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Senate Standing Committees on Environment & Communications  
Department of the Senate  
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*Submitted via online portal*

## Submission: Inquiry into the Middle Arm Industrial Precinct

Tamboran Resources ('Tamboran') welcomes the opportunity to provide a submission to the inquiry into the Middle Arm Industrial Precinct.

Australia faces an energy supply crisis, with a growing risk of shortfalls in gas supply to the east coast market. Without government investment and support to encourage investment in the gas sector, Australian households and businesses could face increased blackouts and supply disruptions. This will not only hurt ordinary Australians and businesses, but also poses a significant security risk to the Australian Government.

As global markets recovered from COVID-19 lockdowns that reduced natural gas demand over the previous two years, global oil and gas supply was subsequently impacted by Russia's invasion of the Ukraine in early 2022. In the NT, gas production from Eni's Blacktip field has fallen away in recent years to approximately 50 TJ per day, leaving an impending gas shortage for Territorians.

The growing risk of gas supply shortfalls in Australia and in global markets is having a material impact on the cost of living for Australian families.

Right now, Australia has the opportunity to address those issues and secure an affordable and reliable domestic supply through our project in the Beetaloo Basin ('Beetaloo'). The benefits of which will put downward pressure on gas prices, meaning cheaper electricity for Australian households and industry.

Tamboran's project is poised to significantly contribute to the Australian Government's goal of achieving Net Zero emissions by 2050 and meeting its commitments under the Paris Agreement. Subject to rigorous scientific and environmental assessments, Beetaloo gas will offer a dependable route for Australia's energy transition. Additionally, the project will provide



neighbouring economies with access to reliable gas as an alternate to coal imports for their heavy emitters.

Subject to environmental approvals, our new gas project will support the creation of new jobs, providing a significant boost to the NT economy as well as secure, skilled jobs and business opportunities for locals. Tamboran is working with Native Title Holders and the Northern Land Council ('NLC') to ensure the project is a genuine partnership that represents significant and real economic benefits for the people of the NT.



## Units of Measurement

<b>BOE</b>	Barrel of oil equivalent
<b>KBOE</b>	Thousand barrels of oil equivalent
<b>J</b>	Joule
<b>TJ</b>	Terajoule
<b>PJ</b>	Petajoule
<b>MMCF</b>	Million cubic feet
<b>MMBtu</b>	Metric Million British Thermal Unit
<b>MTPA</b>	Million Tonnes Per Annum
<b>BCF/d</b>	Billion Cubic Feet per day



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## Executive Summary

The Middle Arm Sustainable Development Precinct, herein referred to as 'Middle Arm', or 'the Precinct', is a NT Government initiative supported by the Commonwealth ('Commonwealth') Government as a key component in the NT's long-term economic development strategy. The Precinct is a master-planned industrial development that will facilitate major investment and export opportunities in the rapidly expanding sectors of critical minerals processing, hydrogen, carbon capture, advanced manufacturing and lower emission energy and fuels (blue hydrogen and natural gas).

Importantly, the Precinct's highly strategic location, in proximity to some of the world's largest and fastest growing markets in the Indo-Pacific, will generate direct economic opportunities for Northern Australia. Being close to high growth and high demand Asian markets such as Japan, Korea and China enables lower transport costs and therefore confers a unique benefit for Australian trade relations. Travel time for trade vessels from Middle Arm to Singapore is less than 4 days, only 6 days to Japan or China, and only 8 days to India. These travel times are significantly less than most other Australian export hubs.

The Middle Arm Peninsula is already home to the Santos Darwin LNG and the INPEX Ichthys LNG processing facilities, and Tamboran has announced plans for an LNG facility ('NTLNG') targeting Net Zero Scope 1 and 2 emissions for an initial production of 6.6 MTPA of LNG ('liquefied natural gas'). LNG is a crucial component in the present and future role of Middle Arm, complementing a wide variety of significant industry investments being actively planned.

Production tests on Tamboran's assets in the Beetaloo indicate that the gas in the basin generally has lower carbon dioxide ('CO<sub>2</sub>') content than industry average for gas fields currently in production or under development in the north-west of Australia. This low reservoir CO<sub>2</sub> gas from the Beetaloo Basin, approximately 640 kilometres to Middle Arm's south, will provide an ongoing secure, long-term source of gas both for LNG export and as an industrial feedstock and energy source necessary for Middle Arm's development.

Whilst heavy industries in other parts of Australia continue to struggle with reducing their dependence on coal-fired power, the sustainability credentials of Middle Arm offer a model for other industrial developments to emulate. Tamboran is pleased be contributing to global efforts to reduce emissions as part of other world-class industrial sustainability objectives at Middle Arm. Middle Arm's new industries will be supported together by either new renewable power sources or low reservoir CO<sub>2</sub> natural gas from the Beetaloo Basin. Under the Commonwealth's new Safeguard Mechanism, natural gas production in the Beetaloo Basin is now required to have Net Zero Scope 1 greenhouse gas ('GHG') emissions and is expected to be the lowest Scope 1 GHG intensity natural gas sourced anywhere the world.

By exporting significant LNG volumes to the Indo-Pacific, the largest global reductions in GHG emissions associated with the Beetaloo Basin are anticipated to come from the Scope 3 emissions reductions. When used to generate electricity, natural gas produces 50% less GHG emissions compared to coal. Beetaloo gas exported from Middle Arm could assist the Indo-Pacific to reduce emissions by displacing coal with natural gas. A reliable supply of LNG from Middle Arm, using natural gas sourced from the Net Zero Scope 1 Beetaloo Basin, has the potential to be one of Australia's largest contributions to reducing global GHG emissions.



Achieving global emission reduction targets and developing new supplies of natural gas are not mutually exclusive and despite the negative sentiment towards fossil fuels in some quarters, natural gas offsetting coal-fired power generation will deliver a fundamental step-change in reducing GHG emissions. It is the ability for natural gas to play a key role in affordable decarbonisation that we are continuing to focus our efforts on commercialising the Beetaloo Basin's low-CO<sub>2</sub> shale gas reservoirs.

Sustainable development at Middle Arm will contribute to economic prosperity for Northern Australia by providing common use infrastructure for local communities and assuring supply chain security and sovereign capability across key industries. All of these outcomes are of strategic and lasting value to Australia.

The NT's Middle Arm development and the NT gas industry continue to receive strong public support amongst Territorians. It is regrettable that only now some seek to oppose the NT's own strategy for sustainable development at Middle Arm, a location that was first conceived as a major future industry area back in 1984.

Tamboran welcomes transparent discussion, economic progress, quality job opportunities and new sustainable industries that not only benefit Northern Australia but also the wider Indo-Pacific.

***In summary, this submission will cover the following topics:***

- Gas-fired generators are essential if Australia wishes to incorporate more alternative sources of into the energy mix, and coordination between gas and electricity systems is necessary for cost reduction and Net Zero emissions targets.
- Middle Arm will serve as a central hub for high-level industry operations, shared infrastructure, and will provide a permanent legacy for local businesses and communities.
- Middle Arm offers significant economic benefits for Northern Australia and the nation, including job creation, investment, sovereign capacity development, and supply chain growth.
- There are significant emissions reduction opportunities that will be driven by low reservoir CO<sub>2</sub> natural gas from the Beetaloo Basin.
- When used to generate electricity, natural gas has approximately 50% lower GHG emissions compared to coal. The use of natural gas compared to coal also materially reduces sulphur oxide, nitrous oxide, and particulate emissions – leading to an improvement in air quality.
- Carbon Capture Utilisation and Storage ('CCUS') is the only technology that contributes both to reducing emissions in key sectors directly, and to eventually removing CO<sub>2</sub>.
- Tamboran is committed to working closely with the Native Title Land Holders recognised by the NLC to protect their sacred sites and who will benefit from the generation of jobs, education, and royalties in the region.



## The Reality of Australia's Energy Future

Natural gas consumption is concentrated in populace areas of the country. The Australian Energy Market Operator ('AEMO') makes the National Gas Rules which apply to three types of wholesale markets;

- Gas supply hubs (located in each of Wallumbilla, Queensland and Moomba, South Australia)
- Short term trading market hubs (located at Brisbane, Sydney, and Adelaide); and
- The declared wholesale gas market (located in Victoria).

