



Centre for Energy and
Environmental Markets

ENERGY WHITE PAPER 2014 Green Paper Submission

by

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About CEEM

The UNSW Centre for Energy and Environmental Markets (CEEM) undertakes interdisciplinary research in the design, analysis and performance monitoring of energy and environmental markets and their associated policy frameworks. CEEM brings together UNSW researchers from the Australian School of Business, the Faculty of Engineering, the Institute of Environmental Studies, and the Faculty of Arts and Social Sciences and the Faculty of Law, working alongside a growing number of international partners. Its research areas include the design of spot, ancillary and forward electricity markets, market-based environmental regulation, the integration of stochastic renewable energy technologies into the electricity network, and the broader policy context in which all these markets operate.

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0 Introduction

The current Energy White Paper (EWP) process could play a valuable role in facilitating Australia's transition towards a more sustainable and prosperous energy future. The challenges involved in making this process valuable, however, should not be underestimated. In particular, strategic planning in energy is invariably undertaken in the context of major and growing global and jurisdictional uncertainties looking forward, and a range of options for action that carry their own uncertainties and hence risks. The 2004 Energy White Paper, for example, predicted ongoing electricity demand growth, continued slow take-up of wind and solar that would remain well below use of biomass, and prominent future roles for geothermal energy and carbon geo-sequestration. It made barely any mention of Coal Seam Gas let alone potential East Coast LNG exports. Such discrepancy from current conditions, just 10 years later, suggests a need for caution in present predictions of what future energy challenges are in store. It also highlights the need to consult with a broader range of stakeholders than present industry incumbents, and the vital importance of policy robustness against such uncertainties. Rather than consideration of particular policies in isolation, we require a coherent and comprehensive policy portfolio robust to a wide range of possible future scenarios. Furthermore, the associated planning process must be continuous to adapt to changing conditions.

In our view, the Energy Green Paper makes significant progress on the earlier EWP Issues Paper. This submission seeks to recognise that progress as well as to identify areas that require further consideration. In summary, this submission addresses the following key matters in relation to the Green Paper:

- Climate change risks warrant far greater recognition. The growing risks of climate change are now nearly globally accepted, and it is well understood by the great majority of investors that the energy sector in Australia will need to undergo dramatic clean energy transformation over the coming decades if dangerous global warming is to be averted. Investors will draw confidence from a clearly elaborated and credible strategy for achieving societally appropriate carbon pricing and associated policies, in a gradual, supported and stable manner. Clarity around the mechanisms that will be applied is an essential prerequisite for investing in any kind of long-lived capital intensive infrastructure. Whilst the Green Paper identifies emissions reductions as

an objective, it fails to seriously engage on climate change. This is in contrast to the previous two Energy White Papers of the Howard (2004) and Rudd/Gillard (2012) Governments.

- There are also energy security related risks associated with Australia's present fossil-fuel export orientation that are not properly addressed in the Green Paper. These include the longer-term willingness of our present customers to continue buying these fuels if other locally-sourced renewable options continue to become more attractive, or as global action on climate change is strengthened.
- There are important opportunities to improve the efficiency of our current electricity and gas markets. However, the focus should be on dynamic efficiency – the support our markets and associated policy and regulatory arrangements provide in facilitating appropriate innovation. Furthermore, some proposed changes in deregulation and privatisation may adversely impact on our ability to undertake market improvements.
- Energy industry issues are highly interrelated and therefore require an integrated approach to policy planning.
- There are opportunities to greatly improve the EWP process including greater stakeholder engagement and a transition from the preparation of a 'static' White Paper to an ongoing dynamic planning process taking advantage of ICT advances.

1 Attracting Energy Resources Investment

This objective for Australia is too broad to carry significant meaning to guide Australian industry. Australia must strive to not simply maximise the quantity of energy resources investment, but to ensure it is appropriate investment. Similarly, the methods outlined in the Green Paper to achieve this goal need some refinement as outlined below; attracting appropriate resources investment must certainly include attracting investment in renewable energy, while carefully balancing the risks as well as opportunities of future fossil-fuel investment.

REGULATORY PROCESSES

Regulatory processes provide a critical control for guiding Australia's energy investments to appropriate applications. Streamlining environmental approvals and other regulatory processes associated with energy projects is important to attracting investment as Australia competes internationally for capital. However such processes, including associated consultation, necessarily take time and there are limits to streamlining these, beyond which their role may be compromised.

The Green Paper's priority on the consideration of cumulative impacts in environmental assessments is commendable. Whilst the focus is on water-related impacts from coal seam gas and coal projects, cumulative impacts are important for Australian development activity more broadly. The importance of cumulative impacts highlights the potential limitations of individual State Governments in appropriately managing development activity that has national significance. There is, then, still a key formal role for the Federal Government in planning processes.

CEEM supports the Green Paper's position that "better engaging communities means genuine contact, and having trusted project impact information available. This information needs to cover environmental, social and economic issues." (p.20). It is appropriate that the onus be on industry for this, however governments must remain wary of the inherent tensions between short term commercial drivers and long term societal benefit that industry faces. Industry certainly has relevant knowledge that other stakeholders and governments lack. However, they also have a strong interest in outcomes. Strong, industry-independent, resource science is fundamental to effective consultation; recent examples of misplaced involvement of

governments in this are flagged in section 3 of this submission in relation to current gas supply issues.

