



DOMESTIC ENERGY USERS' NETWORK

Briefing to Incoming Parliament, 11 November 2008

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The Domestic Energy Users' Network, DEUN, is a network of national organizations which advocates for affordable and sustainable energy services for all householders. Our policies are based on both statistical evidence and the experiences of our organizations. We promote actions that reduce the inequities in well-being, made worse by household energy bills. We promote energy efficiency and renewable energy solutions that improve household living conditions while reducing greenhouse emissions and other adverse environmental impacts.

Our members are:

- Grey Power Federation;
- Royal New Zealand Returned and Services Association;
- Rural Women New Zealand;
- Age Concern New Zealand;
- Public Health Association;
- Child Poverty Action Group.

DEUN supports the principles of the Treaty of Waitangi.

EXECUTIVE SUMMARY

The percentage of city dwellers in potential energy poverty has doubled since 2001. DEUN Recommends elimination of energy poverty in New Zealand through a combination of crisis payments to the most vulnerable home energy consumers and fairer electricity and gas tariffs, plus a long-term programme of home energy retrofits.

Household energy prices are rising faster than inflation. The energy component of domestic electricity prices is twice the cost of electricity from new power stations. DEUN recommends an independent review to determine fair and efficient pricing for domestic electricity and gas supply.

Household insulation is the by far the most cost-effective means of reducing electricity demand and greenhouse emissions from the whole energy sector. Technology solutions: can make household energy both more sustainable as well as affordable. Heat pumps are efficient but are increasing electricity peak demands, a systems approach to clean wood burning can realize the best benefits from both heat pumps and wood burning. DEUN Recommends an audit of the condition of New Zealand houses to determine how many retrofits are cost-effective, including health as well as energy benefits; develop and promote highly efficient wood burning technologies and fuel supply systems.

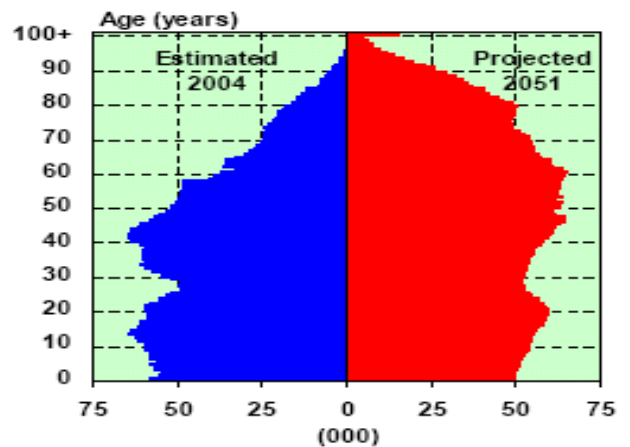
Home energy projects can stimulate the economy through the recession. The Crown receives \$1 billion per year from the electricity sector, even before emission pricing increases windfall revenues. Dedicating some of this to the Household Fund will create jobs, while giving early payback in reducing energy bills as well as improving health outcomes. DEUN Recommends:

Use of the Household Fund be professionally planned using international best practice, including input from the community.

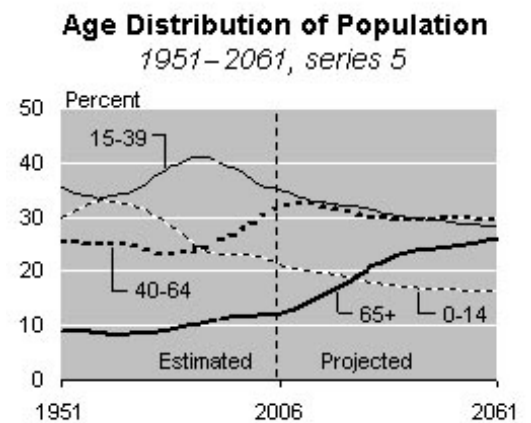
DEUN BRIEFING TO INCOMING PARLIAMENT:

Demographic context

Globally, we are in a time of rapid population ageing. In New Zealand, by 2030, for the group aged 65 to 74, numbers will double from 276,000 in 2006, to 559,000. As indicated in the first figure, by 2030, it is estimated that the numbers of those over 85 will almost treble, from 58,000 today to 150,000¹ As is shown in the second figure, Treasury (2006) has also calculated that the ratio of the young to the old is transposing, and after 2020 we will have more people over age 64 than under age 15.