According to AEMO, over the past ten years, Australia's east coast gas demand has significantly increased due to the commissioning of certain LNG plants in Queensland. However, Australia's domestic gas demand has remained flat, with the only material variation being the consumption of gas in the National Electricity Market ('NEM') gas-fired generation, which is heavily affected by both gas price and electricity conditions. After recent declines, gas-powered electricity generation is predicted to increase over coming years.

AEMO has projected a significant risk of supply shortages on Australia's east coast from 2023 to 2027<sup>1</sup>. AEMO reiterated in their 2022 Integrated Systems Plan ('ISP'), "*As coal-fired generation withdraws and weather-dependent generation starts to dominate... investment is needed to treble the firming capacity provided by new low emission firming alternatives that can respond to a dispatch signal.*"

It is important to note that simply transitioning away from gas appliances will not mitigate the risk of an energy crisis. Gas consumption and electricity demand are correlated, meaning that electrification would lead to an upsurge in natural gas usage for gas-powered generation.

These market fundamentals indicate an acute situation in the eastern part of Australia where the majority of the population are located. In order to bring natural gas to these load centres, there are a number of major transmission pipelines. Tamboran's assets in combination with an infrastructure solution to access gas from the Beetaloo positions the company for gas deliveries to the LNG facilities at Middle Arm as well as to the domestic and export markets on the east coast of Australia.

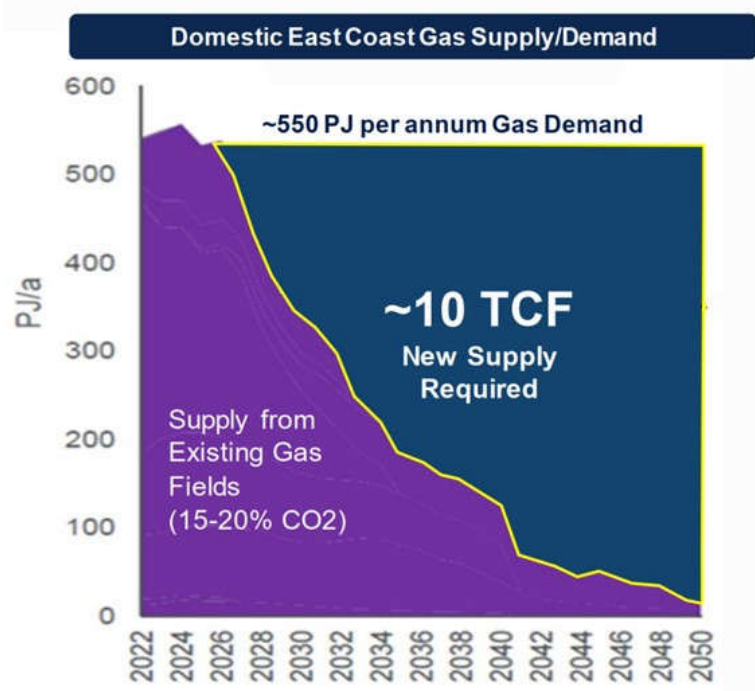
## Growing Demand for New Natural Gas Supply

Natural gas provides ~17% of Australia's total energy consumption and 21% of electricity generation. AEMO's scenario range shows major uncertainty for 2030 domestic gas demand of between 420 – 620 PJ per annum. Forecasts from analysts Wood Mackenzie tell a similar story, finding resilient domestic gas demand until the late 2030s (~610 PJ per annum). This is despite domestic supply forecast to only be ~320 PJ per annum by 2030 when a significant 100 – 300 PJ annual supply gap is evident.<sup>2</sup> For the NT, domestic supply is at risk as volumes decline quickly from the offshore Blacktip resource.

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<sup>1</sup> Australian Energy Market Operator ('AEMO'), *Gas Statement of Opportunities* (March 2023).

<sup>2</sup> Wood Mackenzie Australia, *East Coast Gas Market Outlook* (February 2023).



WOOD MACKENZIE AUSTRALIA, 'EAST COAST GAS MARKET OUTLOOK', FEBRUARY 2023

## Gas Fired Power

Gas-fired power supporting increased renewable energy in Australia represents one of the most cost-effective pathways toward achieving net-zero emissions. Natural gas will play a critical role in stabilising the Australian electricity market, especially as the grid accommodates increasing amounts of intermittent renewable energy. Ensuring a steady and competitively priced supply of gas is fundamental for maintaining industry viability and electricity reliability.

In Australia, natural gas production supplies over five million industrial, commercial, and residential consumers energy and constitutes 27% of primary energy usage, with 15% of production allocated to grid-connected electricity generation. Electricity from gas generation is projected to play a significant, persistent role in the NEM. Whilst coal generation retires in the NEM, gas generation will be critical for support to the power system by responding to sudden changes in the supply demand balance. Gas supply will also play an essential role during extended periods of low renewable generation by providing a critical power system service to maintain grid and stability, particularly when coal generation becomes unavailable.<sup>3</sup>

AEMO highlights that in the medium term, gas consumption for electricity is forecast to rise.<sup>4</sup> Long term, gas generation will be required to provide firming of electricity supply in a system with a high reliance on variable renewable energy ('VRE') such as wind and solar, whilst complementing electricity storage systems such as battery storages and pumped hydro.<sup>5</sup> While shallow battery

<sup>3</sup> AEMO, (n 1).

<sup>4</sup> Ibid, p. 8.

<sup>5</sup> Ibid.





storage solutions can contribute to some increase in dispatchable capacity, these will not provide resilience to all reliability risks in the NEM.<sup>6</sup>

The unique dispatchability of gas-fired generation means it is able to provide a rapid response in electricity demand at short notice, essentially acting as peaking power plants. Maintaining a balance between fluctuating power output from variable renewable energy sources (like solar and wind) and managing unexpected outages of aging coal generators demands adaptable generation technologies. Gas-fired generators excel in this regard, with the ability to swiftly adjust output – perfectly suited for accommodating shifts in electricity supply and demand. This ‘firming’ service grows ever more critical as renewable generation’s share in the energy mix increases.<sup>7</sup>

Despite the reservations expressed by certain parties regarding the Beetaloo Basin’s development and Tamboran’s involvement in the Middle Arm Precinct, it’s important to recognise the challenges of a rapid energy transition toward renewables. The transition towards renewable energy may not occur at the expected speed, and, more importantly, it may not come to fruition without the support of natural gas to provide firmed supply. The Precinct will enhance the effectiveness of Australia’s transition by supplying the necessary energy and fuels, supporting the shift towards a future with Net Zero emissions.

As depicted by AEMO assessments, anticipated decline of natural gas supply will require increased domestic development, particularly as Australia seeks to adopt alternative energy sources. The NT Government’s ‘Road Map to Renewables’ has outlined its aim to expand its renewable energy sector by 2030<sup>8</sup>. This goal will necessitate Beetaloo gas to support energy systems via gas-fired generation which currently dominates the NT’s power generation sector. This coordination is integral to reducing the cost of energy in Australia and contributing to Net Zero emissions.

## Residential & Commercial Use

AEMO’s modelling shows that peak day shortfalls are forecast under extreme peak days in every year from 2023 to 2026 where large demand for gas generation coincides with significant residential, commercial, and industrial consumption. Cold weather drives up demand for both electricity and gas for heating, and further stresses in the electricity system (such as coal unit outages or low wind) can drive up gas demand for electricity generation.<sup>9</sup>

The International Energy Agency (‘IEA’) indicates the potential for ‘cleaner’ LNG to reduce GHG emissions by a substantial 40% when replacing coal for heating purposes.<sup>10</sup> As the demand for heating in buildings continues to rise, it remains critical that Beetaloo Basin gas is approved for development to ensure supply is adequate for the domestic market.

