



## New Zealand Geothermal Association – Action Plan Status as at November 2015

The Action Plan is a key document setting out tasks to be progressed.

The Action Plan sets out tasks that can reasonably be achieved by the Association with available funds and is formalised in discussions by the Board. The Action Plan gives focus to the activities of the Association and in particular the activities of the Executive Officer. An outline of its current status is presented at each Board meeting. The following table shows the current status of Action Plan items. The table also stands as a record of the key activities of the Association throughout the year.

With the changes occurring in the geothermal industry and with successful completion of the World Geothermal Congress, which has been a major focus in recent years, the Board intends to revisit this Action Plan (including its priorities) and Vision. This refocus will be an important task at the first Board meeting of the new Board under the new President.

Action	Comments	Status
<b>HIGH PRIORITY</b>		
<b>Government Lobbying</b>	NZGA should develop key relationships with Government and opposition MPs and officials, highlighting growth opportunities across Cabinet.	<p>From January 2015 fortnightly meetings were held with officials from NZTE, MFAT and MBIE on World Geothermal Congress matters.</p> <p>April 2015 Brian Carey and Brian White had input into Ministerial speeches in relation to WGC and geothermal energy status in NZ. NZGA has formally and informally expressed its thanks to Ministers for their support through WGC.</p> <p>1/10 meeting with Michelle Templar, NZTE</p> <p>30/10 letter to EECA advocating partnering arrangements</p>
<b>Raised Public Awareness</b>	NZGA will lift communications and education of the public.	<p>Meetings with Energy News staff.</p> <p>EO answers queries from public, or provides links to the geothermal community.</p> <p>EO provides an annual geothermal perspective for the Energy NZ Perspectives magazine.</p> <p>EO answers queries from media.</p> <p>3 newsletters were produced during the year, then were added to the website and are well-read.</p> <p>10/12 John Burnell attended Royal Society Constituent Meeting on behalf of NZGA.</p> <p>12/3 EO attended Energy Excellence Awards launch, Wellington. Energy Excellence Awards are promoted to industry as a means of showcasing geothermal projects and people.</p> <p>31/3 EO attended Energy Disruptive Technologies meeting, Te Papa, Wellington.</p> <p>12/6 GHANZ Christchurch Groundwater Energy Seminar, Christchurch – a seminar attended by about 40 people.</p> <p>16/6 Meeting with Edgar Sacayon on his lifecycle emissions research, Wellington.</p>

		<p>1/7 EO represented NZGA at a wind energy function, Wellington.</p> <p>9/7 Waste to Wealth Workshop, Rotorua.</p> <p>3/8 NZGA facilitated a GeoHeat Strategy discussion, Taupo.</p> <p>14/8 EO met with Chris Thomson, Callaghan Innovation.</p> <p>22/8 EO attended a celebration with Ngawha Marae Komiti and Top Energy on recent agreements, Ngawha.</p> <p>15/10 EO and several Board members presented at a meeting of New Plymouth oil and gas service companies on national and international geothermal opportunities.</p>
<b>Submissions on Policy</b>	<p>NZGA will make relevant submissions in response to government consultation documents e.g. climate change regulations, etc.</p> <p>A selective approach is taken.</p>	<p>Ongoing major task – pre-emptive review of geothermal energy regulation and NZS 2403 Code of Practice for Deep Geothermal Wells – see separate Action Item of “Geothermal Regulations”.</p> <p>NZGA did not participate in preliminary meetings on Northland Regional Plan, but will join the formal consultation process.</p> <p>We had no one to lead a submission on the Post-2020 Climate Change Target.</p> <p>15/5 Submission on Electricity Demand and Generation Scenarios prepared by MBIE, encouraging their use of a higher uptake of geothermal energy given its favourable cost and readiness.</p> <p>15/5 Submission on draft Major Hazards Regulations, pointing out the significant effect of a change in standards in bringing all geothermal binary cycle plant under the Major Hazards category with most subject to major safety cases.</p>
<b>Geothermal Marketing Messages</b>	<p>Educational material will be developed for schools and universities.</p>	<p>Spence McClintock has provided some educational material which has been edited by GNS and added to the website.</p>
<b>Research and Development Direction</b>	<p>NZGA will shepherd and guide geothermal research through representation on key committees and discussions with officials and internally. Initial focus will be on deep geothermal and scaling issues, and the de-risking of investments.</p>	<p>Not progressed this year.</p>
<b>Review of Training Requirements</b>	<p>Information and Education Subcommittee should meet to set its own terms with a view to high level direction for NZGA, and to develop broad industry training strategies. Training and currency of information is critical in an expanding industry with ongoing development. We want to proactively encourage school leavers to consider geothermal options, whether through trades or university studies. This applies to electricity generation, heat supply and heat pump applications.</p>	<p>Juliet Newson has developed a paper.</p>
<b>Geothermal Interest Groups</b>	<p>Geothermal is a broad topic and our members have specific interests within this. Various</p>	<p>Geothermal Heat-pump Association of New Zealand – Leader = Brian Carey (on Board). 46 members. Active programme supported by GNS Science with own newsletters, national meetings, web pages. Has developed</p>

