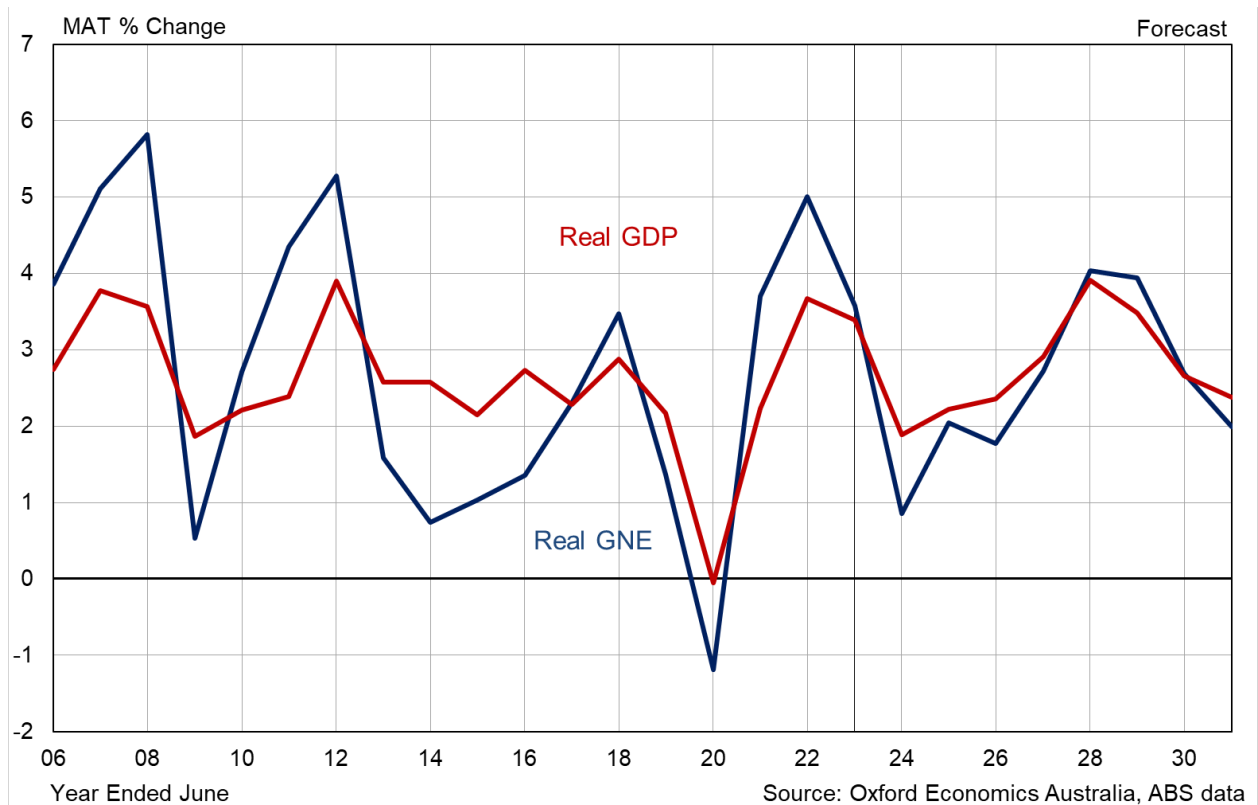
Import demand was broadly flat in the quarter, meaning the goods trade made a positive contribution to growth. Services exports continued to recover sharply from the pandemic, increasing by a remarkable 12.1% q/q in Q2. Growth was driven by tourist and student flows, with the number of



international students in the country surpassing its pre-pandemic level. The outlook for services exports remains positive, but growth will slow from here.

We expect that some of the factors that supported growth in the first half of 2023 will prove to be temporary and that momentum will slow in the second half. Investment in machinery and equipment is likely to pull back, and the recovery in the services balance does not have as far to run. Nevertheless, population growth remains strong, which is supporting growth in household spending and will add to demand for housing and infrastructure going forward.

**Fig 2.1 Australia – Basic Economic Indicators**



The labour market continues to track strongly. Employment growth was an exceptional 4.2% in FY23, with the unemployment rate sitting in a narrow band between 3.4-3.7% and averaging 3.5%, while the participation rate is at record highs. Labour demand remains very strong – employment growth was 3.0% in August while job vacancies are still at high levels, suggesting further solid growth in employment in the near term (see chart 4.2). Faster population growth has facilitated strong jobs growth. This strength is the best insurance the economy has against a drastic collapse in growth. But it is adding to inflationary pressures in the economy. While the labour market continues to track in such a strong position, there will continue to be upward pressure on wage growth, and wages growth will pick up further in FY24.

One main negative influence on economic growth in the near-term is the progressive tightening of fiscal policy, which will see government consumption expenditure wound back. However, the tax cuts slated for July 2024 represent a reversal of this tightening stance and also represent an upside risk to inflation.

After rate hikes at 10 consecutive meetings, the RBA finally paused its hiking cycle in April, but then added another 0.25% increase in May and June, before pausing again over July to October. The

official cash rate now at 4.1%. Price growth has peaked, and while the resolution of supply-side issues will relieve some of the inflation, it's the breadth and persistence of core inflation pressures that are causing most of the bank's concerns. The pickup in wage growth and emergence of strong demand pressures in rental markets pose upside risk to the inflation outlook. Inflation remains uncomfortably high, and the very tight position of both labour and rental markets means there is lots of scope for an upside surprise to core inflation. It's still possible there may be another one or two rate hikes in the near-term. There is also an elevated risk that the tax cuts of July 2024 may induce another one or two rate hikes, particularly if core inflation has not been markedly reduced by early 2024.

### **Global Economic Outlook**

Our baseline forecast for global GDP growth is 2.5% in calendar 2023, 2.6% for FY23 and a weak 2% in FY24, following 3.1% in calendar 2022 (and 4.3% in FY22). Growth is then predicted to improve to 2.5% in FY25 and 3% in FY26. Although economic data continue to paint a relatively downbeat picture, it doesn't suggest that economies are entering a deeper slump. Growth will still remain weak through 2023, particularly in the US, Canada and most of Europe where growth will be between 0.5% and 1.5% over the next two years.

Offsetting the weakness of advanced economies will be strong Chinese GDP growth, forecast to increase by 5% in calendar 2023 (after 3% in 2022), 4.4% in FY23 and 4.7% in FY24, before easing back to around 4.5% over FY25 to FY29. However, recent problems in China's property sector and some weakness in data releases is of concern, although we think that China will take action to keep its economy growing in the near-term. The stronger outlook for China will also improve the outlook in the rest of Asia. Overall, we think that the balance of risks is now less tilted to the downside and believe that the risks of a substantial global economic slump have diminished over the past 8 months.

High and rising US interest rates and increased uncertainty has seen a broad-based appreciation of the US dollar since late 2021, which has pushed down the value of the Australian dollar to around US\$0.68 since mid-2022, with another downshift recently to below US\$0.65. Our outlook is for the AUD to remain weak over 2023 and 2024, before appreciating gradually to US\$0.73 by mid-decade as US interest rates fall faster than Australian rates, with an average of US\$0.73 projected over the second half of the decade.

Beyond the near-term weakness, we expect global growth will return to its trend pace of around 3% by FY26, and gradually slow over the long term as resident population growth eases. Australia's trading partner growth (weighted by exports) is forecast to grow at a faster pace over the next 5-20 years (between 0.5 to 1% higher), due to the high weights of China, East Asia and India (all of which are expected to outpace the average pace of global growth) in Australia's export mix.

### **Domestic demand and GDP to weaken sharply in FY24, improving in FY25**

Australian domestic demand is forecast to slow from 3.4% in FY23 to 0.8% in FY24, with a partial rebound to 2.1% in FY25. Net exports are expected to provide a positive contribution over the next two years, as tourism and education boost exports, while imports weaken due to slowing domestic demand and a low A\$. GDP growth is forecast to be 1.8% in FY24 and 2.3% in FY25.

Housing investment is expected to decline over FY24 and FY25 as the current backlog of work is finished and high interest rates impact new dwelling construction and alterations and additions activity. On the other hand, we expect further moderate growth in business investment in FY24 and FY25 as some deferred investment is undertaken, although some sectors, such as hotel construction and other tourism-related investment, will take longer to recover. Private sector engineering construction will remain buoyant due to higher levels of electricity and telecommunications infrastructure and higher levels of mining investment, particularly oil and gas. Meanwhile, public investment is expected to see moderate growth over the next two years to FY25, as a large pipeline

of transport infrastructure and social and institutional buildings projects come through. Meanwhile, government recurrent expenditure is expected to weaken sharply as governments attempt budget repair. With employment growth expected to slow as investment and government spending eases, household consumption expenditure growth will also slow sharply over FY24, with higher inflation and higher interest rates also weighing on spending. Tax cuts slated for July 2024 will boost spending in FY25, although there is still some uncertainty around these tax cuts.

Trade volumes will be a mixed bag. We expect mining export volumes to pick up over the next 2-3 year as new capacity comes onstream. Rural exports bounced back over calendar 2021 and will remain strong over FY23 and into FY24, with bumper seasons in the eastern states boosting grain, other crops and dairy exports. Meat exports will strengthen too. Manufacturing exports will remain constrained due to weak global growth but will pick up over FY25 and FY26 as overseas conditions improve. Overall merchandise export volumes will continue to display moderate growth over FY23 to FY26. Meanwhile, growth in import volumes will weaken sharply in FY24 before improving in FY25, in line with domestic demand. Net exports are expected to make a positive contribution to growth over FY24 and in FY25.

Large increase in both service credits and debits are expected over FY23 and FY24, before moderating in FY25. This will have different implications for the all-important tourism and education services trade and related industry sectors. Education exports were worth \$37.6 billion in FY19 (before the COVID pandemic), or almost 39% of overall services exports (compared to only \$461m for outbound education import 'debits'). Education exports have bounced back, helped by the earlier-than-expected return of Chinese students and partly because there is a large backlog of visas already for overseas students. We also expect inbound tourism 'exports' to recover well in the medium-term, aided by a low A\$. Tourism exports (including 'business travel') were worth \$25.3 bn in FY19 (26% of overall services exports), compared to \$50.6 billion for outbound services 'imports' – which then accounted for almost 50% of overall services debits. We expect a slower ramp-up in outbound tourism (compared to inbound tourism), with tourism flows unlikely to recover back to their previous levels for another couple of years. The forecasts assume that the tourism and education credits (inbound) will recover back to pre-COVID levels by early-2024, while outbound tourism debits will not get back to the 2018 peaks until 2026.

### **Mild slowdown in mid-2020s, before economy moves to trend growth**

Annual headline inflation jumped to 7.8% (y/y) in the December quarter 2022, while underlying inflation lifted to 6.4%, before the headline rate fell back to 7.0% in the March quarter 2023 and then 6% in the June quarter. Although we think the inflation peak has passed, the rise and broadening of inflationary pressures has seen the RBA lift the cash rate by 4% since May 2022 to 4.1% in June 2023, with standard variable housing rates now around 8.5% and variable discounted rates at 7.1%. The RBA may raise rates again in the near-term, but we expect a pause in rises over FY24. However, large tax cuts expected in July 2024 are likely to see a further lift in rates over the second half of 2024, as the RBA attempts to curtail the extra demand pressures from the tax cuts, with elevated inflationary pressures still expected to be present with unemployment rate at or just below 4%. The persistence of high interest rates – with the extra lift in mid-late 2024 - will continue to impact consumer spending and housing and business investment over FY25 and into FY26. With government capital spending weakening at that time and recurrent spending still constrained, the end result will see annual domestic demand growth falling below 2% in FY26 and remaining somewhat subdued in FY27. GDP growth will also be soft.

Interest rate cuts are expected from early-mid 2025 and over FY26 and FY27 in response to the weakening in the economy and because we expect inflation to be back in the RBA target range of 2%-3%. The large rate cuts will precipitate a very strong rebound in dwelling construction – by mid-decade there will be a very large undersupply of housing, with pent-up demand waiting to be

unleashed. The current undersupply is only being exacerbated by high immigration and under-building. As consumers and businesses re-adjust to the 'normalcy' of higher interest rates – although at much lower levels than the 2000s and 2010s – investment and consumer spending will return to long term trend (or potential) rates of growth over the second half of the 2020s with an initial rebound in GDP growth to 2.9% in FY27 and then 3.9% in FY28, before subsequently easing back.

Over the longer term, potential growth will slow primarily due to a smaller contribution from labour force growth compared to recent history. Net overseas migration will fall back to a more normal level, and the contribution from natural increase (births minus deaths) will also moderate. The relatively large cohort of Australians aged 65+ moving into retirement will also place downward pressure on the labour force participation rate, although this will continue to be somewhat alleviated by relatively high net immigration.