Sixty-five per cent of houses in Australia use natural gas, which is more than 5 million Australian households. In the absence of government investment and support to facilitate gas supply shortages, Australian households and businesses will continue to face material negative impacts

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<sup>6</sup> Commonwealth Scientific and Industrial Research (‘CSIRO’), *Diverse array of energy-storage technologies may be key to firming the grid* (Report, 2021).

<sup>7</sup> Australian Energy Market Operators (‘AEMO’), *Gas Statement of Opportunities* (March 2022).

<sup>8</sup> Northern Territory Government, *Roadmap to Renewables* (Report, 2021)

NT Government, *Roadmap to Renewables: Fifty Percent by 2030* (September 2017)

<sup>9</sup> AEMO (n 1).

<sup>10</sup> International Energy Agency (‘IEA’) *The Role of Gas in Today’s Energy Transitions* (Report 2019).



through higher gas prices and electricity prices passed on by energy retailers, and indirectly through inflation in household products, which are passed through by companies. Reduced supply will not only impact ordinary Australians and local businesses, but also poses a significant security risk to the Australian government. Many Australians will potentially have to make the tough decision to either heat houses or cook meals. This decision is one that several families in European countries have already had to make.

Residential daily demand is forecast to experience increased volatility if Australia does not invest in new gas development as soon as possible. Australians currently depend on an average of 200PJ of gas per annum for heating and cooking. Should this shortfall occur, the implications for the health and safety of Australians will be extensive as is demonstrated in the ongoing global energy crisis where households are unable to afford heating and cooking facilities, creating a wave of people suffering 'energy poverty'.

## Industrial Feedstock

As the primary energy source for Australia's manufacturing sector, developing Australia's natural gas supply, necessitates bipartisan support, especially with the expectation of steady demand until 2028. Manufacturers rely on gas for several crucial services, including on-site electricity generation (38 PJ or 9% of Australia's manufacturing gas use), as a crucial feedstock in chemical processes (66 PJ or 16% of Australia's manufacturing gas use), and as a vital heat source (304 PJ or 75% of Australia's manufacturing gas use).<sup>11</sup>

The need for a secure, long-term supply of domestic gas to support our domestic manufacturing industries has been recognised by a wide variety of stakeholders, including the Australian Industry Group ('AI Group'), the Business Council of Australia ('BCA') and Australian Workers' Union ('AWU').

Australia's manufacturing sector is set to require gas supply, especially in the context of transitioning toward increased electrification and hydrogen power plants. Forecasts indicate that when demand outstrips supply, industries that are fundamental – medicine, pharmaceuticals, and transportation – will experience a significant threat.

The energy security and stability of manufacturing industries in Australia hinges on new basins such as the Beetaloo Basin coming online as soon as possible. Tamboran's operational capability and natural gas assets is positioned to ensure industrial and manufacturing industries in Australia are able to continue operations when estimated production levels are anticipated to outpace demand in 2025.

## International Trade Partnerships

To address potential domestic gas shortfalls in Australia, the Australian Domestic Gas Security Mechanism ('ADGSM') authorises the Minister for Resources to redirect LNG exports to provide volumes of gas to the domestic market as a measure of last resort.<sup>12</sup> However, there would be considerable economic and trade challenges should Australia be required to do so. AEMO has

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<sup>11</sup> Department of Industry, Science and Resources, *Future Gas Strategy* (Consultation Paper 2023).

<sup>12</sup> Department of Industry, Science and Resources, *The Australian East Coast Domestic Gas Supply Commitment* (Agreement).



forecasted that expanded domestic supply capacity is needed to ensure Australia's reputation as a dependable investment partner remains secure.<sup>13</sup>

As outlined by the Department of Industry, Science, and Resources, the operation of the ADGSM is intricate and, if activated, would require a substantial amount of time to yield results due to the magnitude of operations involved in constructing new pipelines and other energy storage infrastructure. This report suggests that the current design of the ADGSM may not be sufficient to avert a potential shortfall in the supply of domestic gas to the east coast of Australia.<sup>14</sup>

Presently, approximately 70% of Australia's gas is exported, primarily through long-term contracts to East Asian economies. In 2022, Australia successfully met the energy demands of various countries, including Japan (40%), Taiwan (36%), the Republic of Korea (25%), Singapore (25%), and China (8%).<sup>15</sup>

Australia's Minister for Trade and Tourism, Senator the Hon Don Farrell, and Japan's Minister of Economy, Trade and Industry, His Excellency Mr. Nishimura Yasutoshi, met in October 2023 to discuss the importance of this trade relationship. The key points of the meeting in relation to natural gas are as follows:

- Australia and Japan's Special Strategic Partnership was stronger and more important than ever, underpinned by common values, deep economic complementarity, and enduring people-to-people links.
- To work towards an enhanced partnership on energy security, transition, and climate change to address mutual opportunities and challenges, including to achieve Net Zero.
- Australia has committed to remaining a reliable supplier of resources and energy to Japan and the region now and into the future. This applies to traditional energy commodities such as coal and LNG, as well as new energy supply, hydrogen and ammonia, as countries decarbonise their economies to meet their Net Zero and Paris Agreement commitments.
- Ministers agreed to ensure the stable energy supply and to provide investment certainty in the transition period based on mutual trust.
- Ministers acknowledged the importance of following various pathways for energy transition while achieving economic growth, ensuring energy security, and addressing decarbonisation. They noted the importance of LNG along with renewables and energy storage technologies in the energy transition.
- Ministers recognised the importance of Australia's and Japan's energy relationship to both countries' economic, security and decarbonisation agendas.
- They noted the importance of LNG along with renewables and energy storage technologies in the energy transition.
- Ministers also agreed to continue their support for the implementation of high-integrity international carbon markets under Article 6 of the Paris Agreement, including through existing initiatives.
- Ministers reaffirmed the Quad Statement of Principles on Clean Energy Supply Chains in the Indo-Pacific, and their commitment to deliver the Quad Clean Energy Supply Chains Diversification Program.

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<sup>13</sup> AEMO (n 1).

<sup>14</sup> AEMO (n 7).

<sup>15</sup> Department of Industry, Science and Resources (n 11).



- Ministers discussed the Coalition for LNG Emission Abatement toward Net-zero ('CLEAN'), announced at the LNG Producer-Consumer Conference 2023 and its efforts to create a globally aligned methane emission assessment of LNG projects. They appreciated CLEAN's efforts to incentivise methane mitigation by LNG producers.<sup>16</sup>

Maintaining contracted volumes of Australian LNG exports will necessitate Beetaloo production to ensure Queensland LNG is not required to divert supply to the domestic market in case of a supply shortfall. Australia must prioritise increased investment in natural gas as neglecting these resources could lead to potential energy crises and adversely impact trade relationships. The vast and high-quality resources of the Beetaloo Basin offer a solution to bridge forecasted supply-demand gaps and ensure domestic energy security, all while contributing to emissions reduction and lower energy costs.

As demonstrated in the Shale Revolution in the United States, achieving net energy exportation, and surpassing domestic demand for gas results in favourable trade balances and geopolitical advantages. The Beetaloo Basin's shale reservoir quality rivals that of the Marcellus shale, providing Australia with the means to meet domestic energy needs, facilitate gas exports, and actively contribute to sustaining crucial trade partnerships.

## Northern Territory LNG (NTLNG) Development

In June 2023, Tamboran was awarded exclusivity over 170 hectares within the Precinct by the NT Government for the proposed NTLNG development under a 12 month 'Do Not Deal' arrangement, which is anticipated to utilise low reservoir CO<sub>2</sub> gas from the Beetaloo Basin. The Middle Arm acreage has been allocated on a 'Do Not Deal' basis for twelve-months, allowing Tamboran to progress a Concept Select phase for a proposed NTLNG development. Tamboran aims to commence pre-Front End Engineering and Design ('FEED') during 2024, with an ambition to commence LNG sales from 2030. The company's near-term commitment remains to ensuring Australia's NT and East Coast gas markets are well supplied.

If exported as anticipated, the 6.6 MTPA NTLNG facility could assist Australia and many countries in our region reach their energy security and GHG emission reduction objectives. If exported as anticipated, the 6.6 MTPA NTLNG facility could assist Australia and many countries in our region reach their energy security and GHG emission reduction objectives. NTLNG represents the first fully integrated onshore LNG development in Northern Australia where upstream, midstream, and downstream production and processing are all based in the NT.