	<p>interests are to be grouped around NZGA Board members who will look at taking these interests forward for the benefit of the sector. The intent of these groups is that they enable a large and mobilised membership, with interests duly represented and addressed.</p>	<p>a GHP Guide and a database on users with EECA funding. Was working on the development on a joint Aus/NZ standard. Members have helped with establishment of the Australasian chapter of IGSPHA. High profile seminars have been held in Christchurch.</p> <p>Environment and Legislation – Leader = Noel Kortright. 67 members. Has been active in preparation of submissions for NZGA e.g. on Northland RPS. The group has been encouraged to prepare papers for WGC and Workshops. Noel took leadership of a WGC policy short course.</p> <p>Generation and Industrial – Leader = Chris Mann (on Board). 77 members. Has promoted various targeted workshops. Group was used as a sounding board for EDGS submission. Members have been encouraged to prepare papers for WGC and Workshop.</p> <p>Service Providers and Finance – This group has now been wound up.</p> <p>Education and R&amp;D – Leader = Sadiq Zarrouk (on Board). 56 members.</p> <p>Smaller Scale Direct Use – Leader = Mike Dunstall. 43 members. This group may be merged with the Generation &amp; Industrial group</p> <p>Tourism – Leader = Trudy Stuart (Board observer). 35 members. Currently developing a database of potential members and linked utilisation map.</p> <p>Iwi and Landowner – still needs a leader. 56 people are interested in this group.</p> <p>Women in Geothermal (WING) – this group is external to NZGA, but has Board representation. NZGA assisted with handling of finances in the leadup to WGC and has subsequently reimbursed the surplus.</p>
<b>Broadening Geothermal Base to Tourism</b>	<p>Our members include landowners and varied businesses including tourism. This aspect should be more prominent.</p>	<p>An Observer position has been established on the Board to help further this interest group. Trudy Stuart is now leading this group. A database on possible members is in development. An interactive map showing location of activities is online (see <a href="http://data.gns.cri.nz/geothermal/index.html">http://data.gns.cri.nz/geothermal/index.html</a> )</p> <p>Whakarewarewa Thermal Village Tours was added as a Corporate member in 2015.</p>
<b>Geothermal New Zealand Initiatives</b>	<p>There are great opportunities for international growth and NZGA can facilitate some of the efforts aimed at a more integrated approach and assist with provision of useful information.</p>	<p>NZGA continues to support Geothermal New Zealand as it progresses its agenda.</p> <p>Very strong links to Indonesia, Philippines, Kenya and Chile plus small island states are being forged by GeoNZ.</p> <p>Brian White advised GeoNZ of international conference activities.</p> <p>Brian White and Brian Carey cooperated with Mike Allen and NZTE in activities related to marketing through WGC 2015.</p> <p>19-21/8 IIGCE 2015, Jakarta, Indonesia - Several New Zealand companies joined in the Indonesian national geothermal conference.</p> <p>15/10 Brian White and Mike Allen were presenters at a meeting of New Plymouth oil and gas service providers on national and international geothermal opportunities</p>
<b>Strong Links with the International Geothermal Community</b>	<p>Our members need to be linked with international leaders in geothermal thought and their ideas and projects.</p>	<p>NZGA has 3 members (reducing to 2 nominated members this year) on the IGA Board and provides some assistance to these members. Of these, Juliet Newson is currently President of IGA.</p> <p>GNS Science acts as a link point for IPGT and IEA.</p> <p>Members are made aware of core conferences.</p> <p>Marketing opportunities are directed through GeoNZ.</p> <p>See later discussion of World Geothermal Congress 2015.</p>

