

From Provider to Parasite

Excess LNG export capacity and state energy policies as emerging threats to WA's domestic gas market, environment, and economy

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Key points in brief

Emerging threats to gas market: LNG exports and barriers to renewable energy

- Rapid growth in LNG production and export capacity in WA has already outstripped the capacity of current and proposed offshore gas fields in Commonwealth waters to supply. This will inevitably place an increasing reliance on the state's domestic reserves and see a growing proportion of these reserves allocated to their lowest-value use as exported LNG.
- Emerging excess LNG export capacity, combined with a lack of renewable energy generation to displace gas in the domestic market will place unsustainable levels of demand on the state's domestic gas supplies in the future.
- The perceived shortage of gas in the WA domestic market is better understood as unsustainable growth in demand. Decisions to allow further extensions or expansions of LNG export capacity and associated onshore projects will further exacerbate this situation by locking in even higher levels of demand on the state's domestic gas reserves.

From provider to parasite: Woodside's Burrup Hub

- Analysis of Woodside's Burrup Hub and North West Shelf LNG facility presented for the first time in this report shows that these developments will transition from a modest provider, to a **net taker of gas** from the WA domestic market in the near future. This is despite recent commitments by Woodside to increase domestic gas supplies.
- Even if all offshore resources currently proposed to supply the Burrup Hub are developed, the **Burrup Hub and associated developments will become the largest single demand on the state's domestic gas reserves**, equal to over 40% of the combined demand on the WA domestic gas market today.

Impacts and implications

- Policy settings that continue to support the rapid expansion of both domestic gas use *and* LNG export capacity will see the WA gas market inevitably take on similar dynamics to the Eastern gas market.
- Not only will this impact the competitiveness of the WA economy by driving up gas prices for consumers and businesses, but it will have other serious negative consequences for the state, including:
 - very significant environmental impacts associated with large-scale onshore gas development,
 - economic and other risks associated with an economy that is highly carbon intensive and not aligned with national or global decarbonisation and temperature goals.
 - Large and growing volumes of WA's domestic gas reserves allocated to their lowest value and highest polluting use.
- Urgent action is required by the State Government to avoid this situation which cannot be resolved through the current approach to domestic gas reservation. A new policy approach is required which must include:
 - a gas substitution and demand management plan for the WA gas market that focusses on replacing gas demand with utility-scale renewable energy,
 - a moratorium on expansion and extensions of existing LNG facilities (including Burrup Hub) and an orderly phase out of excess LNG export capacity, and
 - a protection plan for the state's domestic gas reserves that prioritises critical, high value uses that support rapid decarbonisation.

Summary

This report identifies and analyses several fundamental underlying issues that are presenting serious threats to the WA domestic gas market and gas consumers, as well as the wider Western Australian economy, environment and global climate.

To date, these threats have not been clearly identified in the public debate surrounding the WA domestic gas market, but they must be central to any consideration of domestic gas policy and other state energy policies.

New analysis presented here for the first time demonstrates that the proposed expansions and extensions to the Woodside's Burrup Hub LNG export facilities will result in far greater demand for gas than is able to be supplied by current and proposed offshore gas reserves. This excess LNG export capacity will see a very high level of demand placed on the state's domestic reserves and an increasing proportion of those reserves committed to their lowest value economic use.

This situation is further exacerbated by government policy settings which are encouraging rapid growth in other demand for fossil gas in the state, while simultaneously not moving forward fast enough on development of renewable energy and decarbonising the electricity system which would provide low-cost alternatives to fossil gas use.

Current policy settings on gas in WA are in conflict with decarbonisation goals and undermine the competitiveness of the WA economy. This is occurring at a time when strategic, economic, and climate considerations demand an orderly phase-out of fossil gas in line with the decarbonisation and temperature goals of the Paris Agreement.

The dominant perspective that is presented in the media and by participants in the gas market suggests there will be insufficient supply of gas to meet future domestic market demand, while the only solution presented to this problem is to increase supply. We identify this as the '**domestic gas shortage myth**'.

We argue that a far better perspective for policymakers to adopt is that the market is facing **unsustainable and economically harmful levels of demand**, including from very large emerging excess LNG export capacity. This is a problem which requires urgent attention, however remedies that focus on increasing gas supply are likely to further exacerbate the underlying problem, especially if they involve further expansions and extensions in LNG production capacity.

This analysis demonstrates that WA's growing LNG export capacity has already outstripped the capacity of declining offshore gas fields in Commonwealth waters, and gas exporters are seeking to fill this excess export capacity from the state's domestic gas reserves. This will see WA's largest gas export hub transition from a provider of gas to the domestic market, to very large net **taker** of gas from WA's domestic reserves. If approved, Woodside's plans to extend and increase the capacity of this export facility will strongly exacerbate this transition '**from provider to parasite**'.

Analysis presented for the first time here shows that **in the short term, Woodside's Burrup Hub will be a net taker of gas from the domestic market, rather than a net supplier as the company claims**. If the proposed extension of Woodside's North West Shelf facility is approved, this net demand on WA domestic gas reserves will increase significantly, to around 40% of the total WA domestic gas market, even if all offshore reserves are developed by the company as planned.

If not addressed urgently, this situation will inevitably see the WA gas market take on the same dynamics that have been observed in the Eastern gas market, where a rapidly increasing share of

WA's domestic reserves will be allocated its lowest-value economic use when measured by revenue and employment.

We demonstrate that this excess capacity in the LNG export industry not only threatens the WA economy and existing gas consumers, but it relies on global levels of gas demand which are incompatible with global temperature and decarbonisation goals under the Paris Agreement. A range of other impacts and costs to the state include:

- Continued high levels of carbon pollution in WA and a persistent failure to meet decarbonisation goals.
- WA gas consumers locked into high and increasing gas prices while unable to access cheaper and cleaner electrification options.
- Very significant environmental impacts and other consequences associated with very large onshore gas developments to meet demand for gas from LNG exporters and the domestic market.

These consequences will act together to undermine the competitiveness of the WA economy and create other strategic and economic risks for the state as a whole.

This situation cannot be addressed using the same policy approach that created it. While some elements of the domestic gas reservation policy must be strengthened, this alone will not be sufficient. To address these challenges will require a concerted policy approach which has three main elements:

- 1) A moratorium on expansion and extensions of existing LNG facilities, and an orderly phase out of low-value LNG export capacity in line with decarbonisation goals and reservation of the state's domestic gas resources.
- 2) A proactive demand management and substitution strategy to phase out gas use in the WA domestic market.
- 3) A legislated domestic gas protection plan to reserve domestic gas for high priority and high value uses consistent with supporting rapid electrification and decarbonisation.

Background

Ongoing growth in the demand for gas in the domestic gas market has generally been considered a good thing for Western Australia. Other than during times of unplanned disruption, no policy consideration has been given to the reduction of gas demand, and the state continues to actively encourage and even subsidize large new industrial gas demand. In so far as the state has sought to manage the gas market, the focus of policy attention has been on facilitating and securing supply rather than managing demand.

The primary strategy that Governments have employed to secure this supply has been through promoting and facilitating the construction of large LNG export facilities fed by gas from Commonwealth waters, with a requirement to supply a proportion of produced gas to the domestic market. Aside from this domestic gas reservation, this approach has largely treated overall gas export capacity as a matter of commercial decision-making by gas exporters rather than a matter of strategic public policy.

This has led to a very large LNG production capacity being built in WA, rivaling the size and scale of some of the world's largest LNG exporters. The domestic gas contribution from these facilities has

underpinned the highest levels of gas generation for electricity of any state and one of the largest industrial and mineral processing industries on the planet.

With a total nameplate capacity of over 50 million tonnes per year, WA LNG production already accounts for over half of Australia's total LNG exports.¹

The total gas use by the WA LNG export facilities, not counting losses, was about 2,900 PJ or 7,900 TJ/day in 2021/22. This includes gas equivalent to 10% of the exported LNG used by the LNG facilities themselves (equivalent to about 226 PJ/yr of gas or 728 TJ/day). This represents a total demand from WA LNG export facilities of around 7 times the size of the total aggregate demand in the WA domestic market (or around 1,133 TJ/day in 2023).²

The success of WA's domestic gas reservation policy relies on offshore reserves of a size and a rate of production sufficient to supply the export facilities, including their contribution to the domestic gas market. While this has been the prevailing situation until recently, the WA gas industry now faces a structural shift.

As offshore reserves are depleted and LNG export capacity continues to expand, the industry is passing a threshold where the increasing capacity of LNG export facilities is larger than the remaining and planned offshore reserves can supply. This represents a rapidly emerging problem of excess LNG export capacity in the state. To fill this supply gap, LNG exporters are already contracting for gas to supply LNG export facilities from onshore reserves that are owned by the state and have previously been reserved for the domestic market.

Current policy settings have encouraged an ongoing overbuild of LNG export capacity in WA, which is now presenting a significant risk to the strategic and economic interests of the state, including a major emerging threat to domestic gas security and a fundamental incompatibility with emissions reduction and temperature goals.

