

Submission to *Issues Paper*
Leading to the *Energy White Paper*

Thursday, 6 February 2014

Barney Foran

Adjunct Research Fellow

Institute of Land Water and Society

Charles Sturt University

Albury NSW 2640

bforan@csu.edu.au

02-6051-9879

There is no requirement for confidentiality

1. Key Omissions in Framing the “Energy White Paper”

1.1 Lack of an overarching and numerical integration methodology.

The social expectation of a ‘White Paper’ process is that distillation of key policies be feasible in financial, physical and social terms. The Labour Government’s 2012 EWP gave a ramble of disconnected chapters with little numeracy and less integration. A Coalition Government’s policy is expected to be ‘evidence based’ and not innumerate fairy tales. Meeting this requirement will require modelling and testing of the key outcomes both individually and when combined. The efficacy of the EWP’s policies must be shown for three to four decades hence and have four headline indicators (bullets below). Assessment and modelling groups obvious for this task include Treasury, BREE, ABARES and the University of Canberra’s NATSEM group for social issues.

- GDP growth
- Employment
- Transport fuel security
- Greenhouse gas emissions

1.2 Equity of Access to whitepaper framing and making contributions

The EWPs Reference Panel does not contain a civil society representative, an important omission given that heat wave and cold snaps impact unequally on the young, the old the unwell and the poor. The way the ‘Issues Paper’ is framed, its language and directions could be interpreted as maintaining and expanding the status quo for incumbent companies advantaged most by expansionary fervour and growth zeal.

1.3 The whitepaper context ignores global energy strategies and promotes a narrow ideological purpose

A coherent and robust EWP process should reflect some global directions and expectations. It should not be insular, self interested and navel-gazing. An introduction to the Green Paper should briefly note Shell’s ‘Mountains and Oceans’ scenario series¹ (new series underway now) and the International Energy Agency’s ‘new policies’ and ‘efficient world’ scenarios². Furthermore, the ‘Issues Paper’ asserts a naive manifesto-like belief in growth and expansion as the answer to most challenges and problems (growth has 28 instances). Thoughtful analyses of where developed economies sit currently, reveal that growth is driven by further debt, inequity is growing especially in USA and UK, and that sticky unemployment levels particularly in the young, have few easy answers. That growth answered these problems in the previous 70 years is an historic fact. That growth in a finite world is the answer for the next 70 years may be unlikely, and is certainly not assured. The EWP will be more robust and

¹ <http://s01.static-shell.com/content/dam/shell->

² <http://www.iea.org/publications/specialreports/SpecialReports/Doc.pdf>

useful if it holds Coalition ideology lightly and have ‘growth-ism’ as the dominant belief set among several options that reflect global realities and domestic expectations.

1.4 Massaging of technical energy options

This 2014 ‘Issues Paper’ maintains a technical spin that is not appropriate for a critical analysis of energy policy. Noting that nuclear re-development is underway in the UK (P 36) should also note “a government guaranteed price of 92.5 UK pounds (\$168) per megawatt hour and inflation adjustments for 35 years”³. Likewise robust thermo-technical analysis of CCS deployment increases levelised electricity costs by 35-66% or \$39/MWh for pulverised coal plants and \$17/MWh for IGCC plants⁴. Thus it is disingenuous to promote the geo-sequestration project in gas extraction on the NW Shelf as the pre-feasibility proof for CCS in Australian coal-electricity plants. The Australian Government’s BREE⁵ assessment of technology options in 2012 found that without a carbon price, onshore windfarms gave an electricity cost (LCOE) of \$111-122 while IGCC plants with CCS gave \$183-243 per MWh

1.5 Lack of an ‘Architecture of Surprise’ framework for exploring the strategic risk

Random crises can unpick the best structure and intent of national energy policies. It is critical that nested policy outcomes from the EWP are subjected to a macro-risk assessment using the ‘architecture of surprise’ approach:

- Long term slow burn (rising social inequity in export markets, ageing of populations)
- Big bang (a global financial crisis, a regional war in the Middle East)
- Double whammy (successful bombing of Jurong Island oil refineries combined with a bird flu pandemic originating in China)

1.6 Failure to structurally compare the ‘Energy White Paper’ with the ‘Emissions Reduction Fund Green Paper’ and the previous Government’s EWP of 2012

The United Kingdom Government understands the close linkage between energy and greenhouse policies by having a Department of Energy and Climate Change⁶. Failing that sublime logic in Australia, it is vital that policies from the EWP and the ERF are structurally compared in a graphical matrix for the interim Green Paper. It is also necessary to refer to the high priorities from the previous 2012 EWP and to evolve a technically assured approach to long term energy matters where governments might turnover tri-yearly, but power-plants have lifetimes of 50 years and the global atmosphere has CO₂ residence times of more than 100 years.

