Climate Change Authority

Australian Government

Submitted online: consultation@climatechangeauthority.gov.au

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Climate Change Authority 2024 Issues Paper – Targets, Pathways and Progress

AGL Energy (AGL) welcomes the opportunity to make a submission in response to the Climate Change Authority's (CCA) Issues Paper – Targets, Pathways and Progress (Issues Paper).

Proudly Australian since 1837, AGL delivers around 4.3 million gas, electricity, and telecommunications services to our residential, small, and large business, and wholesale customers across Australia. We operate Australia's largest electricity generation portfolio and have the largest renewables and storage portfolio of any ASX-listed company, having invested $4.8 billion in renewable and firming generation over the past 20 years and added more than 2,350 MW of new generation capacity to the grid since 2003.

We support Australia's ambition of net zero by 2050 and believe this will underpin the competitiveness of the Australian economy. This will be realised by Australia generating low-cost power using zero emissions wind and solar resources, backed up by technologies like batteries, hydro power and, for some of this transition, gas. As the global community responds to the risks of climate change, AGL recognises the large part that we must play in the transition to a low carbon economy.

Our 2022 Climate Transition Action Plan (CTAP) outlines AGL's ambition to become an integrated low-carbon energy leader, including:

- Targeting a full exit from coal-fired generation by the end of FY35;
- Ambition to meet customer energy demand with around 12 GW of new firming and renewable assets by 2036; and,
- An initial target of 5 GW new firming and renewables by 2030.

Ambitious and achievable interim targets on the path to net zero

AGL strongly supports Australia's commitment to the Paris agreement to ensure the increase in global average temperature is held to well below 2 degrees and importantly to pursue all efforts to limit temperature increase to 1.5 degrees.

Consistent with this, AGL continues to support Australia setting ambitious economy wide emissions reductions targets consistent with delivering Australia's share of national contributions to limit global temperature rise to 1.5 degrees, or as close as can be practically and economically delivered.

Decarbonisation of the electricity sector will play a critical and disproportionately large initial role in decarbonising the economy, both in terms of reducing the emissions intensity of electricity supply and also by growing electricity use to substitute for direct fossil fuel use in households, transport, and industry. AGL supports strong action to accelerate decarbonisation of the electricity sector, including driving investment in new renewable generation and storage in line with announced government policies. However, the electricity system is approaching real limits to the rate of change that society and the economy can tolerate or deliver in practice, particularly given the critical role that growing electricity use will have in decarbonising other sectors.

Achieving emissions reductions consistent with a global 1.5 degree ambition, and ensure warming is held well below 2 degrees, will require significant emissions reductions across all sectors of the economy. We acknowledge that sectoral emissions plans are critical to achieving any target and the challenges and opportunities, as well as the nature of the emissions, across all sectors are varied. These sectoral emission reduction plans will be important for being able to collectively meet targets.

Accordingly, AGL is very supportive of the CCA's work, including in its Issues Paper and elsewhere, which supports the sectoral emissions plans and sets out the Authority's initial considerations in making recommendations to the government on 2035 emissions reductions targets that are ambitious and achievable.

We strongly support the analysis being undertaken by the CCA to ensure that the Net Zero Plan and the development of 2035 targets is informed of all of opportunities, challenges, and constraints faced by Australia in meeting its net zero ambitions. If managed correctly, an ambitious target that is supported in its delivery by well-considered and targeted public policies and leverages innovation and investment from the private sector will result in a cleaner, more productive, and more resilient future economy for the long-term benefit of all Australians.

The transition to net zero needs a clear long-term vision, underpinned by ambitious but achievable interim targets, which are supported by detail on how Australia will identify, acknowledge, and overcome significant transitional barriers, while also unlocking and prospering from new opportunities.

Interim emissions reduction targets help set guideposts for the transition to a net zero economy and are an important component of realising this objective. In addition to an overall emissions budget and a legislated long-term emissions reduction trajectory, interim targets assist to provide clarity on the future operating environment and allow all stakeholders and communities to plan for the future.

