

Regulatory Impact Statement

1. Proposal to revise the existing minimum energy performance standards for heat pumps/air conditioners.

Agency Disclosure Statement

2. This Regulatory Impact Statement has been prepared by the Ministry of Business, Innovation and Employment (MBIE). It provides an analysis of options to improve the energy performance of heat pumps/air conditioners through revisions to the existing requirements.
3. The analysis includes an assessment of:
 - the current requirements and state of the market
 - the impact on suppliers and manufacturers of requiring more efficient models (including the cost of compliance)
 - the impact on consumers of purchasing more efficient models.
4. The recommended option will increase the stringency of the existing minimum energy performance standards (MEPS) by mid-2013 and introduce new MEPS requirements for multi-split systems¹ in April 2014.
5. The MEPS requirements will be set out in a joint Australia and New Zealand standard that is a revision of the current standard that draws on international testing standards. The changes will more closely align the requirements with those in place in Australia, which contributes to the objectives of the Trans-Tasman Mutual Recognition Arrangement (TTMRA) and the Closer Economic Relations (CER) Agreement.
6. This proposal has been developed within the parameters of a joint work plan with Australia, which investigates the introduction of measures that are a variation on MEPS and/or energy labelling. This effectively rules out some alternative options from consideration. The variations include different timeframes for introduction, energy efficiency levels, or whether to introduce voluntary or mandatory standards. In the case of heat pumps/air conditioners, mandatory standards and labelling requirements already apply. Voluntary ENERGY STAR[®] endorsement labelling has been available since 2006.
7. The proposed measures are not expected to restrict competition or impose significant costs. Many suppliers also supply to Australia so their products already comply with the revised requirements that are in place there.
8. Industry will incur some additional administration costs to register their products (but no registration fee) and may incur costs to test their product (if it has not already been tested to the relevant standard). These costs will be marginal due to the existing requirements, even for multi-split systems because suppliers that also provide product to Australia will have to comply with the requirements when they are introduced there.

(Signature of person)

(Date)

¹ A heat pump/air conditioner system with multiple indoor heaters (with separate controls) supplied from one outdoor unit.

Status Quo and Problem Definition

9. In New Zealand, reverse-cycle air conditioners are commonly referred to as heat pumps, whilst commercial units are known as air conditioners.
10. The growing popularity of heat pumps in New Zealand homes means that more electricity is being used to run them, particularly at times of peak demand (winter evenings)². It is estimated that one in four households now have one or more heat pumps. Heat pump/air conditioner use in homes and businesses is estimated to use around 1,100 gigawatt-hours (GWh) of electricity annually³. This equates to around five percent of residential and commercial electricity demand in 2011⁴. Sales of heat pumps are forecast to continue to grow, particularly the smaller units used in homes, so that by 2025 it is estimated there will be over 1.2 million units installed, a 40 percent increase from 2012.
11. Heat pumps/air conditioners have been subject to MEPS and energy rating labelling requirements since 2004. Recent analysis shows that there is potential for further energy savings to be made, at low cost to industry, by more closely aligning our MEPS requirements with those of Australia. However, without intervention market failures will prevent these savings from being realised.
12. End users, particularly tenants of commercial buildings, cannot always influence the purchase decision. Often the heat pump/air conditioner is selected by a developer, builder, installer or landlord, who is not incentivised to choose products with lower running costs (because they do not pay running costs).
13. When the end user is involved in the purchase decision, research conducted in Australia⁵ in 2006 suggests that they do not always gather all the relevant information in order to make a rational purchase decision. It found that 28 percent of consumers did not consider the energy rating label when purchasing air conditioners, 30 percent did not research their purchase, and 31 percent purchased on impulse. Even though the label is considered in a substantial proportion of purchases, it only enables a comparison across different models based on typical use and performance information. Other relevant information that consumers could research, such as expected usage of the product in their particular household or business, and the electricity pricing plans available to them, can be difficult to gather and interpret.
14. In addition, mass-market electricity pricing reduces the incentive to consider energy efficiency. Most electricity consumers do not pay for electricity at cost-

² This increase is offset by a reduction in total energy used for heating as heat pumps are a very efficient form of heating, often replacing inefficient wood fires.

³ *Revised Minimum Energy Performance Standards for heat pumps or air conditioners*, discussion document, prepared for the Energy Efficiency and Conservation Authority of New Zealand, May 2012. Available at: www.eeca.govt.nz.

⁴ Residential and commercial demand was 22,015 GWh in 2011. Source: Electricity Information Portal, Ministry of Business, Innovation and Employment.