LABOUR PRODUCTIVITY AND SKILLS

Importing labour and skills from overseas may be a valid short term measure applicable to a relatively narrow range of energy projects. However, given the fundamental role renewable energy will play in Australia's energy future, as explained in section 2 of this submission, Australia's long term skills needs in energy are best served by ongoing support of the renewable energy industry. The Green Paper identifies the significant growth to date in employment by the renewable energy industry. For this to continue, as is required in the long term, local training is essential because international markets will also be requiring a renewable energy industry capability. Such training is best supported by steady and stable renewable energy deployment policies, implemented through targeted education support.

SUPPLY CHAIN AND INDIGENOUS EMPLOYMENT

The Green Paper focuses on measures to develop Australia's supply chain and capability in export-oriented activities. It is important that equivalent improvements are made in renewable technologies. Further to the discussion above in relation to labour productivity, if renewable investment stalls in Australia it is entirely possible that the skills and expertise already developed in this field will be lost. Aside from the loss of employment opportunities (especially in rural and remote areas, such as indigenous communities), it would then take years to re-establish these essential capabilities in the workforce.

Therefore, the most important measure to maintain and expand the training and skills development in the energy sector is likely to be the support of the ongoing growth of the renewable energy industry.

RESOURCE SCIENCE

We note the existing and proposed efforts to provide broad access to quality pre-competitive data to promote mineral resource investment. The value of such data also applies to investment in other Australian energy resources including wind and solar. Public investment in data such as resource and grid capacity mapping can help to reduce the costs and risks associated with renewables investment.

INFRASTRUCTURE CONSTRAINTS

The involvement of the Australian government in guiding infrastructure priorities is welcome, in aid of attracting appropriate energy resources investment. CEEM, however, advocates a very cautious approach to privatisation of energy infrastructure. The current challenges faced in Australia's gas industry are to some extent a result of private ownership of infrastructure from the commencement of the industry as described further in section 3 of this submission. Prospective electricity privatisation processes must consider the learnings from this. The risks involved are not acknowledged in the Green Paper.

In particular, privatisation could significantly reduce the Governments' ability to conduct the restructuring of energy businesses that may be required to facilitate clean energy transition. Key aspects of the proposed network tariff reform discussed in section 2 of the Green Paper, for example, may not be possible if the businesses are in the process of being privatised.

Infrastructure Australia's task to develop a 15 year infrastructure plan is important to the energy sector. The scope should be broader than energy export infrastructure, or if not, the interfaces with other energy infrastructure planning processes should be identified. Avoiding a "project-by-project view of infrastructure" is a worthy aim of such planning. The complex and often poorly specified interface between market driven and government directed infrastructure investment in Australia's energy sector is problematic in this regard, and Infrastructure Australia should identify how governments will more appropriately interface with markets to address this risk. A relevant example is the near simultaneous approval of three east-coast LNG export facilities with insufficient attention to the broader implications for the Australian domestic energy sector.

ENERGY EXPORTS

The Green Paper emphasises the significance of Australia's fossil fuel exports without acknowledging the risks involved. Concern about the dependence of Australia on fossil fuel exports has been expressed by international observers in the form of the International Energy Agency, which in its 2012 review of Australian energy policy, noted:

"One concern of policy makers is the manner in which energy production has begun to dominate the Australian economy. The commodity boom is also

having a negative impact on the economy by driving the Australian dollar upward, squeezing trade-exposed industries such as manufacturing and tourism and boosting inflation. The Australian Treasury expects that conditions in other parts of the economy will continue to be weighed down by the high exchange rate, cautious household spending behaviour and tightened macroeconomic policy settings.”

These concerns should be reflected in the EWP.

The Green Paper provides insight into Australia’s strength in energy services and associated export opportunities. CEEM supports the assessment that there are export opportunities in micro-grids and renewable energy systems delivery, given Australia’s position in Asia Pacific, across almost all aspects except high volume manufacturing. A number of Australian firms are already successfully supplying a range of such services throughout the region.

2 Electricity prices

Australia’s electricity industry has been subject to significant restructuring in recent decades as outlined in the Green Paper Attachment 2. Its current health and prospects are mixed for reasons that could be better addressed in the EWP process:

- Wholesale market arrangements in Australia’s National Electricity Market (NEM) have worked reasonably well to date, except with respect to environmental externalities which is a major market failure. Unpriced externalities result in inefficient market outcomes. The repeal of the previous Australian carbon price represents a major backwards step in appropriately pricing societal externalities into energy market decision making.
- The Australian electricity industry is characterised by a relatively small number of large players. In general it is difficult to design markets that work well with oligopolistic industry structures.
- Ongoing vertical integration across generation and retail may represent a rational response to NEM risks. However, it is having adverse impacts on market competition and, particularly, opportunities for market entry. It certainly contributes to the current lack of transparency and illiquidity in derivatives markets. The NEM design was always intended to be supported by a liquid and well-functioning contracts market. A proportion of futures and options is traded via the ASX 24 Futures Market which provides some degree of transparency around trading dynamics. However, a large proportion remains traded off-

exchange either bilaterally or through brokers in the over the counter (OTC) market, with very little information made publicly available. While it is important to allow confidentiality over sensitive business decisions, and to reduce regulatory burdens, this area of the market is one that could benefit from increased transparency, as recognised by the proposed G20 OTC reforms. This would facilitate more sophisticated monitoring of the health of the market, highlighting any potential issues earlier. It may also reduce barriers to entry for foreign investors, making the market more transparent and accessible.

