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To: Energy White Paper Taskforce
Department of Industry
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Dear Sir, Ms

SUBMISSION FROM PEABODY ENERGY ON THE ENERGY GREEN PAPER

Thank you for the opportunity to provide comment on various aspects relating to the Energy Green Paper.

Synopsis

Peabody Energy Australia is a subsidiary of Peabody Energy (NYSE: BTU), the world's largest private-sector coal company. Peabody Energy has been active since 1883 and currently has majority interests in 27 coal operations located throughout all major U.S. coal-producing regions. Peabody Energy Australia operates 11 coal mine operations in Australia, servicing export and domestic markets with a diverse product range of coal through multiple coal ports. In 2013, Peabody's Australian operations achieved total sales of 34.9 million tons primarily to steel producers in Japan, Europe, Taiwan, Korea, India and South America, as well as to electricity generators in Australia and Asia.

This submission has as a backdrop several points of fact:

- Global demand for coal will continue to grow. The International Energy Agency projects that coal will continue to be a major energy source in? international trade with demand rising from 900 million tonnes of coal equivalent (Mtce) in 2011 to 1,152 Mtce in 2020 and 1,261 Mtce by 2035 with Australia and Indonesia projected as major beneficiaries

- Metallurgical and thermal coals are Australia's second largest export earner with ample reserves of high quality and lower cost reserves able to serve global markets and contribute to providing access to low cost electricity to the over 1.3 billion people currently without any access

We recommend that four principles be applied to formulating Australia's future energy policy:

- First, the provision of energy via competitive markets at lowest cost should be a core element of national energy policy

- Second, given its economic significance and abundance and anticipated global demand growth, Australia's energy policy should recognise coal's role in providing secure, low cost power generation domestically and in global markets
- Third, achieve an integration of relevant domestic and international policy settings to deliver on practical measures to address energy poverty and emissions reduction objectives
- Fourth, recognise and support the role of global technology applications in reducing carbon emissions from coal fired power generation and in commercialising BTU conversion opportunities to convert coal to other high demand energy forms such as coal to liquid fuels and coal to gas.

Against this background, we note that a number of multilateral development banks have adopted a policy position of not financing coal fired power generation facilities and associated infrastructure in aid recipient countries except in rare circumstances. Given the technologies now available for coal fired power generation, we believe this is an unreasonable approach and recommend that the Australian and like-minded governments urge these institutions to reverse this policy position so that coal options can be properly considered and not summarily discounted.

The integral role of coal in the energy mix

As an overarching principle, we believe Australia's broader energy policy must recognise the indispensable role played by coal in providing secure, low-cost energy generation, both domestically and in rapidly growing Asian and developing country markets.

Australia is well served by coal. It is widely dispersed, broadly available, easily transportable, energy-dense, and affordable. It has also served as the world's fastest growing fuel for the last decade.

Contrary to positions taken by some activists, Australia does not need to choose between Australia's coal resources and a low emissions future. Clean coal technologies, including Carbon Capture and Storage (CCS) or Carbon Capture Use and Storage (CCUS), are opening the door to a sustainable low carbon future at lowest cost. Official forecasts suggest that adoption of CCS technologies alone could reduce Australia's CO2 emissions by 31 per cent by 2050.

Existing technologies are already delivering more power with reduced emissions. Newer and highly efficient supercritical and ultra- supercritical coal plants emit almost 40 per cent less CO2 than many existing plants. Moreover, the process of "BTU conversion" – the use of technologies to convert coal into a range of higher value energy forms including liquid fuels and pipeline quality natural gas - represents a critical opportunity to underpin Australia's energy security in these fuels.

In particular, we would urge the Australian government to work more closely and perhaps forge further formal relationships with countries such as Japan and China to highlight and bring together the huge advances which are being achieved and the practical applications of high efficiency technology which are occurring.

Australia is part of the world stage

Indisputably, the dynamics of global energy use continue to change as a result of population growth, geopolitical events, concerns about climate change, access to resources and the need to overcome energy poverty, amongst others.

Diversification is the key and it is clear that a mix of energy sources will be required to underpin our future. We need to be more aware of the range of options that are opening up to us and be prepared to consider all on their merits – particularly given the ongoing rapid advances of a range of technologies placing all energy sources on an equal footing in terms of emissions.

A very real consideration at a global level is that of energy supply security and safety. Coal reserves are geographically diverse and abundant, comprising 55 percent of all fossil fuel reserves. Coal can be found in a variety of nations on every major continent, trade flows are well established, and some 85 percent of coal is consumed locally (not seaborne), providing nations a measure of energy independence.

