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Submission No: 95

Mr. Russell Chafer  
 The Committee Secretary  
 House of Representatives Standing Committee on Industry and Resources  
 PO Box 6021  
 Parliament House  
 Canberra ACT 2600

29 June 2007

Dear Mr. Chafer

**Case study into renewable energy in Australia**

The National Generators Forum (NGF) welcomes the opportunity to make this brief submission on the Committee's case study into renewable energy in Australia. The NGF notes that the case study will focus on a *comparative* study of the following renewables energy sectors: solar, wave, tidal, geothermal, wind and hydrogen with respect to *economically viable electricity generation, storage and transmission*.

The NGF is the industry body which directly represents the 21 major power generators in Australia's National Electricity Market (NEM). Verve Energy in Western Australia is an associate member.

The installed capacity of the NGF members was 44,129MW in 2006, with an asset value of more than \$40 billion. Annual sales are over 186,000 GWh, with a value of \$6,800 million. This is more than 95 per cent of the total Australian market.

The NGF supports competitively priced electricity supply in Australia irrespective of its fuel source (including renewable energy sources) or electricity generation technology. The NEM, as an energy only market, has been singularly successful in delivering least-cost electricity supply outcomes and these have been of great economic benefit to the nation.

The promotion of new renewables in electricity supply in Australia is based on the desirability of advancing sustainable (social, economic and environmental) energy development including the reduction of greenhouse gas emissions. Although many renewable energy technologies have seen a decline in costs in recent years, at present most new renewable energy supply technologies are not cost-competitive with conventional generation technologies.

To facilitate investment in renewables, governments have introduced a number of mandatory measures, including renewable energy schemes, in which retailers and other large electricity buyers pass through the additional costs to consumers, either directly in electricity charges, or indirectly through the cost of goods and services. Governments have justified such added costs mostly in terms of defined industry development but with the longer term objective of reducing greenhouse gas emissions.

### **NGF greenhouse study results**

The NGF has conducted a detailed cost-based study on electricity generation options in a carbon constrained world, using CRA International as consultants to the NGF. The study examined renewable energy options in some detail. The CRA International Report and the NGF Public Report are available from the NGF website ([www.ngf.com.au](http://www.ngf.com.au)).

The study concludes that a wide range of technologies will be required to cost-effectively achieve deep cuts in greenhouse gas emissions by 2050. Over this timeframe nuclear power appears to provide the most cost-effective supply option for reducing emissions from the sector. It would require an average carbon dioxide price of around \$20/tonne. This is followed by new coal-based technologies incorporating carbon capture and storage at around \$30/tonne. Finally, renewable energy sources are effective if deep cuts in emissions are needed, requiring an average carbon dioxide price of around \$40/tonne.

The NGF recognises that nuclear power in Australia may be politically difficult and that advanced coal-based generation faces many technical and cost-reduction challenges, similar to many renewable technologies. Gas-based generation is therefore likely to play a significant role as a transition technology due to its mid-range cost and emission intensity. Over the longer term, large-scale gas-based generation would be necessary in the absence of nuclear power and rapid advances in new coal-based and renewables-based technologies would be needed to compete with gas plant.

To date, electricity consumers have generally been unwilling to voluntarily pay for the significantly higher cost of electricity supply based on new renewable sources, although the momentum is growing with the number of GreenPower customers increasing significantly in recent times.

### **NGF policy statement**

The NGF fully recognises the importance of dealing with the industry's greenhouse gas emissions and the NGF has developed a comprehensive policy position on this issue (a copy of which is enclosed as part of this submission).

The NGF policy explicitly states that *'Governments should not pick technology winners but should ensure that policy and regulatory frameworks support all zero and low emission technologies in order to achieve least-cost outcomes'*

*Further 'Governments must place a priority on research, development and demonstration in order to accelerate the commercialisation and deployment of zero and low emission technologies in order to minimise future mitigation costs'.*

Consistent with the above, and in order to enhance investor certainty, the NGF *'supports the development of a broad-based emissions trading scheme which incorporates compensation to existing generators for loss of asset value and one that is supported by additional policies that encourage low emission technology development'*.

### **Specific comments**

Against the above background, the NGF offers the following comments on the Committee's terms of reference and inquiry:

- The NGF believes that once a broad-based national emissions trading scheme is in place, existing, less effective measures should either be abolished or grandfathered (in order to protect investment made in good faith) into an emissions trading scheme over time (taking into account its ramp-up rate) and this includes renewables-based schemes.
- Great care is needed in conducting the comparative study as some of the technologies listed are virtually fully developed, such as wind and parts of bioenergy, whilst others are essentially prospective, such as significant scale wave and tidal, hydrogen or some aspects of solar power. Consistent with the NGF principles, there is a clear role for government to facilitate research and development into these emerging renewable energy technologies.
- In sustainable energy development and greenhouse abatement terms, using less energy through energy efficiency measures and using solar energy in direct applications, such as water and space heating, are far more cost-effective and immediate than generating and supplying electricity from most new renewable sources and in particular sources that rely on yet-to-be-proven technologies.

### **Solar energy**

- Apart from the direct application of solar energy for water and space heating and drying applications, solar energy can be transformed directly into electricity via photovoltaic cells in a myriad of configurations, including concentrated, and indirectly via heating fluids to provide motive power to drive electricity generating devices, so-called solar thermal technology.

Photovoltaic applications can be cost-effective in stand-alone or remote applications where other supply options are expensive or impractical. It is currently not cost-effective in grid-connected applications but it will benefit from government programs that reduce up-front capital and installation costs.

The NGF supports such programs because they assist in advancing technology development and deployment, they are voluntary, and they are supported by direct grants.