⁵ *The Household Appliances Market in Australia 2006*, BIS Shrapnel, 2008.

reflective prices⁶, so the peak demand impact of heat pumps is largely excluded from the pricing of electricity⁷.

15. The issues outlined above limit consumer demand for more efficient models, which means that importers and manufacturers face less pressure to provide them. In New Zealand, voluntary ENERGY STAR[®] labelling has been successful in encouraging consumers to purchase high efficiency products, but not all manufacturers participate in the scheme, and the nature of the scheme means that less efficient product will always be available⁸. The application of more stringent MEPS would improve the efficiency of this less efficient product.
16. There is also an issue with the existing requirements in that they allow the use of performance simulation⁹ as an alternative to physical testing for heat pumps/air conditioners that do not have an energy rating label. This alternative is increasingly being used in a way that is inconsistent with the original intent.

Recent decisions and trans-Tasman issues

17. The New Zealand Cabinet endorsed the Equipment Energy Efficiency (E3) forward work plan in August 2009 [EGI Min (09) 17/5 refers]. This is a joint work plan for Australia and New Zealand designed to develop/adopt common energy efficiency standards for products sold on both markets. The work plan includes a review of the MEPS for heat pumps/air conditioners.
18. MEPS and energy labelling standards become mandatory in New Zealand when they are incorporated into the Energy Efficiency (Energy Using Products) Regulations 2002 (the Regulations). MEPS and/or labelling requirements currently apply to heat pumps/air conditioners and a range of other household products such as household fridges and freezers, and televisions.
19. This proposal will substantively align the requirements with those in Australia, but no major trans-Tasman trade implications are expected.

Emissions Trading

20. The Emissions Trading Scheme (ETS) is currently the primary intervention to reduce greenhouse gas emissions across all sectors of the economy, including the energy sector. The ETS places a price on carbon emissions in the energy sector, and it is already a feature of energy sector investment decisions and a factor in improving the competitiveness of low emissions alternatives.
21. Amongst other impacts, the ETS increases the price of electricity, giving electricity consumers an incentive to reduce their electricity consumption. The ETS, however, does not create incentives for manufacturers to improve product efficiency, nor does it enable consumers to identify products that use less electricity. Therefore it is unlikely that the ETS will lead directly to improvements

⁶ Mass-market consumers do not usually have time-of-use meters that enable retailers to charge higher prices at peak times.

⁷ Consumer Energy Options: An evaluation of the different fuels and technologies for providing water, space, and process heat, 22 November 2012, Prepared for the Gas Industry Company, page 58 and Appendix B.

⁸ The scheme identifies top performing energy efficient products, typically the top 25 percent.

⁹ Use of computer modelling to estimate the energy efficiency performance of a unit.

in the energy efficiency of heat pumps/air conditioners without complementary measures such as the consistent application of standards and labelling.

22. While the ETS has resulted in increases in the price of electricity, it is complicated for customers to calculate the lifetime running costs of a product, and few customers are willing to do so.

Objectives

23. The main objectives of the proposal are to:
 - cost-effectively reduce the amount of energy used by heat pumps/air conditioners, and energy-related greenhouse gas emissions
 - further reduce the cost to consumers of running heat pumps/air conditioners without compromising product availability, quality or functionality
 - maintain consistent standards with Australia in accordance with the TTMRA and the CER Agreement.

Options

24. The preferred option is to revise the existing requirements for heat pumps/air conditioners to:
 - increase the stringency of the heating MEPS for household heat pumps (units with less than 10 kilowatt (kW) rated cooling capacity) by mid-2013
 - increase the stringency of heating and cooling MEPS for all other heat pumps/air conditioners currently regulated by mid-2013
 - introduce MEPS for multi-split systems in April 2014.
25. The proposed MEPS levels are set out in the standard AS/NZS 3823.2:2011, but a revised version of this standard is under development to better reflect the requirements as they would apply in New Zealand. The revised standard is due to be released for consultation shortly, and published early in 2013.
26. The preferred option also includes a technical change to the standard to limit the use of performance simulation to heat pumps/air conditioners that have a rated output capacity of greater than 30kW, or are bespoke, or of a small production run. This is consistent with the intent of the original requirements, which was to reduce compliance costs for these categories of product.
27. An implementation date of 1 April 2013 (at the earliest) has been indicated to industry (except for multi-split systems), but this may not be achieved due to delays in finalising the preferred option following additional consultation. Industry will be kept informed of progress towards meeting this intended introduction date.

