

## Supporting document 5.12

# BIS Oxford Economics - Gross Customer Connections Expenditure Forecasts to 2025-26

2020-25 Revised  
Regulatory Proposal  
10 December 2019





BIS OXFORD  
ECONOMICS

# **GROSS CUSTOMER CONNECTIONS EXPENDITURE FORECASTS TO 2025/26**

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

**FINAL REPORT NOVEMBER 2019**



**BIS Oxford Economics**

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**November 2019**

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The modelling and results presented here are based on information provided by third parties, upon which BIS Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

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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.

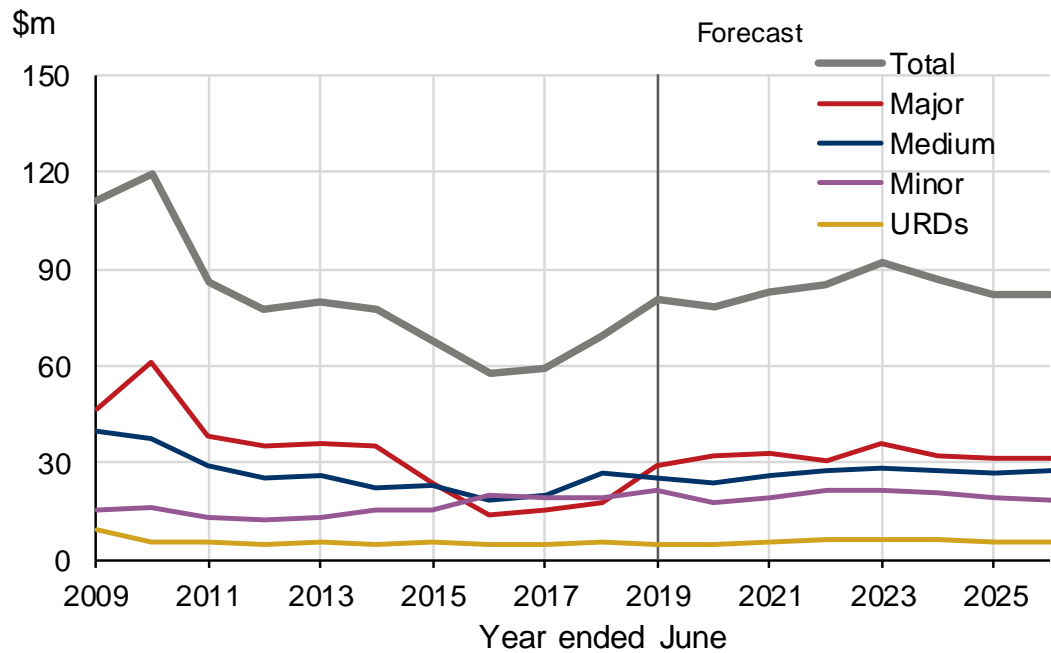
Total customer connections expenditure recovered strongly over 2017/18 and 2018/19, rising 16% and 17% respectively to \$80.9 million. The 2018/19 level is a return to more 'normal' levels of customer connections expenditure, following four years of relatively weak levels. Total connections expenditure is forecast to decline -3.5% in 2019/20, with declines across the minor, URD and medium categories more than offsetting a 10% increase in major connections.

Total connections expenditure is forecast to then rise steadily (cumulatively 18.4%) over the subsequent three years to 2022/23, peaking at \$92.5 million in 2022/23, driven by strengthening economic, building and infrastructure activity, with defence and other government projects key contributors. Thereafter, we expect connections expenditure to decline by a cumulative 11% over the three years to 2025/26 as building and construction activity fall back. The seven-year average to 2025/26 is predicted to be \$84.3 million, compared with an average of \$67 million over the previous five years to 2018/19 (see table below).

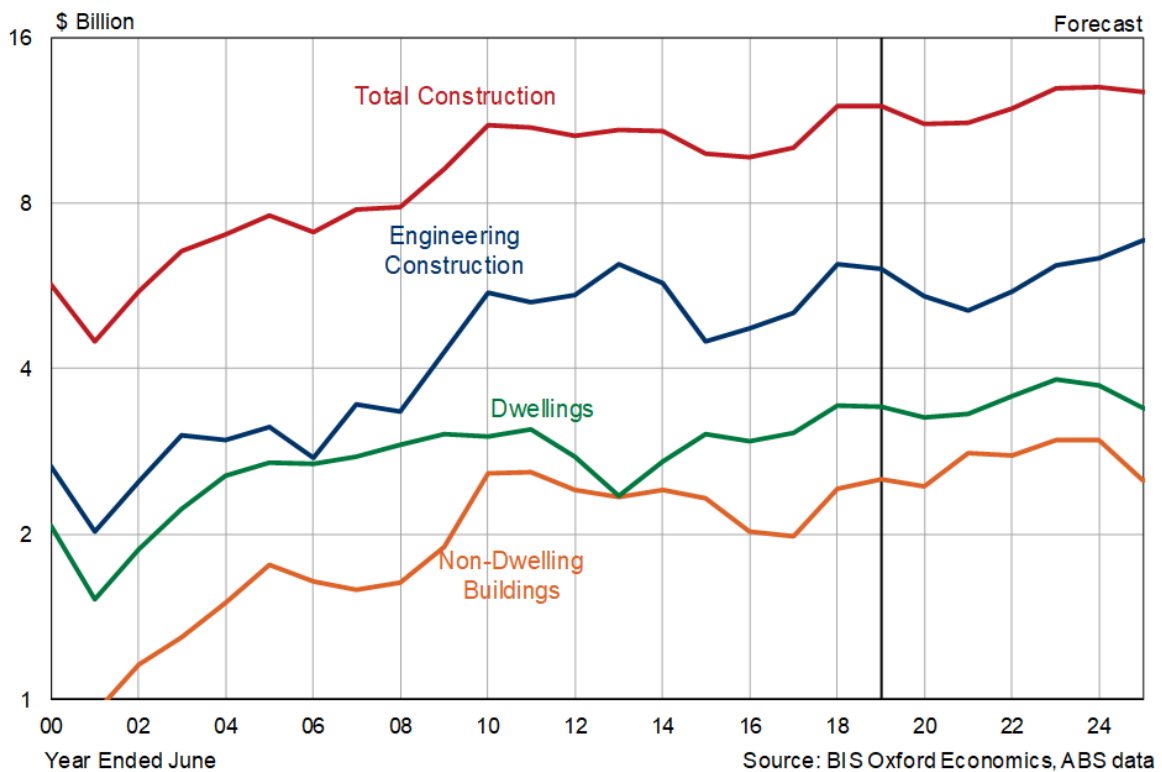
**Table 1.1: Customer Connections Expenditure (Constant 2017/18 Prices)**

Year Ended June	Minor Customer Connect Expenditure (Projects <\$30k)		URD Customer Connect Expenditure		Medium Customer Connect Expenditure (Projects \$30k-\$100k)		Major Customer Connect Expenditure (Projects >\$100k)		Total Customer Connect Expenditure All Projects	
	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH
2009	15,023	2.4	9,180		40,131	-9.8	46,571	144.1	110,904	
2010	15,980	6.4	5,501	-40.1	37,326	-7.0	60,894	30.8	119,700	7.9
2011	13,090	-18.1	5,435	-1.2	28,989	-22.3	38,106	-37.4	85,620	-28.5
2012	12,425	-5.1	4,306	-20.8	25,604	-11.7	35,244	-7.5	77,580	-9.4
2013	13,383	7.7	5,185	20.4	25,913	1.2	35,762	1.5	80,243	3.4
2014	15,665	17.1	4,559	-12.1	22,509	-13.1	35,167	-1.7	77,899	-2.9
2015	15,230	-2.8	5,351	17.4	23,265	3.4	23,794	-32.3	67,640	-13.2
2016	20,221	32.8	4,954	-7.4	18,674	-19.7	13,727	-42.3	57,576	-14.9
2017	19,413	-4.0	4,887	-1.4	19,835	6.2	15,204	10.8	59,340	3.1
2018	18,989	-2.2	5,271	7.9	26,764	34.9	17,950	18.1	68,973	16.2
2019	21,602	13.8	4,734	-10.2	25,523	-4.6	29,070	62.0	80,930	17.3
Forecast										
2020	17,519	-18.9	4,557	-3.7	24,012	-5.9	32,006	10.1	78,094	-3.5
2021	19,440	11.0	5,317	16.7	25,895	7.8	32,550	1.7	83,202	6.5
2022	21,226	9.2	5,823	9.5	27,649	6.8	30,685	-5.7	85,383	2.6
2023	21,728	2.4	6,161	5.8	28,342	2.5	36,229	18.1	92,460	8.3
2024	20,782	-4.4	5,823	-5.5	27,785	-2.0	32,097	-11.4	86,487	-6.5
2025	18,909	-9.0	5,255	-9.8	26,959	-3.0	31,416	-2.1	82,539	-4.6
2026	18,235	-3.6	5,067	-3.6	27,300	1.3	31,425	0.0	82,027	-0.6
Period Averages & Compound Annual Average Growth Rates										
2011-15	13,959	3.9	4,967	-0.4	25,256	-5.4	33,614	-11.1	77,796	-5.7
2016-19	20,056	2.2	4,962	-1.5	22,699	11.0	18,988	28.4	66,705	12.0
<b>2016-20</b>	<b>19,549</b>	<b>-3.5</b>	<b>4,881</b>	<b>-2.1</b>	<b>22,961</b>	<b>6.5</b>	<b>21,591</b>	<b>23.6</b>	<b>68,982</b>	<b>7.9</b>
Forecast										
2020-26	19,691	0.7	5,429	1.8	26,849	2.2	32,344	-0.3	84,313	0.8
<b>2021-25</b>	<b>20,417</b>	<b>-0.7</b>	<b>5,676</b>	<b>-0.3</b>	<b>27,326</b>	<b>1.0</b>	<b>32,595</b>	<b>-0.9</b>	<b>86,014</b>	<b>-0.2</b>

Source: SA Power Networks, BIS Oxford Economics

**Figure 1.1 Customer Connections Expenditure (2017-18 prices)**

Source: BIS Oxford Economics, ABS

**Figure 1.2 Construction Activity in South Australia (work done, 2016/17 prices)**

Source: BIS Oxford Economics, ABS data

# 1. INTRODUCTION

In September 2019, BIS Oxford Economics was engaged by SA Power Networks to provide an updated expert opinion regarding the outlook for the company's gross customer connections expenditure forecasts over a seven-year period from 2019/20 to 2025/26 (i.e. from 1 July 2019 to 30 June 2026). The customer connect expenditure forecasts were used by SA Power Networks to develop their capital expenditure forecasts for inclusion in their next revenue proposal to the Australian Energy Regulator later this year.

In keeping with my instructions, I 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 is included in Appendix C. I have been assisted in the preparation of this report by my colleagues including Tim Hibbert (Principal Economist – Building and Construction) and Nicolas Ng (Economic Analyst). CVs of all relevant personnel are attached in Appendix C. 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 2019 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. The latest data for Gross State Product (GSP) and real gross value added for state industry sectors was 2018/19 only (annual data is available). At the time of production, the latest building activity data was for the June 2019 quarter, while the latest building approvals data was for the month of September 2019. Historical lot production in Adelaide was sourced from the Department of Planning, Transport and Infrastructure South Australia.

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

Forecasts of the economic variables in this report were mostly sourced from BIS Oxford Economics reports, including *Australian Macro Service, Long Term Forecasts: 2019-2033* report, *Engineering Construction: 2019/20 to 2032/33*, *The Outlook for Residential Land in Adelaide 2019-2024*, and *Building in Australia: 2019 – 2033*, plus other unpublished forecasts and from BIS Oxford Economics internal research. We also incorporated SA Power Networks own forecasts of customer connect expenditures over the near term.

The structure of this report is as follows:

- A **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.
- **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, medium and large connections along with underground residential development projects.
- Appendices, including CVs, Terms of Reference and Statement of Compliance.

## 2. OVERVIEW OF THE MACROECONOMIC OUTLOOK

### 2.1 AUSTRALIAN ECONOMIC OVERVIEW AND OUTLOOK

The Australian economy has experienced 27 years of uninterrupted growth since the FY91 recession. Population growth is among the highest of the developed economies, which has helped underpin household consumption and demand for dwelling and infrastructure construction. Government debt is comparatively low by global standards, with the national (Commonwealth) government and the larger state economies of New South Wales and Victoria maintaining AAA credit ratings. Overall, economic risks are low and the Australian economy is situated in the fast growing Asia Pacific region.

Nevertheless, growth in GDP and particularly domestic demand has been lower over the past seven years than the previous two decades. The main factor dragging down growth has been a major decline in mining investment, which has coincided (and contributed to) weakness in non-mining business investment.

Australia's economic growth has slowed over the past year, with GDP growth easing to 1.4% through-the-year to June 2019, and year-average growth slipping to 1.9% for FY19. This followed a rebound in growth to 2.9% in FY18, after only 2.3% in FY17 and an average of 2.6% over the 6 years from FY13 to FY18. Annual growth is expected to remain subdued at around 2.3% in FY20, before subsequently picking up to 2.6% in FY21 and then subsequently strengthening over FY22 and FY23.

#### **Sluggish domestic demand growth to continue**

The recovery in domestic demand, which grew 3.5% in FY18, drove Australia's GDP last year, but it will now act as a drag on overall GDP in the near term with domestic spending growth back below 2% in FY19 and expected to remain below 2% in FY20.

Household spending continues to be held back by sluggish income growth; rising employment is supportive, but wage increases remain tepid and other sources of income (government transfers, rental income and interest earnings in particular) have stagnated. The low savings rate is also an impediment to further growth in consumer spending. While lower interest rates and income tax cuts will be supportive, we continue to be cautious about the near-term outlook.

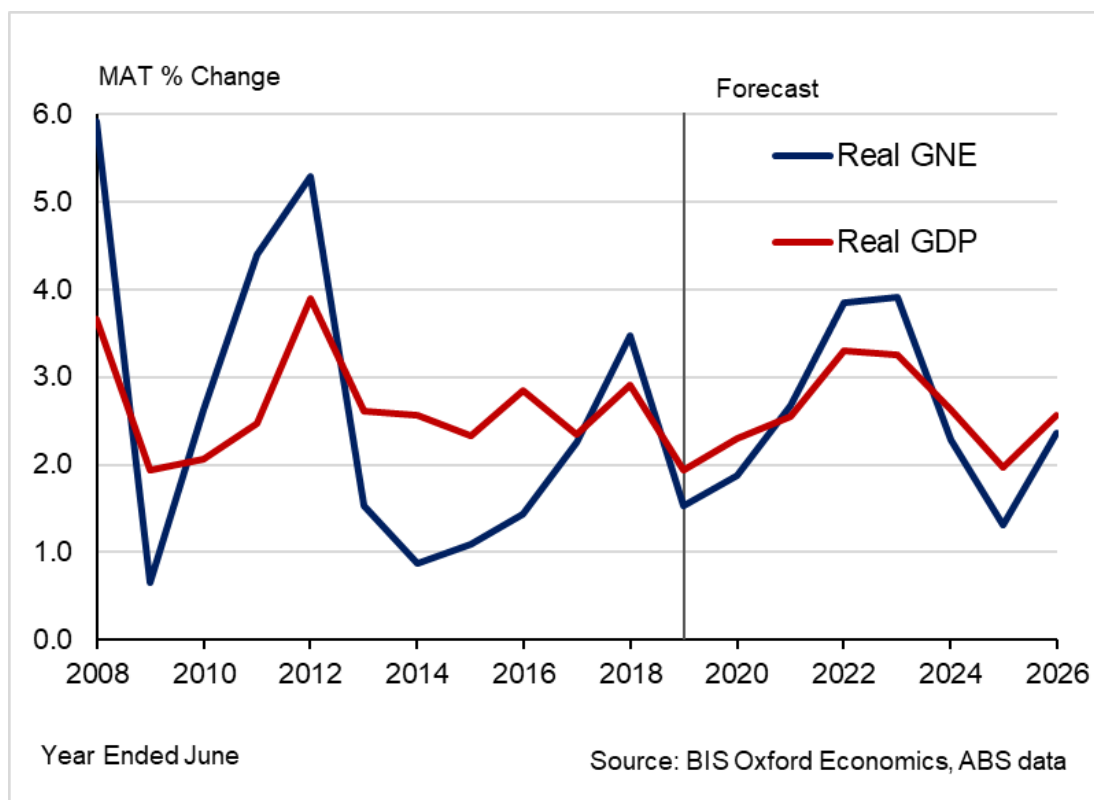
Residential construction activity has turned down sharply and the cycle has much further to run - we expect dwelling investment will be a large drag on GDP growth, and to a lesser extent employment growth, in 2019 and 2020. However, house price falls appear to be moderating in Sydney and Melbourne, and there are tentative signs that turnover is stabilising, which we expect to drive an upturn in dwelling approvals and commencements going into H2 2020.

