

## **SUBMISSION ON EECA'S 2018/19 LEVY FUNDING PROPOSAL AND RELATED WORK PROGRAMME**

**TO: ENERGY EFFICIENCY AND CONSERVATION AUTHORITY**

**SUBMITTER: NEW ZEALAND GEOTHERMAL ASSOCIATION**

### **INTRODUCTION**

1. This is a submission by the New Zealand Geothermal Association (NZGA) on the Energy Efficiency and Conservation Authority's (EECA) Consultation on EECA's 2018/19 levy funding proposal and related work programme. We have liaised with the Geothermal Heatpump Association of New Zealand (GHANZ) in the preparation of this submission.
2. NZGA is an independent, non-profit association that provides information on geothermal resources and utilisation for industry, government, tourism, cultural and educational organisations. As a member of the International Geothermal Association, NZGA contributes to the international exchange of information within the geothermal development industry. NZGA membership comprises participants, regulators, and interested parties within the geothermal community. It totals 293 members currently.
3. NZGA submitted in December 2016 that geothermal energy was not prioritised in EECA's 2017/18 work programme. We note that geothermal energy, as a key New Zealand renewable energy resource, is again not prioritised in EECA's proposed work programme for 2018/19.
4. We submit that geothermal energy should be recognised and provided for by EECA in its 2018/19 work programme.

### **THE ROLE OF GEOTHERMAL ENERGY IN NEW ZEALAND AND FOR EECA**

5. Geothermal energy is the second largest primary energy supply in New Zealand, having surpassed gas in 2015, and only presently being exceeded by oil.
6. The newly elected government's climate change goals (including a Zero Carbon Act and Independent Climate Commission, investing in regional resilience and adaptation to climate change, a net zero emission economy by 2050, 100% renewable electricity target by 2035) give a strong indication that geothermal heat will be a cornerstone of New Zealand's energy sources in the future.
7. Figures 1 to 3 in this document highlight the areas where geothermal energy can make a direct contribution to EECA's programmes, interventions, outcomes and goals. While electricity markets are outside EECA's scope, geothermal energy can contribute to home and business heating through the use

of geothermal heat pumps right throughout New Zealand, and in other areas through the use of warm and hot aquifers. Geothermal energy can also contribute process heat to industry, particularly through the Taupo Volcanic Zone and near Ngawha in Northland whilst geothermal heat pumps can contribute heat to industry and the commercial sector across New Zealand. With such a broad range of utility, the geothermal energy industry has strategic importance to New Zealand, and should be better championed through EECA.

8. Geothermal energy contributes to two of EECA's three priority areas:
  - Renewable and efficient use of process heat; and
  - Innovative and efficient use of electricity (through beneficial electrification, such as geothermal heat pumps which reduce peak loads, reduce energy demand and reduce carbon-intensity of supplied energy, and indirectly as geothermal energy will help meet the 90% renewable electricity targets by 2025 and 100% by 2035).
9. Geothermal energy can make a major contribution to Lower Carbon Business (where EECA plans to invest most significantly), lower Household Energy Use and to lower Commercial Buildings' energy use.
10. We recommend that the following areas (which are currently proposed not to be funded from the levies or are only partially funded from the levies) are identified for funding of geothermal activities:
  - Government leadership in renewable heat;
  - Engagement and information provision to low carbon businesses and large energy users;
  - A process heat action plan (aligning with the Geoheat Strategy); and
  - Technology demonstrations.

## **NZGA'S KEY POINTS**

11. We would like to raise and discuss the following main points (before responding to the specific consultation questions from the Consultation document):
  - I. 2018 is a key year for the implementation of the Geoheat Strategy.
  - II. Geothermal Heat Pumps can contribute to EECA's objectives.
  - III. More data on direct use of geothermal heat is needed.
- I. 2018 IS A KEY YEAR FOR THE IMPLEMENTATION OF THE GEOHEAT STRATEGY**
12. The Geoheat Strategy for Aotearoa NZ was launched in 2017 to stimulate investment in the direct use of geothermal energy at the commercial and industrial level. The Strategy was funded by the NZGA, with technical input from GNS. It is a national framework and its implementation is now underway, with the establishment of a volunteer-based Governance Group coordinated by the NZGA.
13. In 2018, a programme to promote the Geoheat Strategy is required to increase awareness of the benefits and opportunities available with geothermal energy. This implementation will be driven by the Governance Group and through a number of new members who have agreed to assist with its implementation on a voluntary basis.
14. EECA programmes which Geoheat Strategy projects align well with are:
  - Public sector initiatives