The overbuild presents a number of serious strategic problems for WA including:

- Continued increasing carbon pollution in Western Australia and failure to meet State and national emissions reduction targets.
- A large and expanding fossil fuel export industry that is predicated on global LNG demand that is not consistent with global emissions reduction or temperature goals.
- A major emerging threat to WA's domestic gas market as LNG facilities transition from net providers to very large net demand centers from WA's domestic gas market.

Policy arrangements that were intended to underpin the security of WA's domestic gas market in the past are now having the opposite effect and will increasingly exacerbate the emerging structural problems affecting gas supply as described here.

Specifically, by approving ongoing expansions and extensions of LNG production facilities at the Burrup Hub without identified reserves of offshore gas to supply them, the WA Government will dramatically increase the severity of these problems.

¹ Government of Western Australia, Department of Jobs, Tourism, Science, and Innovation (2023) Western Australia LNG Profile July 2023 <https://www.wa.gov.au/system/files/2023-07/walngprofilejuly2023.docx>

² Australian Energy Market Operator (2023) 2023 Western Australia Gas Statement of Opportunities https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gas-statement-of-opportunities-wa-gsoo.pdf?la=en

The Domestic Gas Shortage Myth

This report argues that concerns about an anticipated shortage of gas to supply the WA domestic market are misplaced given that the level of demand for gas in WA is largely a function of public policy and climate change, economic and strategic considerations demand an orderly phase-out of fossil gas use in the state.

Concerns about gas shortages should therefore be understood primarily as a function of inappropriate public policy settings that continue to encourage and subsidize increased demand for fossil gas while at the same time presenting effective barriers to fuel switching and electrification, which would reduce both demand and cost exposure to energy consumers.

The AEMO projects that gas demand for electricity generation in WA will double by 2030 as coal-fired power stations are retired and insufficient renewable energy and storage capacity comes online to replace this generation capacity. In addition, major new demand centers like the Perdaman Urea plant and the H2Perth grey Hydrogen project are supported and subsidised by the WA Government³.

This outcome is not inevitable for a number of reasons.

First, AEMO modelling rules may be excluding a number of significant utility-scale renewable energy projects which are yet to reach financial closure and upgrades to transmission lines and other essential infrastructure may yield further increase in renewable energy capacity beyond what AEMO projections suggest. Historically, overly conservative projections of growth in renewable energy have led to poor policy.

Second, growth in gas demand for other industrial uses is also not inevitable but is a function of current policy settings which encourage and subsidize developments that use gas while presenting barriers to renewable energy alternatives.

Notwithstanding uncertainties in AEMO modelling, the lack of utility-scale renewable energy and storage to replace coal generation reflects policy settings in the electricity market which currently do not provide a supportive environment for such developments.

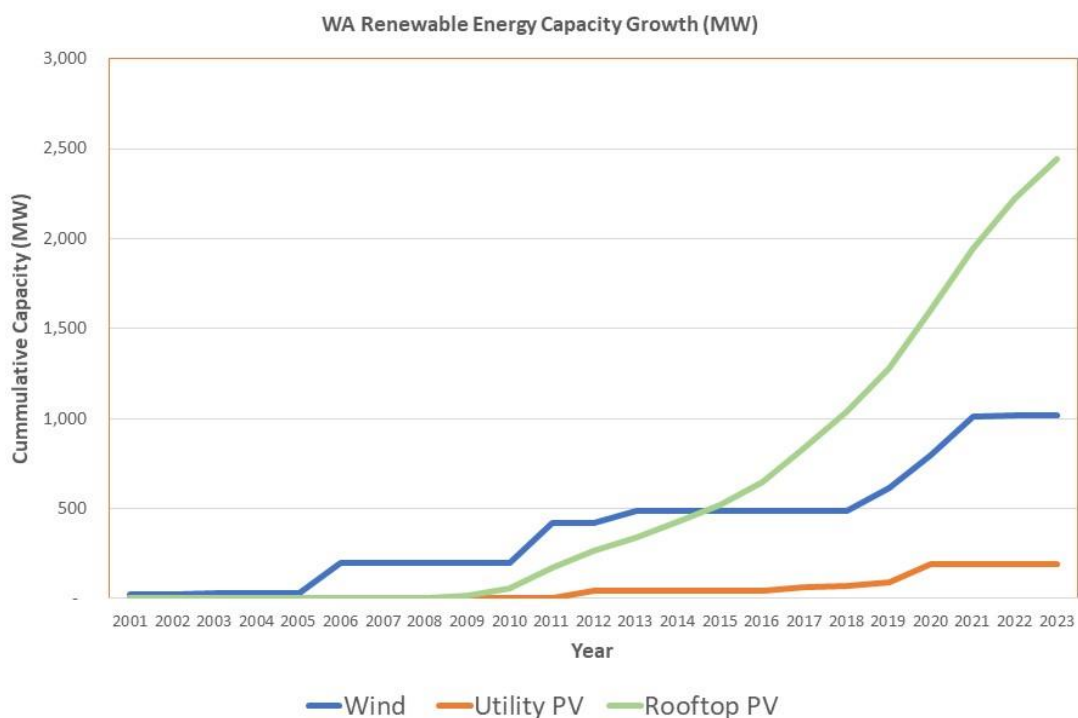
This is well documented in the 2024 report *Western Australia Renewable Energy Transition Survey Headwinds and Barriers*, which surveyed a representative sample drawn from renewable energy project proponents, Gentailers (electricity generators and retailers) and industrial gas users decarbonising primarily via electrification

The survey results show that there are significant obstacles that need to be addressed in order for the state to meet its published renewable energy targets in a timely manner. As data in Figure 2 – WA RE Capacity Growth to 2023 indicates, and feedback from respondents confirms, there is a slowing down of South West Interconnected System (SWIS) connected RE projects reaching final investment decision and coming online in Western Australia, excluding rooftop solar and large-scale battery storage. Renewable Energy projects in Western Australia – both entering construction and operation – have flatlined in recent years, despite the WA Government’s own modeling showing we will need 50 gigawatts of new renewable energy to come online by 2042.

³ Climate Analytics, 2023 Perdaman urea plant to increase emissions in Western Australia and misses green fertiliser opportunity <https://ca1-clm.edcdn.com/assets/perdaman-1.pdf?v=1697125878>

If policy and public spending were adjusted to support a rapid build-out of renewable energy and storage, and if subsidies and other support for new industrial developments encouraged electrification, then the projected increase in gas demand would not occur. Such measures, coupled with a proactive gas demand management and phase-out plan for the state is likely to yield significant economic and strategic benefits for the state, while supporting reduction in carbon pollution and avoiding the projected shortages of gas in the domestic market currently indicated by AEMO.

Figure 1: WA Renewable energy capacity growth over time, showing no growth in utility-scale wind and solar since 2021 and 2020, respectively.



Source: Maywood and Partners Management Consultants⁴ February 2024

Similarly, new and existing industrial gas uses in Western Australia can now, or in the next decade be technically and economically replaced with electrification supplied by renewable energy. This would reduce costs and reduce carbon pollution from these facilities, making Western Australia’s industrial sector both cleaner and more competitive. As new low-carbon technologies emerge and electrification gains pace, this opportunity will continue to grow, and gas demand will decline. In addition, closures and retirement of old and inefficient industrial facilities which currently use large amounts of gas (such as the Alcoa Kwinana facility) will further reduce demand, and in some cases may be preventable if economically viable electrification can be implemented. Current policy settings are presenting barriers to this transition.

⁴ Maywood and Partners Management Consultants (2024) Western Australia Renewable Energy Transition Survey Headwinds and Barriers https://www.bradpettitt.com/wp-content/uploads/2024/03/WA-Renewable-Energy-WA-Survey-Report_1_final.pdf

A program of orderly phase-out of gas demand through demand management, electrification and decarbonisation in line with the emissions reduction and temperature goals of the Paris Agreement would see real demand for gas in WA reduced and support energy consumers to access cleaner and more competitive energy supplies.

A detailed analysis of the policy and investment framework required to support an accelerated rollout of renewable energy and storage potential in Western Australia is beyond the scope of this report, but policy recommendations to provide a framework for an orderly phase-out of gas in Western Australia are presented in the summary.

Declining Reserves and Emerging Excess LNG Export Capacity

Western Australia's gas export industry is at the beginning stages of an inevitable and permanent structural transition, led by the largest and oldest LNG export facility in Australia, Woodside's North West Shelf facility. This has profound implications for the state's domestic gas market and the policy approach that has been taken toward the gas industry in WA to date.

Until now, LNG export facilities in WA have contributed supply to the domestic gas market from offshore gas fields in Commonwealth waters. Now, expanding export capacity and declining offshore reserves mean that LNG exporters are instead looking to supply LNG export capacity from supplies that have been previously reserved for the domestic market. From the perspective of the State's interests (rather than the commercial interests of gas exporters), this is best understood as emerging **excess LNG export capacity**.

This shift will inevitably see the WA gas market take on the same dynamics that have occurred in the Eastern gas market for some time, where demand created by excess LNG export capacity drives up domestic gas prices and creates a driver for large-scale onshore gas developments that damage the environment.

