



Supporting
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BIS Oxford Economics - Gross Customer Connections Expenditure Forecasts

2020-2025
Regulatory Proposal
18 November 2018





**BIS OXFORD
ECONOMICS**

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

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

FINAL REPORT NOVEMBER 2018

BIS Oxford Economics welcomes any feedback concerning the forecasts or methodology used in this report as well as any suggestions for future improvement.

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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 picked up slightly in 2017/18, rising +0.6% to \$76.4 million. This followed seven years of successive annual declines, from the peak of \$161.5 million in 2009/10. Total connections expenditure is forecast to rebound 16.5% to \$89 million in 2018/19, driven by a 85% jump in major connections expenditure (from \$20 million to \$37.1 million), which will offset declines in the other three categories (minor and medium connections and underground residential developments – URDs).

Over the subsequent seven years from 2019/20 to 2025/26 inclusive, total connections expenditure is forecast to more or less plateau at the 2018/19 levels, with the eight-year average to 2025/26 predicted to be \$89.6 million, compared with an average of \$84 million over the previous five years to 2017/18 (see table below). The next peak in activity is forecast to be \$91.9 million in 2022/23, driven by strengthening economic, building and infrastructure activity, before weakening to \$90 million in 2025/26.

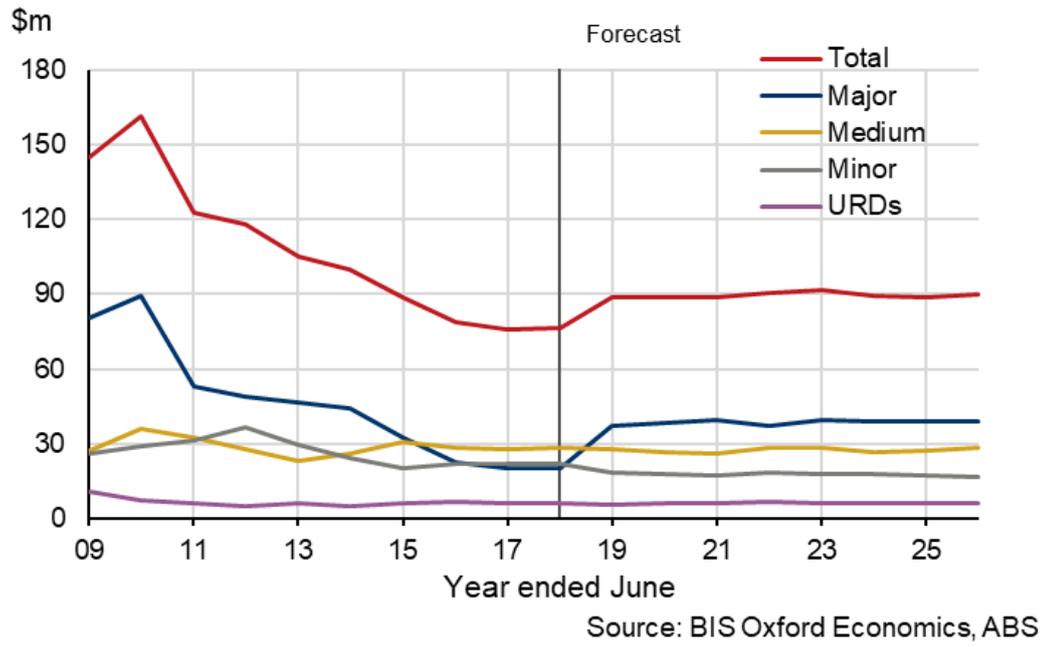
Table 1.1: Customer Connections Expenditure (Constant 2017/18 Prices)

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
2008	25,618		7,739		30,153		32,986		96,496	
2009	26,228	2.4	10,949	41.5	27,211	-9.8	80,504	144.1	144,892	50.2
2010	28,750	9.6	7,097	-35.2	36,035	32.4	89,576	11.3	161,458	11.4
2011	31,173	8.4	5,991	-15.6	32,254	-10.5	53,197	-40.6	122,614	-24.1
2012	36,768	17.9	4,883	-18.5	27,720	-14.1	48,731	-8.4	118,102	-3.7
2013	29,484	-19.8	5,770	18.2	23,066	-16.8	46,747	-4.1	105,067	-11.0
2014	24,461	-17.0	4,776	-17.2	26,151	13.4	44,413	-5.0	99,801	-5.0
2015	20,020	-18.2	6,100	27.7	30,544	16.8	32,201	-27.5	88,865	-11.0
2016	21,794	8.9	6,861	12.5	28,153	-7.8	22,240	-30.9	79,048	-11.0
2017	22,098	1.4	5,953	-13.2	27,687	-1.7	20,146	-9.4	75,884	-4.0
2018	21,687	-1.9	6,233	4.7	28,383	2.5	20,067	-0.4	76,370	0.6
Forecast										
2019	18,347	-15.4	5,644	-9.5	27,929	-1.6	37,064	84.7	88,984	16.5
2020	17,483	-4.7	6,023	6.7	26,477	-5.2	38,547	4.0	88,529	-0.5
2021	17,102	-2.2	6,264	4.0	25,929	-2.1	39,470	2.4	88,765	0.3
2022	18,494	8.1	6,625	5.8	28,121	8.5	37,276	-5.6	90,516	2.0
2023	17,943	-3.0	6,309	-4.8	28,282	0.6	39,409	5.7	91,944	1.6
2024	17,492	-2.5	6,035	-4.3	26,712	-5.6	38,923	-1.2	89,162	-3.0
2025	16,906	-3.3	5,833	-3.3	27,062	1.3	38,763	-0.4	88,565	-0.7
2026	16,760	-0.9	5,782	-0.9	28,451	5.1	39,008	0.6	90,002	1.6
Period Averages & Compound Annual Average Growth Rates (a)										
2013-18	22,012	-6.0	5,985	1.6	28,184	4.2	27,813	-15.6	83,994	-6.2
Forecast										
2018-23	17,874	-3.7	6,173	0.2	27,348	-0.1	38,353	14.5	89,748	3.8
2018-26	17,566	-3.2	6,064	-0.9	27,370	0.0	38,558	8.7	89,559	2.1
2023-26	17,276	-2.2	5,990	-2.9	27,627	0.2	39,026	-0.3	89,918	-0.7

(a) Period average does not include 1st year of the period.

Source: SA Power Networks, BIS Oxford Economics

Figure 1.1 Customer Connections Expenditure



1. INTRODUCTION

In September 2018, BIS Oxford Economics was engaged by SA Power Networks to provide an expert opinion regarding the outlook for the company's gross customer connections expenditure forecasts over an eight year period from 2018/19 to 2025/26 (i.e. from 1 July 2018 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 (Senior Project Manager), Stella McMullen (Economic Analyst) and Harry Good (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 2018 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 2016/17 only (annual data is available). At the time of production, the latest building activity data was for the March 2018 quarter, while the latest building approvals data was for the month of August 2018. 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: 2018-2033* report, *Engineering Construction: 2017/18 to 2031/32*, *The Outlook for Residential Land in Adelaide 2017-2022*, and *Building in Australia: 2017 – 2032*, 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

Australia's economic growth has bounced back over the past year, with GDP increasing by 2.9% in 2017/18, following only 2.1% in 2016/17 and an average of 2.5% over the past 6 years. The current momentum in overall growth is expected to be maintained over the next year, with a slight pickup to 3.0% in 2018/19, before slowing again to 2.7% in 2019/20.

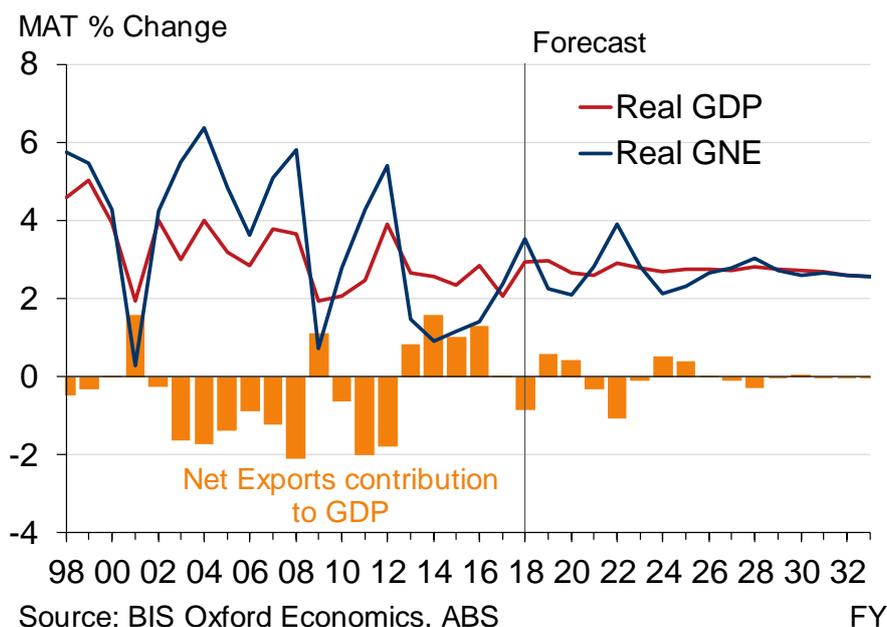
Good short-term outlook for Australian economy, mainly driven by exports

Over the next 2 to 3 years, GDP will be boosted by net exports, with solid growth in export volumes forecast. Underpinning this will be positive momentum in the global economy, new LNG capacity, 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 boosted by a more competitive dollar. The outlook for rural and manufacturing exports is also positive, with both sectors taking advantage of Australia's comparative advantage in high quality, high value-added output.

Pace of expansion has been relatively subdued since the end of the mining investment boom

Growth in GDP and particularly domestic demand has been considerably lower over the past six years than the previous two decades. The main drag has been a major decline in mining investment, which has coincided with (and contributed to) weakness in non-mining business investment. Net exports have acted as a partial offset during this period, due to booming resource and services exports and weak growth in import volumes.

