

The Australian Industry Group

INDEPENDENT REVIEW OF THE FUTURE SECURITY OF THE NATIONAL ELECTRICITY MARKET



Contents

Executive summary	3
Why the energy challenge matters	4
Vision, principles and framework	6
Vision	6
Principles	7
Framework	9
Responses to specific questions	11
General questions.....	11
Specific questions	15

About Australian Industry Group

The Australian Industry Group (Ai Group) is a peak industry association in Australia which along with its affiliates represents the interests of more than 60,000 businesses in an expanding range of sectors including: manufacturing; engineering; construction; automotive; food; transport; information technology; telecommunications; call centres; labour hire; printing; defence; mining equipment and supplies; airlines; and other industries. The businesses which we represent employ more than 1 million people. Ai Group members operate small, medium and large businesses across a range of industries. Ai Group is closely affiliated with more than 50 other employer groups in Australia alone and directly manages a number of those organisations.

Australian Industry Group contact for this submission

Tennant Reed – Principal National Adviser – Public Policy
03 9867 0145 tennant.reed@aigroup.com.au

Executive summary

The Australian Industry Group welcomes the opportunity to make a submission to the Independent Review into the Future Security of the National Electricity Market. The Review comes at a time of extraordinary change in Australia's energy systems and pressure on energy users. The commencement of Liquefied Natural Gas exports from Queensland is tripling gas demand in Eastern Australia, putting supply under intense strain for the time being and forging a more enduring link with international prices. Gas-fired electricity generators have been in greater demand to back up renewables and substitute for retiring coal generators, but their fuel has become harder to obtain and much more expensive. Retirements, scarce and pricy gas, and a bump up in demand from extreme weather and the new Liquefied Natural Gas (LNG) industry have combined to put energy reliability in doubt and affordability in peril. Meanwhile, Australia's greenhouse gas emissions are rising and we are not on track to meet our commitments under the Paris Agreement. The Review has rightly identified the 'energy trilemma': the system must deliver energy that is reliable, affordable and clean to meet our needs. Currently we are failing on all fronts.

Australia has an extraordinary energy endowment: among the best wind, solar, geothermal, gas, coal, geosequestration and uranium resources in the world, all located in a stable country with strong institutions and a highly educated workforce. New technological options are opening up for using our resources more reliably, at less cost, and with low or no greenhouse gas emissions.

Australia should be well placed to turn our energy abundance into competitive advantage and national prosperity. But to do so we will need to reform our energy and climate policies and markets – and maintain broad support for those reforms across many political cycles and at all levels of government.

To be more specific, while technology neutral policy mechanisms are important, it appears plausible that falling wind and solar costs will soon make them significantly cheaper than any other option for new energy. But it is also clear that there are real and substantial challenges to integrating large volumes of variable renewable energy with our current energy systems. These challenges can be overcome, but not without significant reform effort to underpin the necessary investments in flexibility across demand, generation, networks and storage.

The same kinds of reform will be equally relevant if other renewable, fossil or nuclear technologies turn out to be more competitive. The Review is an excellent opportunity to develop these reforms and a consensus around them. We are submitting two documents:

- A. This submission, which conveys why the energy challenge matters; offers a vision, principles and a framework to guide the Review and subsequent reform; and provides direct responses to some of the questions raised in the Preliminary Report; and
- B. A recent Ai Group report on energy prices, which highlights the extent and causes of the current doubling of wholesale electricity and gas prices, as well as potential responses.

Ai Group and our members have been impressed by the Review's open and consultative approach so far and we look forward to contributing further as the reform agenda develops.

Why the energy challenge matters

The Australian Industry Group's members are overwhelmingly energy users rather than suppliers. For many of them the cost of energy is a very important part of their overall cost structure, and reliable energy supply is critical to business continuity for them all. They have a stake in emissions reductions in the electricity sector both as part of an overall least-cost approach to Australia's long term climate policy goals, and because of the greater burdens that may fall to industry if the power sector is unable to play its part.

Our members are intensely concerned by the serious price rises that are taking place across the National Electricity Market and in the Eastern Australian Domestic Gas Market. Security of supply has also become a worry for boardrooms in Australia and in some cases for head offices overseas. While supply security and price concerns have hit South Australian business first, the worry is increasingly national as futures prices have risen in New South Wales, Queensland and Victoria and extreme demand has led to near misses with load shedding.