The main sources of growth in the domestic economy will come from moderate growth in non-mining investment and a recovery in mining capital expenditure from FY20. Conditions remain conducive to a pickup in business investment – utilisation rates are high and monetary conditions are accommodative – but deteriorating confidence and uncertainty around the global outlook may give firms reason to pause. Mining investment has now troughed after a long decline, and the absence of the drag will support growth. Mining is also starting to recover, boosted by higher commodity prices. The continued recovery in mining, concentrated in Western Australia and Queensland and supported by further commodity price rises and an improved investment climate, will contribute to net exports. Major LNG projects in Western Australia will be the key positive contributor further out.



Despite rising global economic risks, we remain cautiously optimistic about the outlook for new business investment. Public demand continues to provide support to growth, with the NDIS rollout and increased education spending boosting government consumption. Growth in public investment will slow a little as the NBN rollout winds down, but there is a strong pipeline of work in transport projects on the east coast. Growth in both export volumes and values has been strong, underpinned by resource exports and pushing the current account into surplus in Q219.

**Figure 2.1 Australia – Basic Economic Indicators**



### **Net export to continue to underpin growth in near-term, despite global headwinds**

Over the next 2 years, GDP will be boosted by net exports, with solid growth in export volumes forecast, despite some moderation in global growth. Underpinning this will be new LNG and oil capacity (as recently completed projects ramp up), and moderate increases in capacity in other key commodities. Also contributing is strong growth in services exports, led by inbound international tourism and education, which is being supported by a more competitive AUD. The outlook for manufacturing and rural exports is also positive (droughts notwithstanding), with both sectors taking advantage of Australia's comparative advantage in high quality, high value-added output.

The acceleration in global growth over the past two years has also been supportive, boosting export volumes and initiating a recovery in commodity prices. However, the global economy has experienced a cyclical slowing in growth over the last year across both developed economies and emerging markets. To some extent the moderation was inevitable, with many developed economies experiencing faster-than-trend growth in the first half of calendar 2018, but it also reflects a number of headwinds including the US-China tariff escalation, political uncertainty in Europe, and the end of fiscal stimulus in the US.

Central banks have relaxed monetary policy since the start of the year, the Chinese authorities have intervened to support domestic growth momentum, and expansionary fiscal policy has been implemented across a number of key Asian markets. Overall, the global economy expanded by 3.6% in calendar 2018 (PPP measure). We are projecting growth of 2.9% in 2019, with the slowdown in growth in the US, China, Europe and India becoming apparent. Nevertheless, global growth is expected to improve and average 3-3.5% over 2020 to 2024.

Over the long term we maintain our view that global growth will be structurally weaker than it has been in the past. Falling population growth and limited improvements in productivity will weigh on trend growth, and we expect the world economy to expand by an average of 3.3% p.a. over the next five years.

Australia's trading partner growth (weighted by export proportions) is forecast to grow at a faster rate of 3.6% over the next five years, 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.

### **Synchronisation of investment to drive stronger growth from FY22**

By early next decade, the investment cycles – which are currently offsetting each other and out-of-sync – are all expected to move into upswing, although there will be differences in the strength and timing across the residential, business and public investment components. The strengthening in investment will lead to an increase in the pace of employment growth and, with the labour market tightening, an increase in wages, household incomes and consumer spending. In addition, with the government's budgetary position improving due to increased taxes, the government is expected to loosen fiscal policy – either via increased recurrent or capital spending or tax cuts, or more likely a combination of all three.

The upshot is that growth in domestic demand will strengthen to around 3.8%, while export growth is forecast to moderate as the increase in LNG production increases hit capacity, although services and non-commodity exports are expected to continue to grow. However, much stronger imports (in line with domestic demand) will see net exports detract from growth. Nevertheless, GDP growth is forecast to lift and average above 3% over FY22 and FY23

The labour market continues to perform well. Despite a small tick up in the unemployment rate of late, employment growth remains healthy. Nevertheless, price pressures remain weak; wage growth is trending higher, albeit slowly and from a low rate, while CPI inflation is very weak at 1.6%/y. Following another soft wages print in Q1 and analysis which suggests that the natural rate of unemployment is well below 5% (implying there remains significant spare capacity in the economy) the RBA Board lowered the cash rate in June and July 2019 and again in October to 0.75%. The policy statement signalled that further cuts will likely be necessary to stimulate jobs and wages growth, and with the outlook worsening globally we now expect more cuts, with the cash rate to fall to a record-low of 0.5% by mid-2020.

With wages growth well below historical averages, domestic cost push pressures are expected to remain limited in the near term. Underlying inflation is forecast to rise from 1.4% now to 1.9% in FY21. A lack of inflation and continuing slack in the labour market is expected to see the RBA hold rates at the expected record lows of 0.5% until mid-2021, before rising to 1.75% by late-2023 as wages and CPI inflation rise back toward historical averages, and the unemployment rate falls back below 5%. 10-year government bond rates will also gradually rise back over 2% by 2023, from under 1% now. Australian long-term bond rates are expected to track the rise in US bonds over the next few years, with US bond rates expected to rise as a result of the deterioration in the US budget deficit.

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

Year Ended June						Forecasts					
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>Total New Private Investment (+)</b>	<b>-2.1</b>	<b>-5.1</b>	<b>-1.6</b>	<b>4.1</b>	<b>-2.2</b>	<b>-0.3</b>	<b>3.4</b>	<b>8.6</b>	<b>7.0</b>	<b>0.4</b>	<b>-3.3</b>
<b>New Public Investment (+)</b>	<b>-8.0</b>	<b>8.4</b>	<b>6.4</b>	<b>9.8</b>	<b>3.6</b>	<b>-0.8</b>	<b>3.6</b>	<b>6.4</b>	<b>4.3</b>	<b>2.4</b>	<b>0.8</b>
<b>Gross National Expenditure (GNE)</b>	<b>1.1</b>	<b>1.4</b>	<b>2.2</b>	<b>3.5</b>	<b>1.5</b>	<b>1.9</b>	<b>2.7</b>	<b>3.9</b>	<b>3.9</b>	<b>2.3</b>	<b>1.3</b>
<b>GDP</b>	<b>2.3</b>	<b>2.8</b>	<b>2.3</b>	<b>2.9</b>	<b>1.9</b>	<b>2.3</b>	<b>2.6</b>	<b>3.3</b>	<b>3.2</b>	<b>2.6</b>	<b>2.0</b>
<b>Inflation and Wages</b>											
CPI (Yr Avg) - RBA forecasts (*)	1.7	1.4	1.7	1.9	1.6	1.8	1.9	2.1	2.3	2.3	2.3
Wage Price Index (Jun on Jun)(**)	2.3	2.1	1.9	2.1	2.4	2.6	2.9	3.2	3.6	3.6	3.3
Wage Price Index (Yr Avg)(**)	2.4	2.1	2.0	2.1	2.3	2.5	2.8	3.2	3.6	3.6	3.3
Average Weekly Earnings (Yr Avg)(^)	2.4	1.9	2.0	2.4	2.7	3.3	3.5	4.0	4.2	4.2	3.8
<b>Employment</b>											
– Employment Growth (Yr Avg)	1.2	2.3	1.5	3.0	2.4	1.9	1.2	1.7	2.2	1.7	1.1
– Employment Growth (May on May) (%)	2.0	1.9	2.1	2.6	2.8	1.3	1.4	1.9	2.3	1.3	1.2
– Unemployment Rate (May) (%)	5.9	5.7	5.5	5.4	5.2	5.3	5.1	4.9	4.6	4.8	5.0
<b>Labour Productivity Growth</b>											
– Total	1.1	0.6	0.8	-0.1	-0.4	0.4	1.3	1.6	1.0	0.9	0.9
– Non-farm	1.1	0.8	0.7	0.0	-0.2	0.3	1.2	1.7	1.0	0.9	0.9

Source: BIS Oxford Economics, ABS and RBA

+Expenditure on new assets (or construction work done). Excludes sales (or purchases) of second hand assets.

\*Headline CPI forecasts based on Reserve Bank of Australia's forecasts to December 2021 quarter. Beyond this, we've used the mid-point of the Reserve Bank's 2 to 3 per cent inflation target range.

\*\* Based on Ordinary Time Hourly Rates of Pay Excluding Bonuses.

^ Average Weekly Ordinary Time Earnings for Full-Time Adult Persons.

e: estimate

Overall, average annual GDP growth over the five years to FY24 is forecast to be 2.9%, which will be an improvement on the 2.5% average of the 5 years to FY19. Growth will also be far more domestically oriented, with Gross National Expenditure forecast to average 3.2%, compared to only 2% in the 5 years to FY19.

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

The tightening of monetary policy will precipitate an overall slowing of economic growth in the mid-2020s. At the same time, we also expect a cyclical slowdown in non-residential building and mining investment, as a number of large projects are completed at the same time, while the completion of some large public infrastructure projects will also see a stalling of public investment. The upshot will be a sharp deceleration in domestic investment and spending growth, leading to an easing in GDP growth back below to an average of 2.3% over FY24 and FY25. Longer term, as consumers and businesses re-adjust to the 'normalcy' of higher interest rates – although at much lower levels than the 2000s and early 2010s – investment and consumer spending will return to long term trend (or potential) rates of growth over the second half of the 2020s.

## **2.2 OUTLOOK FOR THE SOUTH AUSTRALIAN ECONOMY**

The South Australian economy has experienced slower growth over the past year, with State Final Demand (SFD) slowing to 1.6% in FY19. This followed a surge in the pace of growth over the two years to FY18, with SFD reaching 3.6% in FY17 and 3.3% in FY18. In terms of Gross State Product

(GSP), the picture is somewhat weaker, with 2.4% in FY17 and 2% growth in FY18 (which was well below national GDP growth of 2.9% in FY18), while GSP slowed sharply in FY19 to 1.4% due to weaker SFD growth and a collapse in international exports from the state. Job creation also improved over the two years to FY18, but after 2.2% growth in FY18, employment eased to 1.4% in FY19. The state's unemployment rate remains above the national average and, after averaging 5.8% in FY19, jumped to 7.3% in August 2019, before settling back to around 6.2% over September and October 2019 – still well above the current national rate of 5.3%.

### **SA economy picked up over last 3 years thanks to surging investment**

A pick-up in overall investment has boosted the state economy, with total investment increasing 4.3% in FY17, 7% in FY18 and a further 1.1% in FY19. Over the past year, moderate rises in dwelling and business have been partially offset by a second year of modest declines in public investment.

New public investment recovered strongly over FY16 and FY17 before suffering small declines in FY18 and FY19. Further moderate declines are anticipated over the next two years as a number of major projects are completed, and few new major projects commence. The \$415m Osborne Shipyard upgrade (the building component of the \$535m facility for the build of the Future Frigates, which commenced in the March quarter 2018) and the \$180m Queen Elizabeth hospital expansion (commencing in 2019) will be the biggest public projects. Another round of road, rail and utilities infrastructure projects, plus increased public non-dwelling buildings, are projected to drive solid increases in public investment from FY23.

Dwelling investment recorded a small rise in FY19, but with a residential oversupply in the state, a moderate decline is forecast for FY20, before turning around in FY21 and showing solid growth over FY22 and FY23. Dwelling investment is forecast to plateau in FY24 before another decline in FY25.

New business investment rebounded by 10% in FY18 and rose a further 3% in FY19. It is forecast to plateau in FY20, before solid increases resume over the subsequent 3-4 years. The recovery has been led by a surge in non-residential building over the past two years, driven by the \$190 million Skycity Casino expansion, the \$210 million Calvary Hospital, the \$100 million Adelaide Airport Terminal Expansion, and a strong recovery in office and shops construction. Work done will plateau in FY20, with further solid increases over the following 3-4 years. Private engineering construction jumped in FY18 and rose a further 3% in FY19, boosted by a \$600 million debottling and enhancement project at Olympic Dam, a pick-up in gas-related activity, telecommunications-related construction and major electricity-related construction, including wind farms, other generation capacity and network enhancements. However, private engineering construction is forecast to fall sharply in FY20 as a number of major projects finish. The start of the \$2.4 billion Olympic Dam 'Brownfield' expansion will boost business investment from FY21, with other major copper and oil and gas projects also contributing. These projects will provide a major boost to South Australia and help drive strong growth in SFD and GSP over the period from 2021 to 2025.

Employment growth is expected to slow over the next two years, and particularly in FY20 due to the overall decline in investment. Coupled with weak wages growth and low population growth, the end result will be a deceleration in consumer spending. Low population growth will continue to be an ongoing constraint to the state's economic growth. Population growth was only 0.6% in FY17 but has since improved to around 1% in FY19. We expect it to remain weak as South Australians go interstate in search of job opportunities. Over the next six years population growth is predicted to average 0.9%, around 0.7% lower than the national average.

Meanwhile, constrained state government finances will lead to slower growth in government spending, after the surprising strength of the past few years. Note that most of the rise in public



investment over 2015/16 to 2017/18 has come from Commonwealth funding (roads, rail, defence, universities and telecommunications). The state government finances are constrained, with ongoing deficits and debt and a scarcity of public assets to provide revenue or to sell after most of the states' electricity and ports assets were privatised over the past two decades. State government finances are also likely to remain constrained with stamp duty revenue set to fall and payroll tax growth expected to weaken from next year in line with weak employment growth.

### **Defence contracts will support the state economy**

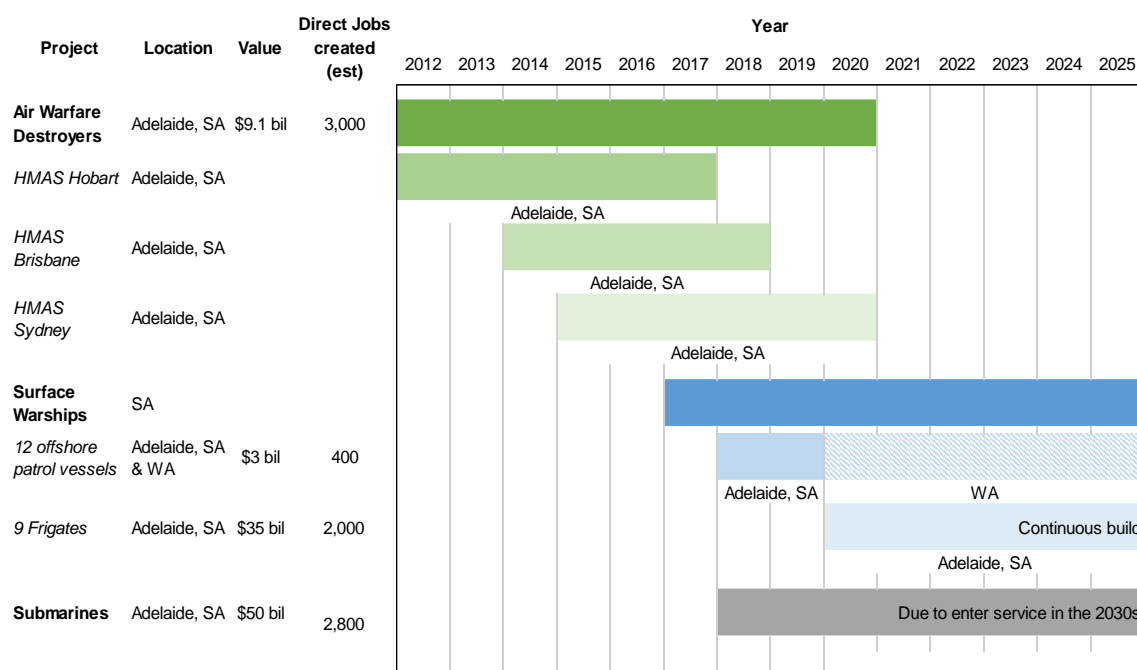
On the other hand, state and federal government commitments to defence projects will support the 'Defence State' economy. Headquarters of major aerospace, land and maritime defence companies are located in the state and numerous large projects will be based in South Australia over the coming decades. There is now a continuous timeline to construct surface warships and submarines for decades to come.

The Commonwealth government announced that Adelaide would be the hub of a continuous naval shipbuilding industry, setting out plans worth \$40 billion for the construction of naval patrol vessels and other boats to fill the gap before construction of frigates and submarines begin. The Minister for Defence announced plans to begin building 12 Offshore Patrol Vessels from 2018 (although after the initial vessels, the construction of the remainder would move to Western Australia). This is expected to avoid the so-called 'valleys of death' between projects, which would have seen a loss of employment and workplace expertise, once current work on the Air Warfare Destroyers is completed around 2020.

The last of the navy's three air warfare destroyers are still under construction in Adelaide and construction of 12 offshore patrol vessels officially began in Adelaide in November 2018. The offshore patrol vessels then fill the gap until the \$35 billion Future Frigate construction begins in Adelaide in 2020. The frigate program will directly contribute to more than 2,000 jobs, and maintenance through the vessels' lives will be worth another \$400 million. There is also a \$50 billion contract to build 12 new submarines in Adelaide, which is expected to create 2,800 jobs, but not get underway until early-to-mid next decade. Shipbuilding projects will have beneficial flow on effects, particularly to local steel manufacturers.

