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Conservation Authority  
Te Tari Tiaki Pūngao

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# Transforming the heat pump market with energy efficiency standards

Terry Collins, Manager Products Programme,  
January 2011

# Overview

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- Heat pumps have been a success in New Zealand in terms of both sales and efficiency improvements
- An effective standards-based regulation programme is crucial to achieve on-going efficiency improvements
- However, getting the best results requires more than just regulation – consumers have to understand and be motivated.



# What is EECA?

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- New Zealand government agency
- Government energy priorities:
  - Stimulate economic growth
  - Develop energy resources
  - Security and affordable energy
  - Efficient use
  - Environmental responsibility
- Supports energy efficiency, energy conservation and renewable energy across the economy (residential, business, industry, public sector)
- Our tools: information, incentives, partnerships, influence and judicious regulation
- 100+ staff (3 offices)

# Heat pump interventions

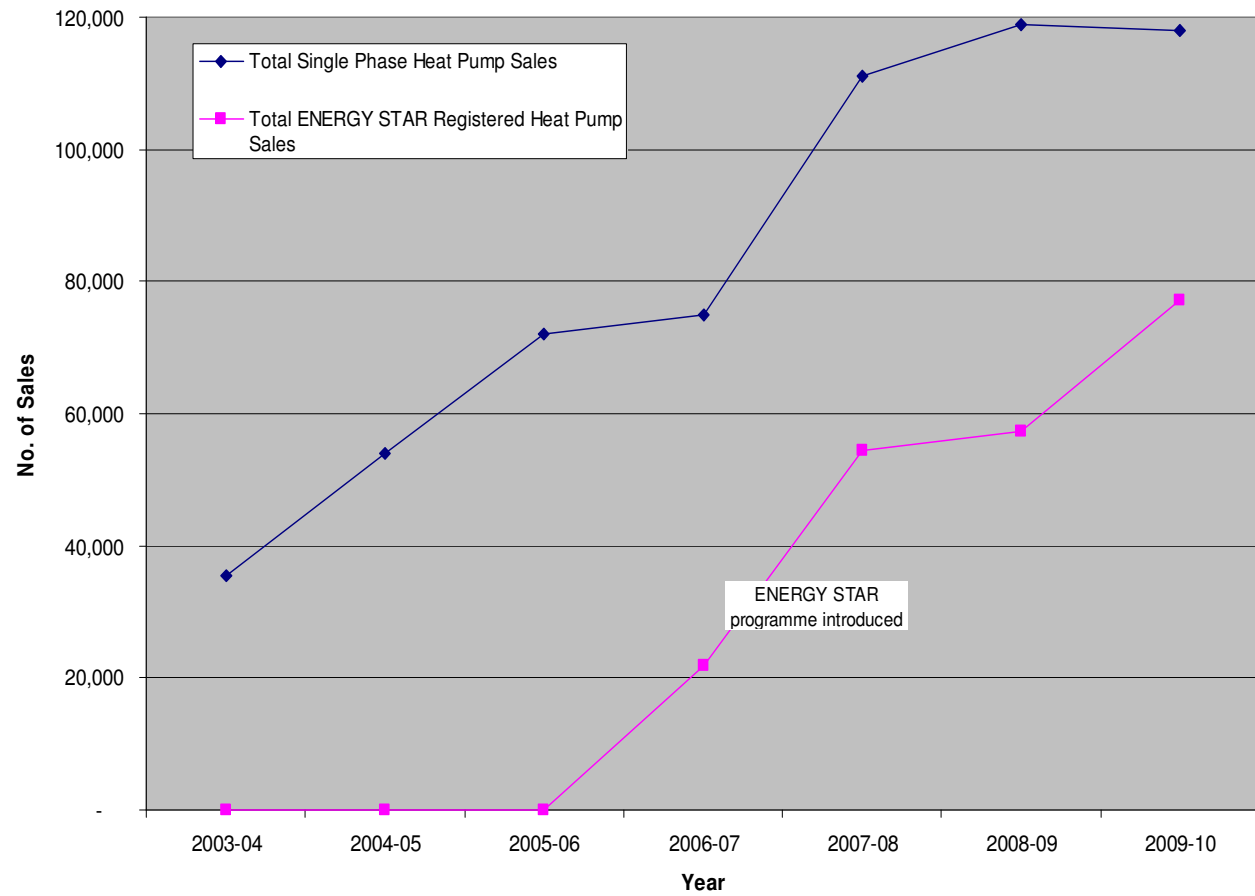
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1. **Overview of heat pump sales and performance**
2. Regulation: MEPS and labelling
3. Information: Energy Star
4. Funding
5. Information