To quote the World Coal Institute, unlike natural gas, "coal does not need high-pressure pipelines or dedicated supply routes that need to be protected at enormous expense". Global natural gas supply is also vulnerable to resource nationalism and protectionism as the largest fields remain concentrated in potentially hostile or politically unstable regions that have demonstrated a willingness to restrict access for geopolitical and economic gain.

Australian energy policy should be integrated with global efforts to not only achieve low emissions objectives, but also to address energy poverty. More than 3.6 billion people, nearly half the world's population, lack proper energy access. Over 1.3 billion people have no access at all. During the next 20 years, another 2 billion people will require power as the global population grows, putting the world on course to have 5 to 6 billion people lacking good access to power in as little as two decades. Every ten-fold increase in electricity access is linked to a ten-year increase in life expectancy, with higher standards of living, higher literacy and a much healthier population.

Fossil fuels have a critical role

The evidence is all around us that fossil fuels help people live longer and better, and repeated studies demonstrate coal is the backbone of the global economy, with a direct correlation between greater coal use and greater GDP. In the study, *The Social Costs of Carbon? No, the Social Benefits of Carbon*, prepared by Management Information Systems, the benefits of fossil fuel energy to society were shown to outweigh the social costs of carbon by a magnitude of 50 to 500 times.

Given the close correlation between access to electricity and longer life expectancy and better living standards, a dramatic improvement in the reliable supply of affordable energy is imperative. The scale of energy required to meet these goals cannot be met by one fuel but will require the continued and increasing availability, production and consumption of ***all*** primary energy sources, especially coal. Coal remains the most affordable energy source, and must be a central element in a genuine global and local energy solution.

Peabody has previously outlined a plan that calls for half of new generation to come from high-efficiency supercritical coal plants that can achieve a key emissions rate that is two-thirds that of the existing US fleet. Even the CO2 emissions rate is 25% lower than the oldest US plants. Each large supercritical plant delivers the equivalent carbon benefit of removing 1 million cars from the road. And an unprecedented 550 GW of these advanced coal plants are in use or development around the world, with the vast majority being funded and built in emerging regions of Asia.

Next on the plan to advance energy solutions, we favour deployment of today's coal conversion technologies, which use coal to produce liquid fuels and synthetic gas.

Finally, over the longer term, continued investment is needed to advance technology toward next-generation applications that will ultimately generate coal power with virtually no emissions. This includes carbon capture and storage (CCS) technologies for various uses.

Notably, this combination of advanced coal and coal conversion technologies achieve an environmental improvement that is well beyond what the carbon policy experiments of recent years have failed to deliver.

To the government's credit, Australia repealed its carbon tax, which the Prime Minister called a "useless, destructive tax, which damaged jobs, hurt families' cost of living and didn't actually help the environment."

Flawed energy policies - that are seemingly designed to eliminate clean and efficient electricity generation from coal - distort markets and cause unnecessary price increases, result in greater reliability risks and deliver no substantive improvement in environmental performance. In the Australian context, such policies contribute to the destruction of manufacturing jobs, increase the cost of energy, hurt real people and ruin hope for a better life.

The path forward

Clean coal technologies, including CCS and CCUS are opening the door to a sustainable lower carbon future at the lowest cost. Official forecasts suggest that adoption of these technologies could reduce Australia's CO2 emissions by 31 per cent by 2050.

Existing technologies are already delivering more power with reduced emissions. Highly efficient supercritical and ultra-supercritical coal plants emit almost 40 per cent less CO2 than many existing plants. For example, utilising supercritical technology, CS Energy's Kogan Creek Power Station and Stanwell Corporation's Tarong North Power Station (both located in Queensland) rank among Australia's most efficient coal-fired power stations, and generate enough electricity to power more than one million homes. Supercritical technology is in use in many parts of the world, and the introduction of ultra-supercritical technology has been driven over recent years in countries such as Denmark, Germany and Japan, in order to achieve further improved plant efficiencies and reduce fuel costs.

Moreover, the process of BTU conversion – the use of technologies to convert coal into a range of higher value energy forms including liquid fuels and pipeline quality natural gas - represents a critical opportunity to underpin Australia's energy security in these fuels.

Coal conversion technology has to be considered as it has potential to be the solution to both energy supply and carbon questions. We need to have the ability to accommodate future requirements for both gas and liquid fuels. In a world of massive future energy demand, gas and particularly oil will become scarce commodities in the long term, short term market fluctuations notwithstanding.

