Primary, secondary and manufacturing sectors

Recipient	Project Description	Financial Year(s)	Results	Estimated Annual CO2 Reduction (tonnes)	Estimated Energy Savings (kWh)	EECA co-funding
Fonterra Brightwater Co-firing	Conversion of Brightwater 8MW coal boiler to co-fire with wood chips. The reduction in C02 emissions from fossil fuels would be nearly halved provided the biomass was obtained from renewable sources.	2019/20	The trial was successful and would benefit from a more user friendly fuel handling system. The combustion could have been improved with the addition of an over fire air system. The project also has the potential to be a game changer for wider replication of most coal burning businesses in New Zealand.	2,400 Tonnes	430,000 kWh	$250,000
Synlait	Installation of a 6 MW electrode boiler at the Dunsandel dairy plant to generate 10 bar steam.	2019/20	This project reduced a significant amount of C02 as it decarbonised a large-scale process heat operation. There is also no need for electrical power to run fans and soot blowers that are necessary on combustion type boilers. There is a good opportunity for replication of this technology.	6,091 Tonnes	9,730,000 kWh	$250,000
Fonterra Wood Pellets Conversion	Conversion of a 43MW coal boiler to biomass fuel handling and storage infrastructure	2019/20	At its time, this project was the largest coal boiler conversion to wood pellets in NZ. It successfully demonstrated the potential for most other dairy plants to do the same. This was a finalist in the Sustainable Business Network Awards.	82,630 Tonnes	42,158,163 kWh	$200,000
Sullivan Farm Snapchill	Installation of a snapchill ice bank unit with full heat recovery.	2018/19	The Snapchill system installed was successful and can use off-peak electricity overnight to produce the ice bank meaning it uses lower cost electricity and, in some cases, there is no need to upgrade the electricity lines into the farm. It is estimated that this Snapchill system could be used in over 1,000 farms.	5 Tonnes	12,000 kWh	$14,625
Simla Farms	Installation of covered anaerobic piggery effluent management pond and storage pond to capture methane and generate electricity, and improve waste management and odour control.	2018/19	Despite making significant amounts of gas, the digestate coming from the CAP was far from fully digested, and consequently, the storage pond had a lot of solids in and further gas production/odour problems. This project ran into a few problems with installation and commissioning.	28 Tonnes	169,000 kWh	$100,000
Glenarleas Farms Limited	Installation of a cover on the existing effluent pond to create a covered anaerobic pond for the capture of methane. This produced electricity to provide hot water to the milking shed.	2017/18	This project was the first to retrofit a cover over an existing anaerobic pond and was also the furthest South where methane recovery from waste ponds is attempted. Recommendations through the monitoring of the biogas farm include automating and linking as many measurement tools as possible.	312 Tonnes	97,000 kWh	$49,040
Rylib Dairies Limited	Demonstration of a Vari-Cool 22 milk chilling systems.	2015/16	There is a very clear efficiency gain over a normal refrigeration unit plus it is 100% electric element water heating. This project saw a reduction of 28% in kW units per kg/MS on the previous year.	4 Tonnes	31,424 kWh	$29,000
Inniskillen Dairy	Demonstration of a Vari-Cool 22 milk chilling systems.	2015/16	There is a very clear efficiency gain over a normal refrigeration unit plus it is 100% electric element water heating. Milk is leaving site at an average of 5 degrees each day making the farm now fully compliant with even the strictest milk chilling standards in the world.	3 Tonnes	24,090 kWh	$29,500