³ <http://www.chathamhouse.org/media/comment/view/195003>

⁴ ENERGY & FUELS Volume: 27 Issue: 8 Pages: 4290-4301

⁵ http://www.bree.gov.au/sites/default/files/files//publications/aeta/australian_energy_technology_assessment.pdf

⁶ <https://www.gov.uk/government/organisations/department-of-energy-climate-change>

[This page is intentionally left blank]

2. The Security of Energy Supplies

The Government seeks comment on:

- ways community expectations can be better understood and reflected in reliability standards;
- the value of developing fuel reserves to meet Australia's international oil security obligations, and augment domestic security;
- ways to increase new gas sources to meet demand and measures to enhance transparency in market conditions; and
- issues relating to the regulation of energy infrastructure.

- Both sides of politics continue to myopically ignore the concept of 'peak oil' even as a benign risk management strategy. The daily business pages trumpet 'sands, seam and shale' as the saviours of fuel sustainability without acknowledging the financial, energy and emissions costs of these technically difficult supply sources. The smart money in the North America has off-loaded most non-traditional extraction activity except for 'sweet spot' locations. Traditional oil in Australia shows the archetypal 'peak oil' transition from a few opulent and easy fields, to larger numbers of scattered and more difficult resources. As a past energy analyst in government I know well the structure of denial around 'resource limits', and while technological innovation is currently winning, the physical laws of thermodynamics and mass balance tell us "you can't forever make brass from muck"
- Given the relatively rapid decline in domestic oil production relative to consumption the nation's failure to develop 90 day strategic stocks of onshore oil is puzzling. Our 'one answer' reliance for diesel fuel on the Jurong Island refineries leaves key transport corridors open to a supply shock, be it physical or financial. The transition to LNG/CNG along the Hume corridor will buffer supplies in the Sydney-Melbourne axis but the fleet turnover will take many decades. The lack of sophisticated skills and machine shops will further constrain a rapid response to a crisis. Improving the national taxation base and introducing an 'oil stock' levy (10 cents per litre raises \$4bn a year) could underpin the investment while the Future Fund could manage the crude oil stocking and trading.
- Conventional economics for the last 60 years insists that price mechanisms are virtually the only relaxer of tension between supply and demand (42 instances of the word 'price' in document). Strange then that in the framing of a Coalition policy document the intent for 'price' be expressed mostly as 'lowest price'. The 'energy price' pain in households results from poor housing standards (ongoing), inappropriate equipment choices (ongoing) and rampant consumption practices (ongoing). Generally mobile phone bills and electricity bills are similar but telecommunications policy does not over-emphasise price as a performance indicator.
- Transport fuel security can be embraced by a transition to methanol or DME, first with natural gas as the feedstock (particularly stranded gas reserves) and gradually to wood and municipal waste for carbon neutral fuels and greenhouse mitigation (See Section 8 later)

3. Regulatory Reform and Role of Government

The Government seeks comment on:

- priority issues, barriers or gaps within the COAG energy market reform agenda;
- possible approaches and impacts of review of tariff structures including fixed network costs, further time-of-use based electricity tariffs and the use of smart meters;
- possible measures to promote greater price transparency in gas markets; and
- areas where further privatisation of government-owned assets would contribute to more effective regulatory frameworks and better outcomes for consumers.

- The trend towards further privatisation of government-owned assets can hardly be resisted given the general adage of efficient markets, profit motivation and the nimbleness of innovative CEOs. However high quality energy is the motor of the modern economy and the lifeblood of social equity. It should not be left solely to the quarterly dynamics of self-interested corporate boardrooms. The historian would note that the greater majority of generators, poles and wires were erected by citizen's taxes. The constraints of quarterly reporting and shareholder value make the 'long view' a difficult task. Thus the wheel-slip we observe in transitioning to anything other than 'coal, coal and coal'. Privately owned or unlisted companies such as Visy Industries constantly promote their advantage in making five to ten year decisions that provide new strategic vantage points, not possible to access with iterative and marginal decision making. Integrated energy firms such as Hydro Tasmania⁷ present an alternative business model not easily dismissed in a 'future of energy' context. However this might be criticised from a 'maintenance of the status quo' context. A personal fascination is the King Island Hybrid Power Plant⁸ which is close to delivering 65% of the island's electricity requirements from renewables day-in day-out, a special case of course given the island's geography! The CFOs of Australia's energy majors would have stopped ongoing investment in this project years ago, as 'not in the shareholder's interest'.