Peabody urges government review of the playing field in relation to these technologies. We believe that the most economical electricity generation strategy to reduce emissions entails developing and deploying a "full portfolio" of low carbon technologies, including advanced coal generation, CCS, gas, renewable energy resources, nuclear, efficiency improvements throughout the chain, and fuel switching amongst other potential technologies. In particular, significant efforts should be directed to ensuring that CCS demonstration projects move forward.

The investigation and development of high efficiency, low emissions (HELE) and CCS technology should be afforded at least as much priority as renewables as they are all targeting the same end result – near zero emissions.

Simply put, just as the world's energy needs cannot be met without coal, it is clear that the level of emissions reductions being sought will not be achieved without embracing this technology.

In fact, because they could allow the world to continue utilising its most abundant fuel source while drastically reducing emissions, the development of reliable, base-load HELE and CCS technologies will be more important than any intermittent renewable energy technology. The criticality of utilising these technologies is recognised globally. Although the European Union aims to get 20% of its energy from renewable sources by 2020, the EC recently confirmed it would award the White Rose CCS Project with up to €300 million (AU$442 million) in funding as part of the second round of its NER300 scheme. NER300 is one of the world's largest funding programs for innovative low-carbon energy demonstration projects. White Rose is Britain's largest renewable energy power station (utilising biomass), but the EC has acknowledged that CCS technology (in this case utilising coal) is "essential" if Europe is to meet its targets to cut emissions by mid-century.

CCS provides a means for the CO2 to be stored securely in deep underground geological formations. Ideally, research could also investigate the potential use of carbon dioxide captured via these projects. A commercial use for the captured carbon dioxide would clearly help to expedite development of the technology by off-setting the additional costs to these projects.

Using carbon dioxide as a value-added commodity can result in a portion of the CO2 being permanently stored — for example, in concrete that has been cured using CO2 or in plastic materials derived from biomass that uses CO2 as one of the ingredients.

CO2 can also be converted into biomass. This can be achieved, for example, through algae farming using CO2 as a feedstock. The harvested algae can then be processed into bio-fuels that take the place of non-biological carbon sources.

In this manner, we would urge the government to establish robust R&D programs enabling industry to create a positive framework around the treatment of CO_2 through enhanced utilisation. Creating a commodity business around carbon dioxide would help to secure our energy future on a growth platform, not energy rationing.

In addition, one should not restrict energy development waiting for technology to advance, but rather embrace in parallel to create a path to success based on real projects and real results, while providing the necessary access to energy allowing people to live their lives.

Sustaining national gas supply

Peabody notes that the government is seeking comments on the nation's gas supply.

In providing these comments, we note there is a clear distinction between western and eastern Australia and a lack of infrastructure between the two. As the western region will continue to rely on conventional extraction, typically offshore, eastern Australia will need to rely to a large extent on unconventional gas production, principally from coal seam gas (CSG), to support the emerging LNG industry and the domestic market.

It appears clear that Australia's demand for natural gas will continue to increase, led by the export market with LNG. LNG exports will increase exponentially as multiple world scale export facilities become operational. This situation is likely to result in gas supply constraints, especially in eastern Australia as increasing export demand faces limited incremental gas production.

Much of the planned LNG expansion in the east is relying on timely development of CSG, including the number and performance of the CSG wells. To meet LNG commitment, small deviations of CSG could result in significant draws from traditional domestic gas supplies for eastern Australia.

In turn, this could lead to domestic gas supply becoming constrained, creating aggressive competition between domestic and export LNG demand and driving up prices. This not only negatively impacts already high electricity prices with growing dependence on natural gas, but more importantly residential and industrial consumers.

Australia is on track to export three times what it consumes domestically by 2020, up from a roughly even split now.

This scenario means that Australian manufacturers accustomed to paying A$3-A$4 per gigajoule for long-term supply contracts will be competing with customers in Asia willing to pay up to A$18 a gigajoule or more.

These upward pricing pressures caused by LNG demand are expected to be the new normal, and offers the potential opportunity for coal-based gasification projects including Substitute Natural Gas (SNG).

As part of the consideration of Australia's energy policy, it is timely for SNG, produced via conversion technologies, to take a place in Australia's energy supply.

China right now is employing conversion technologies transforming hundreds of millions of tonnes of coal into higher value commodities including SNG, liquid fuels, ammonia, etc.

This technology should be further investigated in Australia and developed as an avenue which could undoubtedly assist in addressing potential supply shortfalls and adding to the nation's longer term energy security and stability.

