APA Submission

Electricity and Energy Sector Plan Discussion Paper

April 2024



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Mr Simon Duggan
Deputy Secretary
Department of Climate Change, Energy, the Environment and Water

Lodged online

26 April 2024

RE: APA Submission to the Electricity and Energy Sector Plan Discussion Paper

Dear Mr Duggan,

Thank you for the opportunity to provide a submission on the Commonwealth Government's Electricity and Energy Sector Plan discussion paper (Discussion Paper).

APA is an ASX listed owner, operator, and developer of energy infrastructure assets across Australia. Through a diverse portfolio of assets, we provide energy to customers in every state and territory. As well as an extensive network of natural gas pipelines, we own or have interests in gas storage and generation facilities, electricity transmission networks, and 692 MW of renewable generation and battery storage.

We are actively involved in the energy transition taking place across Australia. In August 2022, we published our inaugural Climate Transition Plan which outlines APA's pathway to net zero operations emissions by 2050. Our asset portfolio across gas, electricity and renewables means we are well-placed to support the energy transition towards net zero.

Energy Ministers recognise that gas will play a crucial role in the energy transition. As ageing coal power stations retire and become less reliable, gas powered generation (GPG) will have an increasingly important role in supporting the security and reliability of the energy system while helping Australia meet its net zero targets. The draft Integrated System Plan (ISP), published in December 2023, increased its GPG capacity forecast for 2050 by 60% compared to the 2022 ISP.

Governments across Australia have recognised that renewable gases will be critical to achieving emissions reductions in many sectors of the economy. Similar to the success of the existing Renewable Energy Target (RET), a technology neutral market based renewable gas scheme will help drive the development of renewable gases such as hydrogen and biomethane.

If you wish to discuss our submission in further detail, please contact our Value Chain Emissions Manager, Bradley Anderson, on 02 8044 7063 or bradley.anderson@apa.com.au.

Kind regards,

Liz McNamara
Group Executive
Sustainability and Corporate Affairs

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1 Submission

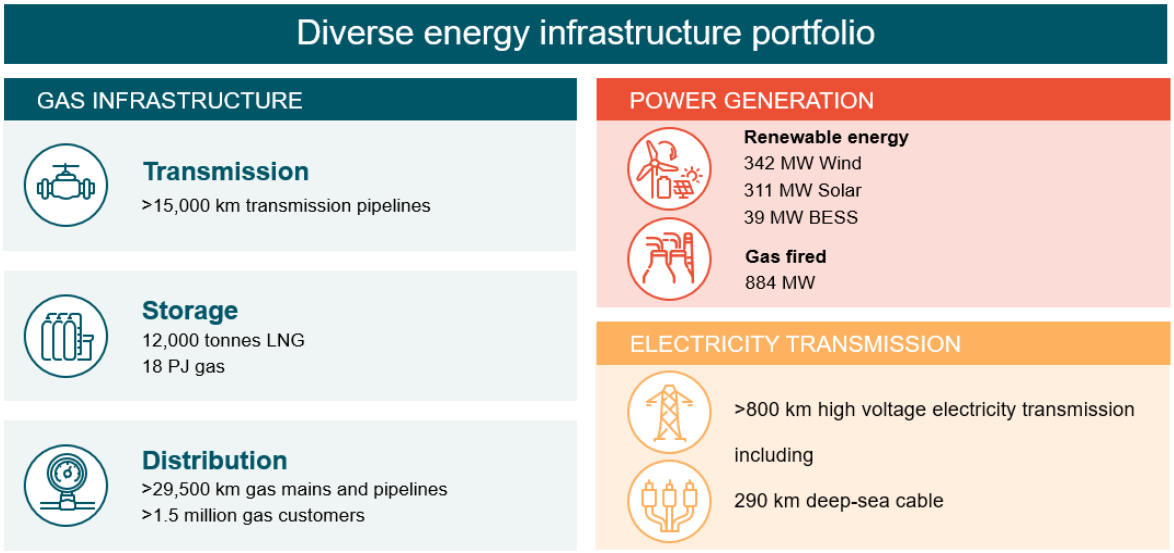
Key points

- Well-designed market-based mechanisms will ensure the most orderly, efficient and least cost decarbonisation of the electricity and energy sector, in support of the Paris Agreement.
- The Electricity and Energy Sector Plan (the Plan) must realistically consider the sector's decarbonisation constraints and challenges as the Plan will become the industry benchmark and influence companies' decarbonisation pathways.
- Displacing coal first while maintaining the role of natural gas enables emissions reduction to occur sooner and supports an orderly transition to net zero.
- Investment in off-grid hybrid energy solutions is needed to support emerging green industries.
- A whole-of-system approach to decarbonisation will achieve greater emissions reductions than focusing on the electrification of a specific consumer group.
- Gas infrastructure has an essential role to play in helping Australia achieve least cost decarbonisation through supporting renewable generation and facilitating the transport. of low carbon gases.

1.1 APA as a partner of choice in Australia's energy transition

APA is a leading Australian Securities Exchange (ASX) listed energy infrastructure business. Consistent with our purpose to strengthen communities through responsible energy, our diverse portfolio of energy infrastructure delivers energy to customers in every Australian state and territory.

Figure 1: APA's portfolio



Our 15,000 kilometres of natural gas pipelines connect sources of supply and markets across mainland Australia. We operate and maintain networks connecting 1.5 million Australian

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homes and businesses to the benefits of natural gas. We also own or have interests in gas storage facilities and gas-fired generation.

