BIS OXFORD ECONOMICS

LONG TERM MACROECONOMIC FORECASTS

FOR THE AUSTRALIAN ENERGY MARKET OPERATOR

31st August 2022

Outline

- **Forecast Assumptions**
- **Step Change projections**
- **Alternative Scenario projections**

Introduction

BIS Oxford Economics has been engaged by AEMO to produce the macroeconomic forecasts that are used as input into AEMO's FY23 suite of gas and electricity forecasting and planning publications.

The core indicators produced by BIS Oxford Economics are:

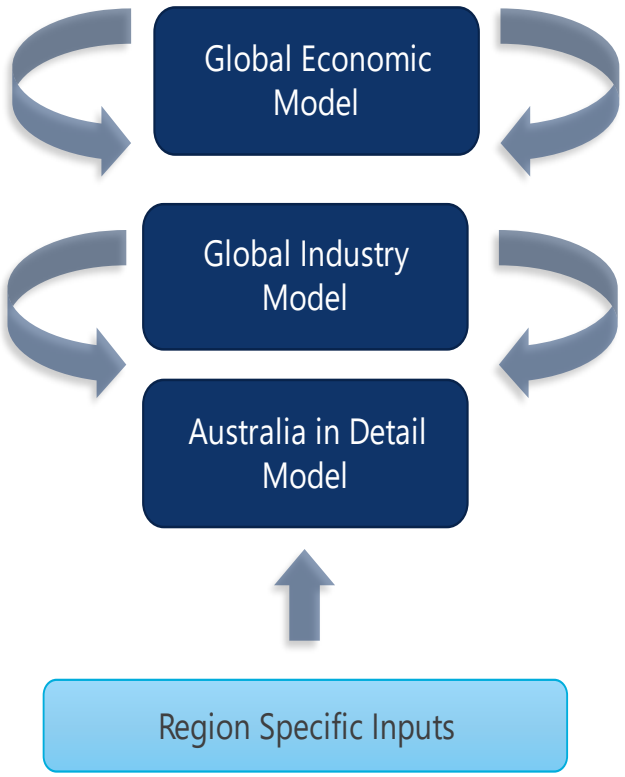
- *Population forecasts*
- *Gross State Product & Gross Domestic Product*
- *State Final Demand*
- *Household Disposable Income*
- *Consumer Price Inflation*
- *USD/AUD exchange rate*
- *Industrial Sector forecasts (at ANZSIC Division level by state)*
- *New Dwelling Forecasts by dwelling type*

This slide deck has been developed to provide further context on the key trends in the forecasts.

* Please note that the forecasts presented here were developed in July-2022.

A model driven approach to scenario quantification

BIS OE Integrated Modelling Approach ensures consistency across global, industry and regional outputs



- Commodity Forecasts
- Financial Variables
- Trade Variables
- Wages & Prices
- Energy Demand & Supply
- Country Macroeconomic Indicators (GDP, Consumption Investment)

- Gross Value Added by Industry Sector (NAIC/ ANZSIC Division), by Country

- Macroeconomic Variables by state
- Industry Forecasts (ANZSIC Division) by State
- Demographic indicators (Population and No. of Households)
- Building Construction forecasts by region, by sector (residential vs. non-residential), by category (approvals, commencements, completions and value of work done)

- BIS OE overarching models are underpinned by a series of **behavioural** equations and identities.
- The models are integrated to ensure **consistency** from global settings through to regional outputs.
- The models are regularly updated to ensure our global experts are informing key assumptions such as global interest rates and the Russia-Ukraine war.
- The model has been enhanced to consider **physical** and **transition** risks from climate change, including a built out energy module.

Key Assumptions – Short and Long Term

BIS OE have produced forecasts for the three core cases: *Step Change**, *Progressive Change* and *Hydrogen Export*. The key assumptions underpinning the three core cases are as follows:

	Step Change	Progressive Change	Hydrogen Export
Population	Moderate Growth (BIS OE Baseline)	Low Growth (ABS Series C adj NOM)	High Growth (> ABS Series A adj NOM)
Energy Transition Investment	High Growth	Moderate Growth	High Growth
Global Activity	Moderate Growth	Low Growth	High Growth
Climate Warming Settings	1.8° by 2100 (RCP 2.6)	2.6° by 2100 (RCP 4.5)	<1.5° by 2100 (RCP 1.9)
IEA 2021 Scenario	SDS	STEPS	NZE
Complete Domestic Decarbonisation	Achieved by 2050	Achieved by 2050	Achieved no later than 2050
Near Term Narrative	BIS OE Baseline	Worsening situation in China and prolonged supply disruptions worsening inflation pressures; hampering consumer and business confidence	More international students and temporary workers attracted amidst labour shortage with NOM surpassing historical average. Inflationary pressures ease faster than Step Change.

* The *Step Change* economic inputs are also used for the *Exploring Alternatives* Scenario

Our global baseline assumptions

Key theme	Baseline assumption
War in Ukraine	We assume that a long military conflict in Ukraine is avoided. The main impact on the global economy will be from higher commodity prices particularly for oil, gas and grains.
Supply-chain problems	There are tentative signs that supply-chain pressure are now beginning to ease and will help reduce inflation growth from current highs.
Government policy	Interest rates are expected to rise rapidly to manage future inflation expectations. Governments are expected to reduce economic stimulus.
COVID disruption	China's zero-COVID policy is expected to remain in place but future lockdowns will be better managed to reduce the economic impact.

National baseline assumptions

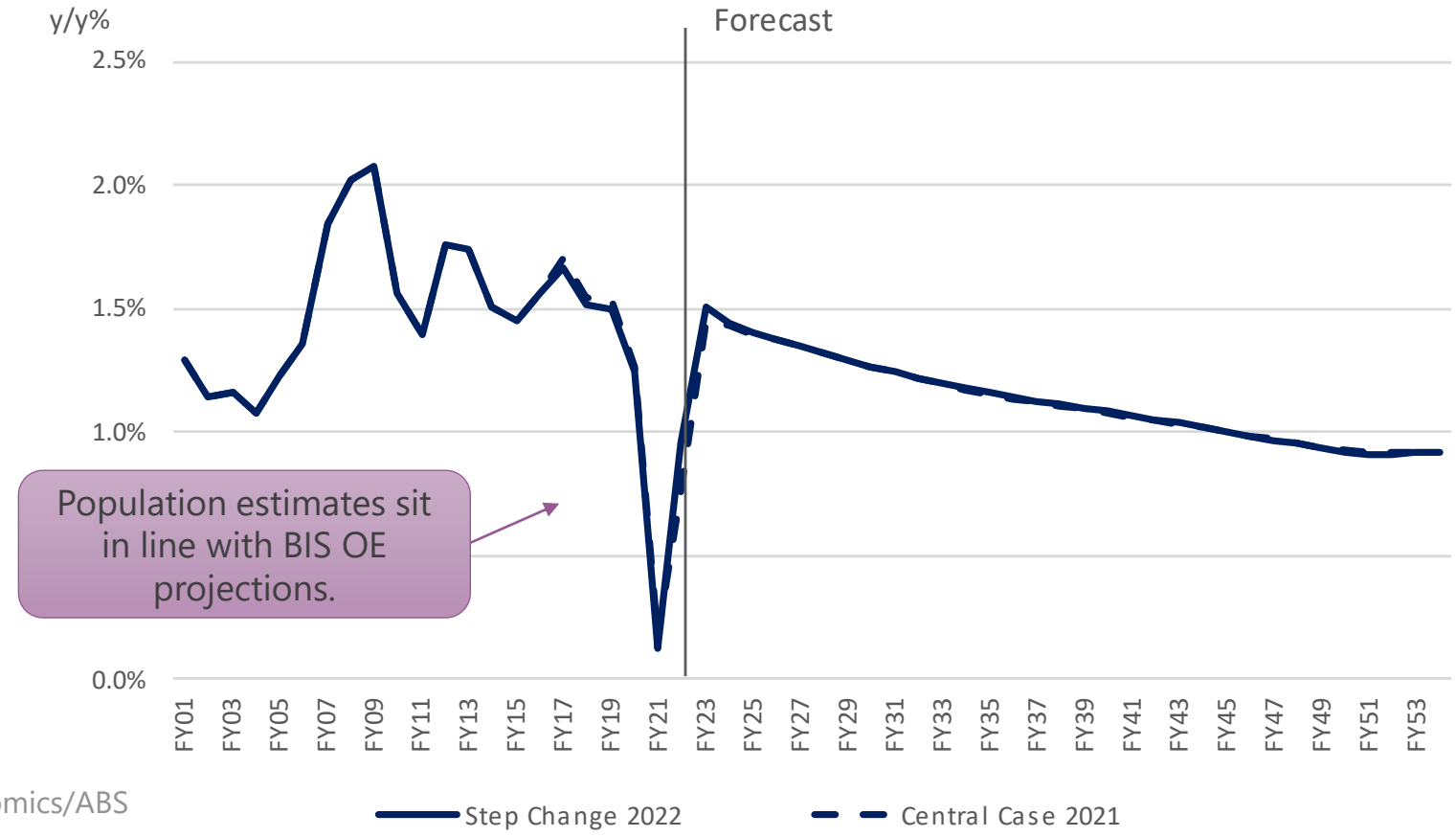
Key themes	Baseline assumption
COVID shutdowns	We don't expect any more major shutdowns to affect the economic outlook. There are clear downside risks to this assumption given the risk of future variants.
Consumption	Households are expected to maintain consumption by normalising the savings rates over the next 18 months – offsetting pressure from rising mortgage repayments and negative real wage growth. There will be major shifts between consumption categories away from discretionary goods and towards international travel.
Investment	There's a strong investment pipeline which is currently being delayed by capacity constraints and cost escalation. This results in an enduring investment profile well into 2023 which will support medium term economic activity.
Net overseas migration	Net overseas migration is expected to return to levels experienced pre-COVID given little-to-no-change in migration planning targets. That said, the recovery is slow and geo-political tension (and China's zero COVID approach) may delay inflow of people from this historically important source market.
Labour market	The unemployment rate is at it's lowest since 1974 (3.9%) and the participation rate continues to set record highs. Skills shortages are becoming more prevalent and workers are increasingly mobile. Power seems to be shifting from employers to employees and wages are beginning to rise – but still trailing the cost of living.
Inflation	Headline inflation to peak at 5% in June this year before returning to the RBA target band by 2023Q1. Short term inflation is expected to be transitory due to the war in Ukraine and COVID supply issues. Longer term inflation kept in place by interest rate rises responding to a strong investment outlook.
Interest rates	Rates are on the rise – and we expect they'll continue moving up throughout 2022. Fixed mortgage rates are moving even faster – 5 year fixed rates currently at 5.5%. There is a risk that the RBA underestimates the cyclical nature of current price rises and moves rates too far, too quick.

Step Change Forecasts

Demographics: Step Change 2022 vs Central Case 2021

2021-22 Population Estimates sat in line with expectations. BIS OE maintains the previous outlook, with a slightly faster return to normal migration patterns.

