

Sustainable Energy in Practice – Ten Years Out in the ‘Real World’

Jake Roos

MAppSc Energy Management 2003

Senior Advisor Climate Change and Energy

Overview

- Ten years
- Kāpiti Coast and CEMARS
- Electric refuse truck
- Greenest Neighbourhood competition
- What I've learned

Ten Years

- 2003 – Completed Masters
- 2004 – Left for the UK
- 2005 – Finished at the Energy Saving Trust and started at Uttlesford District Council



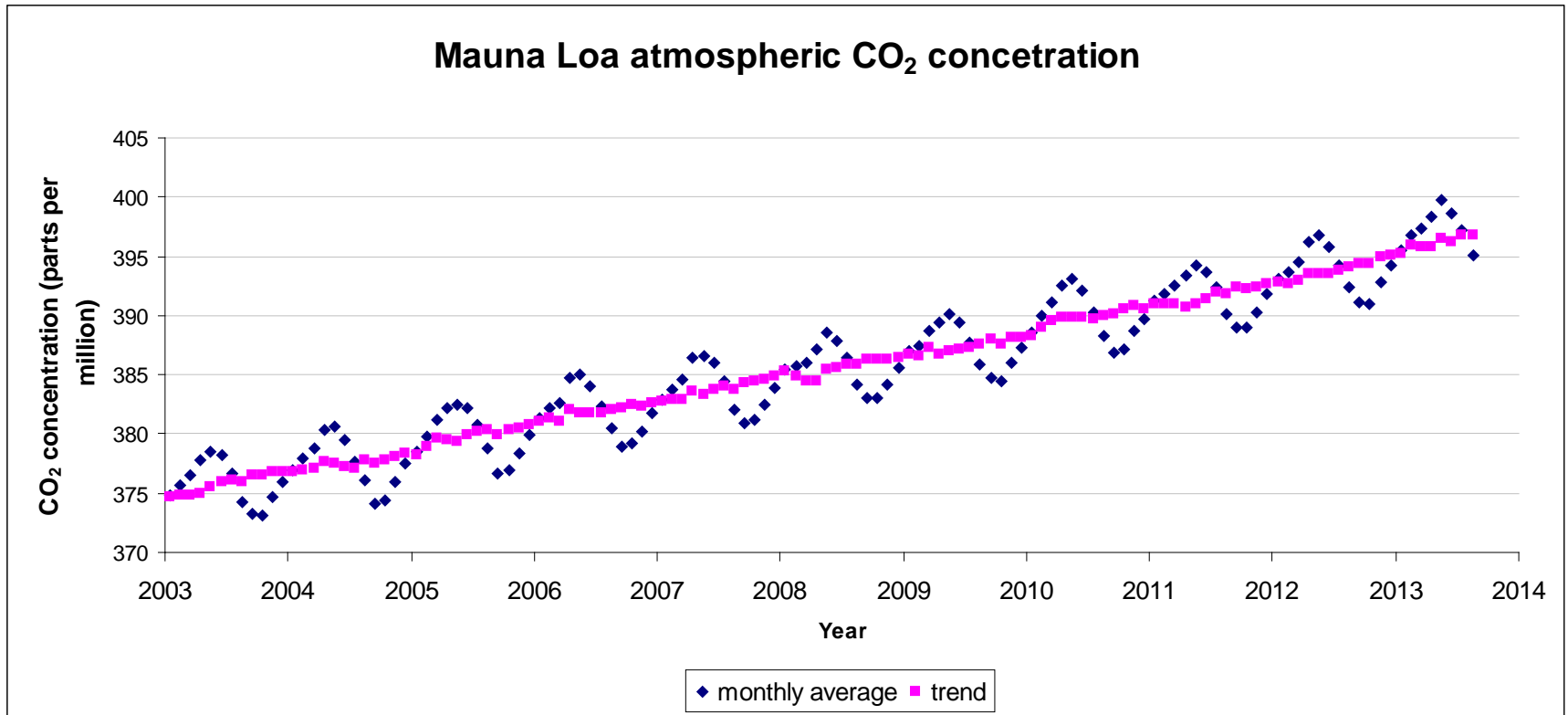
2006 – the turning point that wasn't



Ten years continued

- 2007 – IPCC Fourth Assessment Report
- 2008 – Global Financial Crisis
- 2009 – UNFCCC Copenhagen
- 2010 – Returned to NZ
- 2011 – 2012 record breaking extreme weather
 - Queensland floods
 - Pakistan floods
 - Russian heatwave
 - Hurricane Sandy
 - Australian heatwave and bushfires
 - Arctic sea-ice 2012
- 2013 – Abbott Government elected in Australia