We operate and have interests in 692 MW of renewable generation and battery storage infrastructure, while our high voltage electricity transmission assets connect Victoria with South Australia, New South Wales with Queensland and Tasmania with Victoria.

APA actively supports the transition to a lower carbon future. In August 2022, we published our inaugural Climate Transition Plan which outlines our commitments to support Australia's energy transition and pathway to achieve net zero operations emissions by 2050. In September 2023 we released our first Climate Report disclosing our progress against our Climate Transition Plan.

In early 2023, APA established an Electricity Transmission business unit with a focus on electricity transmission infrastructure across Australia. We have recruited a team of established industry professionals to lead APA in playing a pivotal role in the energy transition. In line with our strategic focus, we have also announced a partnership with leading global infrastructure organisation EDF Group. This partnership synergises EDF's global experience in electricity transmission delivery and operations, with APA's strong local experience in the construction and operation of linear energy infrastructure.[1]

In November 2023, we completed the acquisition of Alinta Energy Pilbara, an energy infrastructure business in Western Australia (WA) with gas and solar generation, battery storage and electricity transmission assets. Alinta Energy Pilbara also has an extensive pipeline of wind, solar, gas and electricity transmission projects.

With our extensive portfolio of assets and expertise across gas, electricity and renewables, APA is well-placed to support the energy transition towards net zero.

1.2 Retiring coal and supporting renewables with gas will help us get to net zero faster

This section relates to question 5

Jurisdictions and market bodies recognise the need to retire coal as fast as possible, as it is the fastest pathway to reaching our emissions reduction targets.

As coal power stations retire, it becomes even more critical to invest in GPG, new gas supplies and other gas infrastructure. This is because as coal exits, we need to make sure we are filling the generation gap left behind.

Black and brown coal provide almost 50% of electricity generation in Australia and are also one of the biggest sources of carbon emissions.[2]

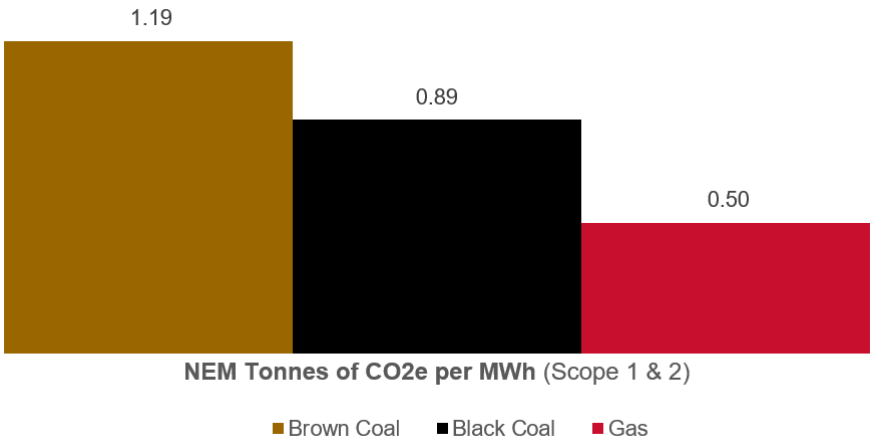
The existing electricity generation mix in the NEM has a higher carbon profile than natural gas. Both black and brown coal generation have much higher carbon emissions than energy produced by a combined cycle gas turbine (CCGT) (see Figure 2 below).

[1] APA, *'APA Group and EDF Group to pursue electricity transmission projects'* (Media Release, 31 October 2023).
[2] Commonwealth Government, '*Australian Energy Update 2023'* (Report, September 2023) 9.

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Figure 2: Carbon intensity of coal and gas powered generation

Source: National Greenhouse and Energy Reporting Data, Clean Energy Regulator



Overseas jurisdictions, including the Netherlands and the UK have recognised that the early retirement of coal generation is one of the biggest single emissions reduction initiatives that can be undertaken.

The recently published report by Boston Consulting Group, 'The role of gas infrastructure in Australia's energy transition' (BCG Report), similarly found that in an Australian context, displacing coal first while maintaining the role of natural gas enables emissions reduction to occur sooner and supports an orderly transition to net zero.[3]

1.3 GPG's increasingly important role in our net zero journey

This section relates to questions 5 and 9

Without a reliable alternative for coal, governments may have to keep coal power stations open longer than forecast, which will further delay Australia's decarbonisation journey.

The Hon Chris Bowen, Federal Minister for Climate Change and Energy has recently stated:

> *"Domestically, the Government has a target of 82 per cent renewable energy in our energy mix by 2030. As big and ambitious as this lift is, it will leave 18 per cent of our electricity mix as non-renewable…*
>
> *And as ageing coal-fired power stations leave the grid, that 18 per cent will increasingly be focussed on gas. Gas is a flexible fuel necessary for peaking and firming as we undertake this transformation….*
>
> *"Unlike coal fired power stations (or, for that matter nuclear power stations), gas fired power stations can be turned on and off at very short notice, making them vital for*

[3] Boston Consulting Group (BCG), *'The role of gas infrastructure in Australia's energy transition'* (Report, June 2023).

peaking and firming. This is before we get to the needs of industrial manufacturers for gas as feedstock and direct energy."[4]

