



INDEPENDENT  
MARKET  
OPERATOR



# Gas Statement of Opportunities

Executive summary and key findings

July 2013



## Disclaimer

The Independent Market Operator (IMO) has prepared this Gas Statement of Opportunities (GSOO) report under Part 6 and Schedule 3 of the Gas Services Information Rules. In preparing this publication the IMO has used all reasonable endeavours to include the best information available to it at the time. Demand and supply forecasts are prepared using publicly available input data as at 31 March 2013.

The purpose of this initial publication is to provide an overview, technical and market data and information regarding the status and opportunities of the gas market in Western Australia.<sup>1</sup> Information in this publication does not amount to a recommendation in respect of any possible investment and does not purport to contain all of the information that a prospective investor or participant or potential participant in the Western Australian gas market may require.

The information contained in this publication may not be appropriate for all persons and it is not possible for the IMO to have regard to:

- the investment objectives,
- financial situation, and
- particular circumstances

of those who make use of this publication.

The information contained in this publication may contain errors or omissions, and may or may not prove to be correct. It is inevitable that actual outcomes will differ from the forecasts presented in this document.

In all cases, anyone proposing to rely on or use the information in this publication should obtain independent and specific advice from appropriate experts including prior to:

- entering into or altering a new or existing agreement;
- entering into or altering a new or existing financial transaction; and
- entering into or altering a new or existing corporate structure.

Accordingly, to the maximum extent permitted by law, neither the IMO, nor any of the IMO's advisers, consultants or other contributors to this publication (or their respective associated companies, businesses, partners, directors, officers or employees):

(a) make any representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of this publication and the information contained in it; or

(b) shall have any liability (whether arising from negligence, negligent misstatement, or otherwise) for any statements, opinions, information or matter (expressed or implied) arising out of, contained in or derived from, or for any omissions from, the information in this publication, or in respect of a person's use of the information (including any reliance on its currency, accuracy, reliability or completeness) contained in this publication.

## Copyright Notice

The IMO is the owner of the copyright and all other intellectual property rights in this publication. All rights are reserved. This publication must not be re-sold without the IMO's prior written permission. All materials are subject to copyright under the *Copyright Act 1968 (Commonwealth)* and permission to copy it, or any part of it must be obtained in writing from the IMO.

## Independent Market Operator

Level 17, Governor Stirling Tower

197 St George's Terrace, Perth WA 6000

PO Box 7096, Cloisters Square, Perth WA 6850

Tel. (08) 9254 4300

Fax. (08) 9254 4399

Email: [imo@imowa.com.au](mailto:imo@imowa.com.au) Website: [www.imowa.com.au](http://www.imowa.com.au)

---

<sup>1</sup> Gas referred to throughout this document refers to natural gas. All other forms of gas are specified.



## Executive Summary and Key Findings

The establishment of a GBB and an annual GSOO were key recommendations of the Gas Supply and Emergency Management Committee (GSEMC), which was formed following two major gas supply disruptions in 2008, with the aim of improving the security, reliability and competitiveness of the WA domestic gas market.<sup>2</sup>

As one of the key information services established under the *Gas Services Information Act 2012*, the GSOO provides an independent insight into the WA domestic gas market that outlines supply and demand with the aim of highlighting potential shortfalls, constraints and opportunities in the WA gas market for existing and potential market participants.

The WA gas market is currently going through an exciting period of development with new domestic gas and LNG export processing facilities, as well as an expansion in gas storage.

In the next few years, the market is expected to see:

- the further expansion of domestic gas processing capacity through the completion of the Red Gully and Macedon processing facilities, adding to the recently commissioned Devil Creek facility;
- the expansion of gas storage capacity at the Mondarra Gas Storage Facility;
- the expected completion of two new LNG export facilities (Gorgon and Wheatstone); and
- the expected completion of two new domestic gas processing facilities associated with these LNG facilities.

These developments will significantly alter both the domestic gas and LNG export markets in WA, broadening the sources of supply to the domestic market, which should improve the security of supply and competitiveness of the market.

In this period of change, the commencement of the GBB and the publication of this GSOO are timely. Improved information about the gas market will assist stakeholders in identifying potential opportunities, improve risk mitigation and inform Government in relation to energy policy development.

To assist with this GSOO, the IMO engaged the National Institute of Economic and Industry Research (NIEIR). NIEIR is a forecasting consultancy that has spent more than 25 years modelling various gas and electricity markets across Australia, including WA. For this GSOO, NIEIR developed a WA gas model and provided demand and supply forecasts.