Families with small children, and older people, spend much more time at home than working-age people. DEUN argues that hardship and poverty for these groups especially, now and in the future, can be significantly reduced by investment in retrofitting houses. Insulated homes are warmer, dryer, and healthier. As well as these benefits, retrofitting results in reduced medical costs and usually lower heating costs. The amount of energy that is “taken back” in the form of warmer houses will vary, but the small amount of data available suggests that insulating homes will on average reduce the demand for electricity, gas, and solid fuel, and create a smaller carbon footprint.

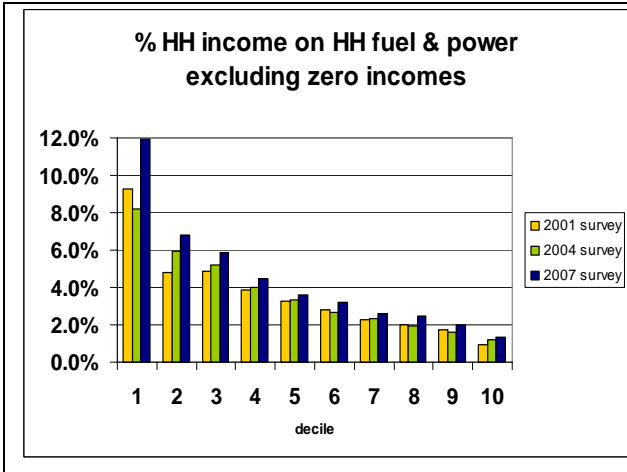


DEUN Recommends: Use of the Household Fund with a particular emphasis on families with dependent children and superannuitants.

Energy Poverty

Household Economic Surveys show low income people are paying by far the highest proportion of income on “household fuel and power”. Average statistics are not relevant to the low income sector.

DEUN supports the definition of energy poverty as “Households which would need to spend more than 10% of their income on all household energy fuels in order to achieve a satisfactory indoor heating regime”. Based on this definition, Bob Lloyd of Otago University has compared income levels with the thermal performance of typical low-income houses in Auckland, Wellington, Christchurch and Dunedin.² He concludes that the percentage of city populations in potential fuel poverty in 2008 has nearly doubled since 2001, having risen from a weighted average of 10-14% to a weighted average of 23%.



Source: NZ Statistics, custom data release
 Consumers in the lowest income bracket spent 11.9% of their income on household fuel and power (2007 HES survey), compared to 8.2% in 2004 and 9.3% in 2001.

Households with zero incomes are excluded here because some of these will be family trusts or other arrangements to maximize tax advantage.

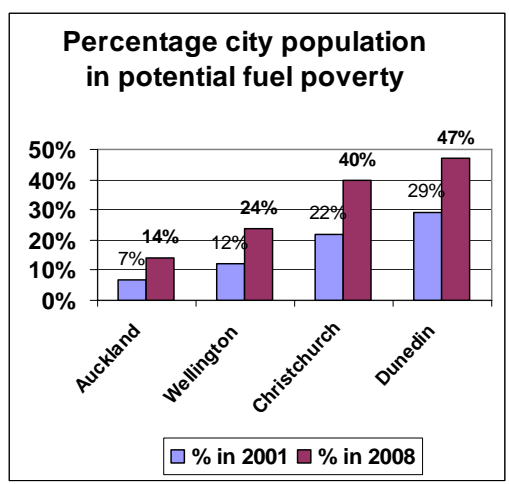
Including zero incomes, the 2007 figure was 12.5%

The model assumes a house of 90 m2, all-electric, paying 21c/kWh in 2008. (The NZ average price in May 2008 was actually 22c/kWh.) Most households using alternative fuels will in fact have lower fuel prices, but that overestimate is offset by the fact that most houses are larger than 90 m2. LPG prices are now higher than electricity prices.

Lloyd concludes: “the problem of fuel poverty is not going to go away as fuel prices are going to rise. Relatively small increases in fuel prices raise the numbers very quickly.”

This has proved to be true in the UK, where a 22% price rise in gas and electricity prices in 2006 tipped a million UK households into fuel poverty.³ Environmentalists and consumer advocates recommend

“a government strategy that combines both short- and long-term solutions - crisis payments to help with the here and now, and in the longer term improvements to the energy efficiency of our housing stock. . . . As a starting point, the government should be working with energy companies to reform their social tariffs to end the inequalities of energy pricing that mean poorer people pay more.”