Today's advanced gasification technologies incorporate significant improvements over earlier versions, including increased flexibility, vastly increased scale, and new applications which are combining to drive gasification technologies to greater prominence than ever before.

The recent upswing of its use, especially in China, clearly demonstrates the advantages of the technology for utilising secure, domestic energy sources to produce commercial products.

A key advantage of gasification systems is that they can be designed to have a reduced environmental footprint.

More than 90% of the carbon in a syngas stream can be captured as CO2 and processed for utilisation and/or storage. Some studies, including the U.S. Department of Energy, have shown that coal derived transportation fuels with CCUS produce significantly less life-cycle greenhouse gas (GHG) emissions than petroleum derived fuels. The addition of biomass has the potential for further reductions.

Around the world, as in Australia, oil and natural gas prices continue to fluctuate dramatically and this technology provides a strategic pathway to utilise local coal resources to produce the energy and products needed for continued economic growth.

Coal can also assist in Australia's liquid fuel energy security, as gasification can be employed to create low-sulfur transportation fuels, thus reducing one of the major contributors to urban air pollution.

Coal is by far the most common source of the carbon feedstock for gasification today — a fact that could have great relevance for, and application in Australia.

Coal's versatility is a great advantage in an energy insecure world, with technologies allowing the energy stored in coal to be converted into electricity, chemicals, pipeline-quality natural gas, liquid transportation fuels and hydrogen.

Countries around the world are currently faced with competing strategic objectives related to energy. These include:

- Energy security, economic sustainability, and environmental care.
- A lack of secure reliable and adequate supplies of energy from a world market that is heavily dependent on unreliable or potentially unstable sources of supply.
- A widespread concern for the health and sustainability of a nation's economy and standard of living reducing a nation's competitiveness.
- The need to provide at scale a meaningful path to a lower carbon profile on the energy supply side.

Peabody believes conversion technology – that can be increasingly deployed on a commercial scale - presents a long-term opportunity for Australia to help meet these objectives.

A number of challenges remain to increasing deployment of the technology. The upfront costs associated with large-scale gasification projects remain a hurdle, but one of the most important considerations could well be policy settings and the provision of regulatory certainty to enable it to develop in an efficient manner.

The outlook for coal

Coal will continue to be the major global energy source. The International Energy Agency projects that international trade in coal will rise from 900 million tonnes of coal equivalent (Mtce) in 2011 to 1,152 Mtce in 2020, before rising at a more modest pace to 1,261 Mtce in 2035. These trends are expected to be confirmed in the soon to be released and updated IEA projections for global energy demand

Asia will continue to be at the centre of this growth, with the IEA expecting that China's growth in coal demand to 2020 will exceed that of the rest of the world put together.

The Australian Bureau of Resources and Energy Economics (BREE) projects that China's consumption and importation of thermal coal will decelerate, but not contract. BREE expects China to remain the world's largest coal producer by far over the next five years. Nevertheless, China's imports of thermal coal are projected to increase at an average rate of 3.2 per cent a year between 2014 and 2018, reaching 281 Mt in 2018.

As with China, India's economic development also has a long way to run. According to the IEA, India doubled its coal use between 2000 and 2011 and its coal demand is expected to double again by 2035, overtaking the U.S. as the

second largest coal consumer soon after 2020. The IEA projects that India's imports will more than triple by 2035, overtaking those of Japan and the EU before 2020, and those of China soon after, to make India the world's largest coal importer.

BREE also expects India to become more reliant on imports of thermal coal over the next five years, projected to grow at an average rate of 6 per cent per annum to reach 174 Mt in 2018.

Similarly, the countries forming the Association of Southeast Asian Nations (ASEAN) are embarking on the same process of coal-fired electrification as China and India. The IEA projects that demand for electricity in ASEAN will double between 2011 and 2035 and that coal use will triple in the same period.

The use of coal to meet growing energy demands in Asia is being driven by three forces: coal's rapid scalability, its lower cost, and the availability of readily accessible reserves. The building of a new coal-fuelled generation fleet across Asia is showcasing the latest technological trends, highly efficient plants with emission controls, while providing a proving ground for widespread use of carbon capture and storage, which will be necessary to meet reasonable climate goals.

Coal also remains an essential fuel in developed economies. The U.S. is the world's second largest consumer of coal and coal accounts for 40 per cent of US electricity generation. Coal is also enjoying a resurgence in Western Europe. Between 2011 and 2012, coal-fired electricity generation increased 65 per cent in Spain, 35 per cent in Great Britain and 8 per cent in Germany.

Thus, the IEA concludes that: "It is currently difficult to envisage a future in which coal is not used to meet growing power demand – not only in non-OECD regions, but also in many OECD countries."