South Australia will also be the base for a number of land defence vehicle and aviation projects. For example, a \$1 billion program to modernise the Army's fleet of M113 armoured personnel carriers will be based in South Australia, and South Australian manufacturers will also be part of the supply chain for the army's LAND 400 program to build land combat vehicles. South Australia will also benefit from 30 years of sustainment and upgrade work on the fleet of P-8A Poseidon maritime surveillance aircraft, which will be based at the RAAF Base in Adelaide.

Now recognised as the 'Defence State', South Australia will benefit from aviation, systems, maritime and land defence projects, with the largest boost to the state's manufacturing sector and flow-on effects to employment and consumer spending. However, it is important to recognise that this economic boost essentially comes mostly from taxpayers in other states, given that South Australia only accounts for 6% of the national economy (% of GDP).

**Figure 2.2 South Australia Timeline of Maritime Defence Projects****Table 2.2 South Australia – Key Economic Indicators, Financial Years**

Year Ended June						Forecast					
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>South Australia</b>											
Total Construction Activity(*)	-9.0	-1.4	3.7	19.4	1.0	-9.7	5.2	5.5	6.9	-0.4	-7.7
State Final Demand	1.8	1.2	3.6	3.4	1.6	0.5	2.2	2.7	3.6	2.4	0.5
Gross State Product (GSP)	<b>0.9</b>	<b>0.3</b>	<b>1.5</b>	<b>2.3</b>	<b>1.4</b>	<b>1.3</b>	<b>2.2</b>	<b>2.6</b>	<b>2.8</b>	<b>2.3</b>	<b>1.7</b>
Employment Growth (Year Average)	0.5	0.5	1.3	2.2	1.4	1.1	1.2	1.6	2.2	1.3	0.2
<b>Australia</b>											
Total Construction Activity(*)	-6.9	-4.9	-3.1	12.0	-9.4	-2.9	2.0	10.5	7.2	-0.3	-5.7
Australian Domestic Demand	0.9	1.4	2.2	3.5	1.7	1.8	2.6	3.8	3.9	2.4	1.3
Gross Domestic Product (GDP)	2.3	2.8	2.3	2.9	1.9	2.3	2.6	3.3	3.2	2.6	2.0
Employment Growth (Year Average)	1.2	2.3	1.5	3.0	2.4	1.9	1.2	1.7	2.2	1.7	1.1

Source: BIS Oxford Economics and ABS

\* Total construction work done in constant 2016/17 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.

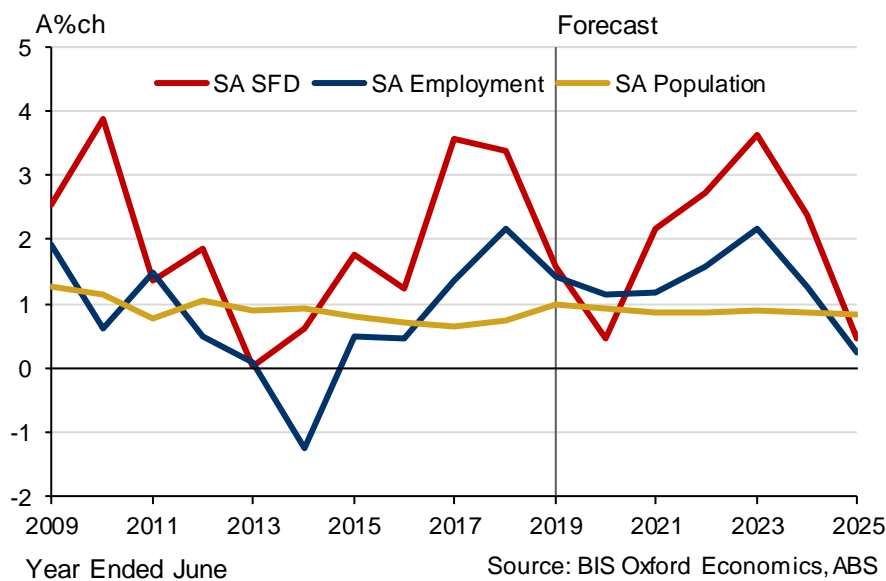
Meanwhile, the manufacturing, agriculture, mining and other tradeable sectors (including education and tourism) will also benefit from a forecast sustained 'competitive' AUD of US\$0.68 to US\$0.78 over the next six years to 2025.

Overall, SFD is forecast to weaken sharply in FY20 to below 1% due to the decline in investment, before bouncing back to a 2.2% increase in FY21 as investment rebounds. Thereafter, we expect an improvement and acceleration in SFD to over 3% in FY23, driven by strengthening investment and employment growth. GSP is expected to track higher than SFD over FY20 and FY21, thanks to positive export growth, before averaging 2.7% over FY22 and FY23. Employment growth is forecast to average a respectable 1.5% over the five years to FY24. The stronger employment growth expected over FY22 to FY24 is expected to push the state's unemployment rate is forecast to fall from

around 5.7% now to under 5% in FY23, close to the projected national average of 4.6% at that time. The tightening in the state's labour market will, in turn push up wages in the state.

Both SFD and GSP are forecast to weaken in FY25 due to declines in residential and business investment, the latter as a number of major projects wind down. Overall, SFD growth is forecast to average 2.3% growth over the five years to FY25 (similar to the past 5 years), while GSP is forecast to average 2.1% over the five years to FY25 (compared to an average of 1.5% for the past 5 years and 2.3% for the past three decades).

**Figure 2.3 South Australia State Final Demand, Employment and Population Growth**



### 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. SA Power Networks have provided actual expenditure up to June 2019 and estimates for gross customer connect expenditure for calendar 2019 - in effect, providing their estimate for the July-December 2019 period. BIS Oxford Economics has used SAPN's July-Dec 2019 estimate as a base for the forecast for 2019/20 (amending where necessary) and has then provided forecasts to 2025/26.

Total gross customer connection expenditure is forecast to average \$84.3 million over the seven years from 2019/20 to 2025/26 inclusive (in constant 2017/18 prices), compared with \$66.9 million over the five years to 2018/19 (see Table 3.1).

**Table 3.1: Customer Connections Expenditure (Constant 2017/18 Prices)**

Year Ended June	Minor Customer Connect Expenditure (Projects <\$30k)		URD Customer Connect Expenditure		Medium Customer Connect Expenditure (Projects \$30k-\$100k)		Major Customer Connect Expenditure (Projects >\$100k)		Total Customer Connect Expenditure All Projects	
	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH	(\$'000)	%CH
2009	15,023	2.4	9,180		40,131	-9.8	46,571	144.1	110,904	
2010	15,980	6.4	5,501	-40.1	37,326	-7.0	60,894	30.8	119,700	7.9
2011	13,090	-18.1	5,435	-1.2	28,989	-22.3	38,106	-37.4	85,620	-28.5
2012	12,425	-5.1	4,306	-20.8	25,604	-11.7	35,244	-7.5	77,580	-9.4
2013	13,383	7.7	5,185	20.4	25,913	1.2	35,762	1.5	80,243	3.4
2014	15,665	17.1	4,559	-12.1	22,509	-13.1	35,167	-1.7	77,899	-2.9
2015	15,230	-2.8	5,351	17.4	23,265	3.4	23,794	-32.3	67,640	-13.2
2016	20,221	32.8	4,954	-7.4	18,674	-19.7	13,727	-42.3	57,576	-14.9
2017	19,413	-4.0	4,887	-1.4	19,835	6.2	15,204	10.8	59,340	3.1
2018	18,989	-2.2	5,271	7.9	26,764	34.9	17,950	18.1	68,973	16.2
2019	21,602	13.8	4,734	-10.2	25,523	-4.6	29,070	62.0	80,930	17.3
Forecast										
2020	17,519	-18.9	4,557	-3.7	24,012	-5.9	32,006	10.1	78,094	-3.5
2021	19,440	11.0	5,317	16.7	25,895	7.8	32,550	1.7	83,202	6.5
2022	21,226	9.2	5,823	9.5	27,649	6.8	30,685	-5.7	85,383	2.6
2023	21,728	2.4	6,161	5.8	28,342	2.5	36,229	18.1	92,460	8.3
2024	20,782	-4.4	5,823	-5.5	27,785	-2.0	32,097	-11.4	86,487	-6.5
2025	18,909	-9.0	5,255	-9.8	26,959	-3.0	31,416	-2.1	82,539	-4.6
2026	18,235	-3.6	5,067	-3.6	27,300	1.3	31,425	0.0	82,027	-0.6
Period Averages & Compound Annual Average Growth Rates										
2011-15	13,959	3.9	4,967	-0.4	25,256	-5.4	33,614	-11.1	77,796	-5.7
2016-19	20,056	2.2	4,962	-1.5	22,699	11.0	18,988	28.4	66,705	12.0
<b>2016-20</b>	<b>19,549</b>	<b>-3.5</b>	<b>4,881</b>	<b>-2.1</b>	<b>22,961</b>	<b>6.5</b>	<b>21,591</b>	<b>23.6</b>	<b>68,982</b>	<b>7.9</b>
Forecast										
2020-26	19,691	0.7	5,429	1.8	26,849	2.2	32,344	-0.3	84,313	0.8
<b>2021-25</b>	<b>20,417</b>	<b>-0.7</b>	<b>5,676</b>	<b>-0.3</b>	<b>27,326</b>	<b>1.0</b>	<b>32,595</b>	<b>-0.9</b>	<b>86,014</b>	<b>-0.2</b>

Source: SA Power Networks, BIS Oxford Economics



### 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 non-residential projects valued at less than \$1 million. New dwelling building (specifically 'detached' houses) and alterations and additions activity form the basis of the model of minor connections expenditure.

Historical data for house commencements and alterations and additions approvals in South Australia was obtained from the Australian Bureau of Statistics (Catalogue No. 8752.0 and 8731.0 respectively).

BIS Oxford Economics' forecasts of house commencements, and alterations and additions (A&A) approvals activity for South Australia are used as the drivers of total minor connections expenditure (see Table 3.2). Underpinning our forecasts of residential building and non-residential building activity are BIS Oxford Economics' forecasts of South Australian population growth (see Table 3.3). However, only a small proportion of A&A expenditure involves new or augmented connections. Furthermore, 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. In any case, as the quantum of alterations and additions activity tends to move with new dwelling activity, any rise or fall in the level of connections associated with A&A will tend to move in the same direction as new house building.

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. 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 Adelaide and housing commencements 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 Department of Planning, Transport and Infrastructure South Australia, and these were then combined with BIS Oxford Economics' forecasts for lot production as reported in our Adelaide Land Study. The forecasts of lot production and house commencements were used as the drivers of URD connections expenditure (see Table 3.2).

In our 2017 report, we used house commencements as a driver of URD customer connections expenditure. However, we found that lot production had a higher correlation with URD customer connection expenditure between 2010 and 2017, and it is a more suitable driver of customer connections expenditure related to 'greenfields' subdivision infrastructure. Hence, we chose to use lot production as the primary driver of URD customer connections between FY2020 and FY2024, with house commencements used as the basis for URD customer connections thereafter. Our Adelaide Land Study lot production forecasts only extend to FY2024. Over the long term, lot production and house approvals and commencements tend to have a close relationship (see chart 3.2), so house commencements are a good proxy beyond 2024.

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

The real value of non-residential building commencements for projects below \$20 million and real the value of 'other dwelling' commencements form the basis of our medium connections expenditure model.

Historical data of non-residential building commencements for projects valued at less than \$20 million and 'other dwelling' commencements were obtained from ABS Catalogue No. 8752 as a special request. Our analysis identified non-residential building commencements and other dwellings commencements as suitable explanatory variables for medium customer connections expenditure.

However, we have excluded mega multi-unit residential projects planned over the next 7 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. These large real estate development projects are included in major expenditures only.

In our previous report, we used 'flat commencements' as opposed to total 'other dwelling commencements' (which includes all attached dwellings such as flats, townhouses, semi-detached houses, etc) as the economic driver of medium residential connections. However, we found that total other dwellings had a higher correlation with medium customer connection expenditure between 2009 and 2019. Hence, we chose to use total other dwellings as the driver of medium residential connections expenditure for this study.

BIS Oxford Economics' forecasts of the real value of non-residential building commencements for projects less than \$20 million and 'other dwelling' commencements in South Australia were both used in the model to forecast medium customer connection expenditure.

### 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 major residential building commencements, non-residential building commencements 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 (e.g. windfarms) 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 including the dominant Olympic Dam mine. Connections to new mines within the network are covered separately.

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

Firstly, BIS Oxford Economics compiled a list of major projects in infrastructure (engineering construction), residential building, and non-residential building sectors that were expected (specifically, those projects associated with a probability greater than 0.8) to commence over the next 7 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, we estimated the connection expenditure for each project. We derived these estimates from the 2019, 2018, 2017 and 2014 SAPN project lists, as well as the ETSA Utilities major projects list provided in 2009.

We then combined BIS Oxford Economics' project lists with the major project list provided by SAPN. If a project identified by BIS Oxford Economics 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 section 3.4.2), 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 connection would be calculated as \$1,600 in the final summation of projects). We also excluded projects from the BISOE list where our estimation of the customer connection expenditure was below \$100k. 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 year 1 and 2 we employ a mostly **bottom-up approach** mainly determined by a probabilistic aggregation of specific customer projects costs; for year 3 we utilise both the bottom-up approach and top-down approach, and for years 4 to 7 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, 2019/20 (i.e. the forecasts and report we prepared in October-November 2019) – we rely heavily on two pieces of detailed information supplied by SAPN.

Firstly, SAPN supplies an estimate of expected major connections expenditure in the current 6-month period (i.e. the July-to-December 2019 period). They also provide an indication of expected (or 'budgeted' or 'approved') major connection expenditure for the current calendar year. In mid-October 2019, SAPN's estimate for the Jul-Dec 2019 period was \$17.46 million, which represented a 20.2% increase on the same Jul-Dec period in 2018. A simple extrapolation of this increase for the second half of financial year 2018/19 (i.e. the Jan-June 2019 period) would see a similar increase for 2018/19. We view this as a 'starting point' for the year 1 forecasts, modified by discussions with SAPN staff, their near-term forecast (i.e. approved major connection expenditure) and the second piece of detailed information provided by SAPN.

The second piece of 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 BISOE projects to the SAPN projects (with what we consider to have a probability of at least 80% of proceeding). This is set out in section 3.4.2 of our report. 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 (2019/20) this residual is a mere 0.5% of both the identified projects and the forecast total of Major

Connections expenditure, while in year 2 (2020/21) the residual is still a very low 1.0%. Note that the forecast residuals for 2019/20 and 2020/21 are much smaller than the 'actual' residual for 2018/19 of 10.8% of the actual total Major Connections expenditure and 12.2% of identified projects.

For year 3, 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 commencements) 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 28.1 in 2008/09 to a low of 6.6 in 2017/18. The long-run average over the period 2002/03 to 2018/19 is 14.9. However, if you exclude the very high and very low ratios of 2008/09, 2009/10 and 2016/17 and 2017/18, the average falls to 13.7. We consider these three 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 two years – which are based largely on the bottom-up approach – we revert to the long-run historical average ratio in year 3 (2021/22), and again in 2023/24 to 2025/26. Overall, the average ratio for the 2019/20 to 2025/26 is 13.5 – lower than the historical long-run averages. Accordingly, the forecasts over the 2019/20 to 2025/26 period could be classified as somewhat conservative, compared to the forecast drivers.

The top-down approach of using long-term or desired ratios is a better methodology than using an econometric model, which did 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 close to balanced, with a small oversupply in 2018/19 expected to move into a small undersupply in 2019/20 (see figure 3.1). Total dwelling commencements have been running at an average of 11,182 dwellings over the past five years, close to underlying demand. Attached (or other) dwellings (units, etc) have been the strongest part of the housing market over recent years, while house commencements have held steady. Over the next seven years to 2025/26, underlying demand for new dwellings (including an allowance for demolitions and unoccupied dwellings) is forecast to average around 11,160 dwellings, underpinned by modest population growth (see table 3.3).

Investor demand has been weakening due to tighter bank lending policies in response to prudential guidelines put in place by the Australian Prudential Regulation Authority to mitigate speculative risk. The end result has lower pre-sales of units, which has slowed the construction of new unit developments, in addition to a curtailing of development finance in response to rising settlement risk as the market weakened. After the 53% jump in 2017/18, the number of attached dwellings plunged 43% in 2018/19 from the record level of attached dwelling commencements in 2017/18. Attached dwellings are forecast to remain around current low levels over 2019/20 and 2020/21, before a modest recovery ensues over the following two years.

