



***Emerging industries, innovation and technology,  
can avoid planetary run-down***

Environment Business Australia submission to the Federal Government  
20 October 2003

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***Introduction***

This paper is submitted to the Prime Minister and Members of Cabinet to provide information relating to the need for a technology response to climate change. Environment Business Australia (EBA) has drawn strong linkages between this technology and investment, emerging industries, market intelligence (or lack thereof), and the role that we believe Government should play in driving innovation and its commercialisation.

Climate change is an insidious threat to our health, quality of life, environment and economy. There is an identified need for all sectors of the Australian economy to respond to a carbon-constrained future and this has been publicly recognised by the Federal Government in statements by the Minister for the Environment and Heritage, that Australia – and the rest of the world – must consider far more significant cuts in greenhouse gas emissions. Indeed cuts of up to a sixty percent will be necessary in order to stabilise atmospheric carbon.

There are a number of issues which we request the Department of Treasury to consider in formulating the budget and which we bring to the attention of Government Ministers:

- The current absence of data regarding the cost of negative externalities to consolidated revenue, and therefore the inability to provide necessary cost signals to the market, or to factor real costs into the supply chain to the end consumer. Our most important recommendation is that Government commission a study by the Productivity Commission, assisted by CSIRO, into the extent of externalities and their impact on the national economy
- The exponential growth curve of cost relating to externalities from generations of past poor performance and the implications this has for intergenerational equity. Our second recommendation is that Government investigate ways to reduce this cost curve with timely and meaningful intervention
- The need for new drivers for Australia's next wave of competitiveness in a carbon constrained future - by all industry sectors. Our third recommendation is for the development of a framework of transition. This is becoming increasingly important in light of growing international market assessment of carbon assets and liabilities. Current carbon litigation may reach Australia with ramifications for company directors.

*Other recommendations:*

- Investment in future development to shore-up current GDP activity across most industries, and the need to focus on generating 'positive GDP'. Investment in social and environmental infrastructure
- Government incentives that can leverage private sector investment (such as superannuation funds). For example, using 10% of Telstra funds to invest in sustainability infrastructure to allay greater longer term costs, and to drive new efficiencies and new levels of competitiveness

- That there should be a portfolio approach to drivers for innovation (and we refer very specifically to the energy sector at the moment because of current debate) including emissions reduction, energy efficiency, energy generation, and energy storage technologies
- Greater use of market mechanisms to achieve change. Revisit the potential of carbon emissions trading
- Close attention to current 'environmental spend' to ensure holistic, long-term outcomes that benefit resource integrity and ongoing viability (from an environmental, productivity, and economic perspective)
- Investigation of current subsidies and preferential contracts especially related to energy supply
- That Australia should pursue a course of action which encourages Australian innovation and the growth of new industry sectors while at the same time encouraging the continued development of competitiveness by mainstream industry. This point is implicit throughout the report as we believe that it is important to keep pace with changing international markets where sustainable production and consumption is increasingly demanded
- Treasury should evaluate the potential for re-investment tax concessions as opposed to shorter term R&D tax rebates and this particularly for high priority development technology sectors that have positive sustainability outcomes

### ***Seeking the vision***

EBA acknowledges the Government's decision not to ratify the Kyoto Protocol and to defer a national greenhouse gas emissions trading system. However, a number of Environment Business Australia members have posed the question "What will drive Australia's continued innovation and commercialisation of energy efficiency, energy generation including renewable energy, energy storage, grid access, advanced voltage conversion systems and emissions reductions technology?"

We believe a similar question should also be applied to the sustainability of natural resources and eco-system services, as well as to the broader competitiveness of Australian industry in light of international market trends towards sustainable production and consumption.

We attempt in this paper to put forward recommendations which may assist government in responding and in developing a long term framework for industry transition.

### ***Australian strengths***

Australian companies, alone and in conjunction with CRCs and CSIRO, have proved the cost effectiveness of R&D in this country and its positive contribution to GDP.

