

Submission on a Proposed Change to a Regional Policy Statement and a Proposed Variation to a Regional Plan under Clause 6 of the First Schedule of the Resource Management Act 1991

To: Environment Waikato

Name of submitter: Ministry of Economic Development (MED)

1. This is a submission on the following proposed change to a policy statement and the proposed variation to a regional plan (the Proposals):

Waikato Regional Policy Statement, Geothermal Section and the Proposed Waikato Regional Plan, Geothermal Module.

2. The specific provisions that MED's submission relates to are:

Regional Policy Statement (RPS)

- 3.7.1 overview
- 3.7.2 policy one, policy two
- 3.7.3 policy 4

Waikato Regional Plan (WRP)

- 7.2.2 policy 1

3. The MED's submission is:

3.1. *The Ministry of Economic Development seeks:*

- greater certainty around the contribution that geothermal energy will make to achieving a sustainable energy future for New Zealand and national energy security;
- that systems classified for development fully contribute to achieving the government's energy policies and objectives; and
- clarity for both existing and potential organisations undertaking development in geothermal systems.

3.2. Overview: Government Energy Policies and Objectives

- The following overview provides some background for MED's position and context relating to national energy policy.
- The government's objectives for the energy sector emphasise energy efficiency and security of supply with an increasing focus on renewables.¹ These objectives sit alongside the government's principles for sustainable development.
- The government's policies and objectives seek to create certainty and security around New Zealand's energy future for both consumers and industry.

Sustainable Development Programme of Action for Energy

- The Sustainable Development Programme of Action is one of the government's major overarching documents designed to guide and underpin policy development. Energy has been identified as one of the target areas for sustainable development because of its correlation to economic growth, potential environmental impact, and because both consumers and industry are heavily reliant on its supply.
- The major objective of the programme of action for energy is to ensure continued delivery of energy services to New Zealanders. It acknowledges that renewable energy sources, such as geothermal, will become increasingly important in providing security of supply. Three desired outcomes are identified:
 - a) energy use in New Zealand becomes progressively more efficient and less wasteful;
 - b) renewable sources of energy are developed and maximised; and
 - c) New Zealand consumers have a secure energy supply.

Security of Supply

- Ensuring security of electricity supply is a critical issue for all New Zealanders and for the government. It is imperative to minimise the risk associated with dry years and to ensure that New Zealand has the generation capacity over the long term to meet the projected growth in energy demand.
 - a) Dry Year Risk
 - Heavy reliance on hydro-generated electricity leaves New Zealand vulnerable to the effects of dry years. Dry years indicate the dependence of both consumers and industry on energy as a key element of infrastructure and, consequently, how essential security of supply is.

¹ MED is aware the RPS states that geothermal resources are non-renewable. This is addressed later in this submission under section RPS: Section 3.7.1 – Summary of Significant Resource Management Issues

- Ongoing development and utilisation of geothermal resources will help ensure continued electricity supply for both New Zealand consumers and industry during dry periods, and at other times, to reduce the likelihood of future energy crises.

b) Growth in Energy Demand

- The most recent Energy Outlook provided by MED predicts that the composition of energy demand will change as the demand for energy increases, the Maui gas field declines and new technologies for the production, delivery and use of energy become more economically viable.²
- It is important that, as the means become available, New Zealand undertakes the transition to renewable energy sources to ensure that we have the capacity to accommodate the growth in demand and to compensate for the inevitable decline in non-renewable sources, such as the Maui gas field. Ensuring ongoing development and utilisation of geothermal systems for electricity generation would contribute to the increased generation capacity required to satisfy demand, while at the same time reducing New Zealand's dependence on non-renewable energy sources.
- The geothermal resource is of great importance for New Zealand's energy supply. Geothermal energy makes the second largest contribution of renewable sources to national energy supply, contributing approximately 7% of total electricity generation and 38% of primary renewable energy supply.³ The Waikato region is particularly important, as the majority of high temperature fields, with the greatest energy potential, are located in this area.

Government Policy Statement: The electricity industry

- The Government's overall objective for the electricity industry is to ensure that electricity is delivered in an efficient, fair, reliable and environmentally sustainable manner to all classes of consumer.
- The government has identified a number of desired outcomes consistent with the above objective. Continued development of geothermal resources would particularly help ensure the following outcomes:
 - a) the use of new electricity technologies, renewables and distributed generation is facilitated and generators using these approaches do not face barriers;
 - b) generation is consistent with government policies on climate change and energy efficiency; and
 - c) risks relating to security of supply are properly managed.