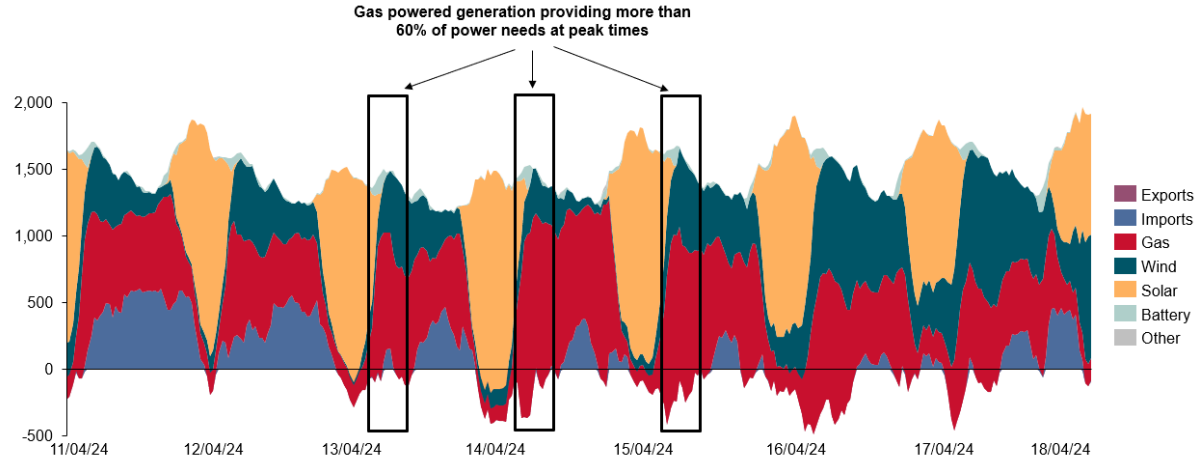
GPG is therefore expected to play a key role in navigating an orderly and secure energy transition, as well as helping Australia meet its net zero ambition targets.[5]

This important role for GPG is already being played out in South Australia, which closed its last coal power station in 2016. As recent experience has shown, periods of low wind and solar availability require significant volumes of long duration dispatchable resources to be available to support the reliability and security of the system.

Without GPG providing long duration dispatchable generation, South Australia is unlikely to have developed its renewable energy capacity to the extent that it has in such a short time frame.

Despite the introduction of synchronous condensers in South Australia, GPG remains critical in ensuring sufficient electricity supply, including system strength and long duration firming, and during periods of low wind and solar generation. For example, Figure 3 shows that for three consecutive days in the middle of April there was little wind across South Australia. GPG stepped up to fill the gap, providing over 60 per cent of the state's power needs at peak times when the sun went down and solar generation went to zero.

Figure 3: GPG supporting energy reliability in South Australia in April 2024



Source: OpenNEM

The gas network is a flexible, affordable, and safe store of energy, making it ideal to help support energy supply during extreme weather or periods of reduced supply.

Locating GPG close to major demand centres also reduces exposure to electricity transmission capacity and frequency constraints often experienced by the overconcentration of renewable generation in common areas of the grid.

[4] Chris Bowen, *'Speech to CEDA WA Energy Transition Summit'* (Speech, CEDA WA Energy Transition Summit, 17 November 2023).
[5] Commonwealth Government, *'Future Gas Strategy Consultation Paper'* (September 2023) p7.

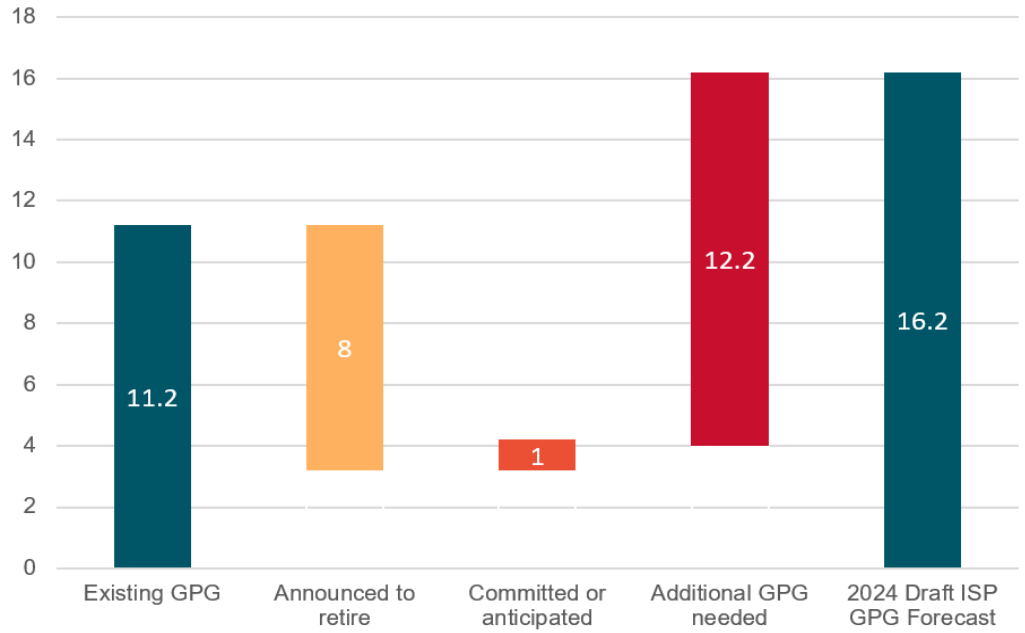
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Since the 2022 Integrated System Plan (ISP), GPG has been recognised as playing an even greater role during the transition:

- In 2022, AEMO flagged that without coal-fired generation, the NEM would require 10GW of GPG by 2050 for peaks loads and firming.
- In the December 2023 draft 2024 ISP, AEMO has since revised its forecasts, with the NEM now expected to require 16.2GW of GPG by 2050 – a 60 per cent increase.