Recipient	Project Description	Financial Year(s)	Results	Estimated Annual CO2 Reduction (tonnes)	Estimated Energy Savings (kWh)	EECA co-funding
			Horticulture and viticulture			
Thymebank Indoor Cropping	Coal to waste biomass conversion of existing Taymac boiler.	2022/23	A significant and positive effect of using biomass is the reduction in quantity of ash. This has significantly reduced cleaning the firebox (once per week versus daily) and the vanes (above the firebox) four times during the winter (versus two weekly). Although sourcing biomass has been a challenge, this project was successful.	104.2 Tonnes	624,911 kWh	$23,000
Forest Lodge Orchard Frost Fans	Electric frost fans for use at cherry orchard.	2021/22	Due to onsite batteries, this technology was able to significantly reduce the amount of carbon emissions emitted. There is large potential for replication.	24.8 Tonnes	8,350 kWh	$39,000
Leaderbrand Vacuum Cooling	Large size vacuum cooling for incoming fresh vegetables.	2021/22	The new system improved product quality, increased shelf life, and decreased energy use and costs compared to the existing forced air system; thus, saving energy, LPG, and reducing waste.	64 Tonnes	378,000 kWh	$58,625
Urban Green	LED lights for food growing within city to supply restaurants and reducing food miles.	2018/19	This project has reduced C02, energy, and diesel throughout the process. Although there are not many microgreen facilities in NZ, there are a large number of growing operations with legacy lights.	62 Tonnes	61,899 kWh	$12,320
Biotelliga Grow lights	LED plant lights in a laboratory growing test crops.	2018/19	This project saw a reduction in energy use and carbon emissions which lead to energy savings. Replication potential for other growers with legacy lights should be high.	6 Tonnes	45,582 kWh	$13,600
J S Ewers Shades	Retrofit thermal screens to glasshouse to improve thermal envelope	2018/19	This technology offers significant carbon reductions of fossil fuels with potential replication for existing glasshouse operations.	1,562 Tonnes	4,028,056 kWh	$50,000
Gron Farms DryGair	Heat pump based dehumidifier in capsicum hothouse to reduce humidity.	2018/19	The dehumidifiers were most effective with overcast conditions and relative mild temperatures with humid conditions inside and outside, rather than colder (night) temperatures. The total production has gone up by 15% and has resulted in energy savings and carbon reductions.	80 Tonnes	179,217 kWh	$42,727
			Projects underway			
Abel Vineyard Autonomous Electric Sprayer	A battery electric autonomous sprayer	2023/24	Project Underway.	TBC	TBC	TBC
Araliya Striks Nursery Heat Pump	Air source heat pump to provide medium temperature water (40-50°C) to directly heat the plant beds	2023/24	Project Underway.	TBC	TBC	TBC
McFetridge Electric Harvest Platform	Battery Electric elevating harvest platform	2023/24	Project Underway.	TBC	TBC	TBC
Clearwater Gardens Hydroponic Heat Pump	Two air source heat pumps to provide medium temperature water (40-50°C) to heat the glasshouse	2023/24	Project Underway.	TBC	TBC	TBC
Leaderbrand Electric Harvest Trailers	Displace the existing trailers which are towed by diesel tractors with two battery electric self-propelled trailers	2023/24	Project Underway.	TBC	TBC	TBC

Recipient	Project Description	Financial Year(s)	Results	Estimated Annual CO2 Reduction (tonnes)	Estimated Energy Savings (kWh)	EECA co-funding
Wardle Frost Fans	Up to eight Fulta Frost Fans to combat spring frost damage to their walnut crop	2023/24	Project Underway.	TBC	TBC	TBC
Forest Lodge Electric Tractor	Fully Autonomous electric tractor for use at cherry orchard with Spare battery.	2023/24	Project Underway.	TBC	TBC	TBC

Buildings, hospitals and pools

EECA
TE TARI TIAKI PŪNGAO
ENERGY EFFICIENCY & CONSERVATION AUTHORITY

Recipient	Project Description	Financial Year(s)	Results	Estimated Annual CO2 Reduction (tonnes)	Estimated Energy Savings (kWh)	EECA co-funding
Canterbury District Health Board (CDHB)	Remove water hardness through electrochemistry, improving heat transfer, reducing energy, water, and chemical consumption	2020/21	This project highlights significant replication potential as there are 20 suitable systems at CDHB alone. There are also energy savings and efficiency gains to be made.	10 Tonnes	154,000 kWh	$25,200
Wellington City Council	Replace diesel fuelled hot water high pressure cleaners with electric hot water blasters for cleaning purposes.	2019/20	This project saw a reduction in both energy and carbon emissions which has resulted in waste management looking to replicate this technology across their 20 sites. Replication potential for this technology is high.	107 Tonnes	54,591 kWh	$19,616
Capital & Coast DHB	Replacement of existing theatre lighting with fully NATA certified cyanosis LED tubes.	2018/19	Benefits of this project included energy savings, a reduction in carbon, and electricity cost savings. With the co-benefit of a reduced load off the distribution board, it provides more capacity for other needs such as EV charging.	7 Tonnes	40,208 kWh	$21,456
Whangarei Council	Installation of a biogas generator at the Waste Water Treatment Plant to produce electricity and heat for on-site consumption.	2018/19	Alongside reducing emissions and electricity costs, this project also made the onsite boiler redundant by heating the digesters with the recovered waste heat.	43 Tonnes	258,720 kWh	$79,640
Hurunui District Council	Small scale co-generation fuelled with fugitive methane.	2018/19	This solution stops 100,000 cubic metres of methane (a greenhouse gas) from being pumped into the atmosphere, which accounts for 15% of the thermal pool's electricity use.	61 Tonnes	427,000 kWh	$90,000
Auckland Council	Apply a Central Plant Energy Control System (CPECS) to optimise the chilled water system	2018/19	This project saw that the CPECS unit and new chilled water plant improved the energy performance of the cooling system by 46%. Replication potential is high for commercial buildings with a chilled water system.	26 Tonnes	202,126 kWh	$19,000
Onsen Hot Pools	Installation of 4x air source heat pumps to provide ~39° water, storage tanks, feedwater heat exchangers from waste pool water, and a metering system.	2018/19	There is a large replication potential for HP technology across commercial and industrial sectors. They also saw a significant reduction in their gas usage and associated costs.	269 Tonnes	1,152,000 kWh	$45,000
Trustees of the Sisters of Nazareth	Installation of a wood fuel boiler	2018/19	This project delivered over 4,400 GJ of wood energy in the first 12 months and over 5,400 GJ in the next 11.5 months showing significant carbon reductions.	176 Tonnes	1,500,000 kWh	$100,000
Christchurch Airport	High Temperature Heat Pump (HTHP) for heating and chilling to replace fossil fuel boilers and aging chillers.	2018/19	The HTHP saw a significant reduction in energy, cost, and carbon emissions. Replication potential is high across the commercial and potentially industrial sector where water temperatures reach up to 70C and notably where there's the potential to consolidate heating and cooling into a single simultaneous HP system.	994 Tonnes	3,405,000 kWh	$200,000
St Georges Hospital	Install EC fans in stage 2 of the hospital development and the installation of a ground water heat pump system.	2017/18	Fine tuning of the system took time but once optimised has run smoothly and successfully. The ground source heat pump (GSHP) is fully backed up by rooftop "air cooled" plant so the building management system (BMS) plays a pivotal role co-ordinating all the plant items.	114 Tonnes	2,046,800 kWh	$45,600