- Market efficiency is discussed by the Green Paper in relation to productivity and pricing efficiency. However, it does not acknowledge the critical importance of dynamic efficiency – the ability to effectively facilitate and manage innovation – in achieving longer-term market improvements. The NEM has demonstrated considerable dynamic efficiency in some areas, such as integration of wind generation in South Australia. However, dynamic efficiency requires particular policy care and attention and there have been failures as well, notably in network regulation. This is an important issue for the future energy technology ambitions discussed in section 4 of the Green Paper.
- Market competition: The key driver of competition is the prospect of new entry, both technologies and participants. The NEM originally had formal objectives of technology and participant neutrality, however, this has not received formal acknowledgement in more recent NEM restructuring processes or, indeed, this Green Paper.
- Demand-side participation is a key opportunity, as identified by the Green Paper. There has been promising progress but this needs sustained effort.
- Regulatory and broader policy uncertainty is currently the key barrier to growth and investment. Providing greater certainty can also reduce costs to consumers. Minimising uncertainty allows investors to access lower cost capital, and savings can be passed on to consumers. This is particularly important in the coming decades, given that uncertainty is high in many ways that cannot be easily alleviated. Regulatory uncertainty is one aspect that the Government has significant control over, and can influence directly.
- Carbon pricing is generally assumed to be inevitable internationally and is commonly used to value long-life assets, but is currently absent in a formal sense from Australia's economy.

TARIFF REFORM

CEEM notes that the COAG Energy Council has requested officials to "assess potential challenges to and risks facing Australian electricity networks over the next two decades" (COAG Energy Council Meeting Communique 1 May 2014). This is potentially a highly valuable exercise, intended to "strategically consider the flexibility of the regime to adapt to changing circumstances". It is due to be completed in mid-2015; the EWP should identify how its findings will be integrated into energy policy development.

Meanwhile the Green Paper appropriately identifies the current disconnect between wholesale and retail prices. As noted above, the wholesale market appears to be functioning relatively well (albeit with major unpriced environmental externalities); retail pricing might be improved by network tariff reform but there are inevitable limitations. A particular challenge is between tariff changes to provide more assured revenue recovery for network businesses versus tariff changes to provide more efficient signals for both generation and end-user investment. Unfortunately some recent tariff developments such as seen in Queensland have been to greatly increase fixed (daily) charges to increase certainty of revenue recovery rather than simultaneously striving for more efficient price signals by a move towards Time of Use and peak demand charges. In general, it is preferable to apply a "causer pays" principle, such that customers receive suitable market price signals to incentivise the desired behaviour, particularly given the evident misallocation of investment over the past decade by both network service providers and end-users.

It is also essential that tariff changes be applied in a manner that is consistent across all technologies and consumers. For example, it is not appropriate to apply penalties or cost structures that disproportionately affect customers that install photovoltaic panels. From the perspective of the grid, the main impact of net-metered solar generators is simply to reduce a customer's consumption. A consumer could achieve an identical effect with a combination of energy efficiency and demand response, and yet it would be inappropriate to charge a "penalty" to the diligent customer who managed to reduce their consumption. Similarly, and as noted previously, air conditioners can create significantly greater network issues and costs than solar photovoltaics, but have not yet been "penalised" in any way, aside from paying the same c/kWh charges that all consumers pay. At the same time there are very large subsidies between urban and rural electricity customers that are in some cases, adversely impacting the adoption of more

economically efficient distributed energy solutions over present grid connection.

Ideally, the methodology for setting network tariffs will focus on getting future investment right, will be technology independent and, as far as possible, economically efficient. Such tariffs will likely require fixed, time-based consumption and peak demand components given the underlying cost structures of network service provision. Calculating these individual components of cost is highly non-trivial.

Pricing below the economically efficient price (including environmental externalities) will adversely impact overall societal welfare. The Green Paper acknowledges that prices have and continue to be subsidised and proposes this will not continue in future. The challenges to this will be seeking affordability; the Green Paper identifies that energy efficiency may assist and CEEM also notes that affordability can be managed via direct payments rather than through non-transparent subsidies.

Important reference is made by the Green Paper to the AEMC's reviews including Power of Choice and the Transmission Frameworks Review. A cautious and carefully considered approach appears wise, building upon this and similar work. It would be ideal to avoid a knee-jerk reaction to solar photovoltaics, and consider the opportunity to introduce a robust methodology that can flexibly respond to many kinds of new entrant technologies that are likely to become available over the coming decades.