		<p>26/11 Meeting with a Chilean delegation led by their Ambassador to New Zealand to discuss geothermal policy and investment.</p> <p>3/12 Brian Carey presented a country update paper at the Pertamina annual conference, Jakarta, Indonesia.</p> <p>5/12 John Burnell met with Japanese geothermal policy researchers.</p> <p>8-9/12 Malcolm Grant represented New Zealand at a meeting in Bonn, Germany on classification of geothermal reserves/resources.</p> <p>26/1/15 Meeting with Ambassador of Indonesia Hose Tavares and Kevin Faure (GNS Science) on New Zealand involvement in the Indonesian geothermal industry.</p> <p>26/2 Meeting with Hakan Armagan (Fullbright Fellow) on renewable energy and environmental policies.</p> <p>16/3 Meeting with Reza Rajasa (Arthindo) and Adam McConnochie to outline the New Zealand geothermal scene.</p> <p>April NZGA was a co-host of WGC2015. A short course and field trips were held in New Zealand. New Zealand Ministers (Hon Simon Bridges and Hon Te Ururoa Flavell) hosted international visitors at industry networking events both in Melbourne and in Rotorua.</p> <p>30/4 HERA AGGAT Global conference, Auckland.</p> <p>8/6 Meeting with MFAT and the National Energy Council of Indonesia at the Indonesian Embassy, Wellington.</p> <p>11/8 NZGA was represented at a 40<sup>th</sup> Anniversary ASEAN reception, Wellington.</p> <p>17/9 Meeting with TY Chen, Taipei Economic and Cultural Office, Wellington on NZ geothermal development environment.</p>
<p><b>World Geothermal Congress 2015</b></p>	<p>NZGA should provide necessary support for the joint NZ/Aus World Geothermal Congress 2015. The Association will work with New Zealand geothermal interests to ensure that they are fully aware of the event and are planning to maximise the benefits of this international conference with New Zealand field trips.</p>	<p>Leadership of the Organising Committee: Barry Goldstein – Chair, Jim Lawless – Vice Chair.</p> <p>The Organising Committee, Steering Committee (IGA) and Arinex organised the Congress. NZGA provided specific assistance around financial matters for New Zealand field trips and short course. Note that Jim Lawless received some NZGA assistance with costs.</p> <p>NZGA representatives attended a joint Organising/Steering Committee meeting in Melbourne in March 2014, but all other OC meetings were teleconferences, on a monthly basis toward the end.</p> <p>There were a record number of papers and record number of parallel sessions across the 5 days (20-24/4). The exhibition space was sold out. Short courses proceeded with some IGA underwriting. A variety of field trips were held including three in New Zealand. Opening and closing ceremonies included strong cultural elements, with New Zealand represented at both by delegates representing Whakarewarewa and Te Puia. A Melbourne Declaration was signed by key members and wider endorsement will be sought. 1,600 people from 76 countries finally registered – New Zealand had 243 delegates, Indonesia 130, USA 126, Philippines 118, Iceland 113, Australia 105 (having almost doubled from early bird closeoff), etc.</p> <p>New Zealand had a high profile through the event with Minister Simon Bridges taking part in the opening ceremony, and hosting a special lunch on the Tuesday. NZTE helped to coordinate an award-winning Geothermal New Zealand exhibition space in a prime location. A New Zealand Trade Commissioner participated in the closing ceremony. A programme of events was planned through the conference period and following (including a well-attended Women in</p>