The IEA expects Australia and Indonesia to be the biggest beneficiaries of increasing international trade in coal.

Clearly these figures and projections present a compelling case to ensure Australia is well equipped to continue its participation in this energy future.

The principles of an Australian energy policy

Over many decades Australian householders' living standards have been built on access to low cost reliable coal-fuelled energy, with residential electricity costs amongst the lowest in the developed world.

Similarly the competitiveness of Australia's manufacturing sector – including the metals and minerals processing sector - has also been built on low cost, reliable energy built on our coal endowment.

However, key contributors to Australia's economic strength and household living standards are now under threat. Australian households now pay among the highest electricity costs in the OECD. Household electricity prices in Australia have risen by more than 40 per cent since 2007, and are still rising. Australian exporting and import competing companies now face electricity costs 80 per cent to 130 per cent higher than in 2005.

Four principles should guide Australian energy policy:

First, the provision of electricity in competitive markets at lowest cost should be a core objective of national energy policy. Higher electricity costs fall disproportionately on lower income earners, with independent data showing that many low income and rural households are forced to outlay up to 10 per cent of

their disposable income in electricity costs. Policy interventions that artificially raise the cost of electricity, such as the failed carbon pricing scheme and the Renewable Energy Target, should not have a place in sensible policy.

Second, Australia's energy policy must recognise the indispensable role played by coal in providing secure, low-cost energy generation, both domestically and in rapidly growing Asian and developing country markets.

Third, Australian energy policy should be integrated with global efforts to address energy poverty and low emissions objectives. Coal remains the most affordable energy source, and must be a central element in a genuine global energy solution.

Fourth, recognise and support the role of global technology applications in reducing carbon emissions from coal fired power generation and in commercialising BTU conversion opportunities to convert coal to other high demand energy forms such as coal to liquid fuels and coal to gas.

The drivers of continued coal consumption will be geology and economics. The strengths of coal as a staple for energy supply was summed up as follows by the IEA in its 2012 document, "The Global Value of Coal":

- Abundant supply – Coal is the world's most prevalent and widely distributed fossil fuel, accounting for 64% of global economically recoverable fossil resources compared to 19% for oil and 17% for natural gas. The amount of proven recoverable coal reserves exceeds one trillion tonnes.
- Secure supply – In contrast to other fuel sources, coal reserves are distributed widely across the globe. The Western Hemisphere itself has over 300 billion tonnes of coal, Europe has 73 billion and Australia over 75 billion.
- Reliability – Coal is the most reliable and cost-competitive base load fuel – in 2009, coal accounted for only 32 per cent of total generating capacity, but produced 41 per cent of the world's electricity.
- Affordability – On the basis of IEA analyses of levelised costs of electricity, supercritical plants are one of the most affordable sources of power generation in China costing USD 33/MWh compared to USD 50 for hydro, USD 53 for nuclear, and USD 71 for wind.
- Versatility: Countries around the world have been initiating an increasing number of projects converting coal to liquid fuel, substitute natural gas or chemicals.

Continual technological improvement will lead to the ultimate goal of near-zero emissions coal-fuelled energy. Studies suggest that coal with carbon capture and storage (CCS) may be the low-cost, low-carbon solution, 15 to 50 percent less expensive than alternatives such as nuclear, wind or natural gas with CCS.

Peabody is a global leader in clean coal solutions and the development of low emission technology. Around the world, Peabody is partnering in more than a dozen major clean coal technology and low-carbon initiatives for state-of-the-art generation, coal gasification and Btu conversion projects.

Chief among these is China's GreenGen project where Peabody is the only non-Chinese equity participant. GreenGen ultimately will be among the world's largest near-zero emissions coal-fired power plants.

Peabody is a founding member of Australia's COAL21 Fund, which will invest up to $1 billion in clean coal technologies in the decade to 2016. A signature project includes the Callide Oxy-Combustion demonstration project currently evaluating performance and operating parameters. And in the United States,

Peabody is supporting the advancement of commercial scale demonstration of coal-fuelled oxy-combustion with the FutureGen project.
Peabody is engaged in clean coal technology development through the Global Carbon Capture and Storage Institute in Australia, the U.S. – China Energy Cooperation Program, and the Consortium for Clean Coal Utilisation at Washington University in St. Louis.

Thank you for the opportunity to provide these comments. If you need any further information regarding this submission, please contact Ian Gray on 0732255510 or at igray@peabodyenergy.com

Yours sincerely

Charles Meintjes
President