RELIABILITY STANDARDS TO BE REFLECTIVE OF CONSUMER EXPECTATIONS

Current and proposed work in this area, as outlined in the Green Paper, is critical and is to be commended. One of the fundamental issues that has plagued electricity market design since its inception is the dominance of the supply side of the market, due to the lack of demand side participation. For this reason, market regulators and operators have always needed to externally define the desired reliability standard that the system should achieve. The process of elucidating customer preferences is itself complex, and it is even more challenging to attempt to standardise the vagaries of customer desires into a single reliability standard to apply across the whole market. For example, previous studies have identified that small business customers place an extremely high value on electricity reliability (far in excess of that currently applied in the market), while residential customers place a much lower value on customer reliability (Oakely Greenwood, "NSW Value of

Customer Reliability”, Australian Energy Market Commission, 2012). The system regulator is then faced with the dilemma of which customer to satisfy; should residential customers pay for more than they want? Or should small businesses accept a lower level of reliability? Furthermore, every individual customer is likely to have unique preferences, sometimes widely different.

The emergence of new technologies, such as advanced metering infrastructure, opens the door to a new degree of customer participation in this process. Rather than needing to rely upon a regulator to define your desires, and be aggregated across the whole market, individual customers could, in theory, have the freedom to define the level of reliability that they individually are prepared to pay for.

Thus, the solution may be intimately connected to other measures designed to encourage greater demand side response. Engagement with consumers on the management of their electricity bills and mechanisms such as time of use pricing could be combined with increasing understanding around the costs of reliability. Customers could then be offered choices about the level of reliability they are prepared to pay for. Advanced metering infrastructure could facilitate selective customer load shedding when required, based upon the level of reliability they have individually chosen.

Beyond these improvements, consideration should be made to whether market arrangements allow new business models to emerge, to be able to respond to consumers’ choices. Historically the energy industry has presented barriers to new business models due to factors including the essential service nature of the product, natural monopoly infrastructure components and the associated high level of regulation involved with these, and cultural considerations and expectations.

The significant discussion of demand-side issues in the Green Paper is important for developing an effective, integrated plan for Australia’s energy sector. Integrated resource planning (IRP) is a planning approach that has the potential to take a society-wide perspective and that has a strong track record in industry planning internationally and in other sectors. A key principle of IRP is that planning should consider both supply and demand-side options. The EWP has the opportunity to set out how such an integrated approach would be achieved.

ENERGY EFFICIENCY

Please refer to section 4 of this submission.

EMISSIONS REDUCTIONS SCHEMES

The Green Paper's assertion that "government interventions in energy markets have proven to be an expensive means of achieving environmental outcomes" is concerning. It is not clear whether the expense being referred to is limited to that incurred by end users, or by society more broadly. Furthermore the evidence to support this claim is not provided.

Rationalising related policies may have the unintended consequence of weakening a portfolio of policy measures that provides additional robustness. Generally there exists uncertainty about the performance of any policy and therefore there is value in having some overlap between policy measures such that there is not over-reliance on any one policy in what may be a rapidly changing context.

The existing schemes to support low emission generation deployment are designed to work cooperatively, and cover all parts of the renewable development chain. The Renewable Energy Target (RET) supports deployment of mature renewable technologies in the market. The Clean Energy Finance Corporation (CEFC) supports the entry of emerging technologies by de-risking capital. The Australian Renewable Energy Agency (ARENA) provides funding for early stage research and development, integration studies, and other "gaps" identified across the entire renewable development pathway. Removal of any one of these schemes weakens the ability of the others to deliver efficiently and cost effectively. For example, the carbon price previously complemented the RET; its recent removal is likely to increase the cost of the RET. Recent agreement by the Government to defer putting forward legislation to unwind ARENA and the CEFC until 2015 at the earliest provides little comfort that these schemes will be allowed to continue to perform their vital roles.

The Green Paper proposes the establishment of principles to help assess the policy effectiveness of emissions reductions schemes. This is an important proposal with broad application, beyond emissions reductions. It would be highly valuable for planning purposes, as discussed further in section 5 of this submission.

Renewable energy is projected to contribute greatly to electricity generation internationally. For example, the International Energy Agency suggests that achieving the globally agreed target of keeping global warming below 2 deg.C above pre-industrial levels requires that the present global electricity industry mix of 68% fossil fuel and 20% renewables based needs to reverse by 2050 - to 65% renewables and only 20% fossil fuel based (IEA, Energy Technology Perspectives, 2014). This is the key theme for international energy industries over the next few decades however the Green Paper does not reflect this.

The RET is a critical policy for the sustainable development of Australia's energy industry, both in its promotion of clean electricity generation and renewable energy capability establishment (see for example the CEEM submission to the RET Review). The Green Paper refers to the report of the independent panel that reviewed the RET and but avoids exploring the findings of that report, noting that the Australian Government would soon announce its response to the report. Some response has now been made in the form of public statements of the Government's position as it seeks to negotiate with other political parties. The EWP must comprehensively integrate the key considerations of the RET Review; to the extent that the EWP does not represent a bipartisan position then investment certainty in Australia's energy industry will continue to be undermined. This would of course work against the need for regulatory certainty to provide investment that the Green Paper has identified as critical with other Energy sectors.

