Sustainable Population Australia

Submission Author:
Dr. Jane N. O'Sullivan
64 Leybourne St
Chelmer Qld 4068
Ph 07 3379 8090
j.osullivan@uq.edu.au

Energy White Paper submission
Department of Resources, Energy and Tourism
Secretariat.ewp@ret.gov.au

Submission to the Energy White Paper process

This submission is made on behalf of the national executive of Sustainable Population Australia (SPA). SPA is an environmental advocacy organization, which recognizes that population is a key factor in all human impacts on the environment. While energy intensity of lifestyles is also an important source of environmental impact, population density increases minimum energy intensity requirements and limits energy resource options. SPA believes that population analysis and population policy are critical to Australia's future energy policy. However, this issue has been ignored in the discussion papers to date.

In general, the discussion papers present a deplorable lack of balance and appreciation of long term national interest. They do not map out Australia's energy security beyond the acknowledged lifespan of the fossil fuels on which we depend. They barely consider demand as a factor in energy security. They focus instead on the need to provide infrastructure, foreign investment and conducive regulatory structures to strip Australia of its non-renewable resources as fast as possible.

Most of this submission provides a response to the discussion papers, four of which are addressed in turn. These are followed by recommendations, from the perspective of sustainable quality of life, in contrast to the perspective of short term corporate profit maximization which drives the discussion papers.

I participated in a consultation workshop for the Energy White Paper in Brisbane on 27 April. Comments made in this submission will draw on points of discussion in that workshop, as well as in the discussion papers issued by RET.

TERMS OF REFERENCE and Strategic Directions Paper

As raised at the Workshop, I find the Terms of Reference, as currently drafted, entirely inappropriate for the important task of planning the future of Australia's energy supply and energy industries. In response to my query about the status of the TOR at the Workshop, we

were told that they are recognized as being out of date, and are likely to be changed when the relevant Cabinet process can be completed. While this would seem an unusual order of events, I am thankful if there is an opportunity to improve them.

The TOR presume a future very similar to the recent past, and prioritize business-as-usual (b.a.u) strategies. This view of the future is at odds with the known and likely impacts of climate change and peak oil[1].

The TOR appear oblivious to the conflicts between genuine national interest and the pursuit of b.a.u. economic goals, and to the vital role of energy policy in managing conflicting interests to enable a rapid and equitable transition to a carbon-neutral society. Environmental sustainability is mentioned as an afterthought, while 'sustainability of economic development' is the criterion of highest priority. As this expression is not defined, it must be interpreted to require the maintenance of currently accepted metrics, including GDP and stock values, which have been shown to serve us so poorly as we emerge from the era of exponential fossil fuel-based growth. The need to reduce carbon emissions is seen merely as a challenge to economic efficiency, and demand management is mentioned only in the context of economic efficiency of consumption.

Prejudices held in the terms of reference and accompanying Strategic Directions paper include:

- *That the energy sector must contribute to economic development.* The possibility of contraction of energy industries is not countenanced. No scenario should be excluded from analysis. This prejudice becomes more problematic when it is assumed that negative impacts on any particular energy industry or energy-intensive industry constitute a threat to economic development, rather than a potentially beneficial evolution towards a more sustainable energy supply and economic base.

- *That energy development should be via private capital.* I suggest that it is difficult to achieve rapid transition by private investment alone, particularly where this transition requires behavioural and structural change in order to realize technological change. Investment in energy infrastructure has long pay-back periods, and Government effectively guarantees future market access to attract such investments, when this may be inappropriate in the context of evolving understanding of climate change implications. Significant conflicts of interest also arise where stakeholders can't exert their influence in the market place, and this holds for all who are adversely affected by other people's consumption choices, and particularly for future generations. It is the responsibility of Government to uphold public interest, present and future, without being compromised by commitments to private enterprise.

- *That competition is the key to economic optimization*, in terms of domestic energy markets and export industries. This is a perversion of market theory, whereby the distinction between comparative advantage and competitive advantage is lost. Comparative advantage results in a net gain for both the seller and the buyer as a result of trade. It describes a win-win situation. Competitive advantage, on the other

[1] "Peak Oil", the concept of world oil production soon reaching a peak and declining, is now becoming widely accepted in the energy literature (see Bardi, U. (2009) *Peak oil: The four stages of a new idea*, Energy **34**(3), pp. 323-326) and political circles (e.g. the EU Energy Commissioner Andris Piebalgs). Forecasts of oil supply are routinely conducted by the Association for the Study of Peak Oil (www.peakoil.net), the Energy Watch Group (www.energywatchgroup.org) and the Oil Depletion Analysis Centre (www.odac.info) and suggest the world is at or near peak oil production now.

hand, is predicated on capturing trade away from other potential suppliers. It is inherently a win-lose situation. Efforts and resources used to bolster competitive advantage often do not lead to optimum resource allocation, but to a distortion away from true comparative advantage. The focus on minimizing price has led to entrenched underpricing of production costs, including externalized environmental impacts, labour costs, and royalties. This in turn undermines the competitiveness of alternative energy sources, which may in fact have a comparative advantage through their lower environmental impacts and minimal asset-stripping of non-renewable resources. The emphasis on competitiveness is the main argument used to resist pricing environmental impacts at their true cost.

- *That international arrangements should not be challenged.* It has been an ideological position of recent Australian governments that regulation of trade is always negative, despite very different context of production among trading countries. If we are to escape the race-to-the-bottom, in which environmental and social standards are abandoned for the sake of competition with less-regulated countries, we must countenance border adjustments for both exports and imports. Debate has already been initiated internationally about the need for international trade agreements to be adjusted to prevent a unilaterally applied carbon price from being avoided by import substitution or off-shoring[2]. Australian policy should support such arrangements, not remove them from consideration. Adjustments need be no more intrusive than those currently applied to the GST.