² These figures refer to the 2003 Energy Outlook.

The reference scenario projects that total consumer energy demand will increase by 0.6% p.a. between 2000 and 2025 for 2.5% p.a. GDP growth. Residential sector consumer energy is projected to grow, on average, at 1.0% p.a. between 2000 and 2025, the industrial and commercial sector to decline by 0.1% p.a., and the transport sector to grow by approximately 1.3% p.a. Over the same period electricity consumption is projected to increase by around 1.2% p.a.

³ Ministry of Economic Development, Energy Data File, July 2003.

- Further discussion of national energy policies, in particular the National Energy Efficiency and Conservation Strategy and the Resource Management (Energy and Climate Change) Amendment Bill, is included under Section 3.3. RPS: Section 3.7.1 – Summary of Significant Resource Management Issues

3.3. Submissions on particular aspects of the RPS and proposed WRP

RPS: Section 3.7.2 Policy 1 and Policy 2 and Section 3.7.3 Policy 4

- The proposed RPS *appears* to represent a departure from the established approach to managing the geothermal resource. In particular, section 3.7.2 policy 1 and 2 *appear* to apply the sustainable management test to each system individually, including to the energy-producing aspects of Development systems, rather than adopting an overall-judgement approach to the regional resource.⁴
- If it is intended that “cross-system” mitigation options are still to be available, where possible, then this should be made more explicit in section 3.7.2 policy 2 of the RPS in order to provide greater certainty for developers. The proposed policy in the RPS (3.7.2 policy 2) is not sufficiently clear on this matter.
- Given the likelihood of natural change to fields and that a development system generally lacks significant or valuable surface features, or that these features have already been affected by development, the Ministry submits that Environment Waikato *continues* to allow developers to mitigate any adverse effects on Development systems, caused by use or development of that system, by enhancing or maintaining aspects of Protected or Other systems, where possible. The existing approach, which promotes sustainable management of the geothermal resource as a whole, better accommodates competing conservation and development uses.
- In addition, the section 3.7.3 policy 4 requirements to preserve, as far as practical, virtually all geothermal features, including those in Development systems, represents a practical impediment to energy development.

RPS: Section 3.7.1 and 3.7.2

- The Ministry considers that there is insufficient clarity around the 100-year sustainability criterion. In particular, this lack of clarity is likely to provide significant uncertainty for industry and potential developers and may deter long-term investment in the geothermal resource.
- Particularly important are the implications of the criterion for new developments and the potential effects it could have on investment in fields and their economic

⁴ Recent Environment Court decisions have emphasised and upheld the “overall-judgement” approach to sustainable management. This approach is reflected in Environment Waikato’s current operative RPS, which classifies fields as protected, development and other, and enables protection of significant geothermal features on a regional basis, rather than on a field-by-field basis, while accommodating alternate uses.

viability.⁵ It is likely that all new developments of geothermal systems will be staged. In other words, any initial take or use of fluid or energy contained within a system will be a fraction of the capacity of that system and highly likely to be sustainable over a 100 year period. Is this sufficient to meet the 100-year criterion or would higher subsequent takes also be required to be proven sustainable for 100 years? Alternatively, would higher subsequent takes only be required to be proven sustainable over the remainder of the 100-year period? The policy appears to invite multiple interpretations and, therefore, creates uncertainty about the availability of the geothermal resource for industry and for the government.

- The Ministry also has the following concerns about the choice of 100 years as the required sustainability period:
 - a) 100 years is considerably longer than the period identified in the section 32 report in which alternative technologies are expected to become widely available and cost effective. The report does not provide sufficient evidence to assume that such technologies will not develop as expected;
 - b) it is inconsistent with both the maximum duration of a resource consent and typical long-term planning horizons for resource use;
 - c) 100 years is beyond the physical life, normally expected, of a mechanical and electrical plant to be installed; and
 - d) proving this level of sustainability may be difficult especially prior to any development.