REGULATION AND PRIVATISATION

The barriers preventing exit of surplus generating capacity are worthy of investigation, as proposed by the Green Paper, to ensure that markets can adequately manage this aspect of industry planning. Recent research by CEEM finds that the primary barriers preventing exit include expectations of compensation for closure and regulatory uncertainty creating a significant "option value" for remaining in the market. More detail is available in Payments for Closure – Should Direct Action include payments for closure of high emission coal-fired power plants? Riesz, J., Noone, B., MacGill, I. (2013), provided as a supporting document to this submission.

As flagged in section 1 of this submission there are some critical considerations for using privatisation as a means of promoting efficient investment in electricity. There is an extensive yet currently neglected, body of research by researchers such as Professor John Quiggin of the University of

Queensland regarding the potential challenges and pitfalls of privatisation. Where there are concerns about efficient government ownership and operation of assets, there are likely to be similarly challenging concerns about that government's ability to effectively conduct the privatisation process. Consumers may, in this time of change and uncertainty, be better served by an approach that aims to increase the efficiency with which government organisations operate. Especially in a time of rapid market transition, it may be extremely beneficial for the government to retain control of electricity infrastructure so that challenging policy choices can be implemented more easily in future to respond to changing market conditions. The Green Paper does not address these risks.

3 Building gas supply and improving market operation

The Green Paper appropriately recognises Australia's leading position as a gas exporter and identifies important measures to enable this to continue. Gas is playing a transitional role internationally in some jurisdictions as electricity generation decarbonises although its potential future role in avoiding dangerous global warming is uncertain. Key questions looking forward include the fugitive emissions and hence overall full-cycle abatement that gas provides over coal generation. More important is the ever growing and urgent speed and scale of global abatement that seems required to effectively address climate change. It is now recognised that increased gas generation that crowds out renewables and other clean energy options may actually work against our climate goals.

Gas as a long term electricity generation source therefore has risks, with implications for Australia's exports and as well as domestic use. Recent CEEM research has highlighted that:

- Gas-fired generation is likely high risk and expensive compared to wind and PV (largely due to anticipated high future domestic gas prices once linked to international markets).
- To get close to necessary emission reduction targets (i.e. 40-60% reductions from 2000 levels by 2030), the least cost and risk options would involve significant renewables and very little share from base-load gas-fired generation.
- But there is still an important role for gas peaking plant since it is still a cost-effective option for meeting peak demand (though this may need market intervention in providing appropriate investment signals).

Further detail is available in Assessing “Gas Transition” pathways to low carbon electricity, Riesz, J., Vithayasrichareon, P., MacGill, I. (2014) provided as a supporting document to this submission.

Caution is also warranted in relation to international gas markets. These are generally characterised by high levels of government (or at least State-owned) participation on the buy side with considerable attention to their implications for future energy security needs. Generally, countries would prefer to not rely on potentially interruptible energy imports if they have better options. This tension between energy suppliers and consumers can even be seen in the current Australian debate about NSW’s gas future. The Federal Government has flagged the risks to NSW of being reliant on inter-state gas supplies as an argument for developing CSG resources within the State. If NSW importing gas from neighbouring states is a valid reason for concern, a similar sentiment amongst Australia’s international customers should also be acknowledged by the EWP.

The Green Paper takes a clear position against calls for a domestic gas reservation policy. CEEM generally supports this position however it is not clear whether the energy security value of local gas reserves has been considered. There are some potential advantages in carefully managing energy exports rather than seeking to maximise them. Such consideration in developing energy policy is distinct from actually setting aside gas reserves for domestic use.

GAS SUPPLY

The Green Paper highlights the significant domestic gas reserves available, including in NSW, that are currently not progressing towards extraction due to community concerns. Ultimately, demonstration of independent scientific support for the ability of industry to manage environmental risks will be critical for communities to be constructively engaged. However recent domestic political interventions in scientific areas including climate change and the alleged health impacts of wind energy has created an environment that is not conducive to allowing Australia’s independent scientific institutions to perform their critical role. Greater acknowledgement of the boundaries of legislative and executive arms of government with regard to the role played by public scientific institutions would be invaluable in restoring the ability of science to provide trusted guidance to society, including in relation to gas projects.

DOMESTIC GAS MARKETS

CEEM notes the commitment in the Green Paper that “The Australian Government will establish, in consultation with stakeholders and state and territory governments, a longer-term gas market agenda to promote an efficiently operating market”. This is potentially a highly valuable sub-planning process to the EWP.

There are many opportunities to improve efficiency in Australia’s gas markets due, in large part, to the limited efforts seen to date. Past efforts have often been thwarted by private ownership of key gas infrastructure and their concerns that more efficient markets may impact on their own future prospects. Such private ownership has, indeed, restricted the ability of governments to restructure the industry as effectively as was achieved in electricity. This has relevance to current Federal and State Government plans to further privatise currently State owned electricity industry infrastructure. It needs to be acknowledged that this may well adversely impact on Government opportunities to undertake future electricity industry reforms. Significant progress in gas markets will require Governments to better manage incumbent pressures to restrict restructuring to changes that benefit, or at least do not greatly adversely impact, existing industry players.