## 2.2 OUTLOOK FOR THE SOUTH AUSTRALIAN ECONOMY

Compared to other states, South Australia's economy was relatively insulated from the impact of the COVID pandemic. After contracting by -1% in FY20, State Final Demand (SFD) increased by a strong 5.3% in FY21 and 5.6% in FY22, before easing back to 2.8% in FY23. Meanwhile Gross State product (GSP) rose 4.7% in FY21 and 5.1% in FY22 - all well above the Australian equivalents of Australian domestic demand and GDP in those two years – before rising and estimated 3.3% in FY23 (close to Australian GDP growth). Strong investment was a key contributor to growth over FY21 and FY22, with dwelling, business and public investment all higher, but falls in dwelling and public investment contributed to slower growth in SFD in FY23.

SFD bounced back strongly in the recent June quarter, increasing by 1.3% q/q, after three weak quarters. Growth in the quarter was driven by government consumption expenditure, dwelling investment and strong growth in private equipment expenditure. Interestingly, these three areas of expenditure are all expected to weaken over the next year, so the June quarter can probably be viewed as a temporary blip.

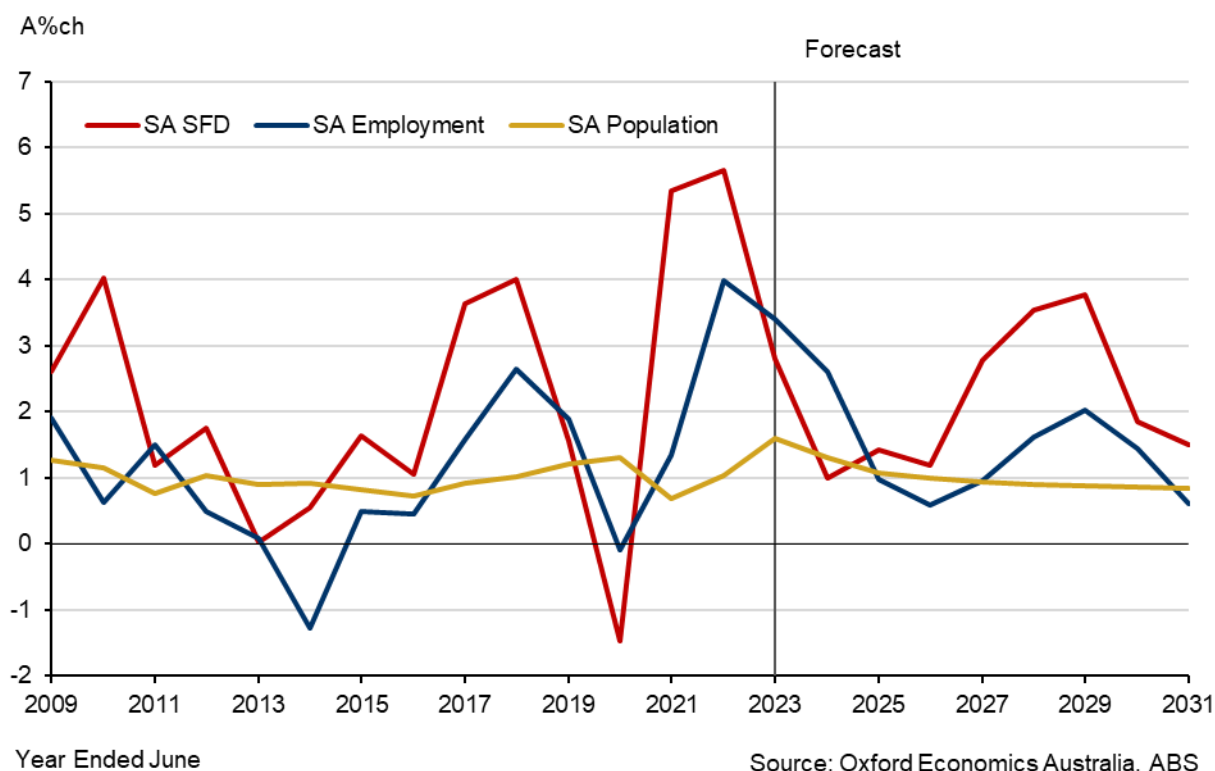
SFD and GSP growth are forecast to weaken sharply over FY24 – to around 1% – due to declines in dwelling investment and government consumption expenditure. As health spending was a focal point of the 2022 election, public demand may provide an upside surprise. Household spending growth will weaken sharply (but stay positive), while the growth in business investment will also slow, with private engineering construction the key contributor due to rising electricity infrastructure and mining-related construction. Public investment is expected to rise due to increase in roads and utilities investment.

The public sector remains a significant direct and indirect consumer. Several defence programs based in Adelaide, including military vehicles and the Space Agency, will support growth in the medium term. This will mitigate the softer outlook for the private sector. Nevertheless, the cancellation of the federal government's submarine contract with French contractor Naval Group has generated considerable uncertainty around defence work - future work is expected to be based in Adelaide, but the degree of domestic construction is still unknown.

The South Australian construction sector is a key contributor to private and public investment and overall state economic growth. The South Australian construction market is dominated by engineering construction work, which has consistently represented 50% to 60% of total work done within the state. Total construction work done surged 11% in FY22 to a historical peak of \$14.4bn (constant 2020/21 prices). Activity levels are expected to see further small increases over FY23 and FY24 to a new peak of \$14.7bn in FY24, before falling a cumulative -5% over FY25 and FY26, as engineering joins the declines in dwelling and non-residential building. Overall construction activity is then expected to show healthy increases over FY27 to FY29, driven mainly by strong growth in residential and non-

residential building, with residential activity responding to a critical undersupply of housing and lower interest rates. Modest increases in engineering construction activity are also expected to contribute, boosted by higher levels of transport, electricity and mining investment.

**Fig 2.2 South Australia State Final Demand, Employment and Population Growth**



The South Australian labour market continues to perform well. Employment growth has been robust since the beginning of the year, with the state adding 28,500 jobs in the 8 months to August and growth through-the-year at 4.1%. The unemployment rate has stayed at a historically low level, averaging 4.1% in FY23 and falling to 3.6% in August – below the national average, which is a rare feat. The participation rate has increased steadily over the past year, reaching a record 64.8% in May, before easing back slightly over recent months.

We expect employment growth will moderate through FY24, before easing sharply over FY25 to FY26. However, the state unemployment rate is expected to remain mostly around (or under) 4% over the next year, and then average 4.1-4.4% in the following three years – indicative of a tight labour market, which will add to wage pressures in the state. Moderate growth in employment in the medium term and higher wages are expected to support household spending, although higher interest rates will constrain consumer demand somewhat over the next 2 years.

SFD and GSP growth are forecast to pick up over FY25 and FY26, before strengthening from FY27 due to increases in residential, business and public investment, the latter as the next round of major projects get underway. Overall, both SFD and GSP growth are forecast to average 2.2% growth over the seven years to FY30 (compared to an average of 2.8% for SFD over the past 5 years to FY23 inclusive; and an average of 2.6% for the past 5 years to FY23 and 2.3% for the past three decades for GSP).

Over the long run, we expect South Australia's economy to underperform against the rest of the economy. This primarily reflects the state's demographic outlook, with population growth projected to be -0.4% slower than the national average over FY24 to FY30.

**Table 2.1 South Australia – Key Economic Indicators, Financial Years**

Year Ended June								Forecast						
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>South Australia</b>														
Total Construction Activity(*)	3.8	19.5	0.0	-4.8	4.9	11.1	1.4	3.6	-4.2	-2.6	5.4	6.5	7.9	-1.2
State Final Demand	3.7	3.9	1.4	-1.7	4.0	5.3	2.4	2.4	2.2	1.0	1.5	3.1	3.6	2.3
Gross State Product (GSP**)	<b>1.9</b>	<b>2.2</b>	<b>1.1</b>	<b>-1.0</b>	<b>4.7</b>	<b>5.1</b>	<b>3.3</b>	<b>0.9</b>	<b>1.6</b>	<b>1.5</b>	<b>2.5</b>	<b>3.3</b>	<b>3.5</b>	<b>2.1</b>
Employment Growth (Year Avg)	1.6	2.6	1.9	-0.1	1.3	3.9	3.4	2.6	1.0	0.6	1.0	1.6	2.0	1.4
<b>Australia</b>														
Total Construction Activity(*)	-3.3	12.2	-9.1	-3.7	-0.7	2.0	6.0	1.9	-1.5	-0.6	2.8	8.0	7.5	2.5
Australian Domestic Demand	2.3	3.4	1.6	-0.8	3.0	5.0	3.6	0.8	2.1	1.9	2.8	4.0	3.9	2.7
Gross Domestic Product (GDP)	2.3	2.9	2.2	-0.1	2.2	3.7	3.4	1.8	2.3	2.3	2.9	3.9	3.5	2.7
Employment Growth (Year Avg)	1.5	3.0	2.3	0.5	0.5	3.3	4.0	2.1	1.8	1.3	0.9	1.8	2.3	1.8

Source: BIS Oxford Economics and ABS

\* Total construction work done in constant prices as per the ABS Building Activity and Engineering Construction Activity  
Total construction is the sum of new dwelling building (includes alterations and additions activity greater than \$10,000),  
new non-building activity and new engineering construction.

\*\* GSP is an estimate for FY23

## 3. OUTLOOK FOR CUSTOMER CONNECTIONS EXPENDITURE

Customer connection expenditure includes all expenditure required to connect or upgrade customers' connections to the distribution network. It is associated with additions, upgrades or alterations to meet increased loads from customer requests for new or additional supply.

There are four categories of connections: minor customer connections (projects less than \$30,000), medium customer connections (projects between \$30,000 and \$100,000), major customer connections (projects greater than \$100,000) and underground residential development projects. In this latest iteration, we have also provided forecasts for connections related to Large Embedded Generation projects. SA Power Networks have provided actual expenditure up to June 2023. Oxford Economics Australia has provided forecasts to 2030/31.

Total gross customer connection expenditure is forecast to average \$92.7 million over the eight years from 2023/24 to 2030/31 inclusive (in constant 2019/20 prices), compared with \$73 million over the ten years to 2022/23 (see Table 3.1).

**Table 3.1: Customer Connections Expenditure (Constant 2020/21 Prices)**

Year Ended June	Minor Customer Connect Expenditure (Projects <\$30k)		URD Customer Connect Expenditure		Medium Customer Connect Expenditure (1) (Projects \$30k-\$100k)		Major Customer Connect Expenditure (Projects >\$100k)		Total Customer Connect Expenditure All Projects		Large Embedded Generation	
	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH
2008	15,359				46,549		19,974		81,883			
2009	15,726	2.4	9,609		42,007	-9.8	48,748	144.1	116,090	41.8	248	
2010	16,728	6.4	5,758	-40.1	39,071	-7.0	63,741	30.8	125,298	7.9	453	82.7
2011	13,702	-18.1	5,689	-1.2	30,344	-22.3	39,888	-37.4	89,623	-28.5	205	-54.8
2012	13,006	-5.1	4,508	-20.8	26,802	-11.7	36,892	-7.5	81,208	-9.4	161	-21.2
2013	14,009	7.7	5,428	20.4	27,124	1.2	37,434	1.5	83,995	3.4	530	229.2
2014	16,397	17.1	4,772	-12.1	23,561	-13.1	36,811	-1.7	81,542	-2.9	938	76.9
2015	15,942	-2.8	5,601	17.4	24,353	3.4	24,906	-32.3	70,803	-13.2	111	-88.2
2016	21,166	32.8	5,186	-7.4	19,547	-19.7	14,369	-42.3	60,268	-14.9	313	181.8
2017	20,321	-4.0	5,116	-1.4	20,763	6.2	15,915	10.8	62,114	3.1	2,864	815.6
2018	19,877	-2.2	5,518	7.9	28,015	34.9	18,789	18.1	72,198	16.2	12,445	334.6
2019	22,612	13.8	4,956	-10.2	26,717	-4.6	30,429	62.0	84,714	17.3	9,322	-25.1
2020	21,725	-3.9	4,617	-6.8	21,277	-20.4	27,470	-9.7	75,089	-11.4	8,850	-5.1
2021	19,267	-11.3	5,774	25.1	15,221	-28.5	28,600	4.1	68,862	-8.3	10,015	13.2
2022	19,935	3.5	6,862	18.8	19,036	25.1	27,030	-5.5	72,863	5.8	8,852	-11.6
2023	22,058	10.6	9,000	31.2	17,680	-7.1	32,516	20.3	81,253	11.5	7,984	
Forecast												
2024	18,138	-17.8	9,146	1.6	20,514	16.0	42,921	32.0	90,718	11.6	4,904	-38.6
2025	16,669	-8.1	8,370	-8.5	19,069	-7.0	55,669	29.7	99,777	10.0	6,974	42.2
2026	17,974	7.8	8,699	3.9	18,141	-4.9	49,601	-10.9	94,414	-5.4	8,865	27.1
2027	19,420	8.0	8,916	2.5	20,282	11.8	42,012	-15.3	90,629	-4.0	8,762	-1.2
2028	20,050	3.2	8,180	-8.2	21,864	7.8	42,264	0.6	92,359	1.9	9,470	8.1
2029	20,269	1.1	7,106	-13.1	22,372	2.3	44,290	4.8	94,037	1.8	9,435	-0.4
2030	20,222	-0.2	7,066	-0.6	23,176	3.6	39,988	-9.7	90,452	-3.8	10,110	7.2
2031	19,808	-2.0	6,894	-2.4	23,672	2.1	38,737	-3.1	89,111	-1.5	10,518	4.0
Period Averages												
2011-2015	14,611		5,200		26,437		35,186		81,434		389	
2016-2020	21,140		5,078		23,264		21,395		70,877		6,759	
2008-2013	14,755		6,198		35,316		41,113		96,349			
2014-2023	19,930		5,740		21,617		25,684		72,971		6,169	
Forecast												
2024-2031	19,069		8,047		21,136		44,435		92,687		8,630	
2021-2025	19,213		7,830		18,304		37,347		82,695		7,746	
2026-2030	19,587		7,993		21,167		43,631		92,378		9,328	