Continuing with the current policy of promoting LNG export projects as a means to secure domestic gas supplies will now have the opposite effect. Instead of securing gas for use in WA, decisions to allow and facilitate increases and extensions to LNG export capacity will accelerate the emergence of excess LNG export capacity and hasten the transition to LNG export facilities, becoming very large net *takers* of gas from the domestic market. This can be seen most clearly with Woodside's Burrup Hub developments, particularly the proposed extension and expansion of Woodside's North West Shelf LNG export facility.

Without urgent and decisive policy action from the State Government, WA's emerging excess LNG export capacity is now identifiable as the single greatest threat to ongoing affordable gas supplies for WA's existing and future gas consumers.

Gas exporters are simply pursuing their commercial interests within the framework provided by a government that has not anticipated or planned for the emerging situation. The commercial interests of the LNG industry to continue extending and expanding LNG export capacity are increasingly misaligned with the interests of the state and WA gas consumers.

This is not a problem that can be addressed by the existing 15% domestic gas reservation policy from offshore fields in Commonwealth Waters. Where LNG export facilities are supplied by state-owned gas reserves, then the imposition of a 15% reservation policy still represents an 85% net loss of gas from what would otherwise be available for domestic use.

This emerging situation of excess LNG export capacity fundamentally changes the dynamics of the WA gas market and the overall cost/benefit of the LNG export industry in Western Australia.

This analysis shows that decisive action by the state government is now required to prevent the state from becoming exposed to very significant and growing economic and environmental risks in the future due to very large volumes of emerging excess LNG export capacity.

Woodside's Burrup Hub is examined here in further detail as the most acute and immediate example of this emerging situation.

From Provider to Parasite - Woodside's Burrup Hub

Contrary to claims by Woodside, from as early as 2025, the company's proposed Burrup Hub developments will be a net taker of gas from the WA domestic market rather than a net supplier.

This is due to a combination of emerging excess LNG export capacity, filled by supplies previously reserved for the domestic market and other large new demand centers that will be created as part of the Burrup Hub developments. In the short term, the Burrup Hub and associated projects will be a net taker of around 80-100 Tj per day from the WA domestic gas market.

Over the longer term, the Burrup Hub will likely present a much larger demand for gas from the domestic market as excess LNG export capacity that cannot be filled from offshore reserves continues to increase over time.

Even if all proposed offshore gas fields, including the Browse Basin, are brought online as proposed, excess export capacity at the Burrup Hub will likely present a longer-term net demand from the domestic market of at least 500 Tj/day and rise by the mid-2030's. **Within a decade, this would see the Burrup Hub become net source of additional demand on the domestic gas market, equivalent to around 40% of total current WA domestic gas demand.**

In the past, approvals and operating licenses for gas export facilities in WA have been linked to identified large offshore gas fields predominantly located in Commonwealth waters. In recent years, Woodside has spearheaded a change to this pattern, seeking unprecedented approvals to continue expanding and operating LNG export facilities at the Burrup Hub at a higher capacity and for decades longer than identified sources of supply gas would otherwise allow. In particular, approval sought by Woodside for the North West Shelf extension to operate at an output of 18.5 million tonnes per year of LNG represents a demand for gas far greater than current and proposed offshore reserves will be able to supply, as demonstrated in the following analysis.

These approvals appear to be contemplated by the State Government without any assessment or regard for the long-term consequences for WA's domestic gas market. Granting further open-ended approvals to Woodside and other LNG exporters will only increase and accelerate the emerging threat they present to the WA domestic gas market.

Burrup Hub in detail

Woodside's Burrup Hub expansion projects include the extension and expansion of two linked LNG export facilities – North West Shelf (or Karratha Gas Plant) and Pluto.

Woodside is seeking approvals to extend the operating life of the NWS LNG facility to 2070 at an expanded capacity of 18.5 million tonnes per year (Mtpa) LNG.⁵ The Pluto Facility is currently undergoing an expansion that will more than double its LNG export output, from 4.9 to 9.9 Mtpa.⁶

Woodside's proposed expansions will see the combined LNG export capacity of the Burrup Hub increase from 21.8 to 28.4 Mtpa of LNG. When energy use to power the LNG facilities is accounted for, this will represent a demand for gas of over 4,750 TJ/day⁷, or 4.2 times the total size of the current WA domestic gas market of about 1,100 TJ/day.

New offshore fields, including Woodside's Scarborough and Browse Basin fields and the Western Gas Equus project, are planned to supply this LNG export capacity.

The Burrup Hub expansion projects also underpin the development of the Waitsia onshore gas project in the Perth Basin, as well as a very large new fertilizer facility on the Burrup (Perdaman) and the construction of Woodside's H2Perth gas fuelled hydrogen facility in Kwinana.

Both the Perdaman and H2Perth facilities present significant new demand centers for gas on the domestic market, while at the same time, the Waitsia project will supply Burrup Hub export facilities with gas from state-owned reserves, further reducing the volume of gas available to the domestic market.

Woodside claims that the Burrup Hub developments will help maintain gas supply in the WA domestic market, when, as a whole, the expanded Burrup Hub will be a modest net taker of gas from the domestic market in the near term. As shown in the table below, the net demand on the domestic market created by Burrup hub projects is around -77 to -100Tj per day.

On 22 April this year, Woodside announced it would supply an additional 50Tj/day to the WA domestic market to help meet the projected shortage.⁸ When this additional gas is accounted for, the net impact on the domestic market from the Burrup Hub is smaller (-27 to -50Tj/day) but will still be negative rather than positive.

⁵ Woodside Energy (2019) *North West Shelf Project Extension Environmental Review Document* https://www.epa.wa.gov.au/sites/default/files/PER_documentation2/NWS%20Project%20Extension%20-%20Environmental%20Review%20Document.pdf

⁶ Bechtel (2023) Pluto Train 2 <https://www.bechtel.com/projects/pluto-train-2/>

⁷ Exported LNG assumed at 55.4 PJ/MtLNG, with about 10% of the energy content of exported gas used in the manufacturer of LNG and not counting losses in the supply chain, production or manufacturing.

⁸ The West Australian (2024) Woodside Energy locks in big boost for WA gas supplies starting May 1 <https://thewest.com.au/business/oil-gas/woodside-energy-locks-in-big-boost-for-wa-gas-supplies-starting-may-1--c-14399276>

Table 1: Summary of Burrup Hub's net impact on the WA domestic gas market (medium-term)

Burrup Hub facility	Impact on WA domestic gas market (Tj/day)	
	<i>addition</i>	<i>removal</i>
Pluto LNG facility		
Scarborough gas	180	
Pluto gas	-	
Perdaman fertiliser plant (linked to Pluto facility)		-125/130
H2 Perth		-40/60
<i>Net impact of Scarborough to Pluto</i>	<i>15 to -10</i>	
North West Shelf LNG facility		
North West Shelf gas	90	
Pluto gas	18	
Waitsia onshore gas supply export LNG		-200
Additional domestic gas announced 22 April 2024	50	
<i>Net impact of North West Shelf LNG</i>		<i>-42</i>
Total net impact of Burrup Hub (medium term)		-27 to -50

Source: AEMO⁹; Woodside Energy¹⁰ Climate Analytics¹¹ The West Australian¹²

The above table outlines the scenario in the short to medium term as the proposed Burrup Hub and related developments come online. Over the longer term, the Burrup Hub is likely to become a much larger net taker of gas from the WA domestic gas market.

⁹ Australian Energy Market Operator (2023) 2023 Western Australia Gas Statement of Opportunities https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gas-statement-of-opportunities-wa-gsoo.pdf?la=en

¹⁰ Woodside Petroleum 2020 ASX Announcement NWS Project Participants execute Gas Processing Agreements https://www.woodside.com/docs/default-source/asx-announcements/2020-asx/nws-project-participants-execute-gas-processing-agreements.pdf?sfvrsn=1379d276_2

¹¹ Climate Analytics (2021) Woodside's Scarborough and Pluto Project undermines the Paris Agreement <https://climateanalytics.org/publications/woodsides-scarborough-and-pluto-project-undermines-the-paris-agreement>

¹² The West Australian (2024) Woodside Energy locks in big boost for WA gas supplies starting May 1 <https://thewest.com.au/business/oil-gas/woodside-energy-locks-in-big-boost-for-wa-gas-supplies-starting-may-1--c-14399276>

Analysis of the proven resources and future development plans of Woodside and other gas companies shows that expanded LNG capacity is highly unlikely to be met by large conventional gas developments in Commonwealth waters as it has been in the past. As a result, the gap between LNG plant processing capacity and available resources will continue to grow over time.

Looking at the Burrup Hub alone, this gas resource gap to feed the LNG export plant exceeds the business as usual for other gas users in the state.

This would see Woodside Burrup Hub facilities emerge as the most significant threat to Western Australia's gas market and energy security under business as usual demands for fossil gas.

Further analysis of each LNG facility at the Burrup Hub is provided below.