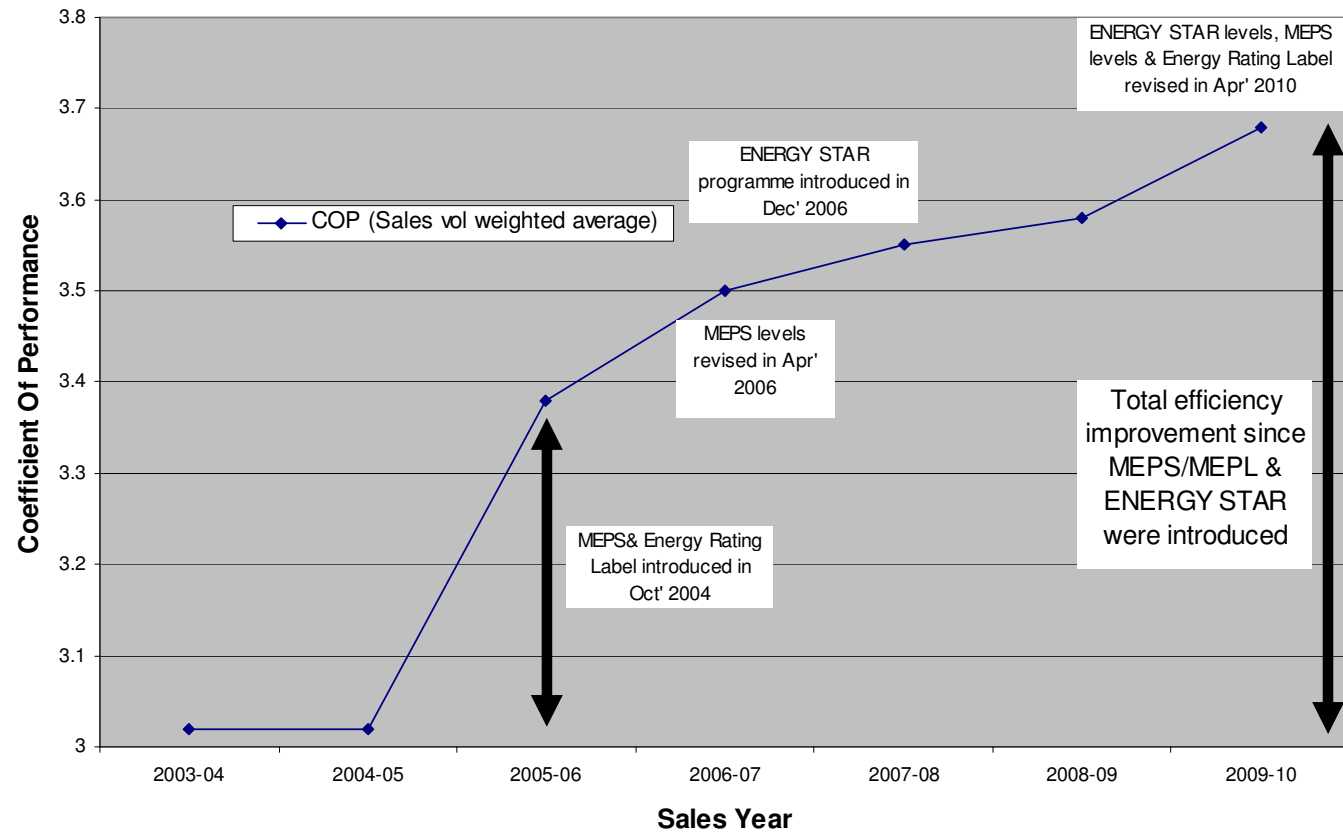
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# Heat pump sales in New Zealand



