

## **NZGA Further Submission on the Government Draft National Energy Efficiency and Conservation Strategy**

### **Submission**

#### **General**

Geothermal generation is unaffected by weather. Geothermal is the only renewable energy source which can provide long term reliable base load electricity generation (e.g. Wairakei plant load factor of greater than 95% for over 40 years). Geothermal is a mature technology with fifty years of successful track record. No one has ever run a geothermal field to exhaustion and operating costs are low.

Geothermal energy (with certain controls) is recognised as renewable in the Strategy. A corollary is that the New Zealand Geothermal Association must be included in the list of renewable energy associations identified in the Energy Supply Action Plan (page 4).

Geothermal energy world-wide is used for electricity generation, industrial heat, residential space heating, domestic hot water heating, and ground source heat pumps. Any renewables policy should recognise that geothermal may have a role to play in all these areas locally.

The national energy efficiency and conservation strategy (NEECS) is being formulated independently from greenhouse policy (and legislation). As a result ECCA is proposing an array of renewable energy certificates and regulations that will be distinct from CO<sub>2</sub> certificates and regulations. There is a consequent risk that conflicting policies will result.

The NZGA believes that if a tax is going to be collected by whatever mechanism, it should be returned to support renewable energy, not just disappear into the consolidated fund.

#### **Preferred Form of Target**

*EECA requested: The NZGA view on the preferred form of target (i.e. one global target only, or separate targets for sectors such as electricity, solar heating etc), and, if the latter how sub-sectoral targets might be set.*

The NZGA believes that geothermal development will be encouraged by a global target regime with either renewable energy certificates or fossil fuel use permits. However, given a choice, the NZGA prefers the renewable energy certificate scheme.

Both the sector specific certificate scheme (as currently practised in Australia) and the more general energy retail scheme will provide benefits to geothermal development. However, there is merit in preferring the general requirement for energy retail certificates due to its overall benefits for New Zealand.

However, if energy retailers are required to hold tradable renewable energy certificates the new renewable energy targets should be spread over all sectors. As new renewable energy in the transport sector, for example, is expected to be costly, this means that the average cost for new renewables will be higher than if the market is free to choose the least costly option from all sectors. Optimal transfer should be possible if the certificates can be traded between sectors, rather than just within a sector.

Similarly for fossil fuel use permits, the least cost option should result if permits can be traded between sectors. However, the NZGA is concerned that if fossil fuel use permits are superseded by a form of carbon-emitting permit that geothermal is not then categorised as a full carbon-emitting energy source and is unfairly penalised for its modest greenhouse emissions.

The third option, tradable renewable energy certificates applied only to electricity retailers, is supported by the NZGA. It is expected that new renewables in the electricity-generating sector will be amongst the cheapest available, meaning that this will be the lowest cost option for the Government. However, the NZGA expresses concern that some sectors, electricity in particular, may become overly burdened with the costs of renewable conversions while other sectors essentially get a free ride. As geothermal currently serves large industrials, our customers have a limited ability to adsorb increased energy costs.

The NZGA has no view on mechanisms applicable to transport and solar water heating, except as noted above.

The NZGA has not formed a view on what are applicable sub-sector targets, but see note on Mechanisms, below. If certificates or permits are fully tradable, the allocation is not important.

The issue of where the renewable energy target is to be determined is not clear. Geothermal energy if used directly for heat has a very much higher efficiency than if used to generate electricity. This is the same for most fuels.

## **Mechanism**

*EECA requested: The NZGA view on the mechanism(s) preferred and the reasons supporting this view.*

As geothermal can only be applied to electricity generation and process heat, the mechanisms for the transport sector and solar water heating are beyond the expertise of the NZGA. The NZGA has an interest in these sectors only if policies are detrimental to geothermal development.

If the goal is an increase in renewable energy use, then the short-term goal is to maximise the uptake of renewable forms. This will be most effective if the lowest cost options are encouraged – irrespective of the sector. These are likely to be in the electricity and process heat sector, so these sectors should be encouraged initially. The alternative is a more costly incentive scheme.

## **Growth Potential for Geothermal**

*EECA requested: The NZGA view on the growth potential for geothermal within the framework of the renewable energy target range.*

Only about 10% of New Zealand's geothermal potential has been developed to date. We have previously estimated the median value of New Zealand's' total high temperature geothermal resource to be 4,100 MW of electrical equivalent, utilising only existing technology and with suitably conservative recovery and conversion factors. Much of this however is at present unavailable through regulatory and environmental constraints.

The NZGA predicts some 200 to 250 MW(e) of new geothermal electricity generation could be available by 2012. This is equivalent to 10 to 30% of the target – depending on whether the target is set at 25 or 55 PJ.

Economics and environmental constraints may limit development to less than this level.

There is a spectrum of cost associated with adding 200 MWe of geothermal by 2012. At the intensive end of the spectrum, operators may be able to add incremental capacity to existing stations for between 4.5 and 5 cents per kWh. At the greenfields end of the spectrum, a new field development could cost in excess of 7 cents per kWh.

The NZGA comments that the expression of capacity costs as a levelised unit rate is an anachronism. In the NZ electricity market, prices are set by competitive bidding and not by the cost of service. This market is unusual in that the prices are set by hydro (i.e. the generators with the lowest marginal cost). So it may not be possible to fully recover the cost of renewable generation projects through the wholesale price alone.

Full development potential is currently limited by environmental constraints and environmental policies. For example, development at Reporoa was rejected because of fears of possible detrimental effects on neighbouring Waio tapu. Te Kopia has recently been rated as a protected field to preserve the surface features. The previously 'unclassified' geothermal fields in the Waikato Regional Plan have very recently all been classified as 'protected 2', making them virtually unavailable for energy development. The combined potential electricity generating capacity of those fields recently made unavailable is estimated to be around 700 MW(e). This may in-effect limit geothermal development to the fields currently exploited. In this case, the additional geothermal capacity that will likely be added between now and 2012 is likely to be in the 100 to 120 MW range.

This is an example of the conflict between regional management of most of the major geothermal resources and a "national strategy" on energy. The recent changes to the regional plan highlight the difficulties that this can cause and the need for a National Policy Statement.

## **Conclusions**

Geothermal resources are available to meet 10 to 30% of the new renewables target. Some of these resources are economically viable now. Other resources may need incentives to encourage their use of competitive (fossil) energy sources.

Using geothermal energy has advantage beyond being a renewable energy source:

- Reduced CO<sub>2</sub> emissions compared to fossil fuels
- Completely independent of weather or climate variations
- Reliably maintains very high availability factors
- An indigenous resource
- Potential export markets for the industry expertise.