North West Shelf LNG facility

The North West Shelf (NWS) facility is the largest LNG export facility in Australia, with current LNG production capacity of up to 18.5 Mtpa of LNG.¹³

In the past, the North West Shelf (NWS) facility has been a significant net gas provider to the domestic market at over 400 Tj/day. However, over the last decade, its contribution has been steadily falling in line with the depletion of the North West Shelf gas fields. Falling production capacity of offshore reserves and changes to the domestic gas reservation from the NWS facility mean that NWS facility now provides just 70Tj/day or around 6% of the gas consumed in WA.¹⁴

Woodside recently announced it would supply an additional 50Tj/day to the WA domestic market from the Pluto fields via the NWS facility.

Even with this additional gas pledged by Woodside, the NWS facility will make a full transition from a net supplier to a net taker of gas from the domestic market when the Waitsia gas project in the Perth Basin begins providing feed gas to the facility for export later this year. With around 200 Tj/day contracted to supply the NWS from the domestic market by the Waitsia project,¹⁵ the net effect of the NWS project on the domestic gas market will be around minus 42Tj/day for the contract period to 2030 (see table above).

Over the longer term, the supply gap facing the NWS facility will steadily grow larger to the point where the demand for feed gas from the domestic market created by this single facility could exceed all other gas users in the state combined.

Even if uncertain offshore gas fields, including the Browse Basin and Equus development, proceed as planned, then the supply gap facing the NWS facility operating at full capacity will only be reduced and delayed, but not be averted.

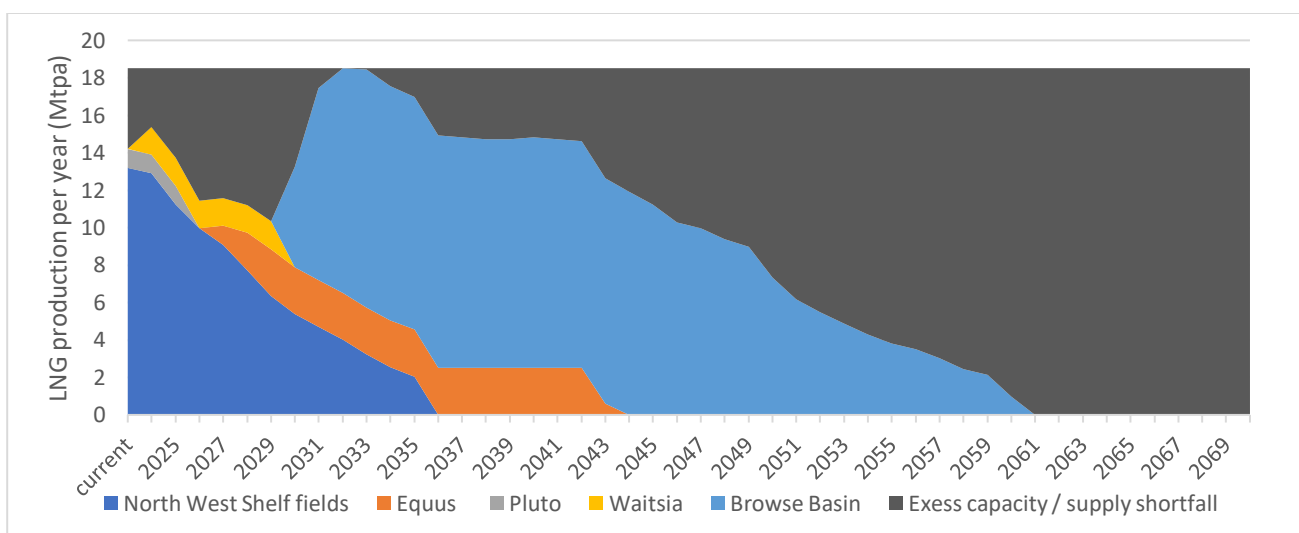
¹³ Woodside Energy (2019) *North West Shelf Project Extension Environmental Review Document*
https://www.epa.wa.gov.au/sites/default/files/PER_documentation2/NWS%20Project%20Extension%20-%20Environmental%20Review%20Document.pdf

¹⁴ Australian Energy Market Operator (2023) 2023 Western Australia Gas Statement of Opportunities
https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gas-statement-of-opportunities-wa-gsoo.pdf?la=en

¹⁵ Woodside Petroleum 2020 ASX Announcement NWS Project Participants execute Gas Processing Agreements
https://www.woodside.com/docs/default-source/asx-announcements/2020-asx/nws-project-participants-execute-gas-processing-agreements.pdf?sfvrsn=1379d276_2

In the event that all proposed offshore developments proceed, the expanded NWS facility is still likely to present a net demand for domestic gas of around 1000 Tj per day in 2026-28, thereafter reducing to briefly hit zero in 2030, before again increasing to over 500 Tj/day and rising by 2036. In this scenario, the NWS facility will present a demand for gas equal to over 40% of the entire WA domestic gas market. This scenario is demonstrated in Figure 1 below.

Figure 12: Gas resource supply gap / excess production capacity at the NWS facility over the proposed life of the NWS extension, assuming Browse Basin and Equus developments proceed as planned.



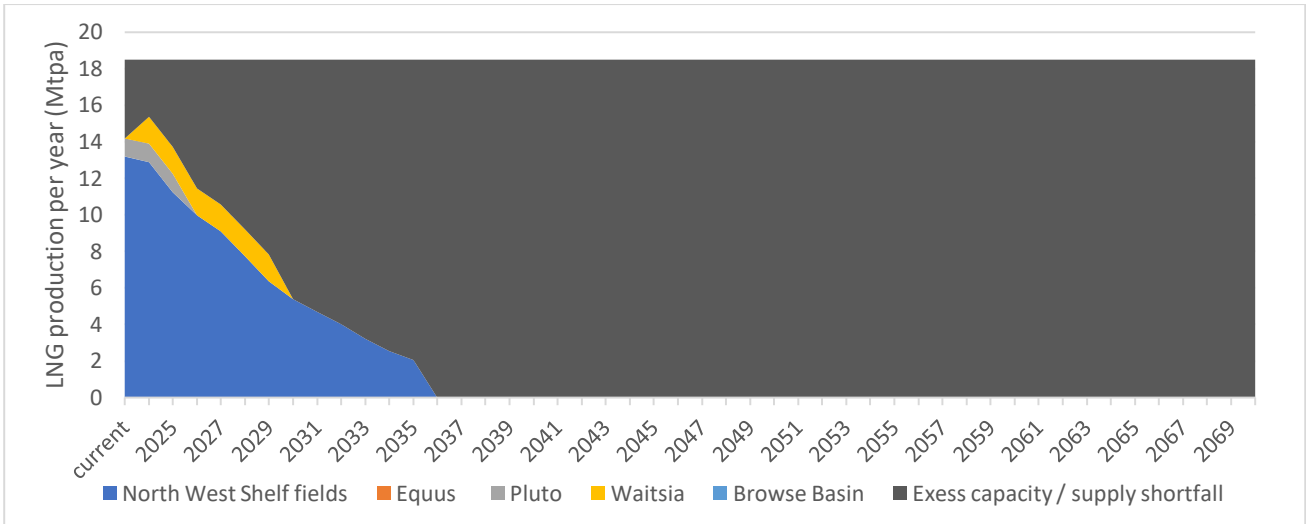
Source: Author calculations using data from KPMG (2022),¹⁶ Woodside Energy (2020),¹⁷ Western Gas (2024)¹⁸ (Data available on request)

Figure 2: Gas resource supply gap / excess production capacity at the NWS facility over the proposed NWS extension, assuming Browse Basin and Equus developments do not proceed.

¹⁶ KPMG (2022) Independent Expert Report for the proposed merger between Woodside and BHP’s petroleum business <https://announcements.asx.com.au/asxpdf/20220408/pdf/457vkk523x0q8z.pdf>

¹⁷ Woodside Petroleum 2020 ASX Announcement NWS Project Participants execute Gas Processing Agreements https://www.woodside.com/docs/default-source/asx-announcements/2020-asx/nws-project-participants-execute-gas-processing-agreements.pdf?sfvrsn=1379d276_2

¹⁸ Western Gas (2024) Our Projects <https://www.westerngas.com.au/project/equus-gas-project>