Ai Group recently published a report on energy prices, [Energy shock: No gas, no power, no future?](#), which we attach to this submission. The key points are as follows:

- Ai Group's recent survey findings add to the multiple lines of evidence that confirm that **energy prices are rising fast** across the National Electricity Market and Eastern Australian gas market. Business and households are going to see severe increases in their costs.
- **Wholesale electricity prices are roughly doubling. Wholesale gas prices are at least doubling** and may well rise much further. Spot prices are becoming more volatile.
- **Business expect their energy prices to worsen.** When surveyed in late 2016 over half (51%) of businesses expected price increases in the coming year and only 4% expected a decrease. In the past year 39% of businesses had retail energy price increases, while 9% had price decreases. Most businesses sign energy contracts of more than one year, and price increases take time to filter through. Wholesale prices have continued to worsen since the survey.
- Once fully passed through, the current **electricity and gas price increases will cost energy users \$10-\$12 billion per year.** Households will pay up to an extra \$3.6 billion a year, and business up to \$8.7 billion a year. Within business, more energy intensive manufacturers will be particularly hard hit, paying up to \$4 billion a year. This will worsen margin pressures for business, with some manufacturers questioning their ongoing viability as a result.
- Companies in primary metals manufacturing, food manufacturing, basic chemicals and non-metallic mineral products (including building products) are particularly exposed to a **double hit to their profitability** from steep electricity and gas price increases.
- **Long-term gas contracts are getting harder to obtain** (worsened by a non-transparent market) and onerous take-or pay provisions mean more risk for users (especially large ones).
- **Several factors are driving up wholesale electricity and gas prices** including the closure of some baseload electricity generators, the unprecedented LNG developments placing strain on both the gas market and the cost and availability of gas-fired electricity generators, record electricity demand related to the pumping of LNG gas, the recovery of global coal prices, and the restriction on the development of additional on-shore gas supplies.
- **Achieving lower energy prices will not be easy:** gas faces international price parity and rising production costs, while all new electricity generation looks expensive and new investment is needed. Easing production, an import terminal and pro-competitive market reform will help in gas. More available gas will help electricity, as will meeting the existing RET and settling national coherent energy and climate policy reforms to ease transition and reward low-cost flexibility. Energy efficiency

and productivity and demand response will help with affordability and reliability for all.

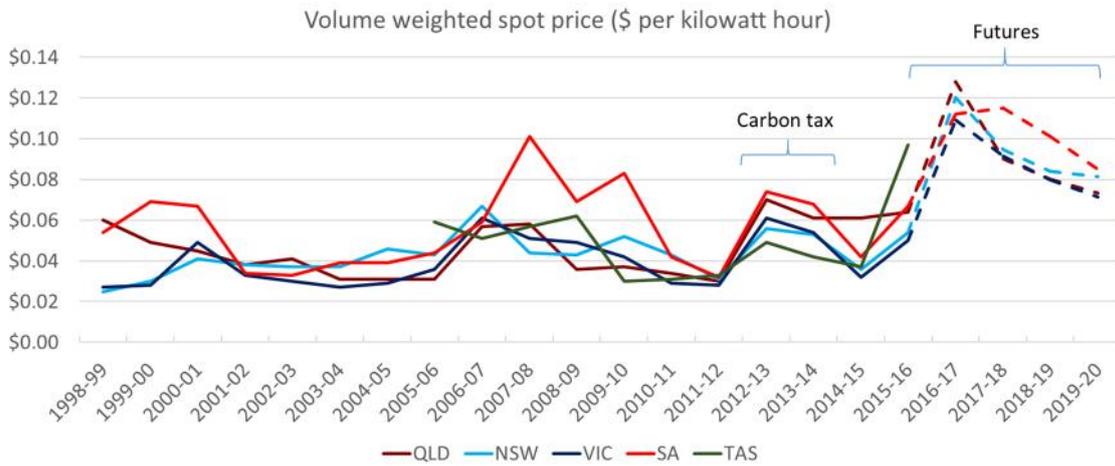


Figure 1 Wholesale electricity prices - historical and futures as at 1 March 2017 (AER, ASXenergy)

Looking to the third aspect of the energy trilemma, recent official [emissions data](#) and [projections](#) highlight that Australia's greenhouse emissions are rising and that we are not currently on a pathway to achieve our nationally determined contribution under the Paris Agreement of a 26-28% reduction in emissions below 2005 levels by 2030, nor the longer term goal of contributing to global net zero emissions.

The present Review thus comes at a time when reliability, affordability and emissions reduction are all under threat. The situation has grave implications for all parts of society, particularly trade exposed industry. Global competition is greater than ever, and Australian businesses need every competitive edge they can find as our economy continues to transition away from mining to other sources of growth. At a time when margins for many non-resources businesses are already under pressure, spiking energy prices will reduce their viability and their contributions to the economy, employment and the broader community.

Reform is urgent to ensure an efficient response to the challenges we face. For instance, it is very plausible that current steep increases in electricity and gas prices induce more households and businesses to use solar and batteries. But without reform to the current market structure, they will only face incentives to cut their use of the market – not to install and operate their assets to support the market and create value for everyone.

The Review has the potential to provide a sensible framework for addressing these challenges, which we hope can bring together industry, other energy stakeholders, and policy makers from all sides and levels of government. The alternative – continued paralysis and division over energy and climate policy – is a threat to us all.

Vision, principles and framework

The Review is just one step in an extended process of reforming markets and policy, but it can play a crucial role in guiding all future efforts. To do so, as well as a package of particular reforms the Review should articulate a vision for Australia's energy systems; principles to guide reforms towards the vision; and a framework to organise our understanding of where reforms are needed and how they are performing.

