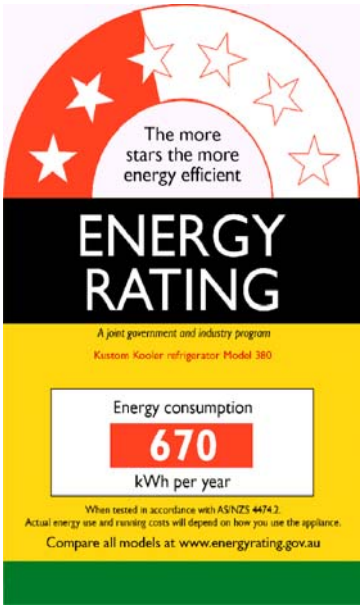
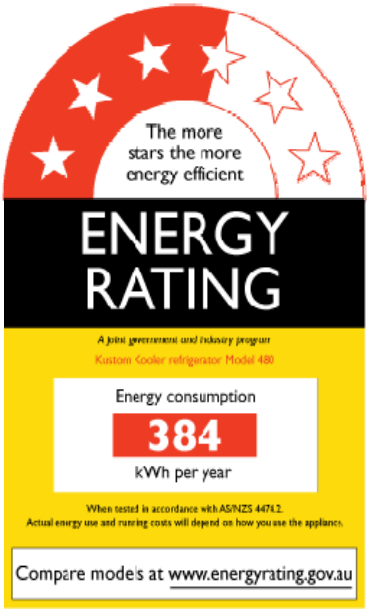
February 2014

Report for the European Commission

Appliance Energy Labelling: Australian Rescaling Experience

Conference: Product Policy – International Trends in EcoDesign & Energy Labelling





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Appliance Energy Labelling: Australian Rescaling Experience

Paper prepared for the conference:

Product Policy – International Trends in EcoDesign & Energy Labelling

Brussels, 20-21 February 2014

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Report date: 14 February 2014

1. Background

Australia first introduced mandatory energy labelling for major appliances in 1986. Initially, regulations were introduced into the two largest states (Victoria and NSW) for refrigerators and freezers. Progressively air conditioners, dishwashers, clothes dryers and clothes washers were covered by labelling regulations in these states. Most states had aligned regulations by the early 1990s.

A major review of the labelling scheme was commissioned in 1990 and this examined all aspects of the scheme. The report is a useful and comprehensive stocktake of the perceived issues at the time. This was one of the primary drivers for the eventual re-grade in 2000, as bunching in the higher star rating scales was already apparent after 5 years.

The next important regulatory milestone in Australia was a report into the feasibility of Minimum Energy Performance Standards (MEPS) for household appliances in 1993. This report recommended MEPS for refrigerators, freezers and electric storage water heaters. Following an extended period of discussion with industry, MEPS regulations commenced in 1999.

From 1998, there were also intensive discussions with stakeholders regarding the possible regrade of energy label algorithms. A wide range of discussion papers and information reports were prepared to inform the discussions. Ultimately all appliance energy labels were re-graded in 2000.

While the energy labelling scheme was always voluntary in New Zealand, in 2002 and 2003, the New Zealand government introduced harmonised mandatory requirements for energy labelling and MEPS. The program has since has been jointly operated with NZ.

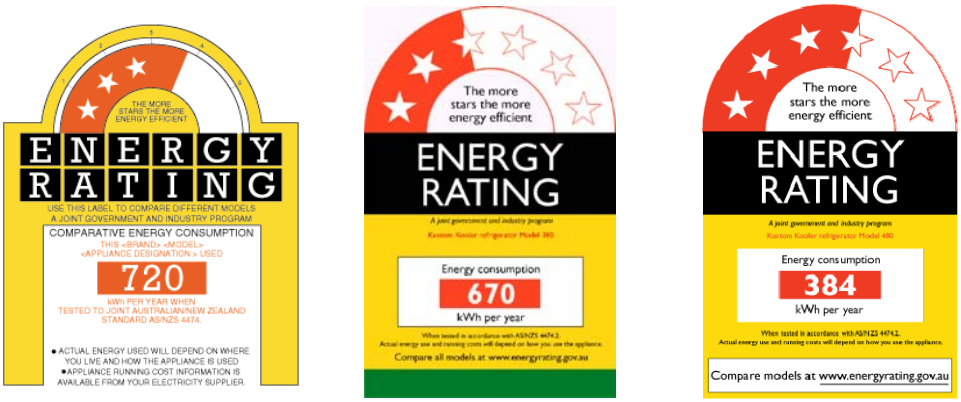
The energy labels for air conditioner and refrigerator labels were re-graded in 2010 – this was driven by the introduction of very stringent MEPS levels for both products and some exceptionally low energy products at the top end of the market.