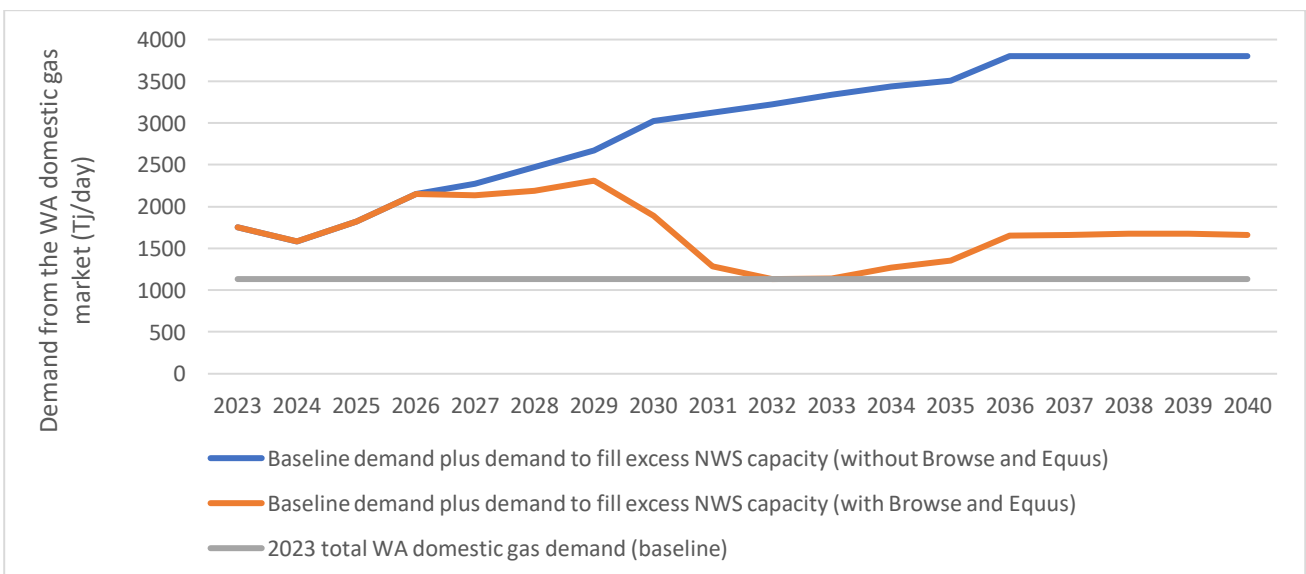
Source: Author calculations using data from KPMG (2022), Woodside Energy (2020) (Data available on request)

If uncertain offshore development plans do not proceed, then the net demand for domestic gas created by the NWS project will be much greater, as the shortfall to supply the facility will be over 1000 Tj/day by 2026, steadily rising to over 2000 Tj/day 2032 and over 2,600Tj/day by 2037 when all identified and committed gas resources have been exhausted. By this time, the excess capacity at the NWS facility will represent the full LNG production capacity of the facility.

In this scenario the NWS facility will present a demand for gas over twice as large as all other current gas consumers on the WA domestic market. This scale of demand could only be met with very large scale onshore gas developments in the Perth and/ or Canning Basins which would have very significant environmental and other impacts.

Figure 3 shows the above scenarios as demand profiles for gas from the WA domestic market, in addition to baseline demand.

Figure 3: Demand profiles for gas from the WA domestic market including 2023 baseline demand and with additional demand generated by excess export capacity at the NWS facility (two scenarios).



Pluto LNG facility

The Pluto LNG facility is currently undergoing an expansion by Woodside to add a second train of 5 Mtpa LNG. This will see the combined capacity of Pluto Trains 1 and 2 grow to 9.9 Mtpa.²⁰ Woodside intends to supply Pluto Train 2, and eventually the full capacity of both Pluto trains with gas from the new Scarborough offshore field once the Pluto gas fields are fully depleted.

The Scarborough gas development is projected to fill the majority of this capacity until at least 2050, so excess capacity at the Pluto facility is unlikely to emerge before this time, assuming the Scarborough production rates are as Woodside anticipates.

Despite significantly underperforming expectations for providing gas to the domestic market, AEMO currently predicts that the Pluto facility will increase domestic gas supply to around 180Tj/day from 2027-28 as the Scarborough gas field is brought online.²¹

According to the Woodside CEO, the Scarborough development ‘enables’ the Perdaman facility²², which will create a new net demand for gas of around 130Tj/day as part of the Burrup Hub.²³ When the new demand created by the Scarborough project is accounted for, the Pluto facility will supply a net amount of 50 Tj/day to the WA domestic market, assuming Woodside fulfills its domestic gas obligations.

The net contribution that the expanded Pluto LNG facility will make (assuming domestic reservation requirements are met) would be equivalent to just 4% of the total 2023 aggregate demand in the WA domestic gas market.

Economic costs of WA’s LNG exports

The use of gas for export as LNG is not only highly polluting but is also the lowest value economic use of the state’s gas resources, yielding less economic benefits or employment than any other sector.

¹⁹ Australian Energy Market Operator (2023) 2023 Western Australia Gas Statement of Opportunities https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gas-statement-of-opportunities-wa-gsoo.pdf?la=en

²⁰ Bechtel (2023) Pluto Train 2 <https://www.bechtel.com/projects/pluto-train-2/>

²¹ Australian Energy Market Operator (2023) 2023 Western Australia Gas Statement of Opportunities https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gas-statement-of-opportunities-wa-gsoo.pdf?la=en

²² ABC News The Business VIDEO: Oil and gas still has a future after 2050, Woodside boss says <https://www.abc.net.au/news/programs/the-business/2024-02-27/oil-and-gas-still-has-a-future-after-2050/103519402>

²³ Australian Energy Market Operator (2023) 2023 Western Australia Gas Statement of Opportunities https://aemo.com.au/-/media/files/gas/national_planning_and_forecasting/wa_gsoo/2023/2023-wa-gas-statement-of-opportunities-wa-gsoo.pdf?la=en

This means that every Pj of gas that is exported as LNG, rather than put to higher productive uses in the local economy represents a direct cost to the State’s economy and Western Australian taxpayers.

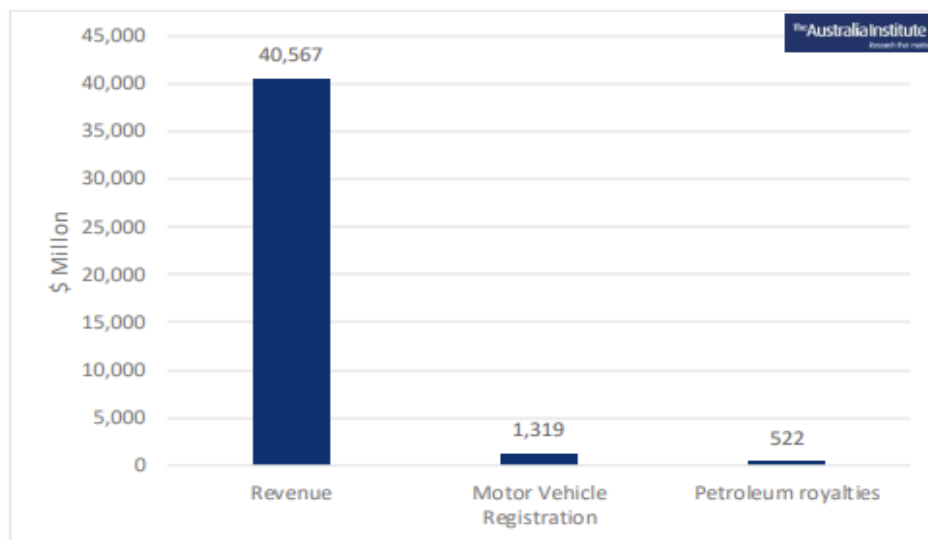
The LNG sector performs particularly badly against three key economic indicators:

- employment,
- revenue paid to government, and
- dividends to Australian investors.

According to recent research by the Australia Institute:²⁴

- Despite the LNG export industry being responsible for nearly 30% of direct carbon pollution from WA, combined petroleum royalties make up just 1.3% of the state’s budget. This is less than half the revenue received every year from vehicle registration charges in WA.
- Federal taxes paid by Chevron, Exxon, Woodside and Shell raise less money than beer excise.
- Just 0.7% of the Western Australia’s workforce is employed in oil and gas extraction. The oil and gas sector is the smallest employer of any sector in the state, with the lowest job intensity of any Australian industry.
- Overall, LNG projects operating in WA are at least 83% foreign owned, meaning that the vast majority of profits and dividends accrue to shareholders outside of Western Australia.

Figure 4: WA Government revenue, petroleum royalty & vehicle registration, 2024-25

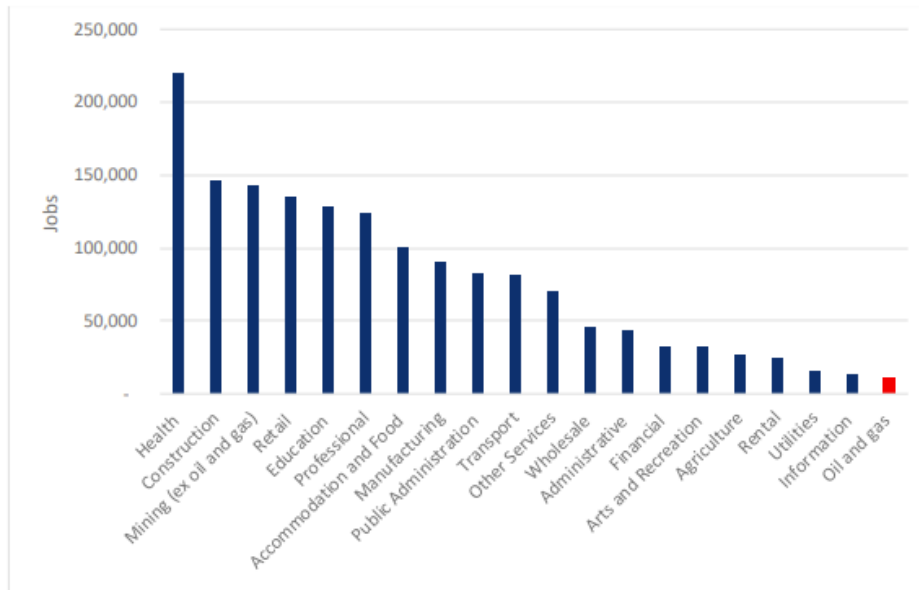


Source: WA Government Budget; The Australia Institute²⁵

Figure 5: Employment by sector in Western Australia

²⁴ The Australia Institute (2024) *Gas in WA: The Economy* <https://australiainstitute.org.au/wp-content/uploads/2024/05/P1533-Gas-in-WA-The-economy-Web-1.pdf>

²⁵ WA Government (2023) WA Budget 2023-24, Budget Paper No. 3 Economic and Fiscal Outlook, <https://www.ourstatebudget.wa.gov.au/2023-24/budget-papers/bp3/2023-24-wa-state-budget-bp3.pdf>



Source, Australian Bureau of Statistics; The Australia Institute²⁶

Environment and climate impacts of gas in Western Australia

Aside from the other issues raised in this report, continuing with the current policy settings for Western Australia’s gas industry is not a desirable or viable option due to the increasing and unsustainable impact of these industries on the climate and environment.