# Performance of Heat pumps in New Zealand

Sales weighted average COP for single-phase Air Conditioner/Heat Pumps

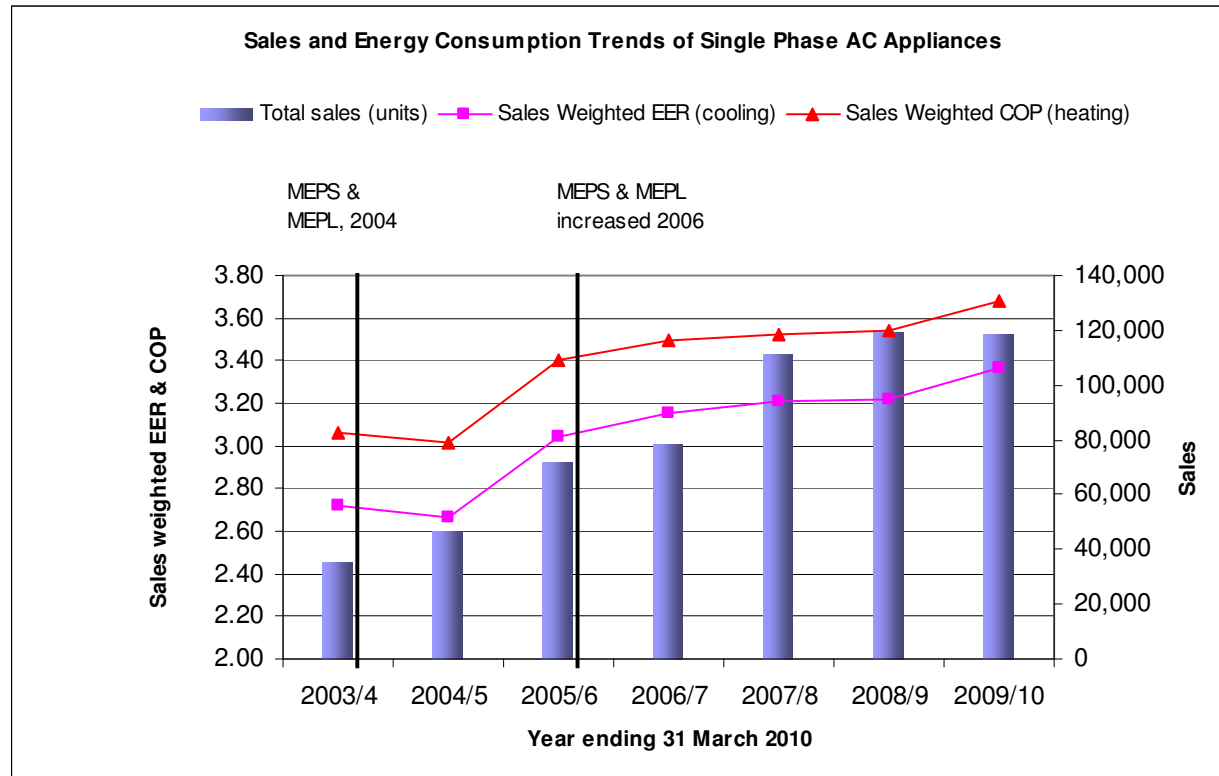


**COP (Coefficient of Performance):** *The ratio of the heat energy supplied Vs the power input . This is expressed in kW/kW, which is a dimensionless ratio*



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# Heat pump success





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# Heat pump interventions

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# Equipment Energy Efficiency Program (E3)

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- Joint Australia and New Zealand programme
- Develops energy efficiency measures for a range of residential, commercial, and industrial products
- E3 tools: Minimum energy performances standards (MEPS) and mandatory labelling
- Benefits of international harmonisation: lower costs, reduces risk of trade barriers