In contrast, new house approvals and commencements are largely underpinned by owner occupier demand, which is expected to remain more stable as the purchase of a new house by an owner occupier will be governed by life stage as well as current market conditions. Growth in house

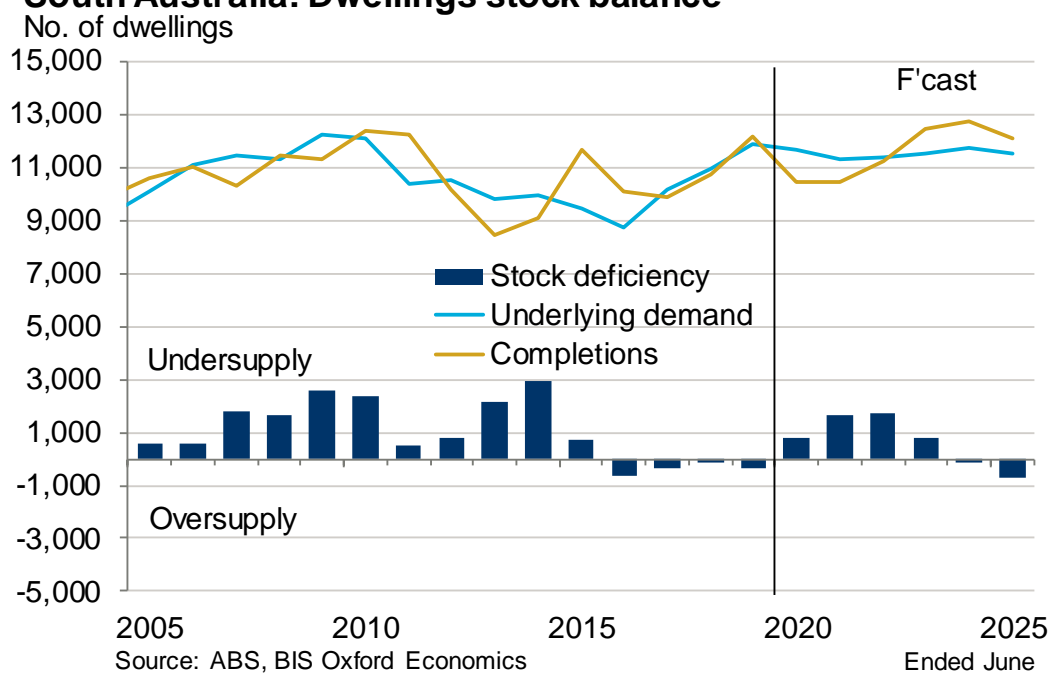


commencements declined 10% in 2018/19, following a 7% increase in 2017/18. A recovery is forecast to get underway this year, with house commencements forecast to rise almost 3% in 2019/20 before rising strongly over 2020/21 and 2021/22 (+11% and 9%), driven by an undersupply of dwellings and rising house prices. Rising interest rates and a more balanced market is then expected to see growth in house commencements slow in 2022/23 (+2.4%). With an oversupply expected to manifest, we then forecast a decline in the following three years, declining a collective -16% over the three years to 2025/26.

Alterations and additions activity tends to track movement in new dwelling construction, although with less amplitude. As such, we expect alterations and additions to decline further in 2019/20 – after peaking at \$416m in 2017/18. Moderate rises are then expected over 2020/21 to 2023/24, before falling back over 2024/25 and 2025/26. Overall, we forecast alterations and additions in the longer term to average \$417 million (constant 2016/17 prices) over the seven years to 2025/26 – above the average over the previous five years to 2018/19.

**Figure 3.1 South Australia Dwellings Stock Balance**

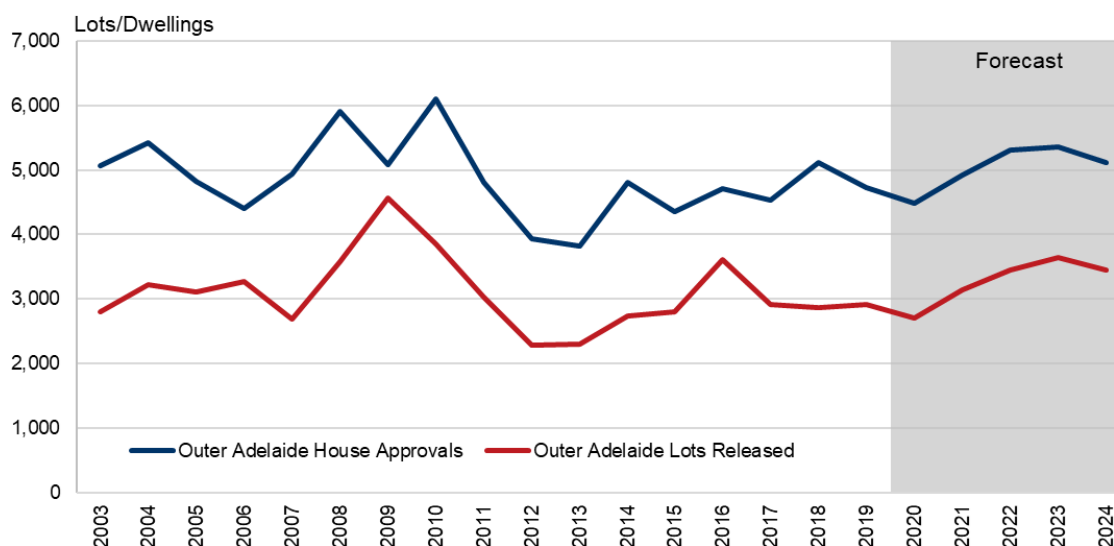
### South Australia: Dwellings stock balance



**Table 3.2: Drivers of Minor and URD Customer Connections Expenditure (2017/18 prices)**

Year Ended June	Minor Customer Connect Expenditure (Projects <\$30k)		URD Customer Connect Expenditure		Houses Commencements		Total SA Alterations & Adds Approvals > \$10k		Outer Adelaide Lots Released No.	
	(\$'000) <sup>(1)</sup>	%CH	(\$'000) <sup>(1)</sup>	%CH	('000)	%CH	\$million (2017/18 prices)	%CH	No.	%CH
2009	15,023	2.4	9,180		9,332	-1.9	391	-1.4	4,573	28.0
2010	15,980	6.4	5,501	-40.1	9,682	3.8	397	1.6	3,851	-15.8
2011	13,090	-18.1	5,435	-1.2	8,259	-14.7	403	1.5	3,031	-21.3
2012	12,425	-5.1	4,306	-20.8	6,939	-16.0	372	-7.7	2,281	-24.7
2013	13,383	7.7	5,185	20.4	6,529	-5.9	357	-3.9	2,310	1.3
2014	15,665	17.1	4,559	-12.1	8,309	27.3	363	1.5	2,744	18.8
2015	15,230	-2.8	5,351	17.4	7,781	-6.4	370	1.9	2,796	1.9
2016	20,221	32.8	4,954	-7.4	7,687	-1.2	376	1.7	3,608	29.1
2017	19,413	-4.0	4,887	-1.4	7,658	-0.4	386	2.5	2,915	-19.2
2018	18,989	-2.2	5,271	7.9	8,210	7.2	416	7.9	2,873	-1.5
2019	21,602	13.8	4,734	-10.2	7,359	-10.4	398	-4.2	2,920	1.6
Forecast										
2020	17,519	-18.9	4,557	-3.7	7,575	2.9	394	-1.1	2,700	-7.5
2021	19,440	11.0	5,317	16.7	8,405	11.0	404	2.5	3,150	16.7
2022	21,226	9.2	5,823	9.5	9,177	9.2	421	4.2	3,450	9.5
2023	21,728	2.4	6,161	5.8	9,394	2.4	437	3.8	3,650	5.8
2024	20,782	-4.4	5,823	-5.5	8,985	-4.4	443	1.4	3,450	-5.5
2025	18,909	-9.0	5,255	-9.8	8,176	-9.0	417	-5.9	-	
2026	18,235	-3.6	5,067	-3.6	7,884	-3.6	406	-2.7	-	
Period Averages & Compound Annual Average Growth Rates										
2011-2015	13,959	3.9	4,967	-0.4	7,563	-1.5	373	-2.1	2,632	-2.0
2016-2019	20,056	2.2	4,962	-1.5	7,729	-1.4	394	1.9	3,079	-6.8
<b>2016-2020</b>	<b>19,549</b>	<b>-3.5</b>	<b>4,881</b>	<b>-2.1</b>	<b>7,698</b>	<b>-0.4</b>	<b>394</b>	<b>1.2</b>	<b>3,003</b>	<b>-7.0</b>
Forecast										
2020-2026	19,691	0.7	5,429	1.8	8,514	0.7	417	0.5	3,280	
<b>2021-2025</b>	<b>20,417</b>	<b>-0.7</b>	<b>5,676</b>	<b>-0.3</b>	<b>8,828</b>	<b>-0.7</b>	<b>424</b>	<b>0.8</b>	<b>3,425</b>	

Source: BIS Oxford Economics, ABS data

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

Source: ABS, Department of Planning and Local Government, BIS Oxford Economics

**Table 3.3: 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	1.1
2011	7.1	9.2	-2.6	12.3	1,639.6	0.8
2012	7.5	12.4	-3.2	17.1	1,656.7	1.0
2013	7.4	11.7	-4.8	14.8	1,671.5	0.9
2014	7.2	11.6	-3.9	15.5	1,686.9	0.9
2015	6.5	11.2	-4.6	13.7	1,700.7	0.8
2016	6.5	11.3	-7.2	12.2	1,712.8	0.7
2017	5.7	12.2	-6.8	11.1	1,723.9	0.6
2018	5.0	12.6	-5.2	12.5	1,736.4	0.7
2019	6.4	15.0	-3.8	17.1	1,753.6	1.0
2020	5.9	13.8	-3.5	16.1	1,769.7	0.9
2021	5.8	12.5	-3.0	15.2	1,784.9	0.9
2022	5.6	12.7	-3.0	15.3	1,800.3	0.9
2023	5.4	13.5	-3.0	15.9	1,816.2	0.9
2024	5.2	13.5	-3.0	15.7	1,831.9	0.9
2025	4.9	13.3	-3.0	15.1	1,847.0	0.8
2026	4.6	13.3	-3.0	14.8	1,861.8	0.8

Source: BIS Oxford Economics, ABS data

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

### 3.2.1 Forecasts of Minor Customer Connections Expenditure and URDs

Minor customer connections expenditure fell -2.2% in 2017/18 (constant 2017/18 prices) despite the 7% increase in house commencements and healthy rise in alterations and additions activity. The main reason for the decline in minor customer connections expenditure was due to the impact of 'metering contestability' and its transition from 1 December 2017, which resulted in a more visible decline of customer connections expenditure in the last quarter. This means SA Power Networks will no longer be responsible for metering services, resulting in a reduction of gross expenditure (and associated customer contributions) of around \$3 million per year less in minor customer connections expenditure – around 15% less than 2017 levels of around \$19.4 million. However, despite this expected loss in capital expenditures in the Minor Connections category and the -10% decline in house commencements in 2018/19, the Minor Connections Expenditure (RIN basis) was estimated to have increased by 13.8% in 2018/19 – contrary to the previously expected decline of around 15%, based on our models of house commencements and the one-off impacts of metering contestability. After discussions with SA Power Networks staff, we believe there that the Minor category has been impacted by an accounting adjustment. Accordingly, we are treating the quantum of Minor Connections Expenditure (on a RIN basis) in 2018/19 as an aberration.

There also appears to be an inconsistency between the estimates of Minor customer connections expenditure (CCE) for the years prior to 2015/16. We have therefore based our analysis on the three years from 2015/16 to 2017/18. Over these three years, the ratio of minor customer connections expenditure to the number of house commencements have averaged 2.5, with the 2017/18 ratio impacted by metering contestability to give a ratio of 2.31. Over the forecast period we used this ratio to set the minor customer connections expenditure. This means there will appear to be a large 'one-off' decline of -18.9% in 2019/20 because of the large aberration boosting the values in 2018/19. Over the forecast period, we expect minor customer connections expenditure (CCE) to track house commencements. The recovery in housing sees minor CCE lift 11% in 2020/21 to \$19.4 million, and

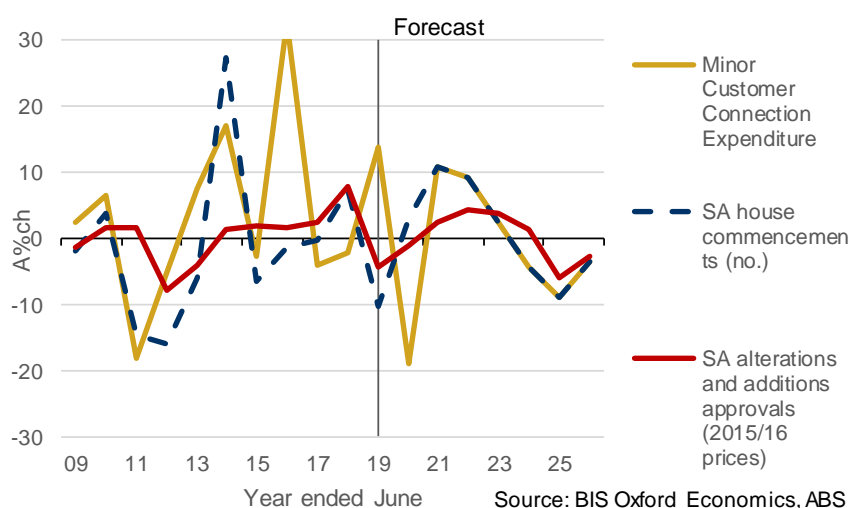
then rise by 9.2% and 2.4% over 2021/22 and 2022/23 respectively to a new peak of \$21.7 million (constant 2017/18 prices). Modest falls over the following three years sees minor CCE drift down to \$18.2 million by 2025/26.

Overall, we are forecasting minor customer connections expenditure to average \$19.7 million over the seven years to 2025/26, slightly lower than the average levels of \$20.06 million over the past four years from 2015/16 to 2018/19.

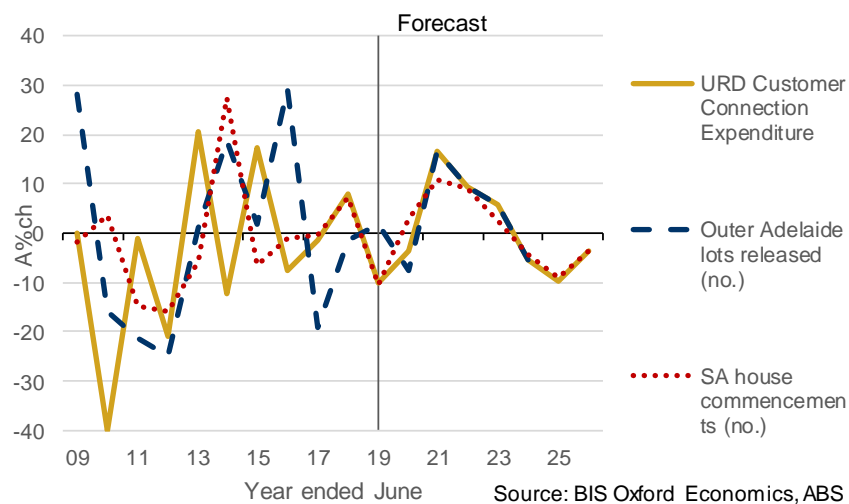
URD customer connect expenditure tends to be erratic. It rose by 7.9% in 2017/18 and then fell back by -10.2% in 2018/19, despite a small rise in new lot development in Adelaide in 2018/19, but in line with the declines in house commencements and approvals (see table 3.2 and figures 3.2 and 3.4).

We expect that URD connections expenditure will decline -3.7% in 2019/20, in line with the decline in new lots releases and then bounce back in the following three years, increasing 16.7% in 2020/21, 9.5% in 2021/22 and 5.8% in 2022/23. Thereafter, we expect the forecast weakening in housing approvals and commencement to cause declines in URD connections. Nevertheless, we are projecting the levels of URDs CCE to be slightly higher over the next 7 years on average, compared to the past 5 years.

**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 (eg. 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 commencements (projects below \$20 million) recovered strongly from the 2014/15 trough, rising a cumulative 44% over the past three years to 2017/18 to \$1.55 million. However, this segment fell 21% in 2018/19, back to more 'normal' levels of construction activity. Modest increases are now expected over the next three years, pushing these lower range non-dwelling building commencements up to \$1.48 million in 2021/22. A modest downturn is then expected over 2022/23 to 2024/25, before recovering over 2025/26. Overall, a higher average level of activity is projected over the next 7 years compared to the past 5 years (see table 3.4).

'Other dwellings' activity is quite volatile, with sharp fluctuations from year to year. The real value of other dwellings commencements rose by 50% in 2015/16 to reach \$847 million supported by low interest rates and strong investor demand. The off the plan concession available for inner city apartments in Adelaide particularly benefited this segment of the market and hence investor demand has held up relatively well. This policy continued until June 2017 and was expanded to apply to all of South Australia. Other dwelling commencements fell back in 2016/17, declining 11% before again lifting 69% in 2017/18 to a record level of \$1271 million. This was reversed in 2018/19, with this sector experiencing a steep -48% decline.

BIS Oxford Economics is forecasting other dwellings commencements to remain around current levels over the next two years. Activity is then forecast to bounce back over 2021/22 and 2022/23, before a set-back over 2023/24 to 2025/26 due mainly to the expected dwelling oversupply.