Required terms of reference:

The Terms of Reference should focus on the following areas:

1. Energy security for Australia in the long term. This requires consideration of trajectories for demand, including implications of population trajectory, and trajectories for resource and technology application to meet that demand. It must not assume the availability of any future technological breakthrough (such as effective and affordable carbon capture and storage (CCS)), but provide alternative scenarios with and without the anticipated change. It must cover whatever time period is necessary to phase out the use of non-renewables for energy, either due to their exhaustion or to a preference to withhold remaining stocks to avoid carbon emissions and to ensure long-term supply of plastics, textiles and pharmaceuticals.

2. Minimizing environmental impacts, especially greenhouse gases, of energy supply to domestic activities, including embodied energy in imports, and international transport.

3. Criteria and strategies for optimizing the mix and scale of export activities over time, considering the carbon intensity and ecological footprint of export activities alongside their social and economic contribution, and the total revenue stream and wealth legacy from non-renewable resources whose price is likely to increase in the future.

[2] James Hansen letter to Dr. Martin Parkinson, Secretary of the Australian Department of Climate Change, 4 May 2009: Worshipping the Temple of Doom.
http://www.columbia.edu/~jeh1/mailings/2009/20090505_TempleOfDoom.pdf

DISCUSSION PAPER: Our People: Demographics, Workforce and Indigenous Participation

This discussion paper considers "the workforce", but not "the population". Like the other discussion papers, it almost completely ignores the demand side of the energy equation.

Most of the paper draws heavily on the arguments of Professor Peter McDonald of ANU. Prof. McDonald gives the right answer to the wrong question. It is as if you were to ask a nutritionist "what diet would give people most energy", and then insist that their answer is applied universally, without stopping to consider that it would cause a rapidly deteriorating quality of life followed by premature death from obesity. This is the prognosis for McDonald's vision of Australia.

Section 4 opens with the statement: "Australia is one of many advanced economies facing the phenomenon of an 'ageing and shrinking' population (see Table 1)." Australia's population is not shrinking, and Table 1 anticipates considerable natural increase throughout the period of its projections, not to mention that our immigration-fueled growth rate is over seven times the average in Europe, the highest in the OECD, well above the global average and rivals most developing countries. It is implied in this statement that both ageing and shrinking are calamitously negative, yet arguments to substantiate this claim are weak at best, and the implications of population growth are assiduously ignored.

The paper then states that "The structure of Australia's population will change fundamentally as the population ages." It will change far more fundamentally as it doubles in size, but this is not considered worthy of mention.

Table 1 is erroneous in understating current immigration rates and Australia's population growth rate at 1.5%. ABS estimated a growth rate of 1.8% for the year to September 2008[3], but the latest figure for long-term arrivals over departures suggests a growth rate in excess of 2%[4]. At this rate, Australia's population would double to over 43 million by 2044, with an obvious associated rise in energy demand.

Demographic Ageing

One impact of ageing, according to the discussion paper (Section 4.1) is that "living standards in Australia are projected to continue to rise over the next 20 years, but at a slower rate than over the past 20 years due to demographic changes." Notwithstanding the dubiousness of assumptions underlying the projection of per capita GDP growth and its relationship with living standards, the impact of demographic ageing on this statistic is somewhat deceptive. As explained in the Productivity Commission's research paper, Recent Fertility Trends in Australia[5], the change in GDP over a person's life cycle does not reflect the change in their spending power, as they are saving throughout their working life and drawing down on savings in retirement. The impression that a higher "dependency ratio" demands that fewer workers must support more aged people is illusory, as to a large extent the workers that support aged people are themselves in a previous time period. GDP "snapshots" do not capture this dynamic.

[3] ABS, 3101.0 - *Australian Demographic Statistics*, Sep 2008, released 18/03/2009: http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0?OpenDocument

[4] Tim Colebatch, *Migrant Figures Jump the Slump*, The Age, 9 May 2009 : http://www.theage.com.au/national/migrant-figures-jump-the-slump-20090508-ay0t.html

[5] Lattimore R. and Pobke C., Productivity Commission, 2008, *Recent Trends in Australian Fertility*: Staff working paper. http://www.pc.gov.au/research/staffworkingpaper/fertility-trends

On p 13 of the Demographic discussion paper, it is noted that "another important lever to increase Australia's overall labour supply is to increase participation rates among the population." The statement is predicated with the caveat "although more limited", presumably meaning more limited than the impact of high immigration rates. No data are given to compare the efficacy of changing participation rates to that of changing immigration rates. Yet several studies (CSIRO's "Future Dilemmas" report[6], Productivity Commission[7], Betts[8]) have shown that immigration has quite a limited capacity to reduce dependency ratio, and is dependent on maintaining perpetually high and ever-growing immigration levels. It therefore implies that population can and should grow indefinitely regardless of its resource base. In the CSIRO's Future Dilemmas report, the difference between percentage of people over 65 in high immigration and stabilized population models was 6%. In contrast, with an overall workforce participation rate of working age people at a mere 65%[9], and a steadily increasing proportion of those workers employed part time and working fewer hours than they prefer, the potential to increase workforce participation is far greater than that needed to compensate for ageing. No data are presented in the paper on participation rates by age and gender, average hours worked by age, or effects of fertility rate on workforce participation of parents.

Note that the shift in pension age from 65 to 67, announced in this year's Federal budget, almost negates the effect on dependency ratio that would result from a shift to zero net immigration. The target to increase the proportion of school leavers completing tertiary studies will have a greater effect on actual dependency. The increase in Australian women's fertility rate since introduction of the baby bonus has probably increased the financial burden of dependency over the next two decades more than ageing. This is because dependency of the young is more costly and protracted than average dependency of the old, but this factor is ignored in dependency ratios.

Demographic ageing is a non-problem, from whichever perspective it has been examined. McGavin and Murray[10] reviewed many international studies that have tested the claims of demographic scaremongers, and found them to be unfounded. The only reason these arguments continue to be promoted is to defend vested interests in population growth, against the overwhelming evidence that growth is doing great harm, both environmentally and socially.