Ten years



Dr. Pieter Tans, NOAA/ESRL (www.esrl.noaa.gov/gmd/ccgg/trends/) and Dr. Ralph Keeling, Scripps Institution of Oceanography (scrippsco2.ucsd.edu/)

Kapiti Coast District Council



Council commitment



Former Kāpiti Coast Mayor Alan Milne speaking at Cities for Climate Protection summit in 2005



Mayor Jenny Rowan accepting the Green Ribbon Award at Parliament in 2011



Cllr Penny Gaylor and Mayor Rowan at EECA Awards 2012 (highly commended)



Highly Commended

Carbon and Energy Management



- Council became **NZ's first CEMARS®** certified territorial authority in 2012
- ISO 14064-1
- Council adopted targets to reduce emissions
 - **45% reduction in 2014-15 compared to 2009-10**
 - **80% reduction in 2021-22 compared to 2009-10**
- Adopted a Carbon and Energy Management Plan
- Set up a working group of asset managers chaired by their manager(s)

Why CEMARS®?



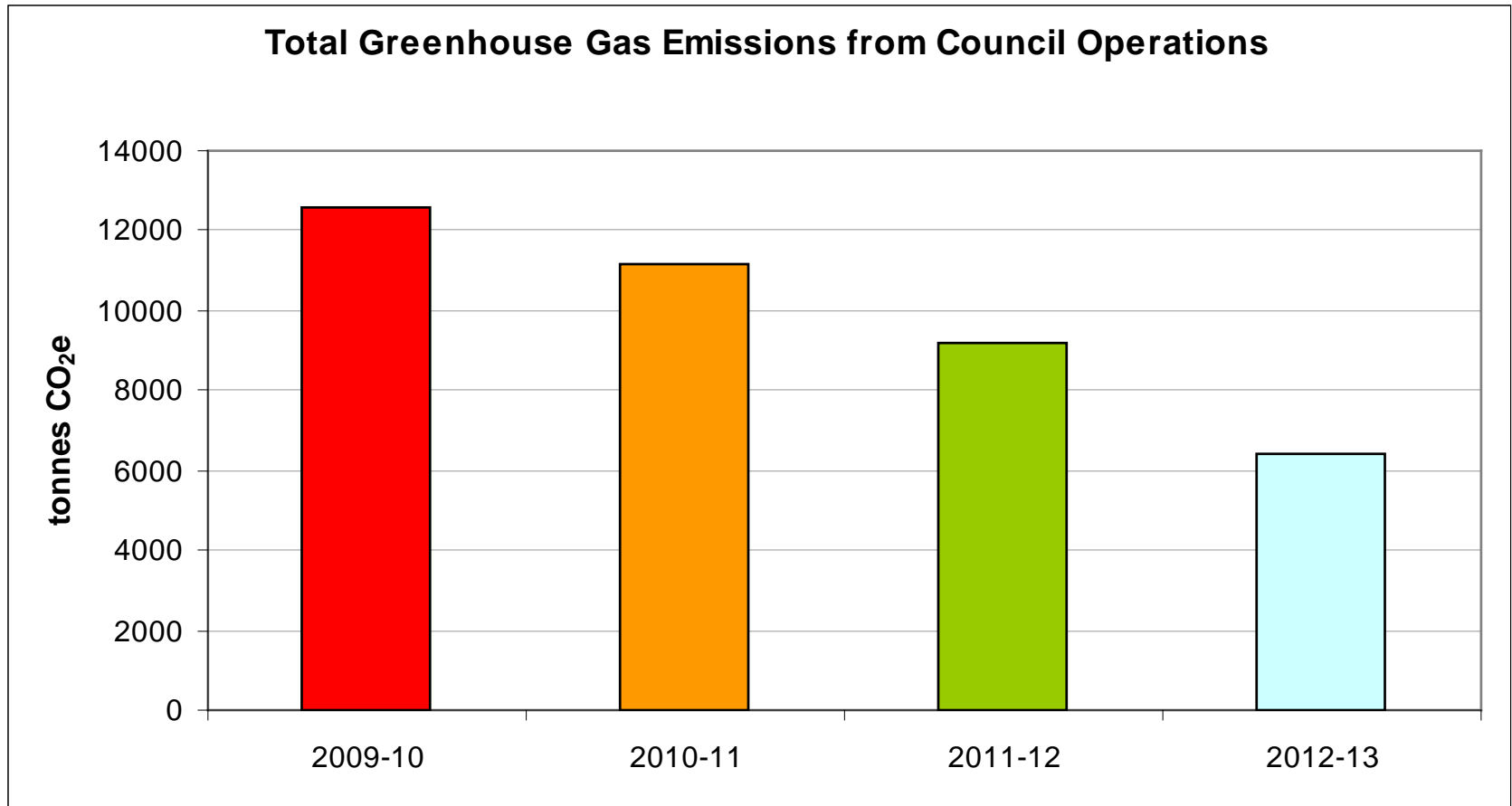
- No mandatory reporting framework to use
- Gives transparency
- Demonstrates leadership
- Adds value
 - Finding emissions sources
 - Getting it right
 - Tools and support