Interim targets can also support an increased level of coordination between government policy action and private sector endeavours to maximise the efficiency of abatement activities. Certainty of long-term policy settings provides a more stable environment for the deployment of capital to support economies and communities going through transition.

Creating value and opportunities for all Australians

The path to net zero will involve all parts of the Australian economy contributing towards an accelerated ambition to rapidly reduce emissions, in a way that provides opportunities to reduce energy input costs for Australian customers and harnesses new technologies and industries to create value and opportunities for all Australians.

While the vision of a decarbonised future should be aspirational, it should not understate the major impacts that the transition will have across the entire economy, many of which will be unevenly distributed across people, businesses, and regions. Long-term certainty and signalling of bigger structural changes or policy shifts are therefore critical to deliver the investment that will underpin the transition.

Although the determination of interim targets is meant to alleviate the impact of policy fluctuations that are made in response to shorter-term trends, present economic challenges provide a useful reference point from which to consider the most sustainable approaches to meet long-term emissions reduction targets.

The broad impacts of the COVID-19 pandemic, including a period of high inflation and increases in input costs, have led to major disruptions across the Australian economy. At the same time, global monetary policy settings and increases in commodity prices, as a result of the pandemic but also recent global

conflicts, have led to inflationary conditions both domestically and internationally, leading to significant household cost-of-living pressures and challenges for businesses from supply chain disruptions and material increases in energy input costs.

As the Australian Government has noted, Australia is a small open economy, heavily reliant on trade for its economic wellbeing. Budget forecasts for Australia's economic health are affected by the global economic outlook; and elevated inflation, interest rate rises, and high levels of public debt are all expected to constrain growth in advanced economies such as Australia.[1]

Although these more recent shifts in macroeconomic conditions have provided impetus for governments to reconsider energy policy and consider opportunities short-term stimulus that may yield longer-term benefits, the Australian and global economies are forecast to be in a period of low growth for some time.[2] Household living and business expenses, including the cost of energy, will therefore remain significant ongoing concerns. As further steps are taken to accelerate the energy transition, both long-term benefits and costs to both customers and the broader economy should therefore be at the forefront of the rationale for reform and at the heart of analysis to determine the appropriate level of ambition for domestic climate action.

To maximise the benefits of the energy transition, the right balance needs to be struck in addressing core domestic economic challenges, creating jobs, and boosting growth – but in a way that also considers the key challenge of building cleaner, more sustainable, and more resilient energy systems, and meeting the long-term objective of achieving net zero emissions as soon as possible.

Advice from the CCA to inform the Australian Government's Net Zero Plan should therefore be grounded in maintaining system reliability and security and keeping energy affordable for all Australians, in addition to rapidly reducing carbon emissions in the energy sector and supporting deep emissions reductions in other sectors.

Decarbonising the electricity and energy sector will be central to the delivery of Australia's Net Zero Plan and the achievement of a more ambitious 2035 interim target. This will require rapidly increasing the share of renewable energy sources, and the uptake of electrification and consumer energy resources (CER) to reduce the dependence on fossil fuels. The energy transformation will need to be supported by significant investments in grid infrastructure, storage solutions, and demand response mechanisms to ensure reliability and security of supply. Most importantly, achieving the necessary rate and scale of transition will need a coordinated approach among federal, state, and local governments, market bodies, industry, and consumers.

AGL looks forward to continuing to work with the CCA and the Australian Government to support the energy transition and help Australia reach its net zero by 2050 ambitions. Further detail in response to this consultation is elaborated upon in Appendix A to this submission.

Should you have any questions in relation to this submission, please contact Aleks Smits (Senior Manager, Policy) at asmits@agl.com.au or on 03 8633 7146.