Tamboran is fully committed to working within the Middle Arm's Strategic Environmental Assessment ('SEA') framework and will seek to maximise economic benefits locally and nationally whilst complying with the highest environmental standards.

As global momentum builds to address climate change, changes in demand for Australian LNG will pose challenges. Given geopolitical uncertainty and volatile energy markets, Tamboran recognises that the NTLNG facility will contribute to the Commonwealth's goal of Net Zero emissions, whilst also strengthening Australia's influence in priority areas of international engagement.

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<sup>16</sup> Senator the Hon Don Farrell, 'Australia-Japan Ministerial Economic Dialogue Joint Ministerial Statement' (Media Statement 2023).



## Middle Arm: legacy infrastructure & future use potential

Where the Precinct will act as a logistical hub for multiple, high-level industry operations, common use infrastructure will be a permanent legacy for local business and communities. However, without development of the Precinct, such first-class infrastructure will not exist.<sup>17</sup> Naturally, the same can be said about local industrial capacity for hydrogen production, critical minerals processing and refinement, and downstream gas processing.<sup>18</sup>

Infrastructure and amenities to be incorporated within the Precinct include roads, power networks, worker accommodation, water networks, telecommunications infrastructure, pipelines and corresponding corridors, and marine infrastructure including common user jetties, marinas and boat ramps, wastewater treatment facilities, dredged shipping channels and module offloading facilities for commercial, exporting and importing operations.<sup>19</sup>

Beyond securing utility for those five parties confirmed as 'Do Not Deal' proponents, this infrastructure will serve as a launchpad for major regional projects into the future.

## Boosting the NT economy & supporting local communities

As a gateway for industry and sustainable trade, the Precinct represents a strategic new frontier for Australian export markets, and the economy at-large.

Beyond its capacity to enliven local industry and capitalise on sustainability initiatives, the Precinct will unlock new jobs, investment, and other critical economic opportunities for Northern Australia. As a developmental enabler, the project is nominated as a core pillar of the NT Government's envisioned '\$40 billion economy by 2030'.<sup>20</sup>

This objective is largely underpinned by the enormous job prospects that Middle Arm will bring through construction and ongoing operations. Where the NT Government has provided five 'Do Not Deal' commitments to different Precinct operators (to provide development and investment certainty), these projects will represent approximately 20,000 new, high-skilled local jobs across a diverse base of industries.<sup>21</sup> On most recent population figures, this approximates to 12.5% of the entire NT population;<sup>22</sup> or 14.5% of the NT's currently employed labour force.<sup>23</sup> As has been stated publicly, there are more 'Do Not Deal' announcements likely to come from the NT Government as further proponents are firmed and land allocations are made, meaning even further positive economic benefits to the NT than those estimated above.

Indirectly, the Precinct will also unlock benefits from those regional initiatives which rely upon Middle Arm as a necessary pillar of supply chains. Among these is Tamboran's development of

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<sup>17</sup> The National Tribune, 'Carbon Capture and Storage another step closer in the Territory', (Web Page, 2023).

<sup>18</sup> Infrastructure Australia, 'Common user infrastructure at the Middle Arm Precinct' (Web Page, 21 August 2023) <<https://www.infrastructureaustralia.gov.au/map/common-user-infrastructure-middle-arm-precinct>>.

<sup>19</sup> NT Government: Department of Infrastructure, Planning and Logistics, 'Project Overview: Middle Arm Sustainable Development Precinct' (Web Page, 2023) [https://dipl.nt.gov.au/\\_\\_data/assets/pdf\\_file/0005/1103756/masdp-project-overview-factsheet.pdf](https://dipl.nt.gov.au/__data/assets/pdf_file/0005/1103756/masdp-project-overview-factsheet.pdf); Infrastructure Australia, 'Common user infrastructure at the Middle Arm Precinct' (Web Page, 21 August 2023) <<https://www.infrastructureaustralia.gov.au/map/common-user-infrastructure-middle-arm-precinct>>.

<sup>20</sup> Camden Smith, 'Middle Arm, Beetaloo the projects that will help get the NT to \$40bn by 2030: Chief Minister' *NT News* (Online, 7 November 2022).

<sup>21</sup> Northern Territory Government, *Middle Arm Sustainable Development Precinct* (Web Page, 8 September 2023).

<sup>22</sup> Australian Bureau of Statistics, *Snapshot of Northern Territory* (Annual Report: 28 June 2022).

<sup>23</sup> Northern Territory Government: Department of Treasury and Finance, *Northern Territory Economy* (Web Page, 2023).



the Beetaloo Basin. Not only can this development generate up to \$36.8 billion in economic activity by 2040,<sup>24</sup> but it also expects to increase net real income for the NT by \$220 million, and a further \$3.5 billion in additional revenue for the NT Government and Native Title Holders over a 25-year period (approximately \$140 million per annum).<sup>25</sup> Not to mention the potential for 6,000 new jobs to be generated by 2040.<sup>26</sup> In today's terms, this is equivalent to 4.3% of the NT's currently employed labour market.<sup>27</sup>

Middle Arm has the potential to accrue mainstream job benefits for many Northern Australians. By way of investment, this utility is recognised by many stakeholders. Thus far, \$1.5 billion in equity has been committed by the Australian Government, representing an enormous vote of confidence in the Precinct and its capacity to achieve these transformative economic progressions. Scope for \$16.4 billion of further, private-sector investment has also been identified as further proof of the Precinct's ongoing economic impacts and potential.<sup>28</sup>

## Supply chain security & sovereign capability

Middle Arm is designed to attract industries that not only reflect the NT's economic future, but which also establish supply chain security and sovereign capability. This will include capacities in hydrogen, carbon capture and storage, gas processing, advanced manufacturing, critical minerals processing, and the production of low-emissions hydrocarbons such as urea, methane, ammonia, and ethylene.<sup>29</sup>

All of these sectors take advantage of the region's natural endowments: high solar irradiance, high-volume mineral deposits, and extensive, low carbon gas and liquid reserves.<sup>30</sup> In this respect, the Precinct provides a unique opportunity for Australia to maximise value extraction in core industries, whilst expanding autonomy over major supply elements – beyond just primary material sourcing. By expanding production, storage and refining capacity within Australia's borders, Middle Arm will reduce supply chain vulnerabilities to external disruptions. This is especially pertinent with respect to critical minerals processing and Australian energy independence.

Noting supply considerations and the wide-ranging impacts of high energy costs, the Precinct will unlock a variety of new energy sources which feed directly into the NEM. Specifically, it will support enormous quantities of low-carbon (only 3-5% reservoir CO<sub>2</sub>) natural gas from Tamboran's operations out of the Beetaloo Basin. At initial capacity, annual output will total 6.6 million tonnes of LNG, however there is future scope to increase output to 20 million tonnes per annum.<sup>31</sup>

In a market context, the Beetaloo Basin (with its capacity of at least 500 trillion cubic feet of natural gas) is well positioned to meet projected East Coast supply gaps of approximately 10 trillion cubic feet between 2026 and 2050.<sup>32</sup>

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<sup>24</sup> Australian Government: Department of Industry, Science and Resources, 'Unlocking the Beetaloo: Beetaloo Strategic Basin Plan' (Report, 2021).

<sup>25</sup> ACIL Allens, *The Economic Impacts of a Potential Shale Gas Development in the Northern Territory* (Report, October 2017).

<sup>26</sup> Australian Government: Department of Industry, Science and Resources, 'Unlocking the Beetaloo' (Report, 2021).

<sup>27</sup> Northern Territory Government: Department of Treasury and Finance, *Northern Territory Economy* (Web Page, 2023).

<sup>28</sup> Commonwealth Department of the Treasury, *Budget 2022-23* (Budget Paper, 2022) 20.

<sup>29</sup> Northern Territory Government, *Middle Arm Sustainable Development Precinct* (Report, 2023).

<sup>30</sup> Northern Territory Government, *Territory Economic Reconstruction Commission* (Report, July 2020).