Fig 1. Population Growth, Australia

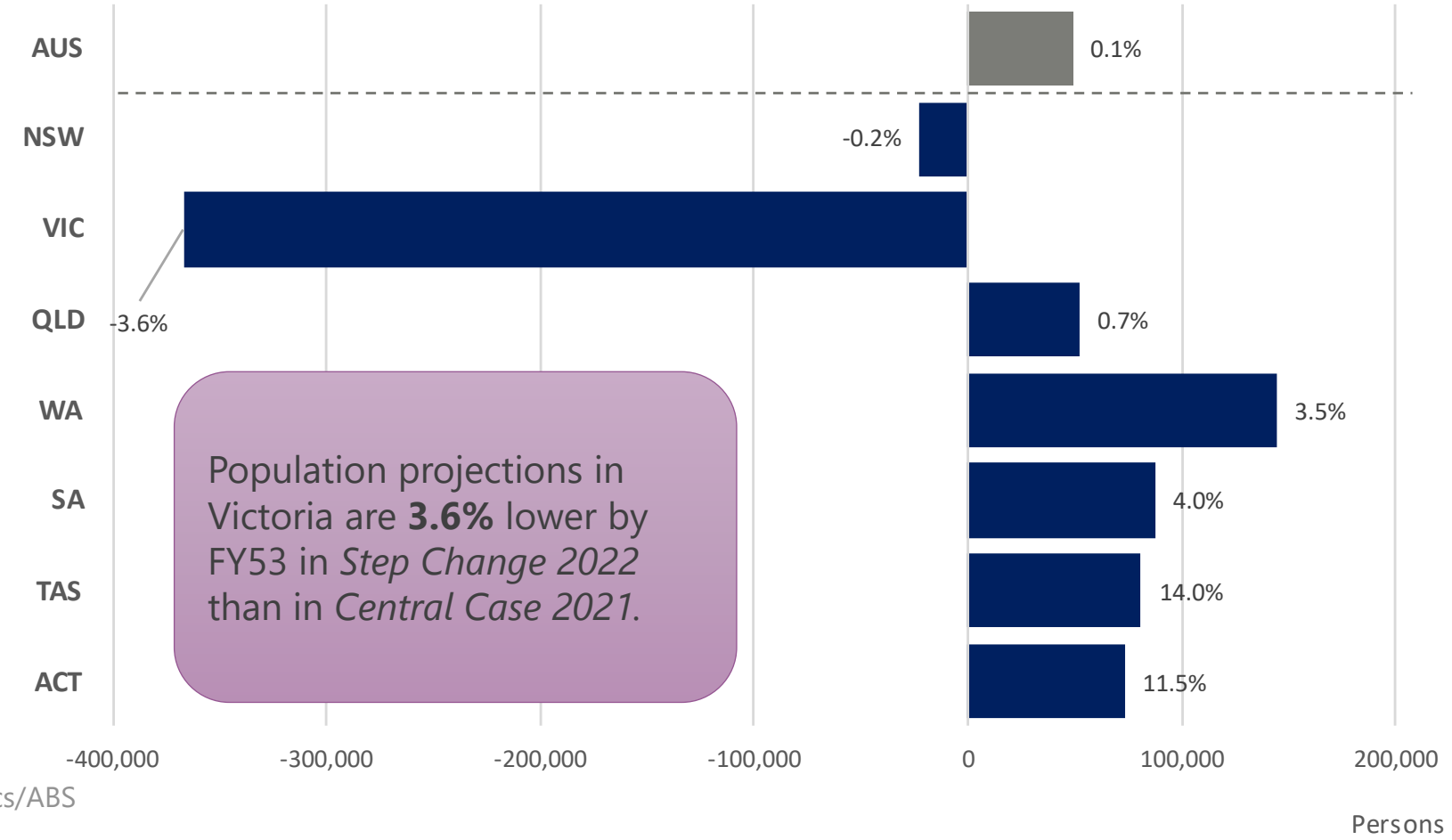


Source: BIS Oxford Economics/ABS

Demographics: Step Change 2022 vs Central Case 2021

While the projections are broadly the same at a national level, there are some more pronounced shifts between states compared to *Central Case 2021*.

Fig 2. Change in Population Projections, state breakdown: Step Change 2022 vs. Central Case 2021

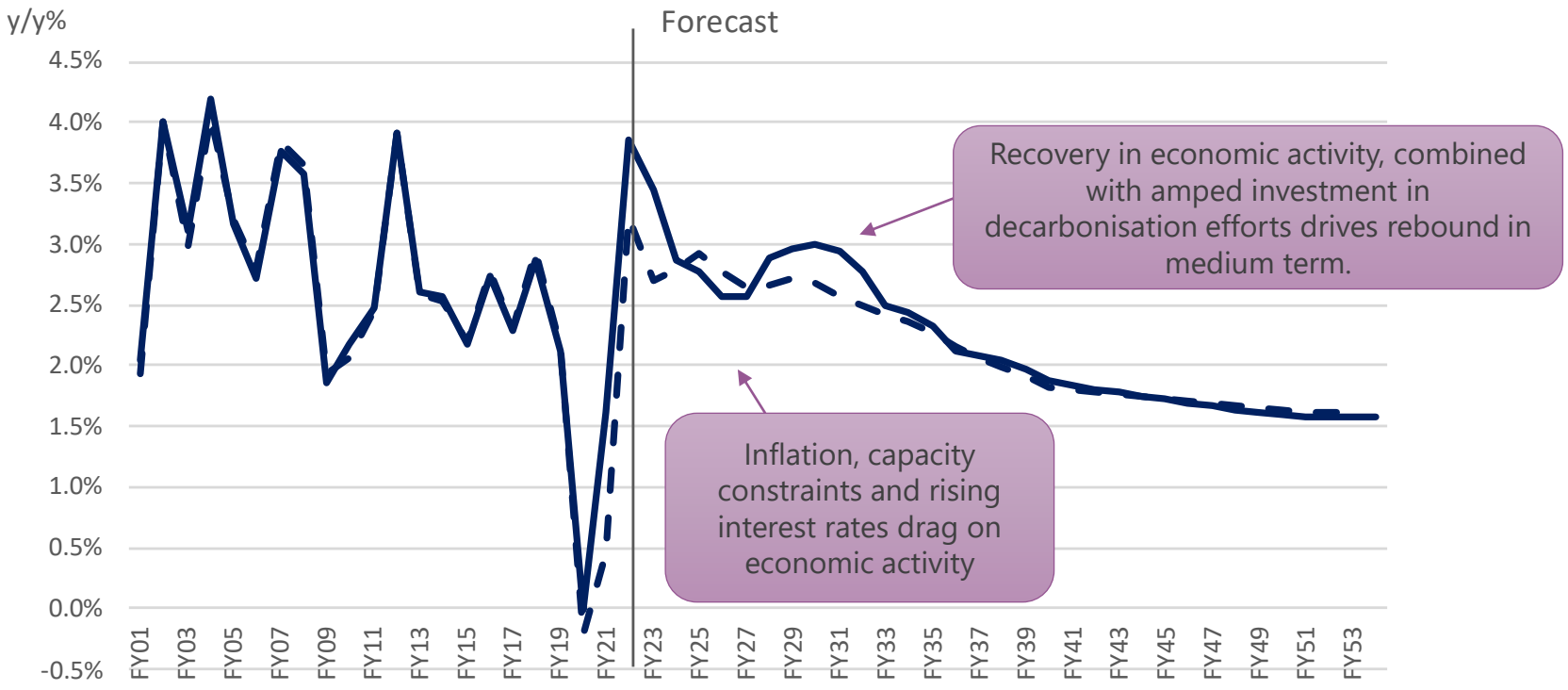


Source: BIS Oxford Economics/ABS

GDP: Step Change 2022 vs Central Case 2021

Economic growth to ease following a strong rebound in H2 2021. Inflation and resource capacity constraints to act as headwinds through the medium term, followed by a swift recovery.

Fig 4. Gross Domestic Product (GDP) Growth, Australia

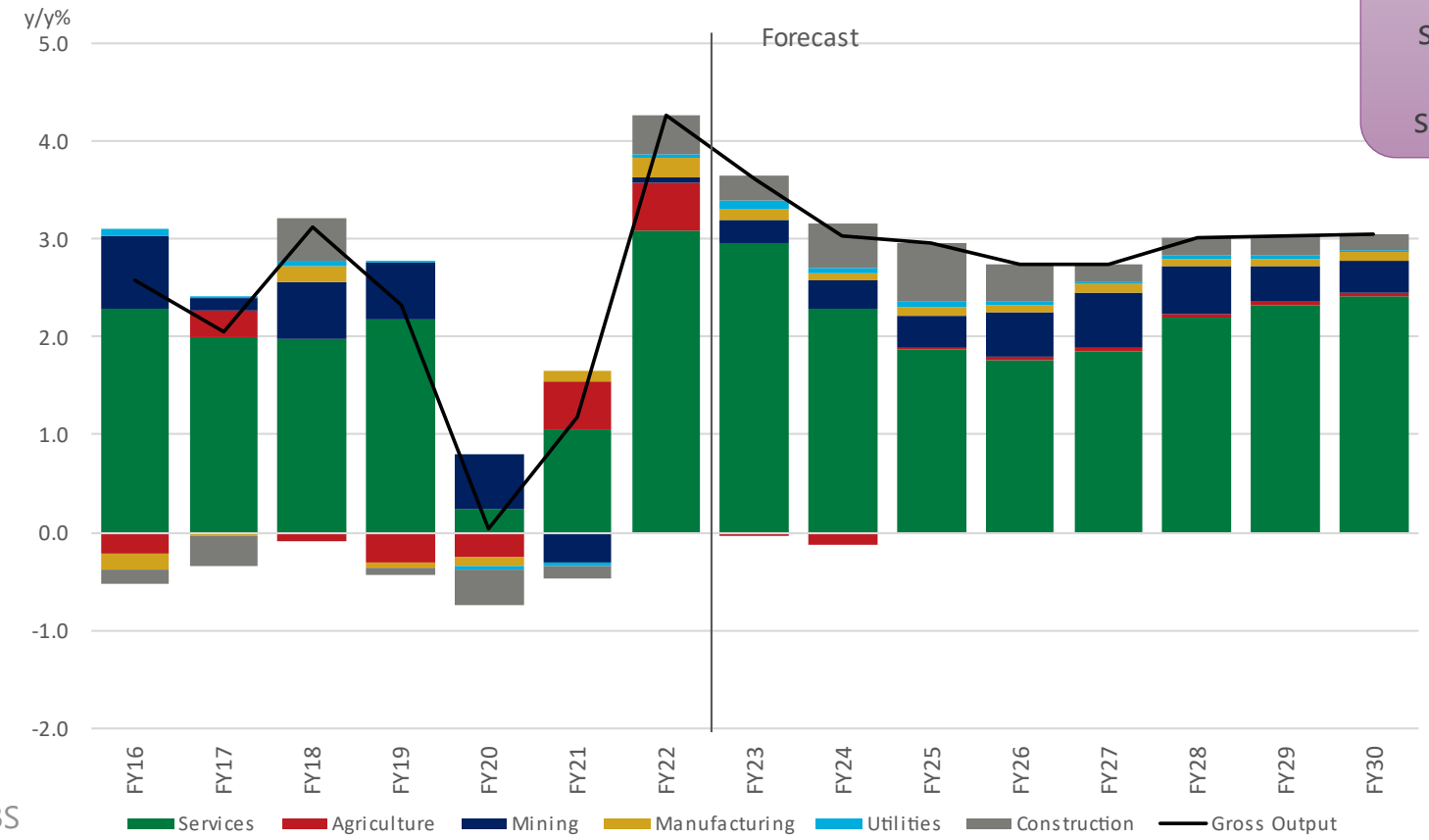


Source: BIS Oxford Economics/ABS

Step Change: Industry Sector Breakdown

Strong services led recovery in economic activity in FY22. Services continues to be a major driver long-term. Strong commodity prices will support a near term upswing for mining.

Fig 5. Industrial Sector Contribution to YoY% change in Gross Output



Contribution of mining to sector output lessens in the long-run as the economy shifts away from Coal & Gas

Source: BIS Oxford Economics/ABS

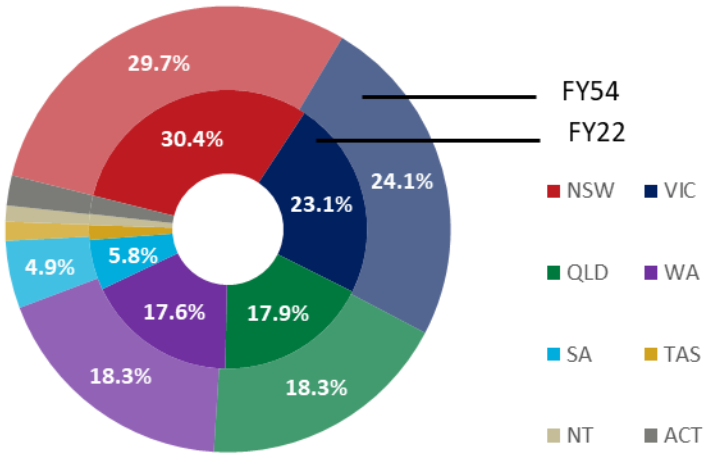
Step Change: State Comparison in the Long Run

Fundamentally long-run growth outcomes are broadly similar to last year. The outlook for QLD has been revised slightly higher owing to strong net interstate migration.