Yours sincerely,

AGL Energy

[1] See, for example: Australian Government, 2023-24 Budget paper no.1, p43
[2] See, for example: Reserve Bank of Australia, Statement on Monetary Policy – February 2024, available here

APPENDIX A – AGL's response to the Issues Paper

Mobilising investment to transform energy and reduce emissions

Reducing emissions from the energy sector is critical in meeting longer-term climate objectives, given that decarbonisation pathways for other sectors (notably transport and industry) often rely on the availability of affordable, lower-emissions energy. We note the ongoing development of sectoral emissions reduction plans by the Australian Government, which highlight important interactions between sectors, with the Australian Government's Electricity and Energy Sector Plan playing a key enabling role for all the other sector plans.[3]

The government's projections indicate that emissions for the electricity sector will decline from 197Mt CO2e- in 2005 to 81 Mt CO2-e in 2030 and to 37 Mt CO2-e in 2035 under a baseline scenario, and to 60 Mt CO2-e in 2030 and to 32 Mt CO2-e in 2035 under a scenario with additional policy measures.[4] It is expected that the government's announced Capacity Investment Scheme (CIS), as well as other policy action, may further accelerate these emissions reduction projections, given that the policy intention of the CIS is to go beyond existing announced State targets to achieve a target of 82% renewables by 2030.

Although these emissions projections are often considered 'baseline' scenarios across planning and policy documents, achieving these targets across Australia's electricity and broader energy markets represents a massive transformation in a short period of time, and is not without significant risks and challenges.

For example, the Australian Energy Market Operator's (AEMO) Draft 2024 Integrated System Plan (Draft ISP) identifies several key risks to the delivery of the optimal development pathway (ODP) for transmission and Renewable Energy Zone (REZ) development, which would support the delivery of sufficient renewable generation to meet the 82% target.

The risks identified in Draft ISP include that: market and policy settings are not yet ready for the rate of change; uncertainty is risking timely investment; the full benefits of customers' investments in CER may not be realised; and the necessary social licence and developing the necessary skilled workforce and supply chains will be significant challenges.

While governments and policymakers are taking steps to address the challenges identified by AEMO in the Draft ISP, timelier and more coordinated policy and reform will be required. Lack of coordination in policy and reform, as well as bipartisan agreement on key transition pathways, present key risks to the achievement of a successful and smooth energy transition.

We recognise and support the collaborative approach that the Commonwealth, state, and territory governments are taking through the National Energy Transformation Partnership (NETP) and the Renewable Energy Transformation Agreements (RETA) to work together on reforms to help transform Australia's energy system to achieve net zero by 2050. Building on this, we would encourage the federal government, where possible, to develop policies that cover all Australian jurisdictions to ensure consistency in objectives and outcomes.

As a first mover in making more significant emissions reductions, important lessons can be observed from the early challenges that the energy and electricity sector has had to overcome and the more persistent issues that present barriers to achieving deeper emissions reductions on an accelerated timeframe. These lessons should be adopted to support the ambition of other sectors and across the economy more broadly.

[3] AGL made a comprehensive submission to the E&E sector plan, which is available here.

[4] See: Australian Government, Australia's emissions projections 2023, available here

Reducing investment and financial risks

With respect to reducing investment risk, we acknowledge the work already done by the Australian Government, in particular the expanded Capacity Investment Scheme (CIS).

The proposed design of the CIS is intended to reduce financial risks to proponents of renewable and zero-emissions firming generation. While this addresses a key risk faced by investors in new projects, we consider there remain other risks and barriers to the deployment of 32 GW of renewable capacity and clean dispatchable capacity projects by 2030, which the design of the scheme does not necessarily address. Complimentary policies and reforms in other areas will therefore be required to successfully accelerate the deployment of new infrastructure.

Some of these challenges arise from the need for coordination of all market reforms under development. Landmark reforms include potential changes to transmission access, a process now having been underway for several years and that continues to pose significant risks of curtailment to developers. Additionally, we have previously provided feedback on the proposed Orderly Exit Management Framework (OEMF),[5] particularly the risk of distortions arising from requiring significant amounts of thermal generation that were forecast to exit to remain in the market while concurrently seeking to drive more supply into that same market.

With regard to a more enduring signal for renewable generation, we support the Commonwealth's work to develop a Guarantee of Origin (GO) Scheme.[6] The proposed Guarantee of Origin (GO) scheme will provide a mechanism to track and verify emissions associated with hydrogen and other products made in Australia, as well as provide an enduring mechanism for renewable electricity certification through Renewable Electricity Guarantee of Origin (REGO) certification, which could support a variety of renewable energy and product claims.

