

The Nga Awa Purua Geothermal Project, Rotokawa, New Zealand

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ABSTRACT

Maori have a key role in many New Zealand geothermal projects through their ownership of land that provides access to some of the best geothermal resources in the World. They have chosen a variety of project ownership models for engagement in projects on their resources that range from receipt of royalties for hosting a power developer to almost full Maori project development and ownership. While a high level of Maori ownership in the power development on their resource is seen as desirable by many, this is tempered by the realities of raising risk capital for resource drilling, needing technical capability for managing drilling and power plant specification/contracting, the need for a reliable operator through the life of the project and the need for suitable power off-take arrangements.

In seeking to secure a long term revenue stream for the benefit of their people, the Tauhara North No.2 Trust which controls access to the Rotokawa geothermal resource have established a joint venture arrangement with the major generation company Mighty River Power for the construction of the World's largest single unit geothermal generation project – the Nga Awa Purua 130 MW project due for completion in 2010. The agreed structure has provided the Trust with the opportunity, from a low capital base, to raise their own finance for buying into the project to agreed levels. It also provides Mighty River Power, who will have a majority ownership of the plant, with the ability to develop and operate the project in partnership with the Trust as resource owner who, through joint ownership, has closely aligned commercial objectives from the power project. Such ownership structures may be applicable elsewhere, facilitating development of geothermal resources while ensuring alignment of goals and a fair return for the benefit of indigenous geothermal resource owners or communities that provide access to the resources.

1. INTRODUCTION

Maori are the tangata whenua or indigenous people of New Zealand and consider that they are merely custodians of the land with their role in preservation of it and its resources for future generations.

They have always had a deep affinity with geothermal energy, with ancient stories of its use and power embedded in their oral history. In ancient times Maori used the heat from Geothermal for cooking and heating purposes. It is said that Ngatoroirangi, was the first ancestor to physically use the natural resources of thermal steam to save his life from the snow of neighbouring Tongariro Mountain.

Colonization of New Zealand by Europeans began over 200 years ago, and in 1840 the Treaty of Waitangi was signed between the British Queen and Maori. This afforded equal status and protection for the Maori people under the British rule. It protected Maori customary rights to much of the

land, yet later large portions of land were confiscated by the government and then sold.

During the nineteenth century, the government encouraged the formalisation of Maori ownership of their traditional lands. It established structures that facilitated Maori to claim ownership of land under tribal, sub-tribal or extended family groups. This formalization was partly to protect the interests of Maori while Europeans were laying claim to apparently unused lands, but unfortunately it also subsequently facilitated the sale of Maori land to Europeans by a few individuals who may have claimed to represent the traditional landowners.

Despite this, Maori retained ownership of large tracts of land and particularly through the central North Island where most of New Zealand's high quality geothermal systems are found. Much of this land remains under the collective ownership of a large number of descendent landowners for each block. In many cases the owners have established Maori Trusts that provide for the management of these lands for the benefit of the owners who are often absent, having moved to other regions or urban areas.

Their ownership of land that provides access to these valuable resources means that Maori can have a key role within the development of geothermal power projects.

New Zealand's power market is dominated by several large integrated electrical generation and retail companies, three of which are state-owned enterprises. A shortfall in the building of generation capacity in the past decade has meant that a significant amount of new capacity is now being sought by the generation companies. Within the context of a national energy strategy that encourages renewable energy, insufficient new natural gas finds to support significant gas-fired generation, and increased costs for imported LNG and coal, geothermal has become the focus for new generation by several of the generation companies. These companies have increasingly recognized the need for developing relationships with Maori who are often the key stakeholders in energy projects that utilize significant land areas and other natural resources.

2. THE ROTOKAWA GEOTHERMAL FIELD

The Rotokawa geothermal field is located approximately 14 km north east of Taupo, within the Taupo Volcanic Zone (Figure 1). Original exploration and deep drilling at Rotokawa was conducted by the New Zealand government as an extension of the successful state geothermal program that led to the development of Wairakei geothermal field during the 1950's. That exploration identified a large high-temperature resource of about 18 sq km with an energy potential estimated to be at least 250 MWe. Production is from depths of around 2000-2500 m with temperatures up to 320°C.

