

12 March 2019

ECOBULB[®]

**ANNUAL \$570 MILLION ELECTRICITY SAVING POTENTIAL :
ELECTRICITY PRICE REVIEW OPTIONS PAPER SUBMISSION**



1. EXECUTIVE SUMMARY

Thank you for the opportunity for Ecobulb Limited to submit feedback about the options listed in the 18 February 2019 “Options Paper for discussion” for the “Electricity Price Review”.

Energy efficient lighting is a low-cost way to reduce consumer energy bills. It is also an effective way to reduce the electricity network peak load and electricity sector carbon dioxide emissions, because light bulbs are on at peak times. However, unlike Australia, there has been little Government funding for energy efficiency lighting in New Zealand over the last ten years.

Replacing all the inefficient light bulbs in New Zealand homes with efficient LEDs would deliver **41 times greater energy savings** than the “Warmer Kiwi Homes” program for approximately the **same funding**.

Our submission therefore outlines our proposal for a New Zealand wide Home Efficient Lighting Project (“2HELP”). 2HELP addresses three options listed in Options Paper through reducing energy hardship and helping prepare for a low-carbon future.

2HELP would:

1. Involve all New Zealand residential consumers being offered high-quality **free LED light bulbs**.
2. Has been proven in South Canterbury and the King Country, where **73% of the permanent residents** came in to pick-up their **free “Ecobulb¹” LEDs**.
3. Save New Zealand homes an estimated **\$570 Million electricity** per year on their energy bills.
4. Reduce the New Zealand peak load by an estimated **780MW**.
5. Reduce the electricity sector **carbon dioxide emissions by 0.9 million tonnes per year**.
6. Deliver energy savings at **0.3 cents per kWh**, which is approximately **20 times more cost effective** than the average wholesale cost of generating electricity.
7. Require **\$149 Million funding** to replace all the inefficient light bulbs in New Zealand homes.
8. Be **Government funded and administered by EECA**.
9. Have a **three-month payback**, with three months of energy savings for consumers from 2HELP equalling the 2HELP project funding provided by the Government.

The proposed next step is for Chris Mardon (Managing Director, Ecobulb Limited) to meet with the Electricity Price Review Expert Advisory Panel to provide further insight into 2HELP.

If you have any further questions about this Submission, please contact Chris Mardon at chris.mardon@energymad.com or on 021 041 2981.

¹ These projects were delivered by Ecobulb Limited, who, with 21 Million “Ecobulb” energy saving light bulbs installed in an estimated 2.9 million New Zealand, Australian, United States and German homes, is half way to its goal to “Save enough electricity to power New Zealand for one year”.

2. EFFICIENT RESIDENTIAL LIGHTING HAS THE BIGGEST POTENTIAL

Replacing the inefficient light bulbs in New Zealand homes with efficient LEDs is the largest and most cost-effective energy efficiency opportunity in New Zealand, where:

1. Replacing all the inefficient light bulbs in New Zealand homes with the most efficient LEDs would:
 - a. Save New Zealanders an estimated \$570 Million electricity per year on their energy bills;
 - b. Reduce the New Zealand peak load by an estimated 780MW. This 10% national reduction is roughly equal to closing the Huntly coal fired power station;
 - c. Reduce the electricity sector carbon dioxide emissions by 19%, equating to 0.9 million tonnes per year. This is equivalent to taking 370,000 cars off the road.
2. Replacing all the inefficient light bulbs in New Zealand homes with the most efficient LEDs would deliver these energy savings at **0.3 cents per kWh**. This is approximately **20 times more cost effective** than the average wholesale cost of generating electricity;
3. A March 2019 Concept Consulting Report² for EECA calculated a 500MW potential peak load reduction for residential energy efficient lighting.
4. This 500MW potential calculation is lower than the 780W we calculated, because Concept:
 - a. Assumed an LED Wattage of 15W, whereas the bulk of our Ecobulb LEDs are now 7W or less;
 - b. Assumed a slightly different mix of inefficient and efficient lighting;
 - c. Did not take into account any potential heating peak load reductions from reduced heat losses by sealing the downlights; and
 - d. Does not appear to have included the 10% distribution losses, which increase the peak load reduction potential by 10%.
5. The large cost-effective residential energy efficiency lighting opportunity has long been recognised in Australia.
6. As a result, installing residential energy efficient lighting has been the cornerstone activity of large Australian State Government Energy Efficiency and White Certificate programs³ in Victoria, New South Wales, South Australia and the Australian Capital Territory.
7. The largest of these programs is the Victorian Energy Efficiency Target Scheme, where 1.47 Million Victorian homes had all or some of their inefficient light bulbs replaced through (predominantly) door knocking campaigns from 1 January 2009 to 31 December 2017⁴. This was funded by \$354 Million worth of Victorian Energy Efficiency Certificates that were created from these inefficient light bulb replacements.
8. In contrast, there has been little Government funding for residential energy efficiency lighting programs in New Zealand in the last ten years.