Importance of competitive markets and private sector investment

Maintaining market competition and appropriate economic signals is imperative to ensuring ongoing efficient investment in the energy transition. Market competition promotes innovation, efficiency, and cost-effectiveness, benefiting energy consumers through lower energy bills and enhanced product offerings.

Appropriate market signals must be preserved to support the efficient operation of markets as this indicates where investment is most needed. If, for example, contract market competitiveness and liquidity is not maintained, there is a risk that the benefits of new investment in renewable and storage will not translate fully to benefits on customers' bills.

Overcoming non-financial investment barriers

While the CIS is focused on helping reduce the financial risks faced by investors in the energy transition, there are still several non-market barriers that sit outside the scope of the CIS design, which need to be addressed concurrently. These include planning approvals, connection processes, and supply chain constraints including workforce availability affecting the construction of new projects and social license issues, as identified in the Draft ISP.[7]

[5] See: AGL's submission to the proposed Orderly Exit Management Framework consultation.
[6] See: AGL's submission to the Guarantee of Origin Scheme and REGO Scheme
[7] See: AEMO, Draft 2024 Integrated System Plan, section 8.3

While the Australian Government's Rewiring the Nation plan will have positive impacts on some of these issues, particularly in expanding transmission capacity, significant barriers to project development remain.

To keep Australia's energy transition on track to meet more ambitious targets, we need to prioritise and expedite approvals for those projects that are most readily achievable while considering the important issues of delivering on our environment and social licence. This would mean an immediate focus on those projects that utilise existing infrastructure, such as existing transmission connections.

While robust planning and environmental approval processes must clearly apply, the need for the energy transition to make significant gains in the next six years means that efficiencies in the planning process and a streamlined connection process will be key to keeping the transition on track.

AGL acknowledges the work that the federal and state governments are already doing in this space and would encourage further focus on these areas going forward.

Energy market design

Market design must have a clear focus on ensuring that consumers benefit and can access competitive supply contracts, primarily through electricity retailers but also for the large customers who directly manage their own wholesale contracting. Despite significant reforms to the operation of energy markets in Australia, it is critical that price signals remain to support the accelerated deployment of capital for clean energy development.

The Australian Government's announced post-2030 review of the NEM (post-2030 review) is an opportunity to address some of these challenges and help ensure that the wholesale electricity market design operates effectively while also continuing to drive investment in a renewable future. We would encourage the federal government to think carefully about the principles that will guide this important piece of work to ensure that it results in an optimal market design that is suited to our future state of high penetration of variable renewable energy (VRE) and CER. We would also encourage the federal government to ensure that this review does not function as a barrier to investment, which will need to continue to accelerate.

One of the important questions for the post-2030 review is how the necessary market reform can be undertaken while maintaining effective price signals to assist in the economic dispatch of a new fleet of generators with fundamentally different operational characteristics than the older generators they will be replacing. Maintaining and strengthening the reliability, safety, and security of our energy system and the other elements of the national electricity objectives is critical. Ensuring that the market works in the long-term interests of consumers will help build confidence in the community and the social licence to undertake necessary investment.

This is particularly the case given the range of demand uncertainty that exists based on present trends, including electrification of transport and the rapid increases in data generation and storage. Although forecasts vary, it is possible that electricity demand may increase faster than expected, requiring even more significant buildout of infrastructure or new frameworks of energy management in order to maintain reliable supply.

We also note the introduction of an emissions reduction objective to the national energy objectives (including the electricity objective). This work has led to the release of an interim Value of Emissions Reduction (VER) from Energy Ministers, through the Ministerial Council on Energy.[8] The interim VER has been designed

[8] See: Advice from Energy Ministers on the interim value of greenhouse gas emissions reduction, available here.

through a ‘target-consistent’ methodology, meaning that the value broadly reflects the marginal cost of abatement to achieve targets across the jurisdictions and Australia.