A 32 MWe (later expanded to about 35 MWe) Ormat combined-cycle power plant named Rotokawa A has been in

operation for over 10 years. That project took advantage of some of the original wells drilled by the government and required only one additional deep production well to provide the required fluids to support the development.

Construction of 130 MWe power plant, Nga Awa Purua, is underway and completion is expected this year (2010).



Figure 1: The Rotokawa geothermal field, location within the Taupo Volcanic Zone of New Zealand.

The Tauhara North No. 2 Trust (TN2T) have ownership of a land block located adjacent the Waikato River and extending across the centre of the Rotokawa geothermal field.

3. REGULATION AND OWNERSHIP OF GEOTHERMAL RESOURCES

While the Crown (the state) at one time considered that it had ownership of geothermal reservoirs and was considering a royalty structure for users of geothermal energy, it stepped back from asserting such ownership largely because Maori, had ownership of the land across many of the remaining resources and would likely have contested such ownership and royalties under the Treaty of Waitangi.

Instead, the use of geothermal resources in New Zealand is regulated under the 1990 Resource Management Act (RMA) which provides a framework for the sustainable management of natural resources. As part of this, the RMA specifies five matters of 'national importance' that must be recognized and provided for. The fifth matter is 'the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga'. The act also requires that the Treaty of Waitangi be taken into account and specifies that regard should be given to '...guardianship; and... the ethic of stewardship based on the nature of the resource itself'.

The RMA gives control over the use of geothermal resources to the regional councils in which the resources are located. Each regional council has a duty to plan for the use of geothermal resources within its boundaries and is

responsible for allocation of consents to exploit geothermal fluids.

When resource consent is obtained, it does not allocate to the holder ownership of the resource, rather the right to use the resource under stated conditions. Any surface thermal features may however be subject to ownership based on land ownership claims. Ownership of surface features does not imply ownership of sub-surface fluids or resources (Waitangi Tribunal, 2003).

In essence, having access to the resource through land ownership, or agreement with the landowner for geothermal development is the key to being able to develop a position for applying for a resource consent under the RMA.

4. MAORI INVOLVEMENT IN GEOTHERMAL PROJECTS

There has been a wide spectrum of the involvement of the Maori landowners in the geothermal projects developed on their lands.

Maori had little involvement in the first government led geothermal project developed at Wairakei in the 1950's. The next major government sponsored development at Ohaaki in the early 1990's was located on land largely owned by Maori, but the limit of their involvement was primarily through a lease arrangement for the land used by plant and steamfield.

The 32 MWe Rotokawa A project was the next significant development built on TN2T land and owned by a private generation company. The TN2T landowners retained ownership of the land and held a 50% stake in the steamfield system and wells.

The 60 MWe Mokai I project was developed by the Maori landowners who own most of the land across the Mokai geothermal field. Through their wholly owned Tuaropaki Power Company (TPC), this project was able to be 100% debt financed because existing wells previously drilled by the government in the 1970's had proven sufficient steam for the project technical and economic feasibility to be demonstrated without further equity injection. State-owned generation company Mighty River Power (MRP) held the power offtake agreement and is contracted by TPC to operate and maintain the steam field, power plant and transmission infrastructure while the Trust retains ownership of the land. Prior to building Mokai II (a 40 MWe expansion), a quarter share of TPC was acquired by MRP. Full ownership of TPC reverts back to the Tuaropaki Trust in 2027 when the geothermal lease expires. All contractual obligations with MRP also cease at this time.

Geothermal wells at Kawerau were under ownership of the Crown until they were transferred to Mighty River Power who then onsold most of the wells to Ngati Tuwharetoa Geothermal Assets Ltd (NTGA; a subsidiary of the Ngati Tuwharetoa (Bay of Plenty) Settlement Trust). NTGA, the Putauaki Trust and Norske Skog Tasman are the major landowners in the area and the trusts hold the rights to use underlying geothermal fluids for electricity production. The four interested parties have agreed to a Steamfield Management Plan that designates MRP as the operator of the Kawerau power station.