Labour and skills

The paper's discussion of labour market management is carefully crafted to support the argument for keeping immigration rates high, regardless of economic cycles. No impact of immigrants is considered except the availability of applicants for jobs. Given the tiny proportion of Australia's workforce that is employed in the mining and energy sector, the emphasis given to these arguments is bemusing. This is particularly the case given the rate at

[6] CSIRO 2002, Future *Dilemmas: Options to 2050 for Australia's population, technology, resources and environment*, CSIRO technical report by Barney Foran and Franzi Poldy, Resource Futures Program, CSIRO Sustainable Ecosystems http://www.cse.csiro.au/research/futuredilemmas/

[7] Productivity Commission 2006. *Economic Impacts of Migration and Population Growth*: Research Report http://www.pc.gov.au/__data/assets/pdf_file/0006/9438/migrationandpopulation.pdf

[8] Betts, K. 2008. *Population ageing in Australia: policy implications of recent projections.* People and Place 16(4): 43-51.

[9] Abhayaratna J. and Lattimore R., Productivity Commission, 2007, *Workforce Participation Rates – How does Australia compare?* Staff Working Paper. http://www.pc.gov.au/research/staffworkingpaper/workforceparticipation

[10] McGavin, B. and Murray, T. 2009. The Demographic False Alarm. http://candobetter.org/node/1027 accessed 06/04/2009.

which *the labour intensity of mining is falling*[11] – a factor ignored in the discussion paper. Figure 3 (p 19) shows that labour force annual growth rate can only be kept positive with immigration. But it is proposed to import more than the total mining industry workforce *annually* in order to achieve this growth. It could have been more validly argued that the slightly negative growth of labour force depicted without immigration could compensate to some extent for the effect of labour productivity increases on unemployment! Additionally, it could have been noted that the transition to a low-emissions economy will require reducing per capita consumption (reducing the throughput of goods, but not necessarily the services derived from them), and it would be beneficial if labour supply shrank in parallel with commercial demand. Indeed, the 0.3% per annum shrinkage depicted in Figure 3 may be less than the ideal rate. Instead, it is assumed that growth is necessary. Arguments as to why we need labour force growth, and what benefits it may bring, are thin. They centre around skills shortages, and the risk that wages will rise. Heaven forbid that the proportion of benefits from economic activity going to workers might actually rise!

The arguments for population growth, through immigration and increased fertility, to meet skills shortages are especially contrived, given that a broader system analysis yields the opposite conclusion: that *population growth exacerbates skills shortages*. Indeed, it is likely that the sudden increase in immigration since the late 1990s, together with the Howard Government's erosion of post-secondary training expenditure, combined to create the current skills shortage. (A third factor has been the aggressive industrial relations agenda which eroded pay and conditions for employees: a proportion of the skills shortage is merely an unwillingness to compensate workers sufficiently to retain them in particular types of jobs.)

My claim that population growth exacerbates skills shortages may be contentious, so I will explain my reasoning in more detail. Consider that in a stable population, post-secondary training in trades and professions is needed to replace retiring skilled workers. The working life after graduation may be expected to be around 40 years, but given the attrition rate in different skill areas, a lower average working life must be applied. In the absence of specific data on working life by job type, a conservative range between 33 and 25 years is assumed, i.e. for every 100 workers in a particular skill area, 3 to 4 of them will leave it annually. Therefore, to replace annual retirements, the annual graduation needs to be between 3% and 4% of the total workforce in each skill area. In a growing population, graduations also have to grow the total workforce (not the population of graduates) proportionally. For Australia's current growth rate of 1.8% per annum, graduate requirements increase from 3-4% to 4.8-5.8% of the workforce: increasing the training burden by 45-60% over that of a stable population.

Over the past decade, as Australian population growth rate has increased, spending on higher education has not increased to accommodate this extra burden. It has been estimated that Australian tertiary spending, as a percent of GDP, would need to increase by 30% to catch up with European standards. But when the lower training burden in Europe is considered, in relation to their population growth rate averaging 0.25% p.a., Australia's training expenditure should increase by 80% to 97%, in order to match per capita skills availability in Europe. It is little wonder that skills shortages have intensified.

Immigration may have alleviated shortages in selected areas, but has increased them across the board. For example, for every 10,000 ICT graduates imported, a number of extra people in all other skill areas are needed to service them. Whether immigration under any particular

[11] ABC Radio National – Background Briefing 10 May 2009. *Remote Boom and Gloom.* http://www.abc.net.au/rn/backgroundbriefing/stories/2009/2563315.htm#transcript

skill category makes a net negative or positive impact involves a number of factors, for which I don't have quantitative data. This doesn't prevent us from examining what criteria are needed. Assuming all skill areas are equivalent, any particular qualification would need to be imported at a rate greater than the effect of the whole immigration program on skills demand. That is, since immigration is contributing to Australia's growth by 1.2% per year, we would need to import more than 1.2% of the total workforce in any skill area annually. However, if we realize that the training requirements for different skills vary greatly, and that the skilled immigration program has been dominated by applicants with the shortest and cheapest qualifications to meet entry requirements, the extent to which they reduce Australia's training burden is unlikely to exceed the extent to which they increase demand for skills. If we further discount those that are actually trained in Australia using Australian training capacity, and all those who do not find or sustain work in the skill category on which they entered, the net benefits of skilled immigration are likely to be further reduced.

Regardless of the quantitative uncertainty in the above discussion of skilled immigration, the conclusion must be that *stabilizing population would make a far more cost-effective contribution to aligning training capacity with training needs.*

In contrast to the preceding arguments, the CSIRO Sustainable Ecosystems "Growing the green collar economy" report, quoted on p 22 of this discussion paper, does not anticipate labour supply problems, but only challenges in identifying training needs ahead of rapidly changing technology applications. It must be noted that the future envisaged in this report is very different to the future implied in the rest of the document, and indeed in the other discussion papers. It includes the phasing out of coal-based power, significant reductions in energy demand of buildings and transport systems through proactive government-driven provision of more efficient technologies, and "the gradual stabilization of primary industries activities, including the production of minerals and energy commodities". This contrasts starkly with the theme throughout the discussion papers of assumed perpetual growth in mining activity, sustained market share for coal, and a supply-side focus that would be unlikely to stimulate any reduction in energy demand. In contrast to this CSIRO report, the discussion papers make no attempt to define possible future scenarios, and the assumptions on which they depend. An explicit evaluation of possible futures would be useful, as it would make obvious that many of the claims, projections and assumptions are inconsistent with any environmentally acceptable future.