LED streetlights illuminate the crossing outside the council offices



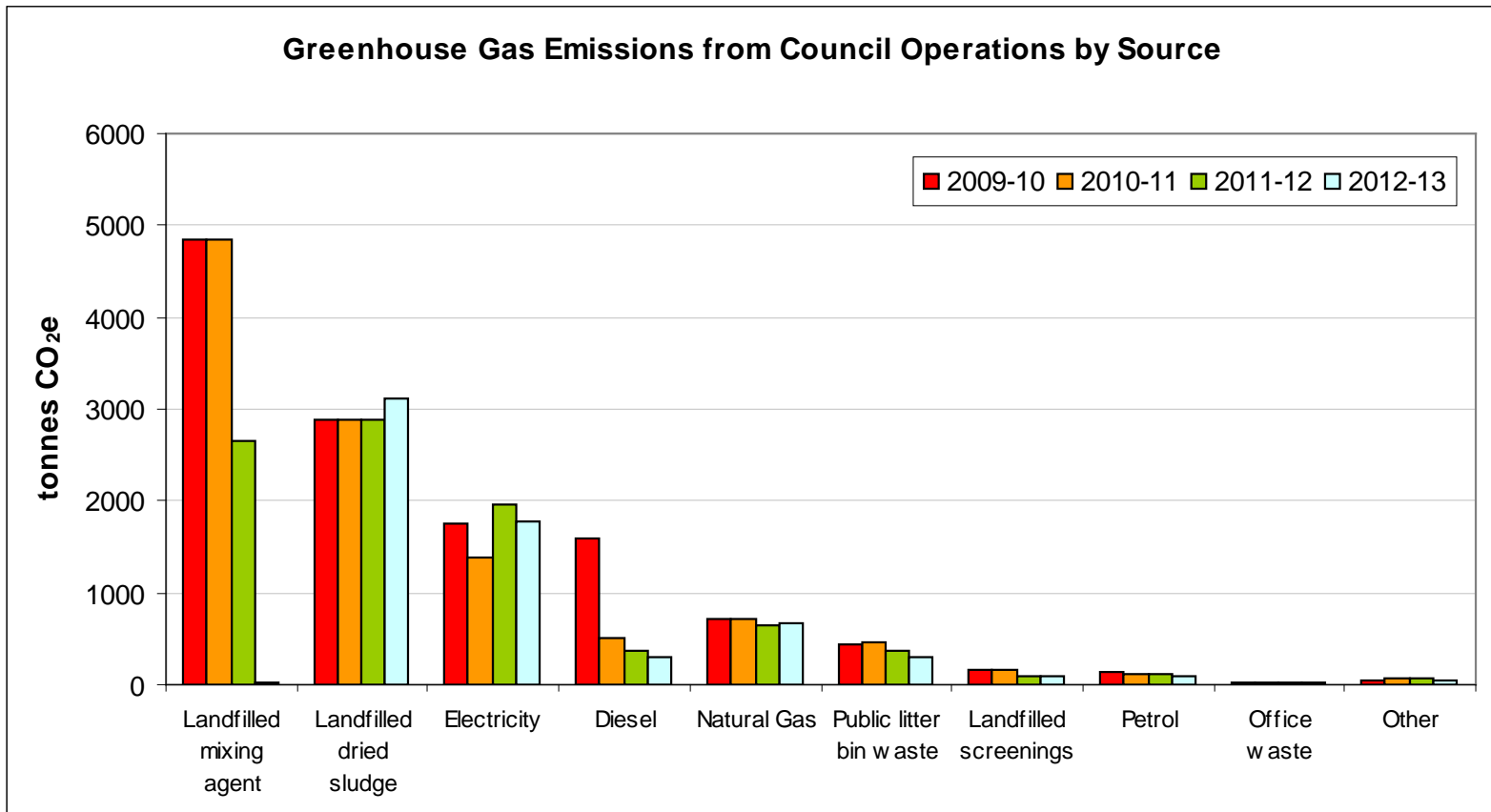
Provisional result for 2012-13 shows a 49% reduction compared to 2009-10: **target exceeded 2 years early**