² "What is the case for electricity efficiency initiatives?", Concept Consulting Group, March 2019 report for EECA.

³ Approximately 13 million of the efficient light bulbs installed in these Australian programs have been "Ecobulbs" supplied by Energy Mad / Ecobulb Limited.

⁴ "VEET Performance Report 2017", Victorian Energy Efficiency Target Scheme.

9. Instead the New Zealand Government has allocated \$1,810 Million funding allocated for the Winter Energy Payment and \$142 Million funding for the Warmer Kiwi Homes Program.
10. The following table compares the energy savings and economics of replacing all the inefficient light bulbs in New Zealand homes with the most efficient LEDs with the energy savings and economics of the Winter Energy Payment and the Warmer Kiwi Homes programs.

Program	Investment	Lifetime Energy Savings \$	Savings / Investment	Lifetime CO ₂ reductions
100% Residential LEDs	\$149 Million	\$18,200 Million	122	29.2 Million
Winter Energy Payment	\$1,810 Million	\$1,810 Million	1	0
Warmer Kiwi Homes	\$142 Million	\$390 Million	3	0.7 Million

11. Compared to the Winter Energy Payment⁵, the LED replacement delivers:

- 10 times the energy** savings dollars to New Zealanders; and
- A **122 times greater return** on investment when dividing the energy saving dollars to New Zealanders by the Government funding invested; and
- 29.2 million tonnes** of lifetime carbon dioxide emission reductions, versus no emission reductions for the Winter Energy Payment.

12. Compared to the Warmer Kiwi Homes Program⁶, the LED replacement delivers:

- 47 times the energy** savings dollars to New Zealanders; and
- A **41 times greater return** on investment when dividing the energy saving dollars to New Zealanders by the Government funding invested; and
- 29.2 million tonnes** of lifetime carbon dioxide emission reductions, versus 0.7 Million emission reductions for the Warmer Kiwi Homes Program.

13. While the uptake of LEDs is increasing in higher income households, the widespread transformation to efficient residential lighting **will not occur** without Government funding, particularly for lower income groups, because of cost and information barriers⁷.

14. **We therefore believe providing sufficient funding to deliver this residential lighting energy efficiency opportunity should be one of the New Zealand Government's highest priorities.**

15. The following section outlines the proposed 2HELP program to deliver this residential energy efficiency lighting opportunity.

⁵ A four-year Government Program.

⁶ A four-year Government Program.

⁷ This was also evident in the recent South Canterbury and King Country Ecobulb LED projects, referenced in Section 5 of this submission, where the greatest participation came from lower income and elderly groups.

3. 2HELP CONSUMER OFFER

2HELP is a proposed program for all New Zealand residential consumers to receive free high-quality LEDs. 2HELP involves all New Zealand residential consumers:

1. Receiving an offer⁸ to pick-up high-quality **free** LED light bulbs from selected venues on selected dates.
2. Consumers would participate by travelling to the selected venues to pick up⁹ their **free** LEDs.
3. Those consumers who missed out on participating¹⁰ at the venues would be identified and given the chance to participate in 2HELP through a door knocking¹¹ campaign.