We have a high tech environment, a very solid educational base, well prepared staff, and good support infrastructure. These are aspects that are very attractive to external investors and a reason why companies find it cost effective to set up R&D bases in Australia. We encourage the Government to resource and support these aspects as they have significant flow-on benefits such as local manufacture of goods, exports of skills and technologies, and of course employment. We believe that there is great potential to capture international investment by becoming a centre of excellence of:

- Alternate sources of energy
- Environment industry
- Land and waterway management

We also encourage Government to provide the framework that will increasingly attract investors who can help Australia build additional strengths - such as being a showcase for demonstration of cutting edge technology and infrastructure. This helps firms fulfil their business case and it helps the country achieve various objectives:

- The growth of employment
- Necessary signals for the development of educational curricula
- The growth of emerging industries
- Export development
- Australia's ability to assist developing countries
- Improved intergenerational equity and the reduction of negative externalities

### ***Natural capital***

Australia has yet to take full advantage of its natural capital and to access the inherent layers of value that can be achieved without running down the fundamental resource base. Our economy has largely been built on extraction of mineral resources and from eco-system services. In both cases these have largely been 'primary' industries with little value-adding.

In some instances this has meant running down the fundamental resource base, in the case of minerals extraction re-investment in exploration for new sites is not apace with closure of depleted mines. In natural resource terms damage is curtailing the potential future viability – this is demonstrated by dryland salinity, river system degradation, acid sulphate soils and soil erosion as well as broader eco-system damage which threatens biodiversity.

While not exactly a fat and lazy balance sheet in all aspects there are some fundamental shifts that should take place in order for the country to maintain its dynamic economy and international competitiveness for the longer term. Or, in the words of Paul Hawken "there is no business case for running down the planet."

To appreciate the advantages of our natural capital, the exponential growth curve of externalities must be curtailed. This has immense urgency because the Antarctica Vortex and its impact on climate change in Australia suggests significantly reduced rainfall in the southern half of Australia. Combined with hotter temperatures and more severe weather events this bodes ill for agricultural productivity and competitiveness and therefore for rural communities. Unfortunately, in relation to climate change Australia's work must complement and fast-track, if not lead, the efforts by other countries in order to reduce emissions and stabilise atmospheric carbon.

### ***Best available technology***

Australia has a good track record of adapting technologies developed in other countries, indeed many of our member companies are directly or indirectly involved in importing, refining, value-adding, and jointly exporting to the region technologies developed overseas.

Nevertheless, on behalf of our membership, and on behalf of the broader industry represented by our partners in the Australian Environment Industry Alliance, we voice our very deep concern that Australia has let slip the huge natural advantage bestowed on us by renewable energy sources such as solar. Australia could have been a world-leader in this area but we have been overtaken by other countries with less solar capacity but a greater rate of adoption of new technology. This is unfortunate, because although solar energy is not cost competitive with fossil fuels at present, the majority of experts believe that it will be by 2015. Solar energy can be generated anywhere in Australia and has tremendous export potential to countries in our region.

A simplistic example, but one that draws people from around the world is the Darwin to Adelaide solar car race. Australian sun is seen as a source of energy the world over.

***Profits – expatriate or repatriate?***

Fortunately solar energy technology development is still pursued by a number of companies in Australia although we may see relocation off-shore as financing becomes easier to obtain in other countries. This raises the issue of Australian IP being sold off-shore with relatively low return to the country of origin. The issue of expatriation and repatriation of profits is one that we request the Department of Treasury to investigate.

***Investment attraction***

EBA believes that more could be done at the national level to develop a national science and innovation program – one where the Commonwealth and the States are closely aligned and harmonised in terms of incentives and legislation.

Steps need to be taken to attract major investment funds from organisations such as the Californian or New York Pension Funds. These bodies are keen to invest in sustainability technologies and have sufficient depth to be able to consider new technology risks that have good potential to drive market acceptance of sustainability as a major improver of environmental, health, and economic outcomes. To organisations such as superannuation funds security of the 'environmental resource' is becoming as important as short term economic returns for shareholders and investors.

