

**SUBMISSION  
TO THE  
AUSTRALIAN GOVERNMENT  
CLIMATE CHANGE AUTHORITY  
FOR THE  
RENEWABLE ENERGY TARGET REVIEW**

## CLIMATE CHANGE CONSIDERATIONS

### Climate Change and Natural Disasters

Global Warming is already causing major changes in the climate in a number of countries, and we are now seeing an increase in the frequency and severity of natural disasters. Global Warming, and the increasing frequency and intensity of natural disasters because of it, are scientific facts and not part of a conspiracy of scientists (as some claim).

The human factor in the Climate Change causes has not yet been quantified however the accelerating growth of Greenhouse gas emissions - with population growth and industrialisation - is very evident.

*The nations of the world must act collectively, and individually to combat the Greenhouse gas emissions.*

### Advocacy for Action

There are many prominent people advocating strong action, Ex Vice President Al Gore is very eloquent and convincing in his presentation “The Inconvenient Truth” on the urgent need to combat Global Warming by using renewable power generation to displace fossil fuelled power generation, and energy efficiency technology to achieve progressively higher reductions of CO<sub>2</sub> per capita - World Wide. It highlights that CO<sub>2</sub> emissions are rapidly accelerating due to population growth and the rapid industrialisation of countries like China, India and Brazil.

*The growth of CO<sub>2</sub> emissions must be slowed or our children and grandchildren are likely to face increasing natural disasters that have the potential to make the Global Financial Crisis look insignificant - because of the cost in lives, property and infrastructure.*

### The Need for Better Weapons

Governments around the world are increasingly reaching a consensus that they cannot ignore the human factor and they are now agonising about how to introduce sufficiently strong measures to mitigate Global Warming without causing economically crippling costs. The challenge is to find new cost effective technical solutions that reduce the economic impact of meeting renewable energy targets.

*Sir Richard Branson, in a 2011 media article in “The West Australian”, calls for the development and application of new, smarter and more effective technologies to expand the range of weapons to combat Climate Change.*

**Advocates for No Action**

There are many cynics who either believe that any Climate Change is a long term natural phenomena and the human factor due to polluting emissions insignificant. There are others who have vested interest in not acknowledging the link between fossil fuel generation emissions and Climate Change.

*For decades the Tobacco Industry and its supporters vehemently claimed that tobacco smoking was not harmful – resulting in great costs to society and lives.*

**Global Warming Opinions Thermometer**

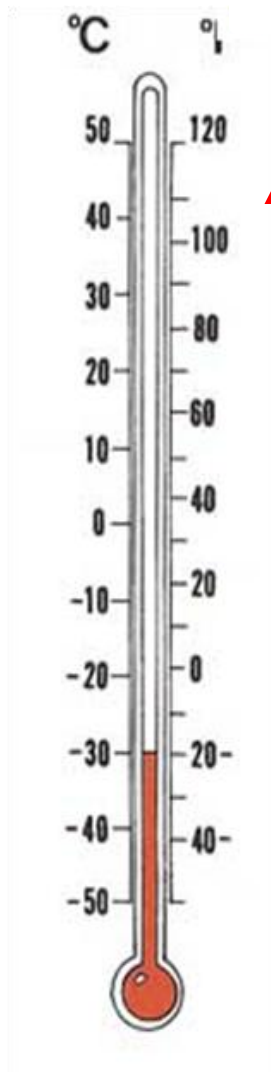
**GRADIENTS**

There is Global Warming and man is certainly a major contributor

There is Global Warming and man is probably a significant contributor

If there is Global Warming it is a natural phenomenon and man is not really contributing to it.

There is no Global Warming.



**ATTITUDES**

Natural disasters are increasing. Urgent action is needed and the measures as a result of Global Warming will need to increase rapidly. Al Gore, Richard Branson, and Ross Garnaut, etc, are advocating the rapid deployment of current and new more effective weapons to reduce the Greenhouse gases.

We need to take some affordable action as an insurance. After all we ensure our homes and cars, so \$800 – 1200/annum is not too steep. What will our children and grandchildren say if we take no action and disasters continue to accelerate.

We are only here for a short time and there is nothing we can do so let's not ruin our economy by paying for measures to combat Greenhouse gas emissions.

Distrust any scientific evidence and the earth is really flat.