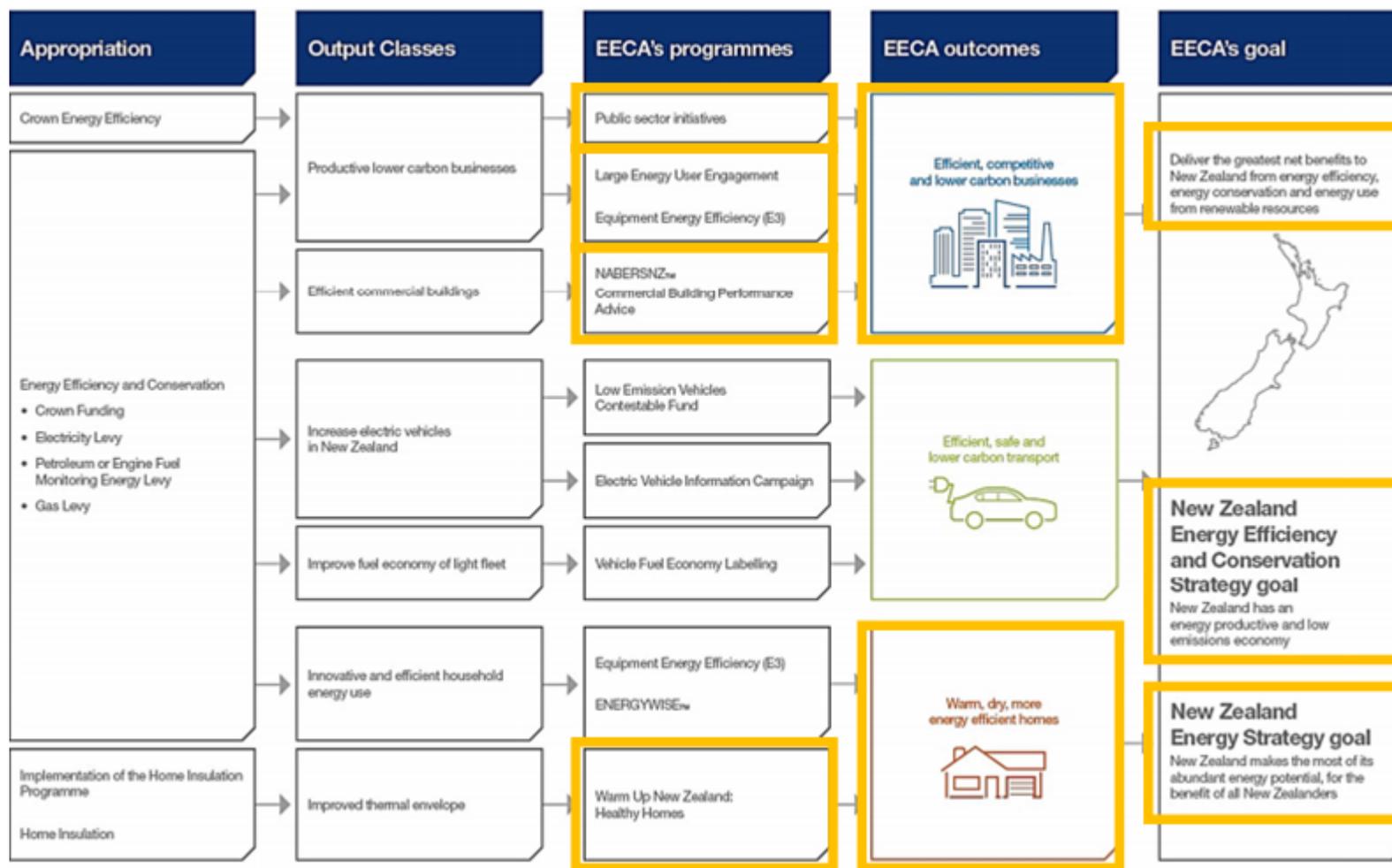
- Large Energy User Engagement
  - NABERSNZ
  - Technology demonstrations
15. Direct geothermal use is also being promoted through the Bay of Connection's Energy Strategy, which is closely aligned to the GeoHeat Strategy, but with a regional focus. A new Geothermal Business Development Lead role has been established to deliver objectives, and is jointly funded by MBIE, Bay of Connections and industry partners, including \$10,000 from NZGA. Longer term this initiative may be extended more widely.