		<p>Geothermal event). A key event was a Rotorua function held on Monday 27 April, hosted by Minister Te Ururoa Flavell who was joined by Minister Simon Bridges. New Zealand field trips were followed by an AGGAT conference in Auckland.</p> <p>NZTE under Cate Hlavac, co-funded an NZ Inc exhibition area (an NZ pavilion), developed collateral material, facilitated a media session with Minister Bridges and other spokesmen, and worked with other Government departments to maximise value and VIP interaction, including stimulating Australian government participation. NZGA provided direct input to the officials committee for documents and guest lists, and also assisted with organising NZ shirts for a team appearance.</p> <p>For details see – <a href="http://wgc2015.com.au/">http://wgc2015.com.au/</a></p>
<b>INTERMEDIATE PRIORITY</b>		
<b>Website Update</b>	<p>The website will be continually updated to include latest studies and information. Some of the tasks below reflect current weaknesses in the website and NZGA's knowledge base. This is one of the principal means by which we educate the public and inform our own members. A 'members only' area will be developed.</p>	<p>The site is hosted by the Royal Society NZ which has regularly increased disk space with site development. The site is regularly updated.</p> <p>The GHANZ section has been particularly developed and could be a model for other interest groups.</p> <p>Average readership – 140 visits/day (28% NZ, 21% USA, 13% China, 5% France, 3% Great Britain, 3% Australia, 3% Germany, 2% Philippines, 2% Japan, 2% Russian Federation, 2% South Korea, 2% Netherlands, 2% Canada, etc).</p> <p>There is strong interest in NZGA, education pages, our fields, market structure, newsletters, electricity generation, GHANZ, our company capabilities, submissions and seminar papers.</p> <p>A Board-only area has been created.</p>
<b>Annual NZGA Seminar and the New Zealand Geothermal Workshop</b>	<p>These will be the premier national industry events for information dissemination and networking. This is part of pro-actively promoting geothermal to potential users and the public, as well as broadening understanding of our own members and the international geothermal community.</p>	<p>The 2014 Workshop was held in Auckland 24-26 November, and was well attended. As usual, NZGA coordinated an 'Industry Update' session on the final day. The Workshop organisers gave a 50% discount to NZGA Life Members to facilitate their involvement.</p> <p>NZGA presented a trophy for an "innovation" paper.</p> <p>NZGA planned to have a combined mid-year meeting with ESONet associations but this was cancelled due to lack of funding for ESONet.</p> <p>The 2015 Workshop will be held in Taupo, 18-20 November.</p>
<b>Geothermal Short Courses</b>	<p>Short courses can give a broad overview of geothermal energy for consenting agencies, developers and other interested parties. This assists development directly. Policy and industry overview meetings are still required</p>	<p>Short courses have been arranged in connection with WGC 2015 with strong leadership from NZ.</p> <p>Short courses have also been arranged as part of the Geothermal Workshop.</p> <p>The NZGA is looking to support Ralph Winmill/Contact in the preparation of a Well Control Course as a supplement to O&amp;G drilling courses to focus on correct control of geothermal wells.</p>
<b>Conference Representation</b>	<p>Actively seek conference speaking slots for geothermal representatives so that the wider community can know about geothermal energy.</p>	<p>This activity is constrained by budget. International opportunities are passed to GeoNZ or other volunteers. NZ had over 250 delegates at WGC2015 – similar to the number attending national conferences.</p>
<b>Salary and Retirement Survey</b>	<p>A recommended outcome of the Skills report was that a collaborative approach should be taken to benchmarking NZ</p>	<p>This activity was suggested in the Board Strategy review but has not been progressed.</p>