Figure 2.1 Australia – Basic Economic Indicators



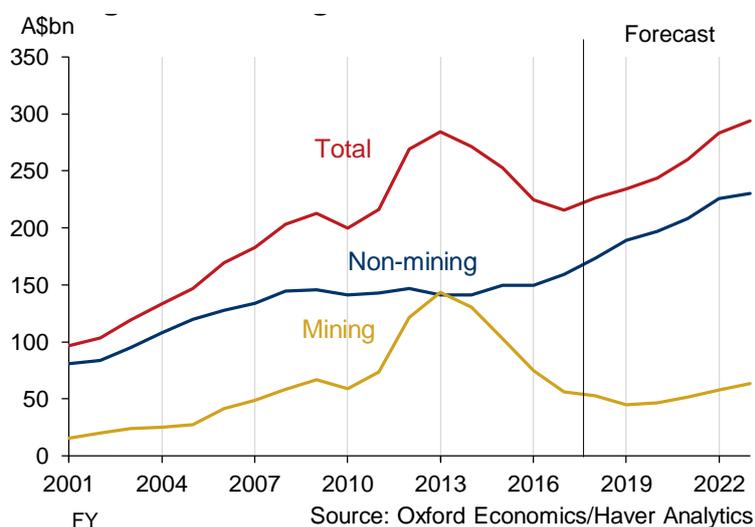
Major structural changes over past 15 years appear to have run their course, and come full circle

Looking ahead, it is becoming apparent that the structural shift in the Australian economy back to broad-based growth following the mining boom is finally gathering speed, with the economy now more balanced and sustainable – back to where it was 15 years ago.

Australia moved from broad-based growth in the early 2000s – underwritten by a very low and competitive exchange rate (below US60 cents) – and into an unprecedented mining investment boom over the decade to 2013. This shift was driven largely by the industrialisation and urbanisation of China (where annual GDP growth averaged over 10%). Chinese and other countries' demand pushed up commodity prices and Australia's terms of trade to new heights, lifting the Australian dollar to over US\$1.00 – a level not seen since the previous commodity boom of the early 1980s. The economy shifted resources toward servicing the mining investment boom and away from the (other) tradeables sector which were impacted by the appreciation of the A\$. The tourism and international education sectors suffered, while the manufacturing sector was severely impacted – gross value added fell a cumulative 13% over the decade to 2016/17, including a 5% fall during 2009/09 (mainly due to the global financial crisis) and another 9% over the five years to 2016/17.

The end of the commodities boom and depreciation of the A\$, which fell over 30% peak-to-trough, has triggered a second structural shift over the past five years. The economy has shifted back towards non-mining tradables sectors. Accompanying this, we estimate that there will be a 69% decline in mining investment from its 2012/13 peak to 2018/19 trough. As mining comprised just over half of total business investment (32% of total investment) at its peak, the steep plunge in mining investment has put a significant drag on economic growth over the past five years.

Figure 2.2 Mining and Non-Mining Business Investment



Broad-based growth has returned, with lower A\$ a key factor

The lower A\$, which has held steady in a US\$72-79 cent band for over 3 years (and recently weakened to around US\$71 cents), has been fundamental in facilitating the return of broad-based growth. Together with rising capacity utilisation and the recovery in profits, it has facilitated a turnaround in non-mining investment, which has become a key driver of domestic demand over the last year. Businesses in the agriculture, mining, tourism, international education and some other services have seen their competitiveness improve markedly, enabling them to compete on the international stage. With all the major industry shutdowns now complete (the last being car

manufacturing last year), manufacturing output bounced back in 2017/18 and is expected to sustain solid growth over the forecast period, buoyed by the lower A\$.

Strong global economy is supporting exports, but trade protectionism concerns rising

The acceleration in global growth over the past two years has also been supportive, boosting export volumes and initiating a recovery in commodity prices. Looking ahead, global economic growth is expected to peak in 2018 at 3.8% and then gradually decelerate over the next five years to 3.3% in calendar 2022. The US economy is currently growing at its fastest pace in four years, but with capacity constraints starting to bite, we expect growth to slow as the fiscal boost (tax cuts) dissipates and inflation and US interest rates rise. Chinese growth will continue to decelerate as the economy proceeds with its own structural transformation toward domestic led growth and services. Momentum is also expected to ease in Japan and Europe as they return to full employment. On the other hand, solid growth is expected to continue in India and most of east Asia (excluding China and Japan), which augers well for Australian exports. Nevertheless, rising US interest rates will pose a risk for a number of emerging economies.

Of more concern is rising protectionism in the form of tariffs imposed by the USA and the reciprocal responses from China and Europe. Although our current view is that the trade war will have a minimal impact on overall global growth, the downside risks have increased. Much of the risks relate to uncertainty and their effects on business and consumer confidence. Already there has been a sharp correction to commodity prices recently (with the exception of oil), and we expect the trade uncertainty to weigh on prices for the next 1-2 years. However, by the early 2020s, the tightening supply-demand balance in a number of commodity markets is expected to initiate a recovery in prices, which will fuel the next round of mining investment.

Slower growth in domestic demand next two years, following 2017/18 rebound

The recovery in domestic demand over 2017/18 (+3.5%) boosted Australia's GDP last year, but we expect it to weaken again over the next 2 years. Momentum in household spending remains weak, with consumers held back by weak growth in wages and other sources of income (including interest receipts and dwelling rental income). And despite the upturn in non-mining investment, total capital expenditure will be somewhat patchy as residential and mining capital expenditure and the end of the NBN roll out (in 2019/20) putting a drag on the outlook.

Synchronisation of investment to drive stronger growth from early 2020s

By early next decade, the investment cycles – which are currently offsetting each other and out-of-synch – are all expected to move into upswing and gradually synchronise and broaden, although there will be differences in the strength and timing among the different residential, business and public investment components. The strengthening in investment will lead to an increase in 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, 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 economic growth. Nevertheless, GDP growth is forecast to lift and average around 3% over 2021/22 to 2022/23. outlook.

Table 2.1 Australia – Key Economic Indicators, Financial Years

Year Ended June	Forecasts										
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total New Private Investment (+)	-2.2	-4.9	-1.6	3.6	0.8	1.5	3.9	7.4	2.4	-1.9	0.8
New Public Investment (+)	-7.6	6.7	10.5	6.9	4.2	-3.2	0.7	2.6	3.8	0.8	2.6
Gross National Expenditure (GNE)	1.1	1.4	2.4	3.5	2.4	2.1	3.2	4.1	2.9	1.6	2.4
GDP	2.4	2.8	2.1	2.9	3.1	2.7	2.9	3.1	2.9	2.4	2.9
Inflation and Wages											
CPI (Yr Avg)- RBA forecasts (*)	1.7	1.4	1.7	1.9	1.9	2.2	2.4	2.4	2.4	2.4	2.4
Wage Price Index (Jun on Jun)**	2.3	2.1	1.9	2.1	2.6	2.7	3.5	3.7	3.8	3.5	3.3
Wage Price Index (Yr Avg)**	2.4	2.1	2.0	2.1	2.4	2.6	3.3	3.7	3.8	3.5	3.3
Average Weekly Earnings (Yr Avg)^	2.4	1.9	2.0	2.4	2.8	3.2	3.7	4.3	4.4	3.9	3.8
Employment											
– Employment Growth (Yr Avg)	1.3	2.3	1.5	3.0	1.9	1.1	1.4	2.1	1.7	1.0	1.3
– Employment Growth (May on May) (%)	2.0	1.8	2.1	2.6	1.5	1.1	1.7	2.3	1.3	1.1	1.4
– Unemployment Rate (May) (%)	5.9	5.7	5.5	5.4	5.5	5.6	5.4	4.7	4.8	5.1	5.0
Labour Productivity Growth											
– Total	1.1	0.6	0.6	-0.1	1.3	1.6	1.5	0.9	1.1	1.4	1.5
– Non-farm	1.1	0.8	0.3	0.2	1.3	1.6	1.4	1.0	1.1	1.4	1.5

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 2020 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

Inflation and interest rates to remain low over the next 2 years, before gradually rising over early 2020s

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 1.9% now to 2.3% in 2019/20. A lack of inflation and continuing slack in the labour market is expected to keep the RBA on hold for a while, with the cash rate forecast to remain at 1.5% until mid-2020, before rising to 2.75% by the second half of 2022 as wages and CPI inflation rise back toward (and above) historical averages, and the unemployment rate dips below 5%. 10-year government bond rates will also gradually rise to over 4% by 2021/22, from around 2.7% 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 monetary tightening in the US. Meanwhile, the 1.25% rise in the cash rate in Australia means the housing variable rate will rise above 6.3% by mid-2022, which will be enough to slow consumer spending and impact housing and business investment over 2022/23 and 2023/24.

Mild slowdown in mid-2020s as economy moves to trend growth

Overall, average annual GDP growth over the five years to 2022/23 is forecast to be 2.9%, which will be an improvement on the 2.5% average of the 5 years to 2017/18. Growth will also be far more domestically oriented, with Gross National Expenditure forecast to average 2.9%, compared to only 1.8% in the 5 years to 2017/18.

The tightening of monetary policy will precipitate an overall slowing of economic growth in the mid-2020s. But 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 finally gained traction over the past 2 years. This follows 6 years of anaemic growth to 2015/16 inclusive, when State Final Demand (SFD) averaged 1.1% p.a. and Gross State Product (GSP) averaged only 0.9% p.a. SFD rose 3.2% in 2016/17 and 4% in 2017/18, while GSP picked up to 2.2% in 2016/17 and an estimated 2.9% in 2017/18.

SA economy has picked over last 2 years thanks to surging investment

The pick-up in overall investment has been the key to the improvement in the state economy. Total investment increased 4.9% in 2016/17 and 7.7% in 2017/18, led initially by dwelling and public investment, and then joined by surging business investment over the past year. This has underpinned the recovery in employment, rising 1.3% and 2.1% respectively over the past 2 years, which has pushed the state unemployment rate down from 7.3% in 2015/16 to 5.4% in June 2018.

A further increase in overall investment is predicted for 2018/19, with moderate rises forecast for dwelling, business investment and public investment. New public investment has increased a cumulative 31% over the past 3 years, and after another small rise in 2018/19 is then forecast to suffer a steep two year decline, 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 are projected to drive solid increases in public investment from 2021/22 to 2024/25.

Dwelling investment is forecast to increase again in 2018/19, but this is expected to worsen the residential oversupply in the state, and significant declines are forecast for the subsequent two years, before turning around in 2021/22. Solid growth is then projected for 2021/22 and 2022/23 before residential investment again weakens.

Business investment rebounded by 11% in 2017/18 and another 3% rise is forecast for 2018/19, before declining in 2019/20 due to the completion of several projects. The recovery has been led by non-residential building and a turnaround in private engineering construction. The cumulative 37% rise in private non-dwelling building over these two years will be 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 then fall back over the following two years before picking up from 2021/22. Private engineering construction will also be higher over 2017/18 and 2018/19, 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.