## II. GEOTHERMAL HEAT PUMPS CAN CONTRIBUTE TO EECA'S OBJECTIVES

16. Geothermal Heat Pumps can align with and contribute to EECA's proposed programmes and outcomes for residential, commercial and process heat.
17. Benefits of ground and water source heat pumps include:
- More efficient heating and cooling than all alternative heating and cooling systems (including air source heat pumps)
  - Not impacted by cold winter conditions as are air source heat pumps
  - Contribute to New Zealand's climate change goals by reducing the use of carbon based fuels and increased resilience through diversity of sources of energy
  - Innovative, world-leading technology supported by skilled designers and installers is attracting a growing number of international experts to New Zealand
  - Can be developed in a range of sizes, and especially attractive commercially for larger scale or high occupancy premises.
  - Geothermal heat pumps can form the basis of high-efficiency district heating and cooling systems. These are being developed in a number of European Cities where the focus on city wide energy systems is driving very significant reductions in city carbon footprints.
18. GHANZ will soon initiate a review of its 2014-2017 Strategic Action Plan. It anticipates that this will include alignment with the following proposed EECA programmes:
- Public sector initiatives
  - Large Energy User Engagement
  - NABERSNZ
  - Technology demonstrations
19. The strategic initiatives discussed above are consistent with the Government's renewable energy and climate change targets and are well aligned with some of EECA's priorities. As such they may serve as a catalyst for further discussion between the NZGA, EECA, industry and local government. The NZGA, in collaboration with GHANZ, would like to discuss opportunities for EECA to provide support, either through advocacy, advice, or co-funding of initiatives.

### **III. MORE DATA ON DIRECT USE OF GEOTHERMAL HEAT IS NEEDED**

20. There is currently limited data on direct use of geothermal heat (particularly in the commercial and residential sectors), with existing published information being limited to surveys and assumptions. Regional councils are now investing in measurement programmes which will help to understand more closely the exact usage. This will include improved understanding about energy requirements, and will involve working directly with users to determine their energy needs and options for more efficient use.
21. Reliable audit data on direct heat use would contribute to outcomes identified by EECA, including those related to energy in commercial buildings and home heating.



**Figure 1** Highlighted areas (orange boxes) where geothermal energy contributes to EECA's 2017/18 programmes, outcomes and goals (adapted from EECA's 2017/18 outcome framework).

EECA Intervention	2018/19 levy request		
	PEFM levy	Electricity Industry Levy	GSMEEL levy
Low Emission Vehicles Contestable Fund	\$7.0 million	-	-
EV information campaign	\$0.5 million	-	-
E3 Programme – Residential products energy efficiency standards and regulations	-	\$1,552,723	-
E3 Programme – Business products energy efficiency and standards regulations	-	\$1,035,148	\$54,609
Large energy user engagement programme	-	\$2,124,419	\$1,054,740
Technology demonstration programme	-	\$206,185	\$190,651
NABERSNZ	-	\$281,525	-
<b>Energy levy total</b>	<b>\$7.5 million</b>	<b>\$5.2 million</b>	<b>\$1.3 million</b>
<b>Total levy funding proposal for 2018/19</b>	<b>\$14 million</b>		

**Figure 2** Highlighted areas (orange boxes) where geothermal energy should be part of EECA’s 2018/19 interventions (adapted from EECA’s 2018/19 levy-funded programmes).