Source: SA Power Networks, Oxford Economics Australia

<sup>(1)</sup>Embedded Generation expenditure is included for financial years 2015/16 to 2019/20

### 3.1 FORECASTING METHODOLOGY

#### 3.1.1 Minor Customer Connections (i.e. projects less than \$30,000) and Underground Residential Developments (URD's)

Minor customer connections expenditure is the sum of expenditures incurred in connecting or augmenting power supply to residential buildings – mainly houses (excluding multi-unit apartment buildings as these usually incur expenditures of more than \$30,000) - and small non-residential projects valued at less than \$1 million. New dwelling building (specifically 'detached' houses) form the basis of the model of minor connections expenditure. Historical data for house commencements in South Australia was obtained from the Australian Bureau of Statistics (Catalogue No. 8752.0).

Oxford Economics Australia's forecasts of house commencements for South Australia are used as the driver of total minor connections expenditure (see Table 3.2). Underpinning our forecasts of residential building and non-residential building activity are Oxford Economics Australia's forecasts of South Australian population growth (see Table 3.3). There is a small proportion of alterations and additions (A&A) activity expenditure which involves new or augmented connections. However, SAPN were not able to provide information which identified the proportion of minor customer connections associated with A&A activity. Therefore, we decided to use house commencements as the sole explanatory variable for forecasts of minor connections expenditure.

Underground Residential Development (URD) expenditure is related to the establishment of the mostly 'greenfields' subdivision infrastructure for the connection of the URD prior to residential houses actually being constructed. In addition, URD expenditure includes some 'infill' works in the Adelaide Metropolitan region. Since 2015 SAPN has also charged for the development of 3 allotments or greater as a real estate development within existing urban areas, where some of the infill relates to rezoning or repurposing from commercial or residential. Therefore, lot production in Metro Adelaide and housing approvals in South Australia form the basis of our URD connections expenditure model. In addition to this, developers' expectations of the property market – such as oversupply (or undersupply) and future property prices will influence their decisions about when to sell blocks, and hence URD connections expenditure.

Historical data for lot production in South Australia was obtained from the South Australian Department of Infrastructure and Transport (DIT). However, this data ceased in the December quarter 2020. Since then, we have estimated lot production by examining industry sources and using house approvals as the underlying driver of lot production. The forecasts of lot production and house approvals were used as the drivers of URD connections expenditure (see table 3.3 and charts 3.2, 3.3 and 3.4).

#### 3.1.2 Medium Customer Connections (i.e. projects between \$30,000 and \$100,000)

The real value of work done (construction activity) for non-residential building projects below \$20 million and 'other dwellings' form the basis of our medium connections expenditure model.

Historical data of non-residential building activity for projects valued at less than \$20 million and 'other dwelling' were obtained from ABS Catalogue No. 8752 as a special request. Our analysis identified non-residential building work done (below \$20m) and other dwellings work done as suitable explanatory variables for medium customer connections expenditure. Note that in modelling these relationships, the value of 'embedded generation' was excluded from the medium customer connections expenditure from FY16 to FY20. The substantial growth in this segment over those 4 years was driven by factors largely unrelated to the commencement of buildings.

Where possible, we have excluded mega multi-unit residential projects planned over the next 10 years in our forecasts, as these projects typically incur connection expenditures greater than



\$100,000. These projects are instead included in our major customer connections expenditure forecasts. Similarly, in years where a large real estate development is likely to commence and incur a major connection expenditure, we adjusted our initial medium expenditure forecasts to prevent double counting of projects.

### 3.1.3 Major Customer Connections (projects greater than \$100,000)

Large building and infrastructure projects are the main drivers of major customer connection expenditure. Specifically, the key economic drivers of major expenditures are assumed to include some very large residential (multi-unit) buildings, non-residential building work done above \$20 million, and selected categories of engineering construction work done (i.e., excluding oil, gas and other hydrocarbons, bauxite, alumina and aluminium, coal and coal handling, other minerals, pipelines and electricity). Engineering construction in the 'Electricity generation, transmission and supply' category is excluded because SA Power Network and most electrical works undertaken do not represent 'customers', although some connections to new generation facilities (eg windfarms) and to Fast Electric Vehicle Charging stations will be 'customers'. These are covered separately. The other exclusions (mainly mines and pipelines) are excluded because they are often outside the state distribution network grid. Connections to new mines within the network are covered separately.

We used a five-stage process to produce major expenditure forecasts.

Firstly, Oxford Economics Australia compiled a list of major projects in infrastructure (engineering construction), residential building, and non-residential building sectors that were expected to commence (specifically, those projects associated with a probability greater than 0.8) over the next 10 years, along with their values, expected starting date, and relevant construction category.

Then based on the 'appropriate load' (kVA) and cost/kVA of comparable projects or the ratio of the cost of connection-to-total project value, we estimated the connection expenditure for each project. We derived these estimates from the 2019, 2018, 2017 and 2014 SAPN project lists (and the ETSA Utilities major projects list provided in 2009), as well as detailed project information from SAPN's database of projects over FY2018 to FY2023.

We then combined Oxford Economics Australia's project lists with the major project list provided by SAPN. If a project identified by Oxford Economics Australia was also included in the SAPN list, we dropped it from our initial compilation of projects to avoid double counting.

To calculate the total expected value of the customer connection expenditure associated with the projects included in the list (see the accompanying excel spreadsheet, 'Major Projects List\_OEA SAPN\_19.10.23.xlsx'), we firstly adjusted the values according to the assigned probability of a project proceeding: we excluded projects with a probability of less than 50%; and secondly, adjusted (multiplied) the value of the connection by its assigned probability (e.g. a project with a 80% probability and a \$2,000,000 connection would be calculated as \$1,600,000 in the final summation of projects). We also excluded projects from the OEA list where our estimation of the customer connection expenditure was below \$100,000. We then summed the expected (adjusted) value of the connection cost of each major project. This gave us the 'minimum' major expenditure forecasts for the next four years.

Historically, actual expenditure has always exceeded the summed expenditure of identified projects (or 'minimum expenditure'), as we cannot know a full project count with certainty in advance. To account for these unknown projects, we included a residual component for each of the next few years. This residual is the difference between our model-generated forecasts and expenditures associated with identified projects.

To further elaborate on our methodology described above, we essentially employ a combination of different methods for different years over the forecast period. To summarise, for years 1, 2 and 3 we

employ a mostly **bottom-up approach** mainly determined by a probabilistic aggregation of specific customer projects costs; for year 4 we utilise both the bottom-up approach and top-down approach, and for years 5 to 10 we employ a top-down approach. The **top-down approach** uses the movements in the drivers of major connections expenditure (a specified set of non-dwelling building and engineering construction) and the ratio of Major connections expenditure to the drivers.

In year 1 - in this case, 2023/24 – we rely heavily on detailed information provided by SAPN. This information is a listing of SAPN's major projects list, which details the type of projects, the year of connection, the approved or forecast budget and the likelihood (probability) of proceeding. As described in our documented methodology above, we add OEA projects to the SAPN projects (which we consider to have a probability of at least 80% of proceeding). Note that the recent actuals and expected expenditure capital expenditures of the individual and summed capital expenditures are reflective of SAPN's financial system, i.e. SAPN's SAP 'Investment Management' (IM) basis – before they are adjusted to represent the estimated (category analysis) 'Regulatory Information Notice' (RIN) direct cost basis. All of the customer connection capital expenditures in this document are reported on the RIN basis.

As the Major Projects analysis shows, after adjusting for probability factors (including excluding those projects which have a probability of less than 50%), we sum the expenditure of 'identified projects'. The difference between these identified (probability weighted) projects is a residual. In Year 1 (2023/24) and year 2 (2024/25) this residual is a low 1 to 1.5% of the forecast total of Major Connections expenditure, while in year 3 (2025/26) the residual is still only 3.5%.

For year 4 and beyond, we once again sum the expected identified projects and review the SAPN approved expenditure (if it covers the part or all of these years), but supplement this with the top-down approach.

The top-down approach uses a long-run average of the ratio of Major Connections expenditure to the sum of the two drivers of these major connections – non-dwelling building projects over \$20m (using work done) and selected engineering construction categories (using work done). This ratio is shown in figure 3.8 in the next section. There is a wide variation in this ratio – from a high of 28.5 in 2008/09 to a low of 7.3 in 2015/16. The long-run average over the period 2002/03 to 2022/23 is 13.6. However, if you exclude the very high and very low ratios of 2008/09, 2009/10 and 2016/17, 2016/17 and 2017/18, the average falls to 12.9. We consider these five very high and very low years to be the 'outliers', with very large deviations from the 'norm'. We also consider the large bounce-back in the Major Connections Expenditure and ratio-to-drivers in 2018/19 to represent a 'return to historical norms'.

Note that after the first four years – which are based largely on the bottom-up approach – we revert to a long-run historical average ratio from year 5 (2027/28) to 2030/31. Overall, the average ratio for the 2018/19 to 2030/31 is 13.4 – close to historical long-run averages. The top-down approach of using long-term or desired ratios is a better methodology than using an econometric model, which did not yield useable results. It also accounts for the extreme variability of the wide range of large non-dwelling building and engineering construction projects.

### **3.2 THE OUTLOOK FOR DRIVERS OF MINOR CUSTOMER CONNECTIONS EXPENDITURE AND URD'S**

As previously outlined, we have modelled minor customer connections as a function of house commencements. The housing market in South Australia is currently estimated to be in a serious under-supply (see figure 3.1). Total dwelling commencements and completions were running close to underlying demand over the four years to 2018/19, but the sharp drop in commencements in FY19 and the faster rise in underlying demand – initially due to faster population growth and less people living in dwellings (increased 'headship' ratios) - saw a serious stock deficiency emerge over the past four years.