# Minimum Energy Performance Standards (MEPS)

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- Removes the least efficient products from the market
- Standards are tightened over time
- Results in continued improvements in product performance and efficiency





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## Products in the MEPS programme

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### Currently Regulated

- Water heaters - Electric
- Refrigerators/Freezers (Domestic & Commercial)
- Air conditioner/Heat Pumps
- Lighting – fluorescent lamps & ballasts
- Distribution transformers
- 3-Phase electric motors

### Scheduled for Regulation 2011

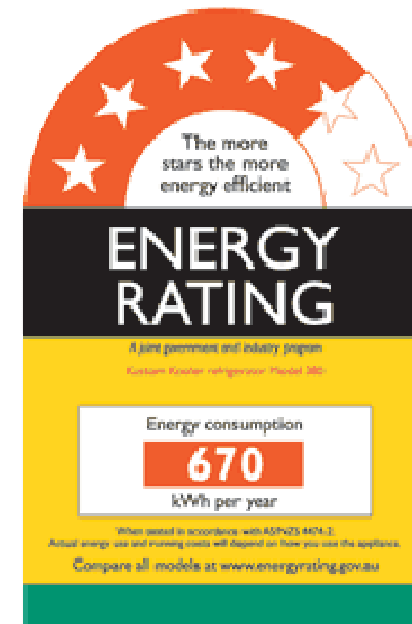
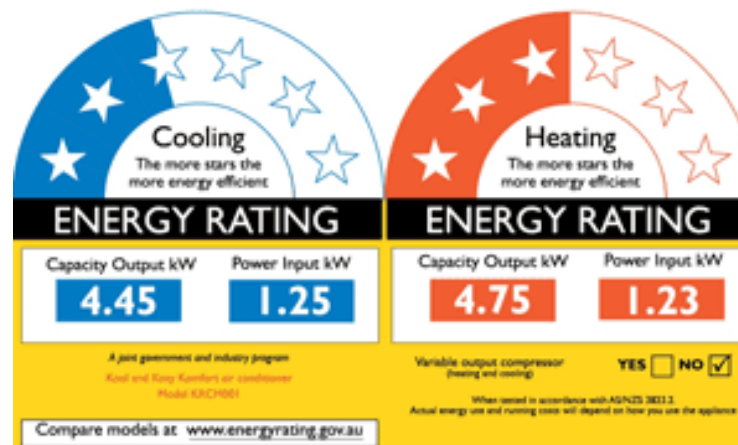
- Commercial chillers & computer/server room A/Cs
- Water heaters - Solar, Gas & Heat-pump
- Home Entertainments (TVs, Computers, Monitors, Set-top Boxes)
- External Power Supplies
- 1W Standby
- Gas Room & ducted heaters
- Lighting – compact fluorescent



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# Labelling (MEPL)

- Mandatory programme
- All products included must display an Energy Rating Label
- Compliance monitoring required to maintain confidence



## Products in the MEPL programme

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### Currently Regulated

- Refrigerators/Freezers (Domestic)
- Air conditioners
- Whiteware (washing machines, dishwashers, clothes dryers)
- Cars (VFEL)

### Considered for Regulation

- Home Entertainment (TVs)
- Gas Water Heaters
- Gas Room Heaters

## MEPS and labelling - results

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- Savings of 706 GWh (2.5 PJ) in the year ended in March 2010 (\$157m)
- Cumulative savings of 2,397 GWh (8.6 PJ.) (\$530 m)
- Cost benefit ratio of 1:53.5.
- New and revised Standards are forecast to contribute an additional 38.4 PJ over the next 10 years. (\$1.7b)





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- ENERGY STAR is a voluntary endorsement programme for the top 25% most energy efficient products.
- Manufacturers and retailers can use the brand to help promote or sell their most efficient products.
- EECA is licensed to run ENERGY STAR in New Zealand by the United States Environmental Protection Agency (EPA). The programme covers:
  - heat pumps
  - whiteware (fridge/freezers, washing machines, dishwashers)
  - home electronics (TVs, audio/video, set-top boxes)
  - office equipment (computers, imaging equipment)
  - solar water heating systems
  - compact fluorescent lamps (CFLs).