DISCUSSION PAPER: Maximizing the Value of Technology in the Energy Sector

Energy demand and population

I note that the projected increase in Australian energy consumption, of 1.6% per annum, is lower than the current rate of population growth (Technology discussion paper, p 8). We must conclude that, under the assumptions of this projection, population growth will account for all of this increase, and per capita energy intensity will actually fall slightly.

Over the past several decades, population growth has indeed accounted for the increase in greenhouse gas emissions globally. Increases due to economic activity have been off-set in most developed countries by reductions in emissions intensity of the economy.

According to Meyerson (Figure 1), no increase in per capita greenhouse gas emissions have been observed in USA or Western Europe since 1970, despite a five-fold increase in GDP. The same pattern is expected to hold for Australia. The small global increase has been due to increases in rapidly developing countries.

It seems irresponsible, therefore, to ignore population trajectory as a variable in planning Australia's energy future.

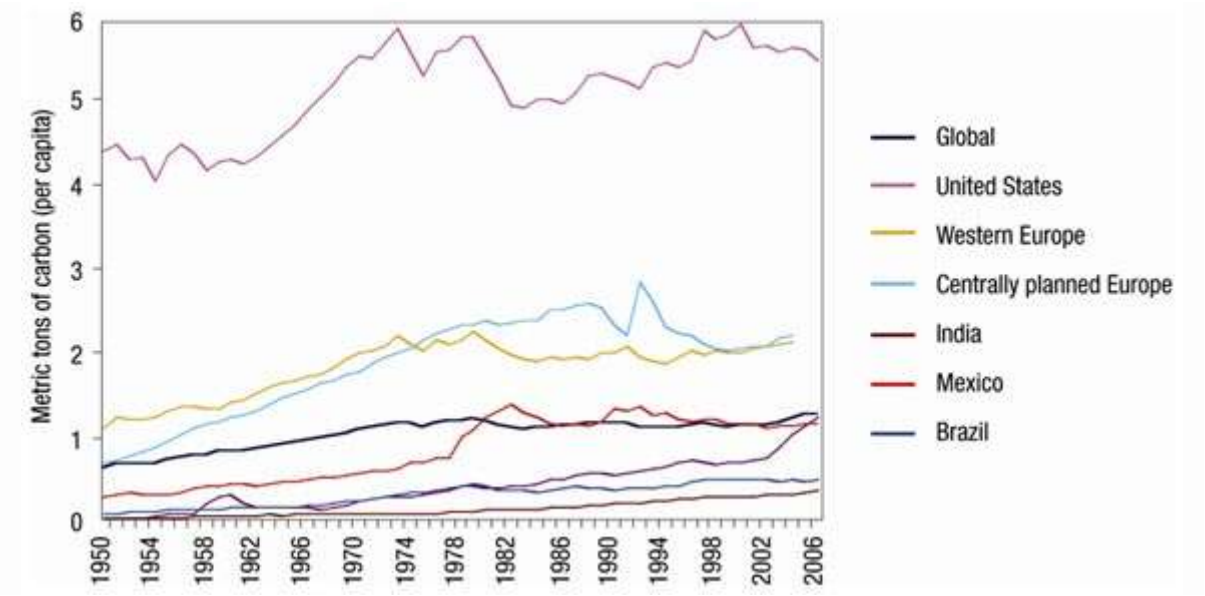

Figure 1 - Per capita global greenhouse gas emissions 1950–2006[12]

Population growth in Australia is optional, and is driven by Government policy. Changes in Government policy over the past 10 years have greatly accelerated the rate of growth. Government policy could rapidly achieve a stable population in Australia. A shift to zero net immigration would result in the population stabilizing between 2030 and 2040 with only 5% to 10% higher than present population[13]. This would be about half the population we would achieve by continuing our current growth rate until 2051 (and a quarter of that by 2090, and an eighth of that by 2129, etc). The lower end of this range (5% increase and sooner stabilization) would be achievable by withdrawing direct incentives to have children (particularly the "baby bonus") and making it less attractive for welfare-dependent parents to expand their families[14]. These are policies that would be revenue-positive, and have many social and environmental benefits apart from *halving the challenge of meeting energy demand and greenhouse gas reduction targets at 2050.*

[12] Graph from Meyerson, F. *Climate Change Science and Policy* (eds Schneider, S., Rosencrantz, A. & Mastrandrea, M.) Ch. 17 (Island Press, Washington, D.C., forthcoming), reproduced in *The Population Problem*, Nature Reports Climate Change , 72 - 74 (2008) Published online: 15 May 2008. http://www.nature.com/climate/2008/0806/full/climate.2008.44.html

[13] Birrel, B. and Healy, E. 2008. *Labor's Greenhouse Aspirations*. People and Place 16(2), 1-15.; Betts, K. 2008. *Population ageing in Australia: policy implications of recent projections.* People and Place 16 (4): 43-51.

[14] In the OECD's report *Babies and Bosses - Reconciling Work and Family Life: A Synthesis of Findings for OECD Countries*, http://www.oecd.org/document/45/0,3343,en_2649_34819_39651501_1_1_1_1,00.html , Australia's public spending stands out from the rest due to its very large proportion of parenting payments to unemployed parents. The Productivity Commission's report Recent Trends in Australian Fertility (cited above) acknowledges "factors — such as welfare design — that may create artificial positive incentives for bearing children" (p 120).

Note that, while some measures for greenhouse gas reduction are factors of energy use, others are factored only by roll-out rate. Figure 2 (p 14) in the Technology discussion paper depicts various wedges of potential contribution to avoided emissions globally. It might be assumed that Australia has similar technology options to those depicted in this chart, but does not necessarily have a similar growth in energy demand. If population were stabilized, the gains from energy efficiency would be proportional to total demand and thus a smaller quantum than if demand had grown (and the residual energy used, after efficiency gains, would likewise be smaller). However, the contribution of renewables would continue to grow, and would replace the need for CCS and nuclear. For the same investment in renewables, a generation capacity that would barely contain our emissions growth (under the current assumption of growth in energy demand) could decarbonize our energy sector if demand did not grow.