A necessary precursor for increased investment in Australia is to level out the playing field for national and international investment. Part of this will require removing risk and increasing opportunity to leverage private sector financing.

For example, in Singapore (new) companies with incomplete technologies can obtain tax relief for seven years, effectively encouraging companies to successfully commercialise and reinvest. Re-investment tax concessions have far greater impact than R&D tax rebates where companies can defray 30% of costs but have less incentive to be successful entrepreneurs and commercialisers of technology. Re-investment tax concessions were a core reason for the early success of Silicon Valley in California.

In Israel there is a high level of intensive funding for new technologies for three years – sufficient time to refine technology at full scale demonstration, and then to commercialise.

***Australian supply base and IP***

The environment industry has several parallels with the biotech industry. While Australia may not have the biggest companies, our supply base is large and the technology developed is of very high standard - disproportionately so in relation to the support given to the industry.

EBA strongly recommends that Government continue its support for mechanisms to encourage Australian industry to invest in innovation developed in this country. We believe this is fundamentally important and the success of such programs in the past can be seen from the R&D Start Grant which ran out of funding due to market need for the program to help drive successful commercialisation. With hindsight we can see that this indicated that need and demand far exceeded available support mechanisms. We believe the obvious step should have been to increase the funding - not curtail the program. This was a Government failure for not supporting a generic market that was producing successes without Government having to 'pick winners'. We

emphasise that for Australia's emerging industries such as the environment and sustainability sector this kind of support is vitally important.

***Employment, education, industry growth, security***

We urge Government, in the strongest possible terms, to encourage the 'home-grown' R&D that spawns new industries, new employment, and new levels of national security. This is simply not achievable solely by importing the achievements of others, especially if we seek to grow our education base, avoid a 'brain drain', have pride in our achievements and our abilities to assist other countries, and develop Australia's emerging environment and sustainability industry.

***Export development***

EBA and the environment and sustainability industry are most keen to support the export drive instigated by Government and being developed by Austrade. To do this requires encouragement for companies at all levels - be they major corporates or SMEs. As outlined in the Environment Industry Action Agenda there is strong growth potential (from \$8.6 billion to \$40 billion per annum turnover) anticipated in the sector and much of this growth will need to come from exports.

***Externalities – an exponential growth curve of cost***

Cost comparisons between fossil fuel sources and renewable energy sources are generally undertaken on a cost per KWh or GWh with limited evaluation of the negative externalities (such as air pollution, climate change) from fossil fuels. We strongly recommend that the positive benefits accruing to the economy from cleaner renewable energy sources should be measured and taken into account.

At present the strongest industry voice is from the energy intensive sector which is demanding production status quo in terms of energy production, subsidies and preferential contracts. EBA puts forward that this demand is narrow, of short term benefit only, and it is not in the broader interests of the nation. However, it is loud and consistent, and it is symptomatic of short term interests dominating longer term common sense and common good - and it has led to a significant part of the exponential growth curve of cost that is now our legacy to future generations to absorb.

Remediating or mitigating externalities poses a significant economic burden on intergenerational equity especially in relation to climate change. The costs to consolidated revenue will continue to grow unless addressed urgently with timely and meaningful intervention.

This cost is unlikely to be economically offset by the advent of new technologies – the harm from climate change has already gone deep and broad (there are clear similarities to the damage that has been created to the landscape and agricultural productivity by dryland salinity). Adaptation will undoubtedly be necessary but viewed retrospectively it is highly unlikely that future generations will see it as the least cost option. The potential for cataclysmic climate change are touched on towards the end of this paper.

Fortunately, even though it is late in the day after so many decades of resource degeneration, the National Water Initiative shows a way forward for the benefit of all Australia with its potential to revitalise catchment and ecology viability. A similar initiative is needed to undo the harm of climate change.

We request that the Commonwealth Government urgently engage the Productivity Commission to study the costs of externalities associated with production status quo, particularly in the energy sector. We firmly believe that such a study would indicate, in no uncertain manner, that fossil

fuel technologies have associated externalities that are a negative drain on consolidated revenue. Logic would lead one to conclude that the analysis of such data would demonstrate that renewable energy sources are not as comparatively expensive as previously thought.