Table 1. Gross Domestic Product & Gross State Product, Compounded Annual Growth Rate (CAGR) FY22-FY53

	Step Change 2022	Central Case 2021
AUS	2.2%	2.1%
NSW	2.1%	2.0%
VIC	2.3%	2.3%
QLD	2.3%	2.1%
WA	2.3%	2.4%
SA	1.6%	1.7%
TAS	1.5%	1.5%
NT	1.9%	2.0%
ACT	2.3%	2.2%

Fig 7. Share of GDP by States (FY22 and FY54)

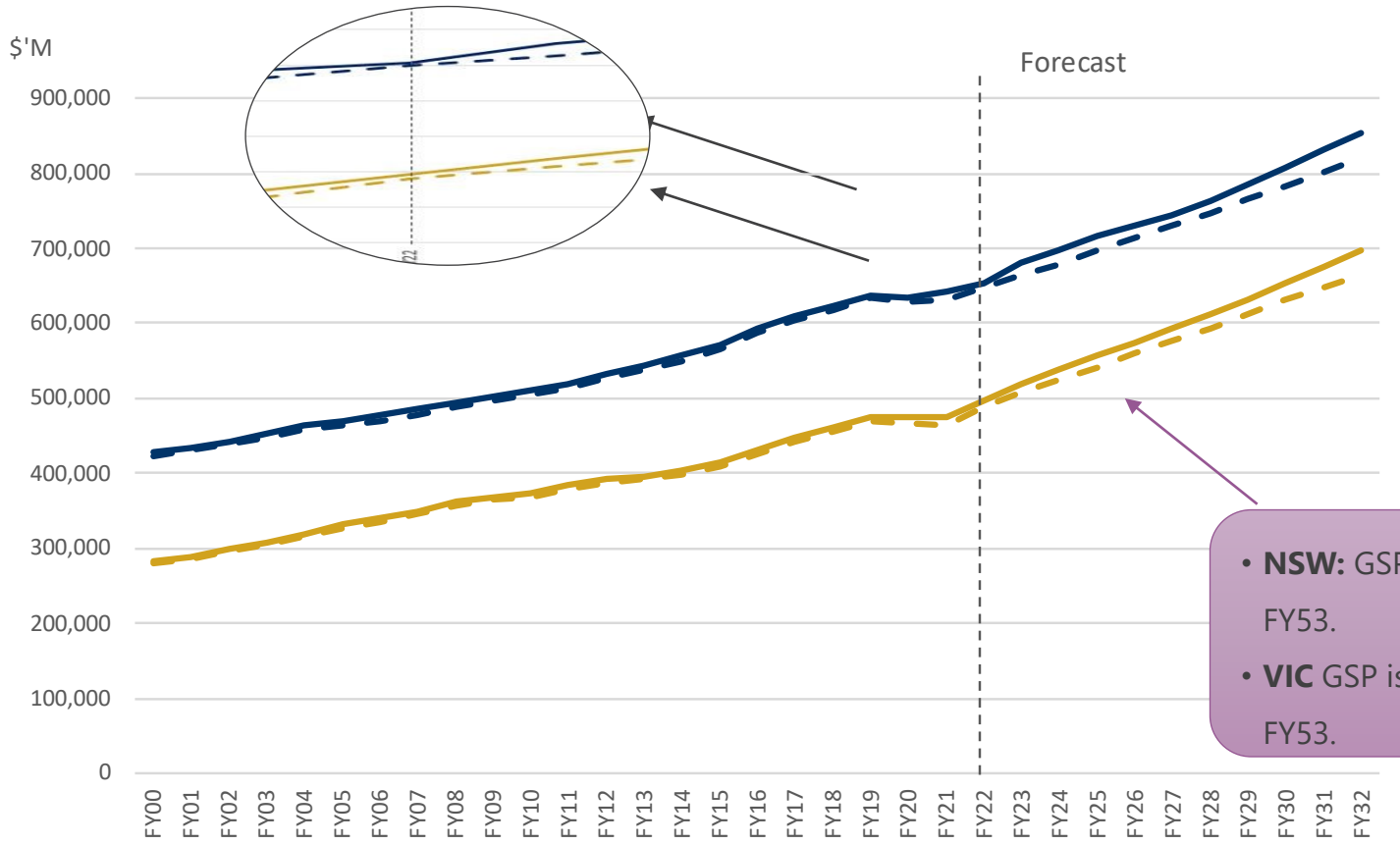


Source: BIS Oxford Economics/ABS

Step Change: NSW & VIC

NSW & VIC were the most affected by the halt to migration and resurgence of cases. Economic recovery will continue in the near term, helped by the return of migration and pipeline of public investment.

Fig 8. Gross State Product, NSW & VIC



- **NSW:** GSP is 4.1% higher (cumulatively) by FY53.
- **VIC** GSP is 4.0% higher (cumulatively) by FY53.

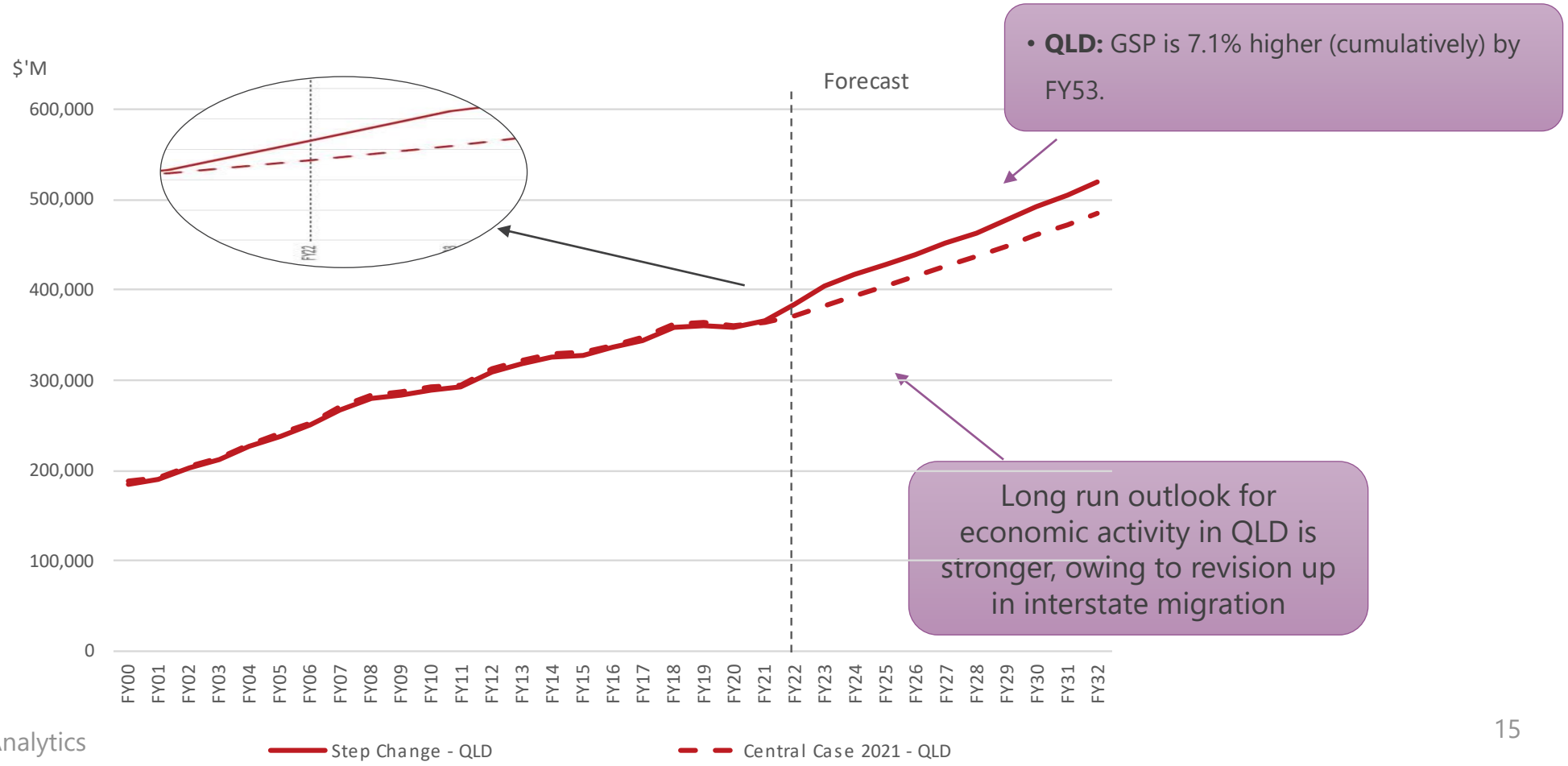
Source: BIS Oxford Economics/Haver Analytics

Step Change - NSW | Central Case 2021 - NSW | Step Change - VIC | Central Case 2021 - VIC

Step Change: QLD

Economic activity in QLD outperformed expectations in FY22. The outlook remains bright, owing to strong commodity prices for the mining sector and continuing migration into the state.

Fig 9. Gross State Product, QLD

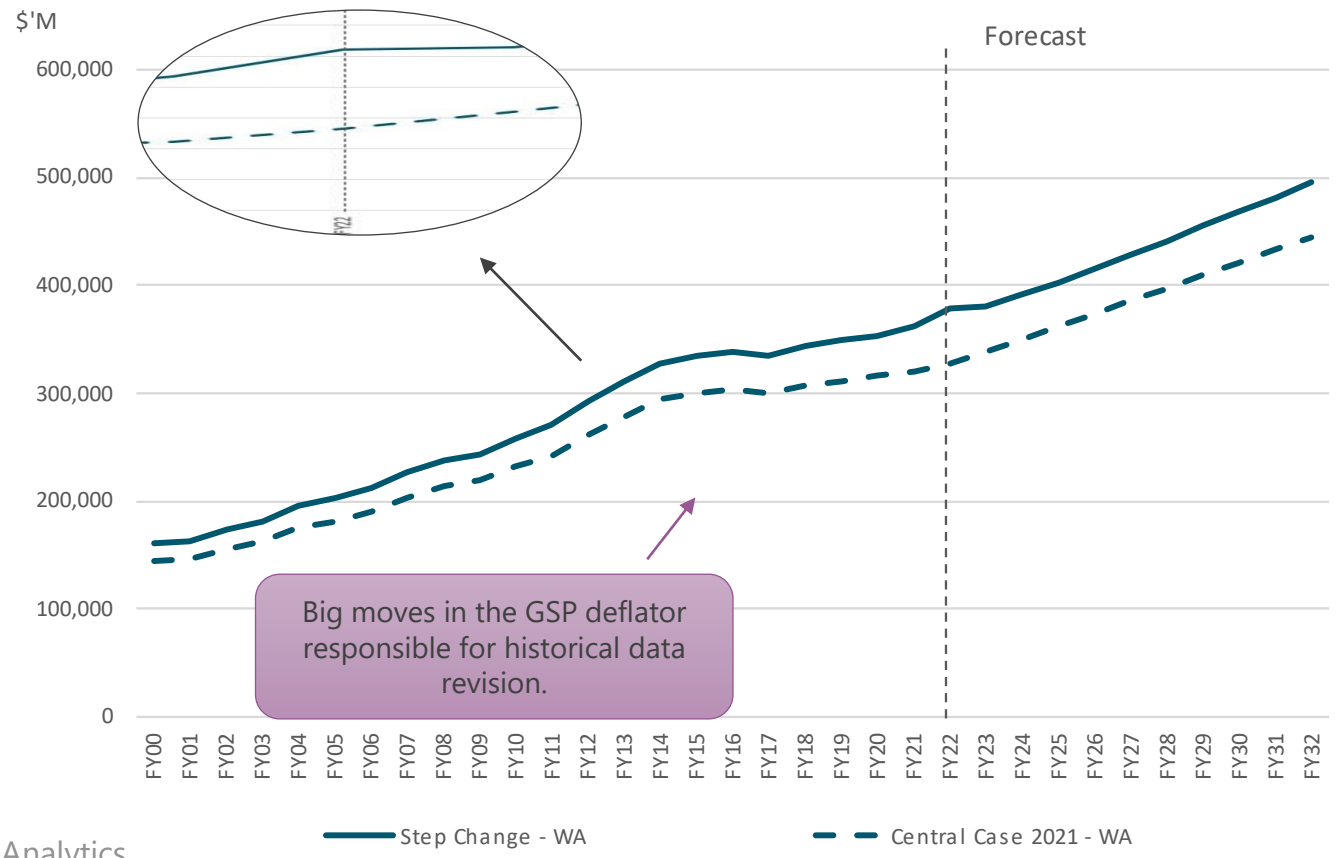


Source: BIS Oxford Economics/Haver Analytics

Step Change: WA

WA also proved resilient through the pandemic. Strong commodity prices have since accelerated the upturn in the mining sector for WA. This will support near-to-medium term growth.