Emissions profile



Greenhouse Gas Emissions from Council Operations by Source



What we are going to do

- Get rid of biosolids emissions via new disposal method
- LED Streetlights
- More solar panels (photovoltaic)
- Efficiency improvements in vehicles and buildings



High Pressure Sodium
- 89 Watts
- life of 4-5 years



Light emitting diode (LED)
- 40 Watts
- life of 20 years +

What we are going to do

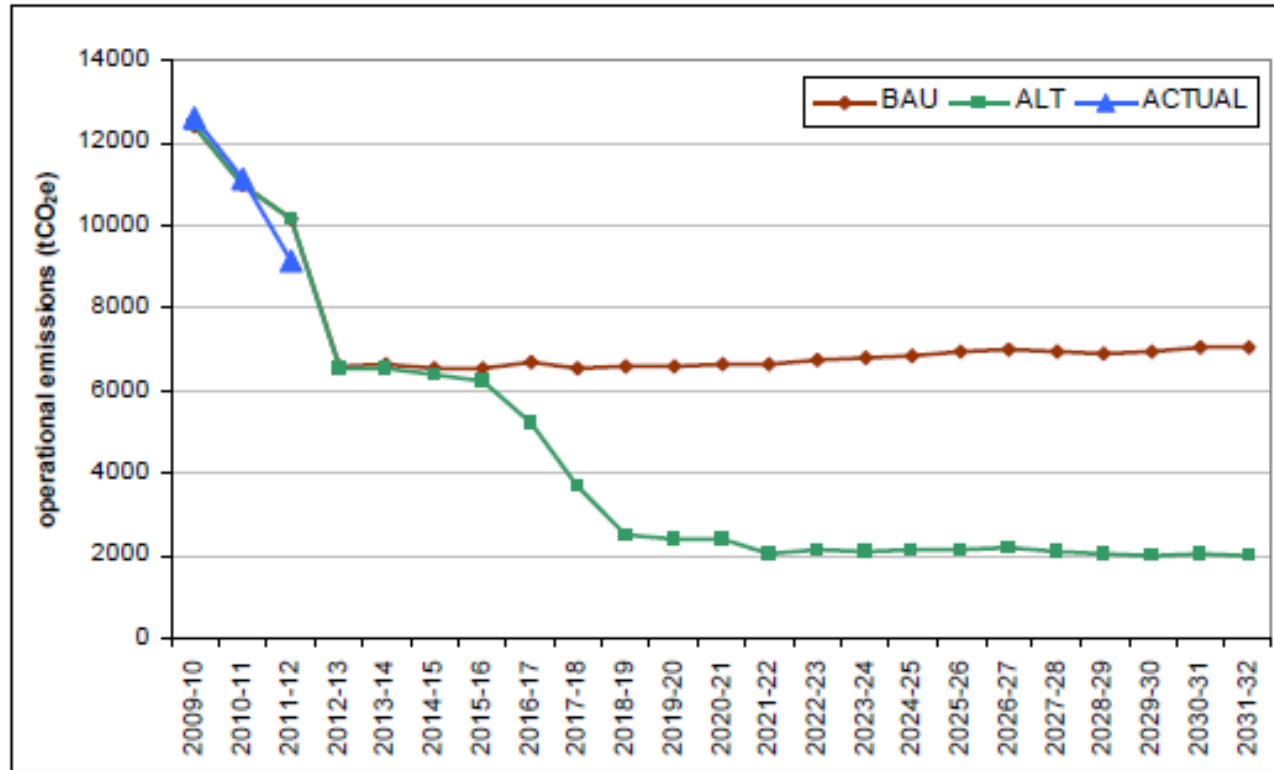


Figure 10 – Energy use and emissions forecast in the business as usual (BAU) and alternate (ALT) scenarios, with out-turn (ACTUAL)