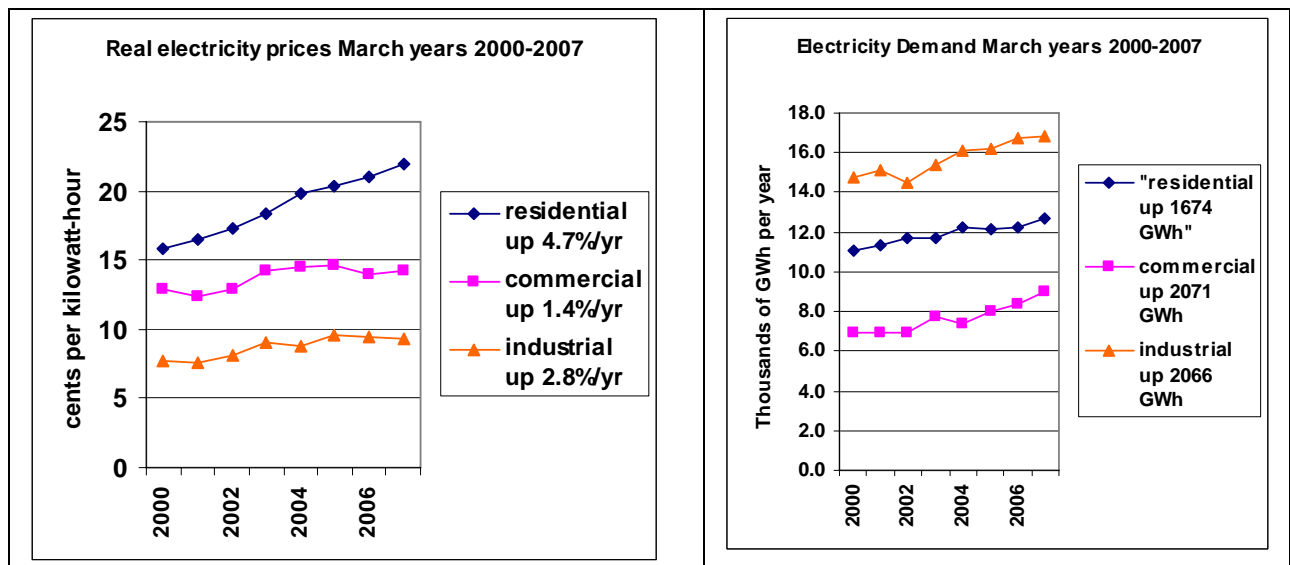
This position is essentially the same as the position DEUN has taken following the past year’s research and policy discussions.

DEUN Recommends: Elimination of energy poverty in New Zealand through a combination of crisis payments to the most vulnerable home energy consumers and fairer electricity and gas tariffs, plus a long-term programme of home energy retrofits.

Household energy prices are rising faster than inflation

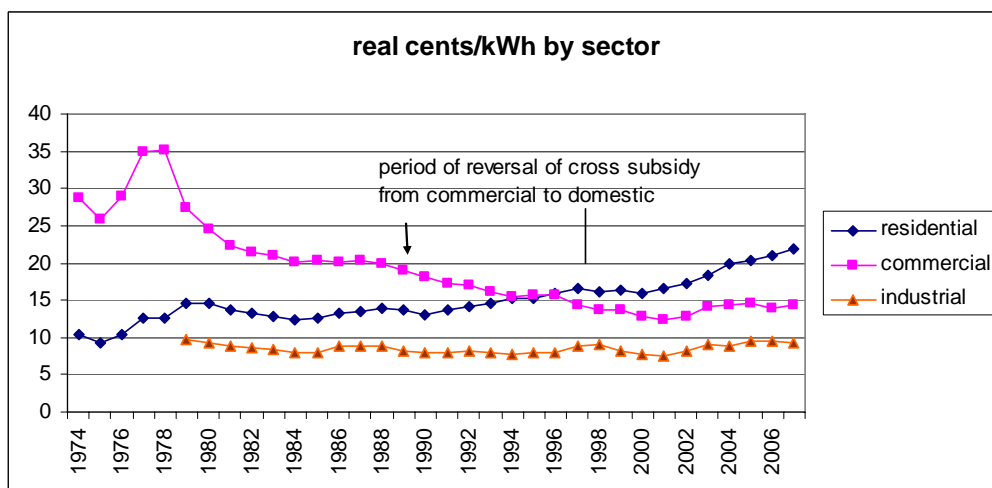
Domestic electricity users are now in effect subsidising commercial and industrial electricity users. Domestic energy prices have risen 5% faster than inflation since 2000, compared to commercial prices 1½ %, and industrial prices 3% faster than inflation.