Given around 8GW of the existing 11.2GW of GPG capacity already in the system is also expected to retire, we need at least 13GW of new GPG to come online to support the significant increase in renewables.[6] Figure 4 below highlights the extent of the challenge before us.

Figure 4: NEM GPG requirements (GW) – draft 2024 ISP



However, just 1GW of dispatchable GPG is currently expected to come online over the next 10 years, according to AEMO.[7] This includes:

- Tallawarra B, a 320MW peaking power station in NSW that started testing in December 2023, and
- the 750MW Kurri Kurri Power Station in NSW that is expected to come online in December 2024.

We are aware that CS Energy has announced plans for the 400MW Brigalow peaking power plant, and this is yet to appear in the projections.

[6] AEMO, *'Draft 2024 Integrated System Plan (ISP)'* (Report, December 2023 - January 2024) 10.
[7] AEMO, *'Electricity Statement of Opportunities'* (Report, August 2023) 46.

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1.4 Reliable energy supply requires investment in the gas sector

This section relates to questions 5 and 9

1.4.1 We need to increase investment in GPG

To meet the GPG requirements set out in the draft 2024 ISP, we need to increase investment in GPG and associated gas infrastructure.

The operating profile of GPG is very uncertain. Many factors will influence the utilisation of a GPG facility, including the cost of gas, unpredictable weather patterns, coal power generation outages (which may increase demand for GPG), and delays in building electricity assets.

As increasing volumes of renewable energy come online, the pressure on thermal power station operators is expected to increase. The completion of the NSW to South Australia interconnector (Project Energy Connect) and other interconnectors, which will increase the amount of energy that can be imported between jurisdictions, will further increase this pressure.

While governments are taking steps to incentivise the introduction of new renewable generation projects, GPG is not being incentivised through similar mechanisms.

This means that GPG operators will need to recover their costs and risk premium through high prices in the NEM. Often, this will involve bidding in capacity at the Market Price Cap (MPC), which is increasing to $22,800/MWh by 1 July 2028.[8] When the NEM dispatches capacity at the MPC, all capacity is dispatched at that price, regardless of whether the capacity is underwritten or not.

In its July 2022 Consultation Paper, the Energy Security Board (ESB) also recognised that the NEM's energy only design and MPC may not be sufficient to encourage investment in enough generation to maintain a reliable system.[9] The ESB's modelling suggested that the existing MPC is materially too low to give a high likelihood of meeting the current reliability standard.

The design of the Capacity Incentive Scheme Agreements (CISA) may further undermine the ability of the market to incentivise new investment. By potentially distorting wholesale prices, this requirement further undermines the ability of the market to incentivise the development of new GPG.

1.4.2 Long term availability payments may be required to incentivise GPG

Over recent months, Energy Ministers have taken steps to support various generation projects in the NEM:

[8] AEMC, *'Amendment of Market Price Cap Final Determination'* (Final Determination, 7 December 2023) 8.
[9] Energy Security Board, *'Capacity Mechanism, High-level Design Paper'* (Paper, June 2022) 13.

- In November 2023 Energy Ministers announced an expanded CIS to a total of 32 GW of capacity.
- In December 2023 Energy Ministers announced the development of an Orderly Exit Management Framework to support the exit and compensation of coal generation.

There have been no announcements regarding GPG, despite the need for at least 13GW of new GPG to come online to support the increase in renewables. Given its increasingly important role as coal retires from the NEM, we therefore need to ensure that government policy supports long term investment in new gas generation.

Consistent with the ESB's findings, state and federal energy ministers need to consider whether alternative arrangements, such as long-term availability or capacity payments, are required to ensure GPG investment takes place when and where we need it.

Including GPG in the CIS or a similar scheme could help extract jurisdictions having to keep coal power stations open for longer than necessary.

1.4.3 Developing new gas supply is critical for energy security

Both AEMO and the Australian Competition and Consumer Commission (ACCC) have flagged the risk of East Coast supply shortfalls this decade.[10] This puts at risk the vital role gas will play in 'unlocking' renewables for a secure energy transition and supporting the decarbonisation of other states beyond South Australia.

APA's submission to the Commonwealth Government's Future Gas Strategy made several recommendations to ensure this risk doesn't eventuate. In particular, we noted Governments have a role to play in expediting approval processes to ensure that frontier basins can be established and connected to the interconnected gas grid. We need to fast-track the development of new gas resources to avoid potential gas shortfalls.[11]

1.5 Ensuring a just transition for gas customers

This section relates to question 5

As decarbonisation efforts increase in pace, residential gas consumers and small to medium businesses may choose to electrify their energy use. This will leave behind a cohort of customers who do not have the financial means to exercise choice in their energy solutions. For example, hard-to-abate manufacturing businesses and low-income families living in rental accommodation have limited energy choice. As gas consumption levels decline and unit costs will increase, there is a risk that more customers will leave the gas market sooner, perpetuating a 'death spiral'. It is likely to be the more affluent customers leaving the network in these circumstances, leaving vulnerable customers, who cannot afford to do so, carrying the increasing costs.

[10] AEMO, *'2024 Gas Statement of Opportunities'* (Report, March 2024); ACCC, *'Gas Inquiry 2017-2030'* (Interim Report, December 2023).
[11] APA, *Submission to Future Gas Strategy, 'Future Gas Strategy Consultation Paper'* (13 November 2023).