**Table 3.2: South Australia Migration and Natural Increase in Population (Thousands)**

	Natural Increase	Migration		Total increase	Population	A%ch
		Net overseas	Net interstate			
2010	7.5	14.5	-2.7	18.4	1,627.3	1.14
2011	7.1	9.2	-2.6	12.3	1,639.6	0.76
2012	7.5	12.4	-3.2	17.1	1,656.7	1.04
2013	7.4	11.7	-4.8	14.8	1,671.5	0.89
2014	7.2	11.6	-3.9	15.5	1,686.9	0.92
2015	6.5	11.2	-4.6	13.7	1,700.7	0.81
2016	6.5	11.3	-7.2	12.2	1,712.8	0.72
2017	5.7	12.2	-6.3	15.8	1,728.7	0.92
2018	5.0	12.7	-4.7	17.5	1,746.1	1.01
2019	5.0	15.1	-3.3	21.3	1,767.4	1.22
2020	4.8	14.9	-1.3	23.0	1,790.4	1.30
2021	5.4	-2.8	4.9	12.2	1,802.6	0.68
2022	4.1	14.2	0.2	18.5	1,821.1	1.03
2023	3.4	27.7	0.2	31.3	1,852.3	1.72
2024	4.1	22.3	0.0	26.4	1,878.8	1.43
2025	4.6	16.4	-0.3	20.7	1,899.5	1.10
2026	4.4	14.8	-0.5	18.7	1,918.2	0.98
2027	4.1	14.8	-1.0	17.9	1,936.0	0.93
2028	3.8	14.8	-1.2	17.4	1,953.5	0.90
2029	3.5	14.8	-1.2	17.1	1,970.6	0.88
2030	3.2	14.8	-1.2	16.8	1,987.4	0.85
2031	2.9	14.8	-1.2	16.5	2,003.9	0.83

Source: SA Power Networks, Oxford Economics Australia

Note: Differences between the sum of *Natural Increase*, *Net Overseas Migration* and *Interstate Migration* and the *Population Increase* are the result of ABS discrepancies, relating to inter-censal distribution

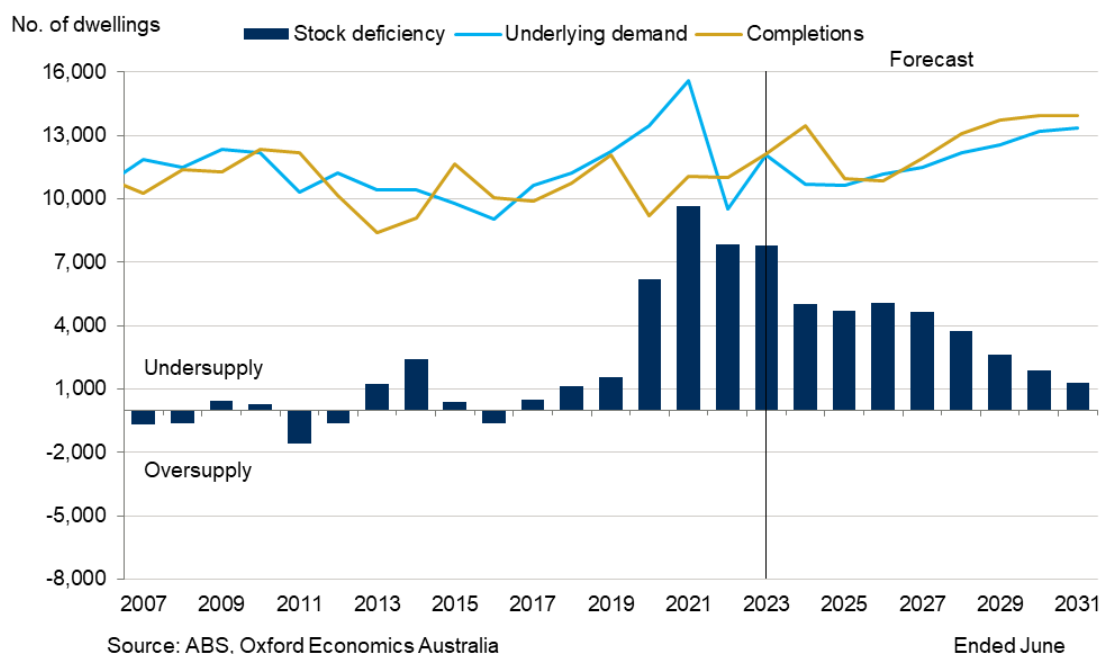
Underlying demand for new dwellings has recovered somewhat from the sharp fall over FY21-22, due to net overseas migration temporarily soaring above pre-pandemic levels and because net interstate migration has continued its pandemic-era trend by remaining positive. The state's long-running internal migration outflow has turned to an inflow, adding meaningfully to the states dwelling requirement, although this trend won't last. While net interstate migration is forecast to revert to its historic outflow by 2024-25, there is a potential upside for slower outflow as fundamental changes in the labour market allow for greater working flexibility. Note that we estimate that the COVID-19 pandemic also temporarily pushed up household formation rates (including increasing 'headship' ratios), with the demand for more local holiday houses also contributing to underlying demand. Post-coronavirus, we expect household formation rates to settle back to more 'normal' long-run rates. Over the next five years to 2027/28, underlying demand for new dwellings (including an allowance for demolitions and unoccupied dwellings) is forecast to average just over 12,380 dwellings, underpinned by modest population growth of around 1% (see table 3.2).

Meanwhile, dwelling completions are expected to push above underlying demand over the next two years, eroding the current high level of stock deficiency. This is in the wake of high commencements over recent years. Stimulus measures and increasing demand saw total dwelling commencements (houses plus other dwellings, including conversions) climb well above past averages for South Australia over FY21 and FY22, reaching a record 14,264 dwellings in FY22. However, despite an

undersupply persisting over the next few years, rising interest rates, high building costs and capacity constraints have seen total dwelling commencements fall 21% in FY23 (mostly in the other dwelling segment), with house commencements declining 14%. Further declines are expected in house commencements over the two years to FY25 inclusive, declining a collective 15% from FY23 to FY25. Conversely, other dwellings are expected to recover from FY24 from the deep trough of FY23, helped by a very tight rental market, with the vacancy rate under 1%. A recovery in house commencements is expected from FY26, while other dwellings will strengthen appreciably over FY26 to FY30. Rising investor demand, the normalisation of overseas migration inflows and falls in interest rates will support growth in attached dwellings from FY26.

Figure 3.1 South Australia Dwellings Stock Balance

South Australia: Dwellings stock balance



3.2.1 Forecasts of Minor Customer Connections Expenditure and URDs

Minor customer connections expenditure (CCE) fell -11.3% in FY21 to \$19 million (constant 2020/21 prices) despite the substantial 43% increase in the number of house commencements and a healthy rise in alterations and additions activity. We understand that the main reason that minor connections expenditure declined was due to the change in service classifications for connection types for the 2020-25 Regulatory Control Period (RCP). This resulted in a change to SA Power Networks’ derivation of expenditures and its basis of preparation for regulatory reporting as required by the AER’s Regulatory Information Notice (RINs). The basis of expenditures within this report are on the basis of the AER’s RINs and related Standard Control Services (SCS) classification.

These changes to the classifications in FY21 appeared to have had a significant impact on Minor customer connections expenditure (CCE). It should be noted that the FY21 changes to the coverage and impacts on Minor CCE follow a number of changes and ‘aberrations’ over recent years. Minor CCE was impacted by the introduction of ‘metering contestability’ and its transition from 1 December 2017. This meant SA Power Networks was no longer fully responsible for metering services, resulting in a reduction of gross expenditure (and associated customer contributions) of around \$3 million per

year less in Minor CCE – around 15% less than 2017 levels of around \$19.4 million. There also appeared to be an aberration in 2018/19, when the Minor Connections Expenditure (RIN basis) showed an increase of 13.8% in 2018/19 – contrary to the -10% decline in house commencements and the one-off impacts of metering contestability. After discussions with SA Power Networks staff, we believe there that the Minor category was impacted by an accounting adjustment – with SAPN's Minor CCE on an 'Investment Management' (IM) basis recording an increase of around 16%. Accordingly, we have treated the quantum of Minor CCE (on a RIN basis) in 2018/19 as an aberration.

**Table 3.3: Drivers of Minor and URD Customer Connections Expenditure**

Year Ended June	Minor Customer Connect Expenditure (Projects <\$30k)		URD Customer Connect Expenditure		Houses Commencements		Total SA Alterations & Adds Approvals > \$10k		Metro Adelaide Lots Released No.	
	(\$'000) <sup>(1)</sup>	%CH	(\$'000) <sup>(1)</sup>	%CH	('000)	%CH	\$million <sup>(1)</sup>	%CH	No.	%CH
2008	15,359				9,508		451		7,101	
2009	15,726	2.4	9,609		9,332	-1.9	496	9.9	7,991	12.5
2010	16,728	6.4	5,758	-40.1	9,682	3.8	469	-5.3	7,944	-0.6
2011	13,702	-18.1	5,689	-1.2	8,259	-14.7	486	3.6	6,145	-22.6
2012	13,006	-5.1	4,508	-20.8	6,939	-16.0	492	1.2	5,202	-15.3
2013	14,009	7.7	5,428	20.4	6,529	-5.9	431	-12.4	4,736	-9.0
2014	16,397	17.1	4,772	-12.1	8,309	27.3	467	8.2	5,628	18.8
2015	15,942	-2.8	5,601	17.4	7,781	-6.4	476	1.9	6,070	7.9
2016	21,166	32.8	5,186	-7.4	7,687	-1.2	465	-2.3	6,972	14.9
2017	20,321	-4.0	5,116	-1.4	7,658	-0.4	462	-0.6	6,326	-9.3
2018	19,877	-2.2	5,518	7.9	8,210	7.2	465	0.7	6,504	2.8
2019	22,612	13.8	4,956	-10.2	7,336	-10.6	491	5.5	7,181	10.4
2020	21,725	-3.9	4,617	-6.8	7,683	4.7	486	-1.1	5,549	-22.7
2021	19,267	-11.3	5,774	25.1	10,953	42.6	527	8.5	9,983	79.9
2022	19,935	3.5	6,862	18.8	11,270	2.9	566	7.5	8,519	-14.7
2023	22,058	10.6	9,000	31.2	9,653	-14.3	545	-3.8	8,455	-0.8
Forecast										
2024	18,138	-17.8	9,146	1.6	8,413	-12.9	508	-6.8	7,376	-12.8
2025	16,669	-8.1	8,370	-8.5	8,224	-2.2	478	-5.9	7,357	-0.3
2026	17,974	7.8	8,699	3.9	8,868	7.8	483	1.0	7,900	7.4
2027	19,420	8.0	8,916	2.5	9,581	8.0	515	6.8	8,376	6.0
2028	20,050	3.2	8,180	-8.2	9,892	3.2	538	4.4	8,470	1.1
2029	20,269	1.1	7,106	-13.1	10,000	1.1	553	2.8	8,194	-3.3
2030	20,222	-0.2	7,066	-0.6	9,977	-0.2	563	1.8	8,148	-0.6
2031	19,808	-2.0	6,894	-2.4	9,773	-2.0	566	0.5	7,950	-2.4
Period Averages										
2011-2015	14,611		5,200		7,563		471		5,556	
2016-2020	21,140		5,078		7,715		474		6,506	
2008-2013	14,755		6,198		8,375		471		6,520	
2014-2023	19,930		5,740		8,654		495		7,119	
Forecast										
2024-2031	19,069		8,047		9,341		526		7,971	
2021-2025	19,213		7,830		9,703		525		8,338	
2026-2030	19,587		7,993		9,664		531		8,218	

Source: SA Power Networks, Oxford Economics Australia

<sup>(1)</sup>Constant 2020/21 Prices

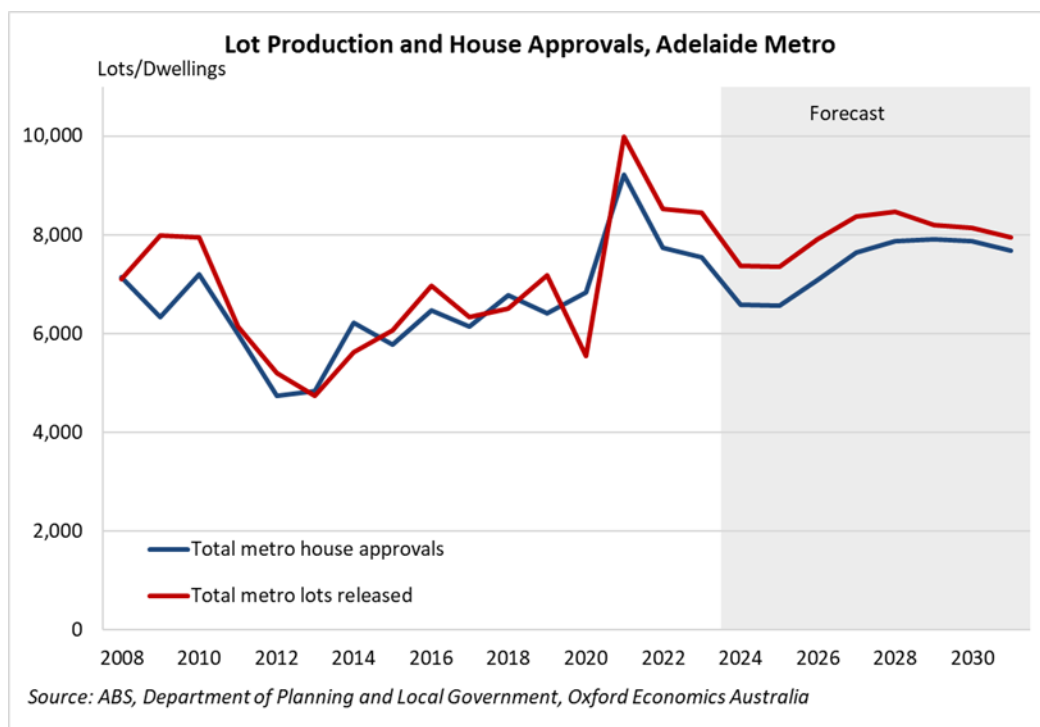
Over 2022, wet weather and flood delays have contributed to a backlog of minor connections work. Accordingly, some of this demand from FY22 spilled into FY23, with a degree of 'catch-up' involved. As a result, Minor CCE rose 3.5% in FY22 and 10.6% to \$22.1m in FY23 (constant 2020/21 prices), the latter despite a -14% decline in house commencements. This significant impact saw the ratio of Minor CCE/house commencements take a step down from an average of 2.8 over FY2016 to FY2020

to an average of 1.8 over FY21 and FY22. However, the ratio of minor CCE to house commencements jumped back to 2.29 over FY23. Assuming that the catch-up in connections to newly commenced houses has run its course, we have assumed that the ratio of Minor CCE/house commencements over 2021/22 and 2022/23 will be close to the long term average. In our projections of Minor CCE, we have assumed that the ratio will drift down to that average by 2024/25 and remain there over the forecast period.