Overall, other dwellings commencements in the longer term are forecast to average \$753 million per annum over the seven years to 2025/26. This compares to an average of \$820 million over the previous five years to 2018/19.

**Table 3.4: Drivers of Medium Customer Connections Expenditure (2017/18 prices)**

Year Ended June	Medium Customer Connect Expenditure (Projects \$30k-\$100k)		Non-Residential Building Commencements (Below \$5 million)		Non-Residential Building Commencements (\$5mil-\$20 mil)		Other Dwellings Commencements <sup>(2)</sup>	
	(\$'000)	%CH	\$million <sup>(1)</sup>	%CH	\$million <sup>(1)</sup>	%CH	\$million <sup>(1)</sup>	%CH
2009	40,131	-9.8	731	-5.1	499	4.0	590	16.4
2010	37,326	-7.0	1593	117.9	417	-16.5	525	-10.9
2011	28,989	-22.3	749	-53.0	404	-3.0	574	9.4
2012	25,604	-11.7	749	-0.1	340	-15.8	495	-13.8
2013	25,913	1.2	742	-0.9	529	55.4	424	-14.5
2014	22,509	-13.1	653	-11.9	516	-2.4	608	43.6
2015	23,265	3.4	815	24.7	266	-48.4	564	-7.3
2016	18,674	-19.7	708	-13.0	435	63.3	847	50.3
2017	19,835	6.2	757	7.0	501	15.3	753	-11.1
2018	26,764	34.9	1067	40.9	486	-3.1	1271	68.7
2019	25,523	-4.6	705	-33.9	529	9.0	662	-47.9
Forecast								
2020	24,012	-5.9	815	15.5	466	-11.9	667	0.7
2021	25,895	7.8	902	10.8	539	15.6	659	-1.2
2022	27,649	6.8	919	1.8	562	4.3	761	15.6
2023	28,342	2.5	894	-2.8	558	-0.8	847	11.3
2024	27,785	-2.0	879	-1.7	559	0.2	816	-3.7
2025	26,959	-3.0	871	-0.9	554	-0.9	761	-6.7
2026	27,300	1.3	890	2.3	567	2.3	757	-0.6
Period Averages & Compound Annual Average Growth Rates								
2011-2015	25,256	-5.4	741	2.1	411	-9.9	533	-0.5
2016-2019	22,699	11.0	810	-0.1	488	6.8	884	-7.9
<b>2016-2020</b>	<b>22,961</b>	<b>6.5</b>	<b>811</b>	<b>3.6</b>	<b>484</b>	<b>1.8</b>	<b>840</b>	<b>-5.8</b>
Forecasts								
2020-2026	26,849	2.2	881	1.5	544	3.3	753	2.1
<b>2021-2025</b>	<b>27,326</b>	<b>1.0</b>	<b>893</b>	<b>-0.9</b>	<b>555</b>	<b>0.7</b>	<b>769</b>	<b>3.7</b>

(1) Constant 2016/17 Prices

Source: SA Power Networks, BIS Oxford Economics

<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

### 3.3.1 Forecasts of Medium Customer Connections Expenditure

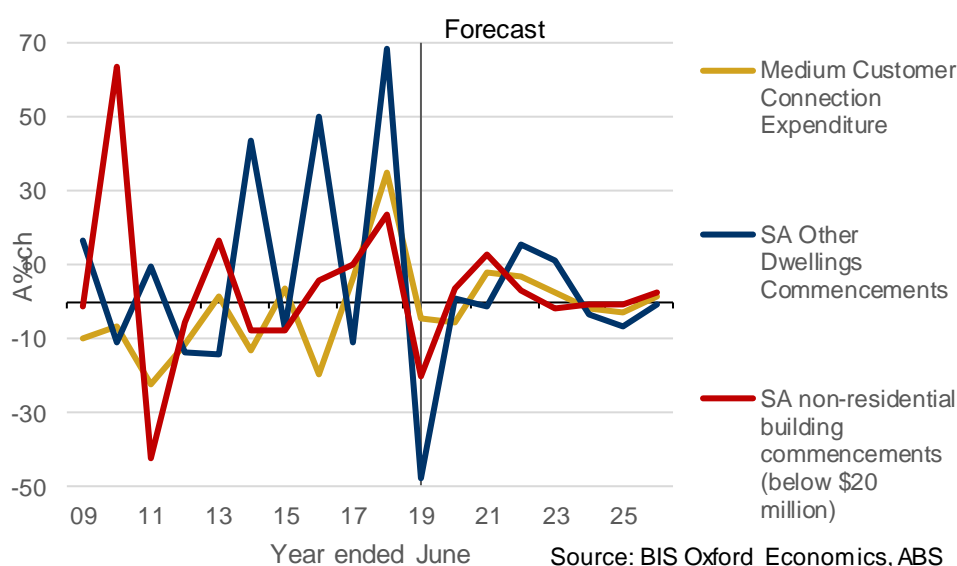
Medium customer connections expenditure jumped 35% in 2017/18, in line with the very strong increases in both non-residential building commencements and other dwelling commencements. Medium CCE then declined -4.6% in 2018/19, although both non-residential building and other dwelling commencements fell significantly. It is likely there may have been a lag in the connections for the high level of building in 2017/18, which is holding up medium CCE over 2018/19.

Actuals over recent months and near-term forward orders suggest medium customer connection expenditure will decline -5.9% in 2019/20, although the sum of the two key building demand drivers are expected to rise by 2.7%. Beyond this financial year, we expect the medium CCE to move in line with the sum of the building drivers. We are forecasting moderate increases of 7.8%, 6.8% and 2.5% in 2020/21, 2021/22 and 2022/23 respectively, supported by increased non-residential building and other dwelling commencements. Medium connections are then expected to decline in 2023/24 (-2%) and 2024/25 (-3%), before increasing 1.3% in 2025/26, cycling with non-residential building (<\$20 million) and other dwelling commencements. Details of non-residential building commencements by category are shown in figures 3.12 to 3.14 in section 3.4.

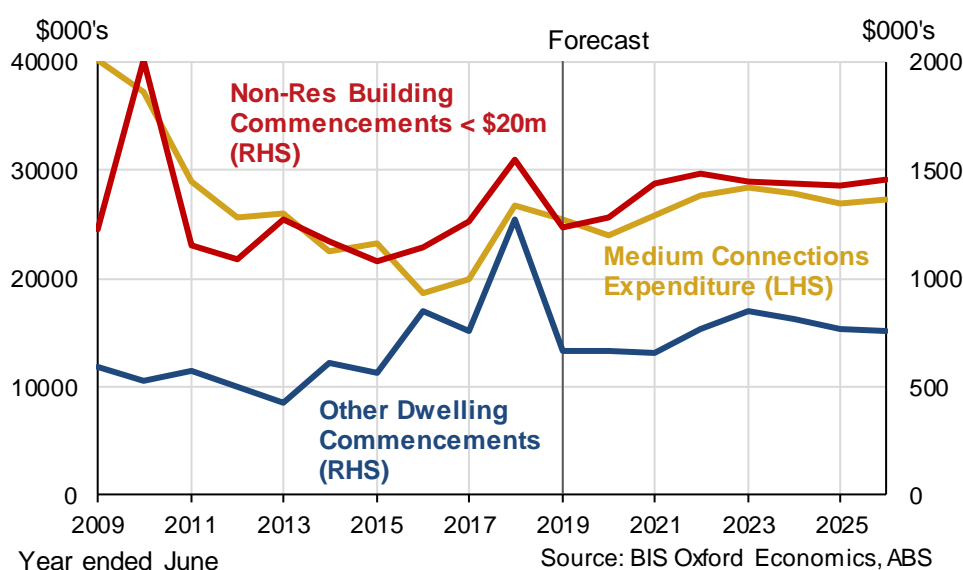
Given the volatile history of medium connections expenditure compared to its building-related drivers (see charts 3.5 and 3.6), we have taken a conservative approach to the forward projections, particularly with regard to the historical ratio of medium connections expenditure-to-sum of drivers. Over the period from financial year 2010 (we have excluded the very high ratio of 22.0 in 2008/09), the long-term ratio is 13.2, with a range of 9.5 to 16.8 (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.

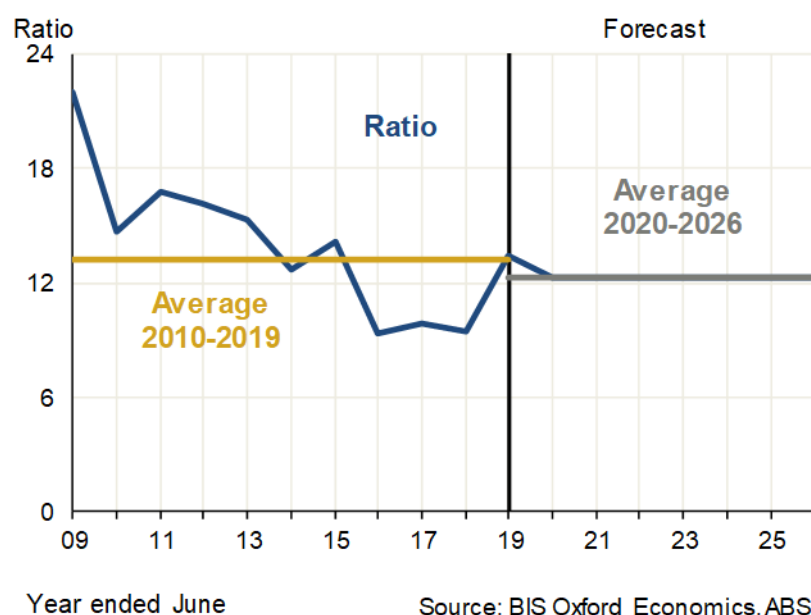
Accordingly, we have based the forecast ratio of 12.3 on the expected value of medium connections in 2019/20, and left this ratio constant over the period to 2025/26. Given this forecast ratio is around 7% lower than the historical ratio, there may be some upside to medium customer connections. Overall, medium customer connections expenditure is forecast to average \$26.8 million over the seven years to 2025/26.

**Figure 3.5 Medium Customer Connections Expenditure and Drivers: %Chg**



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



**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 commencements (above \$20 million) surged 77% to \$1,445 million in 2017/18, with activity led by the commencement of the \$416 million Osborne Shipyard buildings (listed as 'Lefevre Peninsula - Defence in section 3.4.2); the \$140 million Precinct GPO Office Tower 1, the \$190 million SkyCity casino and Hotel expansion, \$75 million Adelaide Railway Operations centre and \$150 million Festival Plaza redevelopment. A number of retail, aged care, schools and student accommodation projects each over \$20 million, also boosted commencements. After the surge in 2017/18, non-dwelling building commencements over \$20 million fell back -39% in 2018/19 to \$877 million (see table 3.5). Major projects which commenced in 2018/19 included the \$60 million Sofitel hotel, \$100 million Adelaide Airport Terminal expansion, \$150 million 199-200 North Terrace office

development, \$70million 102-108 Wakefield Street office development and a number of large retail and schools projects.

In 2019/20, BIS Oxford Economics is forecasting non-residential building commencements above \$20 million to surge again, with a 47% increase predicted. Major projects expected to commence in 2019/20 include the \$30 million Adelaide Oval Hotel, \$35m Ramada hotel, \$35m Peregrine office redevelopment, \$30m Kaufland Forestville retail centre, \$180m new clinical building at Queen Elizabeth hospital, the \$180 million SA Health Medical Research Institute building, the \$150 million Kings Junction shopping centre, \$80 million Metcash food distribution warehouse, \$35 million Woolworths distribution centre at Gepps Cross and the \$100 million Yatala Prison expansion.

In 2020/21 we are forecasting the value of non-dwelling building commencements over \$20 million to fall back -13%, with a 4% increase predicted for 2021/22. the \$150 million Museum/ Gallery on the Old Royal Adelaide hospital site, the \$95 million Westin hotel at 141-159 King William street and some schools and student accommodation projects. In 2022/23 we are forecasting another big lift in commencements, underpinned by the \$1,000 million New Women and Children's hospital (although this could be built in stages). After the surge in big projects, levels are expected to fall back -41% in 2023/24 and another -1% in 2024/25, before a modest recovery ensues from 2025/26. Overall the average level of non-dwelling buildings over \$20 million in the seven years to 2025/26 inclusive is forecast to be \$1,225 million, \$307 million or 33% higher than the average levels of the past five years. Details of non-residential commencement forecasts by category are shown in figures 3.12 to 3.14.

The total value of engineering construction work done in South Australia (excluding the mining, pipeline and electricity sectors) staged a healthy recovery over the three years to 2017/18 inclusive, rising a cumulative 40% from the 2014/15 trough to \$3.7 billion (see table 3.5). Key drivers of the increase were roads, railways, water, recreation and telecommunications (mainly NBN) projects, as well as a huge lift in electricity-related engineering construction (mostly renewables). Activity levels then fell -8.2% in 2018/19. The completion of a number of major projects in 2018/19 and over the next 2 years will see engineering activity stay around current levels in 2019/20 and then decline -4% and -3% in 2020/21 and 2021/22.

A new round of projects is expected to commence in 2021/22 and 2022/23, particularly in the roads, railways and water sectors, along with a number of large mining projects (some within the electricity network catchment area). This will lift the relevant engineering construction activity 15.5% in 2022/23 and another 3% in 2023/24, before easing back a cumulative -5% over the subsequent 2 years.

Overall engineering construction (excluding mines, pipelines and electricity) is forecast to average \$3.48 million over the seven years to 2025/26, around 10% higher than the \$3.18 million averaged over the five years to 2018/19 inclusive. Details of engineering construction by category are shown in figures 3.15 to 3.19.

### 3.4.1 Forecasts of Major Customer Connections Expenditure

Major customer connections expenditure (CCE) has recovered from the very low levels of 2014/15 to 2017/18, with the 62% lift in major CCE in 2018/19 pushing levels to \$29.1 million (2017/18 prices). 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). 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 3.8 and 3.9), 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 section 3.4.2.

**Table 3.5: Drivers of Major Customer Connections Expenditure (2017/18 prices)**

Year Ended June	Major Customer Connect Expenditure (Projects > \$100k)		Non-Residential Building Commencements (Above \$20 million)		Engineering Construction Work Done (excl. Mines & Elec) <sup>(2)</sup>	
	(\$'000)	%CH	(\$million) <sup>(1)</sup>	%CH	(\$million) <sup>(1)</sup>	%CH
2008	19,082		654		2,041	
2009	46,571	144.1	711	8.6	2,781	36.3
2010	60,894	30.8	1,021	43.6	3,727	34.0
2011	38,106	-37.4	802	-21.4	3,312	-11.1
2012	35,244	-7.5	3,325	314.5	3,491	5.4
2013	35,762	1.5	413	-87.6	4,101	17.5
2014	35,167	-1.7	384	-7.0	3,457	-15.7
2015	23,794	-32.3	589	53.4	2,649	-23.4
2016	13,727	-42.3	862	46.4	2,897	9.4
2017	15,204	10.8	818	-5.2	3,241	11.9
2018	17,950	18.1	1,445	76.8	3,704	14.3
2019	29,070	62.0	877	-39.3	3,402	-8.2
Forecasts						
2020	32,006	10.1	1,286	46.6	3,394	-0.2
2021	32,550	1.7	1,121	-12.8	3,251	-4.2
2022	30,685	-5.7	1,166	4.1	3,150	-3.1
2023	36,229	18.1	1,799	54.2	3,636	15.5
2024	32,097	-11.4	1,066	-40.7	3,751	3.1
2025	31,416	-2.1	1,057	-0.9	3,632	-3.2
2026	31,425	0.0	1,081	2.3	3,565	-1.9
Period Averages & Compound Annual Average Growth Rates						
2011-15	33,614	-11.1	1,103	-7.4	3,402	-5.4
2016-19	18,988	28.4	1,001	0.6	3,311	5.5
<b>2016-20</b>	<b>21,591</b>	<b>23.6</b>	<b>1,058</b>	<b>10.5</b>	<b>3,328</b>	<b>4.0</b>
Forecasts						
2020-26	32,344	-0.3	1,225	-2.9	3,483	0.8
<b>2021-25</b>	<b>32,595</b>	<b>-0.9</b>	<b>1,242</b>	<b>-1.4</b>	<b>3,484</b>	<b>2.8</b>

(1) Constant 2016/17 prices.

Source: SA Power Networks, BIS Oxford Economics

(2) 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'.

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.

Over the past year, the huge increase in major connections expenditure may be due to the significant 77% increase in non-residential building commencements and solid growth in engineering construction work done in 2017/18. 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 are a number of large projects which commenced in the 2017/18 financial year, which are not expected to have their connection undertaken until 2018/19 (with some projects spilling into the 2019/20 financial year).