THIS VOUCHER ENTITLES YOU TO GET:
5 ECOBULB LEDs FOR FREE**

KING COUNTRY
ELECTRIC POWER TRUST

SAVE UP TO \$930 ON YOUR POWER BILLS*

Redeem at the Taumarunui, Ohakune and Turangi locations listed on the back of this voucher between 9am to 5pm this Saturday 19 January.

Valid 19 January 2019, or while stocks last.

⁸ This offer would be communicated to consumers in each region through some combination of Government, Energy Trusts, Distribution Lines Companies and Electricity Retailer marketing. This offer was proven in the South Canterbury and King Country “*Ecobulb LED*” projects outlined in Section 5 of this submission.

⁹ While at the venues to pick-up their LEDs, these consumers could be offered assistance to switch to better electricity plan deals. These better electricity deals could be accessed through the “*Powerswitch*” website plus a bulk deal negotiated for consumers.

¹⁰ Such as those consumers who were unable to get to the venues.

¹¹ Door knocking to distribute Ecobulb LEDs has recently been tested successfully through trials in Christchurch with the City Mission (to low income homes) and now in Taumarunui with the King Country Electric Power Trust (through the local Iwi).

4. 2HELP BENEFITS FOR THE GOVERNMENT AND NEW ZEALANDERS

2HELP, through replacing all the inefficient light bulbs in New Zealand homes with the most efficient Ecobulb LEDs, would help reduce energy hardship and help prepare for a low-carbon future.

2HELP would deliver the following benefits¹²:

1. Save New Zealand homes an estimated **\$570 Million electricity** per year on their energy bills.
2. Reduce the New Zealand peak load by an estimated **780MW**. This 10% national reduction is roughly equal to closing the Huntly coal fired power station.
3. Reduce the electricity sector **carbon dioxide emissions by 19%**, equating to **0.9 million tonnes per year**. This is equivalent to taking **370,000 cars** of the road.
4. Deliver energy savings at **0.3 cents per kWh**, which is approximately **20 times more cost effective** than the average wholesale cost of generating electricity.
5. Have a **three-month payback**, with three months of energy savings for consumers from 2HELP equalling the 2HELP project funding provided by the Government.
6. Deliver carbon dioxide emission **reductions at \$5 per tonne**.

¹² These benefits are based on 2HELP being delivered by Ecobulb Limited with their most efficient light bulb and downlight replacement Ecobulb LEDs.

5. RECENTLY PROVEN IN SOUTH CANTERBURY AND THE KING COUNTRY

Ecobulb recently delivered regional sized 2HELP through “**Ecobulb**” LED projects with Energy Trusts in South Canterbury and the King Country.

The Ecobulb projects involved consumers of these Trusts received a letter in the post (from the Trust) with an offer to pick-up five free Ecobulb LEDs from selected locations.

The following table summarises the results delivered.

Description	South Canterbury	King Country
Region	South Canterbury	Taumarunui, Turangi and Ohakune
Project Funders	LineTrust South Canterbury and the Energy Efficiency and Conservation Authority	King Country Electric Power Trust
Project Manager	Ecobulb Limited	Ecobulb Limited
Consumer Offer	5 Free Ecobulb LEDs	5 Free Ecobulb LEDs
Ecobulb pick-up dates	27-28 April 2018	19 January 2019
Ecobulb LEDs distributed	45,000 LEDs	34,000 LEDs
% of homes that participated	73% ¹³	74% ¹⁴
Annual energy Savings per home	\$90 pa	\$93 ¹⁵ pa
Regional Annual energy savings	\$1.0 Million pa	\$0.6 Million pa
Peak load reduction projected	1.4MW	0.8MW
Funding provided	\$303,000	\$169,000

EECA’s July 2018 Research (a 300-home telephone survey) of the South Canterbury project found:

1. 73% of South Cantabrians came in to pick-up their free Ecobulb LEDs over the two-day pick-up period.
2. 99% of South Cantabrians who got and installed their Ecobulb LEDs “*Strongly Agreed*” or “*Agreed*” that the free LED offer was worthwhile.
3. The **low income** benefited the most. This was because these households previously had the lowest usage of LEDs.