Fig 10. Gross State Product, WA



Big moves in the GSP deflator responsible for historical data revision.

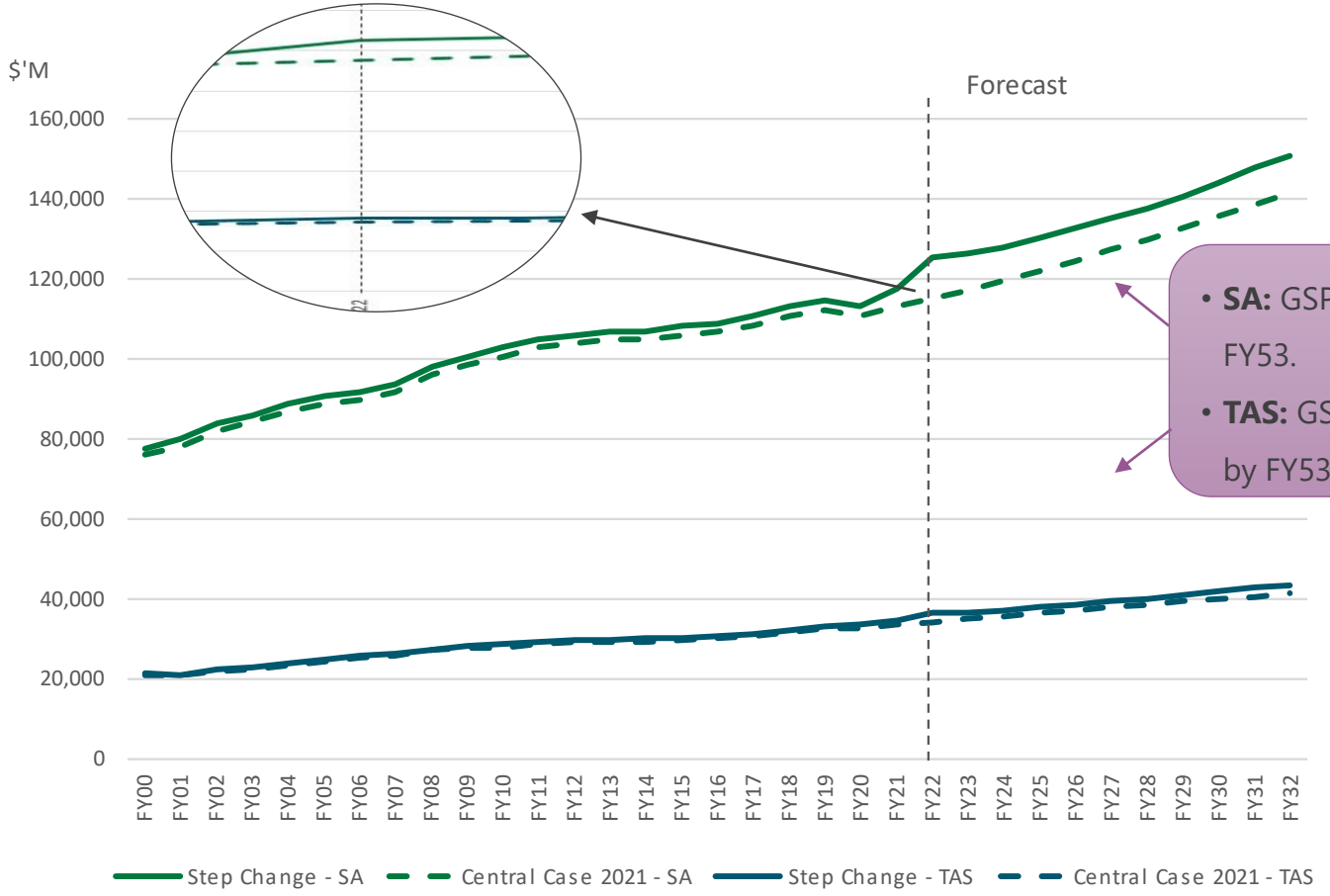
- **WA:** GSP is 0.5% lower (cumulatively) by FY53.

Source: BIS Oxford Economics/Haver Analytics

Step Change: SA & TAS

SA also performed better than expected, boosted by the HomeBuilder program and government investment.

Fig 11. Gross State Product, SA & TAS



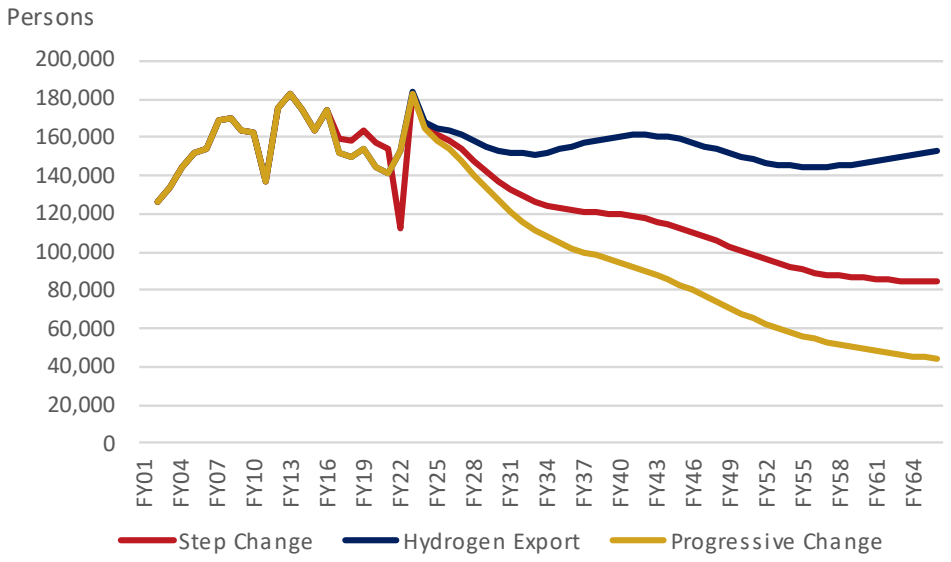
- **SA:** GSP is 7.2% higher (cumulatively) by FY53.
- **TAS:** GSP is 5.7% higher (cumulatively) by FY53.

Source: BIS Oxford Economics/Haver Analytics

Comparison across scenarios

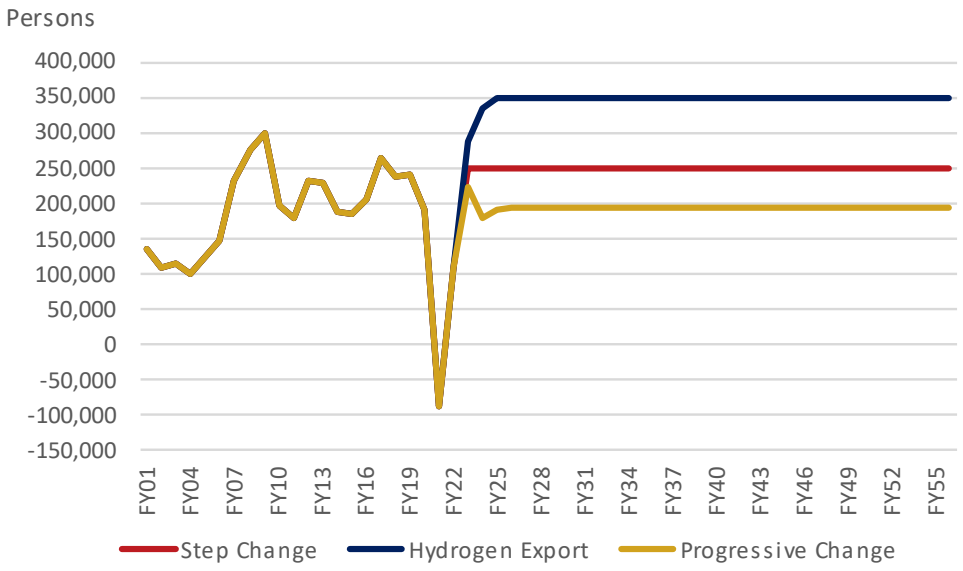
Alternative cases: demographics

Fig 12. Natural Increase, Australia – core cases



Compounded effect of higher migration on future generation of births, materialises through the next two decades.

Fig 13. Net Overseas Migration, Australia – core cases



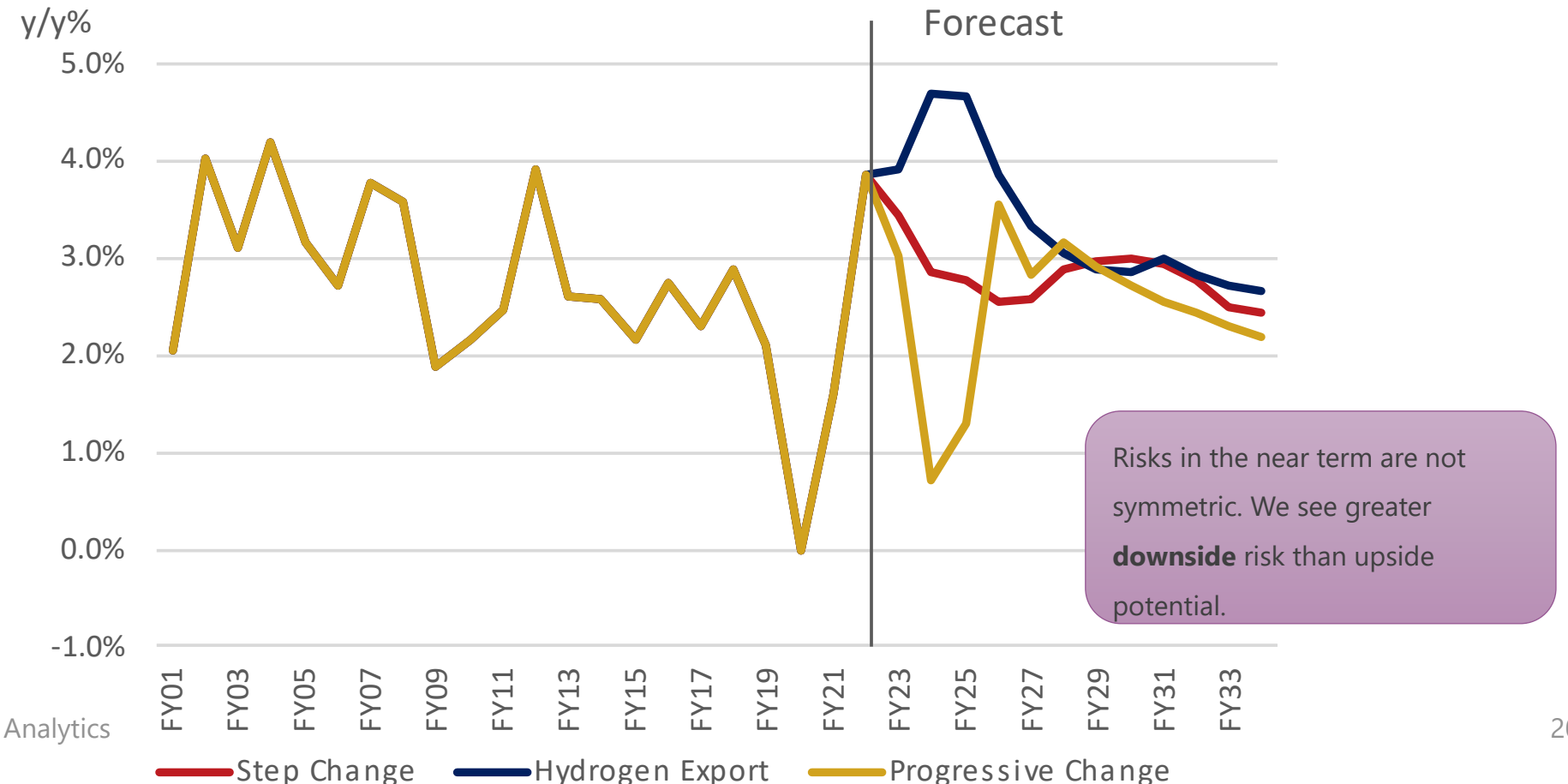
Temporary and permanent workers and arrivals of international students drives stronger NOM in *Hydrogen Scenario,* while a reversal of these factors drives lower NOM in *Progressive Change*.