	Total fully allocated cost per project	(as per 17/18 Forecast)										Total Cost with movement in Commitments included			Levy funding allocated Pro-Rata (except for PEFM levy)					
		Electricity Industry Levy activities		GSMEEE Levy activities		PEFM Levy activities		Non-Levy related activities		Commitments brought forward			Commitments carried forward			Electricity Industry Levy activities	GSMEEE Levy activities	PEFM Levy activities		
		%	\$	%	\$	%	\$	%	\$	Electricity Industry Levy activities	GSMEEE Levy activities	PEFM Levy activities	Electricity Industry Levy activities	GSMEEE Levy activities	PEFM Levy activities					
<b>Thermal Envelope</b>																				
Thermal Performance post 30/06/18	2,044,098						100%	2,044,098												
Energywise	2,400,787						100%	2,400,787												
	4,444,885		0		0		0	4,444,885					0	0	0		0	0	0	
<b>Household Energy Use</b>																				
Energywise	1,028,909						100%	1,028,909												
Standards and Regulations (including E3)	2,317,597	95%	2,201,717	0%			5%	115,880					2,201,717				1,552,723			
	3,346,506		2,201,717		0		0	1,144,789					2,201,717	0	0		1,552,723	0	0	
<b>Electric Vehicles</b>																				
Electric Vehicles - CF	7,508,290						100%	7,508,290											7,000,000	
Electric Vehicles - IC	1,725,483						100%	1,725,483											500,000	
	9,233,773		0		0		0	0					0	0		9,233,773	0	0	7,500,000	
<b>Light Fleet</b>																				
Transport Strategy & Development	298,407						100%	298,407												
VFEL	359,355						100%	359,355												
	657,762		0		0		0	657,762					0	0		0	0		0	
<b>Lower Carbon Business</b>																				
Govt Leadership in Renewable Heat	130,369						100%	130,369												
Standards and Regulations (including E3)	1,545,064	95%	1,467,811	5%	77,253		0%					1,467,811	77,253				1,035,148	54,609		
Engagement and Information: Low Carbon Business	1,317,123						100%	1,317,123												
Process Heat Action Plan	860,173						100%	860,173												
Large Energy Users	7,593,771	51%	3,872,823	15%	1,139,066		34%	2,581,882	(2,819,735)	(626,608)		1,959,279	979,640				2,124,419	1,054,740		
Technology Demonstrations	795,958	27%	214,909	23%	183,070		50%	397,979	(110,217)	(86,599)		187,672	173,236				206,185	190,651		
Industry Development	709,708						100%	709,708												
Public Sector/Crown Loans	655,782						100%	655,782												
	13,607,948		5,555,543		1,399,389		0	6,653,016				4,772,542	1,839,058	0			3,365,752	1,300,000	0	
<b>Commercial Buildings</b>																				
Commercial Building Performance	227,132						100%	227,132												
NABERSNZ	498,994	80%	399,195	0%			20%	99,799				399,195					281,525			
	726,126		399,195		0		0	326,931				399,195	0	0			281,525	0	0	
<b>Total to be expensed in 18/19</b>	<b>32,017,000</b>		<b>8,156,455</b>		<b>1,399,389</b>			<b>9,233,773</b>	<b>(2,929,952)</b>	<b>(713,207)</b>	<b>(2,670,834)</b>	<b>2,146,951</b>	<b>1,152,876</b>	<b>2,670,834</b>	<b>7,373,454</b>	<b>1,839,058</b>	<b>9,233,773</b>	<b>5,200,000</b>	<b>1,300,000</b>	<b>7,500,000</b>
Less Levy expenditure related to commitments made and funded in prior years			2,929,952		713,207			2,670,834												
18/19 Levy activities expensed in year			5,226,503		686,182			6,562,939												
Add: 18/19 Levy activities contractually committed in year but not expensed in year (funding held in retained earnings)			2,146,951		1,152,876			2,670,834												
<b>Total cost of 18/19 Levy related activities</b>			<b>7,373,454</b>		<b>1,839,058</b>			<b>9,233,773</b>												
<b>2018/19 Funding breakdown</b>																				
Levy Appropriations			5,200,000		1,300,000			7,500,000												
EECA Baseline Appropriation			2,173,454		539,058			1,733,773												
			<b>7,373,454</b>		<b>1,839,058</b>			<b>9,233,773</b>												

Figure 3 More detailed breakdown of areas (orange boxes) where geothermal energy should be part of EECA's 2018/19 programmes (adapted from EECA's proposed 2018/19 draft work programme and forecasted budget).

## RESPONSES TO SPECIFIC QUESTIONS IN THE CONSULTATION DOCUMENT

### 1. What kinds of engagement have you or your organisation had with EECA?

NZGA has taken some initiatives over the last few years to forge a closer partnership arrangement with EECA, given our complimentary nature, with EECA being tasked with delivering benefits from renewable energy sources, and our organisation being the New Zealand representative body for geothermal energy.

NZGA regularly comments on issues and on Annual Reports and participates in consultation exercises like this one.

EECA has assisted with funding reports on direct use, heat pumps and on the distributed energy role of geothermal energy, which has been gratefully received. EECA has also provided some funding to the annual industry conference run by the University of Auckland.

We are keen to rekindle and build on this partnership opportunity.

### 2. What forms of energy do you or your organisation use, and which levies do you pay?

NZGA advocates for wider use of geothermal energy, including for electricity generation, industrial geothermal direct heat use, commercial and domestic geothermal space and water heating. With such a diverse membership, some of our member organisations (and key sponsors) will pay all levies, but in particular the Electricity and Gas Levies.

### 3. EECA's proposed levy-funded work programme in 2018/19 will request funding from the three energy levies set out in question 2. Do you support EECA's levy proposal for \$14 million in 2018/19?

Overall, we support EECA's request for funding. However, we note that EECA has been enabled by Cabinet to recover \$17.5m (page 14 of the discussion document) but has only chosen to recover \$14m.