RPS: Section 3.7.1 – Summary of Significant Resource Management Issues

Renewable energy, sustainability and efficiency

- The proposed RPS and WRP both proceed on the premise that geothermal resources are not renewable but can be used sustainably over a given period if extraction is suitably limited (refer RPS 3.7.1 Overview – Summary of Significant Resource Management Issues)
- To clarify, it is government policy that geothermal resources are a renewable source of energy. This is reflected in the following key government initiatives:
 - a) The National Energy Efficiency and Conservation Strategy (NEECS)

The NEECS is the government's primary means to achieve outcomes sought in the sustainable development programme of action. Its stated purpose is to facilitate the move towards a sustainable energy future for New Zealand by promoting energy efficiency, conservation, and a transition to the use of renewable energy sources. Geothermal (with certain conditions) is included in the NEECS as a renewable source of energy.

The NEECS contains two key targets – an energy efficiency target and a renewable energy target. The renewable energy target requires that, by 2012, renewable

⁵ The Ministry may wish to submit further information on the relationship between the 100-year sustainability policy and investment in and economic viability of fields once there is clarification around the interpretation of this policy.

energy sources will generate an additional 30PJ of energy above 2000 levels. The target was set to be ambitious but achievable. Notwithstanding this, the government anticipated, when setting the target, that energy from geothermal sources would play a valuable part in its successful achievement.

In particular, when developing the target and the likely contribution of geothermal energy, the medium confidence level estimates in the table in Appendix One to this submission was used. For geothermal resources in the Waikato region, this meant that expanded use of existing developed fields was assumed, plus an additional 9 MWe from Horohoro and 70 MWe from Tauhara coming on-stream.

b) Resource Management (Energy and Climate Change) Amendment Bill.

The Resource Management (Energy and Climate Change) Amendment Bill has recently been introduced into Parliament. The Bill seeks greater alignment between local government plans and national energy objectives and aims to ensure that councils consider the contribution their regions can make to meeting New Zealand's commitments under the Kyoto Protocol.

Of particular relevance are the proposed amendments to section 7 of the RMA to require decision-makers to have particular regard to the efficient use of energy, the effects of climate change, and the benefits of renewable energy.

The definition of renewable energy in the Bill is 'energy from a source that occurs naturally and the use of which will not permanently deplete New Zealand's energy sources of that kind, because the source is generally expected to be replenished by natural processes'. The definition then goes on to specifically include geothermal in a list of renewable sources of energy.

- Proceeding on this basis that geothermal *energy* is renewable, the government expects that this energy source will contribute to achieving its objective of ensuring a sustainable energy future for New Zealand.⁶

WRP: Section 7.2.2 Policy 1

- The Ministry supports the reclassification of the Atiamuri, Mangakino and Ngatamariki systems into the development category. Ngatamariki in particular is a field with high temperatures, a good prospect for electricity generation (140-240 MW potential), and likely to make a positive contribution to the government's renewable energy target.⁷
- The Ministry considers that those fields classified as Other systems (Reporoa, Tokaanu/Waihi) should be re-classified as either Development or Protected. While

⁶ Debate over whether the definition of renewable energy resources applies to geothermal energy has been long and complex. Geothermal is certainly included in a list of renewable energy resources in the authoritative United Nations Development Programme World Energy Assessment report released in September, 2000.

⁷ By 2012, renewable energy sources will generate an additional 30PJ (combined heat and electricity) of energy above 2000 levels.

they remain in their current classification, any potentially significant energy development is prohibited, and, therefore, Other fields, from a practical perspective acquire an “effective” Protected classification. We note that simply acquiring a Development classification does not necessarily presume that the system will be developed. A potential developer must first prove the economic or commercial viability of any development and fulfil resource consent requirements. However, re-classifying Other systems (either as Protected or Development) will provide a measure of certainty for industry and allow for initial investigation into the viability and sustainability of those reassigned for development.

- The Ministry proposes that the Reporoa and Tokaanu/Waihi systems be included in the Waikato Regional Plan as Development systems.⁸

a) Reporoa

The Reporoa system has development potential particularly for direct heat supply to the adjacent Reporoa dairy factory. During the 1990s work was undertaken with the dairy company investigating the possibility of utilising the system to provide geothermal steam for processing. The system proved economically viable but was not pursued due to uncertainties around the future of the dairy factory.