Source: BIS Oxford Economics/Haver Analytics

Alternative cases: Short Run

Worsening fall out of the Russia-Ukraine war and marked drop off in Chinese international students hamper growth in *Progressive Change*. By contrast, increasing migration and resilient consumer demand contribute to stronger near term growth for *Hydrogen Export*.

Fig 14. YoY% Change in GDP by case (FY18-33)

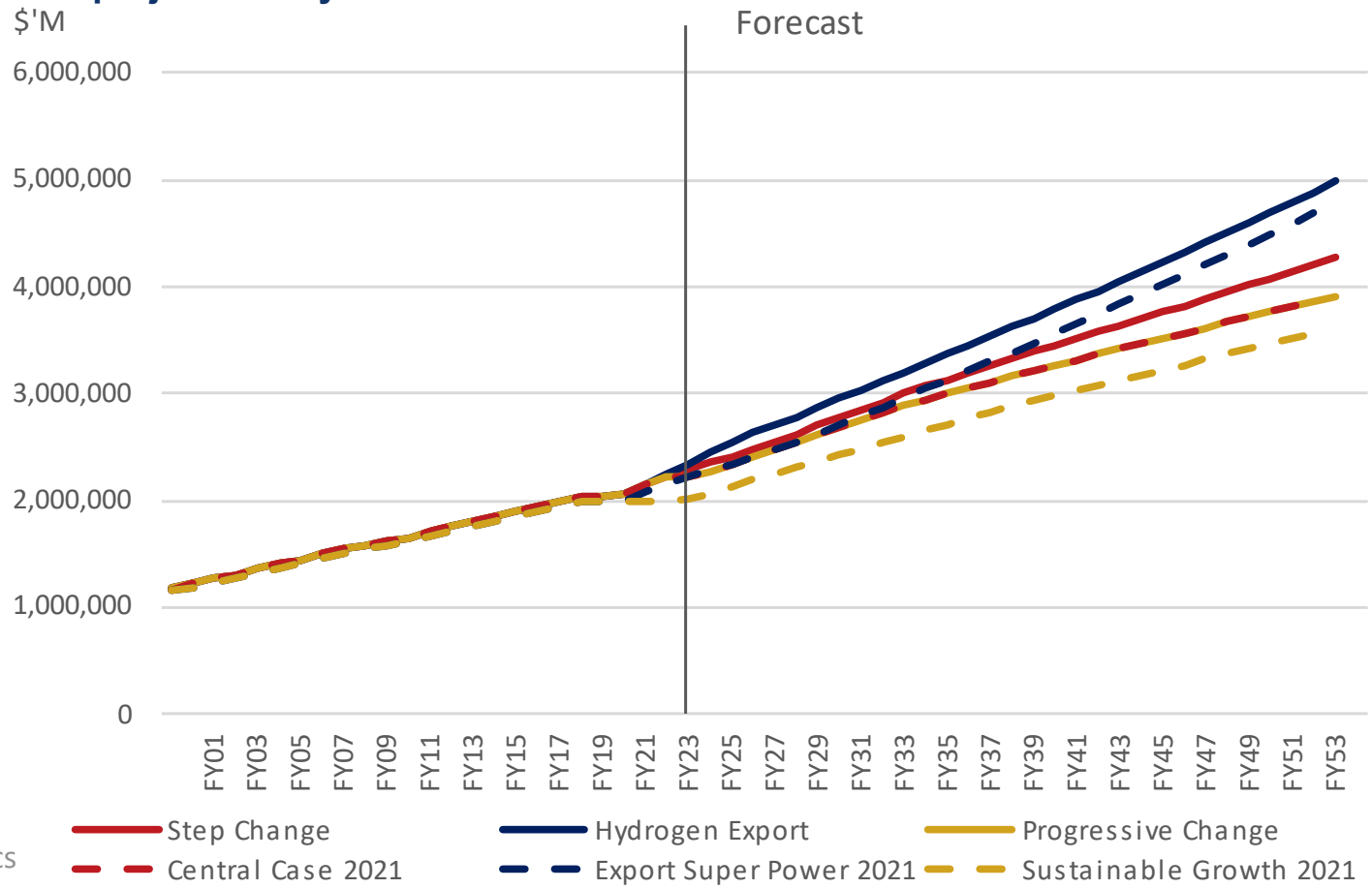


Source: BIS Oxford Economics/Haver Analytics

Alternative cases: Long Run

Stronger decarbonisation policy initiatives this year places Australia on a higher economic path for the central (*Step Change*) case. The *Progressive Change* also has higher growth outcomes this year from stronger decarbonisation, though this is offset by a lower population growth outlook.

Fig 15. GDP projections by case

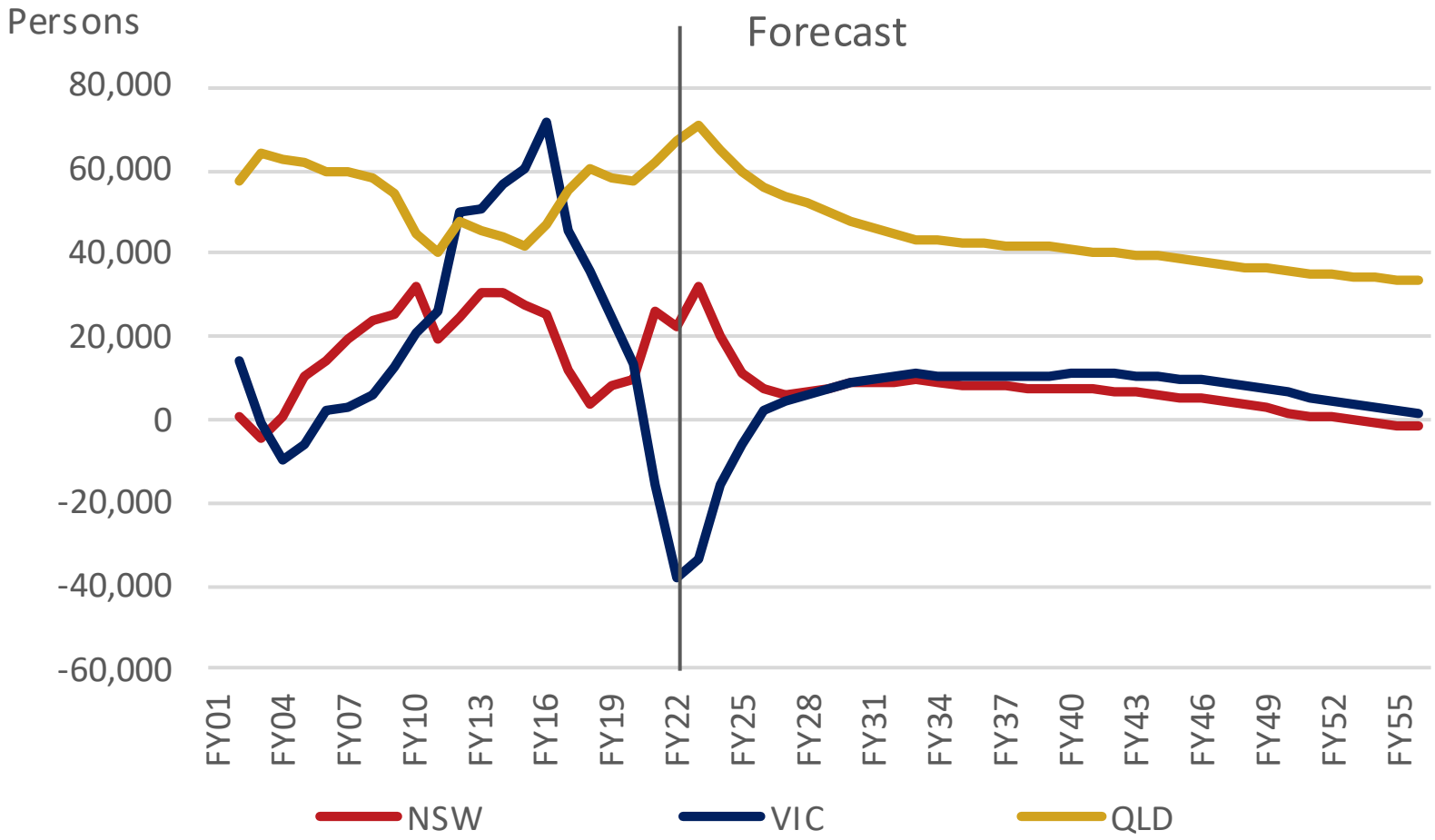


Source: BIS Oxford Economics/Haver Analytics

Appendix

Central case: demographics

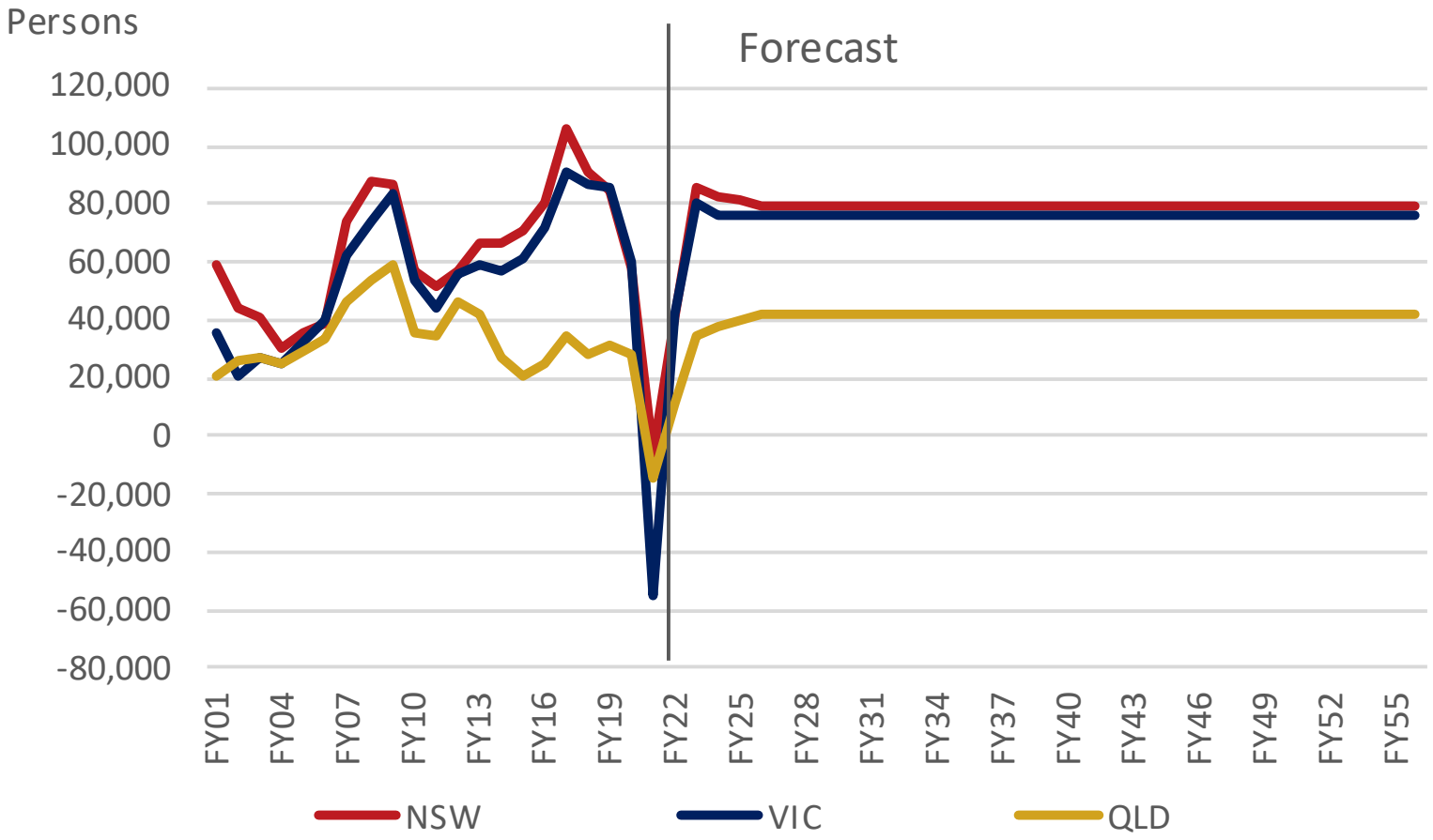
Fig 16. Natural Increase, NSW, QLD & VIC