<sup>31</sup> Tamboran Resources, 'ASX Announcement' (9 June 2023); Conversation with Joel Riddle, CEO of Tamboran Resources (Danielle Ecuyer, ausbiz, 14 June 2023).

<sup>32</sup> Wood Mackenzie Australia (n2); AEMO (n 1).



## Climate Credentials

### Role of natural gas to reduce global emissions

- The continued burning of large amounts of coal globally is heightening climate concerns, as coal is the largest single source of energy-related CO<sub>2</sub> emissions.
- Global coal consumption reached a new all-time high in 2022, rising to 8.3 billion tonnes of coal. This exceeded the previous all-time high set in 2013.
- The IEA expects coal demand to remain at all-time highs in 2023.
- The IEA expects China to account for more than half of the world's coal use, with its power sector alone consuming one-third of global coal supply.
- China and India account for 70% of global coal demand, meaning that China and India together consume double the amount of coal as the rest of the world combined.
- Three-quarters of India's coal demand is for electricity generation.
- When used to generate electricity, natural gas has approximately 50% lower GHG emissions compared to coal. The use of natural gas compared to coal also materially reduces sulphur oxide, nitrous oxide, and particulate emissions – leading to an improvement in air quality.
- Recent real-life events indicate that if a reliable, low-cost supply of natural gas is unavailable, economies will switch back to coal.<sup>33</sup>
- LNG produced in Middle Arm is strategically located near the world's largest coal demand centres.
- LNG from the Middle Arm has the potential to reduce global GHG emissions through the displacement coal. When used to generate electricity, natural gas has 50% lower GHG emissions compared to coal.

### Playing a key role in Australia's path to Net Zero by 2050

- Tamboran is focused on playing its part in supplying Australian households with natural gas from the company's low reservoir CO<sub>2</sub> natural gas field in the NT.
- Natural gas with low-reservoir CO<sub>2</sub> has the potential to play a key role in Australia's energy transition.
- As legacy gas production from the Cooper Basin and Bass Strait decline, where some fields have greater than 15% reservoir CO<sub>2</sub>, Tamboran's Beetaloo Basin assets have potential to replace these volumes with natural gas containing 3 – 5% reservoir CO<sub>2</sub>.
- Using 1 BCFD of natural gas from the Beetaloo Basin with 3% reservoir CO<sub>2</sub> instead of natural gas with 15% reservoir CO<sub>2</sub>, we estimate that Australia's GHG emissions would be reduced by approximately 2 million tonnes of CO<sub>2</sub> per year.
- Due to electricity from natural gas having 50% less GHG emissions compared to coal, Australia could experience a reduction in CO<sub>2</sub> emissions if Australian power plants replaced coal fired power with gas from the Beetaloo Basin. Importantly this GHG reduction can occur very quickly.
- The IEA found that switching to natural gas has already helped to limit the rise in global emissions since 2010, alongside the deployment of renewables and nuclear energy and improvements in energy efficiency.<sup>34</sup>
- Findings from the 2023 McKinsey Report indicate:

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<sup>33</sup> Tamboran Resources Limited, 'Submission on the *Climate Change Bill 2022 & Climate Change (Consequential Amendments) Bill 2022*' (Report, 2022).

<sup>34</sup> International Energy Agency ('IEA'), *The Role of Gas in Today's Energy Transitions* (Report, 2019).



- Natural gas for both primary and peak electrical power generation is required to take immediate action to prepare for climate change.
- Gas generates lower emissions per unit of energy than coal or oil, both before and during combustion.<sup>35</sup>

## Tamboran's Climate Commitments

Access to affordable, reliable, and low GHG intensity energy is essential for economic growth, improving living standards, and addressing climate change. As a developer of natural gas assets, Tamboran has an important role to play and is focused on providing affordable and reliable natural gas that meets society's needs. We are also committed to the production of natural gas, being Net Zero equity Scope 1 and 2 GHG emissions from first commercial production.

We recognise there is an increasing and justified stakeholder focus on climate change and the energy transition. As an upstream natural gas company, managing the risks and opportunities posed by the energy transition forms the basis of our Net Zero strategy and is critical for Tamboran's long-term success.

The consensus of multiple scenarios, including Paris Aligned scenarios, is that natural gas will have an important role to play in the transition to a Net Zero energy system. At Tamboran, we support this position and believe the flexibility of natural gas will become even more critical as more renewable energy is used in the electrical grid and as companies implement their own decarbonisation strategies by using natural gas instead of coal.

Global decarbonisation pathways require a reliable supply of natural gas, and the importance of a reliable producer has never been more important. Recent events over 2022 and 2023 have demonstrated that if a reliable supply of natural gas is not available, coal will re-enter the energy system and lead to higher global GHG emissions. The development of new Net Zero scope 1 and 2 natural gas projects must be prioritised for the world to achieve its decarbonisation goals while continuing economic growth.

Tamboran intends to play an effective role in the transition to a lower carbon economy through the production of low reservoir CO<sub>2</sub> natural gas resources. We are also committed to integrating renewable energy, CCUS and carbon offsets into our projects with the objective of becoming a Net Zero carbon emissions gas producer for our equity share of Scope 1 and Scope 2 emissions when the company initiates commercial production of natural gas.

From a wider environmental perspective, Tamboran is acutely aware of our duty to preserve and protect the local environment and biodiversity, and of the opportunity for us to embed leading environmental practices into developments.

## Safeguard Regulations aligned with Tamboran's Corporate Climate Commitments

The Commonwealth Government's new Safeguard Mechanism legislates **Net Zero Scope 1** emissions from Beetaloo Basin facilities. Tamboran has for many years set a target of Net Zero

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<sup>35</sup> International Energy Agency ('IEA'), *Resilient Portfolio Growth for Energy Companies in Volatile Times* (Report, 2023)





equity Scope 1 and 2 GHG emissions from first commercial production, however, we are encouraged that this is no longer simply Tamboran's target, but a target supported by the Australian Federal Government and Commonwealth legislation.

The Department for of Climate Change, Energy, the Environment and Water ('DCCEEW') has noted when discussing Beetaloo natural gas and the Safeguard Mechanism, ***“that gas (Beetaloo gas) supplied to any downstream user, whether it's pipelines or LNG or domestic, would have at least an equal and possibly a lower emissions footprint than any other gas used in Australia”***.

The DCCEEW has also warned that imposing regulatory restrictions only on Beetaloo gas could unintentionally lead to greater dependence on alternative, less sustainable gas sources. The DCCEEW has also affirmed that restricting Beetaloo gas will increase the projected 5,000 mmscf/d shortfall in Australia's east coast gas market by 2030.<sup>36</sup>

Tamboran shares the views of the DCCEEW and believes that in a decarbonising economy, low-reservoir CO<sub>2</sub> natural gas produced by a company with Net Zero Scope 1 and 2 targets should be prioritised for development.

### Scope 3 Emissions & The Role of Natural Gas

Whilst Scope 3 emissions are not included in Australia's NGER emissions measurement and reporting framework nor in the Paris Agreement, Tamboran is committed to best practice and intends to disclose Scope 3 emissions in observance of the Greenhouse Gas Protocol. Scope 3 emissions will be indirect emissions in Tamboran's value chain, as they consist of Scope 1 and 2 emissions of other entities.