Alternative Options

28. This proposal has been developed within the parameters of the E3 forward work plan, for which options investigated are a variation on MEPS and/or energy labelling. This includes different timeframes for introduction, different energy efficiency levels or product coverage, and whether to introduce voluntary or mandatory standards.

29. In the case of heat pumps/air conditioners, mandatory standards and labelling requirements are already in place. Options considered for this proposal include: maintaining the existing arrangements (business as usual); full alignment with Australia; and implementing more stringent heating only MEPS.

Business as usual

30. Maintaining the existing arrangements would mean a continuation of the existing MEPS levels. Public education and the mandatory energy rating label scheme that enables consumers to compare heat pump models would continue, as would voluntary endorsement labelling based on the globally used ENERGY STAR[®] mark. Introduced in 2006, the mark has been very successful at enabling consumers to identify high performing models. Sales data for household heat pumps shows that 27 percent of models and over 60 percent of sales were ENERGY STAR[®] qualified in 2011/12.
31. However, the business as usual case is not preferred as analysis shows that further cost-effective energy efficiency improvements can be made. It would also result in continued misalignment with the Australian requirements.

Full alignment with Australia

32. Full alignment with Australia would increase the stringency of both heating and cooling MEPS for all units to the levels introduced there in October 2011. This was consulted on in May 2012 and received a mixed response.
33. While the local manufacturer supported the proposal, five importers that supply the majority of the market were opposed because they claimed some of the best heating products available would fail the more stringent cooling MEPS, reducing product availability. It transpired that the analysis presented in the May discussion paper was based on incomplete registration/sales data¹⁰ that meant the impact on suppliers had been underestimated. A further analysis was done with complete registration/sales data and a second proposal, described below, was released for consultation in August 2012.

More stringent heating only MEPS

34. The second proposal was to increase heating only (not cooling) MEPS for all units to the Australian levels. However, the local manufacturer was strongly opposed to this as they believed that full alignment was feasible, and that the economies of scale of supplying to an Australasian market would be lost. In response to these concerns, a third proposal, which is set out as the preferred option above, was consulted on in October 2012.

Impact Analysis

35. The following cost-benefit summary is based on the revised analysis using complete and up-to-date registration/sales data that was undertaken for the first and second proposal, and an additional analysis for the third proposal¹¹.

¹⁰ Suppliers had not been registering all of their models as legally required. The suppliers have now provided up-to-date product registrations and sales data that have been used to re-evaluate the options.

¹¹ Heat pump / air conditioner decision document, November 2012, EECA, available at: <http://www.eeca.govt.nz/content/meps-air-conditioners-and-heat-pumps>

36. The total benefits are the value of energy savings consumers would make by using more efficient products. Energy savings are estimated based on the difference in electricity demand between the business as usual case and the revised MEPS for each proposal. The number of heat pumps/air conditioners was estimated based on installed stock, expected replacements and new sales in each year to 2025¹². It is assumed that consumers continue to purchase a mixture of units of varying efficiency in the same proportions as business as usual. The value of the electricity savings is then estimated using the average retail electricity price paid by households or businesses¹³.
37. The total cost is an estimate of the increased product costs and compliance costs (discussed below) that will be passed on to consumers. Increased product costs will result from increased equipment and component costs resulting from design changes. This is assessed using an assumed correlation between the average efficiency gain and cost increase¹⁴ from increasing MEPS. This is a conservatively high estimate as no real price effect is expected (see Impacts on Consumer section). The total cost does not include taxpayer costs (discussed below), or the cost to electricity retailers of lost revenue owing to a reduction in the electricity demand from heat pumps¹⁵.
38. The estimated benefits and costs for each proposal are shown in Table 1, including an estimate of avoided greenhouse gas emissions (kt CO₂-e). Each proposal includes the impact of introducing MEPS for multi-split systems.

Table 1: Summary of costs and benefits (present value)

	Benefits			Costs		Summary	
	Total \$M	Energy Saved GWh	Avoided Emissions kt CO ₂ -e	Business compliance \$M	Total \$M	Net benefit \$M	Benefit cost ratio
2013-2025							
Full MEPS alignment (original proposal)	7.2	32.8	4.5	0.2	5.1	2.1	1.4
Alignment for heating MEPS only (second proposal)	4.9	22.5	3.1	0.2	3.5	1.4	1.4
<i>Preferred option:</i> Full alignment, except heating only for household heat pumps (third proposal)	5.0	23.1	3.2	0.2	3.5	1.5	1.4

¹² Refer footnote 3, Appendix 2

¹³ Alternative methodologies are being explored currently to estimate national benefits of MEPS and labelling based on the avoided cost of building new generation. Using these methodologies, the benefits of MEPS are estimated to be in the range of \$2.2 – 3.2 million.