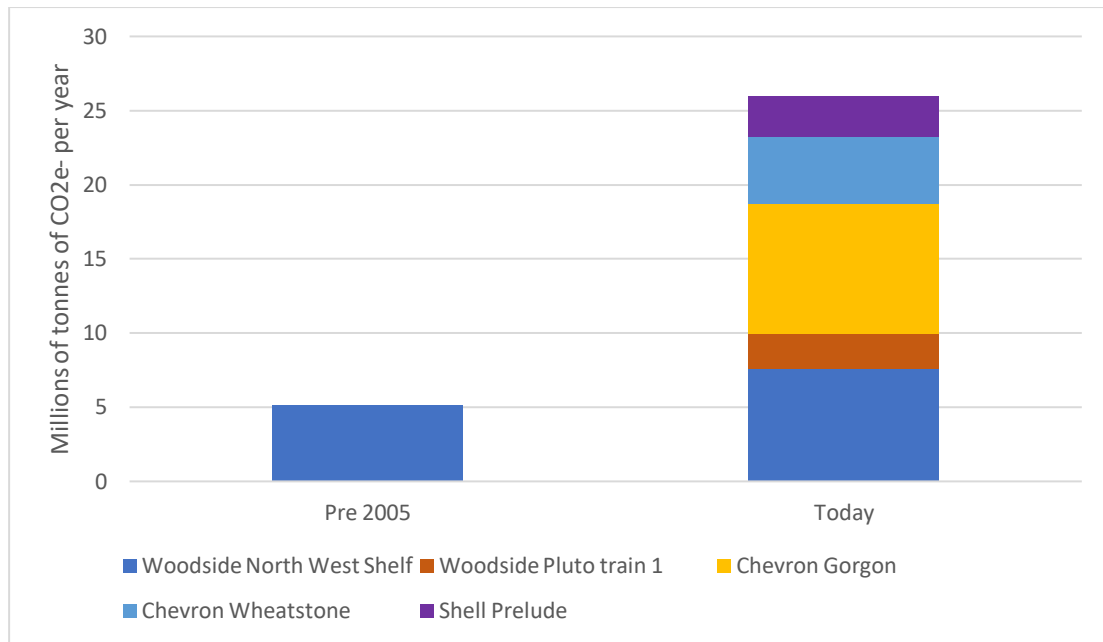
Gas use and LNG production accounts for the largest increase in carbon pollution globally over the last decade. Continued extension and expansion of WA’s LNG export capacity is inconsistent with state, national and international climate and emissions reduction goals and relies on levels of global gas demand that are not aligned with the goals of the Paris Agreement.

LNG production and domestic gas use accounts for the largest and fastest growing contribution to Western Australia’s total carbon emissions and is the primary reason why Western Australia has seen continued increases in emissions since 2005.

National and state emissions reduction goals are set according to 2005 baselines, however direct emissions from LNG facilities in Western Australia have grown over 400% since 2005, and are continuing to increase today with further expansions of LNG export capacity.

Figure 6: Direct carbon pollution from WA gas export facilities pre 2005 and today

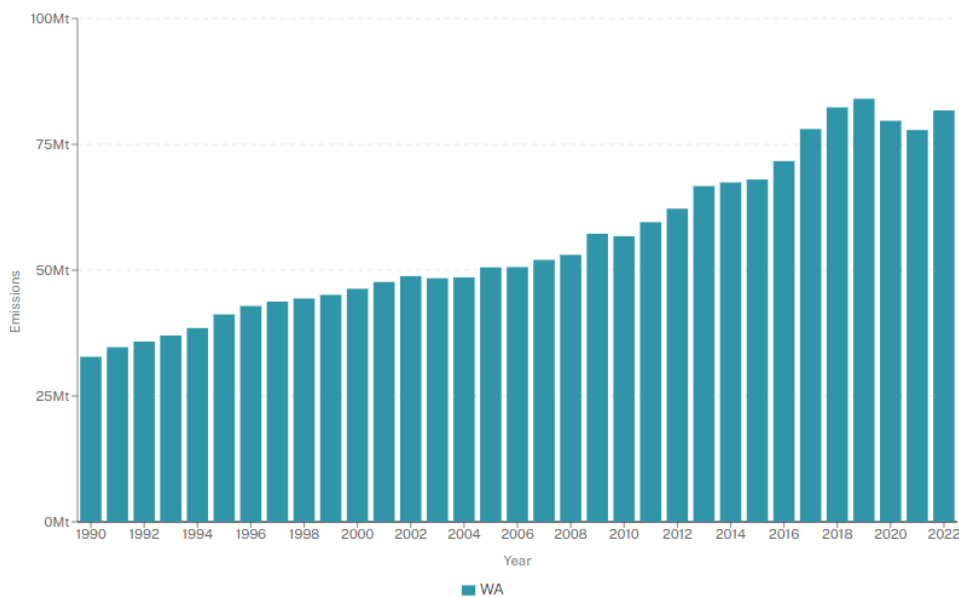
²⁶ ABS (2023) Labour Force, Australia, Detailed, Table EQ06, averaged November 2022- November 2023. <https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australiadetailed/latest-release>;



Source: Clean Energy Regulator²⁷

This growth in emissions from LNG exports has driven a 53% increase in total energy emissions in Western Australia since 2005, with the LNG industry responsible for nearly 80% of the growth.

Figure 7: Growth in WA energy sector emissions since 2005



²⁷ Australian Government Clean Energy Regulator Safeguard Baselines Data <https://cer.gov.au/markets/reports-and-data/safeguard-baseline-data>; Pre-2005 emissions assumes current emissions intensity for North West Shelf LNG facility at a reduced production capacity of 12.5Mtpa LNG prior post-2005 expansions.

Source: Australia's National Greenhouse Accounts²⁸

Indirect emissions from WA LNG exports

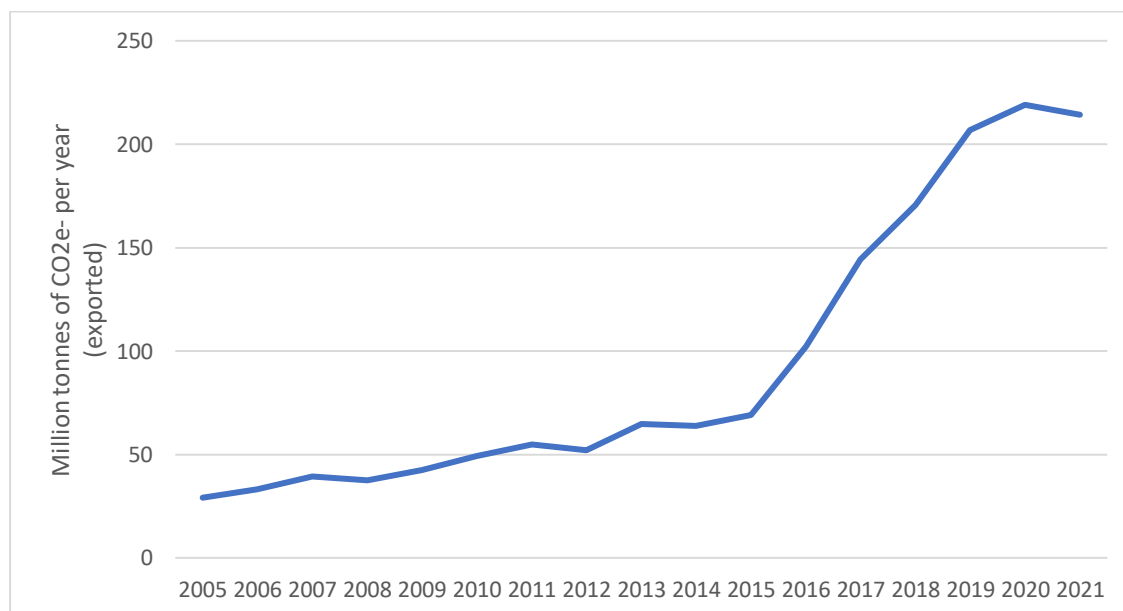
For every tonne of emissions that the LNG export sector produces here in Western Australia, just over 6 tonnes of indirect emissions are produced overseas. This results from emissions at every stage in the value chain including from transport, regassification, distribution and end-use combustion.