For the 2013 to 2022 period, this GSOO provides:

- a brief history of the WA gas market and description of WA gas market infrastructure (chapter 3);
- an outlook for the WA economy (chapter 4);
- projections of WA gas demand (chapter 5);
- a view of the international LNG market (chapter 6);
- projections of WA gas supply (chapter 7);
- estimates of WA gas reserves (chapter 8);
- a supply and demand assessment (chapter 9); and
- a discussion of other topics of interest, such as relevant government policy matters (chapter 10).

---

<sup>2</sup> See GSEMC's recommendations highlighted in its report to the WA Government; [http://www.finance.wa.gov.au/cms/uploadedFiles/Public\\_Utility\\_Office/Energy\\_Initiatives/gsem-committee-report-government-sep-2009.pdf](http://www.finance.wa.gov.au/cms/uploadedFiles/Public_Utility_Office/Energy_Initiatives/gsem-committee-report-government-sep-2009.pdf), accessed 5 March 2013.

## Key Findings of the GSOO

This GSOO finds for the 2013 to 2022 period:

- there is expected to be adequate gas supply to meet forecast demand in the domestic market;
- the forecast average annual growth for WA domestic gas supply is expected to be 3.7% per annum, compared to a forecast average annual growth for domestic gas demand of 1.1% per annum;
- the gas processing capacity in the domestic market is anticipated to be double the forecast level of domestic gas demand by the end of 2022;
- existing gas reserves are forecast to be sufficient to continue to meet 2022 domestic and LNG demand levels for a very considerable period beyond 2022;
- gas demand forecasts suggest demand growth will be higher for areas located outside the South West Interconnected System (SWIS);
- total gas demand in WA, including both LNG production (feedstock and processing) and domestic demand, is forecast to grow 8% per annum until 2022; and
- there are several medium to long-term growth challenges confronting the WA LNG market, although these are not expected to impact on the domestic natural gas sector in the forecast period, but may have an impact into the future.

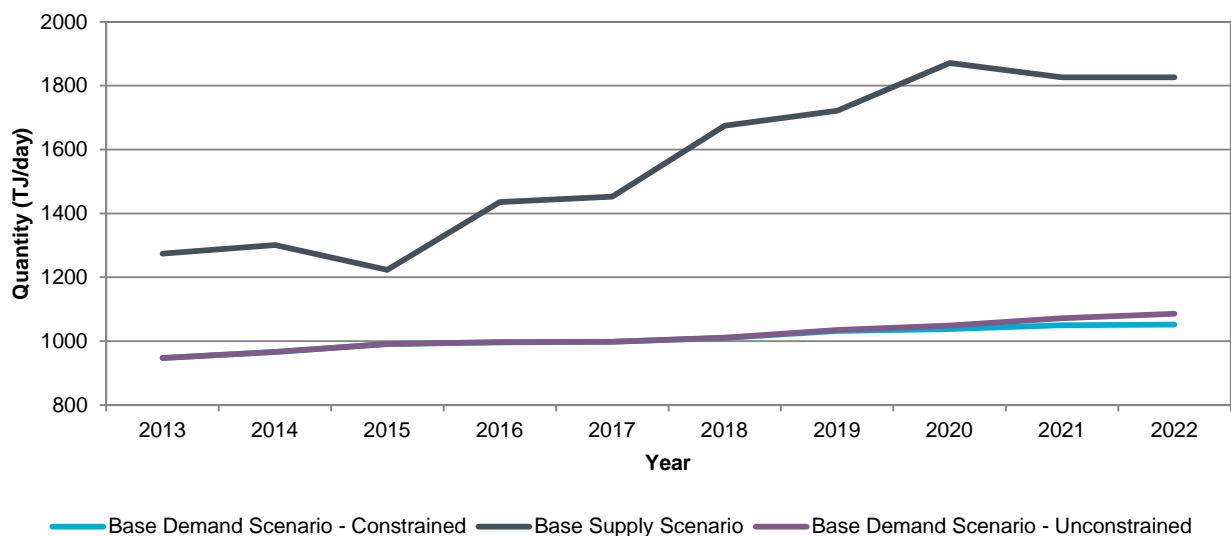
Each of these findings is explained in more detail below.

### Supply-Demand Balance

The WA domestic gas market at the wholesale level is dominated by several large gas consumers (see section 5.1 – Characteristics of Gas Demand). These consumers are supplied mostly by a small number of large gas producers (see section 7 – Gas Supply, Capacity and Projections) through various gas transmission pipelines, which transport gas from gas production facilities predominantly located in the North West of the State, to consumers around the State. WA domestic gas consumption is dominated by the mining, manufacturing and electricity generation sectors was 346 PJ (excluding petroleum processing) of gas in 2012.