Source: BIS Oxford Economics/Haver Analytics

Central case: demographics

Fig 17. Net Overseas Migration (NOM), NSW, QLD & VIC

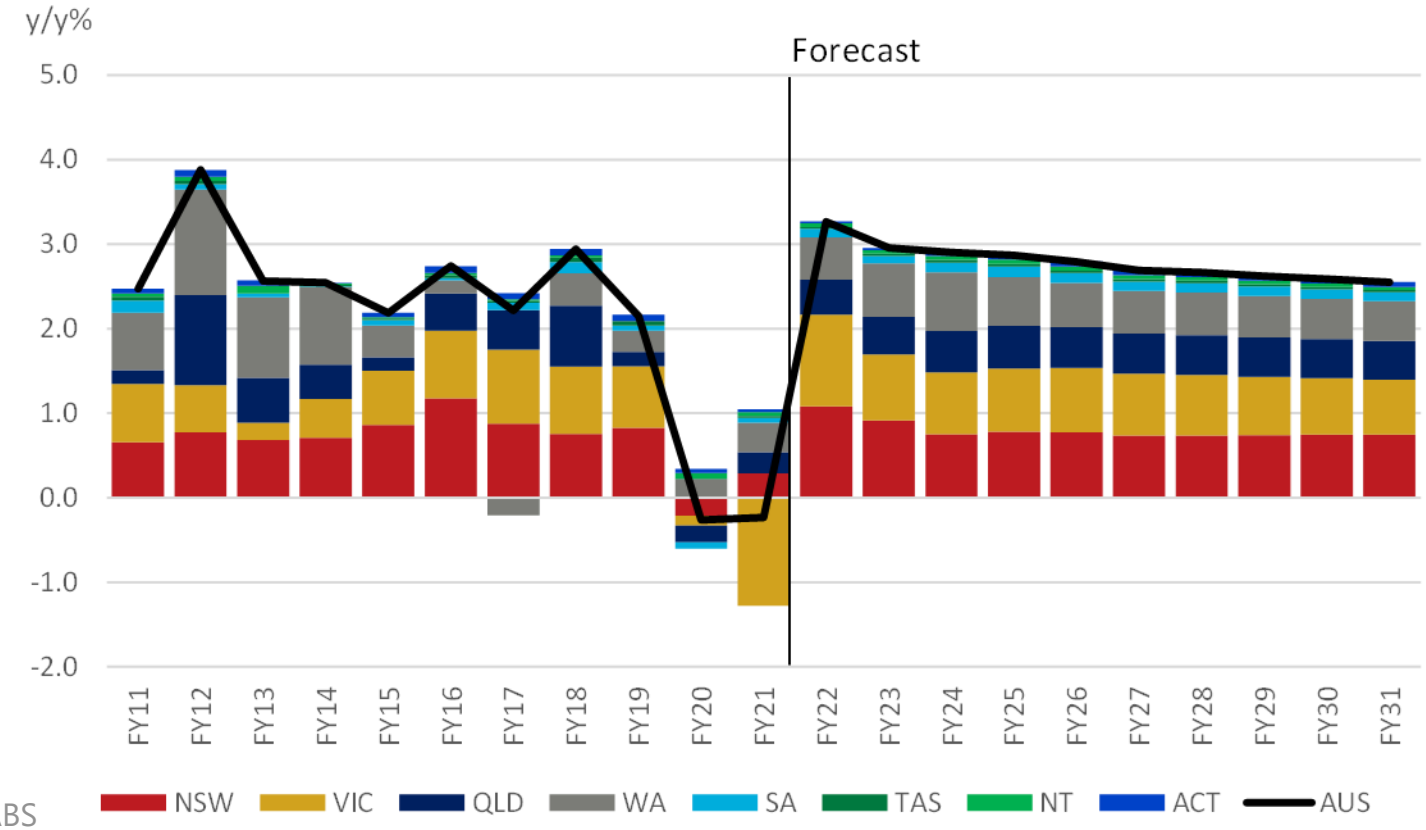


Source: BIS Oxford Economics/Haver Analytics

Step Change: State Breakdown

VIC & NSW to drive growth as the economies recover and migrants return. Strong commodity prices to drive an upturn in the Mining Sector for QLD and WA as well.

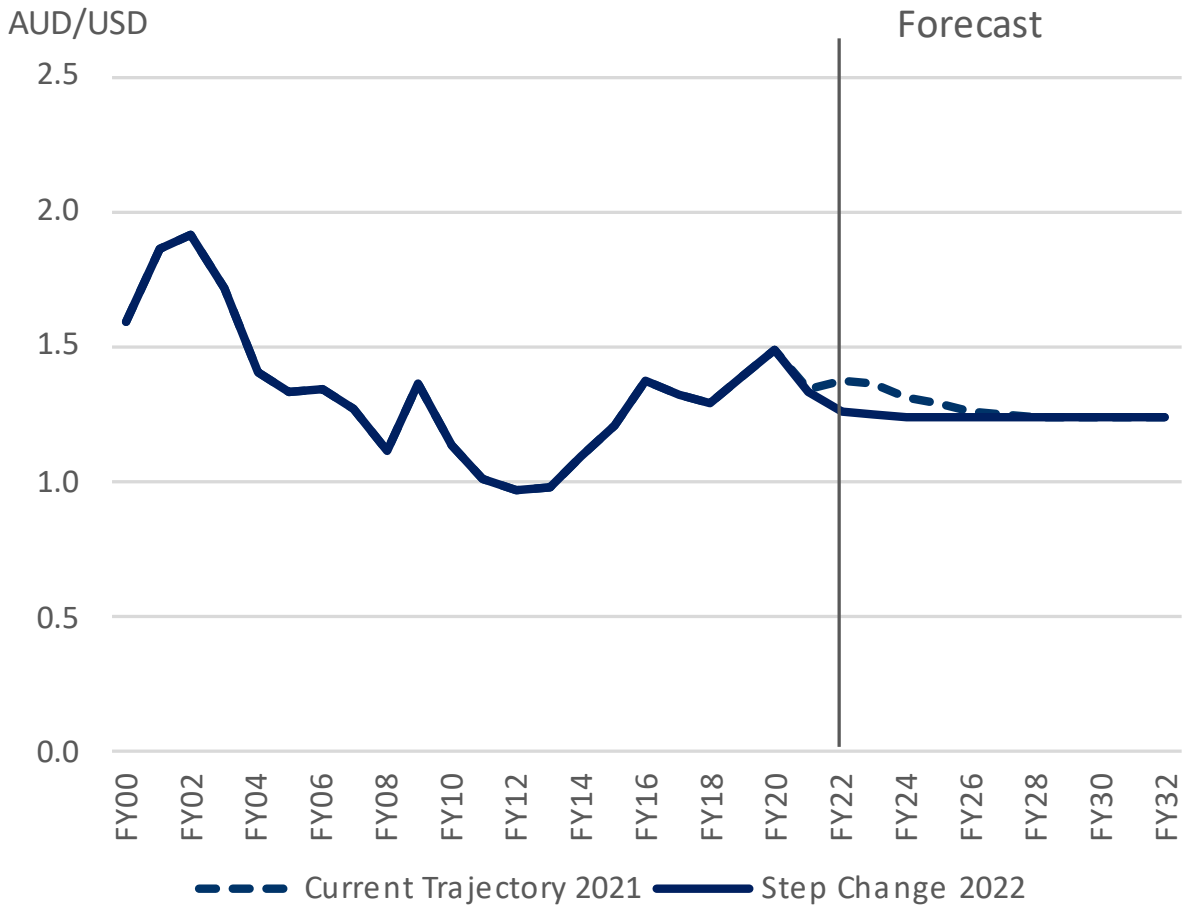
Fig 6. State Contribution to YoY% change in Gross Domestic Product