Government officials and industry people say electricity prices must rise because demand is growing. New power stations have to be built to meet the demand - but demand growth from commerce and industry has been 2 ½ times as fast as growth in domestic demand.



Information provided by the Electricity Commission for its Electricity Market review shows that the domestic prices are far higher than needed to ensure new power stations can be built. The network component of domestic prices has increased little if at all since 2000, while the energy component has risen to twice the cost of electricity from new power stations (the long-run marginal cost).⁴

The longer-term series of real prices for the three sectors showed a rapid electricity price rises after 1976, following a residential price freeze (but a time of fairly high inflation). From about 1990-2000, residential prices rose in real terms while commercial prices fell, reversing the former cross-subsidy from commercial to residential consumers. From 2000 onwards, all prices have risen in real terms, but residential prices have risen the most.



DEUN Recommends: Independent review to determine fair and efficient pricing for domestic electricity and gas supply.

Carbon emissions from household sector

Household energy emissions are significant, with average emissions amounting to 10% of New Zealand’s energy sector greenhouse emissions. Policies to modify consumption to reduce emissions need to be based on marginal emissions factors⁵, in keeping with the concept that prices should be related to marginal costs.

New Zealand’s average emissions from electricity were 180 grams CO₂-equivalent per kWh in 2007. Marginal emissions are generally taken as 600 grams per kWh, and even higher at winter peak times. The big difference is because the majority of generation is from renewable hydro energy, but the year’s inflows are supplemented by gas and coal to make up the year’s electricity consumption.ⁱ

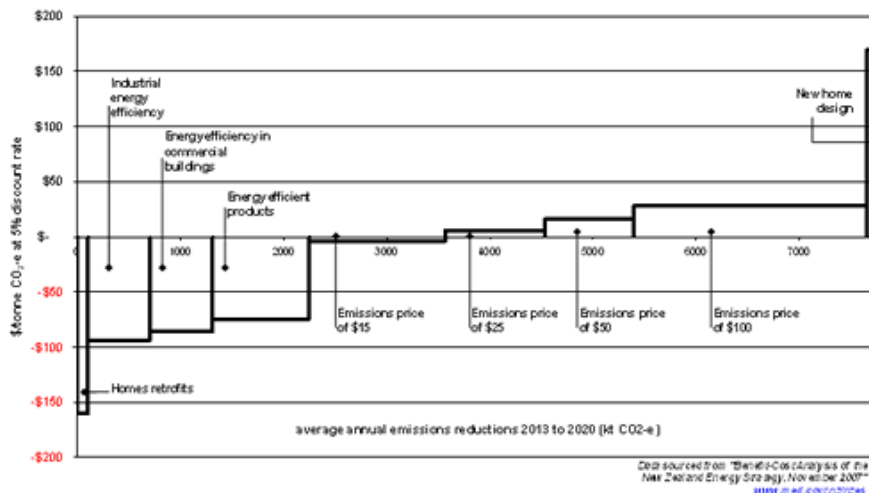
Thus projects to reduce winter electricity peaks, through insulation, efficient wood burning, lighting, double glazing, or curtains, reduce emissions by at least 600 grams per kWh saved.

Emissions from gas and LPG are around 300 grams per kWh of end use heat – marginal emissions are the same as average. Marginal emissions from heat pumps are around 200 grams, but can be much higher on the coldest days when the performance falls. Greenhouse emissions from wood are taken as zero, because growing trees use up all the carbon dioxide that is emitted.

DEUN Recommends: The contribution of the household sector to marginal greenhouse emissions be incorporated into cost-benefit studies of proposed retrofit measures.

Household insulation

Home insulation is the most cost-effective of all household energy efficiency strategies.



The “supply curve” for energy efficiency has long been used to describe cost-effective energy

ⁱ If all new power stations were based on renewable energy sources, average emissions would fall, but marginal emissions would remain the same. Only when hydro and wind energy are in surplus and spilled to waste can it be said that renewable energy is on the margin – and this would be very wasteful of the investment capital used to expand the power system.

efficiency policies. This describes the costs per kWh of energy saved of a number of “measures” which reduce energy consumption, and the quantities of energy that can be saved from each measure.