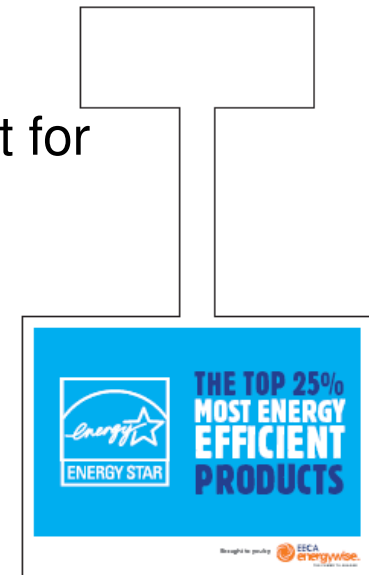
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# ENERGY STAR marketing

- General awareness campaign
- Joint promotional activities with retailers
- Google online campaign
- In-store point of sale information
- Education of retail staff
- Using ENERGY STAR as a requirement for Government funding (clean heat, solar water heating)
- The Energy Spot Campaign



Brought to you by EECA energywise.





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# ENERGY STAR partnerships

- Partnerships with manufacturers and retailers essential to ensure their support and use of the brand.
- Retailers a key channel for reaching end consumers

In 2010/2011, ENERGY STAR partners will spend \$2.50 for every \$1 EECA spends on marketing

**\$75**  
Sony DVD Player  
• Compact with sleek • Multi-format playback • 6 disc tray • 10 disc capacity

**HOT DEAL!**

**\$529**  
HOT PRICE!  
LG 35cm (22") HD IDTV LCD  
• High Definition (1366x768) resolution  
• Integrated Freeview HD Tuner • 13.4MHz tuner  
• PC input • Invisible speakers • Serial card slot

**100Hz MOTIONFLOW**

**\$999**  
100Hz MOTIONFLOW  
Sony 80cm (32") Full HD IDTV LCD  
• Full HD (1920x1080) resolution  
• Integrated Freeview Digital HD Tuner  
• 100Hz • 8MBVA engine • Ambient sensor • Use Colour • USB Media Player  
• 4x HDMI input  
• 4x USB

**100Hz MOTIONFLOW**

**\$1488**  
SUPER DEAL!  
Sony 100cm (40") Full HD IDTV LCD  
• Full HD (1920x1080) resolution • Integrated Super Digital HD Tuner  
• 100Hz • 8MBVA engine • Ambient sensor • Live Colour • 1080p Media Player • 4x HDMI input

**AMAZING PACKAGE DEAL!**

**\$2388**  
WHILE STOCKS LAST  
Samsung 115cm (46") Full HD LCD & Home Theatre Package  
• Full HD (1920x1080) resolution • 100Hz motion plus  
• 100Hz • 8MBVA engine • Ambient sensor • Live Colour • 1080p Media Player • 4x HDMI input  
• PC input and mobility \$2495  
Home Theatre: 1000 Watts • 5.1 Channel • Wireless Sub-Speakers (Ready for external accessories) • Sold and shipped at \$2995

**LOOK FOR THE ENERGY STAR**

The blue ENERGY STAR label tells you at a glance whether the appliance is a leader in energy efficiency. Since ENERGY STAR products use less electricity to do the same job, you'll not only save money on your power bill, but also do your bit to protect the environment and reduce your carbon footprint.

All whitegoods and heat pumps have the red and yellow energy rating labels, which tell you how much energy an appliance uses, and lets you compare energy use between similar models. But only the top 25% most energy efficient products qualify for the blue ENERGY STAR label.

You'll find the mark on an increasing number of products including heat pumps, fridges, washing machines, dishwashers, TVs, stereos, DVD players and computers.

ENERGY STAR is run in New Zealand by the Energy Efficiency and Conservation Authority (EECA), and is proudly supported by 100% Appliance Stores throughout New Zealand.