Source: BIS Oxford Economics/ABS

Central case: AUD

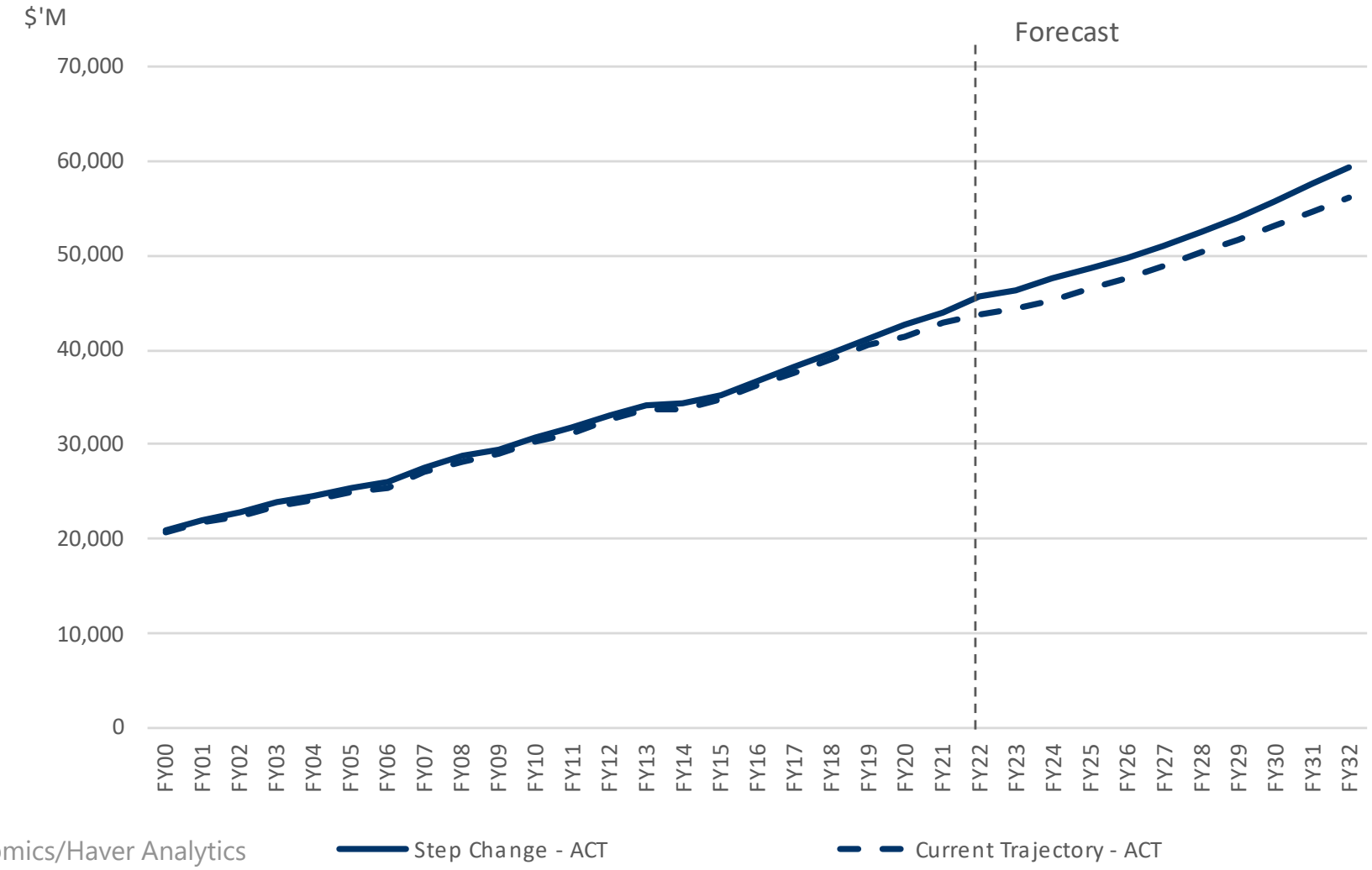
Fig 18. Exchange Rate Forecast



Source: BIS Oxford Economics/Haver Analytics

Central case: ACT

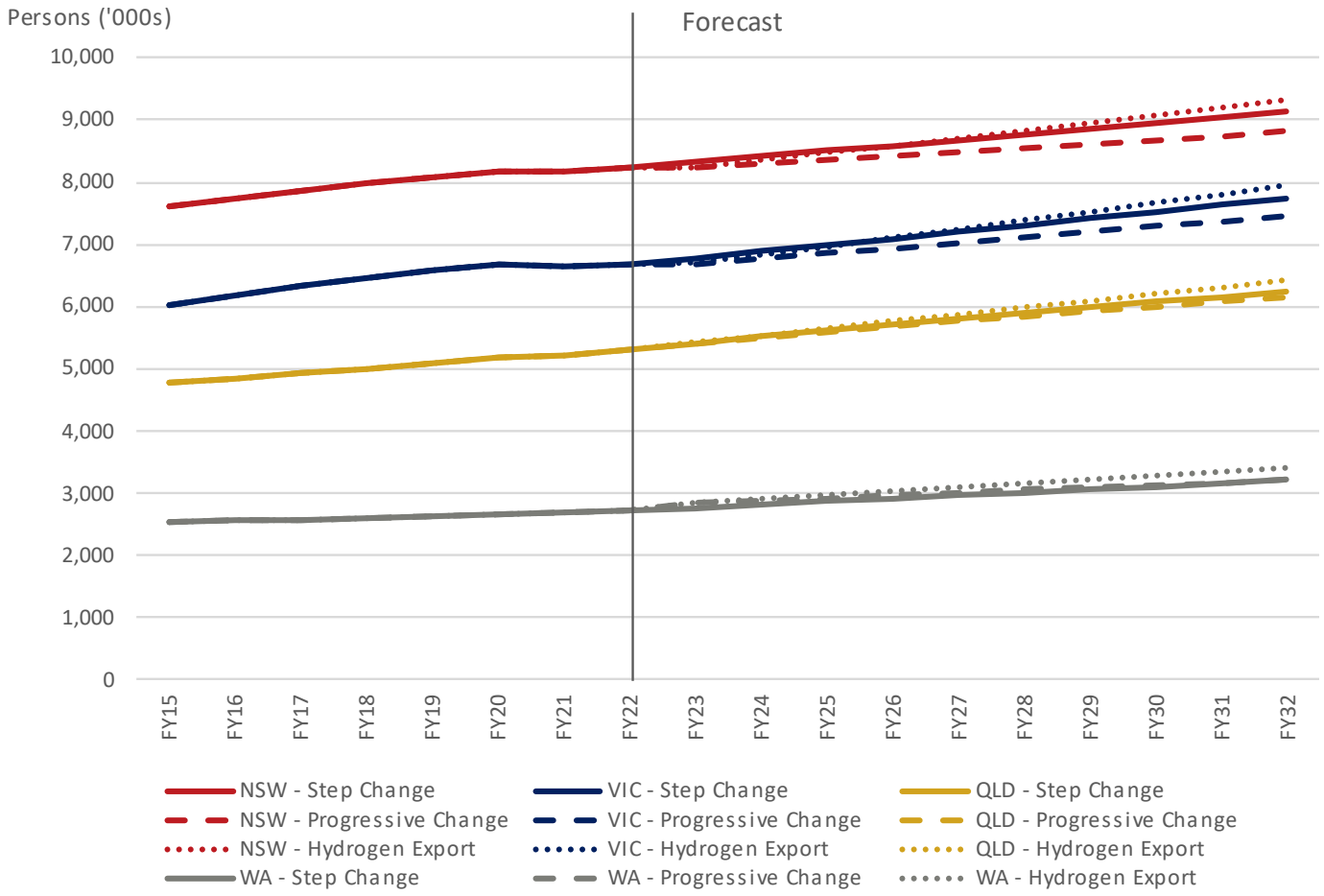
Fig 19. Gross State Product, ACT



Source: BIS Oxford Economics/Haver Analytics

Alternative cases: demographics

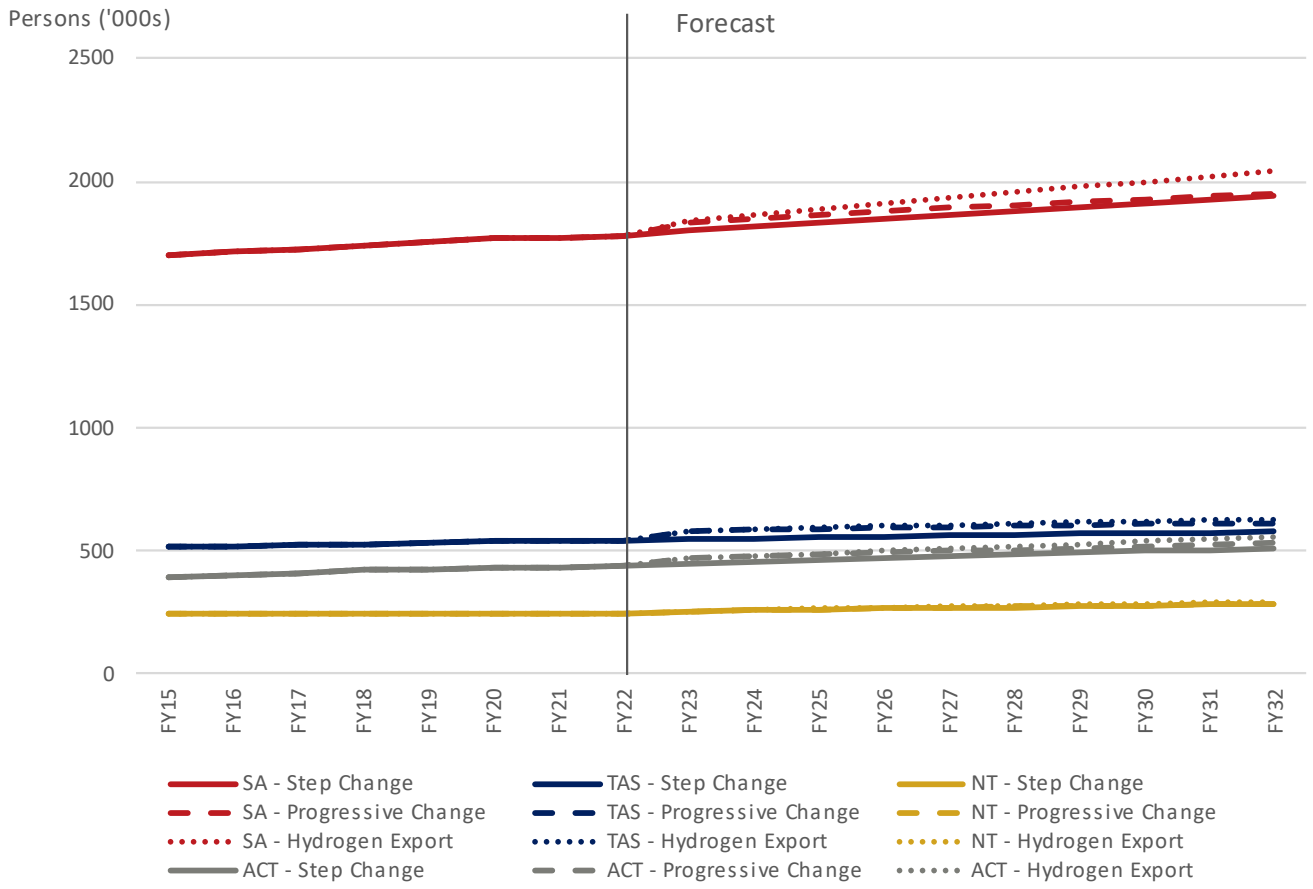
Fig 20. Population Projections, NSW, VIC, QLD & WA



Source: BIS Oxford Economics/Haver Analytics

Alternative cases: demographics

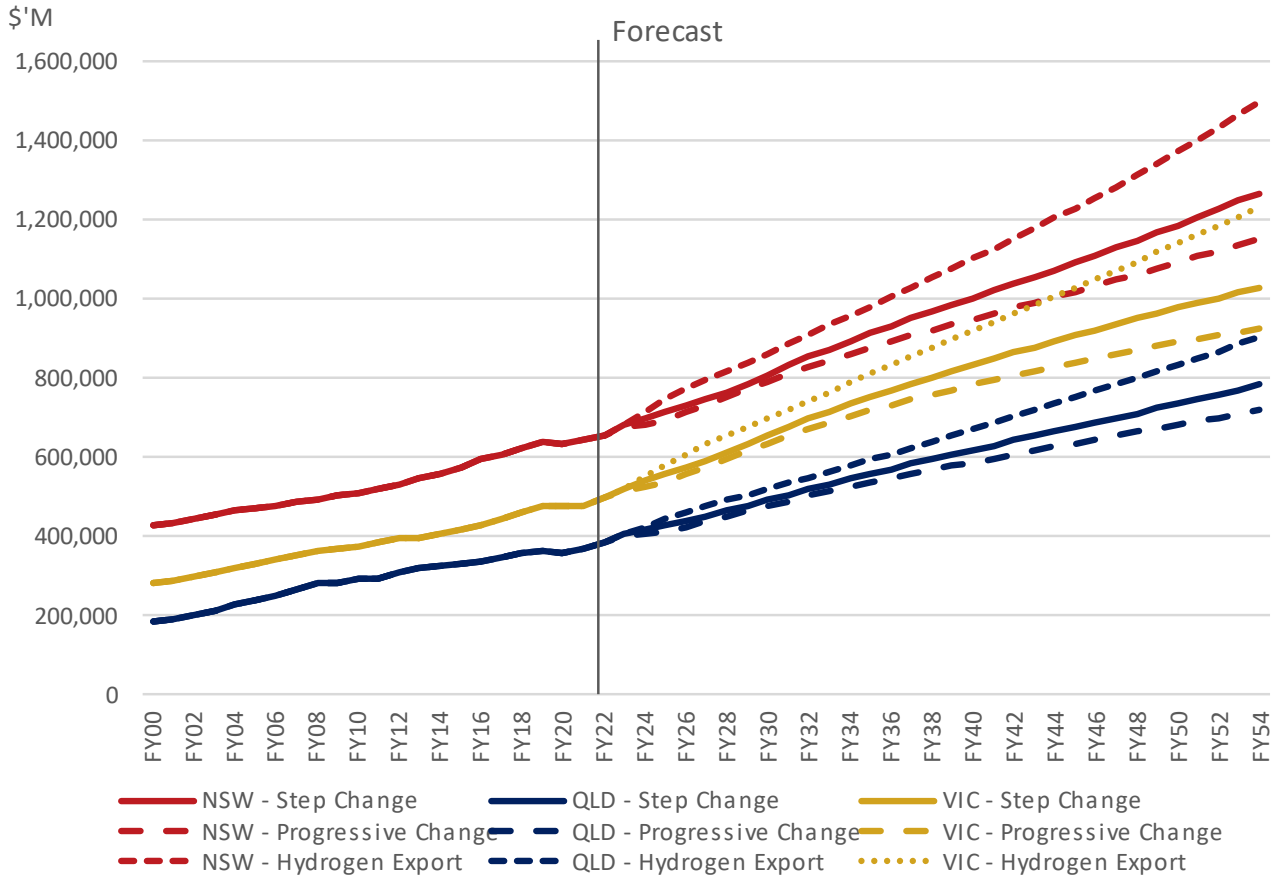
Fig 21. Population Projections, SA, TAS & ACT