## **DISTRACTION FROM RENEWABLE ENERGY FOCUS**

### **International Renewable Energy Focus**

The high level of international concern about Climate Change – already referred to - peaked in 2007 – 2008 with most nations meeting in Copenhagen in late 2008. Since then the major economic problems referred to below have hit hard around the world.

The failure of the international conference in Copenhagen to reach agreement on actions provided an excuse for some nations to divert their focus from combating Climate Change.

### **The Impact of the GFC**

The impact of Global Financial Crisis (GFC) began to hit hard in late 2008, and most nations became pre-occupied with raising and applying funds to address their immediate economic problems. The Climate Change issues have not gone away but there are many who question “the Cost of being Green” in the current economic circumstances.

### **The European Economic Meltdown**

The economic and political measures to combat the GFC were beginning to take effect when the European economy went into crisis (“Meltdown”), with several Mediterranean countries facing bankruptcy and requiring bail-outs. This still remains a major problem with no short term solutions.

### **Asian Economic Growth**

Most of the Asian economies – led by China and India – continue to grow with internal industrialisation but the very high rate of growth is being dampened somewhat by the drop in international demand of products. This impedes the circulation of capital around the world and economic recovery.

### **Period of Economic Adjustment**

There is a good deal of economic adjustment underway and the focus on combating Climate Change has reduced while the Advocates for No Action have become more strident.

*“When you are up to your knees in crocodiles it is hard for you to remember that you were supposed to be draining the swamp”*

## **POPULATION GROWTH, INDUSTRIALISATION, ENERGY DEMAND & POLLUTION**

### **Population Growth**

The world population continues to rapidly expand – mostly in Asian, African and South American countries. Therefore pollution through emissions continues to increase through this factor.

### **Growth In Energy Demand Per Capita**

With the progressive industrialisation of countries like China, India, Brazil, and the economic improvement in some third world countries, the long term picture is one of steady growth in per capita demand for energy and in pollution because of the use of fossil fuels.

### **Greenhouse Gas & Health Risks**

With the above compounding factors the polluting Greenhouse gases from fossil fuels in power generation are a major health risks. This is very evident in the rapidly growing cities in the industrialising countries referred to above. Apart from the need to combat Climate Change the health issue is another reason to reduce the per capita use of fossil fuels using renewable energy.

### **Energy Resources**

Fossil fuels are finite resources and economical, accessible oil reserves are rapidly depleting. This is the dominant factor in the accelerating shift to hybrid and electric vehicles. Countries now have to think more about energy conservation – particularly waste to energy solution. Energy economics and national supply security are further reason to move rapidly towards local renewable energy for power generation.

Australia must consider extensively using its gas resources for transport fuels to replace imported oil, and its wastes and residues for power generation to offset the use of coal, or new technologies to capture and utilise the CO<sub>2</sub> (discussed further in this document).

## RENEWABLE ENERGY TECHNOLOGIES

To combat Climate Change, reduce pollution for health reasons and for much greater energy resource efficiency, there are established technologies such as Solar Power, Wind Power and Waste to Energy Power. There are on-going refinements to these technologies to reduce the Cost of being Green.

Australia has adopted Wind Power as its main weapon for renewable power generation into HV Grids. Wind Farms are mature technology and comparatively quick and easy to establish with a limited number of government agencies involved. Solar Power is also very quick and easy to develop and install. It is nowhere near as cost effective as Wind Power but it captures community interest and therefore is politically expedient.

*Wind and Solar Power are both intermittent generators, and every so often some scientist, engineer or economist laments the amount of money spent for the amount of CO<sub>2</sub> abated.*

Waste to energy solutions such as Biomass Power Plants, whilst addressing pollution health and energy efficiency, require much more dedicated effort, time, and money to successfully develop and launch. Biomass Power Projects can provide valuable, dispatchable, base load, renewable power projects, but they need to satisfy a raft of Commonwealth State and Government agencies, when compared with Wind Power or Solar Power.

Additionally, Biomass power can provide base load which can supply stability such as frequency control, spinning reserve, megavar support as well as reducing GGE by avoiding methane emissions from anaerobic decay. Not enough recognition has been given to the benefits of this technology which is far more advanced in Europe and America. This technology has the potential to reduce bush fire risks by providing a facility for safe reliable and pollution free combustion producing power and heat.

*Projects for Waste to Energy Power suffer from multiple levels of bureaucracies that need to be satisfied.*

More new and effective technologies are now being developed and applied, such as Wave Power and BCI's IRP Technology. However in order to commercialise these projects a greater political consensus is likely to be required to instil investor confidence.