Employment growth is expected to slow over the next 3 years, and particularly in 2019/20 and 2020/21 due to the overall decline in investment. Coupled with weak wages growth and low population growth, the end result will be a sharp deceleration in consumer spending. Meanwhile, constrained state government finances will lead to slower growth in government spending, after the surprising strength over the past two years.

Low population growth and constrained public finances are inherent weaknesses

The economy continues to suffer from a lack of growth drivers. Population growth was only 0.6% in 2016/17 and we expect it to remain weak as South Australians go interstate in search of job opportunities.

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.

The decline in overall construction and investment in 2019/20 and 2020/21 is also expected to impact the state's labour market, with employment growth predicted to slow sharply. This in turn will lead to soft growth in household spending over the next three years. Overall, SFD growth is forecast to weaken in 2018/19 to 2.3%, before slowing sharply to 0.7% in 2019/20 and a still weak 1.6% in 2020/21 and GSP growth is expected to be faster due to positive export growth.

Holden closure is the latest set-back to growth, but Arrium saved

Although the shutdown of the local car manufacturing industry last year (Holden in South Australia and Toyota in Victoria) impacted the state's manufacturing sector (with total manufacturing employment declining almost 14% or by 10,700 jobs), the news isn't all bad. The severity of the overall impacts will depend on the ability of the remaining car component manufacturers to diversify and transition to exporting. However, most of these manufacturers only exported a small proportion of their output and were heavily reliant on domestic car manufacturers for their sales.

Parts manufacturers may benefit from the lower exchange rate, which will help them to shift to an export focus. However, just like the Australian car manufacturing industry, car part makers face comparatively high production costs that make it difficult to compete with foreign operations. Additionally, there are well established component suppliers to overseas car manufacturing operations

The good news is that Arrium (operator of the Whyalla Steelworks and associated iron ore mines) did not shut down. Arrium went into receivership in April 2016, with debts of more than \$2 billion, and there were grave fears that the Whyalla steelworks would close. However, the British-owned GFG Alliance acquired Arrium in September 2017, and announced plans to upgrade the plant and invest in renewables energy, both for the steelworks and state grid. Prospects have also improved for the Whyalla operation due to major rail upgrades announced by the Commonwealth and the strong upturn in non-dwelling building and infrastructure construction – both significant users of the steel products from Whyalla. Indeed, Whyalla steelworks is reported to be now increasing in output, back towards capacity.

Meanwhile, other parts of manufacturing and the tradeables sector generally (including agriculture, mining, education and tourism) will benefit over the medium term from the exchange rate in the more competitive band of US71 to 79 cents expected over the period to 2025.

Defence contracts will support the state economy

Following the end of car manufacturing in South Australia, 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 2018.

The last of the navy’s three air warfare destroyers are still under construction in Adelaide and construction of 12 offshore patrol vessels will begin shortly. The offshore patrol vessels then fill the gap until the \$35 billion Future Frigate construction begins 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).

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
South Australia											
Total Construction Activity(*)	-8.7	-1.4	3.9	17.6	2.3	-9.7	-9.9	5.7	7.3	0.5	-0.2
State Final Demand	1.8	1.2	3.2	4.0	2.3	0.7	1.6	3.9	3.1	1.5	1.9
Gross State Product (GSP)(**)	1.3	0.3	2.2	2.9	2.0	1.3	1.7	3.1	2.9	2.2	2.2
Employment Growth (Year Average)	0.5	0.5	1.3	2.1	0.8	0.7	0.6	2.0	1.7	0.9	0.8
Australia											
Total Construction Activity(*)	-7.0	-4.9	-3.2	11.4	-5.1	-3.1	-1.2	2.2	2.9	-2.2	-0.3
Australian Domestic Demand	0.9	1.4	2.3	3.5	2.4	2.1	3.1	4.1	2.9	1.7	2.3
Gross Domestic Product (GDP)	2.4	2.8	2.1	2.9	3.1	2.7	2.9	3.1	2.9	2.4	2.9
Employment Growth (Year Average)	1.3	2.3	1.5	3.0	1.9	1.1	1.4	2.1	1.7	1.0	1.3

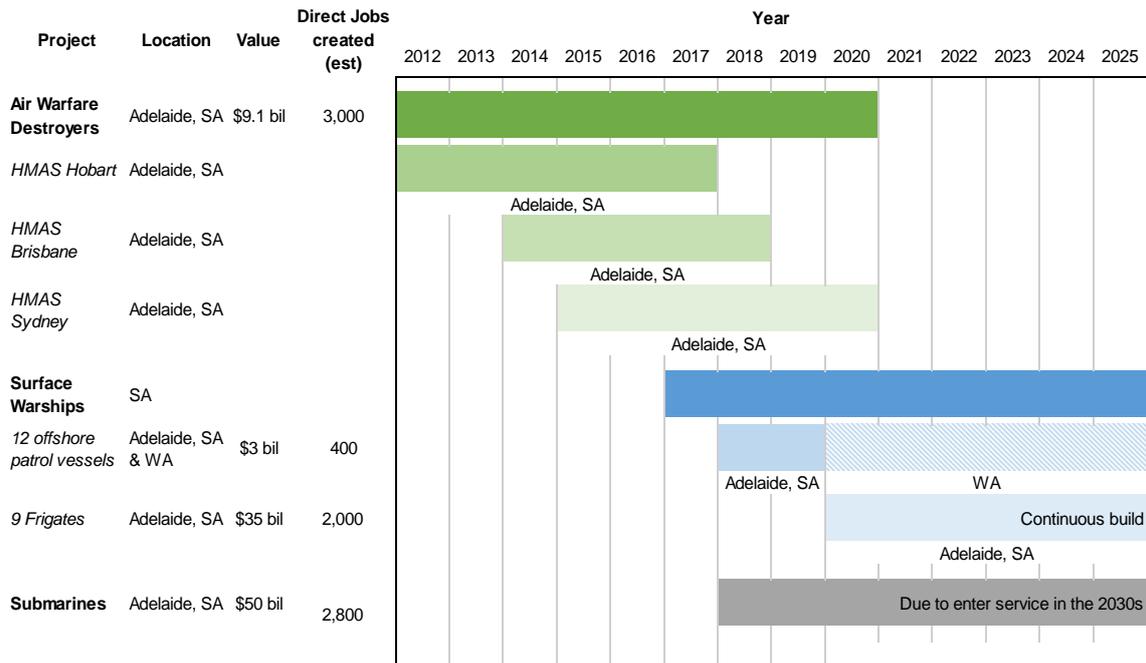
Source: BIS Oxford Economics and ABS

* Total construction work done in constant 2015/16 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.

** FY2018 values are estimates

Figure 2.3 South Australia Timeline of Maritime Defence Projects



Source: BIS Oxford Economics

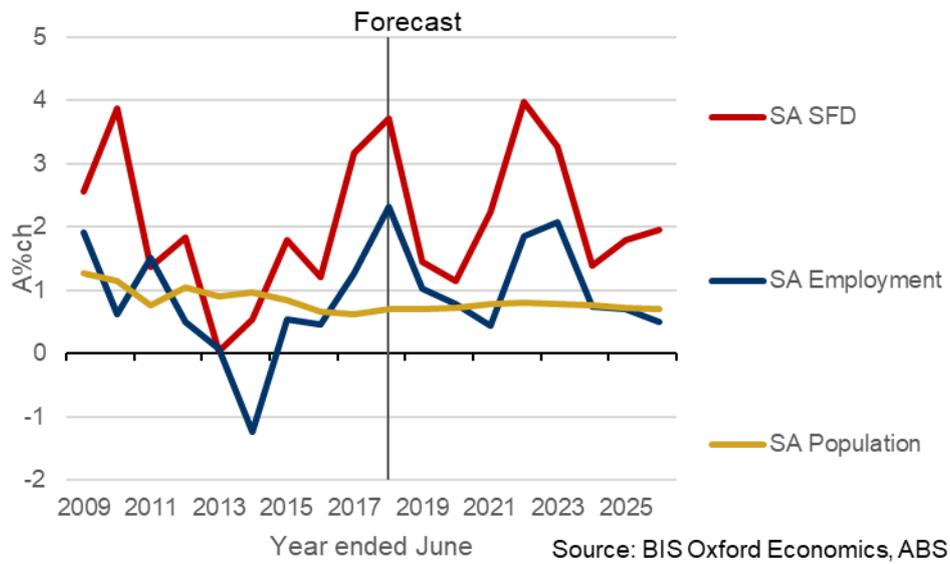
Olympic Dam expansion to drive strong growth over 2021 - 2025

BIS Oxford Economics expects non-mining business investment to pick-up and broaden from early next decade. Capacity constraints, improved profitability and sentiment are finally expected to precipitate a broad-based recovery in business investment. In addition, we anticipate that BHP Billiton will give the green light to a major expansion of the Olympic Dam copper-uranium mine, which we have assumed will cost \$4.5 billion and will commence construction in 2021. This project will provide a major boost to South Australia and help drive strong growth in SFD and GSP over the period from 2021 to 2025.

Combined with a solid pick-up in residential, non-mining business and public investment, the net effect will be a marked pick-up in employment growth and a tightening in the state’s labour market in the early years of the next decade. Indeed, the state’s unemployment rate is forecast to fall from around 5.7% now to under 5% in 2022/23, down to around the projected national average of 4.8% at that time. The tightening in the state’s labour market will, in turn push up wages in the state.

Overall, SFD growth is forecast to average 2.4% growth over the five years to 2024/25 (compared to an average of 2.2% for the past 5 years), while GSP is forecast to average 2.4% over the five years to 2024/25 (compared to an average of 1.5% for the past 5 years and 2.3% for the past three decades).

Figure 2.4 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 2018 and estimates for gross customer connect expenditure for calendar 2018 - in effect, providing their forecast for the July-December, 2018 period. BIS Oxford Economics has used SAPN's July-Dec 2018 estimates as a base for the forecast for 2018/19 (amending where necessary) and has then provided forecasts to 2025/26.