In line with the sharp declines in house commencements, we expect Minor CCE to fall -17.8% and - 8.1% in FY24 and FY25 respectively. Thereafter, we expect that Minor CCE (and the ratio used) will 'normalise' and track the movements in house commencements over the rest of the outlook period to FY31. Accordingly, Minor CCE is then forecast to grow over the four years to FY29, with a cumulative increase of 20.2%, to a peak of \$20.3m, before easing back to \$19.8m by FY31.

Overall, we are forecasting Minor customer connections expenditure to average \$19.1 million over the eight years to 2030/31, lower than the average levels of \$19.9 million over the decade to 2022/23. In the next regulatory period – 2025/26 to 2029/30, Minor CCE is projected to average \$19.6 million.

**Figure 3.2: Lot Production and House Approvals, Adelaide Metro**

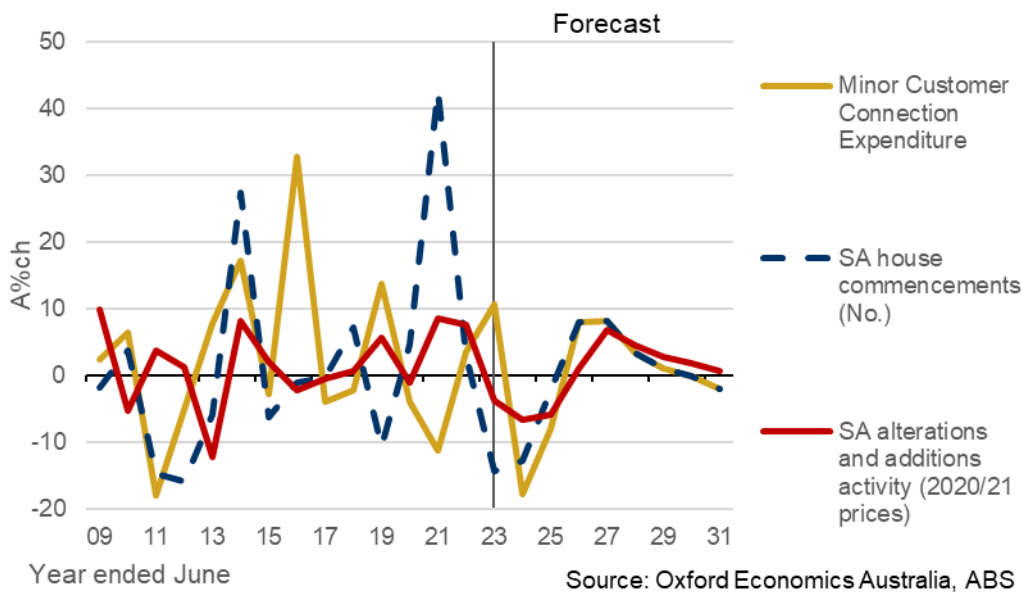


URD customer connect expenditure (CCE) tends to be erratic, compared to the number of Metro Adelaide Lot Releases (see table 3.3 and figures 3.2 and 3.4). OEA’s model of lot releases is based on house approvals, which lead house commencements and, in turn, are driven by the fundamentals of dwelling supply and demand – as discussed above. There was a significant 80% jump in lot releases over FY21 as new land releases attempted to catch up to strong housing demand (see figure 3.2). However, URD connections only increased 25%. We suspect URD connections struggled to keep up due to capacity constraints. Accordingly, we have witnessed some ‘catch-up’ occurring over the past two years, with URD connections growing by 19% in 2021/22 and an impressive 31% in 2022/23, despite a collective 16% decline in lot releases over those two years.

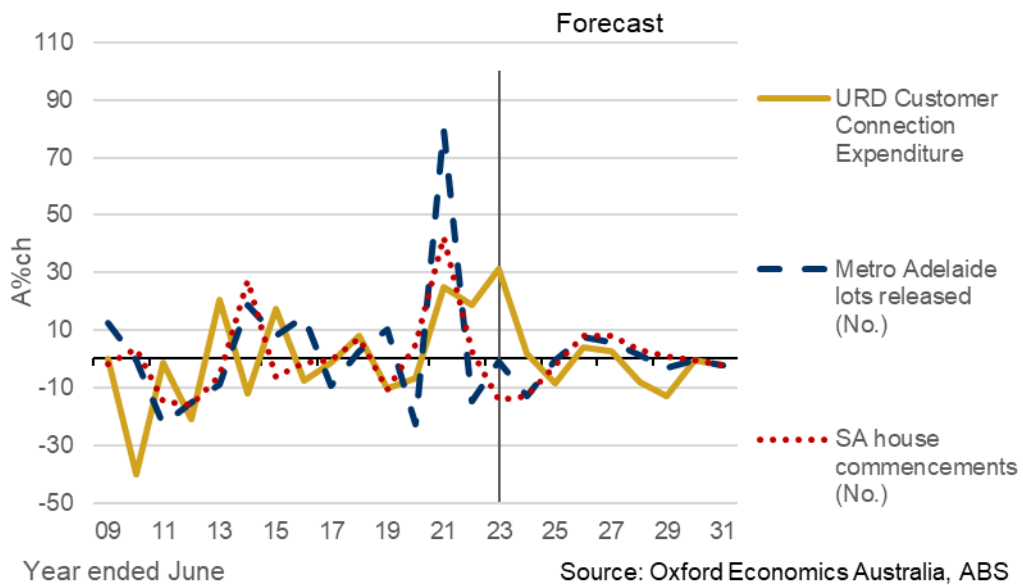
OEA is forecasting Metropolitan Adelaide house approvals and lot releases to decline a further -13% over 2023/24 to 2024/25 inclusive. URD connections are forecast to rise a further 1.6% in 2023/24,

despite the expected decline in Metro lot releases, due to some catch-up in URD work and high levels of lot development. Assuming there is little ‘catch-up’ in connections remaining after this year, then we expect URD connections expenditure to fall -8.5% in 2024/25, down to a trough of \$8.4 million in 2024/25. The recovery in housing approvals and commencements is then expected to see URD CCE increase modestly over the following two years to 2026/27, but then decline as an oversupply of developed land emerges and interest rates rise again in the latter years of the decade – which increases ‘holding costs’. Over the next few years, there is expected to be elevated levels of land and housing development, driven in part by significant increases in ‘social and affordable’ housing and the need to have adequate residential lots available for future demand.

**Figure 3.3 Minor Customer Connections Expenditure and Drivers**



**Figure 3.4 URD Customer Connections Expenditure and Drivers**



### 3.3 THE OUTLOOK FOR DRIVERS OF MEDIUM CUSTOMER CONNECTIONS EXPENDITURE

As previously outlined, medium customer connections are made up of small to medium commercial and residential connection projects. The major trends and drivers associated with medium customer projects include:

- Non-dwelling building commencements in the small to medium range (that is, projects less than \$20 million). Non-dwelling building includes commercial and industrial building (offices, hotels, shops, factories, warehouses, transport terminals) and social and institutional building (religious buildings, schools, hospitals, entertainment and recreation).
- 'Other Dwellings' commencements. This category includes all 'attached' dwellings other than detached houses, which are primarily used for long-term residential purposes and which contain (or have attached to them) more than one dwelling unit (e.g. duplexes, terrace houses, semi-detached houses, villas, maisonettes, townhouses, apartments, flats & home units).

Non-dwelling building construction has experienced larger, but less frequent, cyclical fluctuations than dwelling construction. This is due to the long gestation period between the planning and construction of non-dwelling building, and uncertainty in estimating demand, rentals and prices, which makes this sector more prone to oversupply (and undersupply).

Non-dwelling building work done (projects below \$20 million) increased strongly over the three years to 2022/23, peaking at a historic \$1.84 billion. The sector is forecast further growth in 2023/24 of 10.9%, before a fall of -9.5% in 2024/25. Work done for the sector is forecast to increase a strong 11% in FY24 but will then decline a cumulative -21% over FY25 and FY26 to \$1.62bn. Thereafter, the non-residential building sector (<\$20m) will mostly exhibit modest increases over the following 5 years to reach \$1.76 billion in FY31.

The overall non-residential building sector in South Australia is set for a long period of renewal, following a fairly flat profile over most of the past decade or so. This will include solid increases in social and institutional buildings – such as health, recreational and institutional buildings (e.g. prisons, court houses) – which are mostly covered by the public sector. Similarly, we expect a sustained period of solid growth in commercial and industrial buildings in these lower value range non-dwelling buildings. Overall, a higher average level of activity is projected over the next 8 years compared to the past decade (see table 3.4).

'Other dwellings' activity is quite volatile, with sharp fluctuations from year to year. The real value of other dwellings work done rose by 35% in 2017/18 to reach a record level of \$911 million supported by low interest rates and strong investor demand. This was reversed over 2018/19 to 2020/21, with a brief rally in 2021/22 (+4.6%), being followed by yet another fall of -2.1% in 2022/23, with work done for other dwellings reaching \$691 million. Although there is a risk that higher than expected interest rates may delay the upturn in other dwellings, a bounce back is expected over 2023/24 (+11.7%), with a small decline expected in FY25. Thereafter, a solid recovery is projected over the second half of the decade, increasing to \$1.48 billion in FY31 (see table 3.4), due to a dwelling stock deficiency – which cannot be fully filled by detached houses, and will need a significant lift in other dwellings, including those for rental in a tight market.

#### 3.3.1 Forecasts of Medium Customer Connections Expenditure

The first thing to note with Medium customer connections expenditure (CCE) is that connections related to 'embedded generation' were included in the expenditure data from 2015/16 to 2019/20, after which they are excluded. This makes a material difference to the data presented in tables 1.1 and 3.4, as embedded generation climbed from \$250,000 in 2015/16 to \$9.4 million in 2017/18 (when they comprised around a third of the Medium CCE – and were responsible for virtually all of the



increase in that year). Embedded generation expenditures (EG) eased back over the following two years to \$7 million in 2019/20, but still accounted for almost a third of Medium CCE. As EG is excluded from 2020/21, the following discussion will abstract from the influence of EG.

Medium customer connections expenditure (excluding EG) fell – 26.5% in 2019/20 to \$14.3 million, but then recovered over the following two years to \$19m in 2021/22, boosted by the recovery in other dwelling work done and some residual lags from the rise in non-residential work done in 2020/21, although non-residential building work done (<\$20 million. In 2022/23, Medium CCE fell 7.1% to \$17.7 million. We expect strong growth of 16% over FY24, before declining a cumulative 12% over FY25 and FY26. Subsequently, strong growth of 12% and 8% is forecast respectively for 2026/27 and 2027/28, followed by modest growth over FY29 to FY31, reaching \$23.7 million is expected in 2030/31.