VISION

Australia needs a clear, attractive, ambitious but achievable vision to guide the long term development of energy markets and policy. A vision is more specific than existing statements like the National Electricity Objective ("to promote [...] the long term interests of consumers of electricity [...]"), but more general than the particular package of reforms that the Review will also work on. In the absence of a broadly agreed vision policy is more likely to be reactive, uncoordinated or hostage to unspoken choices and assumptions. There is a particular risk that we assume that Australia will inevitably lose its energy intensive trade exposed industries to lower-cost countries.

[As we have argued elsewhere](#), Ai Group sees strong evidence that manufacturing of all sorts of products can grow and prosper in Australia, particularly through innovation, automation, and increased agility. It is also clearly the case that the world will continue to demand and produce energy intensive products even as it moves to decarbonize its energy systems. Metals and metal products, basic chemicals and many other energy intensive products will remain essential globally, and energy will remain a key part of the cost structure for such products. Finally, Australia's rich endowment of energy resources of all sorts gives us great potential to produce abundant and competitively priced energy while we move towards net zero emissions.

Summing this all up, we propose that the Review adopt a vision that includes the following statement:

Energy should become a source of global competitive advantage for Australia's trade exposed industries. Our energy systems should help make Australia an attractive location for energy-intensive industries all the way through the global transition to net zero emissions.

A vision should also contain elements relating to the interests of household consumers and other stakeholders. But it is important to have specific recognition of the importance of energy to Australian industry, and a call to action to pursue global competitiveness.

PRINCIPLES

A strong set of principles will help to guide the development of energy market reform. We suggest the following principles.

Predictability

Energy users and suppliers need reasonable confidence about the future direction and detail of energy and climate policy. Full certainty is not achievable or desirable, given the need to evolve and adapt our energy system over time to changing circumstances. But it is possible to deliver a clear forward pathway and defined processes for shifting the pathway over time. This is particularly important for investment in new capacity and associated infrastructure to alleviate potential shortfalls or market disruptions. Key elements for predictability include both regulatory stability, as well as transparent energy markets that facilitate short and long-term pricing signals for investment and planning.

Trade competitiveness

Australia's energy system is a critical enabler of our trade exposed industries. Thus we should judge the system (and reforms) not just against community expectations for reliability, affordability and clean power, but relative performance on these metrics against competing nations. Reforms need to contribute to a globally competitive energy system.

Reward for value

Energy market participants can create value for the system in many ways, including: providing energy, demand response, frequency control and inertia at times and places where they are needed; making more efficient use of existing assets and reducing new investment needs; and more. Market design and policy need to ensure that value creation can be adequately rewarded, wherever it happens and whoever is involved. We are far short of this at present, with a system that particularly ignores demand side participation and provides no way of monetizing many forms of value.

Technology neutrality

There are many energy technologies that can potentially contribute towards our needs, and we have been repeatedly surprised by the progress – or lack thereof – that different technologies have made on price and performance. To take advantage of unexpected opportunities and guard against unexpected failures, our energy markets and policies should define the products and outcomes they target and be formally and substantively open to all technologies that can help meet those goals. That said, technology neutral market and policy mechanisms should be tested to see how they fit with what appear to be the likeliest technology options. And every technology will need a base of standards, skills, infrastructure and regulatory systems in order to compete.

Integration of energy and climate policy

Australia's 2030 emissions targets and the longer term move towards net zero emissions have big implications for the development of the energy markets, and *vice versa*. It is important that the substantial overlap between these issues be addressed consistently and coherently.

To the extent that the Review considers the detail of climate policy, it should also be guided by the [climate policy principles](#) developed and adopted by the Australian Climate Roundtable, which brings together a broad cross section of business, environmental, community and union groups. Those state that

We recognise the major parties' bipartisan goal of limiting global warming to less than 2°C above preindustrial levels. Our overarching aim is for Australia to play its fair part in international efforts to achieve this while maintaining and increasing its prosperity.

Achieving this goal will require deep global emissions reductions, with most countries including Australia eventually reducing net greenhouse gas emissions to zero or below.

The Principles also state that an ideal climate policy would:

be capable of achieving deep reductions in Australia's net emissions in line with our overall goal; provide confidence that targeted emissions reductions actually occur; be based on an assessment of the full range of climate risks; be well designed, stable and internationally linked; operate at least cost to the domestic economy while maximising benefits; and remain efficient as circumstances change and Australia's emissions reduction goals evolve.

The Roundtable principles include further detail on cost control; trade competitiveness; innovation; equity; stability; adaptation; the use of any revenues; administration and review. With respect to the energy sector, the Roundtable organisations have agreed that:

Policy should recognise the strategic importance of reducing emissions from the energy sector in achieving the overall goal. It should provide a credible basis for planning and investment by the energy sector and energy consumers, maintain energy security and avoid sovereign risk. While the need to reduce energy sector emissions has been widely anticipated, specific policies may create economic shocks that negatively affect businesses. These shocks should be smoothed without negating the incentives created by the policy.