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To help ensure a just transition for all customers, regulated gas businesses have been thinking about how to smooth tariffs such that they fall in line with demand, producing more stable prices into the future. One option being adopted in five yearly access arrangements with the Australian Energy Regulation (AER) and Economic Regulation Authority (ERA) of WA is to start recovering small amounts of prudently invested capital from users while gas usage is still high. This approach, known as accelerated depreciation, will result in small tariff increases for today's customers rather than leaving later generations to bear the burden with higher prices.

Regulated gas businesses across Australia have proposed various methods of bringing forward capital recovery in this way. Both the AER and ERA have approved accelerated depreciation for gas businesses, including those owned and operated by APA. Where businesses propose accelerated depreciation to promote a just transition, we support regulatory approval of these initiatives.

1.6 Investment in off-grid hybrid energy solutions is needed to support emerging green industries

This section relates to question 1

To support the growth of Australia's critical minerals industry and other green exports, decarbonising the energy intensive and typically remote operations of Australia's leading mining and resources companies will be a major undertaking. These organisations not only account for a significant proportion of Australia's exports, but make up around 15 per cent of our country's total energy consumption, most of which is currently from fossil fuels. It is also recognised that many of these companies have ambitious decarbonisation plans

The Electricity and Energy Sector Plan is one of six decarbonisation sectoral plans being developed under the Net Zero 2050 Plan. The Net Zero 2050 Plan must consider the strong link between the decarbonisation of the electricity and energy sector and the decarbonisation of the resources sector as it relates to off-grid electricity and energy requirements. The substantial investment and new infrastructure required to achieve emissions reduction pathways presents a significant opportunity.

The investment required to decarbonise Western Australia's minerals rich Pilbara region alone is estimated to be about $15 billion[12]. About two thirds of the 2050 forecast for electricity demand in the Pilbara primarily results from the transition away from diesel fuel, used by heavy haul trucks, machinery and locomotives.

Alongside the need to introduce more renewable energy, there are two key challenges to address. The first challenge is energy storage, as mining operations require an uninterruptible energy supply 24 hours a day. Solar and wind could economically provide about 70-80 per cent of the region's energy needs[13], but there will be periods of 'renewable drought' when the sun isn't shining and the wind isn't blowing.

Long duration energy storage solutions, such as pumped hydro or compressed air storage, are not currently cost-effective options for the Pilbara and many other remote locations.

[12] APA analysis
[13] APA analysis

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Although batteries will play an important role in stabilising renewables and short-term duration storage, they can't provide the long duration storage required when there are hours, days and even weeks of cloud cover and/or low wind.

Over the past 11 years, there has been an average of circa 100 renewable droughts per year in the Pilbara – where there was less than 10 per cent variable renewable energy for more than eight hours[14]. This means gas powered generation, with a combination of gas storage and transmission, will need to continue to firm and underpin the region's energy reliability, if the sector, and the broader economy want to address significant economic risks.

The second challenge is the time taken to secure project tenure and approvals. Whilst strong environmental protections are needed as well as meaningful and productive engagement with Traditional Owner Groups and communities to secure the social license for projects, Australia will not achieve the necessary investment for a timely energy transition without a stable and sensible regulatory environment.

APA sees an opportunity to do in the Pilbara what we have successfully done in other remote locations across the country, including in Mount Isa in Queensland and Gruyere in Western Australia. Investment in off-grid energy solutions in remote areas will support future economic growth from Australia's emerging critical minerals industry and other green exports.

1.7 Realistic sector plans that prioritise least cost abatement across all sectors will inform companies' decarbonisation plans

This section relates to question 11

The Commonwealth Government has recognised the Plan's close interaction with the other five sector plans being developed.[15] To achieve system-level outcomes this interaction needs to prioritise least cost and the most achievable abatement across all sectors. The electricity and energy sector accounts for more emissions than each of the other five sectors[16] but it also includes very hard to abate emissions sources, including GPG, that will have residual emissions in 2050. The other five sector plans should account for this emissions deficit to ensure economy-wide net zero emissions are achieved supported by carbon removals.

The role of GPG in reaching net zero (as discussed in Sections 1.2 and 1.3) is not the only residual emissions source that needs to be considered in the Plan. As highlighted in Section 1.6, hybrid energy solutions are needed to support emerging clean export industries which are expected to be predominantly off grid.

There are also challenges to decarbonise the mid-stream gas sector. A unique example of these challenges relates to remote compression in gas transmission pipelines. Remote compression sites often lack access to renewable energy sources or grid connections, limiting the commercial feasibility of transitioning to low-carbon alternatives such as compressor electrification.

[14] Boston Consulting Group analysis

[15] Department of Climate Change, Energy, the Environment and Water (DCCEEW), *Electricity and Energy Sector Plan Discussion Paper Consultation webinar* (April 2024).

[16] DCCEEW, *Australia's emissions projections 2023* (November 2023).

These decarbonisation constraints and challenges must be reflected in the Plan as the sector plans will become the industry benchmark and determine decarbonisation pathways. When developing their climate transition strategies, companies will reference these sector plans to ensure alignment with broader industry goals and expectations.