Figure A presents the supply-demand balance for the 2013 to 2022 period. Forecasts of potential gas supply generated for the 2013 to 2022 period suggest the domestic gas market will be well supplied in this period.

Figure A – Supply and Demand Balance, 2013 – 2022



Source: NIEIR Forecasts 2013-2022

The supply-demand balance assessment is based on gas supply forecasts that take into account assumed market conditions including price. Two forecasts of gas demand have also been prepared:

- including price assumptions (constrained demand); and
- excluding the price assumptions (unconstrained demand)

outlined in section 4.4 of this GSOO.

Domestic gas supply is forecast to grow at approximately 3.7% per annum from 1,274 TJ/day (465 PJ/annum) to 1,826 TJ/day (667 PJ/annum), while constrained domestic gas demand is forecast to only grow by 1.1% per annum from 947 TJ/day (346 PJ/annum) to 1,052 TJ/day (384 PJ/annum) in 2022. By the end of 2022, potential domestic gas supply is expected to be almost 74% higher than forecast demand for the WA domestic market (see section 9.1 – Base Case Demand and Supply).

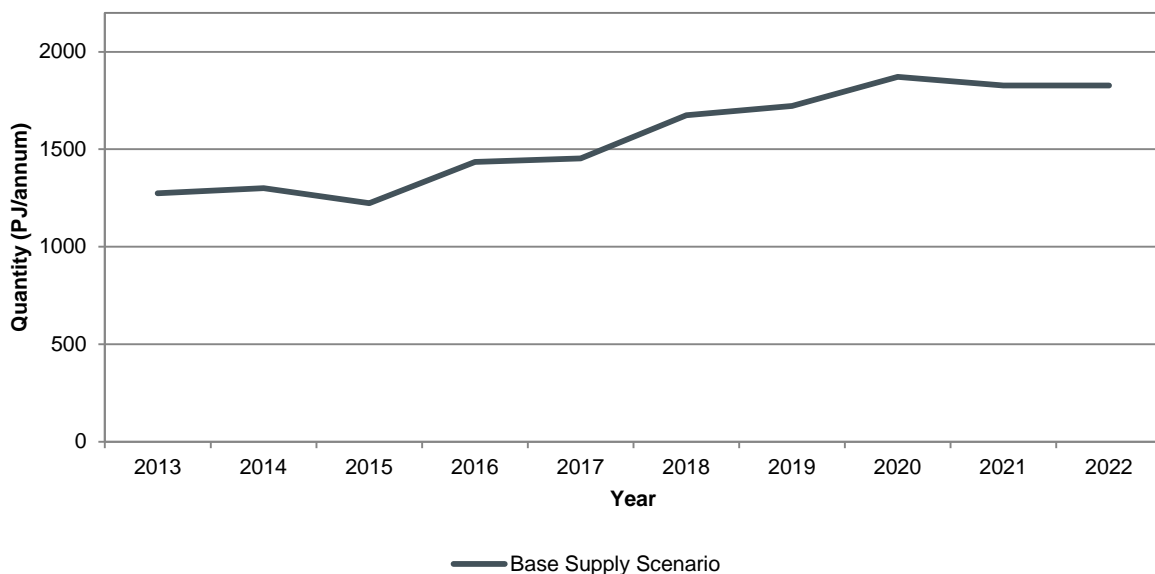
The supply-demand gap (the difference between potential domestic supply and domestic demand) will increase from approximately 327 TJ/day in 2013 to about 827 TJ/day in 2022.

Forecast supply and demand are further considered below.

### **Domestic Gas Supply**

Gas supply forecasts for this GSOO (Figure B) are a measure of the quantity of gas that suppliers are willing to supply to the domestic market at predicted gas prices, an estimate of potential gas supply.