So if you see the blue ENERGY STAR label on a product in a 100% Appliance Store, you can be confident that you are choosing one of the most efficient appliances available.

**LIMITED STOCK**

**\$2649**  
HUGE 55" SCREEN  
Sony 137cm (55") Full HD LCD  
• Full HD (1920x1080) resolution  
• Integrated Freeview HD Tuner  
• 100Hz • 8MBVA engine • 3  
• Use colour • 4x HDMI input  
• 4x USB

## Why ENERGY STAR has been successful

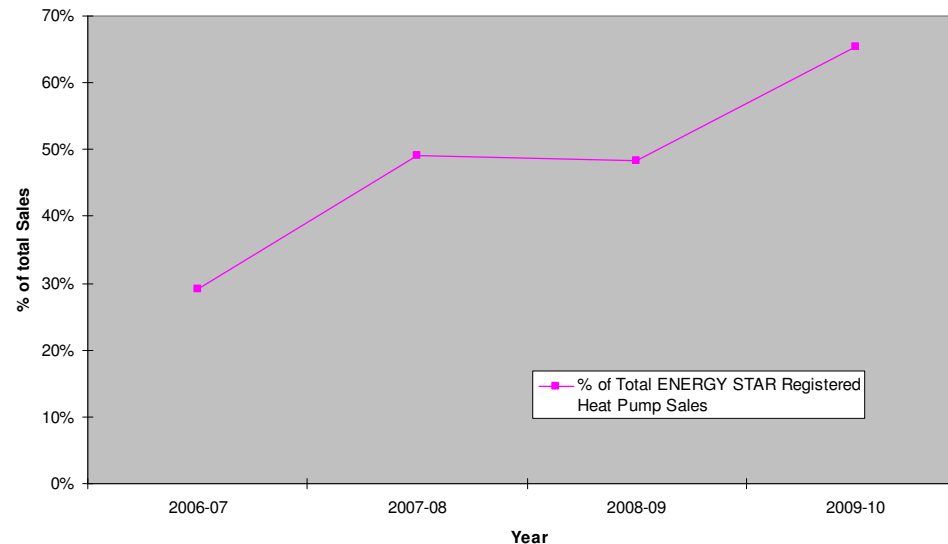
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- Independent endorsement of energy efficiency is valuable for both consumers and manufacturers.
- Simple tool for suppliers to differentiate their products.
- Strong partnerships with major industry players.
- Extensive brand use by partners.
- Specific marketing programme by EECA.
- Qualifying criteria for NZ Government clean heat subsidies.

# ENERGY STAR achievements

- The percentage of heat pumps models that were registered with the ENERGY STAR program increased from 7% in 2006 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.*

ENERGY STAR Sales of Heat Pumps





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## Warm Up New Zealand: Heat Smart

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- \$347 million government programme
- 188,500 homes over four years
- 84,000 homes retrofitted already (18months)
- Subsidises ceiling and underfloor insulation, as well as efficient heating options



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# Information channels

- EECA websites
- Energy Spot
- Stores and partner advertising
- Brochures and guides

The screenshot shows the EECA EnergyWise website. The main navigation bar includes: HOME, WHY BE ENERGY EFFICIENT, HOW TO BE ENERGY EFFICIENT, FUNDING AVAILABLE, RATINGS & LABELS, SUPPLIERS & PARTNERS, and RESOURCE CENTRE. The 'Heat pumps' section is highlighted, featuring a sidebar with a list of topics (Appliances, Building and renovating, etc.) and a main content area with the following text:

**Heat pumps**  
A heat pump that's correctly sized, installed and used can heat your home using less energy.  
But to get the most out of a heat pump, it's really important to choose the right one and use it properly - here's how.