**Table 3.4: Drivers of Medium Customer Connections Expenditure (2020/21 prices)**

Year Ended June	Medium Customer Connect Expenditure (3)		Non-Residential Building Work Done (Below \$5 million)		Non-Residential Building Work Done (\$5mil-\$20 mil)		Other Dwellings Work Done <sup>(2)</sup>		Non-Residential Building Work Done <\$20 mil	
	(\$'000) <sup>(1)</sup>	%CH	\$million <sup>(1)</sup>	%CH	\$million <sup>(1)</sup>	%CH	\$million <sup>(1)</sup>	%CH	\$million <sup>(1)</sup>	%CH
2008	46,549		800		426		518		1,226	
2009	42,007	-9.8	788	-1.4	441	3.4	585	12.9	1,229	0.2
2010	39,071	-7.0	1237	56.9	455	3.2	577	-1.3	1,692	37.7
2011	30,344	-22.3	1184	-4.3	437	-4.0	591	2.4	1,620	-4.2
2012	26,802	-11.7	858	-27.5	383	-12.2	573	-3.1	1,241	-23.4
2013	27,124	1.2	690	-19.6	367	-4.4	374	-34.6	1,056	-14.9
2014	23,561	-13.1	739	7.2	561	53.0	519	38.6	1,300	23.1
2015	24,353	3.4	740	0.2	396	-29.4	612	17.9	1,136	-12.6
2016	19,547	-19.7	806	8.9	353	-10.8	652	6.5	1,159	2.0
2017	20,763	6.2	726	-9.9	383	8.5	675	3.6	1,109	-4.3
2018	28,015	34.9	1009	38.9	433	13.0	911	35.0	1,442	30.0
2019	26,717	-4.6	915	-9.3	564	30.1	892	-2.2	1,479	2.6
2020	21,277	-20.4	866	-5.4	538	-4.5	852	-4.4	1,404	-5.0
2021	15,221	-28.5	952	9.9	663	23.1	675	-20.8	1,615	15.0
2022	19,036	25.1	1028	7.9	730	10.1	706	4.6	1,757	8.8
2023	17,680	-7.1	1105	7.6	733	0.4	691	-2.1	1,838	4.6
Forecast										
2024	20,514	16.0	1188	7.4	850	16.0	772	11.7	2,038	10.9
2025	19,069	-7.0	995	-16.2	849	-0.2	768	-0.5	1,844	-9.5
2026	18,141	-4.9	874	-12.2	745	-12.2	866	12.7	1,619	-12.2
2027	20,282	11.8	957	9.5	768	3.1	1053	21.6	1,725	6.6
2028	21,864	7.8	959	0.2	805	4.7	1231	16.9	1,764	2.2
2029	22,372	2.3	959	0.0	768	-4.5	1337	8.6	1,728	-2.1
2030	23,176	3.6	995	3.7	781	1.6	1398	4.6	1,776	2.8
2031	23,672	2.1	981	-1.4	782	0.1	1480	5.8	1,763	-0.8
Period Averages										
2011-2015	26,437		842		429		534		1,271	
2016-2020	23,264		864		454		796		1,319	
2008-2013	35,316		926		418		536		1,344	
2014-2023	21,617		889		535		718		1,424	
Forecast										
2024-2031	21,136		989		794		1,113		1,782	
2021-2025	18,304		1,054		765		722		1,818	
2026-2030	21,167		949		773		1,177		1,722	

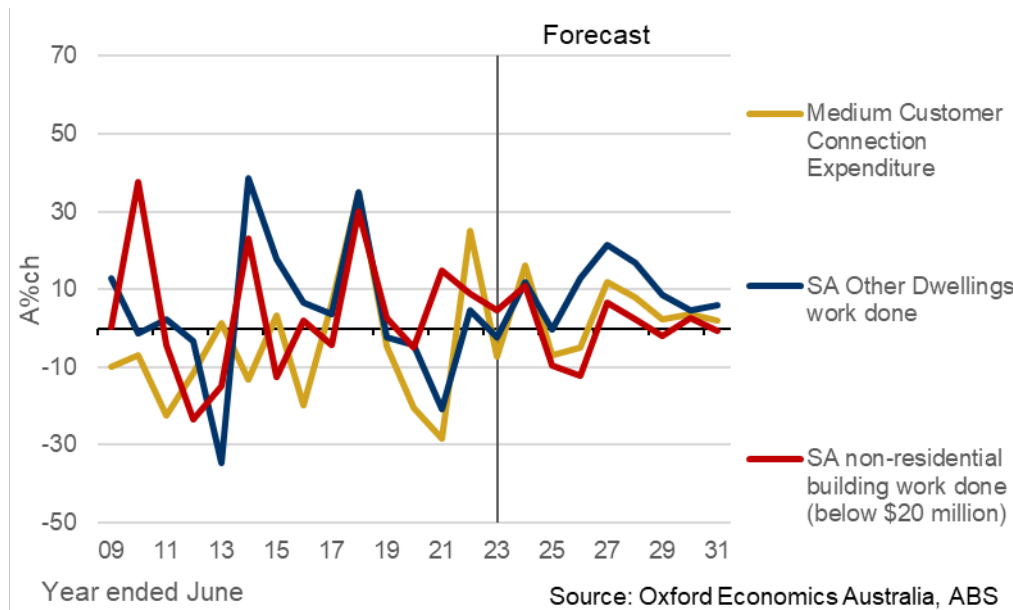
Source: SA Power Networks, Oxford Economics Australia

<sup>(1)</sup>Constant 2020/21 Prices

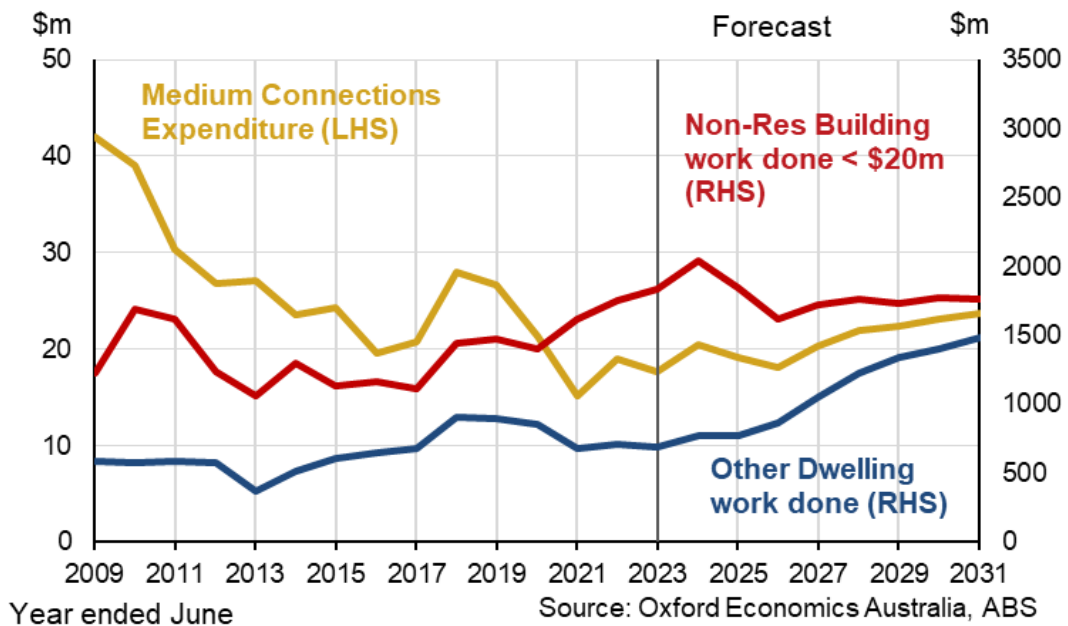
<sup>(2)</sup>Other Dwellings includes buildings other than houses, which are primarily used for long-term residential purposes and which contains (or has attached to it) more than one dwelling unit

<sup>(3)</sup>Embedded Generation expenditure is included for financial years 2015/16 to 2019/20

**Figure 3.5 Medium Customer Connections Expenditure and Drivers (real values): %Chg**



**Figure 3.6 Medium Connections Expenditure and Drivers: \$m**

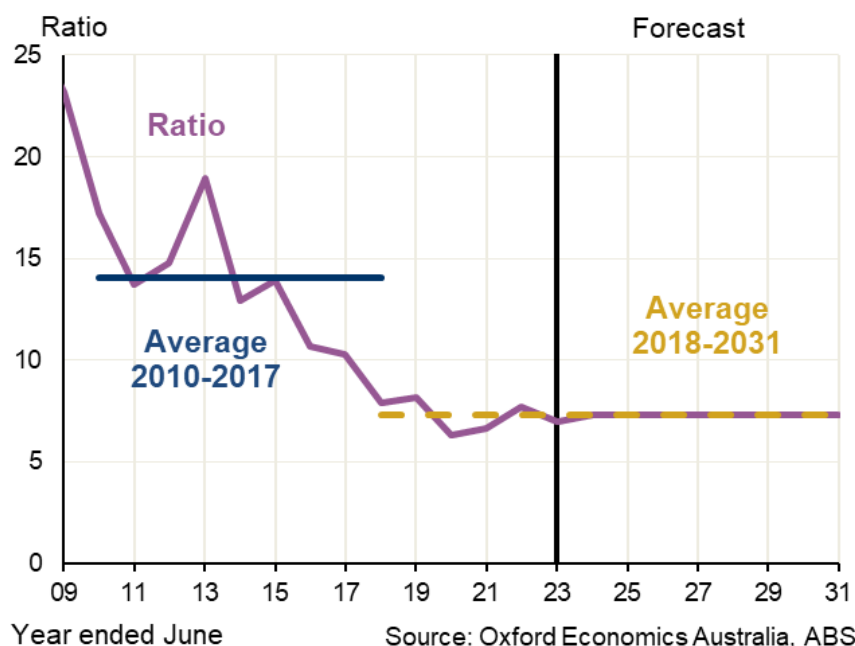


Given the volatile history of medium connections expenditure compared to its building-related drivers (see charts 3.5 and 3.6), we have taken a conservative approach to the forward projections, particularly with regard to the historical ratio of medium connections expenditure-to-sum of drivers. Over the period from financial year 2010 to 2023 (we have excluded the very high ratio of 23.1 in 2008/09 and prior years), the long-term ratio is 10.4, with a range of 6.3 to 19, excluding EG (see chart 3.7). The volatility of the ratio is largely due to differences in timing of connections after commencement of the relevant building and the wide variations in the size and type of building, i.e. the building types are largely not homogenous.

There appears to be a marked step down in the ratio around 2018. The average of 2010-17 was 14.1, but the average of 2018-23 is 7.3. Given the apparent stabilisation of the ratio over recent years

(arresting the trend decline), we have based the long-term forecast ratio on the period 2018-23, i.e., 7.7, leaving this ratio constant over the period to 2030/31. Given this forecast ratio is around 30% lower than the historical ratio (2010-23), there may be some upside to medium customer connections. Indeed, the Medium CCE of \$23.7 million in 2030/31 is still well below the 2009/10 value of \$42 million (values in 2020/21 prices), with the average of \$21.1 million in the 2024-31 period slightly below the average of the 2014-23 regulatory period.

**Figure 3.7 Ratio of Medium Connections Expenditure/Sum of Drivers**



### 3.4 THE OUTLOOK FOR DRIVERS OF MAJOR CUSTOMER CONNECTIONS EXPENDITURE

Major customer connections are made up of connection works for major non-residential buildings, industrial projects, government and private sector infrastructure projects, large residential land developments and the occasional large multi-unit residential or retirement village project. In South Australia, the value of major projects tends to be the key driver of activity, rather than changes in project volumes.

The major trends and drivers associated with major customer projects include:

- Major non-dwelling building commencements (projects above \$20 million).
- Major engineering construction projects. Engineering construction includes infrastructure such as roads, bridges, railways, harbours, water supply, sewerage works, electricity generation and supply works, pipelines, telecommunications and mining and heavy industry construction. We have excluded oil, gas and other hydrocarbons, bauxite, alumina, aluminium, coal and coal handling and other minerals projects, as well as pipelines, as most of these projects are outside SA Power Networks grid, unless a project within these categories is known to be within the SAPN grid and is expected to be connected to the grid. We have also excluded electricity generation and supply works as they are not 'customers' of SA Power Networks – except for specific projects identified by SAPN, including connection-related 'embedded generation' projects.

Non-dwelling building work done above \$20 million have been at consistently high levels over the five years to 2022/23 inclusive, averaging over \$1,338 million, a historically high volume of major projects

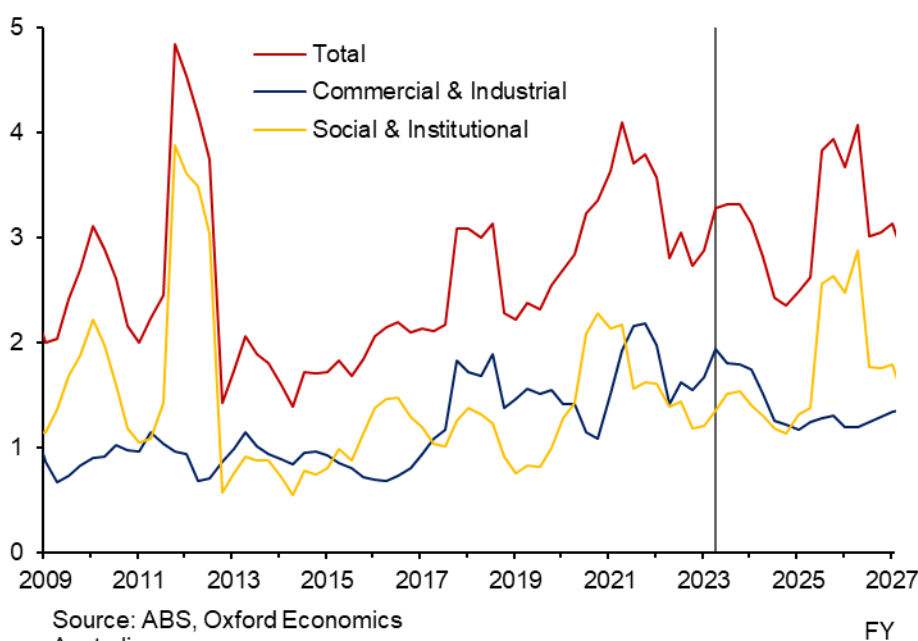
(see table 3.5 and chart 3.11) – 26% larger than the \$1,060 million average of the previous five years. Work done reached a historic peak of \$1,573 million in 2022/23, but Oxford Economics Australia is forecasting non-residential building work done (projects above \$20m) to fall sharply over 2023/24 and 2024/25 by -16.4% and -13.1% respectively.

