

Energy Efficiency Standards – Key to a Total Market Transformation Programme for Heat Pumps

Good morning distinguished delegates, guests, ladies and gentlemen

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Increased affluence in developing countries is driving demand for modern appliances like refrigerators and air conditioning. Coupled with the widespread demand from all countries for consumer products spurred particularly in the fast moving field of consumer electronics we are now seeing an increased energy demand from the residential sector within Asia. This growth is placing considerable demand on energy generation capacity and impacting significantly on our environment. One recognized way to reduce this energy demand and its related CO2 emissions is the development and promotion of energy efficient products.

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Today I wish to talk about how Minimum Energy Performance Standards (MEPS) underpinned the market transformation of the New Zealand Heat Pump market. This presentation is not just about the importance of standards, it also shows how a coordinated suite of tools both mandatory and voluntary, can bring about significant energy savings. These measures comprise MEPS, mandatory labeling, the voluntary endorsement mark ENERGY STAR, financial incentives, procurement guidelines, installation guidelines and advertising that together transformed the market for heat pumps.

These interventions occurred over a period when the penetration rate of heat pumps in New Zealand went from 4% of homes having one heat pump in 2000 to over 25% of homes having a heat pump in 2010.

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What is EECA

The Energy Efficiency and Conservation Authority is crown agency that encourages, supports, and promotes energy efficiency, energy conservation, and the use of renewable sources of energy in New Zealand.

EECA helps New Zealanders at home and in business understand and overcome the barriers to being more energy efficient and using more renewable energy. Our goal is to maximise cost-effective energy savings and co-benefits for all New Zealanders, and stimulate the uptake of both large and small-scale renewable energy.

Our core business is determined by assessing the potential for cost-effective energy savings and emissions reductions. We also go for energy savings that

cost more to deliver where there are significant co-benefits such as health improvements, on the basis that there is a total net benefit to the nation. Our work contributes to a secure energy system for New Zealand.

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Heat Pump Interventions

I will first give you an overview of heat pump sales and their performance. I will also talk about the significant savings that New Zealand has achieved by working together in a collaborative way through a formal agreement with Australia (a close trading partner and, like New Zealand, a small market) to introduce minimum energy performance standards (or 'MEPS') and mandatory labeling across a number of energy using products. I will follow this by explaining how we also use the ENERGY Star mark to endorse the most energy efficient models and how this complements MEPS and mandatory labeling. I will then talk about how we funded the installation of heat pumps into some New Zealand homes and how the criteria for subsidies are linked to MEPS and labelling standards, and, in the case of heat pumps, the ENERGY STAR specification. Finally I will talk about the information we provide to industry and consumers and the different media approaches used. This will demonstrate the integration of the measures we have used and the positive effect they have had on the heat pump market in New Zealand.

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Heat Pump Sales in New Zealand

Reverse cycle air conditioners, known as heat pumps locally, are New Zealand's fastest growing winter heating solution. They are much less expensive to run most than other forms of heating, if used effectively, and are a low-emissions technology as New Zealand's electricity generation is around 70% renewable.

Approximately 1 in 4¹ New Zealand houses have a heat pump installed, up from just 4% in 2000 and almost half of new homes are installing heat pumps². For many this is a first time purchase decision³. This growth in the heat pump market highlights the need for good information to enable consumers to choose the correct appliance for their requirements and use them effectively.

¹ Energy Use Forecasting for heat pumps 2009 by BRANZ of 21% with annual increase estimate of 4%

² Transpower, Energy Use Forecasting for heat pumps 2009 by BRANZ

³ Artcraft Research, October 2005, for EECA.

Sales of heat pumps have grown significantly since data was first collected. In 2004, 34500 were sold. In 2010, total sales of 118,732 single phase non-ducted units were sold. The largest growth segment was in the size range of 4 to 7.5kW capacity, which is essentially product for the domestic market.

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Performance of Heat Pumps in New Zealand

A series of step changes in efficiency first occurred in 2004-05. This was around the time MEPS and labelling was first introduced in New Zealand. Interestingly, the changes started before the date on implementation of MEPS and labelling, as suppliers readied themselves for their introduction and made compliant product available on the market early.

This was a consequence of good consultation between industry and government and was characterised by a cooperative approach to set the stringency levels and sufficient lead in times that allowed industry to respond.

The second improvement occurred around 2006 when the MEPS stringency level was increased. This follows an established pattern of introducing MEPS at a relatively easy to attain level and then increasing the stringency level within three years once the industry has become familiar with the requirements.

The next jump in efficiency was achieved by introducing the ENERGY Star endorsement mark in late 2006. The improvements from ENERGY STAR gained real traction as we promoted the brand and manufacturers used it to promote their products. This led to an increase in the sales share of ENERGY STAR qualified products. Today ENERGY STAR qualified models (the top 25% most efficient) make up 65% of heat pump sales.

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Heat Pump Success

This slide overlays the sales information with sales weighted coefficient of performance COP⁴ efficiency improvements that have been attained. The efficiencies were made at a time of significant sales growth.