The electricity system urgently needs clear, efficient and durable climate policy in order to underpin new investment. A well-designed technology neutral market mechanism would be best; options include an emissions intensity scheme, as well as clean energy targets or carbon pricing schemes. Any of these would need careful consultative design and broad political support to work.

However, it is very important that the debate over which of these policies to adopt does not derail the rest of the work of the Review. Whatever the mechanism that drives emissions reductions in the electricity sector, it appears likely that the result will be heavier use of renewable energy, which is becoming increasingly competitive. Our energy system is not currently set up to digest high levels of renewables, and even a well-designed emissions price signal will not of itself overcome any of the barriers to doing so. The work of the Review in identifying reforms to modernize the electricity system is thus at least as important as the consideration of how to incentivise emissions reduction.

FRAMEWORK

Our energy systems are complex and the options for reform are numerous. While we will need to adopt a set of specific measures, there is a great danger that the reform discussion gets bogged down in arguments over individual options without adequate prioritization, or that policy makers cherry-pick a handful of reforms without consideration to the overall system. The example of the Demand Response Mechanism (DRM; see box) is sobering.

We therefore urge the Review to adopt a clear framework for energy market reform that conveys the areas of need and opportunity, makes it apparent that action of some kind is required in each area, and allows an easy assessment of gaps in the ongoing reform process. While specific mechanisms may run into difficulties, a framework can have enduring value as a guide to reform.

We suggest the framework overleaf as a starting point for the Review's consideration. It is important to distinguish clearly between the physical options to deliver what we need from the energy system, and the policy or market mechanisms that can motivate those options.

There are many reform options and some will be relevant to unlocking physical opportunities across more than one of the segments in the illustrative framework. For instance, five-minute settlement of the wholesale electricity market would potentially be a motivator for flexible offerings across large scale generation, large scale storage, and demand-side generation, storage and response. Broadly applicable market structures and reforms tailored for the needs of one segment are both potentially useful approaches. The point of the suggested framework is to ensure that for each segment there are adequate relevant reforms to help unlock the opportunities for flexibility therein.

Demand Response Mechanism (DRM) debacle shows need for framework

The history of the DRM highlights the need for a strong and consistently applied framework for reform. The DRM is one way to incentivise flexible demand and take pressure of the power market during peak periods. A DRM would allow energy users to sell demand reductions directly into the wholesale market at the prevailing spot price (as much as \$14,000 per megawatt hour). The status quo only allows for arrangements with a user's current retailer, and few of these happen.

The DRM was recommended by the Australian Energy Market Commission (AEMC) as part of its *Power of Choice* review in 2012, and in December 2012 COAG endorsed the DRM as part of an energy reform package. But over the next four years the DRM concept withered in the face of weak COAG commitment, slow development by AEMC, and steady criticism by energy suppliers. In mid-2016 AEMC lost confidence in its own DRM proposal and withdrew it.

Criticisms of the DRM for implementation cost and gameability may have had merit. But they were made in a vacuum, without reference to the systemic challenges we are facing. And when the DRM fell there was no alternative model ready to go. For now we have been left with no plan to unlock demand response.

Illustrative framework for energy market reform

Challenge: the National Electricity Market is under increasing strain from change, particularly the increasing role of variable renewable energy – a role which is very likely to increase further. To deliver affordable, reliable and clean energy in this context the NEM needs to be able to draw on all cost-effective sources of systemic flexibility.

Framework: the following illustrative framework can be completed with the input sought by the present Review. The AEMC should then update it regularly with new information about technical and policy options and current performance, and report to COAG and the public.

Flexibility required	Flexibility needs to be considered within several timeframes: instantaneous, daily and seasonal. This requirement could be expressed in more specific metrics such as systemic inertia, available frequency control (FCAS), and capacity to raise or lower supply and demand. However any metrics will need to be regularly updated in light of experience.			
	Demand side	Large scale generation	Networks	Storage
Physical options and potential <i>What are the technical options for flexibility; how much could they provide and at what cost?</i>	E.g. demand response to provide energy, FCAS or synthetic inertia; distributed generation or storage; electric vehicles	E.g. gas fired generators; spinning condensers; modify wind and solar to provide FCAS or synthetic inertia; diverse uncorrelated resources	E.g. smart meters; upgrades to handle more variable flows; minigrids; interconnectors; transmission to open new energy sources	E.g pumped hydro; large scale batteries; hydrogen or other synthetic fuels; increased gas storage
Policy and market options and potential <i>What reforms would motivate uptake of physical options, how much could they unlock and at what cost?</i>	E.g. direct/aggregated participation in market(s); dynamic/cost reflective pricing; procurement by AEMO, networks, government; regulatory mandates; rebates/grants	E.g. inertia market; five-minute settlement; contracts for difference; capacity market; gas supply incentives; require generators to firm supply	E.g. amend economic, technical or investment test regulation of networks; enable, forbid or bound networks in contestible markets; provide public finance	E.g. enable storage participation in market(s); incentive payments for storage value streams beyond existing markets; direct public investment
Preferred reforms				
Total impact <i>How does the cumulative flexibility from all reforms match against the goal?</i>				

Responses to Preliminary Report questions

In addition to our input on the significance and conceptual framework of the Review, we offer the following responses to some of the questions raised in the Preliminary Report.