In 2025/26 we are forecasting work done to plateau at \$1,142 million, before a large 36% increase in 2026/27. This big lift in work done to \$1,553 million, is underpinned by the commencement of the \$1.4 billion New Women and Children’s hospital. Further solid growth is projected over the following two years, before falling sharply over the two years to 2030/31. Nevertheless, levels over the 2028-2031 period will be quite high, averaging \$1.6bn. Chart 3.8 below shows total non-residential building commencements by broad sectors, which includes all value ranges.

**Figure 3.8 South Australia: Total Non-Residential Building Commencements**

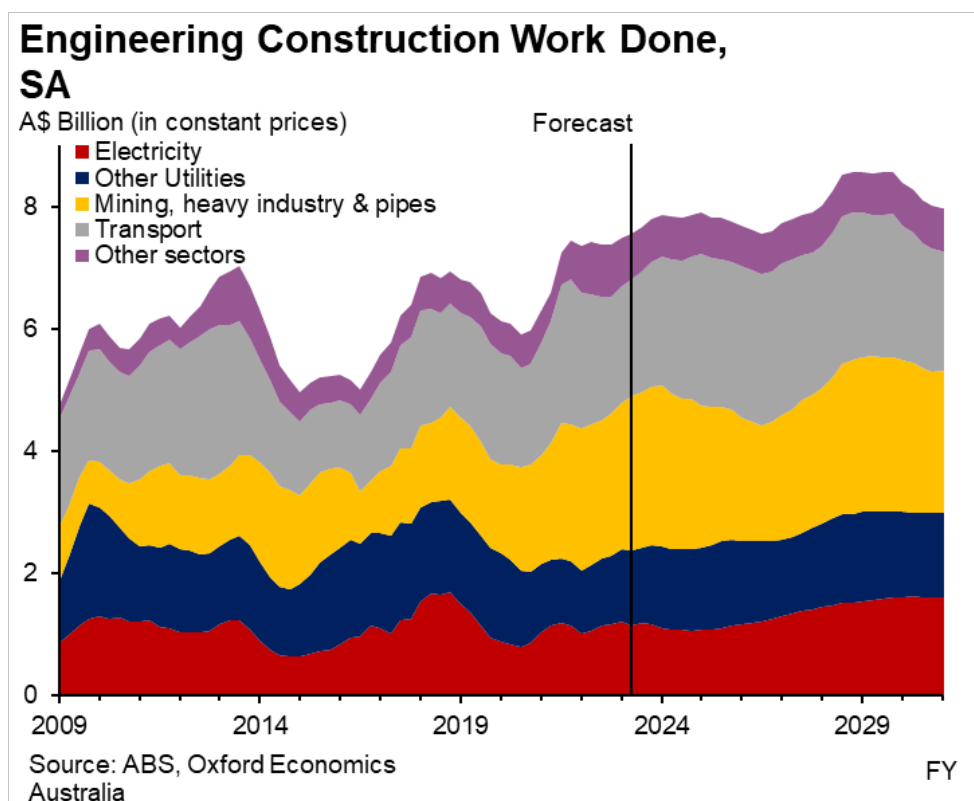
### Non-residential commencements, SA

\$bn, constant MAT



The total value of engineering construction work done in South Australia (excluding the mining, pipeline and electricity sectors) has steadily increased over the past 8 years to 2022/23, reaching around \$4bn over the past two years. In 2021/22 work done in the selected categories rebounded 12.5% to \$4.08 billion due to a new round of projects, particularly in the roads, telecoms and recreation sectors. Across 2022/23, work done fell -2.4% to \$4 billion, although an increase of 20.5% over 2023/24 to \$4.8bn is expected, with a further rise of 7.4% to \$5.15bn in 2024/25. Thereafter, small declines are expected over the following 6 years, with activity stabilising around \$5 billion. A steady and large pipeline of major public sector transport projects will underpin the relatively high levels of engineering construction work over the next few years, with water infrastructure projects contributing later this decade. Details of engineering construction by broad category are shown in figure 3.9.

Figure 3.9 South Australia: Engineering Construction by Sector



### 3.4.1 Forecasts of Major Customer Connections Expenditure

Major customer connections expenditure (CCE) recovered from the very low levels of 2015/16 over the following two years and then lifted 62% in 2018/19 to \$30.4 million (2020/21 prices). It then fell 10% in 2019/20 but rose 4% in 2020/21 to \$28.6 million, before easing to \$27 million. Major customer connections expenditure increased 20.3% in 2022/23 to \$32.5 million. The lift in major connections expenditure signals a return to 'normal' levels, both in terms of historical levels of expenditure, but also in terms of the ratio of major CCE to the two building and construction drivers (i.e. non-residential building commencements above \$20m and engineering construction work done, excluding oil and gas, mines, pipelines and electricity) – see chart 3.13.

In determining this ratio, we add around one-third of the value of engineering construction work done to the value of non-residential building commencements above \$20 million. This effectively gives both drivers equal value in the summation of the 'sum of drivers' (see figures 3.10 and 3.11), as we estimated that in 2017/18 and 2018/19, each of the drivers were responsible for around half each of the value of major CCE. These estimates were based on the analysis of individual projects and their relevant customer connections values. These projects are shown in the major projects listing in the spreadsheet accompanying this report.

Major connections expenditure tends to be very erratic, with the quantum of major connections expenditure driven by the number of specific projects which require major connections (i.e. over \$100,000 each), while the projects needing connections are **not homogenous** in terms of the size of connection. Many large engineering and non-residential building projects, for example, may require only a comparatively small connection, relative to the size of the project; or may only need a 'short' connection if they are already near a major sub-station.

**Table 3.5: Drivers of Major Customer Connections Expenditure (2020/21 prices)**

Year Ended June	Major Customer Connect Expenditure		Non-Residential Building Work done		Engineering Construction Work Done	
	(Projects > \$100k)		(Above \$20 million)		(excl. Mines & Elec) <sup>(2)</sup>	
	(\$'000) <sup>(1)</sup>	%CH	(\$million) <sup>(1)</sup>	%CH	(\$million) <sup>(1)</sup>	%CH
2008	19,974		446		2,258	
2009	48,748	144.1	712	59.8	3,076	36.3
2010	63,741	30.8	959	34.6	4,122	34.0
2011	39,888	-37.4	1,061	10.6	3,663	-11.1
2012	36,892	-7.5	1,238	16.8	3,861	5.4
2013	37,434	1.5	1,337	8.0	4,536	17.5
2014	36,811	-1.7	1,171	-12.5	3,824	-15.7
2015	24,906	-32.3	1,252	6.9	2,929	-23.4
2016	14,369	-42.3	917	-26.8	3,204	9.4
2017	15,915	10.8	923	0.7	3,585	11.9
2018	18,789	18.1	1,036	12.3	4,105	14.5
2019	30,429	62.0	1,104	6.5	3,771	-8.2
2020	27,470	-9.7	1,249	13.1	3,851	2.1
2021	28,600	4.1	1,368	9.5	3,629	-5.8
2022	27,030	-5.5	1,396	2.1	4,082	12.5
2023	32,516	20.3	1,573	12.6	3,983	-2.4
Forecast						
2024	42,921	32.0	1,314	-16.4	4,798	20.5
2025	55,669	29.7	1,142	-13.1	5,154	7.4
2026	49,601	-10.9	1,142	0.0	5,109	-0.9
2027	42,012	-15.3	1,553	36.0	5,058	-1.0
2028	42,264	0.6	1,651	6.3	5,044	-0.3
2029	44,290	4.8	1,761	6.7	5,189	2.9
2030	39,988	-9.7	1,492	-15.3	4,987	-3.9
2031	38,737	-3.1	1,466	-1.8	4,768	-4.4
Period Averages & Compound Annual Average Growth Rates						
2011-2015	35,186		1,212		3,763	
2016-2020	21,395		1,046		3,703	
2008-2013	41,113		959		3,586	
2014-2023	25,684		1,199		3,696	
Forecast						
2024-2031	44,435		1,440		5,014	
2021-2025	37,347		1,359		4,329	
2026-2030	43,631		1,520		5,078	

Source: SA Power Networks, Oxford Economics Australia

<sup>(1)</sup>Constant 2020/21 Prices

<sup>(2)</sup>Excluding oil, gas and other hydrocarbons, bauxite, alumina and aluminium, coal and coal handling, other minerals, pipelines & electricity. Excludes electricity engineering construction because SA Power Networks and most electrical works are not "customers". Forecasts of engineering construction commencements are BIS Oxford Economics work done forecasts with a 1 year lead.

Note that in terms of large project commencements, the electricity connection may not occur early in the construction phase (unlike minor and medium connections, which tend to occur within 6-12 months of commencement). Often the site works come first, and some preliminary construction, before the electricity line is connected. For some engineering projects, sometimes the connection is done late in the project. Indeed, there were a number of large projects which commenced in the 2017/18 financial year, which did not have their connection undertaken until 2018/19 (with some projects spilling into the 2019/20 financial year). Conversely, there appears to have been a one year lag in the fall and then rise in connections in 2019/20 and 2020/21 respectively in response to the fall and then rise in the drivers in the previous years of 2018/19 and 2019/20.

Over 2023/24 and 2024/25, a large number of substantial projects identified by SA Power Networks and Oxford Economics Australia have and are forecast to drive very strong growth in major customer connections, with a significant 32% increase in 2023/24 and further 30% increase to \$55.7 million in 2024/25. Particular substantial projects with significant connection values (in brackets) and a high probability of proceeding over the next 2 years include:

[REDACTED]

Note that as discussed in section 3.1.3, the forecasts for 2023/24 to 2024/26 are based on the bottom-up build of individual project customer connection values, as documented in the accompanying major projects list spreadsheet.

In terms of the ratio of major customer connections to the sum of drivers (1/3 of the relevant engineering construction work done + non-residential building commencements over \$20m), the ratio increases from an average of 11.3 over the past four years to 2022/23, to 15 and 19.8 in 2023/24 and 2024/25 respectively, with engineering construction work done rising sharply but non-residential building activity falling. These recent ratios and ratios over the next three years compare to the long-term average of 12.9, which excludes the very high and very low 'outliers' (see chart 3.13).