⁷ <http://www.hydro.com.au/system/files/documents/Hydro-AR-2012-Full-Report.pdf>

⁸ <http://www.kingislandrenewableenergy.com.au/news/2014/king-island-leads-way-embracing-renewable-energy-solutions-smart-grid-update>

4. Growth and Investment

The Government seeks comment on:

- commercial or market initiatives that could enhance growth and investment in the energy and resources sectors;
- areas where approvals processes could be further streamlined while maintaining proper environmental and social safeguards;
- further ways that regulatory burdens could be reduced while maintaining appropriate levels of disclosure and transparency in energy markets; and
- the impacts of variable land access policy and ways the community could be better informed and engaged on development in the energy sector.

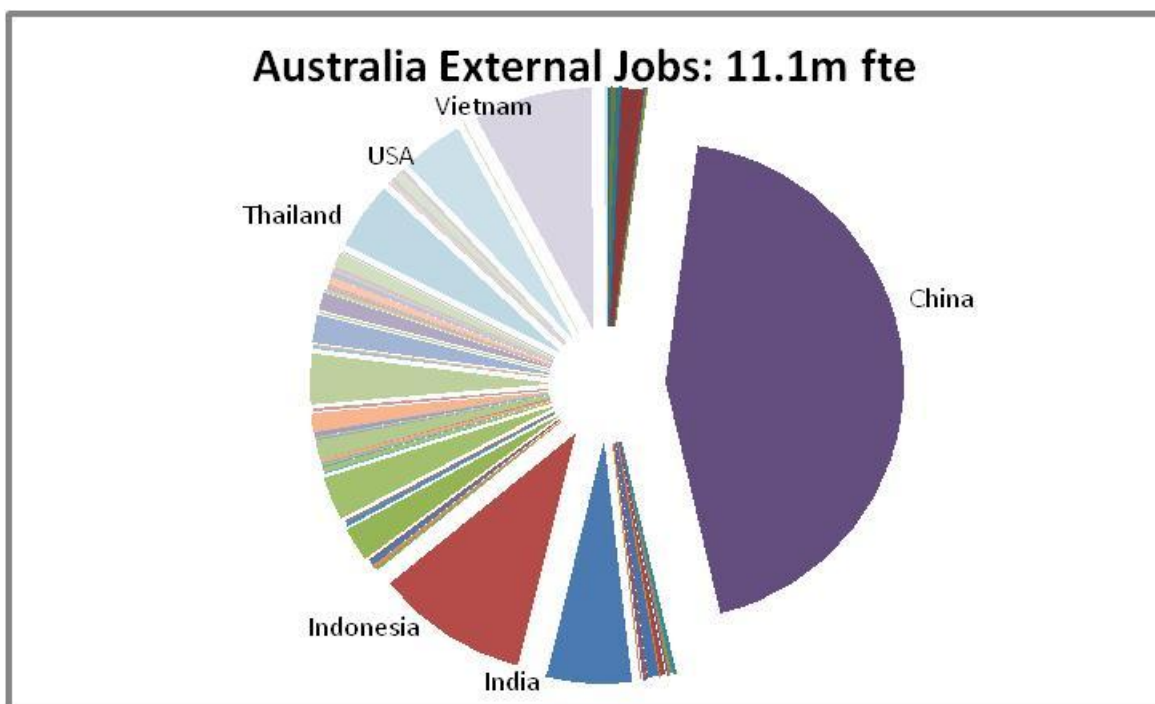
- No substantive comments on this section.

5. Trade and International Relations

The Government seeks comment on:

- how to grow the export of value-added energy products and services;
- ways to remove unnecessary barriers to continued foreign investment in Australia's energy sector;
- ways to strengthen support for access to export markets; and
- ways to support business to maximise export opportunities for Australia's energy commodities, products, technologies and services, including the value of Australia's participation in the variety of international forums.

- The EWP should invert its rationale of “more petajoules for country X” to focus on a bilateral production chain basis. Currently, 11.1 million full time workers outside Australia (55% of total) provide goods and services to its domestic final consumption (Figure below: Eora Global Model⁹). The origins of outsourced labour chains reflect current consumption patterns, with China responsible for nearly one half. Within one decade, international greenhouse accounting protocols will move from a ‘territorial’ basis to a ‘territorial and consumption’ basis, the latter being fully trade-corrected measure of what we consume domestically. Australia could be advantaged by decarbonising and making more efficient its own production chains, while technically improving (energy services exports) those overseas chains which we value and need most.