Total gross customer connection expenditure is forecast to average \$89.6 million over the eight years from 2018/19 to 2025/26 inclusive (in constant 2017/18 prices), compared with \$84 million over the five years to 2017/18 (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
2008	25,618		7,739		30,153		32,986		96,496	
2009	26,228	2.4	10,949	41.5	27,211	-9.8	80,504	144.1	144,892	50.2
2010	28,750	9.6	7,097	-35.2	36,035	32.4	89,576	11.3	161,458	11.4
2011	31,173	8.4	5,991	-15.6	32,254	-10.5	53,197	-40.6	122,614	-24.1
2012	36,768	17.9	4,883	-18.5	27,720	-14.1	48,731	-8.4	118,102	-3.7
2013	29,484	-19.8	5,770	18.2	23,066	-16.8	46,747	-4.1	105,067	-11.0
2014	24,461	-17.0	4,776	-17.2	26,151	13.4	44,413	-5.0	99,801	-5.0
2015	20,020	-18.2	6,100	27.7	30,544	16.8	32,201	-27.5	88,865	-11.0
2016	21,794	8.9	6,861	12.5	28,153	-7.8	22,240	-30.9	79,048	-11.0
2017	22,098	1.4	5,953	-13.2	27,687	-1.7	20,146	-9.4	75,884	-4.0
2018	21,687	-1.9	6,233	4.7	28,383	2.5	20,067	-0.4	76,370	0.6
Forecast										
2019	18,347	-15.4	5,644	-9.5	27,929	-1.6	37,064	84.7	88,984	16.5
2020	17,483	-4.7	6,023	6.7	26,477	-5.2	38,547	4.0	88,529	-0.5
2021	17,102	-2.2	6,264	4.0	25,929	-2.1	39,470	2.4	88,765	0.3
2022	18,494	8.1	6,625	5.8	28,121	8.5	37,276	-5.6	90,516	2.0
2023	17,943	-3.0	6,309	-4.8	28,282	0.6	39,409	5.7	91,944	1.6
2024	17,492	-2.5	6,035	-4.3	26,712	-5.6	38,923	-1.2	89,162	-3.0
2025	16,906	-3.3	5,833	-3.3	27,062	1.3	38,763	-0.4	88,565	-0.7
2026	16,760	-0.9	5,782	-0.9	28,451	5.1	39,008	0.6	90,002	1.6
Period Averages & Compound Annual Average Growth Rates (a)										
2013-18	22,012	-6.0	5,985	1.6	28,184	4.2	27,813	-15.6	83,994	-6.2
Forecast										
2018-23	17,874	-3.7	6,173	0.2	27,348	-0.1	38,353	14.5	89,748	3.8
2018-26	17,566	-3.2	6,064	-0.9	27,370	0.0	38,558	8.7	89,559	2.1
2023-26	17,276	-2.2	5,990	-2.9	27,627	0.2	39,026	-0.3	89,918	-0.7

(a) Period average does not include 1st year of the period.

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 FY2018 and FY2022, with house commencements used as the basis for URD customer connections thereafter. Our Adelaide Land Study lot production forecasts only extend to FY2022. Over the long term, lot production and house commencements tend to have a close relationship, so house commencements are a good proxy beyond 2022.

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 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 10 years in our forecasts, as these projects typically incur connection expenditures greater than \$100,000. These projects are instead included in our major customer connections expenditure forecasts. Similarly, in years where a large real estate development is likely to commence and incur a major connection expenditure, we adjusted our initial medium expenditure forecasts to prevent double counting of projects. 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 2016. 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 8 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 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.

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 in oversupply. Total dwelling commencements have been running at an average of 11,175 dwellings over the past five years, above underlying demand which BIS Oxford Economics has estimated at around 9,800 dwellings. Attached dwellings have been the strongest part of the housing market over recent years, while house commencements have held steady. Over the next eight years to 2025/26, underlying demand for new dwellings (including an allowance for demolitions and unoccupied dwellings) is forecast to average around 10,700 dwellings, underpinned by modest population growth.

With the excess stock forecast to continue to increase through to 2019/20, prices and new dwelling construction will remain under pressure. While low interest rates will provide some support to prices and dwelling activity, the rising excess supply is expected to be the overriding influence on the market.

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. Overseas purchaser demand, while not a key driver of the South Australian new dwelling market, has also fallen back over the past two years, as a result of higher taxes and other government fees and banks also tightening lending policy toward non-permanent resident purchasers. The end result is lower pre-sales of units, which will slow the production of new unit developments, in addition to a curtailing of development finance in response to rising settlement risk as the market weakens. After the estimated 46% jump in 2017/18, attached dwellings (units, etc) are forecast to plunge 49% over the next three years from the current record level of attached dwelling commencements.

In contrast, new house approvals 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 are forecast to rise another 2.3% in 2018/19, following a 4% increase in 2017/18 then ease in the following two years, declining -5.7% in 2019/20 and -2.2% in 2020/21.

Hence, total new dwelling commencements are estimated to have increased 16.4% in 2017/18 but are then forecast to fall back -4.8% in 2018/19. The dwelling oversupply will contribute to further declines in 2019/20 (-14.3%) and 2020/21 (-4.1%). With new dwelling completions continuing to track above underlying demand over this period (largely as a result of projects already underway or about to start), the existing oversupply will have steadily grown and there will be a lack of underlying pressure to drive new development.

From a weak base of only 9,870 new dwelling starts in 2020/21, activity will return to growth over 2021/22 and 2022/23. A strengthening economic and population outlook will prompt an improvement in housing demand and underpin new development. In addition, the diminishing over-supply (see figure 3.1) and relative affordability of South Australia (compared to the eastern states) will boost prices and encourage a dwelling upturn. This will take new dwelling starts to over 11,000 in 2022/23. Thus, over the five years to 2023 new dwelling starts will have averaged 10,208 p.a. compared to 11,000 over the five years prior. Overall, the forecasts of dwelling completions and underlying demand will see the South Australian housing market move back into balance by mid-2023. Over the following three years to 2026, residential building is expected to perform slightly worse. New dwelling starts will average 10,410 p.a. in this period.

Rising interest rates during 2022/23 are expected to be the catalyst for the modest downturn over 2022/23 to 2024/25, but a recovery is expected to be underway by 2026 as the market again moves into undersupply over 2023/24 and 2024/25. Indeed, there may be some upside to dwelling commencement in the 2023/24 to 2025/26 period, given the expected undersupply.

Alterations and additions activity tends to track movement in new dwelling construction, although with less amplitude. As such, we expect alterations and additions rise to 1.9% in 2018/19 and then decline over 2019/20 and 2020/21, before entering an upswing to peak at \$423million in 2022/23. Alterations and additions commencements will then fall over following two years, before recovering in 2025/26. Overall, we forecast alterations and additions in the longer term to average \$405 million over the eight years to 2025/26 – above the average over the previous five years to 2017/18.

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 \$million (2015/16 prices)		Outer Adelaide Lots Released No.	
	(\$'000)	%CH	(\$'000)	%CH	('000)	%CH	(2015/16 prices)	%CH	No.	%CH
2008	25,618		7,739		9,508		394		3,512	
2009	26,228	2.4	10,949	41.5	9,332	-1.9	388	-1.4	4,212	19.9
2010	28,750	9.6	7,097	-35.2	9,682	3.8	394	1.6	3,695	-12.3
2011	31,173	8.4	5,991	-15.6	8,259	-14.7	400	1.5	2,561	-30.7
2012	36,768	17.9	4,883	-18.5	6,939	-16.0	369	-7.7	2,299	-10.2
2013	29,484	-19.8	5,770	18.2	6,529	-5.9	355	-3.9	2,215	-3.7
2014	24,461	-17.0	4,776	-17.2	8,309	27.3	360	1.5	2,470	11.5
2015	20,020	-18.2	6,100	27.7	7,781	-6.4	367	1.9	2,524	2.2
2016	21,794	8.9	6,861	12.5	7,687	-1.2	373	1.7	3,177	25.9
2017	22,098	1.4	5,953	-13.2	7,658	-0.4	383	2.6	2,462	-22.5
2018	21,687	-1.9	6,233	4.7	7,965	4.0	413	7.9	2,400	-2.5
Forecast										
2019	18,347	-15.4	5,644	-9.5	8,149	2.3	421	1.9	2,300	-4.2
2020	17,483	-4.7	6,023	6.7	7,681	-5.7	415	-1.4	2,500	8.7
2021	17,102	-2.2	6,264	4.0	7,514	-2.2	407	-1.9	2,600	4.0
2022	18,494	8.1	6,625	5.8	8,125	8.1	416	2.2	2,750	5.8
2023	17,943	-3.0	6,309	-4.8	7,883	-3.0	423	1.7	-	-
2024	17,492	-2.5	6,035	-4.3	7,685	-2.5	387	-8.6	-	-
2025	16,906	-3.3	5,833	-3.3	7,428	-3.3	383	-0.9	-	-
2026	16,760	-0.9	5,782	-0.9	7,363	-0.9	388	1.3	-	-
Period Averages & Compound Annual Average Growth Rates (a)										
2013-18	22,012	-6.0	5,985	1.6	7,880	4.1	379	3.1	2,606	1.6
Forecast										
2018-23	17,874	-3.7	6,173	0.2	7,870	-0.2	416	0.5	2,538	
2018-26	17,566	-3.2	6,064	-0.9	7,728	-1.0	405	-0.8		
2023-26	17,276	-2.2	5,990	-2.9	7,590	-2.2	395	-2.8		

(a) Period average does not include 1st year of the period.