¹³ Energy Efficiency and Conservation Authority (“EECA”), “*EECA-Led LineTrust Evaluation*”, July 2018.

¹⁴ The participation rate of the permanent residents. A significant portion of the Ecobulb LEDs were distributed after 19 January 2019, because approximately 40% of the homes in the King Country Electric Power Trust region are holiday homes, and because some permanent residents could not make it to the pick-up venues on that day.

¹⁵ The increase in annual energy savings per home from the South Canterbury to the King Country Ecobulb projects was due to an increase in the efficiency of one of the Ecobulb LEDs.

Timaru Herald
Tuesday, April 24, 2018 Casual \$2.00
www.stuff.co.nz

Bulbs giveaway switches on power savings

Ecobulbs Chris Marcus holds a new LED bulb in Great Centre, Peter Stone, Sara Carter and Alison McCracken look on.

AL WILLIAMS
A \$500,000 project is set to light up South Canterbury with low-carbon savings.

ALPINE ENERGY, Christchurch-based Ecobulb and Conservation Authority (ECA) is the first out of 14,000 bulbs.

Lawrence Robinson, Great Centre, says the project is a great example of how to save energy and protect the planet. The project is a great example of how to save energy and protect the planet.

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Free bulbs should save local households lots of money over their life time

A new King Country Electric Power Trust Ecobulb LED Project is set to light up King Country homes and save millions on their power bills over the next 30 years.

The average King Country home could save up to \$300 a year on their power bills over the next 30 years simply by swapping five of their most frequently used, inefficient light bulbs to Ecobulb LEDs, says Adie Doyle, Chairman of the King Country Electric Power Trust.

Tommaso (Stefano), King Country beneficiary of the Trust can save their money for five free Ecobulb LEDs to replace the world first screw in retrofit Ecobulb LED downlight. This downlight reduces the heating and cooling costs by sealing the air gaps found in typical installations. Downlights, without requiring the electrician to install it, are not going to be around the country, we encourage you to give your number to a night hour or friend to collect the Ecobulbs on your behalf," says Adie Doyle.

The Trust's advice is to do your homework before you go to collect your five light bulbs.

Work out which five lights are used the most in your house because this is where the biggest power savings will come from," Adie says.

"When you have decided which bulbs to replace, make a careful note of what kind of fitting they have and whether they have screw threads or are the bayonet type.

"That way you will get the right bulbs and the pick up will be quick and easy," Adie says.

Local RCEPT business Robert Carter, Adie Doyle and Graeme Crawford with some of the free bulbs to be given away tomorrow.

Consumers coming in for their free Ecobulbs at the Timaru Southern Trusts Events Centre



6. ELECTRICITY PRICE REVIEW OPTIONS ADDRESSED BY 2HELP

2HELP addresses three options related to reducing energy hardship and helping prepare for a low-carbon future that are listed in the 18 February 2019 “Options Paper for discussion” for the “Electricity Price Review”.

The following table lists the three relevant options from the Options Paper that 2HELP addresses.

Category	Option	How the Option is met by 2HELP
B. Strengthening the Consumer Voice	B3: Establish a network of community-level support services to help consumers in energy hardship	Through Government funding and contracting to 2HELP partnerships. These 2HELP partnerships reduce energy hardship from the energy savings of the free LEDs.
	B4: Set up a fund to help households in energy hardship become more energy efficient	By Government funding, administered by EECA, to provide free LEDs to cut in-home energy costs.
G. Preparing for a Low-Carbon Future	G4: Improve the energy efficiency of new and existing buildings	From the distribution and installation of the free LEDs provided during the LED distribution events of 2HELP.

7. 2HELP FUNDING

Ideally 2HELP would be rolled out New Zealand wide, with the aim to replace all the inefficient light bulbs in New Zealand homes with the most efficient LEDs.

2HELP could also be delivered on a more targeted scale, through delivering fewer LEDs per home or through focussing on the homes with the greatest energy hardship.

The following table lists four 2HELP LED program options.