Source: BIS Oxford Economics/Haver Analytics

Alternative cases

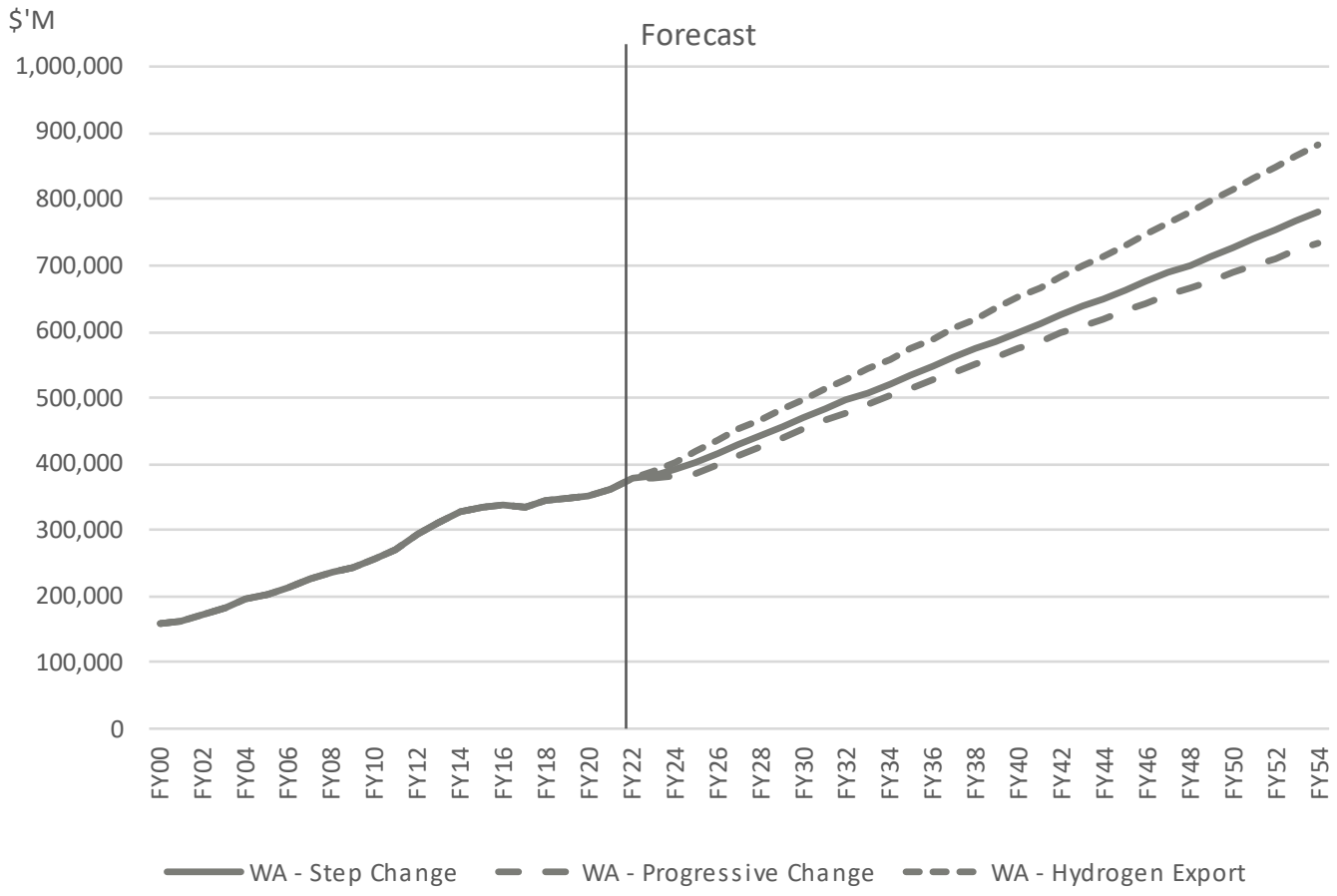
Fig 22. Gross State Product, NSW, VIC & QLD



Source: BIS Oxford Economics/Haver Analytics

Alternative cases

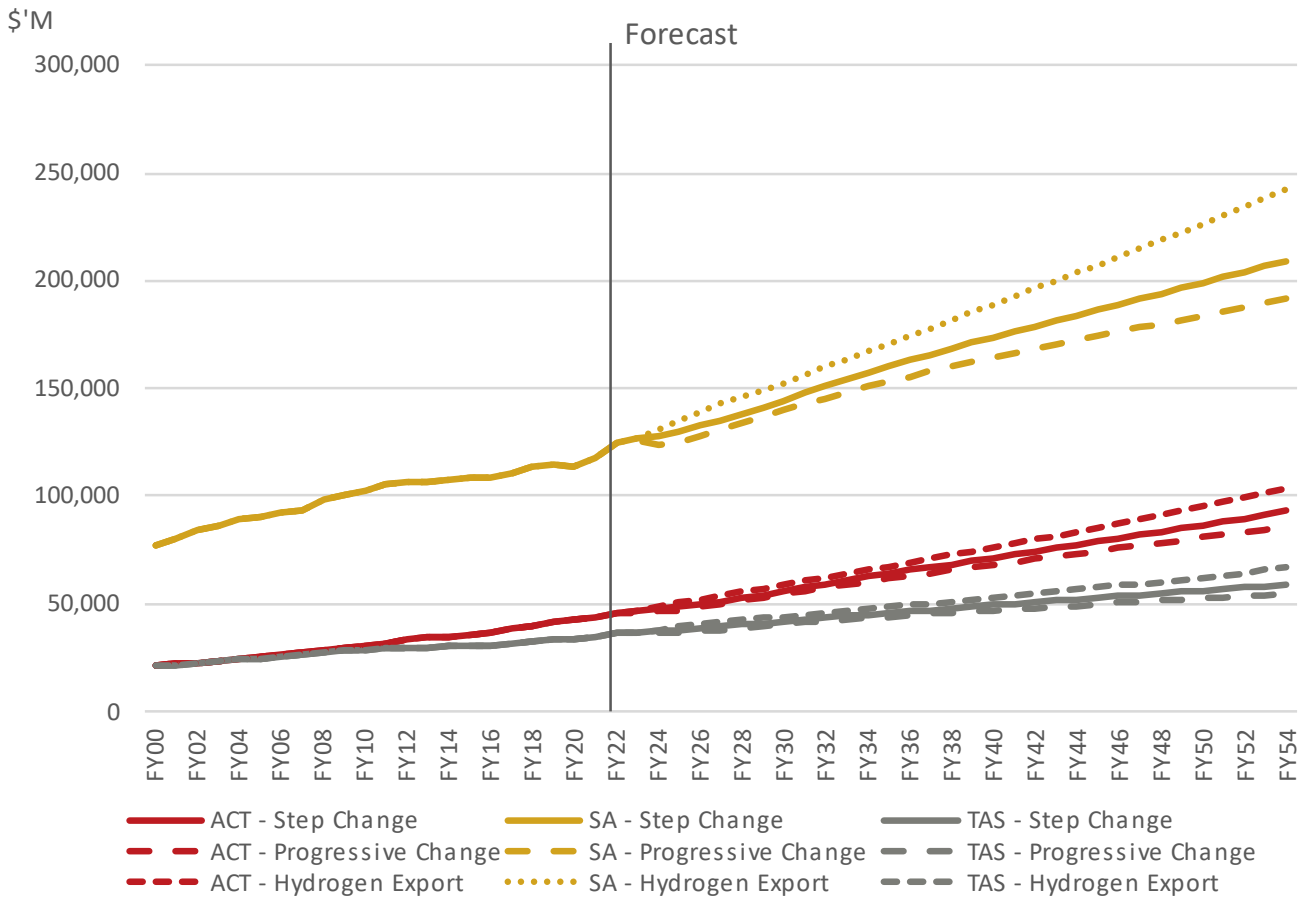
Fig 23. Gross State Product, WA, FY15-31



Source: BIS Oxford Economics/Haver Analytics

Alternative cases: smaller states

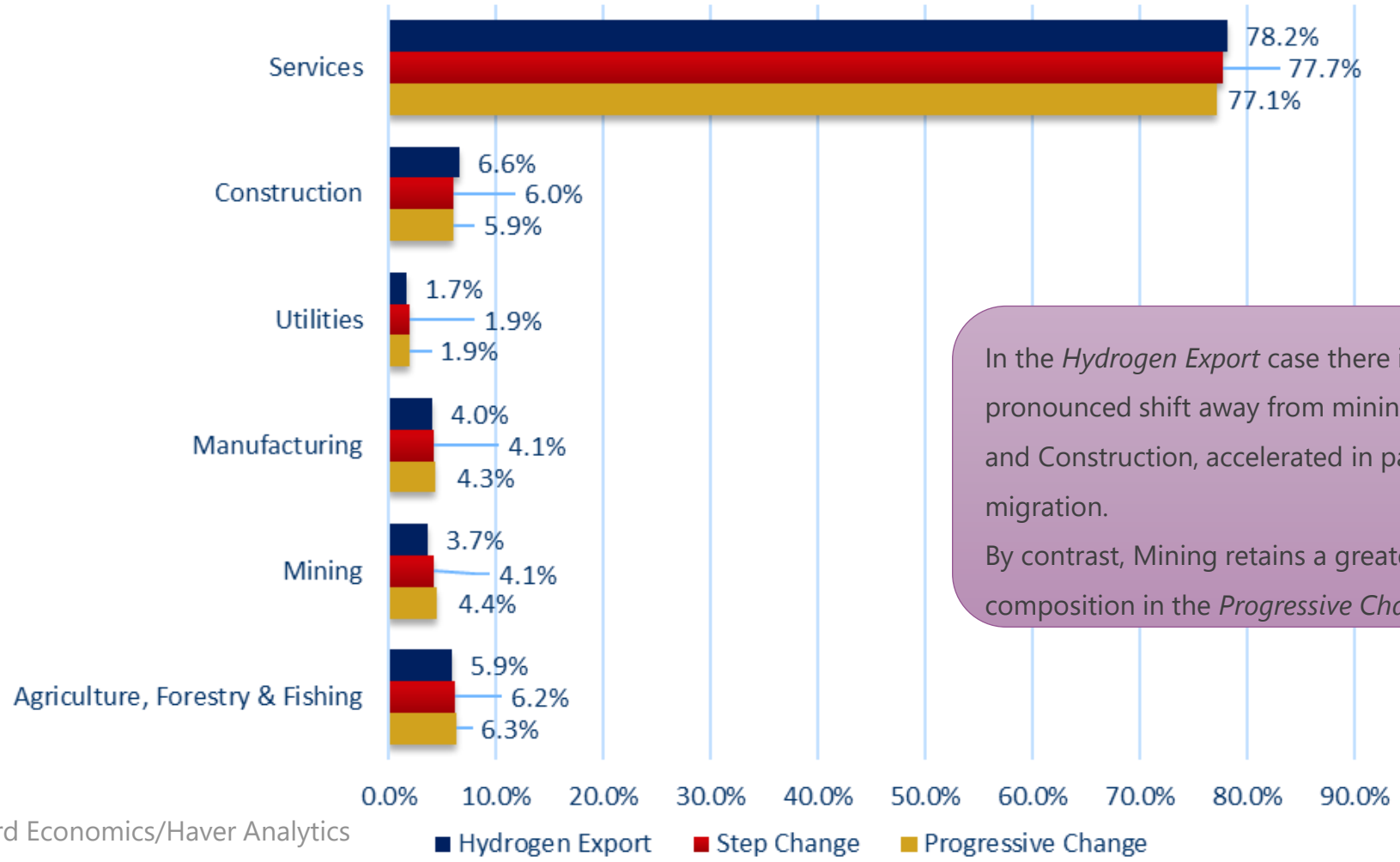
Fig 24. Gross State Product, SA, TAS & ACT, FY15-31



Source: BIS Oxford Economics/Haver Analytics

ALTERNATIVE CASES: INDUSTRY COMPOSITION

Fig 25. Industrial Composition of GDP by Scenario (FY54)



In the *Hydrogen Export* case there is a more pronounced shift away from mining towards Services and Construction, accelerated in part by stronger migration.

By contrast, Mining retains a greater share of industry composition in the *Progressive Change* case.

Source: BIS Oxford Economics/Haver Analytics

Modelling Methodology – further detail

- The forecasts are produced using our proprietary Global Economic Model and Global Industry Model which covers 85 countries. At the country level, the model's structure is Keynesian in the short run, with output driven by shifts in demand, but in the long run the model is neoclassical, and GDP is determined by the economy's supply side potential.
- **Climate Change enhancements**: The model can also accommodate the economic impact of climate change. This is done through three main channels:
  - Global Temperature impact on depreciation of capital stock and productive potential;
  - Degree of investment in energy efficiency improvements leading to productivity gains; and
  - The impact of increased renewable penetration and pace of electrification on global demand for traditional emissions-intensive materials (coal, gas and oil) and the flow on impact on trade.

Contacts

EUROPE

Oxford (Headquarters)
Tel: +44 (0)1865 268 900

London
Tel: +44 (0)20 3910 8000

Belfast
Tel: + 44 2892 635400

Milan
Tel: +39 02 8295 2521

Frankfurt
Tel: +49 69 96 758 658

Paris
Tel: +33 (0)1 78 91 50 52

Stockholm
Tel: +46 (0) 8 446 887 65

AFRICA AND MIDDLE EAST

Cape Town
Tel: +27(0)21 863-6200

Dubai
Tel: +971 56 396 7998

AMERICAS

New York
Tel: +1 (646) 786 1879

Philadelphia
Tel: +1 (646) 786 1879

Mexico City
Tel: +52 155 5419-4173

Boston
Tel: +1 (617) 780 2265

Chicago
Tel: +1 (847) 993-3140

Los Angeles
Tel: +1 (424) 303 3449

Toronto
Tel: +1 (905) 361 6573

ASIA PACIFIC

Singapore
Tel: +65 6850 0110

Sydney
Tel: +61 (0)2 8458 4200

Hong Kong
Tel: +852 3974 8842

Tokyo
Tel: +81-(0)3-4588-2798