*Australian scientists and engineers are developing innovative more effective technologies but there must be more stability in the rules and regulations for commercialisation.*

## **BCI & RENEWABLE ENERGY**

### **Traditional Biomass Power Projects**

There are many Biomass Power Plants in outer suburbs in Sweden and Finland, providing electric power and district heating by co-generation. This is regarded as traditional renewable power generation throughout Scandinavia, much of Europe, and parts of North America.

BCI now has a number of such plants poised to be launched, to provide reliable, competitive, base load power. Most of these projects have been underway for several years but political policy changes have created wildly swinging REC values that have frustrated them being launched. However with the rapid increase in the cost of base load power and plant refinements, the “Window of Opportunity is opening.

*BCI is leading the development of a modular range of Biomass Power Plants in the unit capacity range 20 – 30 MW (based on mature boiler and steam turbine, generating plant) and the application of these plants in projects.*

### **Integrated Renewable Projects (IRPs)**

BCI has been developing the award winning IRP Technology since mid 2006 and applying this for BioTek Fuels in the project they are developing.

The IRP Technology being developed and refined by BCI, takes agricultural and forestry wastes and converts them to energy, and the CO<sub>2</sub> is captured in the production of valuable co-products. There is a huge international potential for IRP Technology.

The launch of projects utilising this new innovative technology have been stalled - mostly because of the impact of the world economic uncertainties on investor confidence.

*BCI is developing new technologies providing practical waste to energy solutions for renewable base load power with CO<sub>2</sub> capture and commercial utilisation.*

### **Recognition and Letters of Support**

The BCI IRP Technology and the BioTek Fuels projects have been recognised and awarded as shown in the articles in **Appendix No 1.**

There are a number of prominent people who have been briefed on BCI’s activities and who have provided letters of support and they are listed in **Appendix No 2.**

*IRP Technology can have a major impact world wide and some of the potential benefits for Australia are listed in Appendix No. 3.*

## AUSTRALIAN CO<sub>2</sub> CAPTURE & UTILISATION TECHNOLOGIES

### Importance of Coal to Australia

The facts of life are that Australia is highly reliant on coal fired power plants for base load power generation, and one of Australia's largest sources of export income is coal sold to other countries for this purpose.

Coal fired power plants are one of the biggest emitters of CO<sub>2</sub> and for example a 300 MW power plant emits ≈ 1,700,000 tonnes per annum (t/a) of CO<sub>2</sub>.

The "Coal Lobby" in Australia is extremely powerful and its voice continues to shape Australian political policy. There is no way in the foreseeable future that Australia will greatly reduce its coal activities, however the growth needs to be contained and more efficient technologies applied.

*There is a desperate search for a way to deal with CO<sub>2</sub> and a challenge to Australian scientist and engineers to develop solutions.*

### Technologies for Reducing CO<sub>2</sub> Emissions for Coal Power

The technology to capture CO<sub>2</sub> and store it in caverns is one approach on which many \$Bs are being spent (with no real success thus far).

*The storage of CO<sub>2</sub> only delays dealing with the problem.*

Companies are now developing technologies to sequester the CO<sub>2</sub> as a feedstock in producing valuable cultured algae (CO<sub>2</sub> to Algae Projects). The current scale of commercialisation is to capture and utilise around 60,000 t/a CO<sub>2</sub>. It is considered to be several years away before CO<sub>2</sub> to Algae Projects capturing over 1,000,000 t/a of CO<sub>2</sub> from large coal fired power plants are in commercial operation. There are at least three companies in Australia working towards this objective but from different directions using Raceway Ponds, and / or Photobioreactors, for algae production.

*The CO<sub>2</sub> to Algae Technology being developed in Australia shows great promise to substantially address coal fired power plant emissions in the medium term.*

The Integrated Renewable Projects being commercialised by BioTek Fuels provide a further level of innovation and achieve a very high level of renewable energy efficiency, by using a Biomass Power Plant as the CO<sub>2</sub> (and waste heat) source for integrated Algae Production Systems. The IRPs also provide a path to the much larger CO<sub>2</sub> to Algae Projects.