While the impact of the VER is yet to be seen, we are hopeful that it will help drive efficient investment across the NEM–particularly around network investment–to support the acceleration of the various renewable energy and emissions reductions targets.

The establishment of the VER in the energy sector may be instructive for the development of a broader economy-wide value to help guide policymakers and better support interactions and dependencies between sectors.

Encouraging household investment in energy transition

Along with encouraging large scale private capital, there is important work to be done to continue to encourage households to invest in the energy transition.

Not only might CER have the potential to provide significant benefits to customers by reducing their energy usage and costs, it may also provide significant system benefits and could offset the need for grid-scale investment. To fully capture the potential benefits, CER needs to be orchestrated and appropriately integrated into the National Energy Market (NEM) in a way that supports power system reliability and security. Customers need to understand and see the benefits and have trust in the energy sector to achieve this. We discuss CER in further detail below.

Enabling electrification for a smooth transition

As AEMO’s Draft ISP projections highlight, electrification is a critical enabler for the industrial, transport and other domestic sectors to reach net zero emission objectives.

Electrification and the sustained uptake of CER will continue to shape energy needs along with the decarbonisation of transport and industrial sectors, which could potentially significantly increase system demand. Given that electrification is the most likely decarbonisation pathway for residential consumers, considering how impacts on system load can be mitigated through better demand management (i.e., by improving energy efficiency and productivity) and orchestration will be critical.

AEMO’s 2024 Gas Statement of Opportunities (GSOO) continues to forecast risks of natural gas shortfalls on extreme peak demand days from 2025 and the potential for small seasonal supply gaps from 2026, predominantly in southern Australia, ahead of annual supply gaps that will require new sources of supply from 2028.[9] This makes the roll out of residential electrification an imperative as there are sectors of the Australian economy that are unable to electrify and will be reliant on increasingly scarce gas supplies.

To drive residential and small business electrification at pace and at scale, government support is essential. Through the right incentives, regulatory frameworks, and policy settings, governments can ensure electrification is a feasible alternative to natural gas.

Noting that customers are often held back by the real and perceived cost of electrification, policies that lower financial barriers to access should be progressed.

Ideally, these approaches should be consistent over time and location. While rates of electrification are very positive, they vary by jurisdiction, in part due to the lumpy nature of some incentive programs that make long

[9] See: AEMO, 2024 Gas Statement of Opportunities.

term education programmes and business mobilization challenging and confuse customers with eligibility and opportunity for different incentives.

CER orchestration

Electricity consumers are participating in the renewable energy transformation through unprecedented investment in CER. The Draft ISP noted that the uptake of CER is increasing faster than initially predicted, with AEMO forecasting 18GW more rooftop solar capacity by 2050 compared to the 2022 ISP forecasts.[10]

Given the prominence of CER in achieving the more ambitious scenarios outlined in the Draft ISP, it is important that appropriate policy settings are accelerated to help ensure the delivery of integrated and orchestrated CER, including the importance of being clear on the roles of industry participants, and need for appropriate standards.

AGL welcomes the recent announcement from the Energy and Climate Change Ministerial Council (ECMC) regarding the development of a CER roadmap. The establishment of an expert taskforce under the roadmap to consider national reforms for efficient CER integration, and how CER can help households reduce costs and benefit from the opportunities provided by electrification is a step in the right direction.

CER has the potential of providing significant system benefits and could offset the need for some grid-scale investment. To fully enable the potential benefits, CER needs to be orchestrated and appropriately integrated into the NEM in a way that supports power system reliability and security. Customers need to understand and see the benefits and have trust in the energy sector to achieve this.

Energy efficiency and productivity

As outlined in its submission the government's National Energy Performance Strategy (NEPS)[11], there are major decarbonisation opportunities through gains in energy efficiency and productivity. In recent years, a range of energy efficiency policies and programs have resulted in reduced electricity use through replacement of appliances and equipment, but there is significant potential for further change. With the rising cost of living pressures across the economy, there is also an opportunity to prioritise better demand management and energy productivity to reduce peak loads, enable efficient system build, and minimise energy costs for consumers, while also reducing emissions.