¹⁴ An approximate average for the ratio between efficiency increases and cost increases is 1.5:1. This is consistent with the majority of industry feedback.

¹⁵ The value of this lost revenue would be somewhat less than the savings consumers make on their electricity bills, and is off-set by the benefits of reduced capital expenditure on additional generation capacity (from reduced energy use and peak demand)

39. Implementing the preferred option would result in cumulative energy savings of 23.1 GWh, with an associated 3.2 kilo tonne reduction in greenhouse gas emissions. The net benefits would be \$1.5 million to 2025 (with a five percent discount rate) compared to business as usual. There were minimal cost differences between the second and third proposals (both around \$3.5m), but they were both less costly than the original proposal (\$5m).
40. About 93 percent of all units¹⁶ sold in New Zealand last year meet the proposed MEPS levels, which are set out in Table 2 below. This is because more efficient models are now more readily available as they are supplied to the Australian market, and suppliers have been anticipating a MEPS revision here.
41. The preferred option means that the local manufacturer can supply its larger units (greater than 10 kW) to the Australasian market. Smaller units are not locally manufactured. No single supplier would be greatly affected by the third proposal, however, some low volume suppliers would need to source different models in order to comply.

Table 2: Proposed Heat pump/air conditioner MEPS levels

Product description	Current Cooling and Heating MEPS levels (AEER* and ACOP**)	Proposed Cooling MEPS levels (AEER)	Proposed Heating MEPS levels (ACOP)
Non-ducted unitary <10 kW	2.84	2.84	3.10
Non-ducted unitary 10 to < 19 kW	2.75	3.10	3.10
Non-ducted split <4 kW	3.33	3.33	3.66
Non-ducted split 4 to <10 kW	2.93	2.93	3.22
Non-ducted split 10 to <19 kW	2.75	3.10	3.10
Ducted < 10 kW	2.75	2.75	3.10
Ducted 10 to <19 kW	2.75	3.10	3.10
All 19 to 39 kW	3.05	3.10	3.10
All >39kW	2.75	2.90	2.90

NOTE: *AEER is the cooling performance measured as Annualised Energy Efficiency Ratio.
 **ACOP is the heating performance measured as Annualised Coefficient of Performance

Costs to the taxpayer

42. The proposal will result in marginal increases in government compliance and monitoring costs, mainly due to the addition of multi-split systems. The costs include: administration of the programme; maintenance of registration and approvals; random check-testing; revisions to leaflets and other consumer information; future standards development; and, research.
43. Based upon similar E3 programs, annual government costs have been estimated at \$20,000, which adds up to total taxpayer costs of \$0.2 million (present value) over the twelve-year assessment period.

Business compliance costs

44. Business compliance costs from revising the MEPS consist of costs relating to educating staff about the new requirements, registering or re-registering air

¹⁶ Excluding multi-split systems for which no data is available

conditioner models, testing and record keeping. On-going compliance costs relating to the existing MEPS are excluded. The business compliance costs have been estimated at \$3,500 per heat pump/air conditioner model based on cost estimates of introducing revised MEPS into Australia in October 2011.

45. It is estimated that, at most, 50 models¹⁷ will need to be tested and registered or re-registered. This will create compliance costs of around \$175,000. In assessing the impact of the proposals, a figure of around \$200,000 was used to allow for some margin of error.
46. As the majority of heat pump/air conditioner models sold in New Zealand are already registered in Australia, the partial harmonising of the New Zealand MEPS with Australia is expected to require only a small number of models to be re-registered for New Zealand.

Impacts on consumers

47. The heat pump market is highly competitive. As previously noted, the majority of the heat pumps sold recently already meet the proposed higher MEPS, so product prices should not increase significantly. The average price increase over all models is expected to be less than one percent, which is not expected to affect demand for heat pumps.
48. Householders are likely to benefit from cheaper winter running costs of units with better heating efficiency. Commercial air conditioners are used for both heating and cooling, so building tenants will benefit from the increased heating and cooling efficiencies.