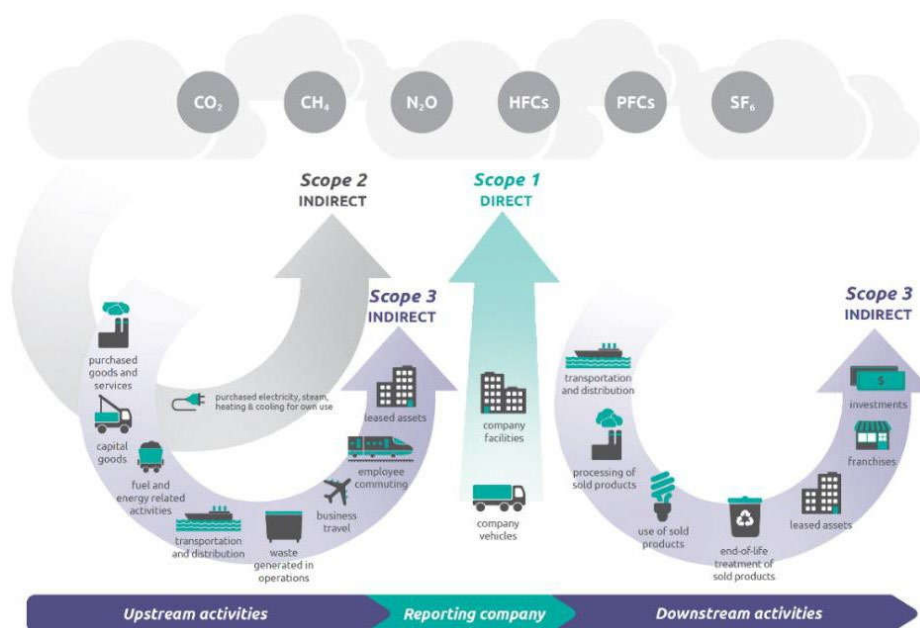
Since 2010, global coal-to-gas switching has saved around 500 mtCO<sub>2</sub> – an effect equivalent to putting an extra 200 million electric vehicles ('EVs') running on zero-carbon electricity on the road over the same period. With coal still making up ~48% of global energy emissions, Beetaloo gas is well positioned to reduce global emissions whilst also meeting the projected 6 – 11 BCF/d shortfall in global LNG supply forecast by 2030.

Analysis undertaken by Tamboran found that displacing global coal consumption used for electricity with 3 BCF/d of Beetaloo natural gas, could potentially result in a reduction of up to 60 million tonnes annually of global GHG emissions.

Tamboran's proposed NTLNG facility at Middle Arm will be a key development to support our regional partners in reducing their own GHG emissions. By supplying LNG from the Middle Arm, our trading partners can reduce the GHG intensities of their economies as they shift away from dominant coal-fired power in the coming decades. Consideration of the Company's NTLNG development at Middle Arm will be critical in achieving that significant sustainability outcome given the sheer scale of the energy transition that is required in the Indo-Pacific.

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<sup>36</sup> Commonwealth of Australia, 'Environment and Communications Legislation Committee: Estimates' (Committee Hansard, October 2023).



CLARIFYING SCOPE 1, 2 AND 3: WHILST THE CLIMATE CHANGE BILL'S 43% EMISSIONS REDUCTION TARGET ONLY RELATES TO AUSTRALIA'S SCOPE 1 AND 2, THE POTENTIAL EMISSIONS REDUCTIONS POSSIBLE FROM BEETALOO GAS FOR ALL THREE (INCLUDING SCOPE 3) ARE HUGE (IMAGE SOURCE: US EPA)

As part of maintaining the integrity of our national conversation about climate change policy, Tamboran believes it is fundamental that a certain level of understanding around carbon accounting occurs to ensure the Australian public understand our commitments under the Paris Agreement, understand that Australia's commitments (and all Government commitments under the Paris Agreement) are on the emissions occurring within their own borders, and understand in particular the difference between Scope 1, 2 and 3 emissions.

## GHG & Climate Change Partnerships

Tamboran recognises that it cannot achieve its Net Zero targets on its own, deep decarbonisation requires new technology, new ways of doing business, and importantly strong partnerships. During 2023, Tamboran joined the Methane Guiding Principles, became a member of the NT Low Emissions Hub working group and entered into an agreement with Helmerich & Payne ('H&P') for the FlexRig®. All of these initiatives will help Tamboran in its aim for Net Zero equity Scope 1 and 2 GHG emissions by first commercial production.

### **Emissions Reduction Partnerships: Methane Guiding Principles**

By joining the Methane Guiding Principles ('MGP'), Tamboran joins an association comprising 50 signatories, including major oil and gas producers, and supporting organisations such as The World Bank, the IEA and the United Nations ('UN') Environment Programme. This collective is committed to reducing methane emissions throughout the gas supply chain. Launched in 2017 by a coalition of industry and civil society organisations, MGP focuses on five key areas of action to combat methane emissions and foster collaboration between industry and government. Members build on the foundation of five key principles to develop and share hands-on interactive tools and guidance to help others learn from experience and put those lessons into practice.

Tamboran plans to utilise new technology in the design of its facilities to minimise or eliminate methane sources. During production Tamboran plans to use methane leak detection and repair



systems to systematically monitor and reduce any remaining methane emissions. Tamboran is proud of its membership in the Methane Guiding Principles and looks forward to working with like-minded companies and organisations to reduce methane emissions across the natural gas value stream.

### **Emissions Reduction Partnerships: NT Low Emission Hub**

Led by the Commonwealth Scientific and Industrial Research Organisation ('CSIRO'), the NT Low Emission Hub is a collaboration between industry and the NT Government to develop a business case assessing the viability of a large-scale low-emission CCUS hub based in Darwin's Middle Arm in the NT.

The aim of the Hub will be to reduce existing emissions significantly, by acting as a catalyst for new Net Zero industries to continue beyond the energy transition. It will also enable the development of an interconnected hydrogen industry, and the use of captured carbon in other industrial processes, such as LNG.

If realised, the Northern Territory Low Emission CCUS Hub will be one of the largest multi-user, multi-access hubs globally. Tamboran's proposed NTLNG facility would likely utilise the CCUS Hub to sequester its reservoir CO<sub>2</sub> emissions.

### **Reduction in GHG intensity of operations: Helmerich & Payne (H&P)**

The H&P FlexRig® is expected to be the Australia's most powerful onshore drilling rig, capable of drilling more than 4,000-metre horizontal wells. The new capabilities of the rig are expected to support a material reduction in cost per unit of recoverable gas and minimise Tamboran's environmental footprint.

H&P's FlexRig® is expected to improve Tamboran's operational efficiency and reduce the Scope 1 GHG intensity of operations. Real environmental benefits of using H&P's larger US rig include:

- Fewer wells.
- Reduced GHG intensity of operations.
- Smaller surface impact and surface disturbance.
- 6 km distance between wells means fewer overall wells.

## Carbon Capture Utilisation & Storage Hub

Middle Arm will be a master planned area with a focus on low emission hydrocarbons, hydrogen, advanced manufacturing, CCUS and minerals processing. CCUS is an internationally proven process that captures carbon dioxide emissions in a gas or exhaust stream. In 2020, the IEA concluded **CCUS is the only group of technologies contributing to both reducing emissions in key sectors directly and removing CO<sub>2</sub> to balance hard to mitigate emissions.**<sup>37</sup> This process necessitates a balance wherein CO<sub>2</sub> emitted into the atmosphere from human activities is offset by an equivalent amount being removed.

The Middle Arm CCUS is proposed as one of the world's largest CCUS facilities.<sup>38</sup> Once captured, carbon dioxide is then compressed, sent down pipelines or wells and safely stored deep

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<sup>37</sup> International Energy Agency ('IEA'), *CCUS in Energy Transitions* (Report, 2020).

<sup>38</sup> NT Government, *Carbon Capture, Utilisation and storage*, (Web Page), <https://middlearmprecinct.nt.gov.au/Industries/carbon-capture,-utilisation-and-storage>.



underground. The NT Government has determined that providing a CCUS facility is a significant economic and environmental opportunity for the Territory.