**Figure B: Domestic Gas Supply, 2013-2022**

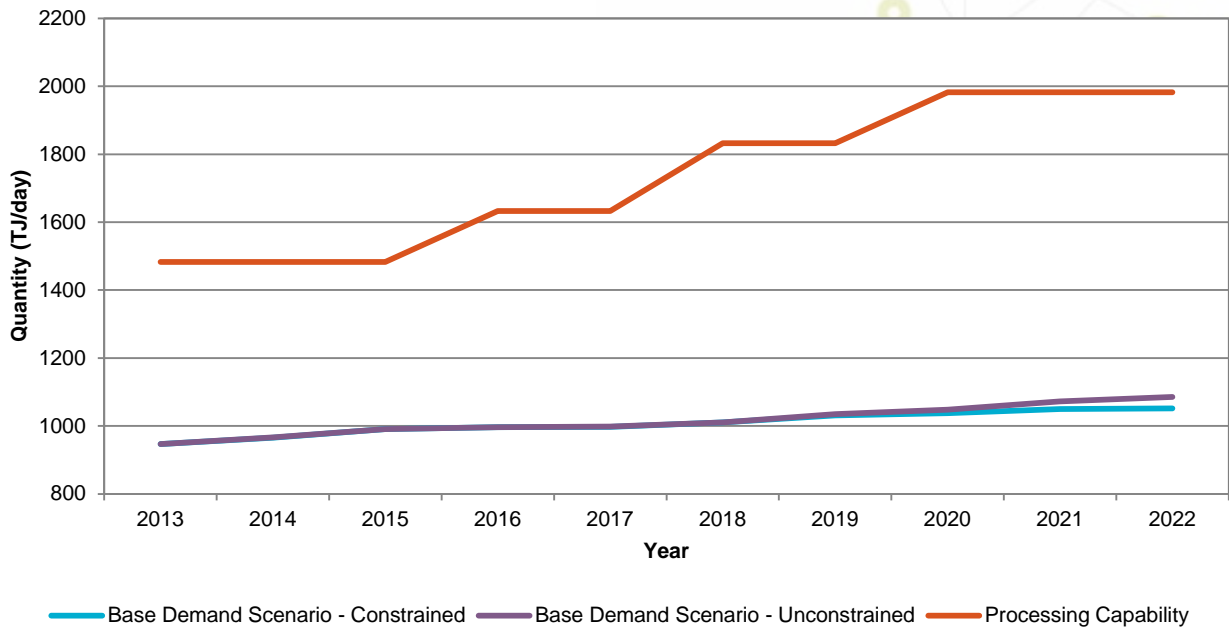


**Source:** NIEIR Forecasts 2013-2022

As noted previously, domestic gas supply is expected to increase by 3.7% per annum over the forecast period to reach 1,826 TJ/day by 2022. In addition to generating a forecast of potential gas supply, this GSOO considers two other perspectives, namely the availability of gas processing capacity and the adequacy of gas reserves.

In the 2013 to 2022 period, a total of 736 TJ/day of domestic gas processing capacity is anticipated to be added to existing gas processing capacity servicing the domestic gas market, bringing the total gas processing capacity to 1,983 TJ/day in 2022 (see section 8.2 – Gas Processing Capacity).

**Figure C: Gas Processing Capacity, 2013-2022**



**Source:** NIEIR Forecasts 2013-2022

Figure C compares the forecasts of total gas processing capacity with the unconstrained and constrained domestic gas demand forecasts for the 2013 to 2022 period. It shows the amount of gas processing capacity available to the domestic market in 2022 is predicted to approach almost twice the level of gas demand for that year.

In terms of gas reserves, WA is the most gas-endowed State in Australia. The Australian Bureau of Resources and Energy Economics and Geoscience Australia estimate WA onshore and offshore basins hold a total of 159,000 PJ of economic and sub-economic reserves in conventional gas, while other studies by the Energy Information Administration in the United States (US) report an estimated 305,412 PJ of unconventional gas in WA’s basins at the end of 2012. Based on these estimates and projections of total gas demand (domestic market and the LNG industry) for 2022, and assuming no additional gas reserves are discovered by 2022, gas reserves in WA have the potential to last for another 131 years beyond 2022 (see section 8.4 – Remaining Reserves).<sup>3</sup>