The Green Paper’s observation of division amongst stakeholders on the level of competition in domestic gas markets is noted. Such disagreement between suppliers and customers generally indicates problems with markets. Accordingly CEEM supports the proposal for an independent review by the ACCC or Productivity Commission. The terms of reference should be sufficiently broad to consider the appropriateness of markets themselves as a tool for gas industry development. It is not clear that the extraordinary market-driven development of east coast LNG from none to three export facilities all coming on line within a few years represents an economically efficient outcome for the broader Australian energy sector.

4 Security, innovation and energy productivity

ENERGY SECURITY

By most measures, and as the Green Paper notes, Australia faces few energy security challenges by comparison with many other countries highly dependent on fuel imports. However, our emissions intensive energy sector by

comparison with many other countries has potentially adverse energy security implications. It is possible that future international agreement on the need to rapidly reduce global emissions might see considerable pressure brought to bear on wealthy, developed countries with high per-capita emissions, such as Australia.

Additionally, physical disruptions to Australia's energy supply due to climate change include extreme weather events, changes to water supply and temperatures. Mitigating climate change is an important strategy to minimise the threat to the security of Australia's power system. Future National Energy Security Assessments (NESA) should consider these risks.

Renewable energy is a means to long term reliability and security of supply. Whilst the Green Paper commendably identifies the following desired outcome: "Australia is able to choose from the broadest possible range of energy options", the significant role renewable energy should play in this is underplayed. Recent CEEM research has shown:

- An increased share of renewable energy will lead to a more diversified energy mix (in terms of fuel types) and hence reducing the risk of energy supply interruption.
- Renewables can also reduce the risk of unaffordable and fluctuation in energy prices given uncertain gas prices due to international price linkage (as discussed in section 3 of this submission).

Further detail is available in *Assessing Long-term Security of Electricity Supply and the Role of Renewable Energy: A Probabilistic Generation Portfolio Analysis Approach*, Vithayasrichareon, P., Riesz, J., MacGill, I. (2014), provided as a supporting document to this submission.

To extract these benefits in Australia the Renewable Energy Target is critical as was discussed in section 2 of this submission.

The prospects for electric vehicles and alternative fuels to contribute to energy security are discussed in the Green Paper. The most effective approach to develop this further in the EWP will be to avoid being locked into the limited mindset of simply continuing the present personal car-based culture, shifted to new technologies. Furthermore, transport is increasingly related to energy and therefore integrated planning needs to be conducted across sectors.

Please refer to section 3 of this submission for discussion of the potential role of domestic gas reserves to promote energy security.

ENERGY PRODUCTIVITY

The Green Paper appropriately places a high priority on energy efficiency opportunities for Australia, which historically have been of secondary consideration behind supply-side initiatives. Energy efficiency has excellent potential to reduce electricity bills for consumers, while simultaneously reducing greenhouse emissions. An increasing focus on unlocking the potential for energy efficiency in households, commercial businesses and industry is likely to enhance the productivity of Australia's economy. It is important, however, that a focus on energy productivity improvements not neglect the broader societal value of improved energy efficiency and demand reduction including greater energy security, affordability and environmental outcomes. Despite some excellent programs and measures, this area has also been neglected by Australian and State governments to date.

There is a significant and growing body of analysis and research on methods for encouraging greater demand side participation and energy efficiency, but much remains unknown. Given that many energy efficiency projects are cost negative (in that they save the customer money) it is clear that the barriers to energy efficiency are often not financial. Thus, any successful mechanism will need to be designed with a strong understanding of the human interaction component, and the barriers that have inhibited past action. It also highlights the potential role of regulatory measures to drive societally beneficial energy efficiency and demand reduction.

The Green Paper's reference to "Amount of energy needed per service" is an example of a growing shift to understanding energy industry output as a service (for example lighting or heating) rather than in terms of quantities of a commodity. This will be important for promoting future energy business performance that is linked to the Green Paper's productivity priorities rather than maximising unit sales.

A National Productivity Plan could build on the range of current and potential initiatives listed in the Green Paper. It is not clear, however, how the Plan would relate to the existing COAG 10 year National Strategy on Energy Efficiency, last updated in 2010. Such planning processes and the EWP itself should acknowledge the integrated nature of issues in this area. For example,

with the successful Energy Efficiency Opportunities program recently repealed, there may now be gaps in the remaining portfolio of energy efficiency policies. In general, the removal of policies that facilitate greater energy productivity should be done with caution, and a clear plan of what they will be replaced with. Further, Australia's energy efficiency planning should make comparison to efforts internationally, for example to California's highly successful energy efficiency achievements.

OUTLOOK CAPABILITY

The Green Paper's proposals in this area are commendable. There is a critical role for public institutions to provide information to government and industry. The EWP should take this further by making it clear how it is expected that the information will be used and by whom. Further, part of developing a better outlook capability will be recognising the inherent uncertainty involved, and therefore the value of scenario analysis. Energy policies should be developed as part of targeted strategies chosen to best equip Australia in a range of future scenarios. This is discussed further in section 5 of this submission, as a critical part of the planning process.

FUTURE ENERGY TECHNOLOGIES

ARENA is identified by the Green Paper as playing a key role in driving the commercialisation of new technologies. Yet the Green Paper then incongruously states that it is proposed to close ARENA; the rationale for this is not provided, including how the gaps left by its removal will be fulfilled.