⁹ <http://worldmrio.com/>

6. Workforce Productivity

The Government seeks comment on:

- the nature of any current skills shortages being experienced and how these could be addressed by and with industry;
- the capacity of industry and education sector-led programs to meet long-term training and skills development needs of the energy and resources sectors; and
- specific long-term training and skills development needs for alternative transport fuel, renewable energy, energy management and other clean energy industries.

- The development of ‘polyworkers’ is a glaring deficiency in the capacity of industry and education sector-led programs to meet long-term training and skills particularly from an energy end-use perspective in domestic households and commercial buildings. A ‘polyworker’ and their parallel ‘poly-certifier’ is a person possessing the skills of a designer, builder, plumber and electrician. In any new-build or retrofit, each of these skills has to be accessed and paid for sequentially with a knowledge loss at each transition step, plus a site visit fee and hourly rates. Instituting advanced building guides in a local suburb or regional context¹⁰ is not a matter of accessible knowledge, but accessible skills. Frankly, most ‘tradies’ in Australia have skills still based in the 1950s, rather than the 2010s. This represents a profound institutional malaise and means Australia’s stocks of houses and buildings will take centuries until advanced environmental and comfort ratings are the norm, rather than the exception.
- Chemical engineers and process fabrication skills will hinder development needs for alternative transport fuel, renewable energy, energy management and other clean energy industries. A steady ramp up of hex-free places at our universities and polytechnics will ensure we have a large skill base, much of it regionally based, if transitions to renewable electricity and fuels becomes national policy, rather than a ‘can kicked down the road’ by the revolving door of successive governments. The ‘methanol from wood’ example given later in Section 8 shows the requirements. Sufficient bio-methanol to underpin a fluent economy will require 30 million hectares of wood crop rotations on 100 million hectares of currently cleared land (about 30% of each farm). Several hundred ‘energyplexes’ will be required in regional areas close to wood supplies. Each ‘energyplex’ produces bio-methanol and bio-electricity, adjusting the energy product to daily market requirements. The process requires gasification of wood and municipal waste, a clean-up of ‘syn gas’ and routing of gas to a gas turbine for bio-electricity or gas across a catalyst giving bio-methanol. Some 15-20% of the processed wood remains un-gasified and becomes bio-char returned to agriculture as a soil modifiers and long term carbon storage. Many bio-chemicals can also be produced.

¹⁰ http://www.indigoshire.vic.gov.au/What_We_Do/Greener_living/better_Build_Toolkit

7. Driving Energy Productivity

The Government seeks comment on:

- the current suite of energy efficiency measures, ways these could be enhanced to provide greater energy efficiency or possible new measures that would enhance energy productivity;
- the use of demand-side participation measures to encourage energy productivity and reduce peak energy use; and
- measures to increase energy use efficiency in the transport sector.

- Since 1990, energy consumption by the Australian economy in a whole-system sense has increased by 38% while energy imports (raw energy plus energy embodied in goods and services) have increased by 59%. This occurred despite unprecedented focus on ‘economic efficiency’ and gains in multifactor productivity. These realities challenge the EWP’s belief and reliance on efficiency gains as the route to a more energy-frugal economy. Unless the savings from efficiency gains are captured and not recycled (retiring debt for a household or company; a sovereign wealth fund for nation) then total energy use will grow. This ‘energy growth’ is the ‘Rebound Effect’ (or Jevons’ Paradox) and is the basic driver of a modern growth economy. Rebound is composed of both ‘direct’ and ‘indirect’ (or inter-sectoral) components. Direct rebound occurs where more efficient lights, compressors or car engines allow more of the energy service (lighting, cooling, kilometres) to be consumed for the same cost. Direct rebound can be large but averages out at 10-20% across a wide range of technologies and countries. Indirect rebound occurs when energy and financial savings migrate from energy use to other sectors stimulating demand there. Recent academic literature for developed countries suggests whole-economy rebounds of 15-120%, household energy services of 30-40% and industrial processes of 30-50%. Academic opinion from a wide range of these studies converges on the need to constrain energy rebound with a pricing mechanism integral to the technical efficiency programs.
- Minimum performance standards are justified providing the standard is raised appropriately every five years. The ‘top runner program’ from Japan¹¹ should be applied domestically to drive possible new measures that would enhance energy productivity. This policy, aimed at both manufacturing and domestic end use covers 21 products (fridges, computers, air conditioners etc.) and allows only the top band of energy efficiency to be sold. This is re-evaluated every five years when the bar is raised till eventually there is little design/thermodynamic purchase left. This approach sets valid performance horizons for appliance industries and signals to the ‘big box’ stores that poor energy efficiency is neither a commercial nor a public good.
- Housing Stock: Six star compliance (and increasing for retrofits) in most jurisdictions should immediately be ramped up to ‘eight star’ and quickly head towards ‘ten star’. My work on an environmental advisory group in a Victorian regional council