Population growth rate and density affect infrastructure and technology options

In addition to the considerations of scale above, there are a number of energy implications of population growth rate, population density and per capita resources.

A growing population requires far greater activity in infrastructure development than a stable population. The magnitude of the increase can be estimated using similar rationale to that described above for training burden. The lifespan of different items of infrastructure may vary more widely than the working life of individuals, but the average turnover rate would be at least as long. Therefore, the increased infrastructure burden must be at least as great as the increase in training burden. Infrastructure creation is an extremely energy intensive activity, and reductions in this sector will significantly reduce overall energy requirements of society. If population were stabilized, construction activity may not contract in the short to medium term, as considerable infrastructure creation is also needed to transition to a low-carbon economy. However, if population growth is maintained, these transition projects become additional to current construction activity, and a challenge to fund and skill. Population stabilization greatly reduces this challenge.

Population density and per capita resources affect the technology options for delivering services. Water pumping in particular is a significant energy consumer that increases at a greater rate than population, due to the need to expand the catchment. As desalination or water recycling becomes necessary, the energy cost of water supply escalates enormously. At low density, household water tanks can supply most domestic water needs, but in high density housing the contribution is small, and often impractical. Multi-storey apartments may reduce transport energy but increase stationary energy use for lifts, air conditioning and clothes drying. The nature of road infrastructure becomes more energy-demanding for high traffic loads, and the average distance for commuting and transport of food is increased. Sewage and waste treatment becomes more complex and less likely to recover nutrients for agricultural applications. There may be some economies of scale as settlements grow, but these are probably exhausted in the hundreds of thousands, with numbers in the millions dominated by negative effects of scale and intensity.

Treatment of demand in the Technology discussion paper

The Technology discussion paper argues strongly that "increased energy use can be compatible with reductions in global carbon emissions" (pp 12 – 14). The argument is used to defend the need to maintain investment in the traditional energy sector. This overlooks the

counter-argument that we could achieve far greater reductions in carbon emissions if energy use did not increase.

Section 5.6, Energy Supply Systems, makes clear that the policy team see no place in energy markets for achieving environmental objectives. "Our energy markets, while imperfect, generally deliver energy at least cost. They are not designed to deliver other objectives (there are more effective ways to deliver other objectives, such as environmental protection regulations)." (p 16) This denies the existence of environmental impacts as economic externalities that can be costed and should be internalized.

Yet even this apparent preference for regulation is ignored when discussing measures to improve energy efficiency. "People and businesses who incur the cost of energy are more likely to insist on greater energy efficiency if they are better informed about their energy use and the energy efficiency performance of products." (p 19) Measures subsequently suggested focus on information and incentives, but do not include regulation of efficiency standards. Yet it is acknowledged that a major role of the energy policy is to address market failures. The individual choices resulting in energy consumption impact on society as a whole. Information will not ensure that consumers place long-term communal benefit above short-term personal benefit. It is reasonable that these choices should be constrained by regulation to minimize those impacts. Regulation of minimum building, vehicle and appliance standards, and possible phase out of some types of vehicles and appliances, should be considered. Regulation should ensure the uptake of technology change where this is demonstrated to have a net social benefit, even if the benefit to individuals is not demonstrable. This concept is well accepted for individual health and safety protection, but not accepted for planetary health and safety. Despite mentioning "standards" and "prohibitions" as possible public policy instruments with demand-pull effects (p. 35), no comment is made on their absence from current measures, and "voluntary or mandatory standards" are only mentioned as possibilities. The implication is that we are as yet in too early a phase of technology development to benefit from these instruments. Yet Europeans, North Americans and Chinese have been using performance standards to drive technology innovation for years.

DISCUSSION PAPER: International Energy

The issues in this paper cut across those in other papers, since all are focused on maximizing short-term export revenue, and none truly address issues of national energy security. Points discussed in this section will focus on Australia's contribution to international climate change mitigation, and Australia's dependence on international oil. Export interests are discussed under "Realizing Australia's Energy Resource Potential".

Australia's contribution to climate change mitigation

The response articulated to the challenge of climate change is to seek to minimize economic impacts of other nations' concerns about greenhouse gas (ghg) emissions. No arguments are presented that our energy activities might be motivated by our own concern and moral responsibility.

The obligatory disclaimer is made yet again, that Australia generates only 1.5% of global ghg emissions, and that our actions are therefore of little significance. On the contrary, Australia

managed to have enormous "spoiler" effect on the Kyoto protocol, and our poor example, as it is shaping up towards Copenhagen, will do little to encourage action by our more populous neighbours. Should we choose to take strong unilateral action, this is likely to have a massive multiplier effect by strengthening the action of developing countries. The early movers, such as Denmark (much smaller than Australia) have set benchmarks that others are now following.

The paper states (p 11) "Australia's international climate change objective is to contribute to a comprehensive global solution that will slow and ultimately reduce global greenhouse gas emissions and avert dangerous climate change. We have committed to play our full and fair part in meeting that goal…. Our commitment to reduce emissions by 60 per cent of 2000 levels by 2050, together with an ambitious 20 per cent by 2020 Renewable Energy Target and the introduction of the Carbon Pollution Reduction Scheme, forms the basis for this effort."