	salaries with a view to international competitiveness, and attracting international expertise. A survey that also looked at impending retirements would further define skills requirements.	
<b>Awards and Honours</b>	A function of NZGA is to recognise significant achievement by members. One aspect of this is awarding of Life Memberships	<p>An “Innovation” trophy for a Workshop paper was presented 2014.</p> <p>The Board endorsed Juliet Newson’s nomination for President of IGA, and she was later elected to this role.</p> <p>The Board has nominated Malcolm Grant to a Royal Society of New Zealand fellowship, and will continue to push this in coming years.</p> <p>Mike O’Sullivan was made a Life Member starting this 2015/16 year.</p> <p>The Board is now considering new awards identifying the past and present pioneers of the industry.</p>
<b>Geothermal Regulations</b>	Current Codes, Regulations and Acts are dated and require revision	<p>NZGA led a revision of NZS 2403 Code of Practice for Deep Geothermal Wells, which has subsequently passed through Standards New Zealand internal and external processes, was then revised into a plain English version with a view to international adoption, and has now been published as the revised NZS 2403:2015 Code. Standards New Zealand released this at WGC 2015.</p> <p>A committee has been set up under the Board to focus on health and safety regulations.</p> <p>MBIE with WorkSafe New Zealand will enact health and safety legislation and finalise a tranche of ‘major hazards’ regulations. Geothermal regulation revision (other than immediate minor changes) will be postponed until 2016/7. Linked to this, MBIE met with interested industry representatives from around the world at WGC to discuss relevant issues.</p> <p>NZGA made a submission on whether binary cycle plant should be considered a class of Major Hazard facilities or not in July 2014 then again in May 2015. The May submission was followed by a joint industry meeting (including Electricity Engineers Association, NZGA, Contact, Mighty River Power, WorkSafe and MBIE) on 17/7 but was unable to get movement so that most geothermal binary cycle plant will be classed as major hazard facilities. NZGA has subsequently facilitated meetings on sites with a combined Worksafe Major Hazards/High Hazards team.</p>
<b>Geothermal Drilling Report</b>	Continuing a suite of geothermal reports, a report will be prepared on geothermal drilling and well design outlining current practice, costs, differences between conventional fields and EGS developments, new areas of development and issues to be addressed by industry	<p>MB Century researched this drilling topic, but found good material available on the web:</p> <p><a href="http://www1.eere.energy.gov/geothermal/pdfs/drillinghandbook.pdf">http://www1.eere.energy.gov/geothermal/pdfs/drillinghandbook.pdf</a> . Brian White has gained permission for website links to this Sandia document.</p>
<b>Development Guideline Report</b>	While large generators can handle their issues, there may be a large number of issues faced by small generators. This will provide a beginners guideline to geothermal development.	<p>This was discussed with MBIE who were looking for a means to support iwi aspirations. This also gained support from the previous Minister of Energy and Resources.</p> <p>A revised concept was developed around direct heat use through Grow Rotorua, with Government support in principal but later abandoned by Grow Rotorua.</p>

<p><b>Geothermal Heat Pump Studies</b></p>	<p>Heat pumps are now entering the New Zealand market. Initial indications are that, for large domestic loads (including water heating) and above, this option is competitive with other common heating options so could be a significant contributor to our national energy future. There is still a need for resource information in the top 100m around NZ.</p> <p>Efforts should also be directed at raising the profile to help with uptake.</p>	<p>GNS Science is reporting on Heat Pumps as part of their Low Enthalpy research program.</p> <p>A geothermal heat pump group (GHANZ) has been established as an interest group under NZGA and this has developed a website to inform the public. A Technical Guide has been finalised. Various public meetings have been held.</p> <p>Heat pumps form part of a wider GeoHeat Strategy discussion which GNS Science and NZGA are facilitating.</p>
<p><b>Memorabilia and Industry Archive Facilitation</b></p>	<p>It is recognised that key information and equipment could be lost if an industry archive is not established. The NZGA should facilitate discussions to collect and preserve this pioneering material.</p>	<p>Paul Bixley followed up individuals after Basil Stillwell's funeral and has contacted Archives New Zealand around archiving personal material.</p> <p>Geothermal colleagues and friends attended funerals for Russell James (January) and Dick Glover (June).</p> <p>Andy Bloomer has been working with MB Century on video archives.</p> <p>Brian White and Isabelle Chambeftort have prepared a TVZ geothermal history for a Geothermics Special Edition.</p>