The Ngawha power station in Northland is run in joint venture between a Maori trust (Tai Tokerau) and privately owned Top Energy, a local electricity network company. A

subsidiary of the two interests, the Ngawha Geothermal Resource Company (NGRC), owns the project itself. Top Energy has a majority shareholding in NGRC. It is of note that an earlier claim by another Maori group (Parahirahi C1 Maori reservation) to gain back the rights to the geothermal resource at Ngawha was declined. Parahirahi had sold the land to Carter Holt Harvey in the mid 1900s and it was deemed by the Waitangi Tribunal that they were fully aware of the consequences of doing so at the time.

The Mokai project, with high level of Maori ownership has set an inspirational benchmark for many Maori who own land near geothermal projects. However, this achievement is difficult to match when major equity investment is required for the conduction of major exploration surveys and the drilling of several exploration, production and injection wells is needed prior to any debt financing is possible.

However, the TN2T has found a good model that minimizes their upfront capital investment while securing a very significant level of ownership and control of the geothermal power projects build on their lands.

5. TAUHARA NORTH NO. 2 TRUST

The Tauhara North No 2 Trust are Ngati Tahu descendants of their tupuna (ancestor) Tahumatua. The Trust represents over 700 individuals who collectively own 326 ha of the original piece of 4000+ ha of land that they once owned in the area. They have elected a small group of 5 trustees to represent them and provide governance support.

The backdrop of all the Trusts' activities is the desire to assist in growing the wealth of its owners. The Trust achieves this by fulfilling what it considers are its charitable responsibilities to its owners. This includes contribution to funerals or tangi, reimbursement of medical, dental and optician expenses, contribution to education and finally assistance to the Trust's four Ngati Tahu Marae or meeting places that the Trust affiliates to. An annual payment to elderly or Kaumatua at Christmas time as well as a dividend based payment is also made.

5.1 Ownership of Rotokawa A

The Trust first began utilising the geothermal potential of its land when a small 32 MW Power Station, Rotokawa A, was built in 1997 (later expanded to 35 MW in 2003). The Rotokawa A project is divided into two companies:

- Rotokawa Joint Venture (a 50:50 joint venture between Tauhara North No.2 Trust and MRP) which owns the steamfield
- and Rotokawa Generation (100% MRP) which owns the generation plant.

MRP operates both the station and the steamfield. Annual generation is about 250 GWh. The Trust opted not to take shares in the power station but instead only the 50% stake in the steamfield along with a monthly royalty payment.

At the time it was felt prudent that the Trust have limited financial involvement in Rotokawa A as it had little experience with commercial issues relating to equity ownership, and limited financial resources. The royalty payments provided the Trust with an annual income of approximately NZ\$700,000 p.a. with no capital risk. Additionally, the Trust has 2 representatives on the 5 man Board of Directors for Rotokawa A despite the fact that they have no financial interest.

5.2 Related Geothermal Development Rights

In 2000 the Trust and Mighty River Power were fortunate to acquire geothermal access rights over other lands on the Rotokawa and nearby Ngatamariki geothermal fields. This happened when the owner of forestry lands in these areas separated out geothermal development rights as an encumbrance on their lands separate from the land ownership. This provide a greater level of control over the greater Rotokawa field as well as all of Ngatamariki.

6. NGA AWA PURUA DEVELOPMENT

After almost 10 years of monitoring the performance of Rotokawa A, the Trust and MRP both agreed that an expansion to the project was desirable.

6.1 Reaching an Agreement

Negotiations for a new increment of generation development at Rotokawa continued for some time with each party proposing various options. Agreement however, was only reached when the senior leaders of both organisations meet together for 2 days and engaged in a process whereby both parties fully acknowledged the value that each brought to the project. At that meeting the TN2T Trust (assisted by its commercial and legal advisors) worked together with MRP to come up with the basis of a commercial agreement to take forward a major expansion to the Rotokawa development.

The main principle of the agreement was that MRP would provide the expertise and initial capital investment to develop the project, while TN2T would provide the land and support for consenting the project. MRP would have a majority ownership of the project (initially) but the Trust for its role would receive a royalty on revenue and the opportunity to buy into the project upon commissioning with no need for equity investment.

Following this the Trust consulted with its owners via a series of meetings supported by geothermal and commercial consultants in which the project, its implications and its outcomes were fully explained. The Trust's complex form of ownership involving so many individuals meant that the approval from the Maori Land Court was required for the long term lease arrangement for a development of this size. The Court required evidence of support for the project from over 50% of the owners before it could proceed. At the start of this process only about 35% of shares/owners were known to the Trust. The 50% threshold was deemed to be achieved by gaining 95% support from known shareholders.