GENERAL QUESTIONS

How do we ensure the NEM can take advantage of new technologies and business models?

The proposed principle of *reward for value* should be a guide: the creation of value for the electricity system needs to be rewarded wherever it takes place. This means both better recognising the increasingly important value that energy technologies can create – varying and time-shifting demand and supply, providing inertia, supporting frequency control; and opening up our energy markets to more meaningful participation by players who can now provide more of that value – particularly demand side participants of all sizes, and the aggregators and energy services companies that can help them.

How do we ensure the NEM meets the needs of all consumers, including residential, large-scale industrial and vulnerable consumers?

Diverse energy users in fact have many interests in common, and a failing NEM would serve none of them. If some households and businesses respond to spiralling prices either by exiting the grid entirely, all energy users are likely to be worse off. All energy users will win if the growing potential of distributed generation, storage and demand response is rewarded when it improves the flexibility of the entire market.

That said, it is important to ask of every aspect of the NEM and energy policy whether it is genuinely accessible to different consumers given their circumstances. Many businesses and households occupy rented premises, which may limit their ability and willingness to make structural improvements to energy efficiency or install distributed energy resources. Mechanisms that are formally open to all consumers can be inscrutable or inaccessible in practice; for instance, the Victorian Energy Efficiency Target has covered business for many years, but only now are methodologies being developed for energy saving activities relevant to industrial energy users.

The best guarantee that the energy market will meet consumer needs is to maintain continuous and deep engagement with consumers throughout the reform process. There is strong and increasing collaboration between representatives of Australia's energy users. Their voice could be better heard if the COAG Energy Council's Stakeholder Meetings included greater opportunity for stakeholders to put their views and current concerns to Ministers and officials, rather than just hearing presentations.

The review should also distinguish the needs of small and medium sized business from those of households on the one hand and the largest industrial energy users on the other. SMEs vary in their energy intensity, but tend to have fewer financial and management resources to put towards energy issues and a weaker bargaining position than their large industrial colleagues. Collectively, however, their energy use and potential for demand side participation is significant.

What role should the electricity sector play in meeting Australia's emissions reduction targets?

Least cost abatement is an important principle which requires that Australia be open to all genuine emissions reduction opportunities across all sectors – and the use of valid international emissions

offsets and allowances. Narrowing our focus from broad-based economy-wide market mechanisms to sectoral policies raises very difficult questions about equity and the efficient allocation of burdens and resources that may significantly impact the community. We need to be open to the probability that our assessment of where and how emissions can best be cut will change substantially over time as technology develops and our understanding improves. All this makes us very cautious about assigning hard shares of our national emissions goals to individual sectors.

That said, it is also obvious that the electricity sector is a substantial part of Australia's current emissions; that electrification is one of the most feasible and affordable pathways for reducing emissions from many parts of transport and industry; and that Australia's long-term climate goals, which include a contribution towards global net zero emissions in the second half of the century, are extremely important for an industry where new assets are expected to operate for several decades.

We therefore reiterate the Australian Climate Roundtable's relevant principle:

Policy should recognise the strategic importance of reducing emissions from the energy sector in achieving the overall goal. It should provide a credible basis for planning and investment by the energy sector and energy consumers, maintain energy security and avoid sovereign risk. While the need to reduce energy sector emissions has been widely anticipated, specific policies may create economic shocks that negatively affect businesses. These shocks should be smoothed without negating the incentives created by the policy.

What are the barriers to investment in the electricity sector?

There are several. The greatest is the intense political uncertainty surrounding climate and energy policy and the resulting lack of a durable framework on which investors can rely. When all parties and all levels of government are at loggerheads and policies are repeatedly abolished or radically amended, the currency and credibility of all energy and climate policy is greatly devalued. The likelihood of a future carbon constraint in the electricity sector weighs on emissions-intensive investments, but the nature and timing of a future policy is far too uncertain to support less intensive investments. The debate over the potential abolition of the Renewable Energy Target (RET) demonstrated the tight link between political uncertainty and investment. While the RET is a far from perfect policy, it is also the only current basis for investment confidence in electricity and the existing target should be preserved and met.

Beyond political uncertainty there is further market uncertainty given the speed and scale of change underway. How will demand evolve given energy efficiency, distributed energy and the potential for demand destruction in light of energy prices and challenges to trade exposed industry? When and how will older generators exit the market, and what impact will this have on market power? Will fuel be available to gas fired generators, and at what price? How quickly will the costs and performance of different technologies improve, particularly solar, wind and batteries? These worries may militate against large lumpy investments and in favour of smaller projects that can be expanded or replicated if successful. Uncertainty and caution have also led some energy suppliers and energy users to hold back from commitment to supply contracts in the hope that better arrangements may be struck later – with the effect that some supply opportunities are lost.