⁴ The **coefficient of performance** or COP (sometimes CP), of a [heat pump](#) is the ratio of the change in [heat](#) at the "output" (the heat reservoir of interest) to the supplied work.

Savings for heat pumps sold in 2009/10 are estimated at 80.5 GWh compared to the BAU case. Total energy savings for heat pumps in 2009/10⁵ was 280 GWh or \$58.0million⁶.

Total cumulative savings for heat pumps, since the beginning of the programme in 2004 is 720 GWh (2.59PJ) or \$147.6million⁷.

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Equipment Energy Efficiency Programme (E3)

In 2005, New Zealand developed a policy framework and funding agreement for a joint programme with Australia. The programme known as the Equipment Energy Efficiency (E3) Programme has been a success for both countries.

The benefits have been a consistent approach to the development, implementation, compliance and enforcement of minimum energy performance standards, labelling requirements and other agreed related projects.

By partnering with Australia, New Zealand has gained major benefits, including:

1. Increased market size and access to products not available in a smaller market
2. Lower compliance costs as the requirements are uniform and test standards and performance levels are aligned
3. Shared development and compliance costs – efficiencies mean a lower taxpayer spend
4. Allows New Zealand and Australia to cost effectively meet requirements of the Tran-Tasman Mutual recognition Arrangement TTMRA trade agreement which facilitates trade between New Zealand and Australia

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Minimum Energy Performance Standards MEPS

⁵ This figure includes all savings made in 2009/10 including the continuing savings from products purchased in previous sales.

⁶ Savings calculated using a combination of the average residential and commercial electricity rates applying during the year of energy saving from the Energy Data File 2009

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Minimum Energy Performance Standards (MEPS) are acknowledged the world over as a cost-effective mechanism for lifting the energy performance of household appliances and other equipment.

MEPS set agreed energy efficiency levels that products must meet or exceed to access the market. They compel industry to make energy performance improvements that are already within reach. MEPS are designed to be cost effective and not to compromise competition in the marketplace, consumer choice, product affordability, product functionality, or technological innovation.

MEPS and mandatory labeling were first introduced under regulation in New Zealand on 1 April 2002. Heat Pumps were made subject to MEPS and labelling in 2004 and the MEPS stringency levels for this product were updated in 2006. Subject to cabinet approval, the stringency levels and label algorithm will be again updated in April 2011.

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Products in the MEPS Programme

15 product classes are now included, with 9 additional classes in various stages of development, consultation and decision (some already implemented in Australia).

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Labeling

Market intervention in the form of labelling can, to some extent, address the lack of public awareness and understanding of the energy performance of products, and how it can impact on energy consumption and costs. It can also affect the lack of incentive for manufacturers and suppliers to improve product energy performance. Addressing these market barriers will provide increased opportunity to realise energy efficiency gains while maintaining product utility.

Labelling is about providing information on the energy use of a product in a form that is meaningful and impacts on the purchase decision of the consumer. Labels alone work, but supported by advertising and informed sales staff their influence is even stronger. It is about providing low cost, high impact information so consumer transact with confidence. Making labelling mandatory allows consumers to be fully informed and creates a level playing field across industry.

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Products in the MEPL Programme

Mandatory labeling tends to suit products that are typically purchased by the energy bill payer and sold in a retail environment. The product classes covered in New Zealand include domestic refrigerators/freezers, heat pumps, white ware (washing machines, dishwashers, clothes dryers), and cars. Product classes under consideration include TVs, and gas water and space heaters.

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MEPS and Labeling Results

Energy savings for New Zealand have been significant - In 2010 alone, the products regulated under the MEPS programme are estimated to have saved 706 GWh (2.5 PJ). Estimated monetary savings are NZ \$150m.

Estimated cumulative savings are 2,397 GWh (8.6 PJ) since the programme started in 2002. Cumulative monetary savings are estimated at NZ \$504m.

Projected saving for the additional 8 product classes to be added in 2011 are 44.6PJ (\$NZ1.73b) over the period 2010-2020.

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ENERGY STAR

ENERGY STAR is a voluntary programme that uses an endorsement label to help consumers identify the most energy efficient models in a product class. ENERGY STAR offers manufacturers and suppliers a tool to promote their most energy efficient models and increases the incentive to supply these models to the New Zealand market.

The advantages that New Zealand attains from using Energy Star are:

1. An important tool to complement mandatory energy ratings and allow for a push – pull strategy in the market
2. It is aligned with many products subject to regulation and sales data collection so good intervention evaluation is possible.
3. Easily identifies the most efficient and used by our Government in its procurement programme
4. It allows New Zealand to pick and choose those products where the specification best suits our local market
5. We can free ride, the development of the specifications.

The percentage of heat pumps models that were registered with the ENERGY STAR program has increased from 7% in 2005 to 23% in 2009. At the same time sales of ENERGY STAR qualified heat pumps have a market share of almost 65% of total sales. This shows that the programme has significant industry and consumer support and being highly successful in influencing a move to high efficiency heat pumps.