*It is the development of innovative technologies such as IRPs that provide some confidence that the predicted major catastrophes (due to Global Warming) can be mitigated and even more sophisticated technologies can be developed.*



## LEGISLATION TO COMBAT CLIMATE CHANGE

### Need for Legislation

Despite the world economic woes, international policy is need to at least provide stronger guidelines for nations in appropriate forums. Whilst there is a general appreciation of this need it is unlikely that the momentum will increase for these considerations in the more immediate future. The development of meaningful international policies that nations will embrace is a slow process.

### Individual Country Initiatives

Individual countries already have measures in place with renewable energy projects established and others on the way. This is particularly advanced in Europe.

In the USA a number of States have enacted their own legislation to achieve defined targets, but national consensus is still missing.

*It is up to individual countries to progressively step forward with Legislation and Regulations, to combat Climate Change. The increasing frequency of natural disasters is likely to accelerate this process.*

### Australian Initiatives

The recent polarised political debate in Australia on Climate Change and the Carbon Tax has further destabilised investor confidence.

Many project proponents like BCI place more hope in Renewable Energy Act and Regulations that have existed since 2001 through Renewable Energy Certificates (RECs). It should be recognised that this was brought in by the Conservative Government in 2001 and is the foundation for the renewable energy projects that have been progressively launched over the years to meet increasing targets.

The target is now to have 20% renewable energy generated by 2020 and penalties of 6¢/kWh (with a 1.2¢/kWh tax addition) for not meeting these targets. This is reasonable from BCI's point of view.

*Australia already has the REC mechanism in place which can provide sufficient incentives for projects provided there is more sophistication in the matching of supply and demand.*

## **RECOMMENDATIONS**

### **Progressive International Target Increases**

Climate Change is an international phenomena and the population growth combined with the progressive industrialisation of several countries, will see an acceleration in emissions. This should precipitate international pressures for 30% - 50% Green Energy targets to be adopted by nations with some grading as to ability to respond.

### **Australian Targets**

It should be made clear by the major political parties that they support the target of 20% by 2020 and the RET process, and the target should be increased along the international guidelines.

### **Approach to Penalties**

The current penalties of 60 \$/MWh (combined with the tax effect) should be maintained until 2020, and an increase of  $\approx 30\%$  in the penalty considered for 2020 – 2030, to ensure the targets referred to above are met.

### **Differentiate between Types of Renewable Generation**

The impact on the power systems and the local benefits provided, by each type of renewable generation, should be assessed and a differential set for each type.

Currently there is a disproportionate support given for Solar Power.

### **Permit all Residues & Wastes to Quality as RET Fuels for Bioenergy**

All community wastes, all harvest residues, and reject tyres, should qualify as RET fuels. It is economically inefficient for the tops and boughs of native forests being cleared and harvested over ore bodies, and residues from thinning native forests over water catchment, to not qualify for RECs if this is being supervised by an appropriate government agency. In WA huge quantities are being burnt and buried. BCI previously received a positive ruling from the Office of the Renewable Energy Regulator and was devastated by the recent Regulation change pushed through by “The Greens”.

### **Incentives for Australian New Technologies**

Higher RET credits should be given to power generated from projects using new renewable technologies that are developed in Australia.

Higher RET credits should be given to power generation projects that sequester and use CO<sub>2</sub>.

## **WA RET CONSIDERATIONS**

The ways in which the Australian RET legislation and regulations are interpreted and applied in WA have a major impact on projects:

Due to the shape of the RET LGC curve over the next couple of years where it actually tips down Synergy and other WA retailers are feeling like they have enough LGCs to meet their short term obligations and this may impact the speed at which retailers may want to reach commercial conclusion on deals. The spikes and dips between now and 2020 are not explained.

Any suggestion of annual review of targets based on reforecast demand would create a lot of uncertainty. The utilities feed their forecasts into the IMO and AEMC forecasts. None of these forecasts has been close to right. Annual tweaking of obligations based on utility driven re-forecasting of demand would not be at all helpful.

Similarly 2 year reviews of the scheme are expensive and create unnecessary uncertainty. It is our approach that the scheme has clear performance outcomes. The Authority should review and report annually against those objectives, and if we are falling short initiate a review.

WA RET target needs to continue to rise towards 30% Renewable Energy by 2030.

The self generator and 100 MW grid exemptions are worth considering. There is a lot of generation nationally that doesn't fit under the scheme which could utilise alternative energy sources. There is currently very little incentive in the frameworks to tip owners or users of such generation towards renewable options.

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**BCI**

**13 September 2012**