As more renewable generation enters the market, and as opportunities for appliance and equipment improvements become scarcer and more capital-intensive, it is important to consider how decarbonisation and energy efficiency objectives can be complemented by improvements in energy productivity, to work towards a broader goal of improved overall energy performance.

As the Australian economy continues to work towards a long-term net zero target, it will be important to ensure that economic productivity is not impacted by reductions in energy use. Energy performance will therefore have a critical role in the decarbonisation of Australia's energy system to support meeting our national emissions reductions targets – by reducing, shaping, and shifting energy demand to maximise the utilisation of renewable energy resources, and minimise energy costs for industrial, commercial, and residential customers.

Growing alternative low carbon fuels

[10] See: AEMO, Draft 2024 Integrated System Plan, page 18.
[11] See, AGL's submission to the NEPS, available here

The role of liquid and gaseous fuels in the net-zero transition, including natural gas, will vary significantly depending on the specific application, as well as other factors such as access to replacement technologies, cost, and location. AGL is supportive of alternatives to natural gas for some specific use cases, including electrification, biogas, and hydrogen.

Hydrogen can itself be an alternative fuel or feedstock in a range of use cases, and hydrogen derived fuels (e.g. synthetic diesel, synthetic aviation fuel and synthetic methane) can be drop-in replacements that are compatible with existing infrastructure and appliances. AGL supports the development of these use cases for future fuels within Australia to assist the decarbonisation journey.

Additionally, biomethane is likely to provide a promising short-term solution to substitute natural gas in the commercial and industrial sectors while helping meet Australia's decarbonisation and energy security objectives.

As outlined in our submission to the Australian Government's Future Gas Strategy,[12] we support a competitive ecosystem that has the right incentives in place to develop a range of technologies to deliver outcomes at the lowest cost. For most applications, we consider that renewable electricity is likely to provide the most cost-effective pathway to accelerated decarbonisation; however, this will not immediately be the case for all applications, especially for some industrial processes where different decarbonisation pathways may be necessary over the short to medium term.

AGL supports the rapid transformation of energy systems to support Australia's emissions reduction targets. Nevertheless, forecasts suggest that while steadily declining, gas demand for residential and commercial applications will continue to be material for some time.[13] This is because of the scope of replacing existing gas appliances that would be required to fully electrify, and because of commercial and industrial applications where electrification may be more challenging; for example, feedstock gas and high-temperature process heat applications.

Gas powered generation

Alongside new transmission infrastructure, DER, storage, and demand response, electricity generation from gas is also likely to be necessary to support Australia's energy system both now and in the future.

As noted by AEMO in its Draft ISP, Gas Powered Generation (GPG) is one of the key technologies to provide the firm capacity the power system needs to support high penetrations of VRE such as wind and solar. Although increasingly storage technologies such as batteries and pumped hydro will support the grid, as ageing coal generation exits the market, some amount of gas generation will be needed to ensure system reliability, with the Draft ISP suggesting that GPG will increase to 16GW by 2050.[14]

Meeting peak demand and ramping challenges, as well as other system services, will require careful market design, and appropriate price signals to ensure all system requirements are always met. Although services provided by innovative technologies such as inverter-based resources and demand response will have an increasing role in supporting the grid, gas generation currently provides a range of essential system services to the power system, in particular for ramping requirements and system strength. As coal-fired generation continues to exit the market, existing gas generators may increasingly be called upon to provide essential system services while the grid transforms to a fully decarbonised system where services can increasingly be provided by zero-emissions technologies.

[12] See: AGL's submission to the Australian Government's Future Gas Strategy.
[13] See: AEMO, 2024 Gas Statement of Opportunities
[14] See: AEMO, Draft 2024 ISP p65

At the same time, reliance on gas generation to support the broader electricity grid can also be mitigated through rapid electrification and innovation in customer products and services. As discussed above, given that AGL considers that residential electrification is the most likely decarbonisation pathway, broader grid impacts may be resolved through better demand management and orchestration of existing and growing CER. For example, orchestration of flexible residential demand from applications such as hot water and EV charging, may shift load from evening peaks to the daytime solar soak period, reducing the need for gas-peaking.[15]

Electric vehicles

Australia has an opportunity to stimulate the widespread uptake of Electric Vehicles (EV) for the benefit of consumers and the environment. From a consumer perspective, barriers to EVs have centred around choice, affordability and charging network limitations.