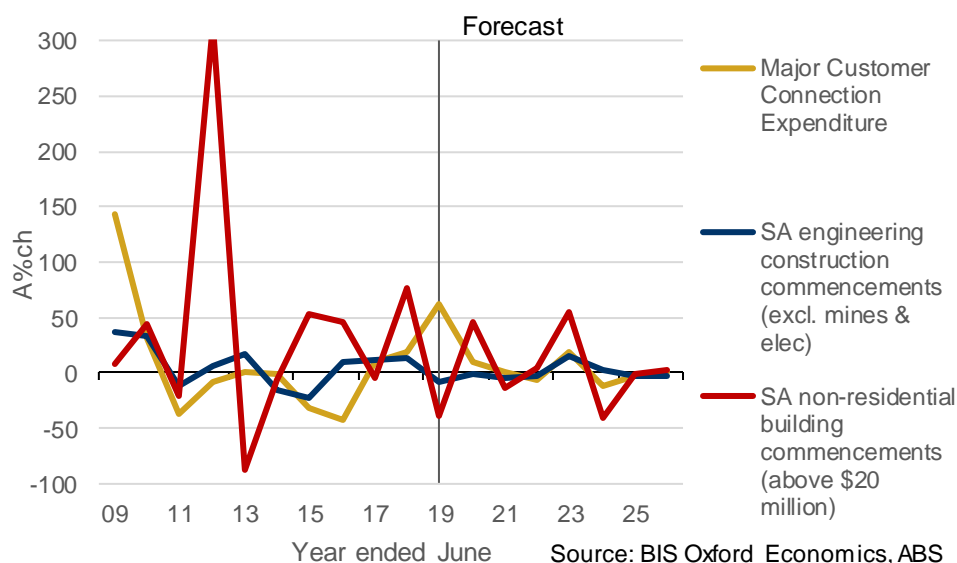
A large number of substantial projects identified by SA Power Networks and BIS Oxford Economics in 2018/19 and 2019/20 will drive further growth in major customer connections over the next two years, projected to increase 10.1% in 2019/20 and a further 1.7% in 2020/21. Particular substantial projects with significant connection values (in brackets) include the Lefevre Peninsula connection for the Osborne Shipyard (connection value \$1m); Tarpeena timber mill (\$3.6m); Peregrine office redevelopment (\$1m); Accolade wine bottling plant (\$1.6m); Queen Elizabeth hospital (\$1.1m); Adelaide Festival Centre (\$5m); Metcash food distribution facility (\$1.6m); a number of large food production facilities, some requiring irrigation pumps (\$1m to \$5m); St Kilda Naval Training Centre (\$13m); DPTI northern connector (\$3m), the DPTI Gawler Train Electrification project (\$29 million from 2018/19 to 2021/22); SA Water generation and irrigation connections (\$10.6m over 2018/19 to 2020/21); and a number of major connections to 'embedded' (new) electricity generation projects (which SA Power Networks has conservatively estimated to be around \$5m per year, on average, over the forecast period). Note that as discussed in section 3.1.3, the forecast for 2019/20 and 2020/21 are based on the bottom-up build of individual project customer connection values, as documented in the major projects list in section 3.4.2. 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 falls from 14.3 in 2018/19 to 13.1 in 2019/20 and then rises again in 2020/21 to 14.6, due largely to rise and fall of non-residential building commencements, with engineering construction work done fairly stable.

In 2021/22, we are forecasting major customer connections expenditure to decline by -5.7%, despite a small rise in the combined drivers. In forecasting this decline, we have reverted to the long-term average ratio of major CCE-to-drivers (excluding 'outliers') of 13.7 - see chart 3.9. Growth is then expected to rebound 18.1% to \$36.2 million in 2022/23 – which would then be the highest level of major CCE since the \$38m recorded in 2010/11, but below the \$46.6m and \$60.9m of 2008/09 and 2009/10. The strong rise in 2022/23 is due to the 54% lift in non-residential commencements above \$20m and strong growth (+15.5%) in the relevant engineering construction categories. However, we have effectively halved the impact of the (36%) growth in the combined drivers for two reasons. Firstly, a significant proportion of the increase in non-residential building commencements is the \$1,000 million New Women and Children's Hospital, which only has an estimated connection value of \$3.5m). Secondly, the completion of the much of the Gawler train electrification connection means that some of the strong rise in engineering construction work done will not be fully replicated in major connections expenditure, as it will be partially offset by the completion of the Gawler project. This means that the ratio of major CCE-to-drivers falls to 11.9. For the subsequent three years, we then use the long-run ratio (excluding 'outliers') of 13.7 to forecast major connections expenditure. This sees major CCE decline -11.4% in 2023/24 and another -2.1% in 2024/25, before stabilising in 2025/26.

Overall, major customer connection expenditure is forecast to average \$32.3 million over the seven years to 2025/26, compared to \$19.9 million over the five years to 2018/19. Although higher than the last five years, major customer connections expenditure is not expected to reach the high average of \$42m seen over 2008/09 to 2013/14.

However, there is possibly some upside to these forecasts, as we have not made an allowance for 2 sets of potential upside factors which could drive higher outcomes over the outlook period. Firstly, there is potential for a number of connections for renewable projects in South Australia (which are not included in our 'selected' engineering construction forecasts, because they are part of electricity-related construction) and secondly, a marked acceleration in the take-up of electric vehicles would necessitate a large programme of higher voltage connections (and sub-stations) to support the electric charging network (for example, if they were put in existing fuel service stations).

**Figure 3.8 Major Customer Connections Expenditure and Drivers: % Chg**



**Figure 3.9 Major Connections Expenditure and Drivers: \$m**

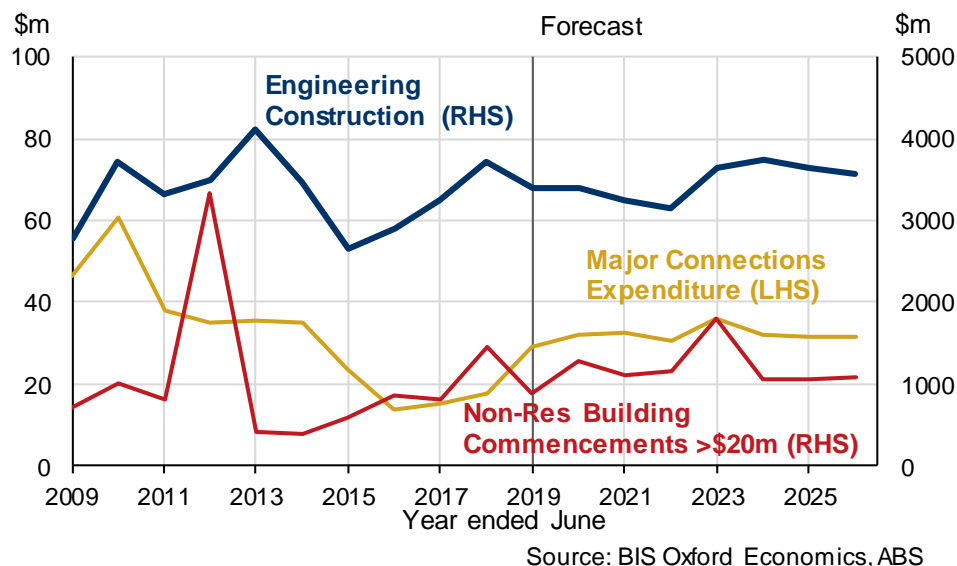


Figure 3.10 Major Connections Expenditure and Sum of Drivers: \$m

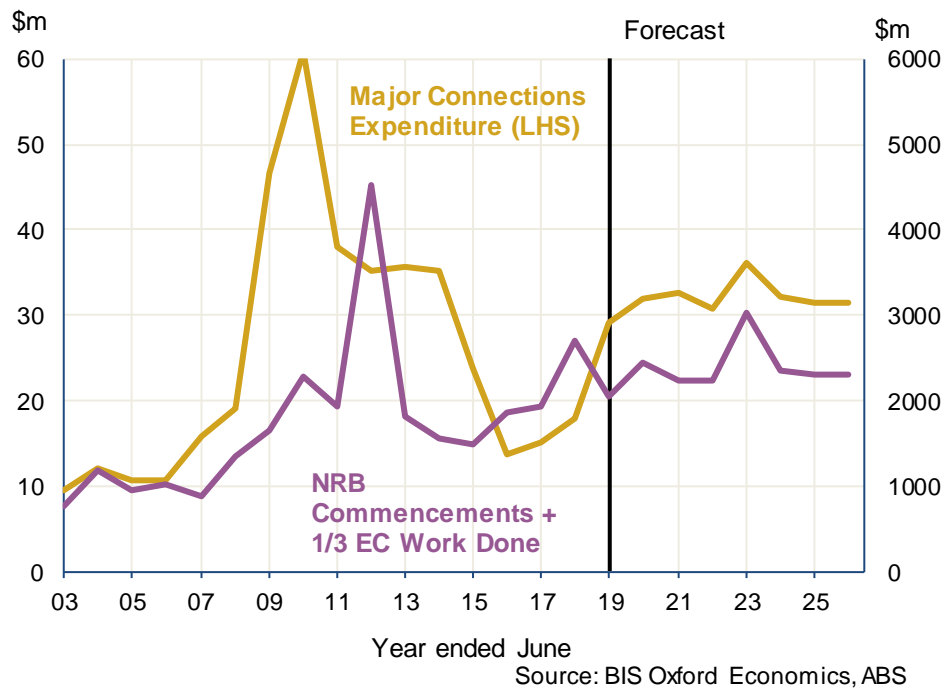


Figure 3.11 Ratio of Major Connections Expenditure/Sum of Drivers

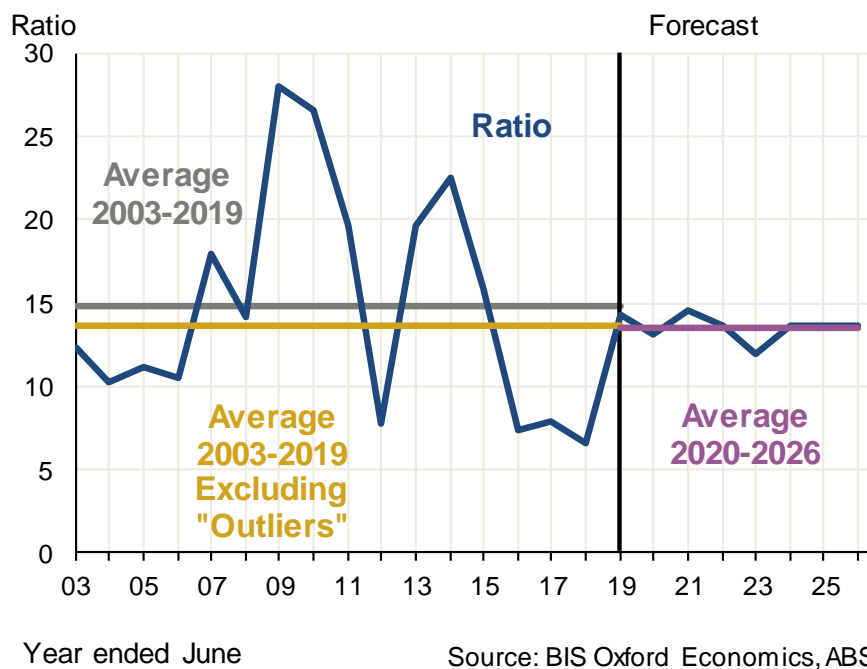


Figure 3.12 South Australia: Total Non-Residential Building Commencements

**Non-residential commencements, SA**

\$bn, constant MAT

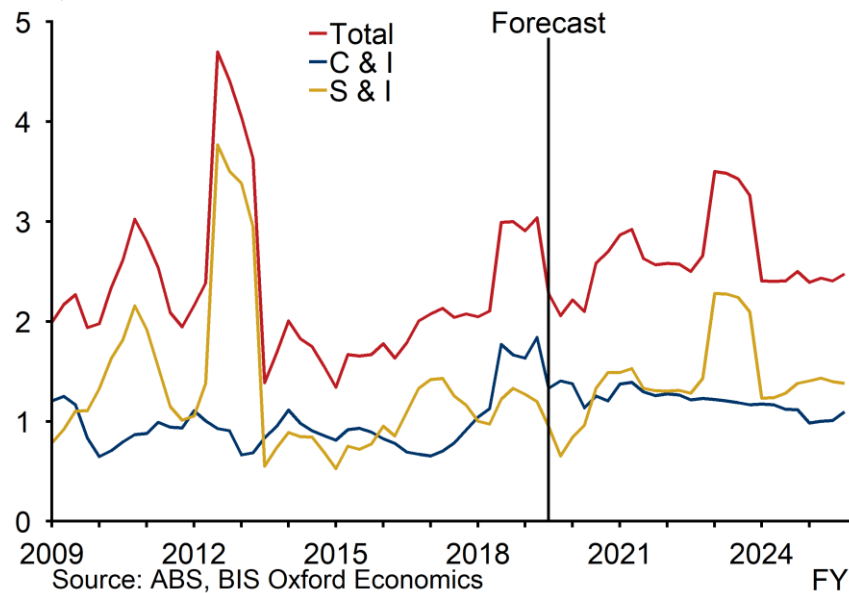


Figure 3.13 South Australia: Non-Residential Building Commencements, Commercial &amp; Industrial

**C&I commencements, SA**

\$mn, constant MAT

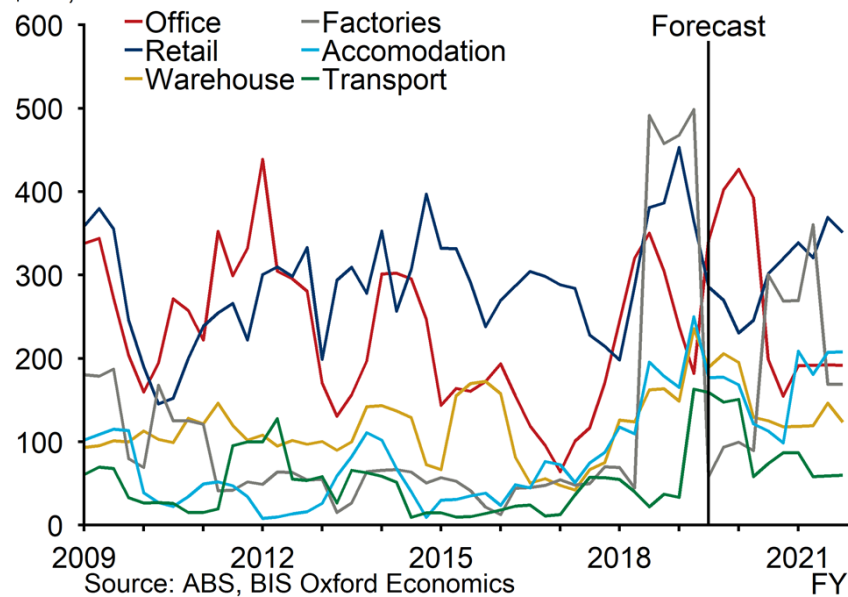


Figure 3.14 South Australia: Non-Residential Building Commencements: Social &amp; Institutional

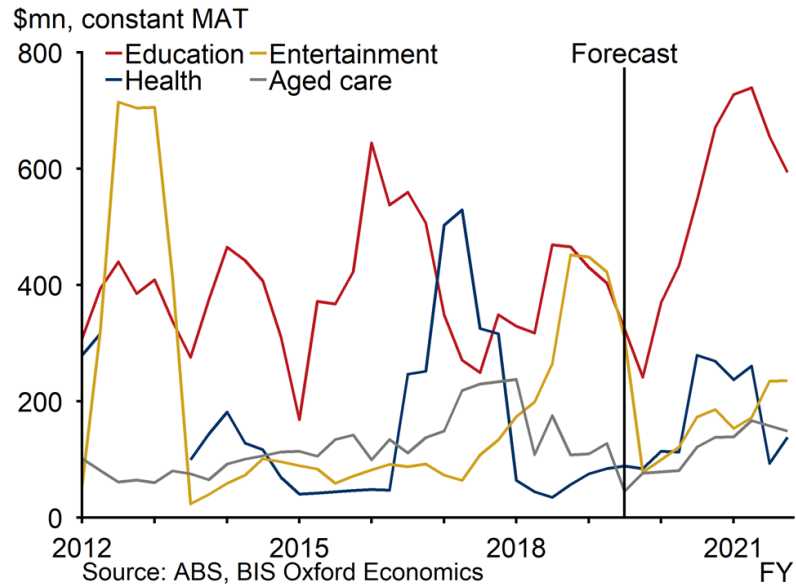
**S&I commencements, SA**

Figure 3.15 South Australia: Total Engineering Construction

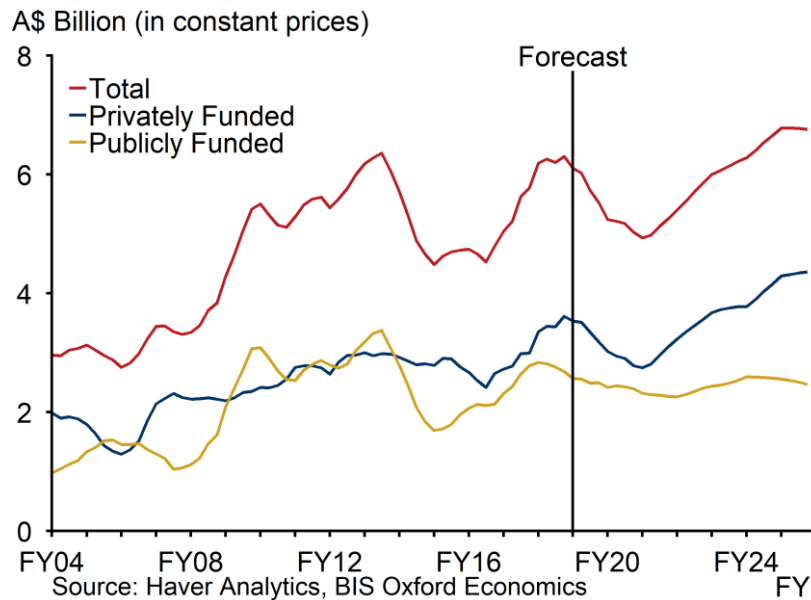
**Engineering Construction Work Done, SA**