Option	Description	Energy Savings pa	Funding Required
1. 100% Replacement	Replacing all the inefficient light bulbs in New Zealand homes with the most efficient LEDs	\$570 Million pa	\$149 Million
2. 10 LEDs per home	Replacing the 10 most inefficient light bulbs in New Zealand homes with the most efficient LEDs	\$299 Million pa	\$79 Million
3. Energy Hardship	Replacing the 10 most inefficient light bulbs, in the 40% of homes with the greatest energy hardship, with the most efficient LEDs	\$120 Million pa	\$31 Million
4. 5 LED offer	Replicating the free five LED offer from the King Country and South Canterbury Ecobulb Projects across New Zealand	\$120 Million pa	\$30 Million

It is proposed the **Government would fund**, and **EECA would administer**, 2HELP.

Providing \$149 Million funding¹⁶ to replace all the inefficient light bulbs in New Zealand homes would deliver:

1. Energy savings at **0.3 cents per kWh**, which is approximately **20 times more cost effective** than the average wholesale cost of generating electricity.
2. **\$122 lifetime savings for New Zealanders for every \$1 invested** in 2HELP.
3. A **three-month payback**, with three months of energy savings for consumers from 2HELP equalling the 2HELP project funding provided by the Government
4. Carbon dioxide emission reductions **at \$5 per tonne**.

¹⁶ Ecobulb notes that **\$149 Million funding** to replace all the inefficient light bulbs in New Zealand homes equates to just 8% of the \$1,810 Million funding allocated for the Winter Energy Payment. This **\$149 Million funding** is also comparable to the \$142 Million funding for the Warmer Kiwi Homes Program.

8. PROPOSED NEXT STEP

The proposed next step is for Chris Mardon (the Managing Director of Ecobulb Limited) to meet with the Electricity Price Review Expert Advisory Panel to provide further insight into:

1. The results delivered from distributing 79,000 free Ecobulbs LEDs during the South Canterbury (two day) and King Country (one day) Ecobulb LED Projects.
2. How the proposed 2HELP project could be delivered nationwide.

9. ABOUT ECOBULB AND ENERGY MAD

Ecobulb is half way to its goal to **“Save enough electricity to power New Zealand for one year”**.

The aim is to complete this goal by replacing all the inefficient light bulbs in New Zealand homes with efficient Ecobulb LEDs.

To date Ecobulb and Energy Mad¹⁷:

1. Developed the ultra-high performance CFL and LED **“Ecobulbs”** that replace incandescent and halogen light bulbs and downlights. Ecobulb LEDs also maximise the peak load reduction and energy savings for New Zealand conditions.
2. Have implemented 40 New Zealand **“Ecobulb”** projects with the Government, Energy Trusts, Lines Companies, Electricity Retailers, 450 supermarket stores and 240 Shell New Zealand stores. 6.0 million Ecobulbs were sold and installed, with **57% of New Zealand homes** purchasing five or more Energy Mad Ecobulbs each.
3. Developed the innovative monitoring methodology to measure the peak load, electricity savings, and carbon dioxide emission reductions arising from the Energy Mad Ecobulb projects. These projects were independently verified to the Clean Development Mechanism of the Kyoto Protocol.
4. Have implemented 82 electricity utility projects in four countries with generators, retailers, lines companies, governments, supermarkets, Shell stations and third-party installers.
5. Supplied energy saving bulbs to **all 8,000 Walgreens** (the world’s second largest retailer) United States stores.
6. Have approximately **21 Million “Ecobulb”** energy saving light bulbs **installed in an estimated 2.9 million** New Zealand, Australian, United States and German homes that are **saving an estimated \$4.1 billion electricity** over their lifetimes.
7. Is half way to its goal to **“Save enough electricity to power New Zealand for one year”**.
8. Was **New Zealand’s fastest growing company** by winning the 2007 Deloitte **“Fast 50”** Award.
9. Have won New Zealand awards for business, energy efficiency, sustainability and clean technology, and innovation.

Further information about Ecobulb and Energy Mad can be found at <http://www.energymad.com/>.

¹⁷ The Energy Mad assets were purchased by Ecobulb Limited, through an Agreement signed on 5 May 2017.