This statement is so full of misrepresentations, it is hard to know where to begin. The scientific discourse agrees that averting dangerous climate change requires emissions to peak no later than 2015[15], which can hardly be referred to as "ultimately". The requirement for a 60% reduction by 2050 is the minimum of the IPCC's estimated range of "safe" responses, and scientific consensus has already moved beyond this (as recognized in the Garnaut report), although political agreement is yet to follow. If indeed a 60% reduction in total global ghg emissions were all that is needed, Australia's "full and fair part", as the highest per capita emitter in the world, would be a much higher percentage. The principle of "contract and converge" is well accepted in the international discourse on "fair" responses. It proposes that the highest emitters must reduce most, and allows that the lowest emitters may increase their per capita emissions to achieve development goals, with all nations converging towards a common per capita rate. Nothing less than a 90% reduction in Australian emissions would bring us to a "fair" per capita emissions share[16]. Given that a large proportion of our total emissions are non-CO_2 emissions from agriculture and land use, and that reducing these poses even greater challenges than reducing energy emissions, it is most likely that virtual carbon neutrality of the energy sector will be necessary, even to reach the 60% national target, let alone to play our "full and fair part" to avert dangerous climate change. This reality is far from the vision expressed in the discussion paper.

It has already been noted that Australia's population growth makes achieving real reductions in ghg emissions much more difficult than it would be for a stable population. It should not be assumed that the focus on per capita emissions under "contract and converge" will get us off the hook. When this principle is tabled at Copenhagen, it is likely to incorporate a census date for population, on which national emissions targets are based. This is recognized as necessary to discourage population growth by some nations derailing the global trajectory, or reducing the "size of the pie" for others. This will further disadvantage Australia, as long as our population growth rate is higher than the global average.

Australia's dependence on oil imports

The discussion of Australia's dependence on oil imports focuses on ensuring reliable and affordable supply. It plays up the importance of promoting free trade and efficient and transparent energy markets, and promoting production investment in supplier countries.

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[15] Anderson, K. and Bows, A. 2008. *Reframing the climate change challenge in the light of post-2000 emissions trends.* Phil. Trans. R. Soc. A. http://www.tyndall.ac.uk/publications/journal_papers/fulltext.pdf

[16] Garnaut Climate Change Review: *Interim Report to the Commonwealth, State and Territory Governments of Australia*, February 2008.

Reasonable actions of self-interest by other countries, such as mercantilism and resource quarantining, are disparaged. Little mention is made of strategies to reduce our oil dependence. The implications of peak oil are entirely ignored.

The rapidly increasing volumes of oil imports predicted in Figure 4 are quite likely to be unprocurable by 2030. The strategies proposed in the paper, to minimize price by increasing competition among suppliers, will only result in earlier exhaustion of supply. There is no escaping the reality that we will soon have to do without oil for most of the uses to which it is currently put. It would be far more prudent to focus on transitioning our transport dependence away from oil, than to pin our hopes on efficient international markets.

DISCUSSION PAPER: Realizing Australia's Energy Resource Potential

National interest for energy security and economic benefit

The discussion papers in general poorly separate discussion of Australia's energy security and the activity of energy resource and energy-intensive industries, most of which is export-focused. It is necessary to make this separation explicit, as the national interest is quite differently represented in domestic energy security and in export activity. Conflicts of interest between these priorities are not acknowledged.

Clearly, Australia's long-term energy security would be maximized by ceasing the export of non-renewable energy resources. This conflicts with the desire to maximize export revenue.

Even if it is assumed that all domestic energy requirements beyond 2050 can be met using renewables, and that fossil energy resources are of value only as exports, it does not follow that "optimizing" means digging up and shipping out at the maximum rate[17].

The experience of Great Britain with North Sea oil should provide a cautionary example for Australia. The resource is now spent, and the nation has little to show for it. In contrast, Norway has used its energy resource revenue to build a fund intended to provide a perpetual legacy for the nation.

It must also be acknowledged that *doubling the population halves the per capita value of resources*. Wealth is meaningful only on a per capita basis. Whether they are exported or used domestically, the wealth legacy of Australia's non-renewable resources will be maximized by minimizing our population.

Optimizing what?

The paper gives no doubt that "optimizing" the development of Australia's energy resource potential (p 9) means finding, mining and exporting fossil resources as fast and as cheaply as possible.

The price of fossil fuel has, to date, reflected the cost of supplying it, and has not reflected its impact on the environment nor its scarcity and the difficulty of substitution. It can be expected that fossil fuel prices will increase steeply as supply declines due to exhaustion of

[17] Bartlett, A.A. (2006) *A Depletion Protocol for Non-Renewable Natural Resources: Australia as an Example*, Natural Resources Research **15**(3), pp. 151-164,
doi: 10.1007/s11053-006-9018-1

the resource. While international prices remain in the range that assumes perpetual business-as-usual, the enthusiasm to expand supply in response to any increase in world demand would seem foolhardy. It removes the opportunity to sell at much higher prices later. Yet any failure to meet world demand is portrayed as "a substantial loss in export revenue" (case study, section 8.1) because "Australia… was caught unprepared" (p 7). It is as if this was revenue that was scheduled to happen but did not eventuate, rather than a potential transient windfall that we never budgeted for and wouldn't miss, and which would be reaped at the sacrifice of greater income later.

The map of Australia's energy resources, on p 2 of the 'resource potential' discussion paper, shows only fossil fuels. Where is the map of sunlight energy yield per annum? Where is the distribution of economically harvestable wind and wave energy? Where are our geothermal resources and locations with tidal power potential? This "Quarry Vision" permeates not only this paper but all the discussion papers.

The discussion of the importance of Australia's energy resources (Section 5) deliberately plays up the economic value of fossil fuels, quoting the aberrant 2007-08 statistics as representative.

This tunnel-vision about fossil fuels is disturbing, given the very short lifespan of known reserves. These lifespans (deceptively quoted on the basis of current production levels, despite all other discussion projecting increasing rates) are presented as if they are impressively long:

"*If current levels of production were to remain constant, Australia's known conventional gas reserves would last for over 57 years, coal-seam gas reserves for over 100 years, and uranium resources for more than 72 years. Our black coal reserves would last for over 100 years and our brown coal reserves for more than 500 years. In contrast, in recent years crude oil reserves have stood at between 8 to 10 years of production… However, less than 30 per cent of our prospective sedimentary basins have been explored, creating an opportunity to increase petroleum exploration and, potentially, production.*" (p 10-11)

Given expected increases in production, all but brown coal would be exhausted by around mid century. It is worth noting further that brown coal at current production rates contributes approximately *one tenth* of the energy compared with black coal, hence its deceptively long exhaustion time (500+ years). If brown coal production were (somehow) able to replace black coal in terms of energy production, it too would be exhausted in around 50 years.