The NGF does not support the use of feed-in tariffs that force retailers or others to purchase electricity from photovoltaic or other systems at a mandated pre-determined price. Such an approach is contrary to the efficient operation of the NEM.

### **Bioenergy**

- The Committee needs to take care in considering bioenergy issues and ensure that a whole-of-life approach is considered, particularly in relation to energy crops, which could be quite energy intensive. An advantage of energy crops, unlike some other renewable sources, such as wind and solar, is that, like fossil fuels, they provide a store of energy that can be transformed as needed.

### **Geothermal**

- Geothermal electricity production also has the advantage of delivery on demand and there are early indications that geothermal energy sources in Australia are amongst the best in the world. However, two key obstacles will need to be overcome: the high capital production costs and the high grid connection costs, with transmission involving often very long and uneconomic distances.

### **Hydrogen**

- Much has been written about the so-called 'hydrogen economy' but the gap between it and reality appears to be very large and a range of sustainability issues will need to be addressed. First, hydrogen is not really a 'source' of energy, but essentially an energy 'carrier' in that it takes more energy to produce hydrogen than it can deliver. Second, it will initially be based on fossil fuels via gas-shift reactions and hence has a significant greenhouse gas emission signature. Ultimately, it will have to be based on renewables, but given their higher costs, this may not be economically sustainable, at least in the foreseeable future.

Ultimately, hydrogen is likely to have two advantages: it can be stored and used as needed and it can be used in applications, such as fuel cells, that are highly efficient. However, the efficiency gains will need to be demonstrated and the deployment of cost-effective hydrogen fuel cells still have a very long way to go.

### **Wind**

- Wind is currently the most competitive and readily deployable renewable energy technology in Australia. However, there are a number of infrastructure barriers to increased penetration, including access to transmission.

### **Hydro generation**


- From a NGF perspective, upgrading existing hydro generation technology has some key advantages and these should not be overlooked. The cost of such

upgrades is generally modest in relation to the amount of additional electricity that can be delivered. Compared to many other renewable technologies, a focus on hydro upgrades could be very attractive.

## Summary

In summary, the NGF welcomes the Committee's case study into renewable energy in Australia as it will consolidate the existing knowledge base. As a principle, the NGF is of the view that governments should not pick technology winners but should ensure that policy and regulatory frameworks support all zero and low emission technologies in order to achieve least-cost outcomes. Measures that pick technology winners are generally not cost-effective in electricity generation terms nor deliver effective greenhouse abatement outcomes in the shorter term. However, there is a key role for government, in partnership with industry, to facilitate research and development. The NGF supports the facilitation (including direct funding) by government and other parties of research, development and demonstration of new renewable energy and low emission technologies.

Yours sincerely

A handwritten signature in black ink, appearing to read 'J. Boshier', written in a cursive style.

John Boshier  
Executive Director

Attachment: The NGF Greenhouse Policy

## National Generators Forum

### GREENHOUSE POLICY

#### POLICY PRINCIPLES

1. Climate change is an international issue requiring action by all nations.
2. Australia should make an equitable contribution to global action to reduce greenhouse gas emissions.
3. Electricity generators support the need for abatement action, consistent with national requirements.
4. Australia's greenhouse policy measures should:
  - (a) Be mindful of international arrangements and developed at the national level.
  - (b) Promote opportunities to continue to grow the economy in a sustainable manner.
  - (c) Address all greenhouse gases, emission sources and sinks.
  - (d) Be applied to all emitting sectors but implementation should take account of differing sectoral circumstances.
  - (e) Where appropriate, be based as far as practical on least cost market approaches.
  - (f) Not discriminate against new entrants nor disadvantage early action.
  - (g) Recognise Australia's natural resource base and maintain Australia's international competitiveness.
  - (h) Provide for compensation of existing electricity generation businesses unduly affected by major policy change.
  - (i) Balance, in a cost-effective manner, abatement and adaptation strategies consistent with national economic interests.

## POLICY STATEMENT

1. In order to facilitate efficient investment in electricity supply in the future, the NGF supports the need for long-term greenhouse policy certainty and a broad national policy framework. Given the long-lived economic value of assets, a bipartisan political approach to greenhouse abatement action is highly desirable.
2. To enhance investor certainty, the National Generators Forum supports the development of a broad-based emissions trading scheme:
  - (a) which incorporates compensation to generators for loss of asset value, and
  - (b) is supported by additional policies that encourage low emission technology development.
3. Government policy that places a price on greenhouse gas emissions, through a tax, an emission cap or an emissions trading regime should provide adequate compensation to existing asset holders who suffer loss of revenue or asset value.
4. Consistent and efficient national greenhouse response programs are preferred over the existing mix of multiple federal and state based programs.
5. Responding to future climate change impacts as a result of greenhouse gas emissions is a complex issue that will need to be accepted by the general public. The NGF supports activities to facilitate informed debate on the subject.
6. Greenhouse response measures should be implemented in a manner that does not impact on the efficient operation of the National Electricity Market.
7. NGF members are expert in developing and operating electricity generation plant in a least-cost manner and seek to use this expertise to contribute to the greenhouse policy debate with all stakeholders.
8. NGF members support voluntary greenhouse gas abatement action and NGF members are engaged in a range of related activities delivering significant abatement outcomes. Recognition for early action will need to be incorporated in greenhouse policy.
9. Governments should not pick technology winners but should ensure that policy and regulatory frameworks support all zero and low emission technologies in order to achieve least-cost outcomes.
10. Governments must place a priority on research, development and demonstration in order to accelerate the commercialisation and deployment of zero and low emission technologies in order to minimise future mitigation costs.
11. Greenhouse policy actions should be consistent with zero and low emission technology developments; that is, policy should be based on available technology in order to minimise costs.

(Approved NGF Board Meeting 7 May 2007)