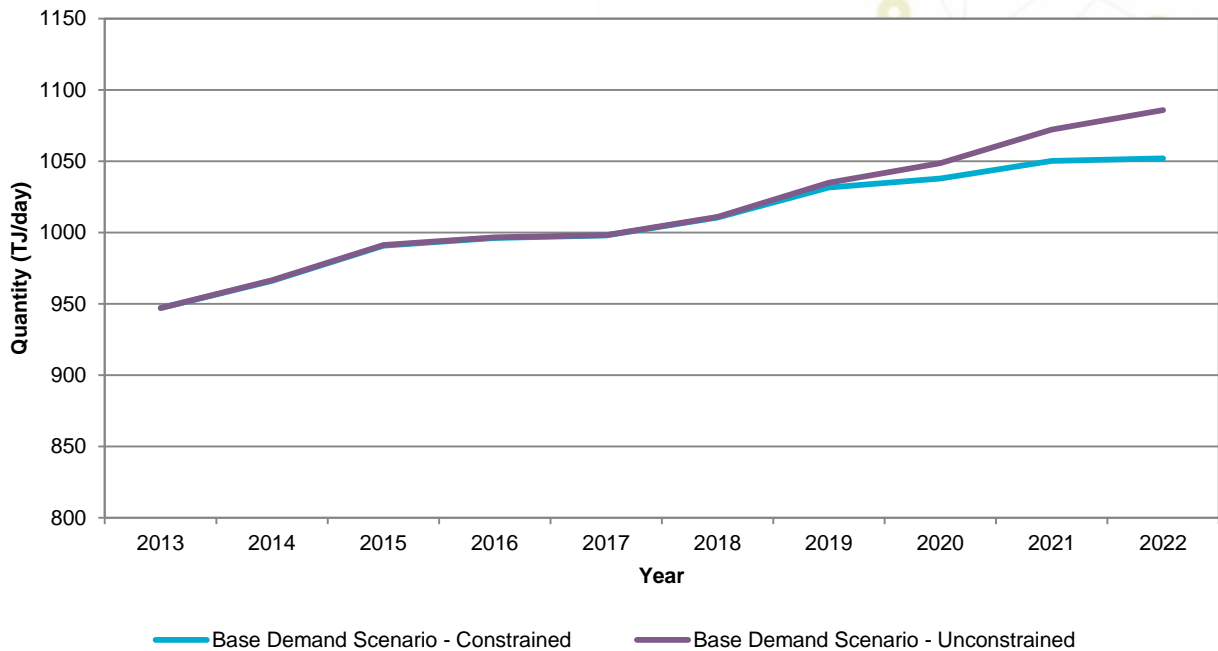
**Domestic Gas Demand**

Domestic gas demand represents NIEIR’s projections of gas required by the domestic market within WA (comprising industrial, commercial and residential demand, but excluding LNG processing consumption) for the 2013 to 2022 period.

Figure D presents the Base forecasts of domestic gas demand for the 2013 to 2022 period prepared by NIEIR. The forecasts predict that domestic gas demand will grow at approximately 1.1% per annum from approximately 947 TJ/day (346 PJ/annum) in 2013 to about 1,052 TJ/day (384 PJ/annum) in 2022 for the constrained scenario, which takes into account NIEIR’s forecasted gas prices offered to the domestic market.<sup>4</sup> The forecast constrained rate of growth is similar to the average growth rate of the domestic market experienced between 2003 and 2012 (see section 5.2 – Projected Domestic Demand).<sup>5</sup>

<sup>3</sup> The estimate assumes that total gas demand in WA remains constant at approximately 3,172 PJ/annum beyond 2022.  
<sup>4</sup> Constrained domestic demand forecasts are forecasts of gas demand that consider the impacts of forecasted gas prices.  
<sup>5</sup> The forecast unconstrained growth rate is 1.4% per annum.