### ***Market mechanisms***

National policies such as the National Water Initiative and the proposed National Energy plan have the potential to instigate far-reaching market mechanisms and EBA is strongly supportive of using the market to achieve objective. However, we caution that markets can only function efficiently when the market is provided with real intelligence and part of that intelligence is the need for strong legislation that acts in the greater good and takes the longer term into account.

At present investment in the Australian environment industry sector is being stifled by uncertainty and this has been exacerbated by the MRET review which, at the time of writing, has been presented to Government but the outcomes are not yet known.

### ***Emissions trading***

EBA is very strongly supportive of a technology way forward to reduce GHG emissions, however we strongly believe that emissions trading provides an excellent opportunity to catalyse R&D, provide funding for accelerated depreciation, and to deliver a firm signal to the market that carbon has an asset or a liability cost associated with it - this will take significantly longer to achieve via a technology-alone route.

### ***Efficiencies and renewable energy sources do no harm***

The integrity of the whole of industry in the face of such threats must obviously be borne in mind and while EBA's role is to represent the interests of the environment and sustainable industry, our sector relies heavily on others for market access as it enables their better performance, greater efficiency and increased productivity. Australia is an energy intensive country and our production relies on adequate supplies of cost effective energy. However, we believe that we should not lose sight of four fundamental issues:

1. That market demand is changing with preference being increasingly shown to sustainable production and consumption
2. The increasing production capacity of countries such as China, likely to become a major competitor with Australia
3. Australia's mineral resources while showing high productivity, are not attracting sufficient exploration funding and at current known resource and productivity levels will begin to run down in 15-20 years (with the exception of coal). This potentially has significant repercussions on long-term export capacity
4. Australia has been slow to value-add to its resource base preferring to export quantity of resource to other countries

Australia's emerging industries have the potential to add-value to existing resources and industries.

### ***Cumulative R&D adding value to Australian innovation***

There is now extensive research into and commercialisation of renewable energy sources. Spain for example is becoming a world leader in wind power, Wales has extensive photovoltaic development, and Greenland has long capitalised on its geo-thermal capacity. We have noted that most countries looking towards a hydrogen economy are seeking renewable energy sources as catalysts. China is investing heavily in geo-thermal and hydrogen. The UK is undertaking extensive work into wave generated power.

With ongoing support Australia has the potential to be a world-leader in wind, wave, tidal, solar, geo-thermal and perhaps even the extraction and use of methane gas hydrates.

What is needed is legislation that encourages market mechanisms that facilitate public and private sector investment in the development of new technologies and infrastructure. And, as noted above, this needs to be part of a national science and innovation policy that has the support of the States.

As noted above we expect the real costs of renewable energy sources to become highly competitive with the real cost of fossil fuels (within 8 to 10 years, although we believe wind energy is already close to being cost competitive). Furthermore, the diversity of Australian renewable energy provides greater national energy security and resilience and the potential for an improved spread of employment to rural and regional Australia.

### ***Clean coal technology***

EBA is supportive of research into clean coal technology and despite of some setbacks in the research in the USA we encourage Government to continue to pursue this avenue for emissions capture and sequestration. However, we are concerned at the low costs that have reportedly been associated with this technology. While the oil industry has effectively demonstrated that geological sequestration is workable, there is little evidence to date to provide confidence that the capture, compression, storage and transportation of CO<sub>2</sub> will be cost competitive when compared with emissions prevention or with alternate energy generation from renewable energy sources such as wind in the short term, or solar, wave, tidal, co-generation with bio-fuels, and perhaps most importantly geo-thermal energy in the longer term (2015).

We believe that it will take another 15-plus years to achieve cost competitive sequestration and in the meantime the advances in renewable energy may make the necessity for geo-sequestration obsolete. We particularly refer to the ability of fuel cells to store energy for release on demand and the advent of the hydrogen economy, combined with advanced voltage conversion and the many new devices capable of reducing energy consumption at the household, commercial, social infrastructure, and industrial levels.