- www.kapiticoast.govt.nz/CEMARS

Enviro 9000 - Electric Refuse Truck



Clean Technology

- ‘Clean Technology’ part of Council’s economic development strategy
- Willing to engage with ‘Clean Tech’ companies to see if they can assist council
- My job to engage, assess and help develop proposals if merited



Enter: Zero Emission Vehicles

- Zero Emission Vehicles (ZEV) is a consortium of engineers who own their businesses in Palmerston North
- Have been developing technology for commercial EVs since 2005.
- Developed unique IP for battery management



Why a Rubbish Truck?

- Existing truck at the end of its useful life
- Highest mileage/fuel use of any of the fleet
- Regular routes – daily range predictable
- Start/stop usage
- Hadn't been one before in Aus/NZ – clean slate
- Good potential for replication/further sales



Specs

ZEV Enviro 9000	
Weight	9,000kg
Top speed	90 kph (speed limited)
Capacity	5.0 m ³
Battery type	Lithium iron phosphate
Battery pack capacity	104 kWh (108 cells)
Engine power	160 kW
Voltage	410V DC peak
On board charger	8kW single phase
Charge time	9 -10 hours
Headlights	Hella LED

Building and testing





Performance on Friday 13/9

Distance driven	88 km
Energy used on truck	67 kWh
Energy for recharging	56 kWh
% regeneration	16.4%
Purchased kWh/km	0.636
Range to 70% discharge	115 km
Theoretical max range	163 km
\$/km	0.078

- Energy running cost 1/4 to 1/3 that of a diesel equivalent

What's next?

- Council to help produce case studies, support ZEV in securing more orders
- Will consider further vehicles, however scope is fairly limited
- ZEV to refine design on future trucks
 - larger pack, higher operating voltage
 - mechanical two speed gearbox
 - faster charge





Increase resilience

Build community

Reduce environmental impact

What is it?



- Nine month competition
- Groups of neighbours work together to
 - reduce their ecological footprint
 - do community projects
 - get to know each other
 - have fun
 - win the prize and the title
- Support and guidance from council advisors



'Kakariki Street' launches.

Key concepts



- Positive empowering messages relating to sustainability
- Many different reasons to get involved
- Maximise co-benefits e.g. emergency preparedness
- Heterogenous, place-based groups
- Normalising 'green' behaviours
- Well defined framework but still community led



Rainbow Court - 2010-11 competitors

Why do it?



- Educates public about the environmental challenges we face
- Builds community/connectedness/social capital
- Stimulates demand for council 'green' services
- Helping people help themselves in a challenging future
 - Climate change/extreme weather
 - Earthquake/tsunami
 - Economic hardship/oil crisis
 - Pandemic



Flooded house Waikanae 1998

Council resources



- Sustainable Communities Co-ordinator
- Eco Design Advisor (home energy and health)
- Sustainable Water Use Advisor
- Funding assistance for rainwater and greywater systems
- Green Gardener
- Biodiversity Advisor
- Waste Minimisation Officer
- Waste minimisation grants



Hannah Zwartz Council's 'Green Gardener' gives composting advice.

The Ecological Footprint

MEASURES

how fast we consume resources and generate waste



Energy



Settlement



Timber & paper



Food & fibre



Seafood

COMPARED TO
how fast nature can absorb our waste and generate new resources.



Carbon Footprint

Built-up land



Forest

Cropland & pasture



Fisheries

Why footprinting?



- Includes the broadest range of environmental considerations and personal responses
- Simple way to communicate complicated issues
- Provides a reasoned weighting system to judge progress/improvement
- Draws attention to the lifestyle choices that have the biggest impact on the environment
- Draws attention to issues of global and intergenerational equity



Process



- Registrations – getting groups together
- Launch and judges tour
- Footprinting
- Groups do their thing – projects and workshops
- Blogs and media coverage
- Challenge events (new)
- Garden Show
- More footprinting
- Judges tour and finale



Janet, Vic and Jude check out eco-downlights in Avion Terrace.