Multi-split air conditioners

49. The May 2012 discussion document also proposed the introduction of MEPS requirements for multi-split systems. This is intended to be in place from April 2014, which is the same time as Australia intends to introduce them.
50. Multi-split air conditioners (unlike other split systems) have not previously been regulated and were specifically excluded for two main reasons:
 - there were no international testing standards developed for these systems and it did not appear to make sense for Australia and New Zealand to develop such standards in isolation
 - the number of multi-split systems being sold was extremely low when MEPS requirements were introduced for other systems.
51. The situation for multi-split systems has changed since then. The number of multi-split systems is increasing and an international testing standard has been developed (ISO 15042:2011). A modified version of this standard is intended to be adopted as the Australia/New Zealand method of test. There were no objections received from industry. The proposed MEPS levels are the same as those set out for non-ducted split systems in Table 2.

Performance simulation

¹⁷ Refer footnote 3

52. When MEPS were first introduced for three-phase air conditioners in Australia in 2001, the simulation of testing results was included as an alternative to physical testing. This was in order to reduce testing costs to industry (as it can be expensive to acquire an air conditioner sample and to set this up for a test), especially for large products (typically over 30kW) and bespoke or small production batches. Simulation is currently only permitted for products that do not carry an energy rating label.
53. The original intent was for simulation to be an alternative for testing of large products only, but it is now used increasingly for smaller products, especially smaller ducted systems (around 10kW). The proposed restriction on the use of performance simulation will reflect the intent of the original requirements.

Consultation

54. A stakeholder meeting was held in August 2011, where it was advised that Australia intended to increase MEPS in October 2011¹⁸, but that it would not be proposed here until the impacts on the local market had been assessed. A series of interviews were conducted with some of the main suppliers early in 2012. The first discussion paper was then prepared and released in May 2012, followed by another stakeholder meeting. Two further proposals were then released for consultation in August 2012 and October 2012.
55. Industry consensus has now been achieved on the preferred option. The proposal is consistent with New Zealand's international obligations under the World Trade Organisation's Technical Barriers to Trade (TBT) Agreement and has been notified through the TBT process. The Australia and New Zealand Standard applies equally to products produced locally and overseas.
56. Stakeholders also had the opportunity to participate in the development of the standards through representation on standards committees, and also when draft standards are released for public comment.

Conclusions and Recommendations

57. The preferred option results in modest net benefits and energy savings, but increasing the stringency of MEPS removes the poorer performing products from the market and prevents regression in product energy efficiency performance. Closer alignment with the Australian requirements will facilitate trade, reduce business costs and produce administrative efficiencies for both governments.
58. The preferred option cost-effectively achieves the objectives of raising the efficiency of heat pumps/air conditioners, lowering the running costs for end users, and improving consistency with Australian standards. It is proposed that the requirements for heat pumps/air conditioners are revised to introduce:
 - more stringent heating MEPS for household heat pumps (systems with less than 10 kW rated cooling capacity) by mid-2013
 - more stringent heating and cooling MEPS for all other heat pumps/air conditioners currently regulated by mid-2013

¹⁸ Stakeholders that also operate in Australia would have been involved in consultation on this.

- a restriction on the use of simulated testing so it can only be used for heat pumps/air conditioners with a rated cooling capacity greater than 30kW, or that are bespoke, or of small production runs
 - MEPS for multi-split systems in April 2014, at the same time as Australia.
59. The proposed MEPS levels are based on those set out in the joint standard (AS/NZS 3823.2:2011). A revised version of this standard is being prepared and will set out how the requirements would apply under the above proposal. The revised standard will be published before it is incorporated into regulation.

Implementation

60. An amendment will need to be made to the Regulations to revise the existing requirements. Industry stakeholders will be notified well in advance of the introduction date to allow them to prepare. Products that have been manufactured in, or imported into, New Zealand before the date the revised requirements apply can still be sold¹⁹.
61. As with the existing requirements, compliance will be achieved primarily through working cooperatively with businesses, raising awareness, and helping industry members understand their obligations. However, the Regulations provide for penalties of up to \$10,000 for each instance of non-compliance.
62. Independent testing is carried out periodically to verify performance claims. Selection is based on factors such as past performance, high performance claims, market share, and complaints received.

Monitoring, Evaluation and Review

63. Sales data for heat pumps/air conditioners will continue to be collected annually and used to compare actual and forecast energy savings under MEPS and labelling requirements. A report on the impacts of MEPS and energy labelling for heat pumps/air conditioners will be prepared annually and shared with stakeholders. The relevant standards are generally reviewed every three to five years. Independent surveys in the marketplace are also used to determine the rate of compliance with MEPS and energy rating labelling requirements.

¹⁹ It is difficult to estimate the amount of stock that would be covered by the transitional provisions, but given the high proportion of sales that are already compliant, it is likely to be minimal.