Accelerating the uptake of EVs will be an integral technology pathway for decarbonising Australia's economy, as transport currently accounts for 21% of Australia's emissions.[16] As AGL has previously stated,[17] the widespread uptake of EVs, when coupled with the decarbonisation of the electricity grid and increasing penetration of local solar photovoltaic technologies, presents a substantial opportunity to deliver emissions reductions consistent with Australia's long-term commitments under the Paris Agreement.

AGL welcomes the introduction of a National Electric Vehicle Strategy and its focus on establishing a national framework for the uptake of EVs as part of Australia's decarbonisation ambitions. We support the objectives and outcomes set out in the strategy including increasing supply of affordable and accessible EVs, establishing the resources, systems, and infrastructure to enable rapid EV uptake, and encouraging increase in EV demand. AGL also supports the introduction of the New Vehicle Efficiency Standard that will incentivise car companies to supply new cars that use less fuel per kilometre.

Bi-directional vehicle-to-infrastructure (V2X) EVs are likely to become more prevalent in the Australian market in the latter part of this decade and beyond. V2X EV batteries will be an additional important CER source of energy storage in orchestration of the home.

Low carbon liquid fuels

While we see electric vehicles as key for road transport, we recognise that low carbon liquid fuels (LCLF) will play a key role in decarbonising fuel reliant sectors that can't readily electrify. This is particularly true for aviation, heavy vehicles, maritime, construction, mining, and agriculture.

AGL supports the Australian Government developing a framework to support the domestic LCLF industry and help the market overcome barriers in the short, medium, and long-term. We also support the Commonwealth's investments in projects through the Sustainable Aviation Fuel Funding Initiative and the Hydrogen Headstart program. In fact, investment in sustainable aviation fuel (SAF) technologies and production facilities in Australia is urgently needed given SAF is a drop-in replacement for jet fuel. As feedstocks for bio-SAF become less able to satisfy the global demand for SAF, investment in eSAF (produced from green hydrogen) will be required to ensure sufficient volumes are produced for the global aviation industry. This will drive a need for additional investment in carbon capture technologies like DAC (direct air capture) to minimise the carbon emissions created by the eSAF production process.

[15] See: AGL's South Australian Hot Water Orchestration Trial and AGL's Electric Vehicle Trial.
[16] See: Australian Government, Australia's emissions projections 2023, available here
[17] See, for example, AGL's submissions to the 2018 Select Committee on Electric Vehicles and the 2021 Senate Economics Legislative Committee's Inquiry

Building Australia's clean energy workforce

The energy transition presents both a massive opportunity and major challenge with respect to energy workforce transformation.

Some of the opportunities presented by the transformation of the energy workforce include new employment opportunities in renewable energy and other emerging technologies and industries. The energy transformation also presents an opportunity to increase diversity in the energy sector.

However, the transformation of the energy workforce also presents some major challenges including a significant increase in the demand for a technically skilled and diverse workforce, particularly engineers and electricians along with corporate professionals skilled in community liaison, commercial trading, and project management. There will also be significant impacts on those in the regions and currently working in the fossil fuel industries.

AGL welcomes the forthcoming National Energy Workforce Strategy and the establishment of a national Net Zero Economy Authority (NZEA). We also welcome the work being undertaken by the states in this space, including the Victorian Energy Jobs Plan.[18] To bring a whole-of-society focus on this important issue, we would encourage both the state and federal governments to work closely together on ensuring that workers and communities are supported through Australia's transition to net zero.

The energy transition is an industry-wide transformation that will involve significant changes to the way AGL operates. In our CTAP, we set out our approach to supporting workforce transition, acknowledging that labour and skills required to operate our generation assets will change over time. AGL is committed to working constructively with employees and their representatives, as well as state and federal governments, in relation to workforce and site transitions.