¹¹ <http://www.enecho.meti.go.jp/policy/saveenergy/toprunner2010.03en.pdf>

confirms that appalling energy use standards are being maintained in 80% of all new houses, most of those being project designs complying with six star standards. Four issues are at play: (1) The star standards have many escape clauses (2) Local council officers and private compliance consultants do not enact the 'spirit' of the code (3) The 'size and cost' equation always favours size over reducing the yearly energy consumption of the building/lifestyle matrix (4) Most builders are naively ignorant of synergies available from the correct integration of building shell, energy and water efficiencies.

- Demand Side Management: Legislation restricting personal choice is pervasive in seat belts, guns, drink driving, child immunisation, cigarette packaging etc. Thus the effort given to standard setting and labelling for the energy-using machines in our homes and commercial buildings is largely wasted. Most big box stores are still full of two star appliances and each heat wave sees a rush on cheap Chinese air conditioners. Legislating immediately to cease the sale of 'low star' appliances is relatively easy and should be backed by penalties. Poorer households will be affected and civil society NGOs could be tasked with bulk buying programs and also refurbishment of second hand appliances.
- Transport Efficiencies: This seems a duplicitous question from the EWP group given that this Department's contribution to the declining domestic vehicle industry has launched the Holden Commodore SS Ute that requires 18 litres/100km¹². Industry assistance for the past 20 years has not required a cross compliance for vehicle efficiency, a critical flaw of poor policy design. But for the record there are five headline issues: (1) Require all local, state and federal agencies to purchase yearly 50,000 Australian-made Toyota Hybrid Camrys to sustain a local manufacturing base (2) Phase in over five years punitive registration fees on all old and new cars that use over 10 litres/100km (3) Hypothecate 50% of fuel excise over all jurisdictions to investment in light/heavy rail and efficient bus fleets while decreasing public funding for city tunnels and motorways (4) Phase out diesel excise rebate to farmers and miners while adding excise to domestic jetfuel.

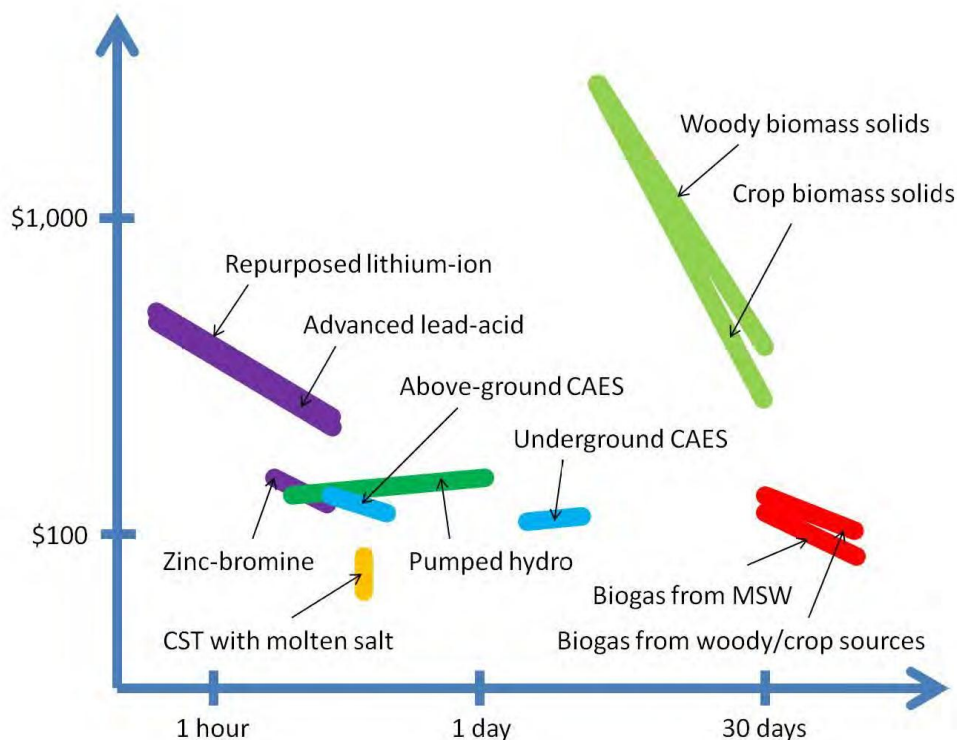
¹² <http://www.caradvice.com.au/198994/holden-commodore-ss-ute-review/>