1.8 A whole-of-system approach will support least cost decarbonisation

This section relates to questions 2, 3 and 4

Achieving Australia's emissions reduction targets requires a whole of system approach to decarbonisation. The BCG Report highlights that adopting a whole-of-system approach will support the decarbonisation of the economy at least cost. Within this whole-of-system approach, there are three actions that will contribute most to emissions reduction in Australia: (i) retiring coal-fired generation; (ii) electrification of light vehicles; and (iii) decarbonising industrial gas loads.[17]

The BCG Report found that a fast and low cost pathway to reducing emissions is to displace coal generation and liquid fuels with grid-connected renewable electricity, before displacing gas end uses and mandating electrification for all gas users. This is especially given natural gas' role in serving critical end uses and heavy industry gas users which currently do not have alternative energy sourcing options. Even with high levels of electrification in industry over the next 10-15 years, BCG's modelling shows that an additional 200PJ of renewable gas will still be needed.[18]

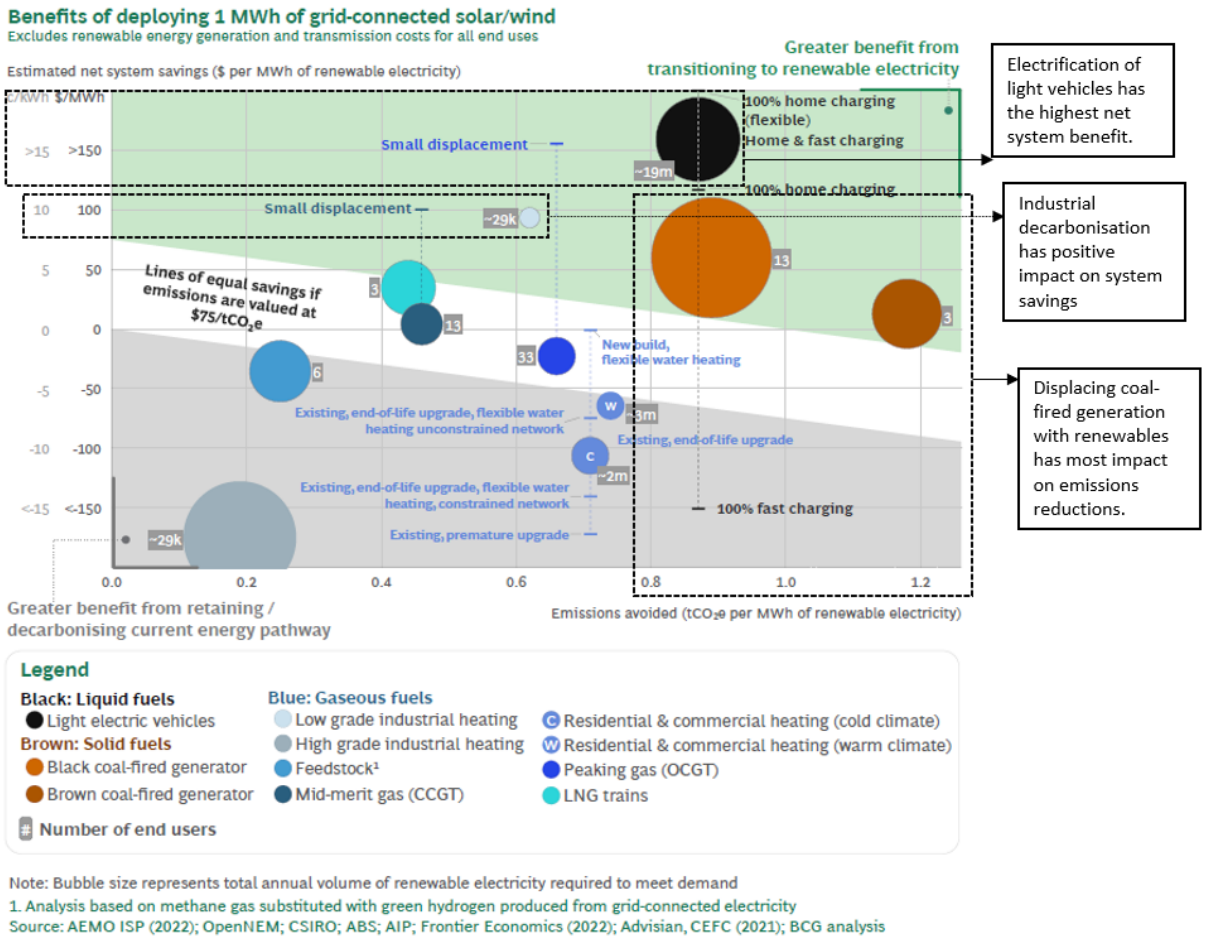
A soon to be released ACIL Allen report also demonstrates a balanced approach involving both renewable gas and electrification reduces cost. ACIL Allen's modelling demonstrates that restricting use of renewable gas and favouring electrification under their Electrify Everything Possible scenario increases the overall cost of the transition, relative to the use of a renewable gas target (RGT). Some users may also find it difficult to electrify, creating an additional level of risk to the transition relative to more balanced approaches that use more renewable gas.[19]

The 2024 Draft ISP states that renewable energy connected by transmission, firmed with storage and backed up by gas is the lowest cost way to supply electricity to homes and businesses through Australia's energy transition. Figure 5 below shows that deploying 1 MWh of grid-connected renewable generation would have the most impact, in terms of emissions reductions, if it is used to displace coal-fired generation.[20]

[17] Boston Consulting Group, *The role of gas infrastructure in Australia's energy transition* (Report, June 2023).
[18] Boston Consulting Group, *The role of gas infrastructure in Australia's energy transition* (Report, June 2023).
[19] ACIL Allen, *Delivering lower cost decarbonisation for gas customers and the Australian economy,* (Report, TBA).
[20] Boston Consulting Group, *The role of gas infrastructure in Australia's energy transition* (Report, June 2023), with APA amendments.