Maximising outcomes for people and businesses

AGL strongly believes that people, equity, and fairness must be at the heart of the energy transition. It is incumbent on us to make sure the actions we take now ensure the energy markets of the future will achieve these objectives.

The energy transition is changing the way Australian's interact with their energy retailers through new market operations, technological advancements, and decarbonisation objectives. These changes present significant opportunities for both customers and businesses to redefine how energy is produced, supplied, consumed, and shared. However, it is critical that energy consumers are empowered, guided, and protected as they undertake this new journey into the energy market of the future.

As part of the energy transformation, many innovative solutions and framework designs are currently being explored across the energy industry. Changes of this scale are inherently complex and require collaboration across all governments, industry, and communities.

We must consider how the costs of these changes will be shared, both now and in the future. As part of this consideration, we must ensure that we have appropriate cost allocation frameworks in place so that all consumers pay their fair share towards the energy transition.

In November 2023, AGL's Customer Council published an open letter announcing its agreed priorities and considerations for policy makers, market bodies and the energy sector more broadly. In that letter, the Customer Council called on governments, energy ministers, regulators, policymakers, and market bodies to

[18] See: AGL's submission to the Victorian Energy Jobs Plan.

urgently address the following key structural elements for the energy transition through transparent, constructive, and effective dialogue and timely and meaningful reforms:

- **Co-responsibility**: Governments, the community, and the energy industry (including retailers, networks, generators, and other energy service providers) must continue to work together to support customers experiencing short-term, episodic, or entrenched vulnerability.
- **Amplifying consumer agency**: Innovative solutions, leveraging new technologies and modern approaches, should be used to strengthen agency in supporting consumers to control their energy use, costs, and transformation journey.
- **Equity**: Governments and policymakers must ensure the decisions we make today are sustainable and benefit current and future generations without transferring a major cost burden.

AGL considers this to be an appropriate framework for governments to consider when looking at maximising outcomes for energy consumers in the energy transition.

Social licence

Social licence will be critical to achieving an orderly energy transition. Significant risks are apparent in the rollout of renewable energy infrastructure in regional areas, with social licence issues resulting in renewable project delays. We believe that both industry and governments have a critical role to play in building community awareness and acceptance of the need for the energy transition, and building trust in the energy industry through further engagement to ensure that communities feel heard and benefit from the transition.

Affordability and customer vulnerability need to be considered as part of the pathway for the energy transformation, to ensure that no one is left behind. Additional support mechanisms may also be required for vulnerable customers and to ensure public support.

Circular economy

Circular economy is a critical consideration in any industry and for society as a whole. We need to move away from a single use, throw-away mentality to one of avoid, reduce, reuse, and recycle. Consideration needs to be given to recycling and reuse of solar panels, batteries, and wind turbines, particularly as the energy transition accelerates. Increasingly, large-scale renewable energy project planning approvals are requiring consideration of end-of-life management of materials, and this is likely to flow through to other products and industries.

It is expected that globally, demand for critical battery minerals such as lithium will increase forty times on 2020 levels by 2040 as economies transition, with demand for cobalt and graphite expected to increase twenty times[19]. It only makes sense that reducing our usage of critical materials, and reusing and recycling where possible, will assist with the transition, and may reduce costs in the long run.

Building a recycling industry in Australia for solar panels, batteries, among other materials, will provide numerous opportunities for the Australian economy. It may also be necessary to manage end of life domestically for certain products such as lithium-ion batteries, given the difficulty in shipping these materials internationally. Domestic recycling facilities would also complement a domestic manufacturing industry.

AGL's strategy to transform our three thermal generation sites into low carbon integrated energy hubs, have been designed with circular economy principles at the forefront. We are supportive of policy focuses that can support bringing together industries to make a positive contribution to the energy transition, and deliver significant workforce and economic benefits in moving to a lower carbon economy.

[19] https://www.industry.gov.au/publications/critical-minerals-strategy-2023-2030/operating-environment#:~:text=Demand%20for%20battery%20minerals%2C%20such,same%20period%20(IEA%202021).