There are some areas that appear to be inadequately funded (e.g., Technology Demonstrations (\$800k) and Industry Development (\$700k)) for which geothermal applications can be found.

### 4. Do you support the proportions EECA has requested across the three energy levies?

NZGA notes the methodology used and the choice to fund certain activities from general appropriations. Table 1 overleaf compares appropriations for 2017/18 and those proposed for 2018/19.

It is apparent that the absolute value of Electricity and Gas Levy appropriation has been retained while the fuel levy has been increased by \$1M (and the logic for the fuels' increase has been explained in terms of bringing \$1M forward from future years for a contestable fund). Given that the Electricity and Gas levies feed into the under-resourced Technology Demonstration and Industry Development programmes, then an increase to the previously accepted proportions for the Electricity and Gas Levies could be justified in our view.

**Table 1** EECA appropriations for 2017/18 and 2018/19

Levy	2017/18		2018/19	
	% of total	Value (\$M)	% of total	Value (\$M)
Electricity Levy	40	5.2	37	5.2
Gas Levy	10	1.3	9	1.3
Petroleum or Engine Fuel Monitoring Levy	50	6.5	54	7.5

**5. Which of EECA’s levy-funded activities is of most interest to you?**

**Electric Vehicles (EV) Programme**

Many of our members are involved with the production of electricity. As such, promotion of electric vehicles will help to grow the electricity market and allow renewable energy to displace fossil fuels. We support funding for this area, including for both the private and the public transport sector.

**Large energy user engagement programme**

There can be a close meshing between EECA’s large energy user engagement programme and the Geoheat Strategy. We would like to closely collaborate with EECA (both in terms of potential monetary and staff resources) in the implementation of the Geoheat Strategy through this programme.

**Technology demonstration programme**

This programme could benefit both the Geoheat Strategy and the Geo Heat Pump Strategy. We would like both of these strategies to specifically benefit from the programme.

**NABERSNZ**

This programme could benefit both the Geoheat Strategy and the Geo Heat Pump Strategy. We would like both of these strategies to specifically benefit from the programme.

**6. Do you support the mix of levy-funded activities listed above?**

NZGA supports the funding of the activities proposed but submits that vital activities are missing from the proposal, in that specific geothermal initiatives as outlined above are not referenced.

**7. Are there any new activities or specific sectors that you think EECA should invest more or less levy funding in for 2018/19, and in the future?**

We have pointed out that monitoring was originally a specific element of the levies. As such we would like to see collaboration around use data capture.

While we have suggested that the Geoheat Strategy and the Geothermal heat pump initiatives could be brought specifically under the general programmes outlined by EECA, specific support may need to be given by EECA outside these planned programmes.

We consider that there should be further consideration of opportunities for the direct use of geothermal energy for home heating, which is consistent with EECA’s goals around healthy homes. While resource sustainability is an issue that needs to be carefully managed in some geothermal systems (e.g. Rotorua), there is considerable potential for wider use of direct geothermal heat or GSHPs for home heating. Some of the obstacles to this wider use include affordability, lack of information

about available technology, and the lack of visibility of successful business models, particularly for domestic schemes.

Partnership/multi-agency initiatives could potentially help minimise these obstacles, especially for greenfield developments, and could result in significant social and cultural benefits (e.g. partnerships with regional and district councils, iwi and other public sectors).

**8. Do you agree that EECA's levy-funded activities result in benefits for New Zealand businesses and consumers in:**

- **Reducing greenhouse gas emissions**
- **Reducing engine fuel consumption**
- **Improving energy productivity**
- **Improving electricity efficiency**
- **Improving gas efficiency**
- **Encouraging, promoting, and supporting energy efficiency, energy conservation, and the use of renewable sources of energy?**

NZGA considers that the proposed activities to be funded do result in these benefits.

However, the promotion of increased usage of geothermal energy will help New Zealand meet these objectives more effectively through:

- the use of a low emissions renewable form of energy;
- substitution of current fossil fuel transport fuels with electric vehicles; and
- the use of efficient technologies such as geothermal heat pumps.

NZGA would like to see more encouragement, promotion or support from EECA for geothermal energy in general, and direct use in particular.

**9. Would you like to provide any other comments on EECA's 2018/19 levy proposal and activities?**

In the New Year, I will be in touch to seek a meeting with EECA Chief Executive, Andrew Caseley, to introduce myself as the new President of NZGA, and to discuss opportunities for our respective organisations to continue to work closely together.

**Date:** 15 December 2017



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