While we certainly support R&D into clean coal technology, we do so on the understanding that it is one in a suite of technologies important for Australia's future as an energy-intensive nation. We certainly wish to express our unease about it becoming the 'technology of choice', and this for several reasons:

- Cost
- Externalities
- Effectiveness unproven
- Market acceptance

Much apprehension has been expressed to EBA, even by those who are supporters of clean coal technology, that Government may consider this technology as the main way forward to reduce greenhouse gas emissions by industry. If this were the case this may be at the expense of further meaningful investment, or signals that encourage investment, in the renewables industry.

Another issue is that as much of the production of Australian brown coal is exported we have little or no control over the emissions in other countries. Clean coal technology may therefore have a limited impact on global emissions of carbon.

With much international work being focused on renewable energy sources and the high costs of negative externalities, EBA is concerned that even if coal technology does eventually prove to be cost competitiveness (circa 2030), the global marketplace may have moved so significantly as to make coal redundant in spite of vast Australian and German supplies.

One of the strongest recommendations of this submission is therefore that Government should continue its broad portfolio approach to support of innovation.

### ***Developing countries***

We believe that renewable energy has an integral role to play in helping developing countries modernise their economies and alleviate poverty through the provision of even basic infrastructure for drinking water, sanitation, and irrigation. Regional stability, health and environmental outcomes are dependent on all countries being involved in creating a sound and healthy future - access to energy is one of the most critical elements to the success of this objective. Australia has good opportunities to develop exports of energy related technologies and expertise. This has potential to help reduce GHG emissions exactly where they are most likely to grow without intervention.

### ***Cataclysmic carbon releases***

Markets are not currently responding adequately or fast enough to the carbon overload which has been created and this is where markets fall down in their inability to respond quickly to threats that are perceived as slow and insidious. As we know, carbon already emitted has a 70-80 year life span in the atmosphere, and emissions worldwide continue to rise. Recent research has pointed to the potential dramatic releases of carbon from ocean stored methane hydrates, should the world's atmosphere rise by 4-5 degrees centigrade. 1.6 degrees centigrade rise has already been recorded and the rate of rise appears to be speeding. Rapid releases of high volumes of carbon from methane hydrates could lead to a massive and rapid rise in temperatures – a further 4 to 5 degrees centigrade within a decade. This would be too short a time span for ecological adaptation as was demonstrated at the end of the Permian Age.

### ***Carbon leakage***

There has been much media attention paid to certain companies' and organisations' claims regarding MRET and emissions trading, and the potential increase in energy costs which according to some may result in some energy intensive companies seeking to relocate overseas. As demonstrated by studies undertaken by McLellan Magasanik on behalf of Origin Energy, inter alia, these increases in costs are likely to be marginal only.

The issue of potential 'carbon leakage' where companies threaten to move to less demanding regimes in order to be able to continue to pollute should be seriously questioned. Exactly how many reputable companies will seek a 'licence to pollute' from their shareholders, insurers and bankers, and abandon sunk assets in the process of relocating to a less stable economic and political regime in order to seek marginal reductions in energy costs for an indeterminate period? There may well be *some* decisions to put new investment into other countries but the reasons for doing this will be complex and it is unlikely that the shadow cost of carbon will be as important a consideration as labour costs, taxation, exchange rates, and the general cost of infrastructure and services in Australia. It would be interesting to see an analysis of any likely losses compared with gains from new technologies and approaches.

EBA urges the Government to continue to support the renewables energy industry for the long term broad benefits that it offers to the whole economy. EBA and its member companies look forward to working with Government to realise the huge opportunities available to Australia.

***Excerpt from the Prime Minister's address to the National Press Club, 1 August 2001***

"The technological and scientific advances being made would have been unimaginable even a decade ago and increasingly profitable businesses and industries will be marked by their efficient use of scarce natural resources. Australia already has a dynamic and vibrant environmental industry sector, ready to provide solutions, not simply identify challenges. The success of this sector, over coming years, will have enormous implications for Australia, both in its local application and because of its export potential."

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