**Figure D: Domestic Demand (Constrained and Unconstrained) 2013-2022**



**Source:** NIEIR Forecasts 2013-2022

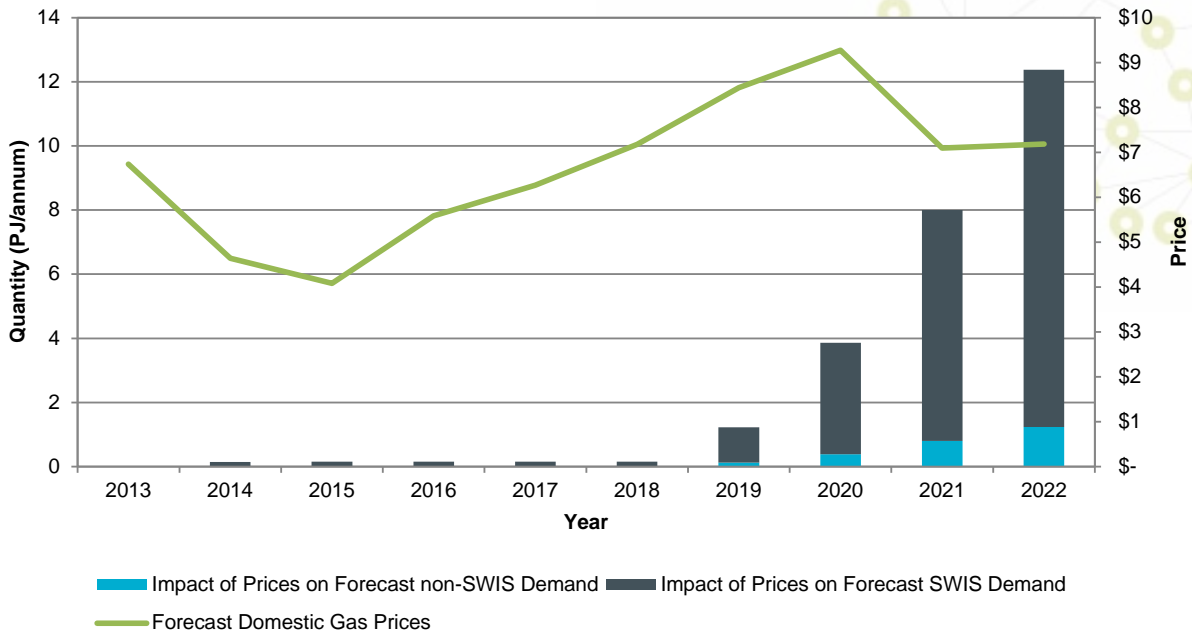
Figure D shows domestic gas demand is forecast to be only mildly impacted by the forecast gas price rises for the 2013 to 2022 period. This reflects NIEIR modelling assumptions, in particular that domestic gas demand is fairly inelastic and will not immediately respond to price changes while the gas price remains below the cost of competing fuels.

The assumed inelastic nature of domestic gas demand reflects the fact that gas consumption is dominated by the capital-intensive mining and industrial sectors. These customers have already committed capital for existing infrastructure and are likely to have long-term gas contracts. This means they are unlikely to immediately change their consumption. This inelasticity is also evident in historical gas consumption data (see section 5.1 – Existing Gas Demand).

Figure E presents the reduction in demand between the constrained and unconstrained forecasts of gas demand. Put another way, this represents potential additional gas demand that may be realisable if future gas prices are lower than NIEIR’s forecast gas prices. With lower gas prices, it is forecast that gas consumption in WA in 2022 could be about 12 PJ/annum higher, of which 11 PJ/annum (or 3% of total gas demand) is in areas that comprise the SWIS and about 1 PJ/annum (or 0.3% of total gas demand) is in areas located outside the SWIS (see section 5.2 – Projected Domestic Demand).

Figure E also reflects an expectation that the impact from changes in gas prices will be lagged and the fall in gas demand is not immediate. Figure E shows as forecast gas prices rise from 2015 to 2020, forecast gas demand does not start reducing until 2019. A key factor supporting this assumption is the existence of long-term gas contracts in the domestic market.