Finally in 2006 the Trustees elected to enter into a Joint Venture arrangement to build and operate a 132 MW geothermal power station on its land with MRP. The name Nga Awa Purua was chosen for the power station because it is unique to Ngati Tahu. The name was originally given to Nga Awa Purua Rapids located on the Waikato River, adjacent to the Trust's land.

6.2 The Deal

The main features of the agreement reached with MRP are:

- Agree to proceed to develop a series of projects at Rotokawa and other areas that the Trust and MRP jointly own geothermal development rights
- The Trust receives a royalty based on project revenue, indexed to unit power price, and highest for projects based on Trus-owned land.

- The Trust has the option to buy into the Rotokawa project that is built on Trust-owned land.
- Buy in is at the time of project commissioning, and so the Trust has to provide no capital during construction.
 - Initial buy-in is at 25% or 35%
 - Option to increase to ownership 50% over a defined period of years
 - Ownership will be on the basis of a Joint Venture structure.
- The Trust has the option to buy into other projects covered by the agreement, with lower maximum shares.
- The Trust provides land on a long term lease basis for projects on its lands. This covers only the land required for wells, pipelines, and power plant. The Trust retains use of other surrounding land.
- The Trust actively supports the consenting process for all projects.
- MRP will be operator for the projects, contracted to the owning JV, with 5 yearly review of performance
- MRP will be the power offtaker for projects with suitable transparency on power price and hedge arrangements

6.3 The Consent Process

From this point the Trust assisted its JV partner (MRP) by providing dedicated resources throughout the consent process. This involved canvassing neighbours to gain support or to allay fears as well as making submission to the various Consenting Authorities. The outcome of this was that the process, which could typically take as long as 12 to 24 months, was completed inside 9 months. Site work commenced in May 2008 (Figure2).

Involvement in the Trust's latest development has come about as a result of a maturing of understanding of the risks and advantages associated with the geothermal resource and power station ownership. The Trust owners have decided that they want to be more involved and have some "skin in the game."

6.4 Calling in the Experts

The challenges with the Trust's involvement in Nga Awa Purua Power Station have been significantly different to the first venture.

Starting with the breakthrough meeting with MRP, experienced commercial and legal advisors have provided extensive advice. This has been essential to establish ownership and commercial structures that meet the needs of having a JV for project ownership, while protecting the land asset base of the Trust and providing mechanisms that enable the benefits of the project to efficiently flow back to the beneficiaries of the Trust.

It has also been necessary for the Trust to have a far greater technical understanding of the project and thus have employed Sinclair Knight Mertz (SKM) to provide them with that. SKM are also responsible for testing and challenging MRP's operation of the plant.

The Trust has followed a policy of obtaining the best advice possible in any area that they are involved in.

6.5 The Risks

The geothermal exploration risk is one area that the Trust has been exposed to and has required a level of trust with MRP who provide the primary expertise for assessing the resource and drilling wells. Effectively this is the one major area of the project that the Trust has been unable to control through recognised risk management tools. However, with 10 years of operating experience on the field, the risks were much less than for a Greenfield development.

The Trust was also protected from major capital over-runs because the agreement with MRP included the provision on whether to take a capital investment in the project be delayed until the day the construction contractor formally hands the plant over to the owner/operator.

6.6 Financials

Financing the Trust's equity share in the project proved to be less of a challenge than was originally thought. Initially three banks were approached who were perceived as more experienced in financing this type of project. Fundamental to the ownership of Maori titled land is the desire not to expose the land to risk of forfeiture through commercial default of any form. As such the Trust was not prepared to offer banks any form of security over its land. This was advised to the banks at the outset and was a precondition the Trust imposed that was a deal breaker. As an alternative the Trust offered a security over the royalty stream as well as a General Security over the interest in the Joint Venture. This position was accepted by the banks that were prepared to provide 100% financing of the Trust's equity investment.

In the eyes of the banks, this project was relatively low risk. They recognised that development risk to the Trust was nil and that if the plant did not perform up to expectation then the Trust could elect not to buy in. They also recognised that the Trust were partnering with an experienced generator who have a proven record and that are wholly owned by the NZ government. They recognised that the financial fundamentals of the project were very strong with the Trust having the ability to repay all its debt over a relatively short period of time.