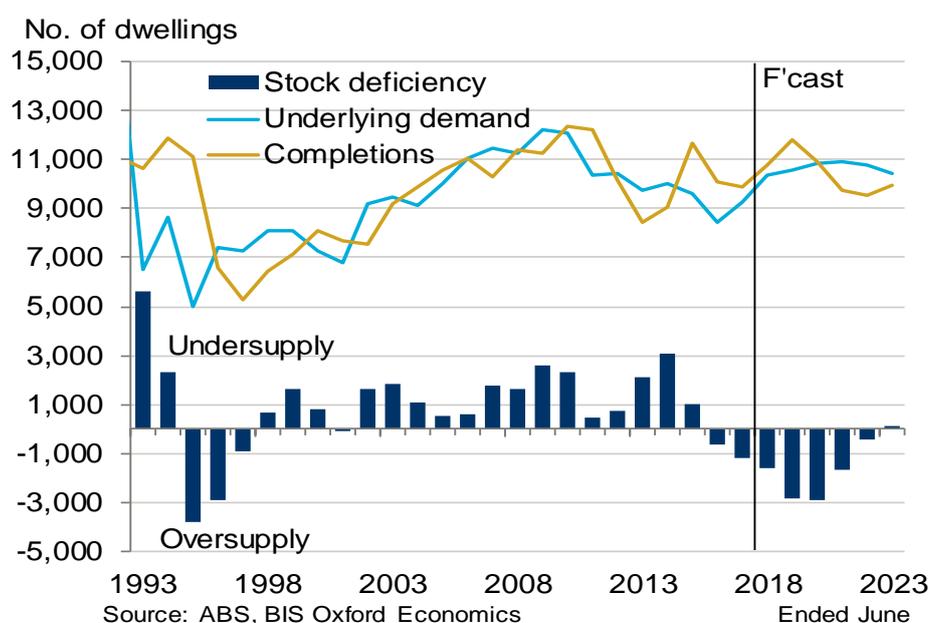
Source: BIS Oxford Economics, ABS data

Table 3.3: South Australia Migration and Natural Increase in Population (Thousands)

	Natural Increase	Migration		Total increase	Population	A%ch
		Net overseas	Net interstate			
2007	7.0	14.6	-3.4	18.1	1,570.6	1.2
2008	7.3	15.3	-4.2	18.0	1,588.7	1.1
2009	7.2	18.0	-4.4	20.2	1,608.9	1.3
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	11.4	-2.4	17.1	1,656.7	1.0
2013	7.4	10.8	-4.0	15.0	1,671.7	0.9
2014	7.2	11.1	-3.0	16.0	1,687.7	1.0
2015	6.5	10.6	-3.8	14.2	1,701.8	0.8
2016	6.5	10.5	-6.4	11.2	1,713.1	0.7
2017	5.9	10.5	-5.9	10.5	1,723.5	0.6
2018	6.9	11.0	-6.0	12.0	1,735.5	0.7
2019	6.8	10.5	-5.0	12.3	1,747.8	0.7
2020	6.6	10.0	-4.0	12.6	1,760.4	0.7
2021	6.4	10.2	-3.0	13.6	1,774.0	0.8
2022	6.2	11.2	-3.0	14.4	1,788.4	0.8
2023	6.0	10.9	-3.0	13.8	1,802.2	0.8
2024	5.7	10.9	-3.0	13.6	1,815.8	0.8
2025	5.4	10.9	-3.0	13.3	1,829.0	0.7
2026	5.1	10.9	-3.0	12.9	1,842.0	0.7

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-censual distribution

Figure 3.1 South Australia Dwellings stock balance

3.2.1 Forecasts of Minor Customer Connections Expenditure and URDs

Minor customer connections expenditure fell -1.9% in 2017/18 (constant 2017/18 prices) despite the 4% increase in house commencements and healthy rise in alterations and additions activity. The main reason for the decline in customer connections expenditure was the introduction of 'metering contestability' from April 2018 which resulted in the decline in customer connections expenditure in the last quarter. This means SA Power Networks will not fit meters from April 2018, which is estimated to result in around \$4 million per year less minor customer connections expenditure – around 18% less than 2017 levels of around \$22 million. Accordingly, a large decline of -15.4% is predicted for 2018/19, with the first full year impact of metering contestability only partially offset by a 2% increase in both house commencements and alterations and additions activity.

Over the past 15 years, the ratio of minor customer connections expenditure to the number of house commencements have averaged 2.8, in a narrow range of 2.6 to 3.3 (excluding the 'rogue' years of 2010/11 to 2012/13). Adjusting the historical average ratio for the 18% reduction due to metering contestability gives a ratio of 2.3. Over the forecast period we used this ratio to set the minor customer connections expenditure. After the large 'one off' decline in 2018/19 for the introduction of metering contestability, we expect minor customer connections expenditure (CCE) to track house commencements and decline another 7% over the two years to 2020/21 inclusive. The recovery in housing then sees minor CCE lift 8% to \$18.5 million, before modest falls over the following four years sees minor CCE drift down to \$16.8 million by 2025/26. However as mentioned, there could be upside to this forecast, particularly if residential construction activity is stronger than expected in response to the improving residential market fundamentals.

Overall, we are forecasting minor customer connections expenditure to average \$17.6 million over the eight years to 2025/26, an annual average decrease of 3.2% p.a. from 2017/18 levels.

URD customer connect expenditure tends to be erratic. It rose by 12.5% in 2015/16, then fell back by 13.2% in 2016/17, before partially recovering by 4.7% in 2017/18. In 2018/19 it is expected to fall back 9.5%, given the weakness in new lot development in Adelaide over the three years to 2018/19 inclusive (see table 3.2 and figure 3.3).

We expect that URD expenditure will bounce back in the following three years, increasing 6.7% in 2019/20, 4.0% in 2020/21 and 5.8% in 2021/22. Thereafter, we expect the weakening in housing approvals and commencement to cause declines in URDs. Nevertheless, we suspect the levels of URDs CCE to be slightly higher over the next 8 years on average, compared to the past 5 years.

Figure 3.2 Minor Customer Connections Expenditure and Drivers

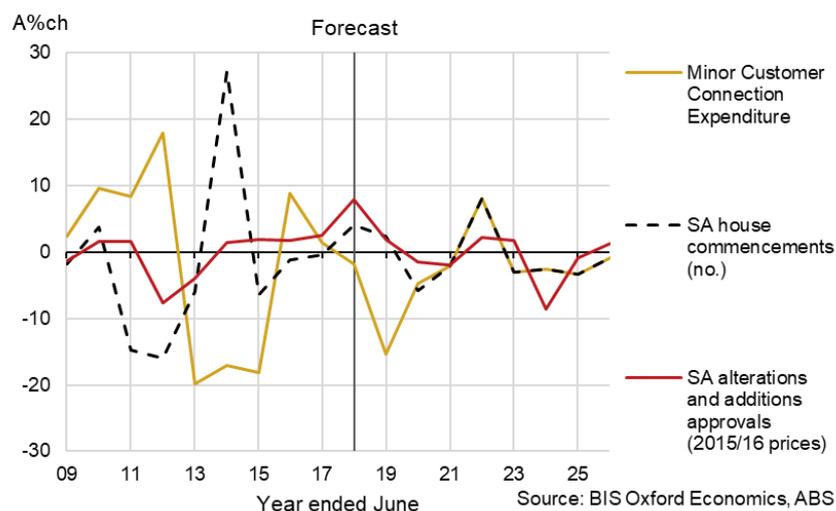
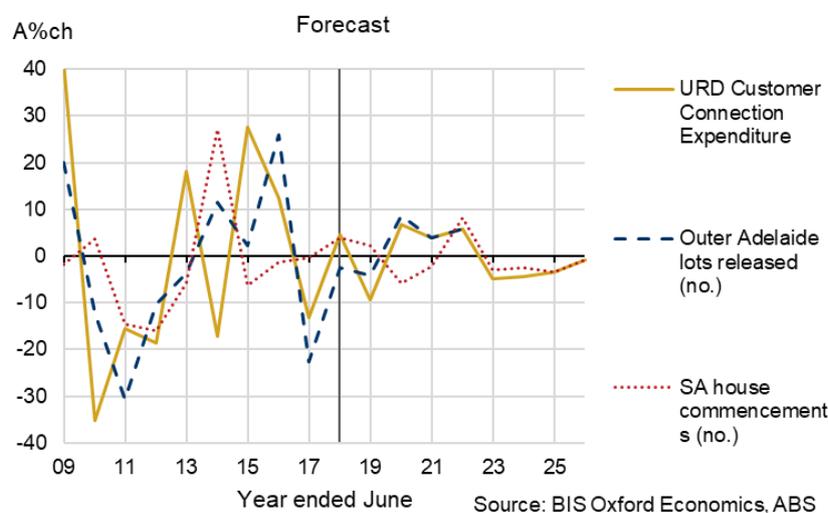


Figure 3.3 URD Customer Connections Expenditure and Drivers

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) have recovered from the 2014/15 trough, rising a cumulative 33% over the past three years to \$1.42 million. However, BISOE is forecasting a 15% decline in 2018/19, back to more 'normal' levels of construction activity. Modest increases are subsequently expected over the following three years, pushing these lower range non-dwelling building commencements up to \$1.31 million in 2021/22. A modest downturn is then expected over 2022/23 and 2023/24, before recovering over the two years to 2025/26. Low population growth below 1% per annum and economic growth of over 2% in the state will limit the growth of non-residential building commencement (below \$20 million), but should still see a higher average level of activity over the next 8 years compared to the past 5 years (see table 3.4).

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 ⁽²⁾	
	(\$'000)	%CH	\$million ⁽¹⁾	%CH	\$million ⁽¹⁾	%CH	\$million ⁽¹⁾	%CH
	2008	30,153		760		473		496
2009	27,211	-9.8	722	-5.1	492	4.0	577	16.4
2010	36,035	32.4	1572	117.9	411	-16.5	514	-10.9
2011	32,254	-10.5	739	-53.0	399	-3.0	562	9.4
2012	27,720	-14.1	739	-0.1	336	-15.8	485	-13.8
2013	23,066	-16.8	732	-0.9	522	55.4	415	-14.5
2014	26,151	13.4	644	-11.9	510	-2.4	596	43.6
2015	30,544	16.8	804	24.7	263	-48.4	552	-7.3
2016	28,153	-7.8	699	-13.0	429	63.3	830	50.3
2017	27,687	-1.7	748	7.0	495	15.3	739	-10.9
2018	28,383	2.5	943	26.1	478	-3.4	1086	47.0
Forecast								
2019	27,929	-1.6	779	-17.4	430	-10.0	935	-13.9
2020	26,477	-5.2	781	0.2	445	3.4	568	-39.3
2021	25,929	-2.1	797	2.0	467	4.9	502	-11.6
2022	28,121	8.5	817	2.6	492	5.4	606	20.7
2023	28,282	0.6	798	-2.3	492	0.0	674	11.4
2024	26,712	-5.6	759	-4.9	468	-4.9	616	-8.6
2025	27,062	1.3	766	0.9	472	0.9	630	2.2
2026	28,451	5.1	796	3.9	490	3.9	677	7.5
Period Averages & Compound Annual Average Growth Rates								
2013-18	28,184	4.2	768	5.2	435	-1.7	761	21.2
Forecasts								
2018-23	27,348	-0.1	794	-3.3	465	0.6	657	-9.1
2018-26	27,370	0.0	787	-2.1	470	0.3	651	-5.7
2023-26	27,627	0.2	780	-0.1	480	-0.1	650	0.1

⁽¹⁾Constant 2015/16 Prices

Source: SA Power Networks, BIS Oxford Economics

⁽²⁾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

'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 \$830 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 an estimated 47% in 2017/18 to a record level of \$1086 million.