8. Alternative and Emerging Energy Sources and Technology

The Government seeks comment on:

- ways to encourage a lower emissions energy supply that avoids market distortion or causes increased energy prices;
- the need to review existing network tariff structures in the face of rapidly growing deployment of grid-backed-up distributed energy systems, to ensure proper distribution of costs;
- additional cost-effective means, beyond current mandatory targets and grants, to encourage further development of renewable and other alternative energy sources and their effective integration within the wider energy market;
- how the uptake of high efficiency low emissions intensity electricity generation can be progressed;
- any barriers to increased uptake of LPG in private and commercial vehicles and CNG and LNG in the heavy vehicle fleet; and
- any barriers to the increased uptake of electric vehicles and advanced biofuels.

- Renewable electricity will be made more grid-friendly by mandating on-site storage obligations for each commercial-sized windfarm and photovoltaic site. Storage for rooftop photovoltaics may be more difficult to underwrite but large battery storages in city suburbs and regional areas could complement or mostly replace the ‘poles and wires’ augmentation process now underway. The commercial opportunities from widescale deployment of battery storage is obvious particularly if most infrastructure is fabricated by domestic firms. The EWP process will be aware of the thorough 2012 AEMO study¹³ which details technologies, costs and discharge times (see figure below)



¹³ <http://www.climatechange.gov.au/sites/climatechange/files/files/reducing-carbon/APPENDIX8-CSIRO-energy-storage.pdf>

- In terms of Australia’s eventual obligation (beyond 2020) to transition to a low carbon, financially resilient and equitable economy the requirement for high efficiency low emissions intensity electricity generation is a misconstrued objective if it is code for “better ways to burn black and brown coal”. The best combined cycle gas turbine will release 400 kg of CO₂ per MWh while carbonate fuel cells may halve that. This can be a circular argument of “my technology’s better than yours” but eventually their environmental loading will saturate in thermodynamic terms. Good fossil technologies can take us part of the way to anticipated global obligations but ‘technology saturation’ will leave stranded assets and financially ruined enterprises.
- Barriers to increased uptake of LPG in private and commercial vehicles is another misconstrued objective as LPG is mostly a by-product of a declining domestic refinery sector and was promoted by the oil majors to use it. Given the demise of Ford and Holden there seems little strategic reason for LPG promotion other than seeing out failed manufacturing policies. However should LPG be replaced by CNG, then fuel security and vehicle manufacturing can be enhanced by (1) Transitioning to the requirement that all “combustion” cars and light vehicles sold domestically be dual fuelled and (2) Introducing domestic compression technology¹⁴ to expand markets and prices for domestic gas producers and retailers, thus underpinning the business case for “keeping domestic gas onshore”.
- Barriers to the increased uptake of advanced biofuels must be reconfigured to include **methanol** (from wood or natural gas) as a fuel that could underpin long term fuel security¹⁵ and a system-wide transition to low carbon fuels. Production methods aside (gas or wood), methanol or its gas relation DME (di-methyl-ether) has four fuel advantages: (1) One of the cleanest combusting fuels in city airsheds because of its molecular structure (2) It is an easily transported and stored carrier of hydrogen for use in fuel celled cars, through an in-car reforming process (3) Methanol for transport fuel presents a large value-adding industry for Australian natural gas, currently notable for its volume rather than its value (4) Domestic methanol capability prepares Australia to transition to carbon neutral fuels based on extensive wood crops grown on one third of each farm in currently cleared areas¹⁶. Long term resilience for Australia’s farmed landscapes requires substantial re-introduction of treed cover for micro-meteorological, biodiversity and redundancy reasons.

¹⁴ <http://www.cngnow.com/vehicles/refueling/Pages/refueling-at-home.aspx>

¹⁵ http://www.meoaustralia.com.au/icms_docs/124028_Methanol_Market_Conference_Presentation_Shanghai_10_May_2012.pdf

¹⁶ <http://www.sciencedirect.com/science/article/pii/S0304380011002705>