CEEM supports the Green Paper's proposal that a review of the alignment of research funding for energy technology activities to strategic priorities should be part of normal review cycles. It should be clarified, however, what the strategic priorities are. The EWP is the appropriate process for consulting on and communicating these. Recent cuts to CSIRO and Australian Research Council funding raise concerns about whether this proposed approach has been followed, and if so, what strategic priorities drove this.

As commented earlier in this section renewable energy receives little detailed attention in the Green Paper, relative to the significant role it will almost certainly play in energy systems of the future. Reference is made to the ability of energy storage "increasing the reliability of renewable energy supply". The EWP should explore this further with reference to Australian-specific context. Recent research suggests that renewable energy would need to grow

significantly from current levels of penetration before integration with the National Electricity Market (NEM) becomes a concern. Certainly, the existing NEM design including ancillary services markets has appeared to effectively manage the variable supply of renewables to date, and offers an excellent basis for managing higher penetrations. Further detail is available in:

- 100% Renewables in Australia – Will a Capacity Market be Required? Riesz, J., MacGill, I. (2013), provided as a supporting document to this submission.
- Strategies to Reduce Grid Integration Costs of Solar Electric Plants in the Australian National Electricity Market, Elliston, B., MacGill, I. (2011), provided as a supporting document to this submission.
- Renewable Energy Integration in South Australia, Australian Energy Market Operator, Electranet (2014)

Accordingly, increasing renewable energy usage is not reliant on the deployment of new storage technologies at present. However, the EWP should address storage given its growing importance. A key aspect of this importance lies in the potential for storage to be deployed by households and businesses outside traditional centralised planning processes. The EWP should identify how this and other distributed technologies will be managed with reference to the role of markets as compared to some centralised decision making.

Nuclear energy receives appropriate attention in the Green Paper as a potential source of power. Its significant use internationally demands that it continue to be monitored as an option in Australia, though the many challenges facing its deployment are well noted.

The prospects for carbon capture and storage (CCS), however, do not receive balanced assessment in the Green Paper. Whilst CCS holds significant appeal in light of Australia's fossil fuel reserves, the Green Paper does not adequately address the severe technical and commercial challenges facing this technology, including those noted by the IEA in their 2012 review of Australian energy policy:

"The IEA commends Australia's commitment to the development of CCS but notes a risk that delivery of integrated commercial large-scale CCS by 2030 is not guaranteed at this stage. A number of challenges lie ahead; among them improving the efficiency and reducing the cost of large-scale CO₂ capture technologies, provision of suitable commercially viable CO₂ storage sites and building integrated transport networks to agreed pipeline standards."

More generally, it should be noted that nuclear and CCS are unable to compete with coal and gas generation in the current NEM context. Indeed, the recent removal of carbon pricing has greatly harmed the prospects for nuclear and CCS to contribute to Australia's future electricity supply.

INTERNATIONAL COLLABORATION

Constructive and positive participation in a wide range of international forums is vitally important for maintaining Australia's enviable position of relatively good favour among other nations on energy matters, and achieving effective action on our growing global energy challenges. The United Nations Framework Convention on Climate Change (UNFCCC) is one of the most important of these forums; Australia would be well served by a constructive presence at these negotiations.

The Green Paper states that the Australian Government is seeking to rationalise its level of international engagement on energy technology. Such collaboration can be a low cost yet valuable method of contributing to or benefiting from energy industry innovation. Priorities for such involvement could be based on an energy technology assessment of Australia, similar to that which formed part of the 2004 Energy White Paper regarding "Australia's Place in Global Energy Innovation".

5 Other comments or additional information

ROLE OF THE ENERGY WHITE PAPER (EWP)

The Green Paper provides a strong description of Australia's energy governance arrangements, identifying accountabilities held by the various public and private organisations, and who makes what decisions. There is a critical absence, however, of any discussion of the role of the EWP. It is implied in the Green Paper that the role of the EWP is to help the Government achieve "coherent and constructive market reform, and properly integrated policies [to] give industry and consumers confidence in energy policy" (p.vii).

This stated intention of the Government is appropriate and welcome. The role of the EWP in this could be greatly clarified for the benefit of all stakeholders. CEEM proposes that the role of the EWP in large part should be to outline how the policy integration will be achieved. This should include consideration of

why this has been so hard to achieve in the past and identification of what will be done differently in future. The Green Paper lacks explicit attention to the EWP as a planning process.

In clarifying the role of the EWP, critical references to time, the dynamic nature of the industry and therefore policy management needs could be made. Without these elements the EWP is set to become a static document rather than a dynamic process.