BIS Oxford Economics is forecasting other dwellings commencements to fall back sharply over the next three years, declining a cumulative 54% from the record 2017/18 levels, back to \$502 million in 2020/21. Weakening investor demand will be the main driver and is a result of tighter lending policies applied to investors by APRA, the dwelling oversupply and easing prices. Activity is then forecast to bounce back over 2021/22 and 2022/23, before a set-back in 2023/24.

Overall, other dwellings commencements in the longer term are forecast to average \$651 million per annum over the eight years to 2025/26. This compares to an average of \$761 million over the previous five years.

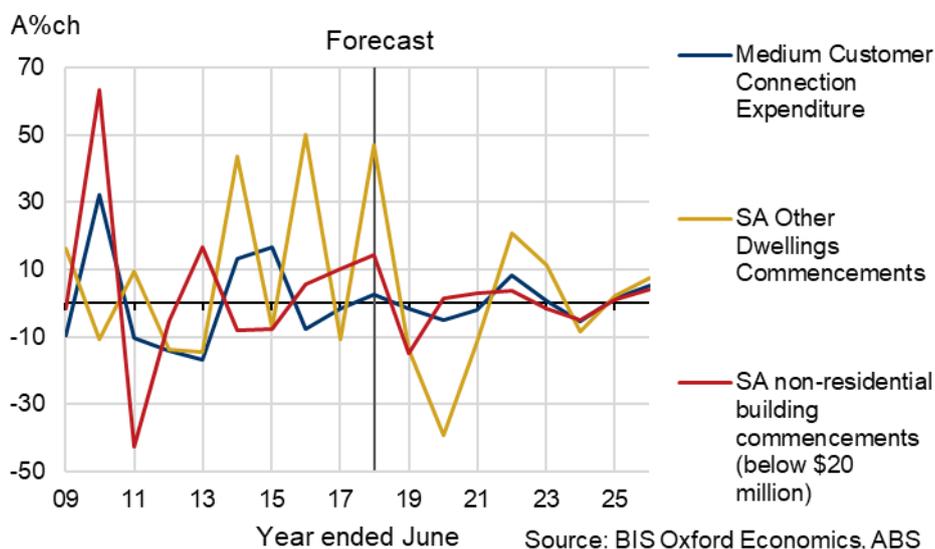
3.3.1 Forecasts of Medium Customer Connections Expenditure

Medium customer connections expenditure declined by -9% over the two years to 2016/17, before rising a modest 2.5% in 2017/18 – despite the overall strengthening in both non-residential building commencements and other dwelling commencements. Actuals over recent months and near-term forward orders suggest medium customer connection expenditure will decline -1.6% in 2018/19, although the two key building demand drivers are expected to fall by around 14%. It is likely there is a lag in the connections for the high level of building in 2017/18, which is holding up medium CCE over the near term. We are forecasting declines of -5.2% and -2.1% in 2019/20 and 2020/21 respectively, as the effect of substantial falls in other dwelling commencements outweighs modest growth in non-dwelling building commencements below \$20 million.

Medium connections expenditure will then rise in 2021/22 (+2.5%) and 2022/23 (+0.6%), supported by increased non-residential building and other dwelling commencements. Medium connections are then expected to decline in 2023/24 (5.6%), before increasing in 2024/25 and 2025/26 (+1.3% and 5.1% respectively), cycling with non-residential building (<\$20 million) and other dwelling commencements.

Overall, medium customer connections expenditure is forecast to average \$27.4 million over the eight years to 2025/26.

Figure 3.4 Medium Customer Connections Expenditure and 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 commencements. 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.

Non-dwelling building commencements (above \$20 million) surged 81% to \$1,463 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 Railyard Operations centre and \$150 million Festival Plaza redevelopment, with a separate \$60 million carpark. A number of retail, aged care, schools and student accommodation projects each over \$20 million, also boosted commencements.

After the surge in 2017/18, we expect non-dwelling building commencements over \$20 million to decline -29% in 2018/19 to \$1,039 million and a further -2.5% in 2019/20 to \$1,013 million - which are still healthy levels compared to lower historic levels (see table 3.5). Major projects expected to commence in 2018/19 include the \$60 million Sofitel hotel, \$40 million District Outlet centre (retail), \$100 million Adelaide Airport Terminal expansion, \$150 million 199-200 North Terrace office development, the \$200 million SA Health Medical Research Institute building, \$50 million Metcash food distribution warehouse and a number of schools projects. Major projects expected to commence in 2019/20 include the \$95 million Westin hotel at 141-159 King William street, the \$100 million Kings Junction shopping centre, \$35 million Woolworths distribution centre at Gepps Cross and the \$100 million Yatala Prison expansion.

In 2020/21 we are forecasting another lift in the value of non-dwelling building commencements over \$20 million, with a 35% increase predicted, underpinned by the \$600 million New Women and Children's hospital (although this could be built in stages), the \$150 million Museum/ Gallery on the Old Royal Adelaide hospital site and some schools and student accommodation projects. Once again, after the surge in big projects, levels are expected to fall back a cumulative -19% over the following three years to 2023/24, before a modest recovery ensues from 2024/25. Overall the average level of non-dwelling buildings over \$20 million in the eight years to 2025/26 inclusive is forecast to be \$1,151 million, \$335 million or 41% higher than the average levels of the past five years.

The total value of engineering construction work done in South Australia has staged a healthy recovery over the past three years, rising a cumulative 39% from the 2014/15 trough. Excluding the mining, pipeline and electricity sectors, the increase has been a similar (+41%) over the past three years to 2017/18, to almost \$3.7 billion (see table 3.5). Key drivers of the increase have been roads, railways, water, recreation and telecommunications (mainly NBN) projects, as well as a huge lift in electricity-related engineering construction (mostly renewables). Activity levels are expected to stay high in 2018/19, with only a small -2% decline predicted.

However, the completion of a number of major projects over the next 2 to 3 years will see engineering activity fall a cumulative 30% over the four years to 2022/23 inclusive. 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 17.4% in 2022/23 and another 2.5% in 2025/26.

Overall engineering construction (excluding mines, pipelines and electricity) is forecast to average \$3 million over the eight years to 2025/26, only 5% lower than the \$3.16million averaged over the five years to 2017/18 inclusive.

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

Year Ended June	Major Customer Connect Expenditure		Non-Residential Building Commencements		Engineering Construction Work Done	
	(Projects > \$100k)		(Above \$20 million)		(excl. Mines & Elec) ⁽²⁾	
	(\$'000)	%CH	(\$million) ⁽¹⁾	%CH	(\$million) ⁽¹⁾	%CH
2008	32,986	21.5	646	154.8	1,963	12.7
2009	80,504	144.1	701	8.6	2,710	38.0
2010	89,576	11.3	1,007	43.6	3,664	35.2
2011	53,197	-40.6	792	-21.4	3,254	-11.2
2012	48,731	-8.4	3,281	314.5	3,426	5.3
2013	46,747	-4.1	407	-87.6	4,020	17.3
2014	44,413	-5.0	379	-7.0	3,400	-15.4
2015	32,201	-27.5	581	53.4	2,618	-23.0
2016	22,240	-30.9	851	46.4	2,869	9.6
2017	20,146	-9.4	807	-5.1	3,227	12.5
2018	20,067	-0.4	1,463	81.3	3,693	14.4
Forecast						
2019	37,064	84.7	1,039	-29.0	3,608	-2.3
2020	38,547	4.0	1,013	-2.5	3,108	-13.9
2021	39,470	2.4	1,366	34.8	2,628	-15.5
2022	37,276	-5.6	1,238	-9.3	2,581	-1.8
2023	39,409	5.7	1,165	-5.9	3,029	17.4
2024	38,923	-1.2	1,108	-4.9	3,104	2.5
2025	38,763	-0.4	1,117	0.9	3,051	-1.7
2026	39,008	0.6	1,161	3.9	2,971	-2.6
Period Averages & Compound Annual Average Growth Rates						
2009-13	63,751	-12.7	1,238	-12.7	3,415	10.4
2013-18	27,813	-15.6	816	29.2	3,161	-1.7
Forecasts						
2018-23	38,353	14.5	1,164	-4.5	2,991	-3.9
2018-26	38,558	8.7	1,151	-2.9	3,010	-2.7
2023-26	39,026	-0.3	1,138	-0.1	3,039	-0.7

⁽¹⁾Constant 2015/16 prices. Source: SA Power Networks, BIS Oxford Economics

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

3.4.1 Forecasts of Major Customer Connections Expenditure

Major customer connections expenditure weakened over the past eight years, falling a cumulative 78% from a peak of \$89.6 million in 2009/10 to \$20.1 million in 2017/18 (\$ figures are in constant 2017/18 prices). Even though engineering construction rose in 5 of those 8 years, activity was centred

on a few major projects, rather than several projects. Similarly, the large growth in non-residential building commencements (projects above \$20 million) in 2011/12 was predominantly driven by just one project — the Royal Adelaide Hospital.

Certainly, 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, major connections expenditure only declined -0.4%, which may be due to the significant 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. A good current example is the large factory building for the Osborne Shipyards (Lefevre Peninsula). The ABS recorded a \$416 million commencement in the March quarter 2018, but the \$5 million connection will not be connected until the 2018/19 and 2019/20 financial years. 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 significant growth in major customer connections over the next two years, projected to increase 84.7% in 2018/19 and a further 4% in 2019/20. Particular substantial projects with significant connection values (in brackets) include the Lefevre Peninsula connection for the Osborne Shipyard (connection value \$5m); 199-200 North Terrace office tower (connection value estimated at \$1.4m); Queen Elizabeth hospital (\$1m); New Women and Children's Hospital (\$3.6m); Adelaide Festival Centre (\$5m); a number of large food production facilities (\$1m to \$3m); DPTI northern connector (\$4 million in 2018/19), the DPTI Gawler Train Electrification project (\$34 million from 2018/19 to 2020/21); SA Water generation connections (\$4m 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 \$7m per year, on average, over the forecast period).

Major customer connections expenditure is expected to increase a further 2.4% in 2020/21, supported by known projects and particularly strong growth (+35%) in non-residential building commencements above \$20 million. Furthermore, there may be some upside to the next 2-3 years, if some of the large projects with lower probabilities come to fruition, such as the Iron Road project, with an estimated connection value for the mine and port of \$64.7 million (SAPN considered this project to have a probability of proceeding of 25% - with which BISOE agrees, as it would need a significant increase in iron ore prices to be viable, which BISOE views as unlikely).