One of the more crucial features of the Trust's relationship with lenders has been communication. They also imposed covenants that required reserves for capex and debt servicing to be built up as well as expectations around regular key financial ratio reporting. The Trust has been keen to engage with the bank from the outset and have emphasised the long term nature of the investment and the potential long term relationship advantages that will accrue with that philosophy for them. Despite the recent turmoil within the financing markets, banks have competed strongly for the Trust's business in providing 100% debt funding for the Trust to buy its share of the JV project.

One of the more interesting challenges that the Trust will have is ensuring the fairness of the price the JV receives for selling its power. Not only are MRP a generator trying to sell output at the highest possible price, but their subsidiary is a retailer trying to buy power at the lowest possible price. However, we have put in place various measures to ensure transparency in this process, while providing sufficient confidence in the forward revenue stream to satisfy the lenders and to retain a required return for the Trust.

6.7 Legalities

The legal structure that the Trust adopted came with strong recommendations from their legal advisers. The Trust remains the parent for all entities within the group, and the Trust's logo is visible across those entities, however the Trust was keen to ring fence their commercial structure in such a way that in the event of failure of the business, assets held by the Trust could not be exposed. They adopted the Limited Partnership structure between the Trust and their Charitable Company and Tahumatua Ltd – their commercial arm. This structure requires that the commercial arm is responsible for all decisions of a commercial nature. The Trust and our Charitable Company cannot be a party to commercial decisions otherwise loss of protection afforded by this structure will occur. The Limited Partnership structure also allows the passing of taxable profits generated by commercial activity to be passed back to the Trust at its concessionary tax rate.

6.8 Success

The NZ\$450 million (US\$227 m) 132 MW Nga Awa Purua power station was commissioned this year and produces about 3% of New Zealand total electricity needs. The plant is expected to generate an average of 1100 GWh annually.

The Trust negotiated an equity share of the development from which it receives a profit share based around their equity involvement. A key to the Trust's involvement is the ability to take an additional equity stake in the project at cost after 2 years. It is likely that the Trust will over time increase its equity stake to 50% however these latter increases will be based around fair market value considerations. They will also benefit from a royalty payment stream along similar lines as that in place for Rotokawa A Steamfield.



Figure 2: The ground breaking ceremony for Nga Awa Purua in April 2008.



Figure 3: Nga Awa Purua power station under construction.

7. FUTURE OPPORTUNITIES

So what does the future hold for Tauhara North No.2 Trust?

In 2000 the Trust and MRP were fortunate to acquire geothermal access rights over other lands. These rights will ultimately lead on to further Joint Venture developments at Ngatamariki as well as further expansion of the existing Rotokawa field.

The Trust plans to purchase additional equity interests in the Nga Awa Purua Power Station, up to 50% within 10 years. Also planned is the purchase of rural based assets to add to their portfolio of land holdings. These farms will provide both return on investment, training and employment opportunities for their owners and also will be able to demonstrate environmental sustainability and economic viability.

The Trust also plans to significantly increase their support to their owners through continuing initiatives to improve their standard of living. This does not extend to simply handing out cash, as this would be counterproductive in the long term.

The Trust believe that their joint venture partner has greatly benefited from their involvement in this project. They have been able to show that as a government State Owned Enterprise they are supporting Maori development in NZ which for the last 200 years has been happening at too slow a pace. In return they have had the support of Maori in navigating through the consents process, by having Maori speak in support of projects like this. Their experience with dealing with the Trust has also given them more confidence in dealing with other Maori groups and understanding the underlying issues that they would need to resolve before proceeding.

Most of NZ's geothermal resources lie under land owned by Maori. The need for strong and robust relationships from this point alone is obvious. Sitting behind all this is the fact that our generator joint venture partner is also a retailer – so this project gives them security of supply for their customer base.

Ultimately this project will allow the Tauhara North No 2 Trust to provide tangible benefits to its owners which should translate into improving their standard of living. This is fundamental to the objectives of the Trust. The Trust do not see themselves as empire builders but rather opportunity providers with a deep seated desire to preserve and sustain rather than exploit and exhaust.

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