**Figure E: Demand Suppression due to Forecast Prices (SWIS and non-SWIS Demand), 2013-2022**



**Source:** NIEIR Forecasts 2013-2022. **Note:** Gas prices are nominal prices.

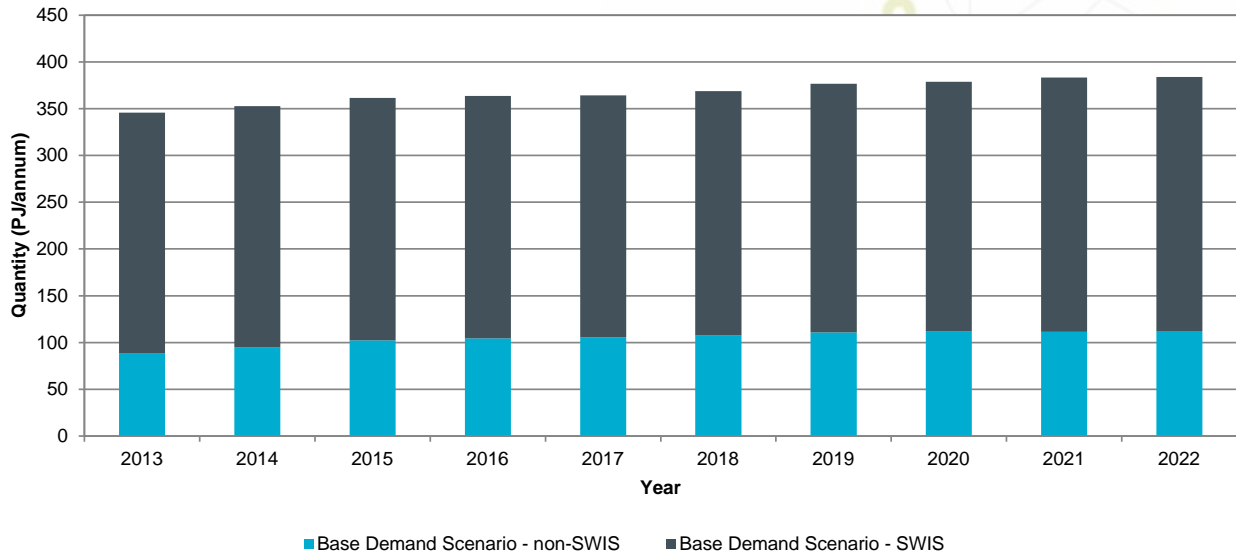
**Gas Demand by Areas**

In assessing domestic gas demand, the IMO has considered demand in both the SWIS and the area representing the remainder of the State. These areas were investigated separately, recognising the drivers of gas demand may differ. For example demand for gas in the SWIS is heavily impacted by its use for electricity generation, while demand outside the SWIS is largely driven by resources projects.

Figure F presents the gas demand forecasts for the SWIS and areas outside the SWIS. As can be seen, demand is projected to grow from about 257 PJ/annum to 272 PJ/annum (0.5% per annum growth) for the SWIS, while for areas outside the SWIS, gas demand is forecasted to grow from approximately 89 PJ/annum to 113 PJ/annum (a more rapid 2.4% per annum growth) by the end of 2022 (See section 5.2 – Projected Domestic Demand).