A recent study by Mohr and Evans[18] predicts global coal production, based on energy yield, to peak between 2011 and 2047, with a Best Guess peak at 2026. On a mass basis, the Best Guess peak is 2034. Australia's production is depicted as sustaining for a few more decades, but increasingly dependent on brown coal to sustain the volume and consequently reducing energy yield.

[18] Mohr S.H. and Evans G.M. (2009) *Forecasting coal production until 2100*. Fuel (in press) doi:10.1016/j.fuel.2009.01.032

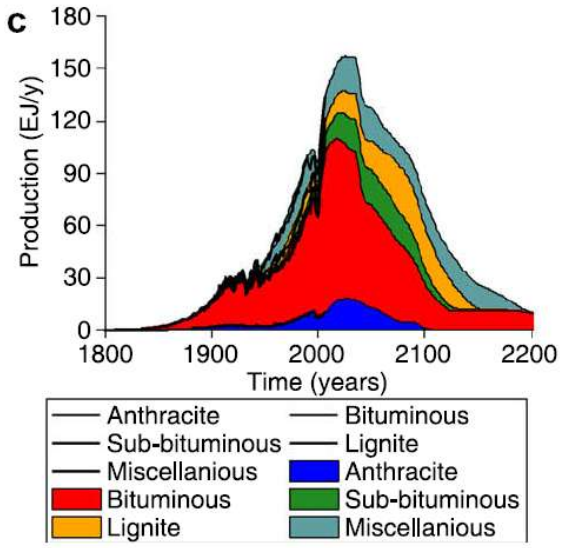

Figure 2. Mohr and Evans' global coal production prediction plotted on the basis of energy yield, for the Best Guess scenario.

The *International Energy* discussion paper makes much of the growth in energy-related exports that "have helped to underpin nearly two decades of uninterrupted economic growth in Australia." Figure 3 on p 12 depicts the value of these exports by commodity. It shows a more than 10-fold increase in value from 1980 to 2006, and predicts a continuing steep rise to 2011 (although admitting that the global economic slowdown has overtaken these predictions).

Far from impressing the reader with the importance of energy exports, this chart should ring alarm bells. At this rate of growth, there are few decades left of our coal and natural gas reserves. To the extent that they do underpin Australia's economic prosperity, which is arguable[19], we would seem to be cultivating a dangerous addiction. We have gone from a one-pack-a-day habit to a 10-pack-a-day habit in the space of a few years, and we probably should be thinking about weaning ourselves off before abstinence is forced upon us.

CCS won't save the day

The vision put forward in the discussion papers depends on the successful deployment of CCS, enabling coal to continue dominating energy supply in Australia and in the nations we supply. However, if coal supply peaks as early as 2026 and CCS is not expected to reach scale-up before 2030, new and expensive CCS power stations and carbon dioxide pipelines will need to be financed without any certainty of appropriate quality coal supply lasting for their planned lifespan. These are likely to become stranded assets. This is not factored into the diminishing cost of CCS coal depicted in the Technology discussion paper (Figure 4).

Most technical commentators agree that CCS will be too little too late, to impact on climate change mitigation. Peak coal analysis suggests it will also miss the boat for available coal.

Depletion, legacy and exit strategies

Unbelievably, *no exit strategy* is discussed for any of the fossil resources, either as economic contributors or as domestic energy. No analysis is made of the total revenue likely to be generated, and what strategies might increase the wealth legacy from these one-off resources

[19] Pearse G. (2009) Quarterly Essay 33 *Quarry Vision: Coal, Climate Change and the End of the Resources Boom* http://www.quarterlyessay.com/qe/currentissue/

(such as deferring consumption until international prices are much higher, substantially increasing royalties, and using the income stream for projects yielding perpetual benefits).

The discussion of royalties is limited, given that these are set by each State. Yet, with the emerging understanding of the implications of fossil fuel exhaustion, it would be appropriate to review whether royalty levels are sufficient to repay the future people of Australia for this asset-stripping, quite apart from paying for the impacts of the emissions that their combustion is causing.

The paper quotes the Taxation Review consultation paper, saying "*What is the most appropriate method of charging for Australia's non-renewable resources, given they are immobile but that Australia needs to compete globally for mining investment?*" (p 23). What a curious way of framing the question! It is designed to reconcile us to rock bottom prices, given that investors have to come all this way to get it. Why not ask "*What is the most appropriate method of charging for Australia's non-renewable resources, given that future generations, who may need the resource much more than we do, will have nothing to show for it but the legacy, if any, of the royalty we have levied?*"

Price minimization and perverse incentives block sustainable alternatives

It is assumed that minimizing the cost of energy is always the best outcome. Yet it is widely acknowledged that the cheap price of energy has led to the wasteful consumption at the heart of many global environmental problems. Price distortions created by Government policy are creating perverse incentives to consume more energy from the dirtiest sources.

At the 27 April Brisbane workshop, the issue of gas pricing was raised. I learned that the Australian Government imposes a domestic price of gas, that is a fraction of its international price. This differential is a major barrier to investment in domestic gas supply, and further measures are used by some States to ensure producers offer a proportion of the gas mined on the domestic market. This is an immensely misguided distortion of market forces, intended to keep energy prices low for Australian consumers. As a result, renewable energy sources are comparatively disadvantaged by the subsidization of domestic gas supply by gas exports. An alternative, that would improve the net benefit to Australians without distorting the technology mix for energy supply, would be to remove the domestic price restraint, but significantly increase the royalty on gas, and to use this revenue to subsidize retrofitting of home insulation and efficient heating options. The cost of gas to consumers would increase, only reflecting its true cost, and therefore removing an artificial incentive to overconsume it. The impact on consumers would be alleviated by reducing their energy demand, and this benefit would be directed preferentially to low-income households. And the nation would gain a greater legacy from its gas resources. If increasing the royalty reduced the rate at which the resource is extracted, this is only an appropriate adjustment, that will reduce the squandering of the resource at low cost, and reserve more for a time when its value is increased.