Current total emissions from WA LNG production are around 187 Million tonnes CO₂ per year,²⁹ far larger than Western Australia's total domestic emissions from all sources.

Western Australia's LNG production and export capacity accounts for more than half of Australia's total LNG exports. Nationally, the rapid increase in LNG production capacity, led by growth in Western Australia has seen a rapid rise in exported carbon pollution.

Total exported emissions from LNG production in Australia were nearly 220 million tonnes of CO₂ in 2022, representing a 650% increase compared with 2005 levels (see figure 8).

Figure 8: Growth in exported CO₂ from Australia's gas production since 2005



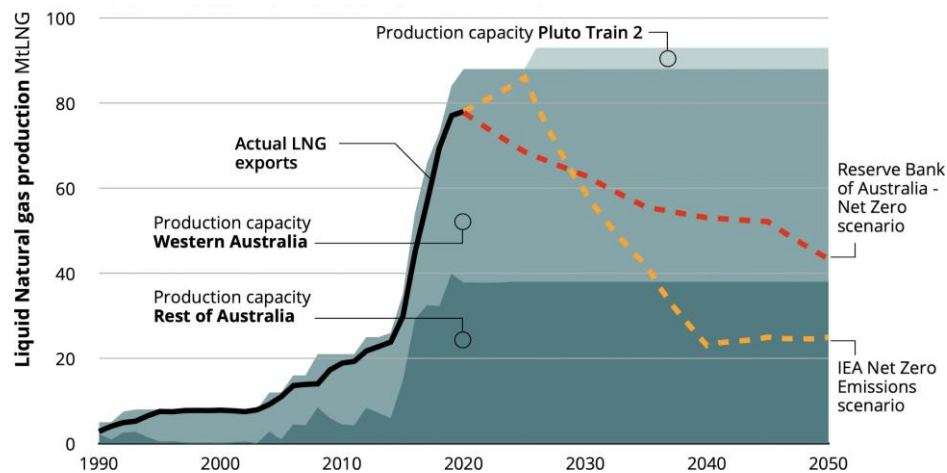
²⁸ Department of Climate Change, Energy, The Environment and Water (2024) *Australia's National Greenhouse Accounts, Emissions by State and Territory* <https://greenhouseaccounts.climatechange.gov.au/>

²⁹ Calculated from LNG export nameplate capacity of 51.5Mt per year multiplied by standard factors for Scope 3 emissions intensity for Australian LNG exports of 3.13 tonnes of CO₂ produced per tonne of LNG exported (Woodside, Ecoinvent) plus direct emissions produced in Australia.

Source: International Energy Agency³⁰

LNG emissions compared with global temperature goals

Analysis by Climate Analytics, Australian Industry Energy Transitions Initiative and others shows that LNG capacity in WA and Australia must decline significantly and quickly to be consistent with the world meeting the Paris Agreement 1.5 degree temperature goal.



Source: Climate Analytics³¹

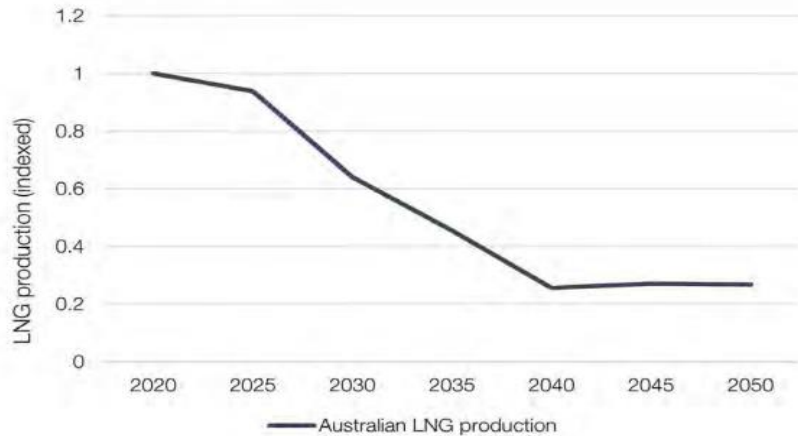
The Australian Industry Energy Transitions Initiative, which includes Woodside, BHP, and other partners has also examined LNG production pathways in Australia. Guided by the International Energy Agency NZE scenario (which has since been updated to include less fossil gas), the Australian Industry ETI assumes a 36 per cent reduction in Australian LNG exports between 2020 and 2030 and a 73 per cent reduction between 2020 and 2050 would be necessary, in response to emissions reductions in key export markets (such as China, Japan and South Korea).³²

Figure 10: Australian LNG production scenario consistent with global 1.5 degrees temperature scenario

³⁰ International Energy Agency *World Energy Balances* (2021 data) <https://www.iea.org/data-and-statistics/data-product/world-energy-balances>

³¹ Climate Analytics (2021) *Warming Western Australia How Woodside's Scarborough and Pluto Project undermines the Paris Agreement* https://ca1-clm.edcdn.com/assets/climateanalytics_scarboroughpluto_dec2021.pdf

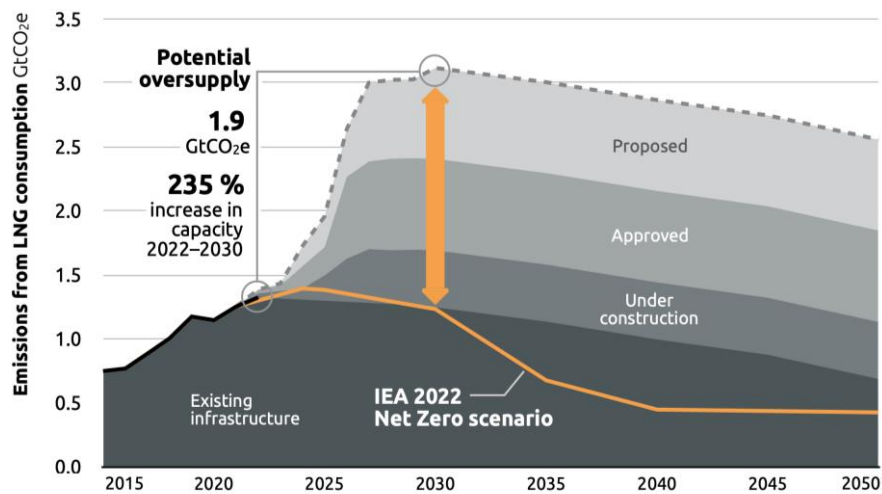
³² Australian Industry Energy Transitions Initiative (2023) *Pathways to industrial decarbonisation Positioning Australian industry to prosper in a net zero global economy* <https://energytransitionsinitiative.org/wp-content/uploads/2023/08/Pathways-to-Industrial-Decarbonisation-report-Updated-August-2023-Australian-Industry-ETI.pdf>



Source: Australian Industry Energy Transitions Initiative

Global Climate Action Tracker has identified an industry pattern of investment globally in new and expanded LNG production capacity which represents a massive oversupply of LNG compared with what is required to meet net zero energy scenarios, undermining the 1.5°C goal of the Paris Agreement.

Figure 11: Current global plans for LNG production capacity compared with 1.5 degrees net zero scenario