Organisations, including the International Energy Agency ('IEA'), International Renewable Energy Agency ('IRENA'), Intergovernmental Panel on Climate Change ('IPCC'), and Bloomberg New Energy Finance ('BNEF'), have all developed long-term energy outlooks that depend on a rapid expansion of CCUS to limit the global temperature rise to 1.5°C.<sup>39</sup>

The IEA has placed emphasis on the capacity for CCUS hubs - industrial centres with shared CO<sub>2</sub> transport and storage infrastructure – to play a critical role in accelerating the deployment of CCUS. This can support economies of scale and reduce unit costs, including through greater efficiencies and reduced duplication in the infrastructure planning and development phases.<sup>40</sup>

A major ramp-up of CCUS deployment is required in the next decade to put the global energy system on track for Net Zero emissions. Governments have a critical role to play through policies that establish a sustainable and viable market for CCUS. Tamboran recognises collaborating with the NT and Commonwealth Government affords a crucial opportunity for Australia to revolutionise our energy production and consumption methods, aligning them with our commitments under the Paris Agreement.<sup>41</sup>

Research conducted by McKinsey reveals CCUS has the potential to decarbonise more than 25,000 global industrial CO<sub>2</sub> emitters, spanning 11 industrial sectors. The widely distributed nature of emissions indicates addressing these challenges requires decarbonisation hubs on a large scale.<sup>42</sup>

Dr. Howard Smith, Director of Industrial Ecologies and NT Government Lead for CCUS, identifies the capacity for Australia to reduce CO<sub>2</sub> emissions from its trading partners and neighbouring countries to the fullest extent possible via a CCUS Hub.

Dr Smith stated,

*'The hub is being developed not only as a mechanism for capturing CO<sub>2</sub> but also as a comprehensive service platform for the region, assisting our neighbours in cultivating similar capacities within their territories.'*<sup>43</sup>

Furthermore, CSIRO has highlighted the implementation of large-scale CCUS will facilitate the development of low-emission industries and advanced manufacturing sectors. It also provides the potential for establishing a significant emissions management hub in the wider region, including south-east Asia.<sup>44</sup>

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<sup>39</sup> London School of Economics ('LSE'), *What Is Carbon Capture and Storage and What Role Can It Play in Tackling Climate Change?* (Report, 2018).

<sup>40</sup> Ibid.

<sup>41</sup> International Energy Agency ('IEA'), *Global Energy Outlook* (Report, 2020).

<sup>42</sup> Krysta Biniek et al., 'Scaling the CCUS Industry to Achieve Net-Zero | McKinsey' (Research Paper, McKinsey & Company, 2023).

<sup>43</sup> Asia CCUS Network, 'Australia's Northern Territory's CCUS Hub Project to Facilitate Carbon Reduction Initiatives in Asia' (Webinar, 2023).

<sup>44</sup> Commonwealth Scientific and Industrial Research ('CSIRO') *Opportunities for CO<sub>2</sub> Utilisation in the Northern Territory* (Report, 2023).



## Public Health Benefits of Gas Development

Tamboran welcomes the opportunity to address recent reports that have claimed an association between health and natural gas.

The World Health Organisation ('WHO') has sounded the alarm for the one-third of the world's population are burning biomass fuels (such as charcoal and dung) for household cooking, heating and lighting, leading to millions of premature deaths each year. Many of those deaths are in the markets that NTLNG plan to supply with a secure source of gas, and where governments are actively working to bring clean burning gas to millions of the world's poorest households.<sup>45</sup>

Additionally, a secure global gas supply is critical for the what the UN and the World Bank has been calling a "global food crisis."<sup>46</sup> The production of modern fertilisers, based on ammonia and urea, require gas as their primary feedstock. The invention of these commodities is up there with penicillin as one of the 20th century's greatest life-sustaining improvements. Producing more high-quality fertiliser is fundamental in addressing the global food insecurity and supporting the world's growing population.

The following is a non-exhaustive list of government-backed health studies from Australia, the United Kingdom, United States, and the IEA. These studies affirm the safety and positive impact on human health attributed to natural gas development. For those looking to assess the environmental and social impacts of gas development, it is critical to integrate genuine and verifiable data obtained from governmental entities engaged in primary data collection. The studies listed below ought to be weighed against academic literature alleging adverse effects associated with gas developments.

**WA Department of Health, Human Health Risk Assessment (June 2015):** Hydraulic fracturing can be executed without jeopardising drinking water sources, attributing this assurance to the depth of gas resources, adherence to industry standards, implementation of best practices, and strategic site selection.<sup>47</sup>

**International Energy Agency (2016):** This report projects a decline in global sulphur dioxide ('SO<sub>2</sub>') emissions by 20%, nitrogen oxide ('NO<sub>x</sub>') emissions by 10%, and particulate matter by 7% by 2040; attributing 30% of these reductions to natural gas, which emits less air pollution than other fossil fuels or biomass.<sup>48</sup>

**Public Health England, Review of the Potential Public Health Impacts of Exposures to Chemical and Radioactive Pollutants as a Result of the Shale Gas Extraction Process (2014):** The potential risks to public health from exposure to emissions associated with shale gas extraction are low, provided operations are conducted with due diligence and in compliance with regulations.<sup>49</sup>

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<sup>45</sup> World Food Programme ('WFP'), *Global Food Crisis*, (Web Page, 2022)

<sup>46</sup> The World Bank, *Food Security Update | World Bank Response to Rising Food Insecurity*, (Web Page, 2023)

<sup>47</sup> WA Department of Health, *Hydraulic Fracturing for Shale and Tight Gas in Western Australian Drinking Water Supply Areas Human Health Risk Assessment Hydraulic Fracturing for Shale and Tight Gas in Western Australian Drinking Water Supply Areas: Human Health Risk Assessment* (Report, 2015).

<sup>48</sup> International Energy Agency ('IEA'), *World Energy Outlook Special Report 2016: Energy and Air Pollution* (Report, 2016).

<sup>49</sup> Centre for Radiation, Chemical and Environmental Hazards, *Review of the Potential Public Health Impacts of Exposures to Chemical and Radioactive Pollutants as a Result of the Shale Gas Extraction Process* (Report, 2014).



**Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (2018):** The Panel's assessment of the risks was generally 'low' for likelihood and 'low-moderate' for consequence, with these categorisations being highly dependent on site-specific factors, such as the proximity to habitation, potential pathways for contamination of surface and sub-surface water bodies, and the efficacy of regulatory controls over the exploration, production, and decommissioning processes.<sup>50</sup>

**CSIRO & AICIS (NICNAS) (2017):** The employment of chemicals in the coal seam gas ('CSG') industry poses minimal risks to both the community and the environment. CSIRO has determined that residual chemicals, remaining underground following hydraulic fracturing, are unlikely to impact people or ecosystems in concentrations that would elicit concern, thereby rendering the risks negligible.<sup>51</sup>

**Pennsylvania Department of Environmental Protection (2012):** Highlighted that total Pennsylvania emissions reductions attributable to natural gas represented 'between \$14 billion and \$37 billion of annual public health benefits.'<sup>52</sup>

**Colorado Department of Public Health and Environment (2017):** Collected over 10,000 air samples in parts of Colorado with 'substantial' oil and gas operations, concluding that emissions did not reach levels considered harmful to human health, even when measured against conservative standards intended to protect sensitive individuals.<sup>53</sup>

**Hildenbrand et al. (2016):** Found ambient emissions in and around hydraulic fracturing sites in South Texas' Eagle Ford Shale are within acceptable limits.<sup>54</sup>

**Massachusetts Institute of Technology Energy Initiative (2010):** Concluded there is nothing to indicate that hydraulic fracturing in deep formations endangers groundwater, based on over sixty years of practical application and a lack of evidence to the contrary.<sup>55</sup>

## First Nations Engagement

Tamboran works closely with local communities, landowners, the NLC and Native Title Holders to ensure compliance with all applicable regulatory requirements in the areas in which we operate. Tamboran is subject to the *Native Title Act 1993* (Cth), the *Aboriginal Land Rights (Northern Territory) Act 1976* (Cth) and the *Northern Territory Aboriginal Sacred Sites Act 1989*.

Tamboran is committed to ensuring that we protect and respect sacred sites and works with the Aboriginal Areas Protection Authority to ensure that cultural heritage is protected and safeguarded. We are committed to working with Native Title Holders and the NLC to ensure a sustainable future for their communities.

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<sup>50</sup> NT Government, *Final Report of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory*, (Report, 2018).

<sup>51</sup> Commonwealth Scientific and Industrial Research ('CSIRO'), *Deeper groundwater hazard screening for chemicals used in coal seam gas extraction—Overview* (Report 2017).

<sup>52</sup> Pennsylvania Department of Environmental Protection, *Unconventional Natural Gas Emissions Inventory* (Report, 2012).