Recipient	Project Description	Financial Year(s)	Results	Estimated Annual CO2 Reduction (tonnes)	Estimated Energy Savings (kWh)	EECA co-funding
Invercargill City Council	Demonstration of a 70 kW Entec generator to convert biogas to electricity	2017/18	The results indicated that the performance of the generator was better than initially expected. Both carbon and cost savings were achieved.	52 Tonnes	356,606 kWh	$81,730
Wellington City Council	De-scaling cooling water systems.	2017/18	There was a reduction in cooling tower energy consumption and a decrease in water consumption of about 50% while most chemical additives have been removed from the process. There was also a reduction in chiller electricity consumption.	52 Tonnes	152,250 kWh	$46,000
Northern Arena	Installation of two air source tandem compressor large scale heat pumps to take the pool water heating duty off the existing system.	2016/17	The Northern Arena Aquatic centre has significantly reduced electrical consumption costs through replacing the old system. There is potential for replication at other pools with similar systems.	43 Tonnes	261,000 kWh	$61,192
CDHB – Burwood Hospital	Advanced biomass-specific boiler systems.	2016/17	This project successfully demonstrated the benefits of advanced biomass-specific boiler system designs. This project showed lower cost of wood fuel, higher efficiency, lower operational costs and automatic de-ashing.	5,500 Tonnes	280,612 kWh	$300,000

Alternative transport

Recipient	Project Description	Financial Year(s)	Results	Estimated Annual CO2 Reduction (tonnes)	Estimated Energy Savings (kWh)	EECA co-funding
Shotover Electric Jet Boat	Conversion of an existing jet boat to 100% electric propulsion with river trials leading to tourism operation.	2022/23	This project is the first known case of converting a jet boat of this size and scale to electric with the advantage of reduced sound output for a more peaceful ride. It will reduce emissions and is applicable to most jet boats in New Zealand.	133 Tonnes	641,772 kWh	$200,000
Urgent Couriers Cargo E-Bike	Procure five electric cargo bikes to replace at least five petrol fuelled vehicles for delivery and pick-up courier services in the Auckland City region.	2021/22	This technology is new to New Zealand and has high replication potential as it can displace many fossil fuelled services such as couriers, produce delivery, and food delivery services. This project successfully reduced emissions and will save on costs over time.	44 Tonnes	176,000 kWh	$15,000
Electric Boat Company Hire Boats	Small medium large electric hire boats with propulsion pod and Lithium-Ion batteries.	2020/21	There is huge potential for replication in many private marine businesses. They had very positive reviews leading them to starring in major NZ boating magazines. They have also shown a reduction in emissions through the purchase of these boats.	41 Tonnes	17,505 kWh	$35,000
Kiwirail Aratere EnergoProFin	Installed EnergoProFin propeller hub cap on the Arahura boat propeller to improve efficiency by weakening the propeller hub vortex.	2018/19	This technology has the potential to be deployed on a number of different ships in New Zealand and will help to reduce both C02 and energy.	686 Tonnes	1,613,321 kWh	$100,000
Recreational Services Electric Mower	Procurement and operation of two electric ride-on mowers for the use in the provision of commercial mowing services.	2018/19	The charge capacity of this has been more than enough for a commercial mowing run, with units typically using 30-50% of their charge per day. In addition to the fuel saving, there have also been some significant repair and maintenance savings due to the lower mechanical complexity of the electric unit, and no need for mechanical servicing.	22 Tonnes	25,600 kWh	$52,000