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Figure 5 Benefits of deploying grid-connected solar/wind



Note: Bubble size represents total annual volume of renewable electricity required to meet demand
1. Analysis based on methane gas substituted with green hydrogen produced from grid-connected electricity
Source: AEMO ISP (2022); OpenNEM; CSIRO; ABS; AIP; Frontier Economics (2022); Advisian, CEFC (2021); BCG analysis

1.9 Enhanced policy is needed to incentivise gas industry decarbonisation

This section relates to questions 1, 5, 6 and 9

Recent recommendations from the Climate Change Authority (CCA) to improve the National Greenhouse and Energy Reporting (NGER) scheme highlight the opportunities available now to improve decarbonisation efforts related to existing gas use.[21] Early methane action is critical in a 1.5°C scenario[22] and has the largest impact on slowing the rate of warming over the next few decades.[23] This is impacting the prioritisation of methane reduction opportunities investment as the emission reductions cannot be verified and reported under the NGER scheme.

Reporting of methane emissions under the NGER framework (Method 1) is based on high-level calculations using default emission factors and a broad range of assumptions around

[21] Climate Change Authority, *2023 Review of the National Greenhouse and Energy Reporting Legislation* (Report, December 2023)
[22] International Energy Agency, *Global Methane Tracker 2024* (Report, March 2024)
[23] Sun, Ocko, Sturcken, Hamburg, *Path to net zero is critical to climate outcome* (Report, November 2021)

transmission assets' design and operation. As such, there is limited confidence in the accuracy of these estimates. NGER framework (Method 3) is the highest order reporting methodology for transmission networks but still does not accurately reflect real methane emissions as it relies on generic emission factors for each component to estimate the total methane emissions of an asset/company.

The CCA identified several improvements to the NGER Measurement Determination that would enhance the accuracy of fugitive methane emissions reporting and bring the NGER scheme into better alignment with international best practice methane measurement, reporting and verification. These improvements would allow for the verification of methane emissions reductions achieved from abatement measures, including the reporting of site-based measurements and reductions achieved through Leak Detection and Repair (LDAR) campaigns.

The CCA also recommended the introduction of a framework to approve certifications that can guarantee the renewable status of renewable gaseous fuels. Once this framework is operational, the CCA recommends the introduction of optional market-based reporting of low carbon gases. This market-based method would incentivise investment in low carbon gas projects to reduce scope 1 emissions. This is an important change that will allow Safeguard Mechanism Facilities to meet their requirements including through low carbon / renewable gas certificate procurement.

APA is broadly supportive of CCA's recommendations 6 to 8 to introduce market-based reporting, and 15 to 22 to increase the accuracy of reported fugitive methane emissions in the NGER scheme. We agree that the Government should prioritise and support the development of Australia's sovereign capability in methane emissions measurement and quantification by building on existing expertise and leveraging international partnerships where appropriate.

1.10 APA's growing footprint in low carbon gases

This section relates to question 6

APA fully supports policy developments which help will help establish domestic low carbon gas markets and drive the uptake of low carbon gases. We are actively leading efforts to unlock the innovation and capabilities needed to establish a low carbon gas industry in Australia. Through our Pathfinder Program, we are investigating how CCS, hydrogen, other future fuels and emerging technologies can support a lower carbon future.

One of APA's key Pathfinder projects, the Parmelia Gas Pipeline (PGP) Conversion Project, is seeking to enable the conversion of around 43-kilometres of the PGP in WA into Australia's first 100 per cent hydrogen-ready transmission pipeline.[24] This project was partially funded by the Western Australian Government's Renewable Hydrogen Fund.

In May 2023 APA announced findings from phase two of the PGP Conversion Project which confirmed the technical feasibility of converting a 43km section of the high-pressure natural gas pipeline to carry 100% hydrogen.[25] The project will now progress to phase three, which will consider preparing the section of pipeline for hydrogen service and will include detailed

[24] APA, *APA set to unlock Australia's first hydrogen-ready transmission pipeline* (Media Release, 23 February 2021)
[25] APA, *Testing confirms technical feasibility of converting gas transmission pipeline* (Media Release, 19 May 2023).

safety studies and conversion plans. The detailed conversion plans will consider any modifications to ancillary equipment such as above-ground facilities and investigating supply and offtake arrangements required to meet the needs of customers.

Off the back of this research, APA has also developed a Pipeline Screening Tool that provides a high-level assessment of the hydrogen readiness of its pipeline assets, based on key pipeline material and operating characteristics. Initial assessments using the Pipeline Screening Tool indicates there is a high likelihood that around half of APA's natural gas pipeline assets could be used for hydrogen transportation, in 100% pure or blended form, with no, or small, changes to their current operating profile.

In parallel to our PGP Conversion Project, a Memorandum of Understanding (MoU) has been signed between APA and Wesfarmers Chemicals, Energy and Fertilisers (WesCEF), to undertake a pre-feasibility study to assess the viability of producing and transporting green hydrogen via the Parmelia Gas Pipeline to WesCEF's ammonia production facility in the Kwinana Industrial Area. WesCEF sites deliver products for the agricultural, mining, construction and manufacturing sectors, as well as energy for households for cooking, heating and hot water.

1.11 A technology neutral, market-based approach to low carbon gases and CCS

This section relates to questions 5, 6 and 9

We are of the view that decarbonisation pathways can be best supported through a market-based approach that provides strong incentives across different emissions sources and abatement activities. This provides for the most orderly, efficient and least cost transition in support of the Paris Agreement.