A third major inhibitor of investment is the inability to monetize all the value streams that electricity investments can create. A battery, for instance, can be operated to:

- arbitrage high- and low-price wholesale power;
- reduce unserved energy;

-
- provide frequency control;
 - provide synthetic inertia;
 - ‘firm up’ renewables projects to provide steadier supply;
 - ‘flex up’ baseload generators to endure a more dynamic market;
 - avoid variable costs for generators;
 - lower wholesale prices by reducing the dispatch of expensive peaking generators;
 - avoid new investment in generation assets;
 - reduce or avoid distribution and transmission network investment and augmentation;
 - and potentially more.

The current rules and practicalities of the market do not allow a single investor to turn enough of these value streams into revenue. The same is true for demand response, distributed generation, and even for large scale generation technologies: coal and gas generators are not currently rewarded for the inertia they provide to the system. The result is underinvestment in the assets that would strengthen our system at least cost. While falling costs for some technologies will drive higher uptake, we will remain far short of efficient investment levels (and types) until investors can count on adequate reward for creating genuine value.

What immediate actions can we take to reduce risks to grid security and reliability?

The Review is right to identify the opportunity for near-term technical projects, potentially including different forms of storage or conversion of close generators to spinning condensers, to make immediate contributions to the grid while also improving our understanding of how these technologies function in our market, and how the market design can best unlock their potential. Worthy projects should proceed in parallel with market reform efforts that will underpin wider future investment in successful technologies.

We encourage a strong focus on energy efficiency and demand response. These can reduce chronic and acute pressures on our electricity and gas markets. Relevant State and Federal policies have often suffered from weak and intermittent resourcing and a lack of national coordination; they have also tended to focus on reducing annual energy demand rather than focussing on peak constraints for particular times and locations. Efficiency and demand response demonstration projects, including the aggregation of many small- and medium-sized energy users, could be developed at reasonable scale and procured in advance of more enduring market reforms.

Action on gas is particularly important to both price and reliability in the near term – see below.

Is there a role for technologies at consumers’ premises in improving energy security and reliability?

Yes, demand side technologies including distributed generation, energy storage and demand response are likely to be very important in providing the flexibility the NEM needs to digest the likely growth of variable renewable energy. Compared to traditional generation and network players, demand side participants will tend to have fewer resources, less familiarity with the energy markets, and a different

appetite for risk and options to manage it. It is vital that policies and market structures are both formally open to demand side participation, and actually structured and operated in ways that make their participation practical. The role of intermediary service providers and aggregators will be very important. Demand side participants should have as many options open to them as possible, in particular by being able to engage with networks, retailers and third parties, as well as to offer services directly to the energy markets where this suits them.

What role is there for new planning and technical frameworks to complement current market operations?

While there is much to be said about the valuable roles of planning, technical frameworks and regulation in underpinning an effective electricity market, we offer comment on one issue in particular: whether technical regulation should be used to strengthen the requirements on market participants to support system reliability. For instance, we have heard suggestions that the NEM adopt rules similar to those in the Quebec or Texas electricity markets, where existing and new wind farms are required to be able to provide synthetic inertia or frequency control services. While regulatory responses can have the advantage of providing clear performance outcomes, they also bring the risk that the actions mandated are more expensive or rigid than necessary to meet the goal of enhancing the flexibility of our energy system. We urge the Review to consider carefully the alternatives to regulatory standards and avoid retrospective changes. Approaches that incentivise flexibility wherever it can mostly cheaply be delivered can be better, at least where their complexity is manageable. An approach that required wind farms and other variable generators to firm their production or deliver system security services, but left it open to them to provide this themselves or contract it out, would be more flexible. Liquid and widely accessible markets for system flexibility and security services would be even better; such markets require vigorous participation, whether those services are procured by the market operator, energy retailers, or generators.

How can we improve the supply of gas for electricity generation to contribute to reliability and security?

Gas is crucial not just to electricity security but to price and emissions reduction as well. Beyond electricity it is also crucial to industry as efficient fuel and valuable feedstock, and plays an important role for many households. Gas supply is under severe challenge in Eastern Australia, as highlighted in the separate [Energy shock report](#) we are providing along with this submission.

The supply and price crisis has so far been shaped mostly by the take-off of the Queensland LNG industry, which has tripled Eastern Australian gas demand, failed to increase Queensland coal seam gas supply as far and fast as intended, and drawn significantly from other production as a result. The restrictions on unconventional gas production in New South Wales, the Northern Territory and Victoria will worsen pressures significantly over time if sustained, since conventional reserves are depleting and unconventional onshore gas dominates remaining identified resources. Lifting these regulatory blocks is critical, but a three pronged response is needed.

- There is considerable work already underway on **reforms to the gas market** to improve transparency and competition, including via the work of the Australian Energy Market Commission, the Australian Competition and Consumer Commission, and the Gas Market Reform Group. Reducing information asymmetries, providing clearer data for futures, stronger trading hubs and more accessible transport are valuable but will take time to have any effect; they may not impact the fundamentals of supply and demand.