**Figure F: Gas Demand by Regions, 2013-2022**

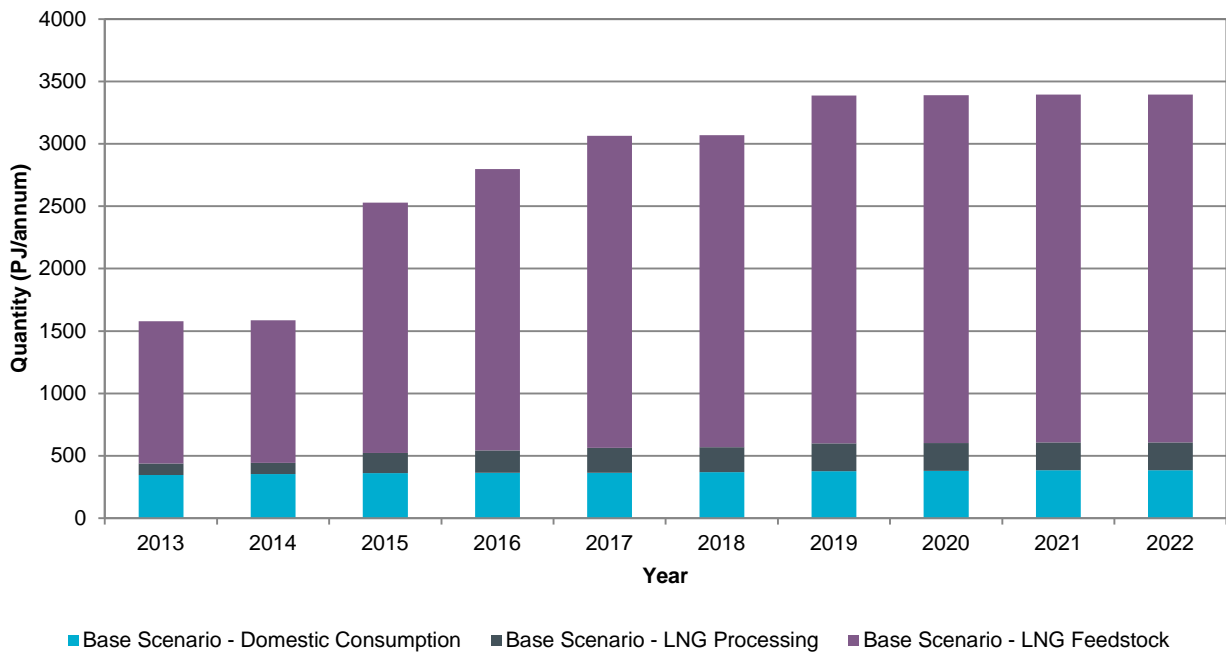


Source: NIEIR Forecasts 2013-2022

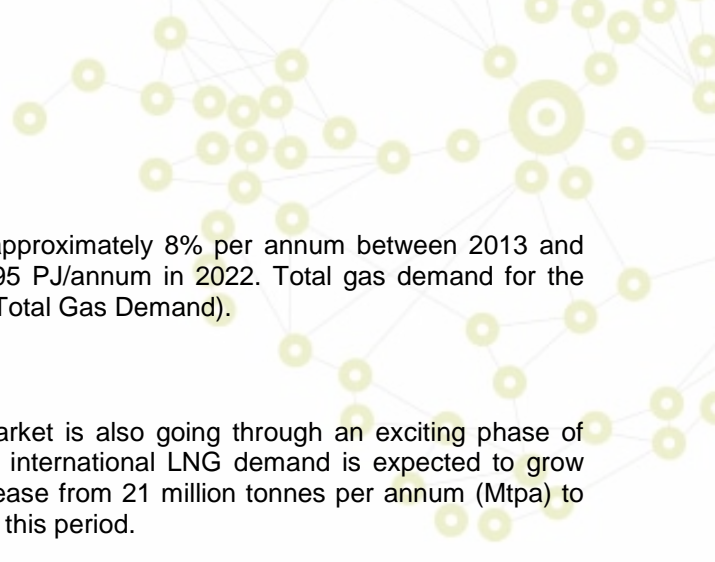
**Total Gas Demand**

Although forecasts suggest growth in domestic gas demand is expected to be slow, forecasts for total gas demand (domestic gas demand plus LNG, including feedstock and gas consumed in LNG production) is expected to rapidly increase. This growth is driven by the gas feedstock and processing requirements of the Gorgon and Wheatstone LNG facilities that are anticipated to be completed in the 2013 to 2022 period.

**Figure G: Total Gas Demand, 2013-2022**



Source: NIEIR Forecasts 2013-2022



This GSOO forecasts total gas demand will increase at approximately 8% per annum between 2013 and 2022 from approximately 1,579 PJ/annum in 2013 to 3,395 PJ/annum in 2022. Total gas demand for the forecast period is presented in Figure G (see section 5.2 – Total Gas Demand).

### **Growth Challenges to WA's LNG Exports**

Similar to the domestic gas market, WA's LNG export market is also going through an exciting phase of expansion and development. In the 2013 to 2022 period, international LNG demand is expected to grow rapidly, with WA's LNG export capacity anticipated to increase from 21 million tonnes per annum (Mtpa) to about 50 Mtpa, more than doubling WA's LNG exports over this period.

Notwithstanding the positive outlook, there are several medium to long-term challenges confronting the WA LNG industry (see section 6.6 – Supply Risks in the International LNG Market). These include:

- potential changes to international LNG supply;
- the potential end of premium LNG pricing in the Asia Pacific region;
- the high cost of LNG production in WA; and
- the emergence of unconventional gas as a source of supply.

WA predominantly exports its LNG to customers located in the Asia Pacific. Due to the large price differentials between the Asia Pacific LNG market and other LNG markets, several countries such as Russia, the US and Canada have announced their intentions to increase supply to the Asia Pacific LNG market. If these planned LNG export projects go ahead, they are well positioned to compete against WA LNG exports.

Increasing competition in the Asia Pacific market means premium prices previously paid by Asia Pacific customers may not persist. The downward pressure on Asia Pacific LNG prices may also impact on LNG prices agreed under previous contracts that are predominantly linked to oil indexes.

The high cost of LNG production in Australia remains an issue for the LNG export market. McKinsey<sup>6</sup> reports the cost of developing of LNG export facilities in Australia is now 20% to 30% higher than that in North America and East Africa. If the cost of developing LNG projects becomes prohibitive in Australia, potential LNG developments currently planned for WA may be abandoned.

The emergence of unconventional gas as a new source of gas supply is also a potential game changer. In the last decade, unconventional gas has transformed the US from a net importer into a net exporter of gas. Unconventional gas is also transforming gas markets in eastern Australia and there are indications that WA is well endowed with unconventional gas resources. While its production is still in its early stages in WA and around the world, unconventional gas has the potential to transform gas markets internationally. The impact of unconventional gas on LNG exports is still not clear and will need to be monitored closely by WA LNG exporters, market regulators and governments.

These challenges facing the LNG export sector are not expected to impact on the domestic supply of natural gas in the forecast period, however they may have an impact over the longer term.

---

<sup>6</sup> See McKinsey (2013), Extending the LNG boom: Improving Australian LNG productivity and competitiveness [http://www.mckinsey.com/locations/australia/knowledge/pdf/Extending\\_LNG\\_boom.pdf](http://www.mckinsey.com/locations/australia/knowledge/pdf/Extending_LNG_boom.pdf), accessed 13 July 2013.