Expenditure is forecasted to weaken (-5.6%) in 2021/22, due to declines in non-residential building commencements above \$20 million and a further decline in engineering construction commencements - which are expected to decline a cumulative 28% from 2018/19 levels. Growth is then expected to rebound 5.7% in 2022/23, due to strong growth in relevant engineering construction commencements. Major connections expenditure is subsequently expected to ease slightly over 2023/24 and 2024/25, and then rise 0.6% in 2025/26.

Overall, major customer connection expenditure is forecast to average \$38.6 million over the eight years to 2025/26, compared to \$27.8 million over the five years to 2017/18. Although strong growth is

expected, major customer connections expenditure is not expected to reach the high of \$89.6 million seen in 2009/10 (or even the second highest year of \$80.5 million in 2008/09).

Figure 3.5 Major Customer Connections Expenditure and Drivers

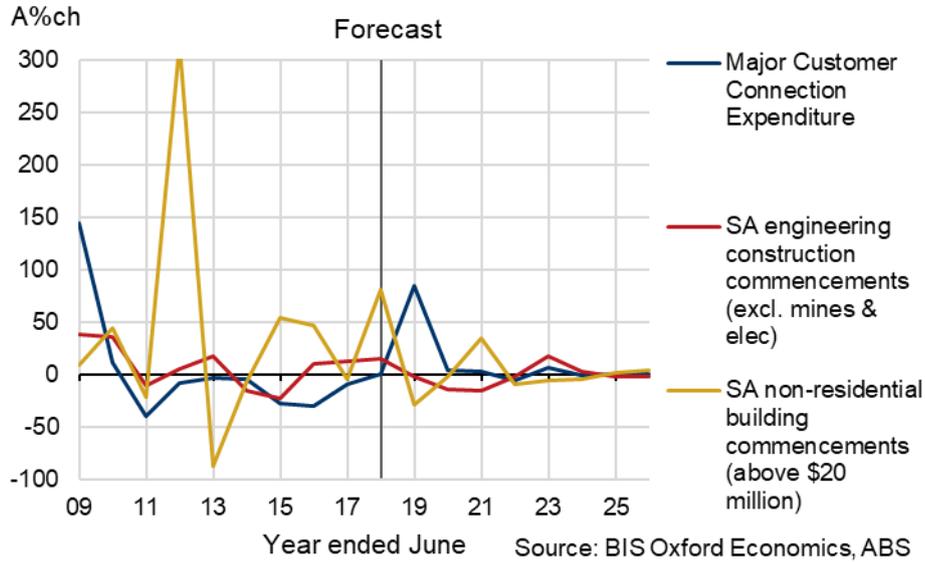
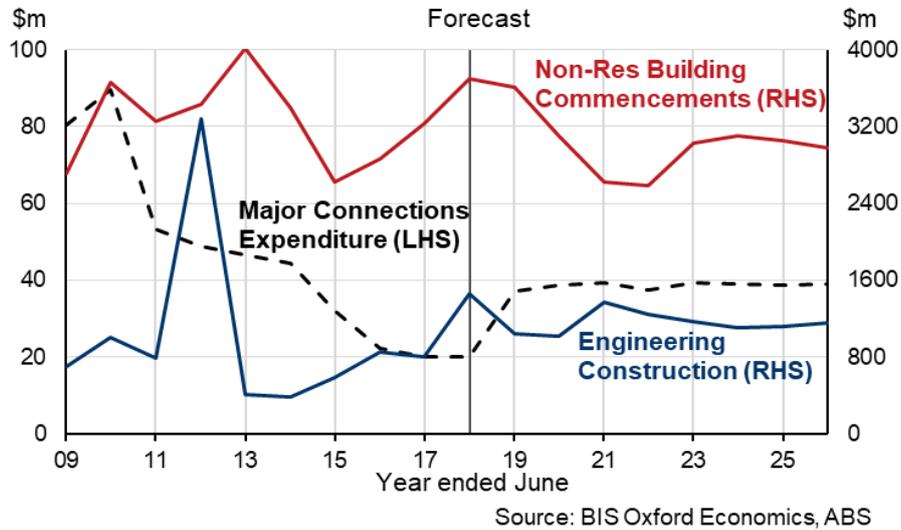
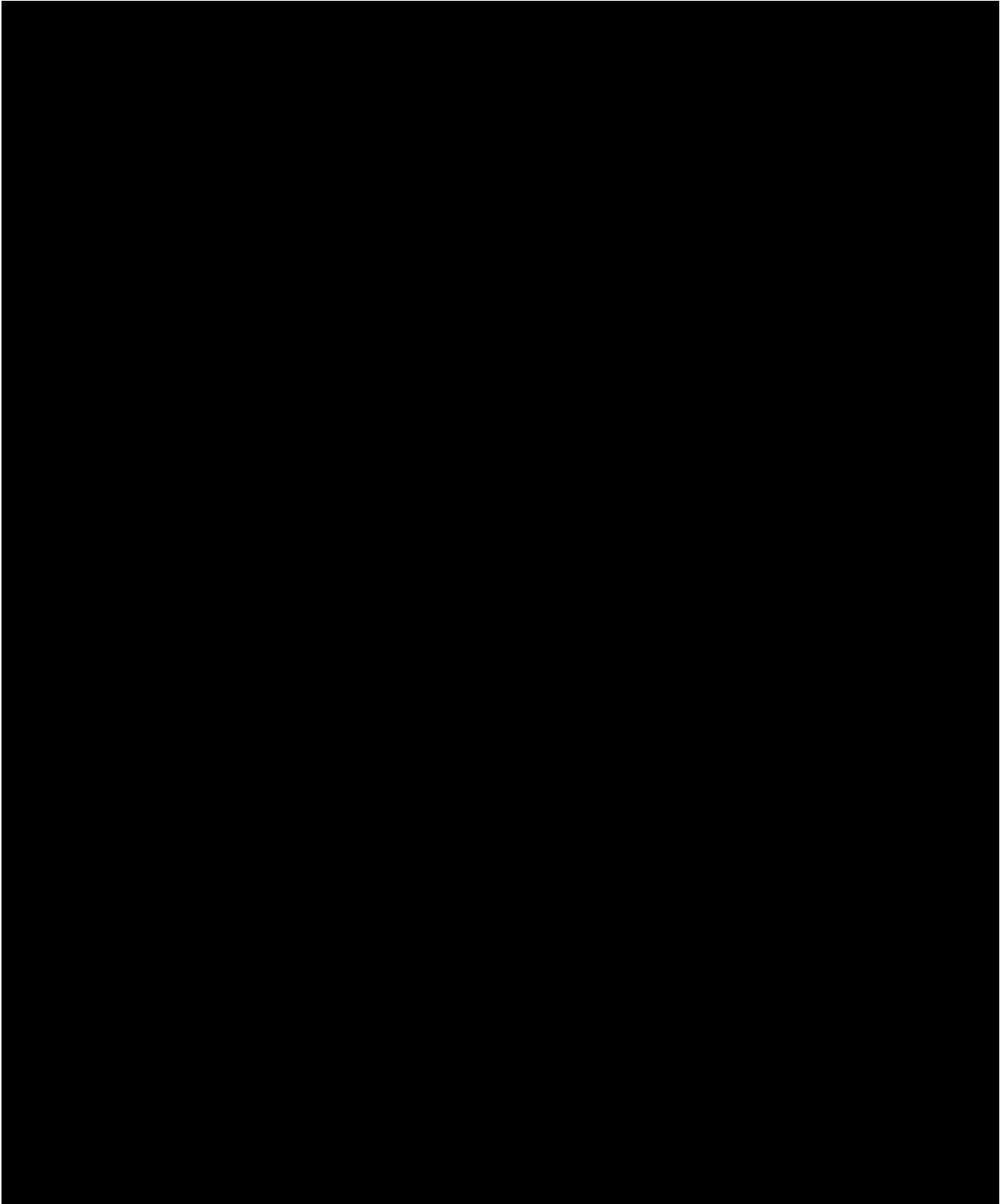
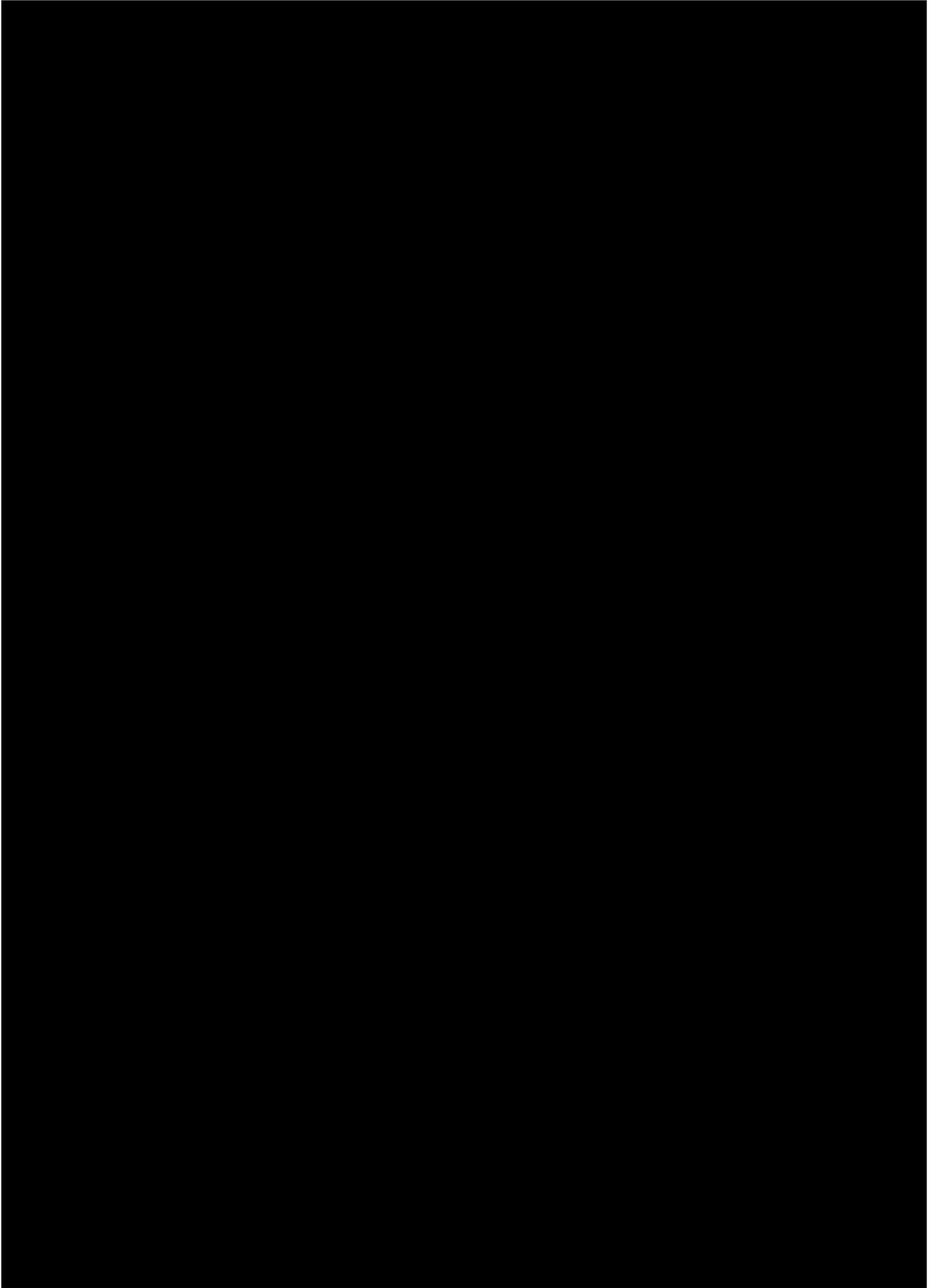