New Zealand has not recently produced supply curves for household energy efficiency. However Ministry for the Environment has produced a similar curve can be described for measures that abate greenhouse emissions. This indicates a net benefit to the NZ economy of about \$160 per kilotonne CO₂-equivalent⁶ for household retrofits. **This is by far the most cost-effective of all measures to reduce CO₂ emissions.**

DEUN Recommends: Review of the condition of New Zealand houses to determine how many retrofits are cost-effective, including health as well as energy benefits.

Technology solutions for low-cost, low-emission household energy:

The only practical way of reducing the impacts of increasing energy prices and emissions from household energy will be through improved technology, but only if houses are insulated also. Technology change was rapid in the mid 1970s, when residential electricity prices rose by 55% in two years. New Zealand research led to the rapid introduction of “double burning” wood burners, and firewood became the main source of household space heat.

Solar energy for water heat, and pellet burners for space heat, are fully commercialised now. Technologies for central heating plus water heating using wood chips or logs are commercially available in Europe, and are being adapted and further developed in New Zealand. They are especially appropriate for large houses, and for new houses in New Zealand’s cold climates.

Clean and efficient wood burning depends as much or more on the quality of the fuel and on understanding how to use the fuel, as on the appliance itself. Packaged dry firewood and firelogs are sold in supermarkets today – a market that is growing by over 10% per year, despite the high retail margins. Retail prices for very dry firewood could potentially be greatly reduced.

Heat pumps are an important part of the strategy for low-emissions, low-cost home heating. Yet at present, heat pumps are causing a rapid increase in both winter peak and winter energy demands, especially in the coldest locations. It’s not the heat pumps themselves, it’s how we’re using them - that is driving excessive electricity demand. If used in poorly insulated houses, heat pumps will be working very hard on the coldest days, and their efficiency will fall severely. They may well be being supplemented by ordinary electric heaters, causing high peak demands.

Where householders have access to wood or LPG heating, new tariff options including critical peak pricing could encourage the use of heat pumps when they are most efficient, while using the other fuel at the coldest times when heat pump efficiency drops markedly.

DEUN Recommends: Develop and promote highly efficient wood burning technologies and fuel supply systems.

Home energy projects to stimulate the economy during a recession

DEUN does not have a position on whether to favour economic growth as measured in conventional terms, or to prefer other means of measuring and promoting ongoing well-being in

New Zealand society. We do however recognise that Government has a vital role both in job creation and in mitigating the financial impacts of the recession on New Zealanders.

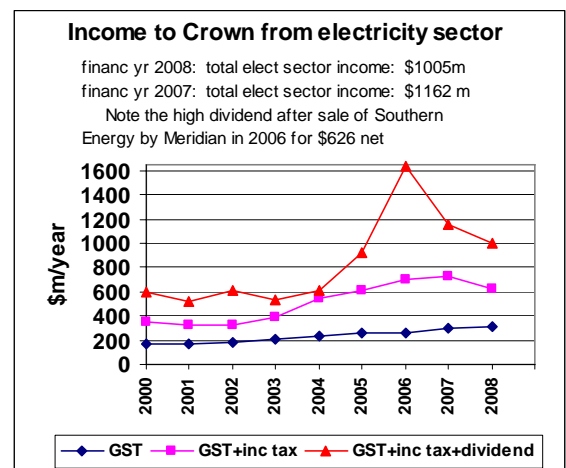
A focus on home energy retrofits, on repair and rebuilding of houses, and of energy-efficient new houses for low-income as well as high-income earners, would lead to jobs throughout the regions. It has even been suggested that closure of major industrial plant may be mitigated by retraining the unemployed specifically for housing upgrades in the district. Projects within a small area can create many economies, with better use of tradesmens' time, bulk buying of materials, etc. New businesses would be required for a massive home retrofit programme, in particular, new plant to manufacture insulation⁷.

Funding for home energy retrofits

The Climate Change Response Act 2002 (as amended in September) provides for a Household Fund⁸, "for the purpose of reducing non-transport household greenhouse gas emissions through the promotion of household energy efficiency and conservation and household renewable energy technologies." Specifically mentioned in the Act are household insulation, clean heat retrofits, energy efficient appliances and lighting, and space and water heating efficiency improvements.

The Minister determines the criteria, after seeking and considering advice from EECA, having regard to income and energy needs of households, and cost-effectiveness of the measures. EECA must manage and administer the fund according to the Minister's criteria.