Source: Climate Action Tracker³³

Carbon pollution from Woodside’s Burrup Hub

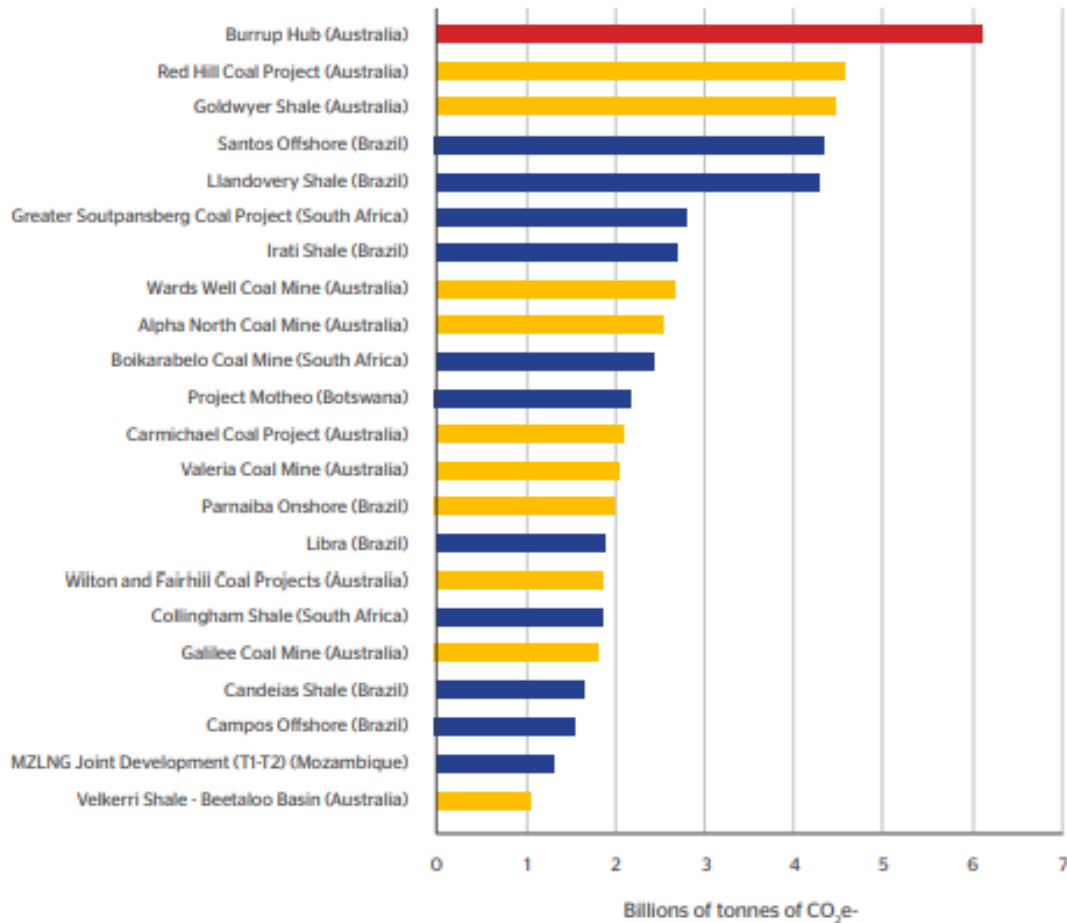
Aside from the threat Woodside’s Burrup hub developments present to the WA gas market, they will also be a globally significant source of carbon pollution. ‘Carbon bombs’ are identified in the

³³ Climate Action Tracker (2022) Massive gas expansion risks overtaking positive climate policies New CAT analysis shows LNG expansion plans threaten 1.5°C warming limit https://climateactiontracker.org/documents/1094/CAT_2022-11-10_GlobalUpdate_COP27.pdf

international literature as fossil fuel projects which will result in over 1 billion tonnes of carbon pollution.

Woodside’s proposed Burrup Hub developments have been identified as the largest new carbon bomb in the Southern Hemisphere, with total lifetime emissions of over 6 billion tonnes CO₂e-.³⁴

Figure 12: New fossil fuel projects identified as carbon bombs (over 1 billion tonnes of CO₂e-) in the Southern Hemisphere



Source: Australian Conservation Foundation and Verstegen (2024)

Total lifetime emissions from the Burrup Hub are many times larger than Australia’s annual emissions from all sources and Australia’s cumulative abatement efforts from all measures.

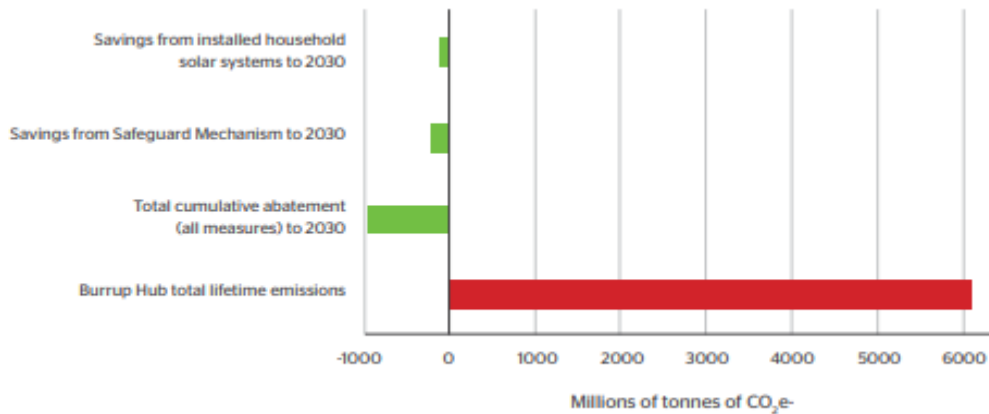
Burrup Hub lifetime emissions are roughly:

- six times larger than the entire cumulative abatement effort that will be delivered by all Australian climate policies between now and 2030
- more than 13 times greater than Australia’s total annual greenhouse gas emissions from all sources.

³⁴ Australian Conservation Foundation (2024) Woodside’s Burrup Hub carbon bomb in perspective https://assets.nationbuilder.com/auscon/pages/23223/attachments/original/1710373378/ACF_Burrup_Hub_report.pdf?1710373378

- more than 30 times greater than the total cumulative savings that will be achieved by the Australian Government’s Safeguard Mechanism from all industrial facilities in Australia from now until 2030.

Figure 13: Burrup Hub total lifetime emissions compared with savings expected from Australia’s climate policies and measures to 2030



Source: Australian Conservation Foundation and Verstegen (2024)

Other impacts on the environment and communities

Offshore gas developments and LNG production infrastructure have already caused considerable impacts to Western Australia’s environment, communities and cultural heritage. These impacts are likely to increase further where the supply of LNG export gas is met through development of onshore and unconventional gas resources in WA.

In order to supply the very large demand created by emerging excess LNG export capacity from onshore and unconventional developments, the domestic carbon emissions, impacts on the environment, communities, groundwater and agricultural land will be very significant indeed.

This presents an unprecedented threat to the environment, heritage, and agricultural values in the Perth Basin (Midwest) and Canning Basin (Kimberley). The significance of this threat is difficult to overstate. For example, if well productivity in the Canning Basin is similar to what has been seen in US shale plays, then over 10,000 wells would be required to be drilled and fracked, impacting an area of over 1000 square kilometres in the iconic Kimberley region, just to supply excess capacity in Woodside’s North West Shelf facility over its proposed operating life, assuming all currently identified offshore gas developments proceed as planned.

If this scenario eventuates, the cost to the state will be far higher than the impact on the state’s domestic gas market alone.

Urgent action required by State Government

As demonstrated in this report, maintaining policy settings that support and facilitate expansion of both domestic gas use *and* export capacity will see the WA gas market inevitably take on similar dynamics to the Eastern gas market.

In this scenario, excess export LNG capacity will inevitably place very high levels of demand on the state's domestic gas supplies led by Woodside's North West Shelf LNG facility. Not only will this impact the competitiveness of the WA economy by driving up gas prices for consumers and businesses, but it will have a number of other serious negative consequences for the state.

These include very significant environmental impacts associated with large-scale onshore gas development, as well as economic and other risks associated with an economy that is highly carbon intensive and not aligned with global decarbonisation and temperature goals.

Policy recommendations

The following recommendations are presented as a framework for public policy to respond to this situation.

- 1) Develop a proactive gas substitution and demand management strategy for the WA domestic market.** This should set out a plan for the orderly phase-out of gas from the domestic energy market in line with the decarbonisation goals of the Paris Agreement.

Such a plan should include the following essential components:

- Utility-scale Renewable Energy:** A plan for investment, infrastructure and market reform to replace coal-fired electricity generation and meet demand growth with utility-scale renewable energy and storage so that gas demand for electricity generation declines rather than increases.
- Industrial Gas Switching:** A major program to support, encourage and facilitate electrification and fuel switching by potential new and existing industrial gas consumers with targets to reduce gas demand over time.
- Commercial and Residential Electrification:** A program to rapidly scale up the electrification and phase out the use of pipe gas in the household and commercial sectors.

- 2) Develop a domestic gas protection strategy to reserve WA's domestic gas for high priority and high value uses consistent with supporting rapid electrification and decarbonisation.**

Essential components of this strategy should be:

- Urgently legislate to place a **permanent ban on the export of gas from WA's domestic gas reserves**, including the Canning Basin, and other sources historically reserved for the domestic market. This would see the current policy arrangements for the Perth Basin legislated, reinstate the ban on exports from the Canning Basin, and extend this to gas reserves in State Waters.
- Establish a **WA domestic gas use strategy** that ensures remaining uses of gas are put towards the highest strategic and economic value of the resource. This would prioritise gas supplies to uses which genuinely facilitate a transition to a lower carbon economy, rather than the lowest value and highest pollution uses such as export of LNG.

3) Implement a moratorium on further growth, and an orderly phase out of excess LNG export capacity.

This should include the following high priority and urgent actions:

- a) Place an immediate **moratorium on developing new or expanded LNG export capacity** in WA
- b) **reject applications from Woodside** and other LNG exporters to operate LNG export facilities at a capacity beyond what can be supplied by existing committed offshore gas resources in Commonwealth Waters.
- c) In particular, **reject Woodside's current proposal** to extend the operation of excess capacity at the North West Shelf LNG facility to 2070. Woodside's proposal will lock in gas demand for export from this facility which could rise to several times the size of the entire current WA gas market.
- d) Develop and legislate a plan for the **orderly retirement and decommissioning of excess LNG export capacity in WA** as existing offshore gas resources supplying these facilities are depleted, and in line with the decarbonisation goals of the Paris Agreement. This should start with the permanent decommissioning of excess capacity at Woodside's North West Shelf LNG facility as soon as possible.