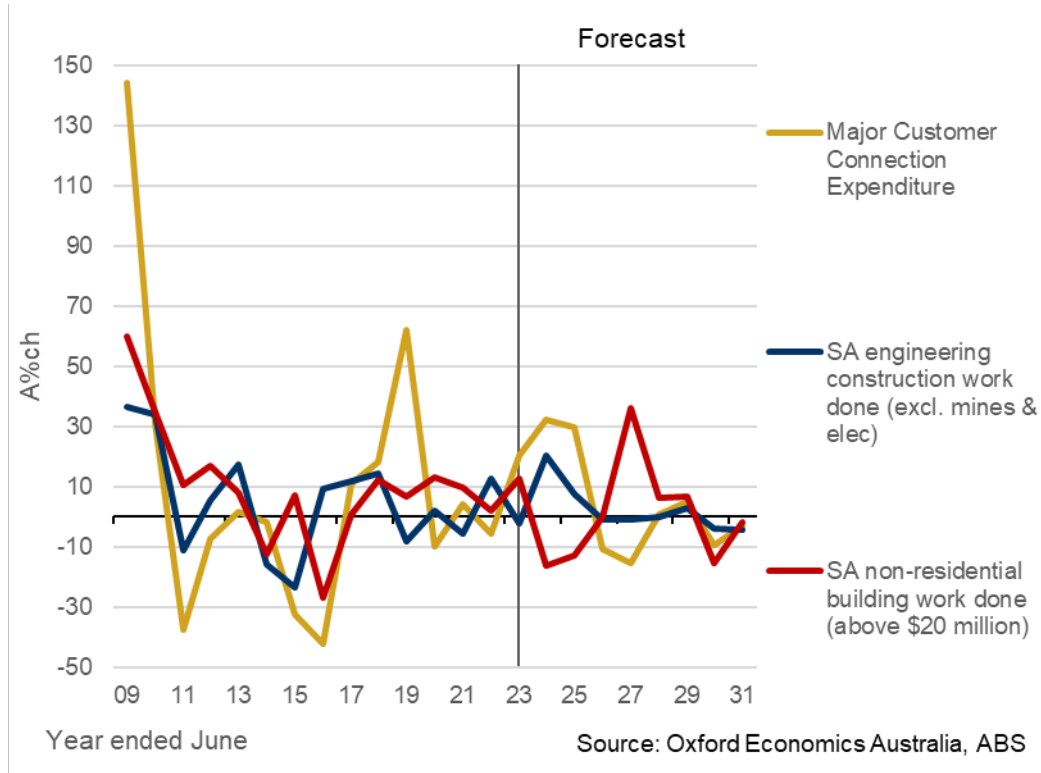
In 2025/26, a significant proportion of the increase in non-residential building work done (and commencements) is the \$1,400 million New Women and Children's Hospital, but which only has some smaller connections and enhancements, as it is expected to use existing connections to the Royal Adelaide Hospital. As such, this very large building value – but very low connection value – pushes the ratios downward over FY26 to FY28. For the next 3 years, we expect considerable volatility in the relationship of Major CCE to its key drivers, but over the second half of the decade we expect the ratio to settle down and see Major CCE track the growth in the key drivers. Accordingly, the long-run ratio over 2027-31 is projected to be 12.9 – close to the last few years. Supporting the higher connections values in the years from 2026/27 to 2030/31 are a large number of key projects identified in the major projects list, most of which have high probabilities of proceeding, although the timing can be uncertain. These projects include

[REDACTED] projects.

Overall, major customer connection expenditure is forecast to average \$49.4 million over the next three years to 2025/26, compared to \$29.2 million over the five years to 2022/23. Over the five years to 2030/31 Major CCE is forecast to average \$41.5 million. Although the next decade is considerably

higher than the last five years, major customer connections expenditure is not expected to reach the high average of \$50.8m seen over 2008/09 to 2010/11.

**Figure 3.10 Major Customer Connections Expenditure and Drivers: % Chg**



**Figure 3.11 Major Connections Expenditure and Drivers: \$m**

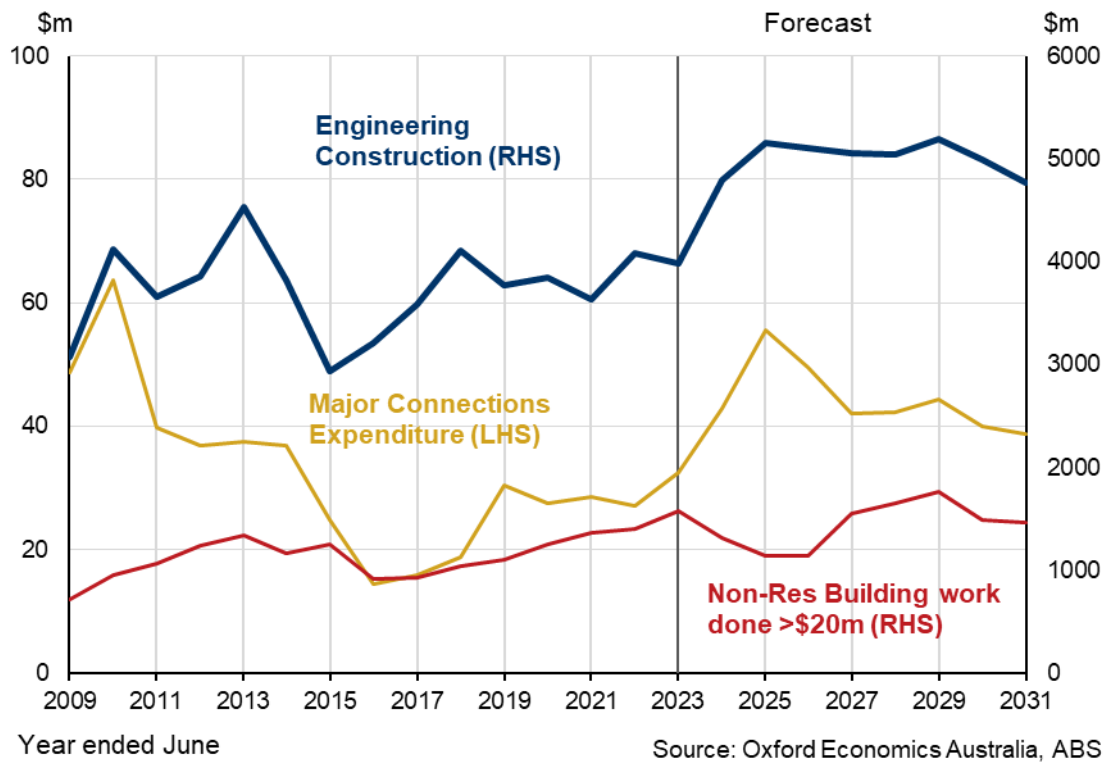




Figure 3.12 Major Connections Expenditure and Sum of Drivers: \$m

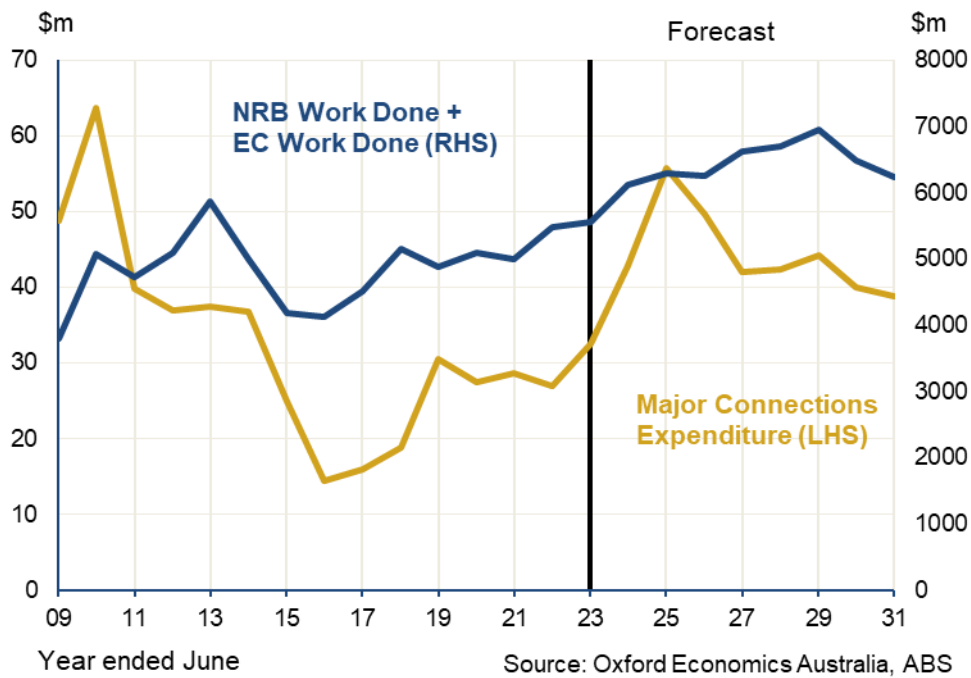
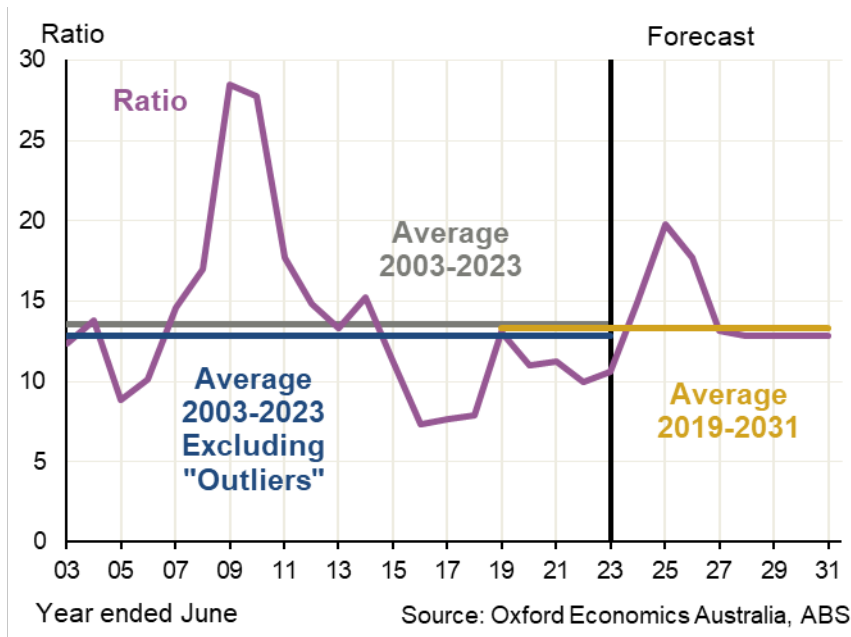


Figure 3.13 Ratio of Major Connections Expenditure/Sum of Drivers



However, there is possibly some upside to these forecasts, with 2 sets of potential upside factors which could drive higher outcomes over the outlook period. Firstly, there is potential for greater volume of connections for renewable projects in South Australia, although these may be part of 'Large Embedded Generation (see next section). Secondly, there is potential for a quicker acceleration in the take-up of electric vehicles would necessitate a larger programme of higher voltage connections (and sub-stations) than envisaged in these forecasts, in order to support the electric charging network (for example, if they were put in existing fuel service stations). Fast EV charging stations are now

becoming an underlying program in major projects from 2022/23 onwards, for both highway chargers and fleet change-overs for various transport entities and commercial businesses with large fleets ie Councils, delivery vehicles, etc

### 3.4.2 Forecasts of Large Embedded Generation

**Table 3.6: Drivers of Large Embedded Generation (2020/21 prices)**

Year Ended June	Large Embedded Generation Connect Expenditure		Electricity Generation Engineering Construction Work Done	
	(\$'000) <sup>(1)</sup>	%CH	(\$million) <sup>(1)</sup>	%CH
2008				
2009	248			
2010	453	82.7	770	
2011	205	-54.8	671	-12.9
2012	161	-21.2	378	-43.6
2013	530	229.2	477	26.2
2014	938	76.9	367	-23.2
2015	111	-88.2	238	-35.1
2016	313	181.8	338	41.7
2017	2,864	815.6	520	54.0
2018	12,445	334.6	737	41.9
2019	9,322	-25.1	692	-6.1
2020	8,850	-5.1	242	-65.1
2021	10,015	13.2	473	95.6
2022	8,852	-11.6	400	-15.5
2023	7,984	-9.8	464	16.2
Forecast				
2024	4,904	-38.6	422	-9.2
2025	6,974	42.2	395	-6.2
2026	8,865	27.1	397	0.6
2027	8,762	-1.2	415	4.5
2028	9,470	8.1	476	14.6
2029	9,435	-0.4	474	-0.4
2030	10,110	7.2	508	7.2
2031	10,518	4.0	529	4.0
<b>Period Averages &amp; Compound Annual Average Growth Rates</b>				
2011-2015	389		426	
2016-2020	6,759		506	
2008-2013	319		574	
2014-2023	6,169		447	
Forecast				
2024-2031	8,630		452	
2021-2025	7,746		431	
2026-2030	9,328		454	

Source: SA Power Networks, Oxford Economics Australia

<sup>(1)</sup>Constant 2020/21 Prices

Connections related to Large Embedded Generation (LEG) were added in the March-April 2023 iteration. In order to retain some consistency with previous forecasts provided by OEA, the LEG connection values have not been included in the Totals. Historical LEG values have been provided by SAPN. Going forward, the near-term forecasts to 2025/26 are based on the projects supplied by SAPN, applying the estimated probability factor to give the final value. Thereafter, the LEG values are based on OEA forecasts of engineering construction for electricity generation projects in South Australia (see table 3.6).

# APPENDIX 1: TERMS OF REFERENCE

To be inserted by SA Power Networks.

## APPENDIX 2: STATEMENT OF COMPLIANCE WITH EXPERT WITNESS GUIDELINES

I have read the Guidelines for Expert Witnesses in Proceedings of the Federal Court of Australia and confirm that I have made all inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Court.

# APPENDIX 3: CURRICULUM VITAE OF KEY PERSONNEL

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