-
- **New gas supply** is badly needed, including reforms to State policy to ensure that unconventional gas production can proceed with sufficiently strong and science-based regulation, particularly of water resource impacts, to ensure community confidence. The potential LNG import terminal being considered by AGL deserves full investigation and could be very useful. There may be further opportunities around new pipeline infrastructure. However, community concerns about coal seam gas and hydraulic fracturing are sincere and intense in some quarters, and will not easily be answered. Moreover, even if State regulatory barriers were lifted immediately, it could be three to five years before new production or imports delivered significant volumes of gas to the domestic market. The size of the opportunity is particularly unclear in Victoria, where exploration had not proceeded far even before being banned.
 - **Shorter term measures** are thus needed to bring gas supply and demand into better balance until new supply sources can be developed. At present the most likely course is for extreme domestic prices to balance the market through demand destruction. This would be extremely painful for gas users in general; but it would present intense risks to the electricity sector, where gas generation is badly needed and the terms on which gas is available, as much as the price, can wreak havoc on the cost structure and availability to the market of generators. Measures to encourage energy efficiency and productivity, as well as fuel switching by gas users, could play a positive role and should be an immediate focus, but their contribution will take time to grow.

LNG exports are an obvious focus for action, given their size and role in pressuring the market. However, onerous and retrospective policies impacting existing gas fields and terminals would be extremely undesirable and raise major sovereign risk issues, and so are unlikely to be adopted. Instead it may be possible to coordinate voluntary arrangements between LNG exporters in Australia, their overseas customers, third party suppliers and Australian customers. This could swap gas from export to domestic markets at export parity pricing, and meet export contracts with gas from international spot markets. Such an arrangement would be complex to put together, and would need to be transitional while other sources of supply are developed.

SPECIFIC QUESTIONS

1.1 How do we anticipate the impacts, influences and limitations of new technologies on system operations, and address these ahead of time?

Australian governments and energy governance bodies have been unable to keep up with current developments in energy demand and technology, let alone anticipate future ones. The tasks are inherently challenging and many observers have had similar problems. But policymakers have tended to ascribe far too much force to forecasts and modelling reports based on incorrect assumptions and long-out-of-date technology data. While market modelling and forecasting remain useful to extrapolate current knowledge, they need to be treated with much more caution. Policymakers and market governance require more emphasis on market intelligence and real-time updates, rather than annual or semi-annual publications.

1.3 What other electricity innovations are you aware of that may impact the market in the future?

The potential for **new and improved battery chemistries** to substantially reduce the loss of capacity through repeated cycling and deep discharge would have very large implications. There is widespread

research and development effort to this end. Such improvements would allow electric vehicles (EVs) to play a much bigger role in the energy system as providers of energy-shifting and system stability services. While EV uptake in Australia is currently negligible, declining costs and improving performance, combined with vehicle efficiency standards currently under consideration, could see a large resource of underutilised battery capacity potentially available to the electricity market over the coming decades. Market rules to reward providers of flexibility need to be practically accessible to such a mass market if it eventuates.

Some large data centres now operate on **direct current** (DC) as opposed to alternating current (AC). This simplifies business continuity when grid power is unavailable, as the data centre can be powered by a DC uninterruptible power system (UPS) incorporating energy storage, typically a battery. By increasing the energy storage capacity of the DC UPS, the data centre relies less on, and may disconnect from, the grid during high demand periods. The International Electrotechnical Commission (IEC), with the help of Standards Australia, are in the process of publishing standards for DC UPS: IEC 62040-5-1 Safety for DC UPS and IEC 62040-5-3 Test and performance for DC UPS.

3.2 What is the role for natural gas in reducing greenhouse gas emissions in the electricity sector?

In the near term gas plays an immense and essential role in stabilising the electricity system, and this role is growing as coal retires and variable renewables increases. Gas fired generation offers the best combination of existing large scale infrastructure, flexibility and affordability right now, and is likely to remain significant for decades. While much of the gas generation role could be supplanted in the longer term, including by energy storage and demand response, gas could have a strong role even in a net zero emissions world if gas with carbon capture and storage proves to be competitive.

3.4 What are the key elements of an emissions reduction policy to support investor confidence and a transition to a low emissions system?

The [principles adopted by the Australian Climate Roundtable](#) are relevant to the electricity sector as well as the wider economy. Among them, the most conspicuously lacking in current policy is durability: Commonwealth policy is not yet designed with our longer term commitments in mind; there is almost no bipartisanship in this policy area; and the Commonwealth and States have clashing approaches. While there are many potentially workable and efficient policy approaches, none of them can function without broad and sustained political support. The current absence of this is a dire challenge to investment of all sorts in the electricity system.

3.5 What is the role for low emissions coal technologies, such as ultra-supercritical combustion?

Ai Group strongly supports the principle that energy and climate policy should promote technology-neutral mechanisms that allow all options the opportunity to compete on their merits. That said, we have [published analysis](#) that suggests ultra-supercritical coal projects are unlikely to be part of our future energy system. On a levelised cost basis new plants based on this technology would be significantly more expensive than incumbent generators; while they would provide inertia, they would find the emerging highly variable market physically and financially challenging to participate in, particularly compared to gas; and their emissions, while significantly lower than subcritical coal plants, would be a significant regulatory and financial risk over the extended life of a new plant.