Bloomer and Maxwell [2003] believe that a suitable monitoring programme can be developed in order to investigate the system while at the same time monitoring any potential affects on the Waiotapu-Waikite-Waimangu system. They consider it unlikely that an effective link exists between Reporoa and Waiotapu-Waikite-Waimangu.⁹

b) Tokaanu/Waihi

A number of factors mean that Tokaanu represents a good development prospect both for power development and direct heat supply.¹⁰ Its estimated potential is between 150 – 310 MW.¹¹ In particular, the system is already utilised for domestic purposes and the Ministry understands that there is interest in its further development by Ngati Tuwharetoa and others.

4. MED seeks the following decision from the local authority:

4.1 Regional Policy Statement

Section 3.7.1 Overview – Summary of Significant Resource Management Issues

- Delete the sentence “Geothermal resources are not renewable.”

Section 3.7.2 Policy 2

⁸ Bloomer, A. and Maxwell, A. Century Resources *Development and Utilisation of Geothermal Resources*, September 2003.

⁹ Ibid.

¹⁰ Ibid.

¹¹ East Harbour Management Services Ltd, September 2002.

- Continue to allow developers to undertake “cross-system” mitigation for adverse effects caused by the use and development of Development systems. Reflect this stance explicitly in 3.7.2. Policy 2.
- Reword to provide greater certainty around the interpretation of 100-year sustainability, particularly providing clarity on the way new development systems will be assessed and the treatment of staged development.
- Any other relief/decision that gives effect to the above submissions.

4.2 Waikato Regional Plan

Section 7.2.2 Policy 1

- Retain Atiamuri, Ngatamariki and Mangakino as Development systems
- Reclassify Reporoa and Tokaanu/Waihi as Development systems
- Any other relief/decision that gives effect to the above submissions.

5. The Ministry of Economic Development wishes to be heard in support of its submission

6. If others make a similar submission, MED will consider presenting a joint case with them at the hearing.

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17 September 2003

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Appendix One

Additional Utilisation over the Present Level¹²

	Year 2012						Year 2025					
	High		Medium		Low		High		Medium		Low	
	MWe	GWh	MWe	GWh	MWe	GWh	MWe	GWh	MWe	GWh	MWe	GWh
Horohoro	0	0	9	70	18	140	0	0	9	70	18	140
Kawerau	100	790	150	1180	477	3760	257	2020	357	2810	477	3760
Mokai	42	330	75	590	192	1510	42	330	97	770	192	1510
Ngawha	20	160	40	320	109	860	20	160	64	500	109	860
Ohaaki	0	0	0	0	0	0	0	0	0	0	0	0
Rotokawa	50	390	100	790	393	3100	223	1760	303	2390	393	3100
Rotoma	10	80	20	160	46	360	28	220	35	280	46	360
Tauhara	20	160	70	550	70	550	70	550	70	550	70	550
Tikitere-Taheke	10	80	10	80	10	80	10	80	10	80	10	80
Wairakei	40	320	90	710	432	3400	40	320	182	1430	432	3400
Mangakino	-	-	-	-	120	950	-	-	-	-	120	950
Ngatamariki	-	-	-	-	240	1890	-	-	-	-	240	1890
Reporoa	-	-	-	-	90	710	-	-	-	-	90	710
Tokaanu	-	-	-	-	310	2440	-	-	-	-	310	2440
	292	2310	564	4450	2507	19750	690	5440	1127	8880	2507	19750

NB. High confidence resources are those that are well proven and readily able to be permitted and developed. Achievable development rate has been taken into account. High confidence resources represent an 80-90% confidence that the uptake will occur. Medium confidence estimates represent a median estimate of uptake. Generally these are associated with a more liberal consenting environment. Low confidence estimates represent resources that can be developed but difficulties are expected in terms of permitting and access. They represent a 10-20% confidence that the uptake will occur. Confidence levels are cumulative e.g. the medium confidence resource available will include both the high and medium confidence bands.

- Ngatamariki and Mangakino are classified here as low confidence because of their previous status as Protected 2 fields. Given their reassignment into the Development category, their potential as an energy source is good and it would effectively now be considered a system that could be developed with high confidence. Similar increases in confidence would be associated with Reporoa and Tokaanu if they were to be re-classified as Development systems.

Note: these estimates are based on stored heat calculations assuming a 35-year life. The 100 year criteria would limit the potential additional utilisation shown here.

¹² East Harbour Management Board Services Ltd, *Availabilities and Costs of Renewable Sources of Energy for Generating Electricity and Heat: Report to the Ministry of Economic Development*, September 2002.