<sup>53</sup> Colorado Department of Public Health and Environment ('CDPHE'), *Assessment of Potential Health Effects from Oil and Gas Operations in Colorado* (Report, 2017).

<sup>54</sup> Zacariah L. Hildenbrand et al., 'Point Source Attribution of Ambient Contamination Events near Unconventional Oil and Gas Development' (2016) 573(15) *Science of the Total Environment*.

<sup>55</sup> Massachusetts Institute of Technology Energy Initiative (Web page, 2010) <https://ceep.mit.edu/>.



## Community Engagement

Tamboran aspires to be the partner of choice of local communities, and we are committed to developing and maintaining positive relationships with our local and host communities, Indigenous peoples, and representative groups where we operate.

Tamboran has had a strong focus on contributing to local sport and cultural activities and continue to work on supporting local business development. We will continue to actively encourage community participation in our operations to foster economic empowerment in our host communities.

## Further information

For further information please contact us on (02) 8330 6626 or via [info@tamboran.com](mailto:info@tamboran.com).



## Reference List

### A REPORTS/ ARTICLES / MEDIA

- ACIL Allens, *The Economic Impacts of a Potential Shale Gas Development in the Northern Territory* (Report, October 2017)
- Asia CCUS Network, *Australia's Northern Territory's CCS Hub Project to Facilitate Carbon Reduction Initiatives in Asia* (Webinar, 2023)
- Australian Bureau of Statistics, *Snapshot of Northern Territory* (Annual Report: 28 June 2022)
- Australian Energy Market Operators ('AEMO'), *Gas Statement of Opportunities* (March 2022)
- Australian Energy Market Operator ('AEMO'), *Gas Statement of Opportunities* (March 2023)
- Australian Government: Department of Industry, Science and Resources, *Unlocking the Beetaloo: Beetaloo Strategic Basin Plan* (Report, 2021)
- Biniek, Krysta, Phil De Luna, Luciano Di Fiori, Brandon Stackhouse and Alistair Hamilton, 'Scaling the CCUS Industry to Achieve Net-Zero | McKinsey' (Research Paper, McKinsey & Company, 2023)
- Commonwealth Department of the Treasury, *Budget 2022-23* (Budget Paper, 2022)
- Commonwealth of Australia, *Environment and Communications Legislation Committee: Estimates* (Proof Committee Hansard, October 2023)
- Commonwealth Scientific and Industrial Research ('CSIRO'), *Diverse array of energy-storage technologies may be key to firming the grid* (Report, 2021)
- Commonwealth Scientific and Industrial Research ('CSIRO'), *Deeper groundwater hazard screening for chemicals used in coal seam gas extraction—Overview* (Report, 2017)
- Commonwealth Scientific and Industrial Research ('CSIRO'), *Opportunities for CO<sub>2</sub> Utilisation in the Northern Territory* (Report, 2023)
- Department of Industry, Science and Resources, *Future Gas Strategy* (Consultation Paper 2023).
- Department of Industry, Science and Resources , *The Australian East Coast Domestic Gas Supply Commitment* (Agreement).
- Infrastructure Australia, 'Common user infrastructure at the Middle Arm Precinct' (Web Page, 21 August 2023) <<https://www.infrastructureaustralia.gov.au/map/common-user-infrastructure-middle-arm-precinct>>
- International Energy Agency ('IEA'), *CCUS in Energy Transitions* (Report, 2020)
- International Energy Agency ('IEA'), *The Role of Gas in Today's Energy Transitions* (Report, 2019)
- International Energy Agency ('IEA'), *World Energy Outlook Special Report 2016: Energy and Air Pollution* (Report, 2016)
- International Energy Agency ('IEA'), *Global Energy Outlook* (Report, 2020)
- International Energy Agency ('IEA'), *The Role of CO<sub>2</sub> Storage* (Report, 2019)
- International Energy Agency ('IEA'), *Resilient portfolio growth for energy companies in volatile times* (IEA, 2023)
- London School of Economics ('LSE'), *What Is Carbon Capture and Storage and What Role Can It Play in Tackling Climate Change?* (Report, 2018)
- Massachusetts Institute of Technology Energy Initiative, (Web page, 2010) <https://ceepr.mit.edu/>
- National Industrial Chemicals Notification and Assessment Scheme ('NICNAS'), *Identification of chemicals associated with coal seam gas extraction in Australia* (Report 2017), p11
- Northern Territory Government, *Middle Arm Sustainable Development Precinct: Carbon Capture, Utilisation and Storage* (Web Page, 2023)
- Northern Territory Government, *Middle Arm Sustainable Development Precinct* (Web Page, 8 September 2023)
- Northern Territory Government, *Middle Arm Sustainable Development Precinct* (Report, 2023)





- Northern Territory Government, *Territory Economic Reconstruction Commission* (Report, July 2020)
- Northern Territory Government: Department of Treasury and Finance, *Northern Territory Economy* (Web Page, 2023)
- Northern Territory Government: Department of Infrastructure, Planning and Logistics, 'Project Overview: Middle Arm Sustainable Development Precinct' (Web Page, 2023)  
[https://dipl.nt.gov.au/\\_\\_data/assets/pdf\\_file/0005/1103756/masdp-project-overview-factsheet.pdf](https://dipl.nt.gov.au/__data/assets/pdf_file/0005/1103756/masdp-project-overview-factsheet.pdf)
- Northern Territory Government, *Roadmap to Renewables* (Report, 2021)
- Riddle, Joel, CEO of Tamboran Resources (Danielle Ecuyer, ausbiz, 14 June 2023)
- Ross, Andrew 'Previous Next Contents Vol 62 (S2: Presentations) Concurrent 8. Presentation for: Collaborative development of the Northern Territory low-emissions carbon capture, utilisation and storage hub – a blueprint for the rapid decarbonisation of Northern Australia' (CSIRO Publishing, 2022) <https://doi.org/10.1071/AJ21326/>
- Senator the Hon Don Farrell, 'Australia-Japan Ministerial Economic Dialogue Joint Ministerial Statement' (Media Statement 2023)
- Schandl, Heinz, Tim Baynes, Nawshad Haque, Damian Barrett and Arne Geschke, 'Final Report for Final Report for GISERA Project G2 - Whole of Life Greenhouse Gas Emissions Assessment of a Coal Seam Gas to Liquefied Natural Gas Project in the Surat Basin, Queensland, Australia' (CSIRO Publishing, Report, 2019)
- Smith, Camden, 'Middle Arm, Beetaloo the projects that will help get the NT to \$40bn by 2030: Chief Minister' *NT News* (Online, 7 November 2022)
- Tamboran Resources, '2023 Annual Report' (June 2023)
- Tamboran Resources, 'ASX Announcement' (9 June 2023)
- Tamboran Resources, Submission on the *Climate Change Bill 2022 & Climate Change (Consequential Amendments) Bill 2022* (Report, 2022)
- The National Tribune, *Carbon Capture and Storage another step closer in the Territory* (Web Page, 2023)
- WA Department of Health, *Hydraulic Fracturing for Shale and Tight Gas in Western Australian Drinking Water Supply Areas Human Health Risk Assessment Hydraulic Fracturing for Shale and Tight Gas in Western Australian Drinking Water Supply Areas: Human Health Risk Assessment* (Report, 2015)
- Wood Mackenzie, *Australia East Coast Gas Market Outlook* (Report, 2023)
- World Food Programme ('WFP'), *Global Food Crisis* (Web Page, 2022)
- The World Bank, *Food Security Update | World Bank Response to Rising Food Insecurity* (Web Page, 2023)
- Zacariah L Hildenbrand et al, 'Point Source Attribution of Ambient Contamination Events near Unconventional Oil and Gas Development' (2016) 573(15) *Science of the Total Environment*.

## B LEGISLATION

- Aboriginal Land Rights (Northern Territory) Act 1976* (Cth)
- National Greenhouse and Energy Reporting Act 2007* (Cth)
- Native Title Act 1993* (Cth)
- Petroleum (Environment) Regulations 2016* (NT)
- Northern Territory Aboriginal Sacred Sites Act 1989*