Figure 3.16 South Australia: Engineering Construction by Sector

**Engineering Construction Work Done, SA**

A\$ Billion (in constant prices)

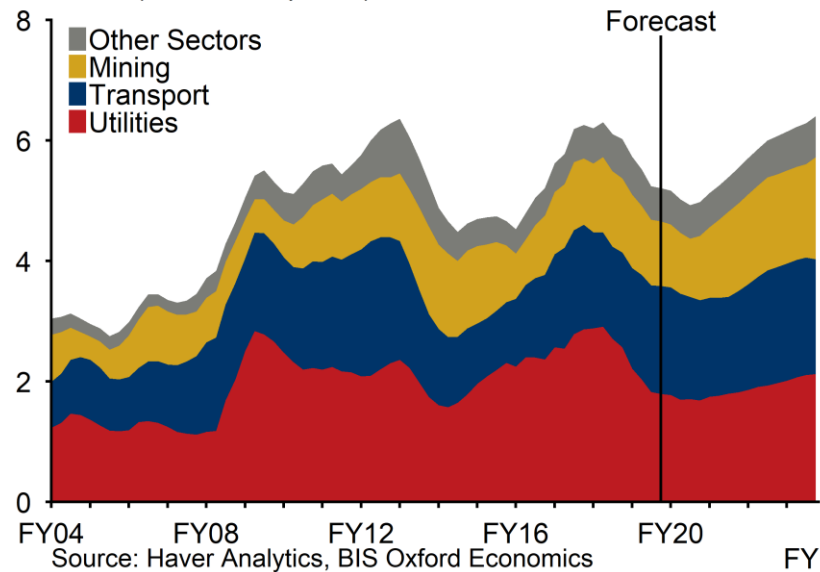


Figure 3.17 South Australia: Transport Engineering Construction

**Engineering Construction Work Done, SA**

A\$ Billion (in constant prices)

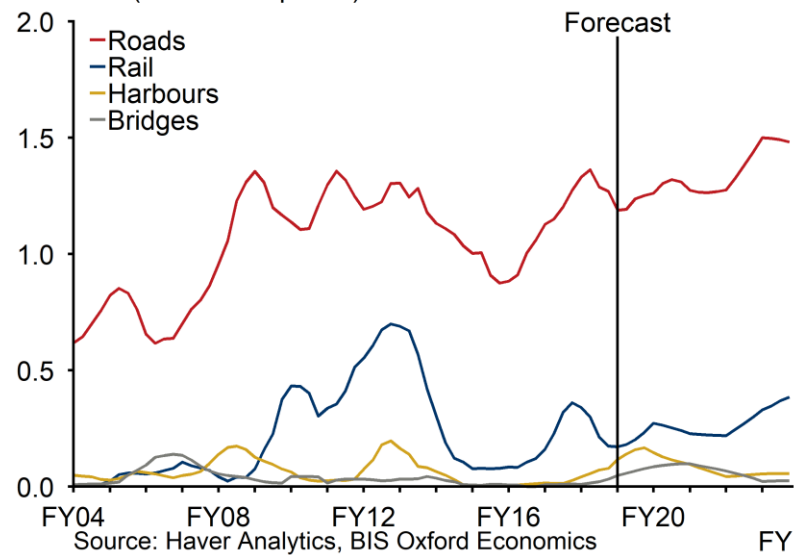


Figure 3.18 South Australia: Utilities Engineering Construction

**Engineering Construction Work Done, SA**

A\$ Billion (in constant prices)

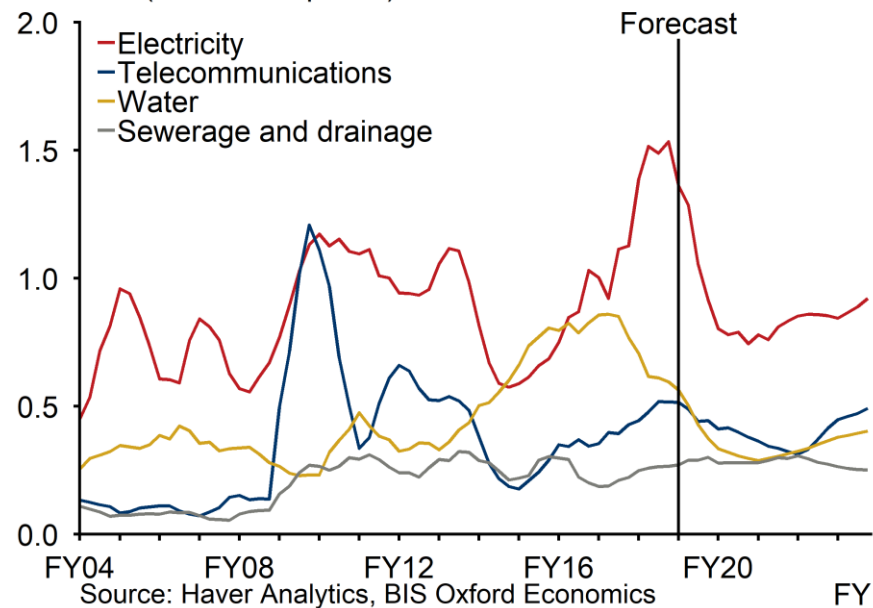
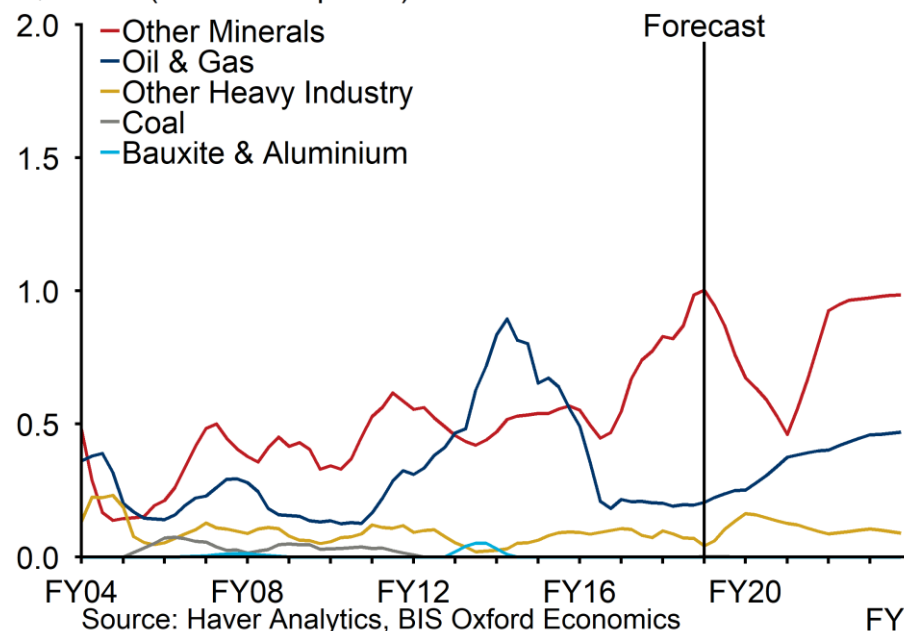


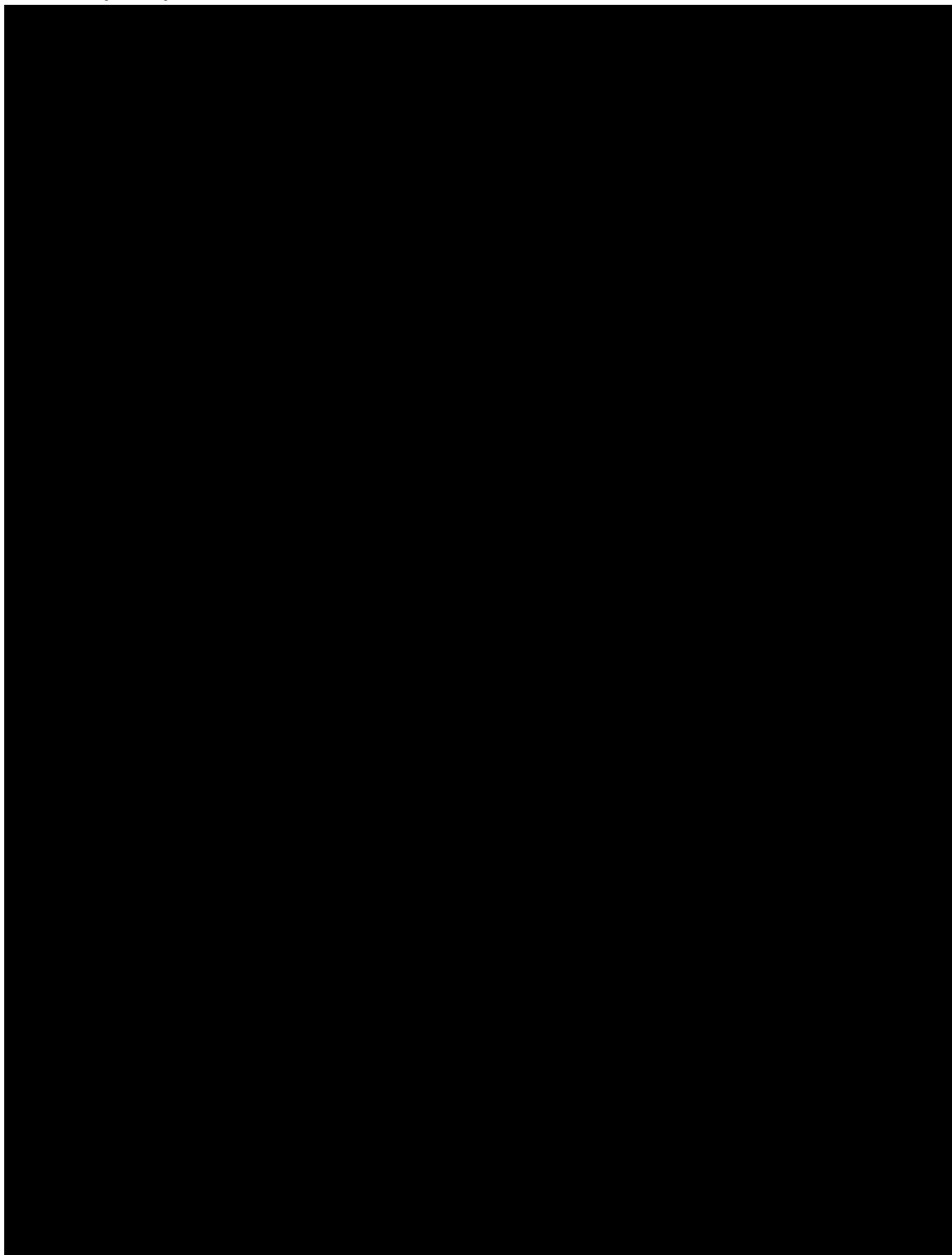
Figure 3.18 South Australia: Mining Engineering Construction

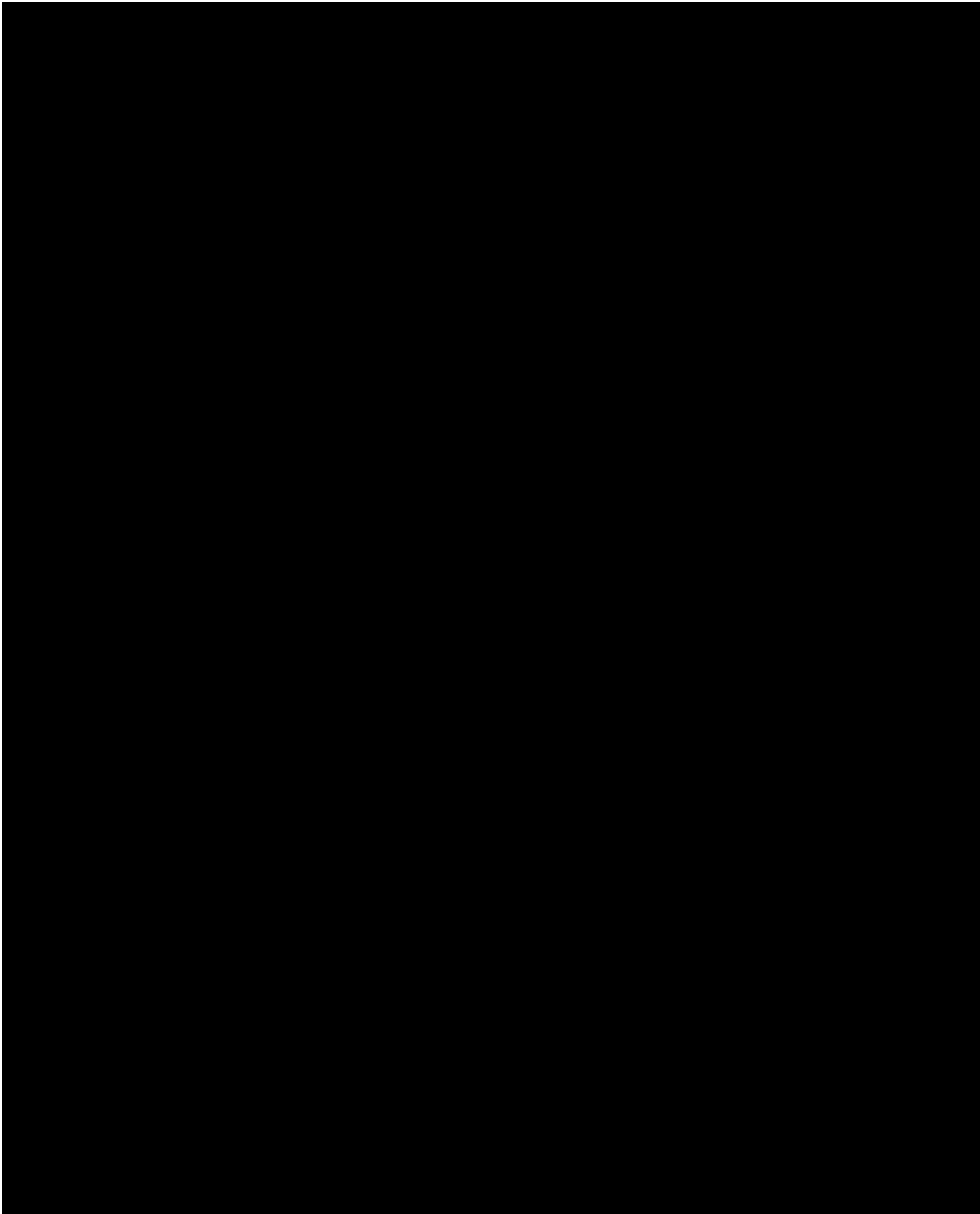
**Engineering Construction Work Done, SA**