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Energy Star Marketing

General awareness campaign – ENERGY STAR is integrated into EECA's ENERGYWISE consumer information campaign including the 60 second Energy Spot TV commercials and advertorials in key publications.

Through our partnerships with retailers we run ENERGY STAR focused promotional activities which are designed to raise brand awareness and educate consumers about what ENERGY STAR means.

EECA research shows that consumers are turning more and more to researching products online before purchasing, so we have links to our website on related Google search results and tiles on key websites like www.trademe.co.nz.

We put a variety of point of sale materials into retail partner stores to draw attention to products that are ENERGY STAR qualified, and communicate key reasons to consumers about why they should buy qualified products.

Retail staff are key influencers of consumer purchasing, so EECA uses a third party to do in-store training sessions to help educate staff about the importance of energy efficiency, how to read and understand Energy Rating Labels, and how to use ENERGY STAR as a selling tool.

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ENERGY STAR Partnerships

EECA has developed partnerships with most of the major appliance retailers, who in turn use the logo in their advertising and allow for additional point of sale information and staff training.

Retail partners have significant marketing budgets, so this is an effective way of increasing the chances to influence and educate consumers. In 2010/2011, ENERGY STAR partners will spend \$2.50 for every \$1 EECA spends on promoting the ENERGY STAR brand.

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Why ENERGY STAR has been successful

Energy efficiency is a key purchasing criteria for heat pumps, so an independent endorsement like ENERGY STAR of a products energy efficiency is valuable for both consumers and manufacturers.

EECA undertakes a specific ENERGY STAR marketing programme targeting consumers and influencers. It has also been integrated into ENERGYWISE consumer campaign including Energy Spot TV commercials.

ENERGY STAR is the qualifying criteria for NZ Government clean heat subsidies. This provides an added incentive for manufacturers to support ENERGY STAR while helping promote the brand to a target audience.

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ENERGY STAR Achievements

The percentage of heat pumps models that were registered with the ENERGY STAR programme was 7% when introduced in 2006. The percentage of qualifying models has risen to *21% in 2010*.

At the same time sales of ENERGY STAR heat pumps have risen from a market share (sales volume) of 29% to 65% of total sales.

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Funding

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Warm Up New Zealand Heat Smart

Another key element driving the success of both ENERGY STAR and the market share of ENERGY STAR qualified heat pumps is the linkage to another Government funded programme, known as Warm Up New Zealand: Heat Smart. This is a \$NZ347 million government programme that will insulate 188,500 homes over four years. Already 50,000 homes have been retrofitted in first year.

As well as insulating homes the programme also offers a subsidized clean heating device to home owners. These can be a gas fired heaters, approved

wood or pellet burner or an ENERGY STAR qualified heat pump. By using ENERGY STAR we ensure the devices are suitable for heating as ENERGY STAR heat pumps are tested at H2 or 2⁰C to ensure they perform in a cool climate. It also further promotes the brand in the eyes of consumers.

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Information

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Information Channels

Labels are an effective mechanism to provide energy efficiency information to consumers. However, in an increasingly sophisticated market, consumers use a variety of other media sources to gather information. The use of websites, print and television advertising is common today. That is why EECA also actively promotes both its generic message around energy efficiency and conservation and specific product information on its websites; in television advertisements and print media. We publish best practice installer guides targeting industry and also incorporate these into our contract provisions of Warm Up NZ: HS.

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The Energy Spot Campaign

Run the advertisement

<http://www.energywise.govt.nz/energyspot/episode-19/efficient-heating-options>

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Public Awareness of Labels

In New Zealand and Australia, energy rating labels have very high consumer awareness with 98% recognition level amongst consumers and 75% stating that the energy rating has a significant impact on the final purchase decision. Combined with a very high compliance rate of 98%, products that display labels have a major impact on consumer choice.

Energy Star has within 5 years also established strong brand awareness with a 75% recognition level amongst consumers. The strategy of both EECA promoting the brand and industry promoting products that carry the brands has been highly effective over this period.

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Overall Achievements

Savings for heat pumps sold in 2009/10 are estimated at 80.5 GWh compared to the BAU case. Total energy savings for heat pumps in 2009/10⁸ was 280 GWh or \$58.0million⁹.

Total cumulative savings for heat pumps, since the beginning of the programme is 720 GWh (2.59PJ) or \$147.6million¹⁰.

Combined with a compliance rate of 99%, which means that the programme has significant industry and consumer support and is highly successful in influencing a move to high efficiency heat pumps.

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Lessons Learnt

No one measure is a silver bullet. Any successful programme must have a suite of complementary measures. These are built on standards – testing and either MEPS and/or Labelling as the foundation. On top of this the provision of information, through various media and brand recognition as a trusted and independent source of information ensure any programme has the most impact on consumer choice. It is a partnership between government and industry – each contributing and working together on a common goal.

⁸ This figure includes all savings made in 2009/10 including the continuing savings from products purchased in previous sales.

⁹ Savings calculated using a combination of the average residential and commercial electricity rates applying during the year of energy saving from the Energy Data File 2009

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