The Household Fund was conceived as a means of recycling revenue that the Crown receives from the electricity sector. Government already takes about \$1 billion per year in revenues from dividends, income tax and GST from the electricity sector, up from about \$500 million per year in 2004.⁹ The dividends from electricity state-owned enterprises are now reducing, as funds are being retained for investment in new generation and transmission. But as prices rise, income tax and GST still provide a generous revenue base to recycle into home energy efficiency projects.



Emissions pricing will add further windfall revenues from 2010.

DEUN Recommends: Dedicating a proportion of the Crown's revenues from the electricity sector to the Household Fund.

Implementing home energy schemes

To date EECA's Energywise Homes schemes have been very difficult to implement, with energy efficiency trusts being required to find 40% (formerly 60% or more) of the funding from outside sources. Partnership funding is becoming rapidly more difficult to find, with corporate and charity funding sharply reduced. Many retrofit organizations have had to lay off staff even while energy price rises have increased the need for the programmes.

The billion dollar 15-year Household Fund needs to be implemented by a much more sophisticated process. Internationally funded energy efficiency projects, for example those

funded by the Global Environmental Facility, require a fairly standardized design.¹⁰ A \$10 million programme for a developing country, might take several months to design, beginning with professional input, and continuing with five or six local teams looking at policies, institutional and technical aspects. It would begin with an assessment of any previous programmes – based on extensive data collection, not just a few small studies. The proposed goals and proposed indicators of success would be made available on a public website, and there would be stakeholder meetings to identify barriers to achievement of success, and propose how to overcome the barriers.

DEUN members have already participated in this type of process, in two cases. Three DEUN members were invited by the Auckland Regional Council to attend stakeholder meetings on its Regional Energy Strategy, with the first meetings addressing a broad vision for the future, desired outcomes, and barriers to achieving those outcomes. We are very hopeful that the consultation document will reflect the extensive comments we made during these meetings. DEUN was also invited by Transpower to participate as stakeholders in their long-term transmission planning project.

A similar analysis framework, which targets greenhouse emissions reduction, is already in operation in 34 local councils representing 83% of New Zealanders. “Communities for Climate Protection”, a Government initiative linked to the International Council for Local Environmental Initiatives (ICLEI)¹¹, gives Councils a standardised framework for identifying greenhouse emissions both from their own activities and in their communities. The programme helps councils set their own emissions reduction goals, develop and implement a local action plan, and monitor and report on progress towards their goals.

A billion-dollar 15 year programme deserves to be designed through a data-rich, broadly consultative public process, rather than simply in-house as has been done by both EECA and the Electricity Commission for their energy efficiency programmes.

DEUN Recommends: Use of the Household Fund be professionally planned using international best practice, including input from the community.

¹ (Treasury (2006). Working New Zealand, Obtained under the Official Information Act).

² Lloyd, Bob (2008). Fuel Poverty in NZ.

http://www.cea.co.nz/files/Fuel_Poverty/_Lloyd_Fuel_Poverty_in_NZ_ver_2008.pdf accessed Nov 1 2008

³ “Number of homes in fuel poverty rises by 1 million.” guardian.co.uk, Thursday October 02 2008

<http://www.guardian.co.uk/money/2008/oct/02/householdbills.energy>

⁴ Market Review Options Paper briefing, slides 9 and 12.

<http://www.electricitycommission.govt.nz/pdfs/opdev/wholesale/market-design/presentation-MDR-BriefingSession-12Aug08.pdf>

⁵ http://www.pce.govt.nz/_data/assets/pdf_file/0013/3523/Concept_Smart_Metering.pdf, appendix D

⁶ Mitigation Potential and the Cost of Mitigating Greenhouse Gas Emissions in New Zealand 2013 – 20, Briefing for the Climate Change Leadership Forum, Prepared by the Ministry for the Environment

February 2008, <http://www.climatechange.govt.nz/emissions-trading-scheme/input-and-engagement/climate-change-leadership-forum/2008-02/mitigation-potential-cost-gas-emissions.html>

⁷ Michael Camilleri, BRANZ, pers. comm

⁸ http://www.legislation.govt.nz/act/public/2002/0040/latest/DLM1662838.html?search=ts_act_climate#DLM1662838

⁹ Data from Official Information Request to CCMAU, plus annual reports of Contact Energy and TrustPower. GST estimated from table G.5a of Energy Data File

¹⁰ From correspondence on the Sustainable Energy Forum newsgroup

¹¹ <http://www.iclei.org/index.php?id=3920>