The Australian low carbon gas and CCS industries are rapidly developing and governments should play a key role in ensuring a level playing field for all potential uses. In our view, any low carbon gas policy has a significantly better chance of meeting its objectives if the low carbon gas scheme is 'use agnostic' and open to all potential use cases. Policy decisions should therefore encourage the market to find the best opportunities for commercialisation, and not explicitly rule out any use cases while the market is developing. It is unclear how the low carbon gas and CCS industries will develop and the speed at which sectors will look to decarbonise, but the industries could move to large scale deployment with the right market-based approach.

The Discussion Paper infers that low carbon gas alternatives should be reserved for the hard to abate sectors.[26] In our view, any low carbon gas policies should not limit opportunities to particular use cases. Instead, the market should be allowed to find the best uses for low carbon gases. Widening the scope of opportunities for low carbon gas is likely to stimulate domestic demand substantially more than restricting use to particular use cases.

[26] DCCEEW, *Electricity and Energy Sector Plan Discussion Paper* (March 2024).

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1.12 Repurposing of existing gas infrastructure for low carbon gases

This section relates to questions 5 and 6

Energy Ministers recognise that gas will play a crucial role in the energy transition, and that the continuing use or repurposing of gas infrastructure could therefore be important for both gas and electricity users.[27]

Gas infrastructure has an essential role to play in helping Australia achieve least cost gas decarbonisation. Repurposing natural gas pipelines to transport low carbon gases, including hydrogen, has significant advantages:

- Converting existing gas networks is more cost-efficient in comparison to constructing new, dedicated hydrogen pipelines.[28]
- Gas pipeline networks are already available and socially accepted (routes, including rights of way and use).[29]
- Conversion of natural gas infrastructure to hydrogen operation has already been demonstrated extensively in Europe and North America.

Regardless of which low carbon gas proves most effective, low carbon gas providers can utilise pre-existing gas infrastructure like distribution networks, pipelines, metering equipment, and human expertise. An Oakley Greenwood report commissioned by the Tasmanian Government in the development of its gas strategy supports this approach.[30]

As outlined in section 1.11 of this submission, findings from Phase two of our PGP Conversion Project have confirmed the technical feasibility of converting high-pressure natural gas pipeline to carry 100% hydrogen. Gas distribution networks are also being assessed for compatibility with 100% hydrogen. According to the BCG Report, some distribution networks are compatible with 100% hydrogen – requiring only little modification.[31]

The BCG Report also found that many of Australia's distribution networks are compatible with transporting a 10-20% hydrogen blend. This means that many networks in Australia could be well-placed to demonstrate the physical and economic feasibility of low-carbon gases and support their development by blending low carbon gas into the distribution network.[32]

According to BCG, existing gas infrastructure will play an important role in supporting sectors where electrification will be too hard or expensive (peaking applications in particular). During the transition phase, preserving gas infrastructure was also considered to enable the development of low-carbon gases like green hydrogen, which will likely be needed in a net zero future, for industrial use at a minimum.[33]

[27] Energy Ministers Consultation Paper, *December 2022,* p8
[28] Ibid, Amber Grid et al, *European Hydrogen Backbone* (Report, April 2022).
[29] European Union Agency for the Cooperation of Energy Regulators, *Transporting Pure Hydrogen by Repurposing Existing Gas Infrastructure: Overview of existing studies and reflections on the conditions for repurposing* (16 July 2021) 6.
[30] Oakley Greenwood, *Tasmanian Gas Strategy: Background research, analysis and suggest next steps* (Report, October 2021) p.16.
[31] Boston Consulting Group, *The role of gas infrastructure in Australia's energy transition* (Report, June 2023).
[32] Boston Consulting Group, *The role of gas infrastructure in Australia's energy transition* (Report, June 2023).
[33] Boston Consulting Group, *The role of gas infrastructure in Australia's energy transition* (Report, June 2023).

The cost-effectiveness of pipeline infrastructure has also been considered in the Pipelines vs Powerlines: A Technoeconomic Analysis in the Australian Context report, produced by GPA Engineering and commissioned by the Australian Pipelines & Gas Association (APGA).[34]

The report indicates that hydrogen pipelines are likely to play a central role in Australia's net zero energy market. Hydrogen pipelines, for the purpose of energy transport and storage, were found to be up to four times more cost-competitive when compared to electricity transmission infrastructure, in the context of like distance and capacity scenarios.

The ability of pipelines to store large amounts of energy is another factor supporting the repurposing of gas pipelines. The gas network is a flexible, affordable and safe store of energy, making it ideal to help support energy supply during extreme weather or periods of reduced supply. Gas turbines can quickly ramp up and provide long term dispatchable generation, which shows gas pipelines will be a critical part of the energy system for many years to come. While gas pipelines are currently used for storing natural gas, it is likely that they will be repurposed and used as a hydrogen store in the future.

1.13 Social licence is needed to ensure a timely transition

This section relates to question 10

Community opposition to the development of new transmission infrastructure is one of the key reasons why many projects are delayed. Approval and planning processes can inadvertently hinder a project's ability to develop strong relationships with local communities. A focus on demonstrating targeted consultation and support at a particular point in time, for example an approval point, can result in a polarising 'for or against' framing of a project, rather than a process which works through concerns, and achieving positive outcomes in impacted communities.

Projects can contribute to long term and sustainable beneficial outcomes if communities and regions are supported in the development of clear priorities and long-term plans for development prior to commencement of a project.

[34] Australian Pipelines & Gas Association, *Pipelines vs Powerlines: A Technoeconomic Analysis in the Australian Context* (Final Report, 24 August 2021).


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