Judging



- 30% on size of average footprint at end of comp
- 20% on percentage reduction through the competition
- 40% on achievements as a community
 - Panel of 5 judges do this
- 10% wildcard (individual actions not recognised by footprinting)



L to R: Mayor Jenny Rowan, Kath Irvine, Robert Glensor (judges), Jake Roos, Prof Brenda Vale (judge), Dan Neely (WREMO) and Ames St residents Vicky Noon and Janet Holborow



Four months of glass recycled in just a few hours.



Discussing the finer points of eco-friendly housework.



Rainbow Court's Spring Fair included tours of their community garden.



The community composting area, complete with the Trojan Horse.



Santa comes to Rainbow Court.



Working up an appetite at a 'Kakariki Street' gardening bee.



Wellington Road gets busy building rat traps.



If life gives you lemons, make limoncello with your neighbours!

Results

2010/2011

Neighbourhood Average Footprint in 'Earths'

<i>Neighbourhood</i>	<i>Oct-10</i>	<i>Jun-11</i>	<i>% improvement</i>
Avion Terrace	3.6	3.1	15%
Rainbow Court	3.5	2.8	20%
Te Roto Road	3.6	2.6	29%
'Kakariki' Street	2.9	2.3	21%

2011/2012

<i>Neighbourhood</i>	<i>Oct-11</i>	<i>Jun-12</i>	<i>% improvement</i>
Alexander Rd	3.3	2.7	18%
Wellington Rd	3.3	3	9%
Grange Park Ave	3.6	3.4	6%

The New Zealand average footprint was 3.7 Earths for 2010/11 & 2011/12
 Calculated using Centre for Sustainable Economy 'Redefining Progress' Calculator @ myfootprint.org

Results



The proportion of survey respondents who ranked the listed outcomes as being 'very beneficial' or 'beneficial' for them.

Got to know my neighbours better	97%
Strengthened our community	94%
Reduced my impact on the environment	94%
Got extra help/services from the Council	85%
Helped win the \$3,000 prize – <i>% of winner respondents</i>	85%
Won the 'Greenest Street' title for my street – <i>(% of winner respondents)</i>	77%
Discussing/doing things with others in my household	88%
Learnt more about my ecological footprint	91%
Learnt some useful skills	82%
Saved money	59%
Increased awareness of my choices & the impact of my lifestyle	94%

“We loved being part of it. We loved meeting all of our lovely neighbours. We loved the changes that we incorporated into our life during this time. And we loved all the things we learned.” *Anja, Kristin & Kailash, ‘Kakariki’ Street.*

“It has been hard for us to meet people since moving here so the camaraderie that this competition has supplied, through shared meals and get-togethers to learn new things, has been a godsend to us.” *Sue & Tom, Grange Park Ave.*



“We have learnt so much and what we don't know we just ask the neighbours....I feel I can ask my neighbours for help and advice with pretty much anything.” *Gwen & Jason, Alexander Road*

“I've always wanted to have a compost, and now we have one. The next goal is the vege garden – a small step to living off the land!” *John, Grange Park Ave*

Changes for Round 3



- Name
- Timing
- Launch
- Shared blogsite
- Challenge events
- NZ Footprint Calculator



'Pimp my Long Drop' challenge event, August 2013. Above: Alex Road gets serious with their build. Below: Waimeha Lagoon residents chill out in theirs.

'Building Sustainable Communities – Kapiti Coast's Greenest Street 2010-12'

www.kapiticoast.govt.nz/building-communities

Follow the current competition:

www.greenestneighbourhood.net

- Many thanks to my colleague Stacey Gasson, our judges, and Dr Ella Lawton for her support with the NZ Footprint Calculator



Alexander Road takes the title in 2012.

What I've learned

- Humans are not rational
- Mitigation is still the best adaptation
- Individual behaviour change is not enough
- Technology change is not enough
- People power matters
- Leaders matter most of all

Advice

- Don't give up – we can pull back from the brink



Thank You



Contact: Jake Roos

– 04 2964846

– jake.roos@kapiticoast.govt.nz