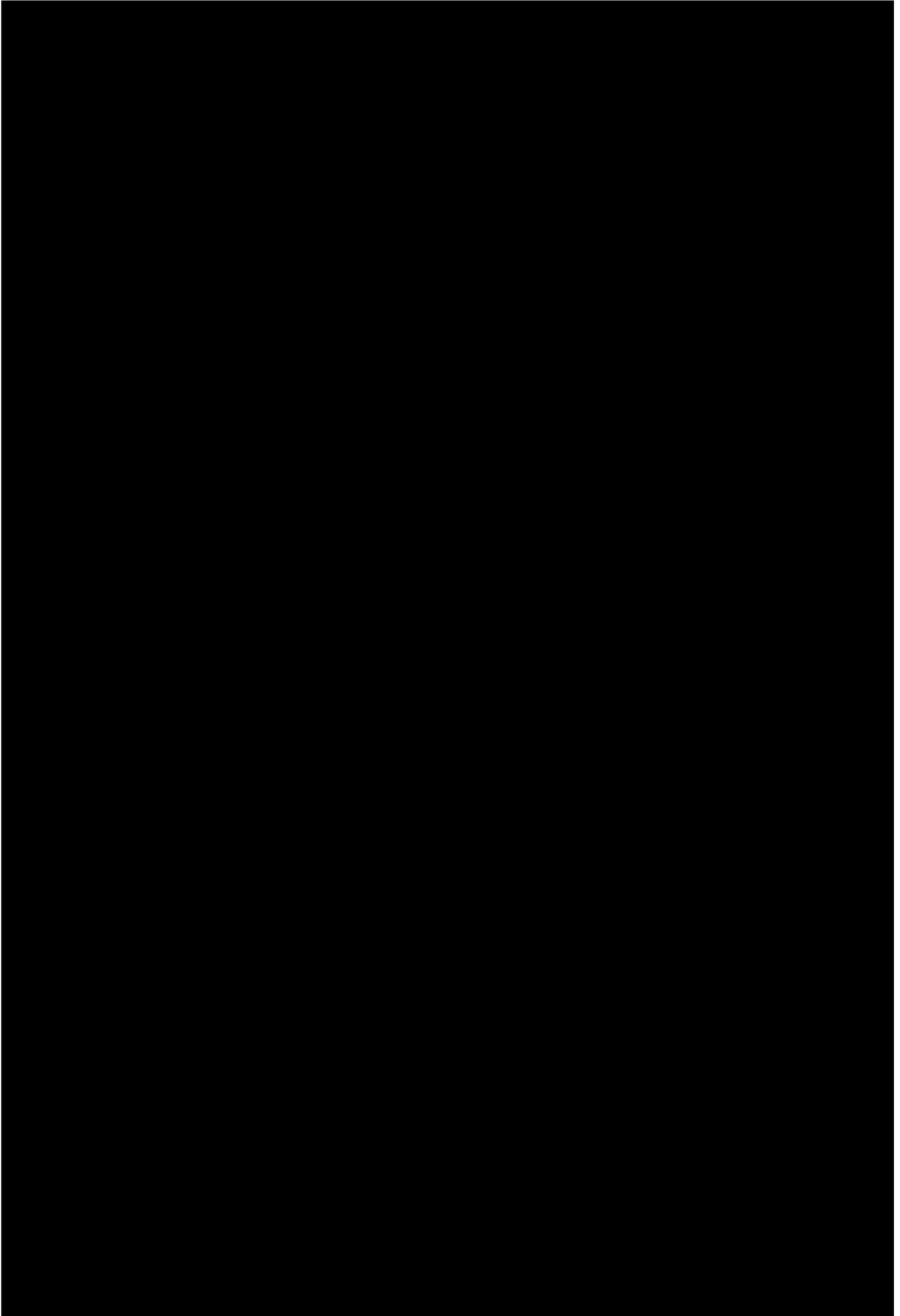
Figure 3.6 Major Connections Expenditure and Drivers: \$m

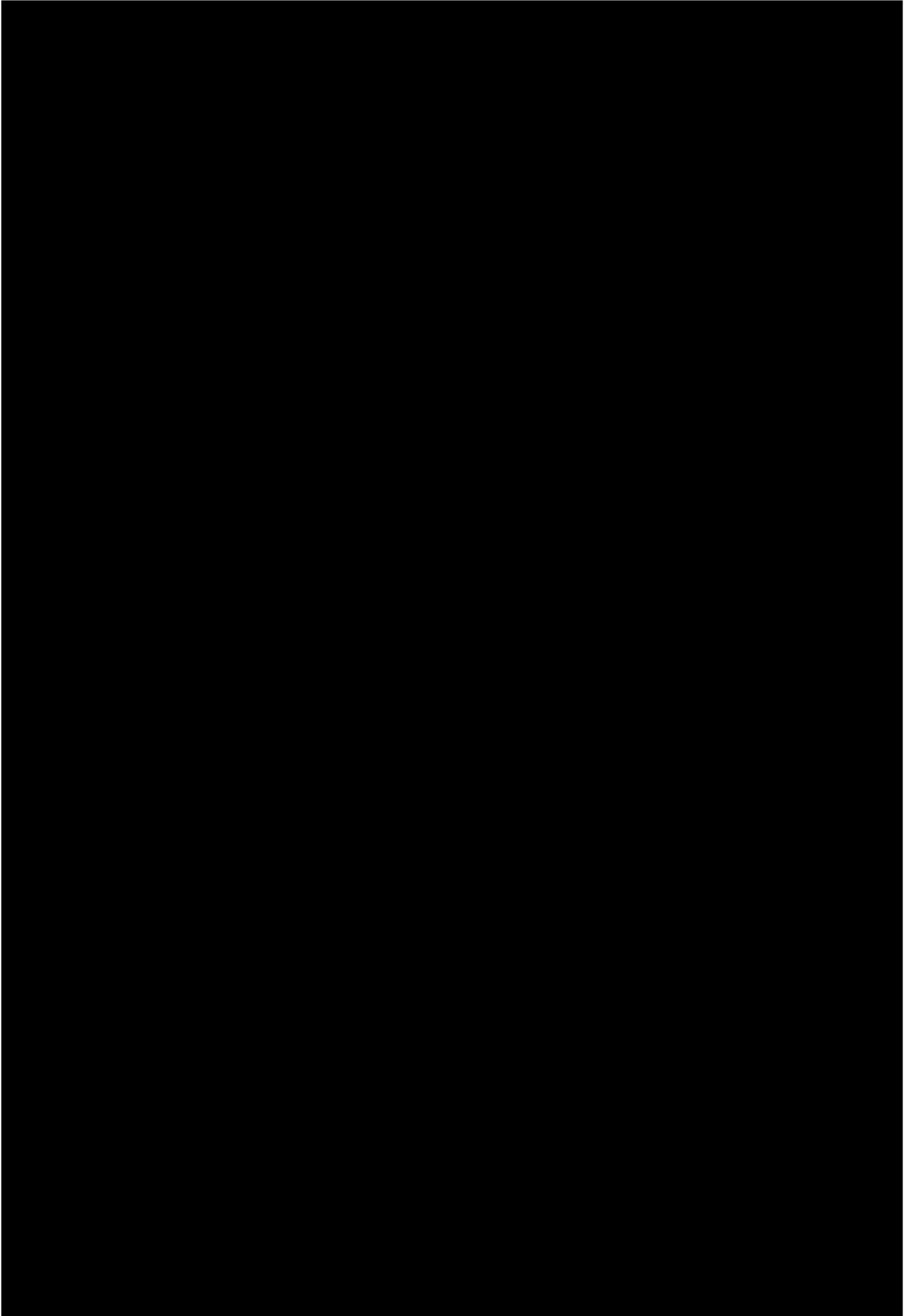


3.4.2 Major Projects List









APPENDIX 1: TERMS OF REFERENCE

To be inserted by SA Power Networks.

APPENDIX 2: STATEMENT OF COMPLIANCE WITH EXPERT WITNESS GUIDELINES

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

APPENDIX 3: CURRICULUM VITAE OF KEY PERSONNEL

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.

Stella McMullen, BCom (Economics) /BSc (Mathematics) University of Auckland
Economic Analyst

Prior to working at Oxford Economics, Stella held an internship at Motu Economic and Public Policy Research in New Zealand. She was responsible for estimating intergenerational mobility in New Zealand using linked census data. Before joining Motu, Stella spent two years as the primary researcher at social development organisation Lifewise in New Zealand, where she worked on a variety of projects related to homelessness, including an article estimating the economic cost of homelessness to New Zealand. She also has a background in mathematics research, and has contributed to articles at the University of Auckland, Auckland University of Technology, and the University of New South Wales. Stella holds a bachelor's degree in economics and mathematics with high distinction from the University of Auckland.

Harry Good, BCom (Economics)

Harry Good is an economic analyst in Economics and Infrastructure & Mining at BIS Oxford Economics. Harry is responsible for monthly updates regarding the labour market as well as retail turnover conducts researching briefings that offer insights into a wide range of economic trends. Harry is also involved economic forecasting, modelling and macroeconomic related consultancy projects. Harry studied Economics at the University of Technology Sydney, receiving a First-class Honours.



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