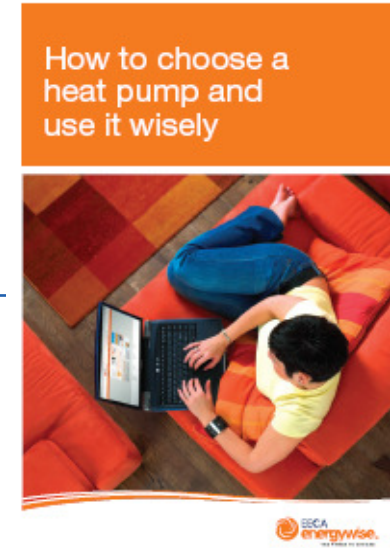
**For top efficiency and performance, look for ENERGY STAR®**

**Better efficiency**  
While heat pumps are the most efficient way of using electricity to heat your home, some are more efficient than others.

**Better performance when the outside temperature drops**  
Some heat pumps struggle to keep up between 0°C, when they are more prone to icing up. That's why ENERGY STAR now includes a requirement that's designed to ensure a correctly sized ENERGY STAR heat pump will perform efficiently in this temperature range.

**Checklist for choosing a heat pump**  
As well as choosing an efficient model, here's some other important things to think about:

- **Insulate first.** Make sure your ceiling and underfloor insulation is sorted first - you'll be able to buy a smaller heat pump and your home will be cheaper to heat properly.



**Revised heat pump and fridge and freezer labelling**

New energy rating labels for heat pumps/air conditioners and fridges and freezers are being phased in. It means that for some time, there will be a mix of old and new labels in shops - here's what you need to know about the change.

**Adjustment to Energy Rating Labels**  
The efficiency of fridges and freezers, and heat pump/air conditioners, has improved a lot over recent years. The new heat pump's star rating has been adjusted to reflect this gain. Star ratings on the new labels for fridges and heat pumps have been dialled back by about two stars. For example, a 4-star model on the old label will be about a 3-star model on the new label.

**Side-by-side heat pump/air conditioner labels**  
The new energy rating label for heat pump/air conditioners has heating and cooling side-by-side (the old label combined them).

**New 'Crown' for super efficient models**  
Technology is improving every year. In 2019 you'll see a 'crown' label on super energy efficient models of fridges and freezers, and heat pump/air conditioners, which goes up to ten stars. Models that exceed the 6-star energy rating can use the crown to show a higher rating.

**Comparing labels on fridges and freezers**  
Star ratings are not the only way to compare efficiency between different fridges and freezer models. These labels also have an annual energy consumption figure.

**EECA recommends using the annual energy consumption figure on the energy rating label to help compare similar products. The lower the energy consumption, the more efficient the model is.**

**ENERGY STAR - the mark of energy efficiency**  
The ENERGY STAR mark is only awarded to the most energy efficient heat pumps and fridges on the market. Because some heat pumps struggle to keep up at 0°C, when they are more prone to icing up, ENERGY STAR now also includes a requirement for qualified heat pumps to perform in this temperature range.

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EECA energywise THE POWER TO CHOOSE

For more ways to save energy at home call 0800 749 782 or visit www.energywise.govt.nz





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## The Energy Spot campaign

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- 60 second TV ads promoting a variety of energy efficiency messages
- four major TV networks, three nights a week during prime time.
- Thirty different episodes have been produced including efficient heating:
- <http://www.energywise.govt.nz/energyspot/episode->





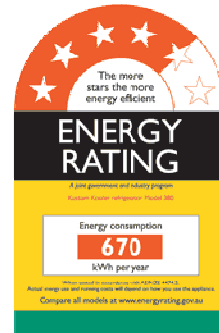
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# Public awareness of labels

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77%



95%

Synovate consumer research, July-Sept 2010

## Overall achievements

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- Heat pump efficiency has improved by more than 20% since 2003
- 2.59 PJs saved since 2004
- Estimated \$147.6 million savings
- Comparative energy labels have 95% consumer recognition.
- Label compliance rate is 99%

## Lessons learned

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- No “silver bullet” – a range of complementary interventions is needed
- Cross support helps, e.g. using ENERGY STAR as a requirement for funding
- Education needs to include use as well as the right choice
- Government and industry have to work together