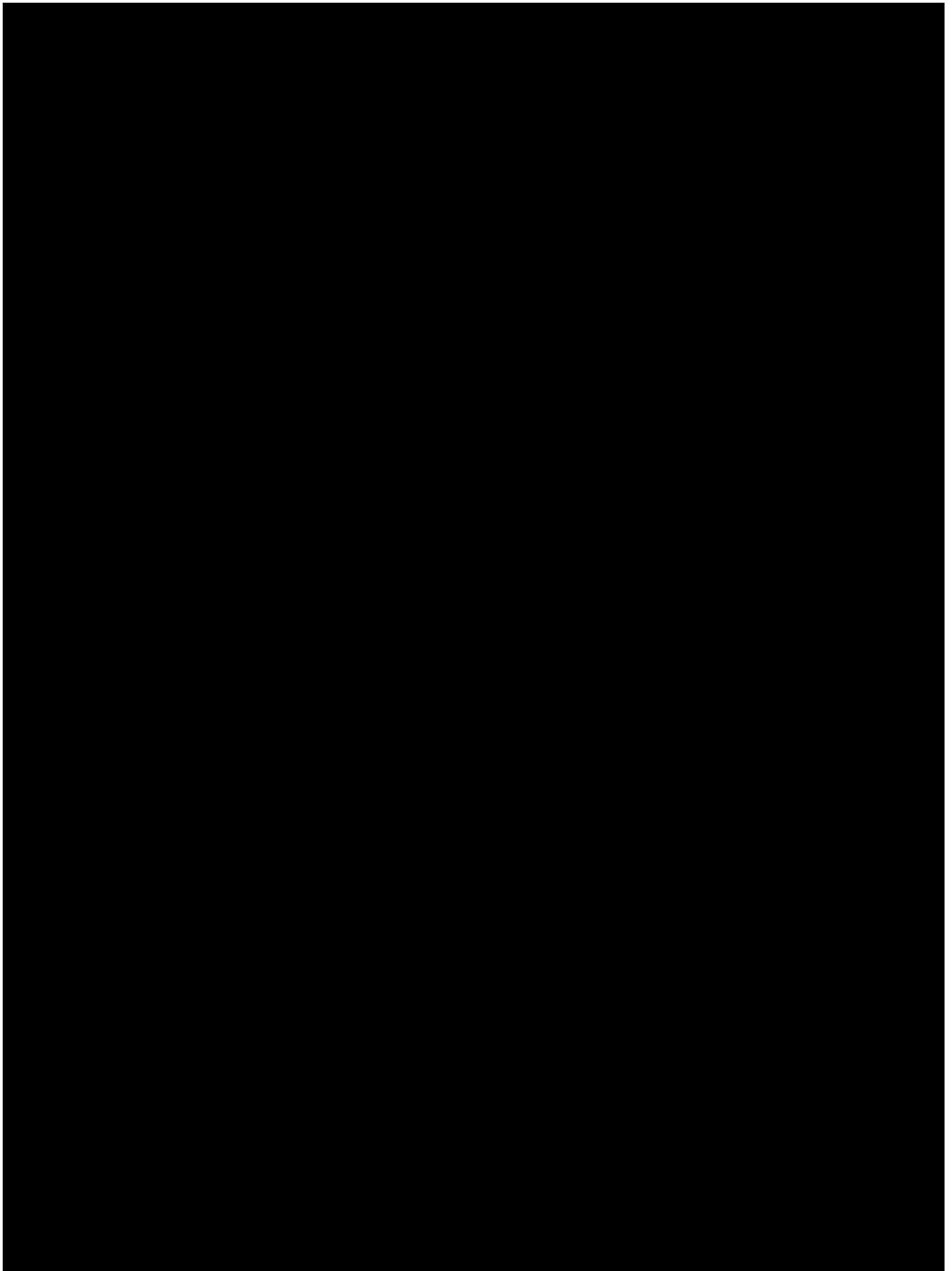
A\$ Billion (in constant prices)

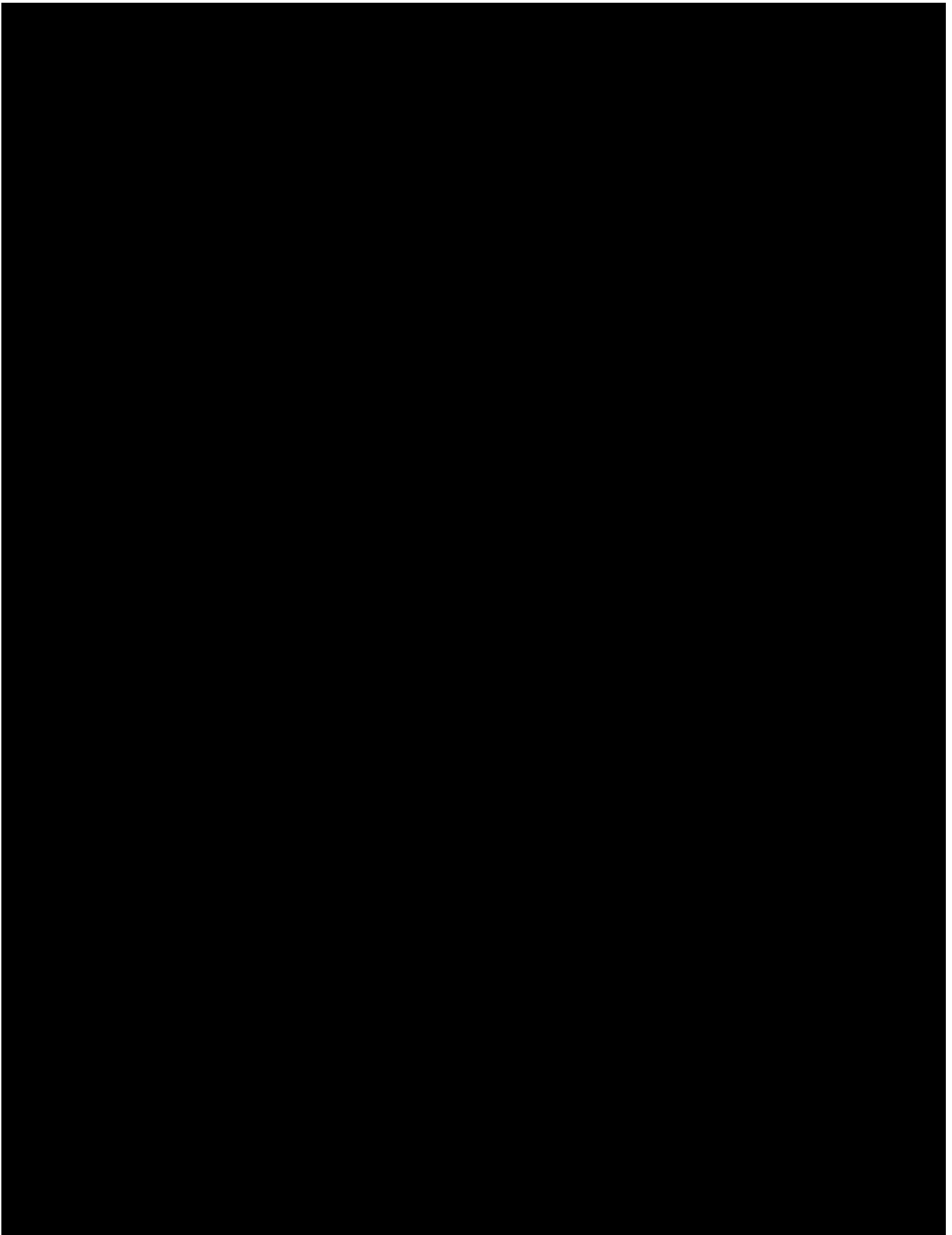


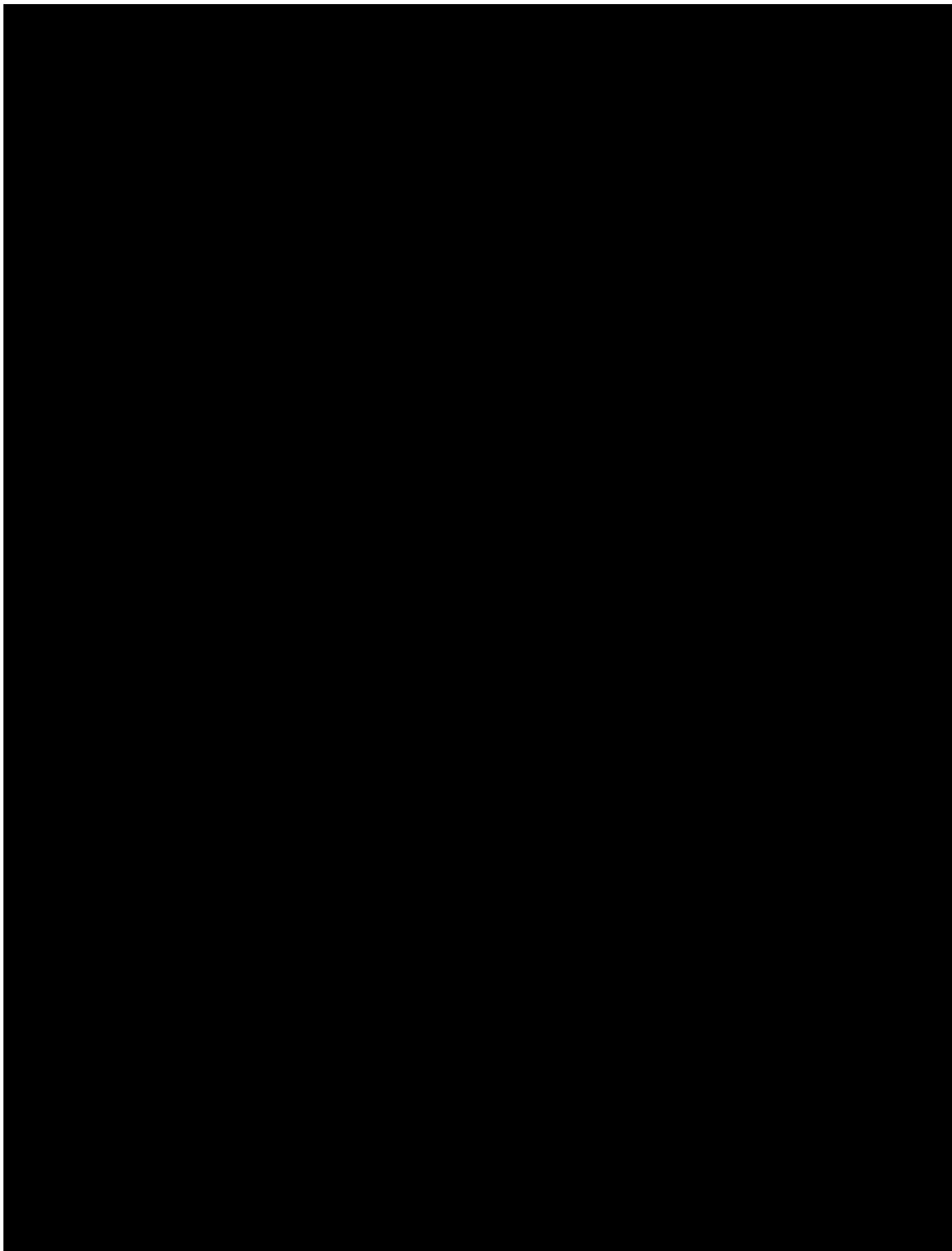
### 3.4.2 Major Projects List



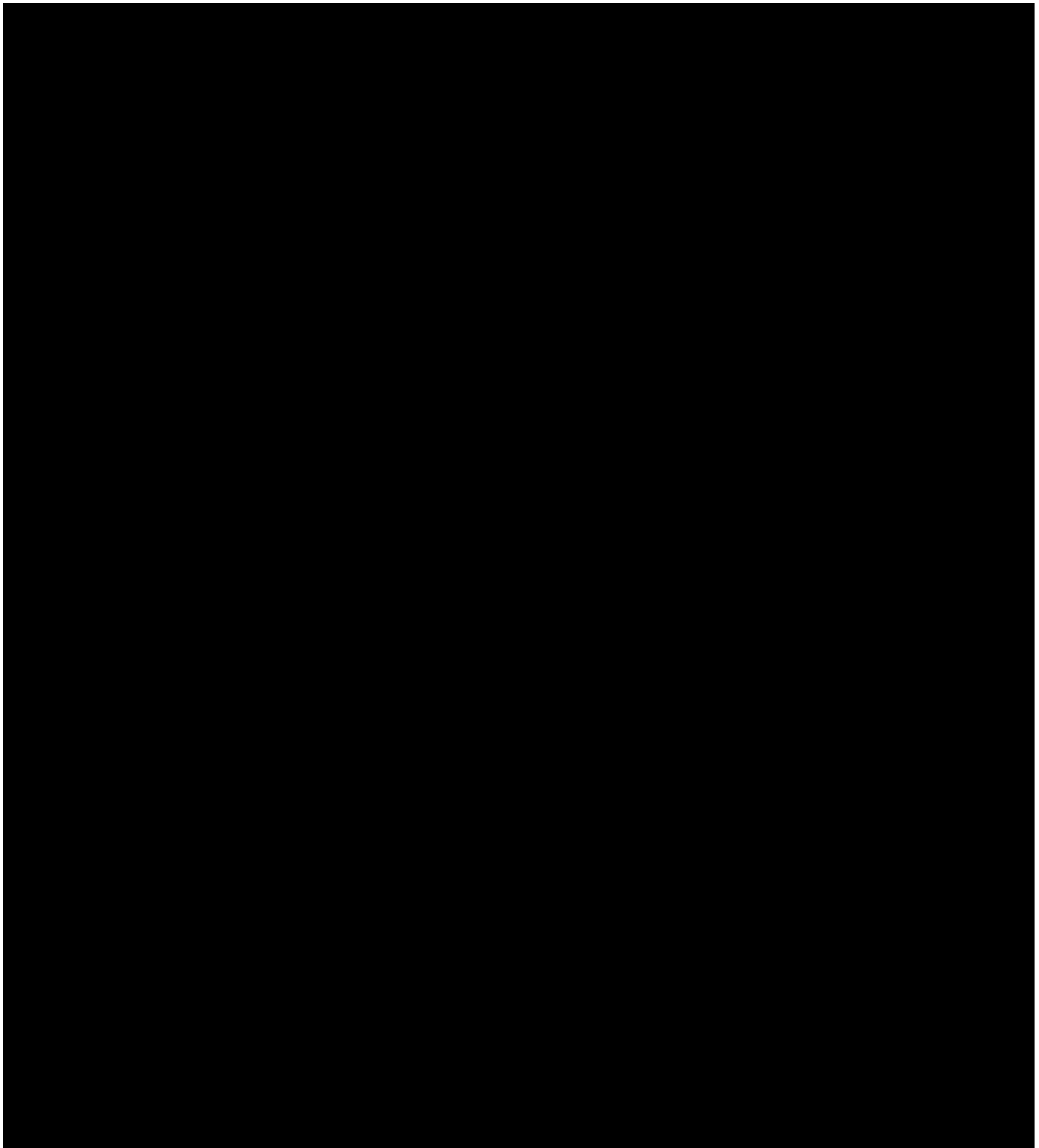












# APPENDIX 1: TERMS OF REFERENCE



## 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

**Richard Robinson, BComm (Hons)**  
**Senior Economist**  
**Associate Director - Economics**

Richard is BIS Oxford Economics' principal economic forecaster, with over three decades of economic forecasting experience. He is largely responsible for the short term economic forecasts presented at the company's half yearly conferences in March and September. He contributes forecasts and analysis to the regular subscription services, *Economic Outlook*, *Long Term Forecasts* and the *Australian Macro Service*. He also conducts private briefings and presentations to facilitate clients' strategic planning and budgeting.

Richard regularly analyses and forecasts resources investment, investment by type and by industry, civil engineering construction activity and production of manufactures, consumer goods and commodities. In this work, he has developed considerable industry expertise in the resources, infrastructure, construction, manufacturing, agriculture, transport and services sectors of the Australian and state economies. He also regularly forecasts output and employment by industry sector by state, and other key state economic variables.

Richard has been involved in a wide range of multi-client, consultancy and private client projects including formulating end-use sector demand models for forecasting demand for products, energy, electricity, employment, land use and transport-related variables; cost escalation for wages and materials; project evaluation studies; cost-benefit analysis; assessments of individual property markets and analysing the consistency of escalators in contracts.

Among the multi-client studies, Richard has researched and formulated models of demand for commercial, retail and industrial property markets; whitegoods appliances demand and supply; studies of the mining industry and a wide range of resource and infrastructure-related construction studies. Some other projects have included a report on the *Economic Impact of LNG Exports on Manufacturing and the Economy - How Should we Respond to the Looming Crisis* (2014); *The Benefits of a Local Government Procurement Policy for Local Steel in Government Construction* (2015); analysing and forecasting freight tonnages; a study of the repair and maintenance market; the preparation of economic arguments for state and National Wage Cases; submissions to energy regulators on behalf of energy utilities; regular analysis and detailed short and long term forecasts of economic variables in a number of overseas countries; and contributing discussion papers to CEDA (Committee for Economic Development of Australia).

**Timothy Hibbert, BEc (Hons)**  
**Senior Project Manager, Building and Construction**

Timothy is a member of BIS Oxford Economics' building & construction unit, and has worked with the company since April 2008. He manages and is the prime contact for BIS Oxford Economics' non-residential construction forecasts.

Timothy oversees the companies Work Done Forecasts of Building Activity publications and makes regular contributions to multi-client publications such as Building in Australia, Building Industry Prospects and Regional Residential Building. He has also worked on a wide array of private client projects, focused on construction material demand modelling and regional construction analysis. Prior to joining BIS Oxford Economics, Timothy worked as an economic data analyst for the Australian Bureau of Statistics.

Tim graduated with a Bachelor of Economics degree with Honours from Macquarie University.

**Nicholas Ng – Economist – Building and Construction**

Nicholas has contributed to numerous studies and projects in infrastructure and mining & heavy industry. With a developed understanding of the trends and drivers impacting investment, production, and contracting, Nicholas been a project manager and key contributor to several editions of Mining in Australia, Engineering Construction in Australia, and Road Maintenance in Australia. His experience in the consulting realm includes an audit of capital projects for the Western Australian Department of Mines, cost escalation studies, and detailed investigations into resource investment and supply chain from ground to consumer. A track record of bespoke work has also exposed Nicholas to forecasts of domestic versus foreign engineering work, regional activity analysis, and state level coverage of residential, non-residential, and civil construction.



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