That said, Ai Group has been approached by several technologists and entrepreneurs with innovative coal-based energy technologies in development or ready for commercialisation, including variations on carbon capture and storage and coal gasification. It is possible that one or more of these technologies will prove to be competitive on price, flexibility and emissions. Technology neutral policy and market structures should create space for such outcomes.

4.5 What other non-market focus areas, such as cybersecurity, are priorities for power system security?

Cyber security is already extremely important to energy system security, and will get much more so in an IT-heavy grid with many more medium-scale and small active players in demand response, distributed generation and storage. There is already a broader cyber security agenda and an active discussion in the context of the Internet of Things; the energy sector needs to maintain strong engagement with this agenda.

5.3 Are commercial and industrial users experiencing difficulties in obtaining quotes for supply?

Many of our members in South Australia have found that very few retailers willing to quote on electricity over the past year. There are much wider problems with contracting for gas.

5.5 Rule changes are in process to make the bid interval and the settlement interval the same, both equal to 5 minutes. Are there reasons to set them to a longer or shorter duration?

While most Ai Group members have not expressed a view, we have had advice from some energy sector members both for and against a five-minute settlement rule. On the one hand there is an argument that the rule would have significant implementation costs and could have the effect of making it harder and riskier for gas-fired generators to bid into the market to address pressures, since they could not be sure of recovering their costs without greater confidence about price and dispatch over a half hour period. On the other hand, there is an argument that the current market design does not adequately reward extremely fast-start technologies that could provide cheaper and more responsive services, and that other technologies like gas will retain a market as long as their performance merits it.

Ai Group urges the Review to consider the five-minute settlement issue in the light of the reform framework outlined above. Something needs to incentivise the increased flexibility that storage, demand response and fast-start generation can provide. If five-minute settlement is not attractive, what is the superior alternative?

5.6 What additional system security services such as inertia, as is currently being considered by the AEMC, should be procured through a market mechanism?

System security and flexibility resources need to be procured, whether by market participants, the market operator, or government. Doing this inside the energy markets is attractive, since it offers a greater likelihood of internal coherence and responsiveness in a dynamic energy system. However, we submit that some procurement is better than no procurement; if market mechanisms cannot be agreed, alternative or transitional arrangements will be needed. And any mechanism, market or otherwise, needs to be genuinely accessible to all potential providers of valuable services, including on the demand side.

6.3 What are the benefits of cost reflective prices, and could the benefits be achieved by other means?

Cost reflective pricing for energy and use of the network has the potential to encourage more efficient behaviour by consumers. However, there seems to be intense caution among State governments about the potential for consumers to be disadvantaged by a mandatory or opt-out move to such pricing, whether because they may misunderstand new price structures, be unable to take advantage of opportunity, or be affected by the unwinding of current cross-subsidies. Opt-in arrangements are unlikely to draw strong participation and activity, both because of consumer inertia and because incentives may not be intense enough to justify action unless consumers take on levels of risk that are worrying and difficult to manage.

If cost reflective pricing is to be a successful option, it needs to be advanced through joint work and consensus between energy user representatives (particularly vulnerable household advocates), state governments, energy retailers, and energy networks. Significant investment in consumer education will be required. And again, if this approach to unlocking demand side opportunity is not taken, something else is required – perhaps one-sided incentives that reward demand reduction at its marginal value, but let users who cannot reduce demand continue paying their contracted rates. That could be done through a version of the Demand Response Mechanism concept, or by arrangements managed through retailers, network businesses, governments or a collaboration.

7.5.2 Should the NEO be amended?

The National Electricity Objective, like the NEM itself, was designed two decades ago in a very different era – marked particularly by steady and increasing demand. Technological disruptions, economic change and new concerns may merit a refresh of the whole structure. But in particular there have been some arguments to amend the National Electricity Objective to include a climate or environmental element in some form as part of the long term interest of consumers. Ai Group does not have a firm position on the amendment of the NEO. However, we note that climate policy is an extremely important factor in investment and operational decisions in the energy sector and that a clear and durable framework is urgently needed. That policy approach cannot currently be developed within the NEM design itself because it does not match the NEO as currently drafted and interpreted.

A policy outside the NEM design could work without any change to the NEO if it provided price or other signals which the NEM could incorporate to produce efficient outcomes. A national carbon pricing mechanism, an emissions intensity scheme or a clean energy target could perform this role. Regulatory measures on closure of older or more highly emitting facilities are likely to be blunt and inefficient, but could play a transitional role in the absence of other measures. However, if national policy is unable to supply a workable policy framework, an amended NEO could potentially allow the development of measures inside the NEM design to address the emissions element of the trilemma. However, the political polarisation that has frustrated national climate policy would also be likely to make an objective change difficult too.

A further consideration with any change is that the current NEO is deeply linked to every aspect of the market. Changing the NEO could thus have widespread and unexpected consequences. Any change would have to be extremely carefully drafted in parallel with efforts to develop whatever substantive reforms to market structures a NEO change is intended to enable. Transitional uncertainty should be minimised.