The considerable public contributions to infrastructure for the fossil fuel industries also constitute a price-distorting subsidy. This includes transport and social infrastructure in mining-dependent communities, where this is much more costly than equivalent per capita services in less remote areas. Rail and port infrastructure may remain in Government ownership and anticipate commercial returns, but thereby create a conflict of interest for Government, as their investment is best served by running the infrastructure at capacity but the public interest may require that volumes decline. The primary industries exemption to the

diesel fuel tax also constitutes a significant subsidy to fossil fuels. Government contributions to research and development are massively weighted towards the coal industry. Yet no objective cost-benefit analysis has demonstrated the likely superiority of investment in CCS research over investment in renewables.

RECOMMENDATIONS

1. Energy policy **must define energy security as providing sustainable supply** to meet Australia's energy needs.

2. The White Paper should **clearly articulate the dependence of energy security on ending population growth**, and the additional benefits of population decline for energy availability. Energy security cannot be achieved without containing energy demand[20], and this requires ending population growth. Initially, large efficiency gains are possible but these will be exhausted and a residual per capita energy requirement will remain. Both renewable and non-renewable energy capacities are limited. Continuing population growth will progressively mean diminishing energy availability and increase energy cost per capita, and this will limit quality of life. Minimizing population will maximize the standard of living that can be sustained.

3. **The role of energy policy in effecting reductions in greenhouse gases must be acknowledged**. The discussion presented so far regards the CPRS and international measures merely as commercial context for energy industries. The carbon trading mechanism alone is not sufficient to achieve the required reductions. Proactive Government policy is needed to regulate emission-generating activities and facilitate scale-up of technologies for energy efficiency and source substitution (see Diesendorf 2007, and Birrell and Healy 2008, cited above).

4. The **benefits of deferring consumption of non-renewable resources** must be articulated, including
   - avoiding greenhouse gas emissions;
   - maximizing the value of the resources when they are sold;
   - ensuring protracted supply of hydrocarbons for non-fuel uses, including plastics and pharmaceuticals;
   - promoting technological development of sustainable alternatives.

5. **For each non-renewable energy resource**, the White Paper should provide estimates of the ultimately recoverable resource (URR), **trajectories for its consumption and dates for exhaustion** under b.a.u. demand-driven consumption and under conservative policies such as no new mines, royalty levels intended to limit the viability of least profitable deposits, or regulated annual volumes. Effects of declining global supply on prices should be estimated, to **provide a cumulative total value realized from each resource** under rapid depletion or deferred utilization scenarios. **Exit strategies must be provided** for the deliberate phase-out of non-renewables, and for the instances where their supply or price limits the range of viable uses. Energy supply cannot be considered secure while it remains dependent on a non-renewable resource.

[20] Diesendorf, M. (2007) *Paths to a Low Carbon Future.* http://www.greenpeace.org/raw/content/australia/resources/reports/climate-change/paths-to-a-low-carbon-future.pdf

6. **Detailed information should be presented for each renewable energy resource**, on the extent, technical viability and barriers to utilization.

7. The White Paper should **objectively model energy supply options under a range of scenarios**. For each of several greenhouse emissions targets for 2050 (for example, the current 60% reduction target, Garnaut's estimate of Australian reduction based on contract and converge, and full carbon neutrality of energy), scenarios should contrast conditions of energy demand (population trajectories and varying technology and regulatory options for energy efficiency) and energy supply (assuming various preferences for or availability of technology options), clearly demonstrating the achievability, relative costs and greenhouse gas impacts of each scenario. David MacKay[21] has done similar analyses for the UK, and provides a methodology that should be applied in the Australian context.

8. In the light of these scenarios, the White Paper should **critically review the distribution of Government funding for energy technology development**, and query whether the current emphasis on clean coal reflects its likely relative contribution to long-term sustainable energy security.

9. The White Paper should **recommend a moratorium on new coal mines and new coal-fired power stations**, until such a time that CCS is demonstrated to be safe, price competitive without Government subsidy, and to remove a higher proportion of emissions than is deemed necessary for the energy sector as a whole to maintain atmospheric ghg levels in a safe range. Given the intractability of much of the landuse-related emissions, a very high rate of capture is likely to be required. Emissions from coal power must include all process and fugitive emissions from coal mining and emissions sequestration. This means that 100% CCS at the power plant is unlikely to be enough, unless mining emissions are substantially reduced.

10. **A national feed-in tariff**, consistent for all renewable energy sources, should replace the MRET. However, this may be a temporary measure until the mechanism for a true carbon price signal is in place.

11. The White Paper should **thoroughly explore regulatory options for ensuring uptake of energy efficiency technologies and behaviours**. This would include building, vehicle and appliance efficiency standards, metering requirements enabling user monitoring of power consumption, and potential phase out of fossil-fueled on-road vehicles and certain appliance types such as electric water heaters and clothes dryers.

12. The White Paper should investigate **proactive Government investment in alternative transport infrastructure**, and its capacity to diminish overall transport volumes, increase energy efficiency of transport, and substitute fuel for renewable power sources.

13. The White Paper should identify all **perverse subsidies and pricing distortions** that encourage consumption of non-renewable fuels. This would include below-international-parity pricing of gas, fuel tax rebates and fringe benefit arrangements for corporate vehicles. Options for removing each distortion should be explored.

[21] MacKay, D.J.C. 2008. *Sustainable Energy – without the hot air.* UIT. ISBN: 9780954452933 / 978-1-906860-01-1. http://www.withouthotair.com/

14. The White Paper should identify the **challenges faced by developing countries in our region**, in meeting obligations for climate change mitigation and providing energy for development, and explore areas where Australian renewable energy resources and expertise may assist.

SPA thanks the Department of Resources, Energy and Tourism for the opportunity to comment on the Energy White Paper process, and looks forward to the next phase in the development of Australia's energy policy.

Jane O'Sullivan

29 May 2009