ENERGY INDUSTRY PLANNING

CEEM puts forward the following assessment of the Green Paper in terms of the necessary elements of a plan, with specific proposals to address the gaps (note that there are valuable examples of such planning from other jurisdictions such as Denmark, California and the UK that could assist in this process):

- **Prioritised objectives:** The Green Paper identifies various objectives for Australia's energy policies including "attract investment", "reliable supply", "competitively-priced energy", "energy security" and "lower emissions". Some prioritisation of these is indicated, for example: "securing reliable and affordable energy in a technology neutral way that could also help to lower emissions". However it is fundamental for a plan that objectives be more clearly prioritised, and the justification for this provided. This provides important guidance for when inevitable trade-offs between objectives arise.
- **Governance arrangements:** The Green Paper sets out a strong overview of energy industry governance arrangements. The proposal that "COAG Energy Council will undertake a review of governance arrangements for energy markets" is promising but it is not clear what bearing this will have on the EWP.
- **Assessment of status quo, policy coherence and comprehensiveness:** The status quo has been well clarified since the Issues Paper. There are strong assessments of the development of Australia's industry to the current status, with extensive reference to credible work by energy industry institutions. The Green Paper importantly identifies policy coherence as a goal of the EWP. A proposal to promote effective policy management is provided in section 2: "The Australian Government could develop principles for the COAG Energy Council to determine the market impact of on-market interventions.... COAG could periodically receive reports on market interventions and their impact". This is a very encouraging proposal and would help assess

Australia's policy coherence and comprehensiveness, and enable progress to be monitored – an important element of planning outlined below.

- Targeted strategies: A policy plan requires a focus on policy robustness against surprises, positive and negative. The Green Paper puts forward essentially only one projection for energy needs and sources in Australia and internationally. Meanwhile there is a proposal to develop a better “outlook capability”. This is commendable and the EWP should take this further by discussing alternative scenarios, and how these influence the costs, benefits and risks of the various implementation options available. Australia's public energy institutions already provide highly important information to stakeholders. There is the opportunity to make this more frequent, more open, open to consultation from a broader range of stakeholders, and to leverage technology to communicate the impact of changes to plans such as the EWP at a much greater frequency than present.
- Description of steps, resourcing, time and risks to implement: These are basic elements of a plan and whilst the EWP will necessarily be high level, it should refer to these elements and where more detail of them is to be addressed.
- How progress will be measured; how the plan itself will evolve: During implementation of the activities set out by the EWP the status of work in progress should be made clear to stakeholders (for example via a COAG Energy Council status report). The Green Paper puts forward the commendable proposal in section 2 that “The Australian Government could seek COAG agreement to a set of principles for interventions to ensure they are cost-effective” (p. 36). It appears that this is made specifically regarding emission reductions schemes, however it has broad application. The proposed approach applies to all aspects of energy policy management, not just for emissions reductions. If such principles can be developed, the effectiveness of policies can be monitored, enabling future EWPs to be adjusted. This dynamic and ongoing aspect of planning is critical but has been overlooked in EWPs to date.

STAKEHOLDER CONSULTATION

According to the EWP process outlined in the Green Paper, the role of the Green Paper is to summarise the feedback from stakeholders on the Issues Paper and to put forward potential policy approaches. However there is a

marked lack of reference to the 260 submissions that were made on the Issues Paper. There is only 1 specific reference to a submission (Far North Queensland Regional Organisation of Councils, p.31) and just a few general references relating to the formation of the four key themes of the Green Paper, differing views on gas market transparency and the merits of a reservation policy. The lack of reference to submissions undermines the EWP process.

Meanwhile there is a positive, growing level of stakeholder engagement evident in COAG Energy Council proceedings, demonstrated by the recent agreement to make stakeholder participation (peak energy industry organisations, consumer groups, the energy market bodies and energy businesses) a regular feature of meetings (Standing Council on Energy Resources Meeting Communique 13 December 2013). The EWP should refer to this and other key methods within Australia's energy industry to achieve ongoing stakeholder consultation. The consultation processes of the AEMC and ACCC provide another potential basis for improved processes that demonstrate meaningful engagement with all stakeholders and the submissions that they make.

6 Conclusion

Energy policy has a vital societal role and will invariably require ongoing efforts given changing priorities and other drivers. Proper integration of policies is also essential – within the inevitably large number of policy measures and instruments that will be required to drive appropriate development of the energy sector, and also the broader policy context of related areas including climate change, transport and regional development policy.

Unfortunately, the Green Paper does not provide clear guidance on how such integration will be achieved. It will require prioritisation of objectives and detailed analysis of the potential interactions – synergistic and adverse – that may occur between policies. Such analysis should also focus on policy framework robustness so that essential objectives are achieved regardless of the potential failure of particular, novel and hence unproven, policy measures.

Another area requiring integration is that of policy coherence and consistency over time. The Green Paper has emerged within the context of a decade long series of efforts to respond to emerging economic development, energy security and climate change concerns. This includes two previous Energy White Papers in the past decade. However, the Green Paper makes very little effort to integrate the learnings of these efforts, or explain why changes to them are required.

The previous energy white paper process was particularly drawn out but did, in 2012, deliver a comprehensive energy policy framework. The International Energy Agency commended the work in its 2012 review of Australian energy policy noting that: “The IEA welcomes the publication of the Draft EWP and commends the open, inclusive manner of its preparation.”

While some elements remain in the Green Paper, others do not; notably the prioritisation of clean energy transformation in the earlier document. The reasons for this have not been made clear in the current paper. The risk, of course, is that we continue to see policy making undertaken without a clear understanding of where and why some previous policy plans and efforts are no longer considered appropriate. Without such understandings, our ability to develop effective, efficient, equitable and robust energy policy is severely hampered.