In 2009, energy labelling for televisions was introduced. By 2013, the market had moved so quickly that a re-grade downward of 3 stars was necessary. Over the period 2009 to 2011, the average product improved 20% per annum, or 1 star per annum. MEPS levels at 4 stars on the 2009 scale were introduced in 2013, necessitating regrade (quite a few products already exceeded 7 stars by 2011).

Mandatory energy labelling for monitors was introduced in 2013.

The focus of this paper is the mechanics around the re-grading of energy efficiency labels. This paper also covers a range of other related issues regarding the design and operation of the energy labelling program in Australia.

Figure 1: Refrigerator Energy Labels in Australia – 1986, 2000 and 2010



The original label scale was based on a simple kWh/adjusted litre function. The 2000 scale set 1 star at 1999 MEPS with a 23% energy reduction per additional star (common scale for all similar products). The 2010 scale was based on a volume function to the power of 0.67. The green bar was removed and the website address enhanced. The 2017 proposed regulatory change will use the new IEC standard and will move to and energy based on two ambient measurements.

2. Rescaling Energy Labels

2.1 History of Rescaling in Australia

Following an intensive review of the energy labelling program that had been operating for 12 years, in 1998 it was decided to rescale the energy label for all labelled products (refrigerators and freezers, clothes washers, clothes dryers, dishwashers and air conditioners). In part this was driven by a review of energy labelling conducted in 1990. This major regulatory change had a number of objectives:

- Introduce a new label design (graphic) that had improved information and clearer layout for consumers (consumers recognised, understood and liked the original label; the design changes were evolutionary in nature);
- Show all 6 stars in outline (previously unearned stars were not visible), introduce half star grades;
- Reduce bunching around the higher label grades – many product categories had a majority of models in the higher or highest star rating categories and the pull effect of the label was being diminished. Many of the labelling algorithms were rudimentary and were developed prior to any market or product knowledge (and were some were hence poor) – much improved data through registrations and sales weighted market tracking provided a sound basis for re-grading in 2000;
- Introduce a more consistent approach to the star rating label equations – define a 1 star category with a consistent energy reduction for all additional stars (this reduction factor still varied by product).

2.2 Mechanics of Rescaling

There were a number of critical elements to the rescaling process.

1. Algorithm development: For each product, detailed analysis was undertaken and a new labelling algorithm was developed. Stakeholder groups met to review the proposals and fine tune the technical details.
2. Review of label designs: An intensive series of focus groups was conducted to determine what design changes were most salient for consumers. An international review of labelling programs and label designs was conducted in order to document and test the most useful label design approaches used in other countries, as applicable.
3. Technical requirements: All of the technical requirements regarding the re-grade were set out in the relevant Australian Standards. These were published well ahead of the transition time.
4. Regulatory Impact Statements: governments require detailed documentation to justify changes whenever regulatory changes are proposed that may have cost impositions on stakeholders.
5. Communications: A media consultant was engaged to manage the labelling communications with retailers and the media.
6. Shadow shopping: a series of store surveys were undertaken during the transition window to track progress of the new energy label and the proportion being displayed.

2.3 Transition Details

For the 2000 re-grade, there was a window where old and new labels could be on display. This was nominally from October 2000 to March 2001. Products could be registered with the new label details up to 6 months before the transition window. From a legal perspective, it was not really possible to make old labels illegal – if the product was labelled correctly at the time of import or manufacturer, the new labelling regulations could not really make these labels illegal retrospectively (retrospective legislation is generally only reserved for very serious matters, like life threatening safety issues).

In practical terms, 90% of the labels were converted to new labels by mid 2001. There was some disincentive to change labels, as for most products the new star rating was lower than the old star rating.

Many of the details are set out in the transition report: Energy Label Transition – The Australian Experience

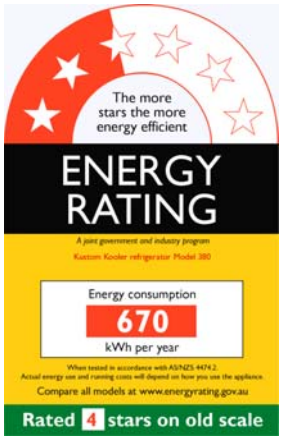
http://www.energyefficient.com.au/reports/200405-labeltransition.pdf

2.4 Transition Issues

There were a number of concerns raised prior to the transition. Some of these were unfounded, but some eventuated in varying degrees. While the transition was carefully planned, such a large scale and complex task will always encounter some problems. Some of the key points were:

Consumer confusion: This was a key concern before the transition, but there was little evidence that this was a practical problem to any significant extent. While the labels were obviously very different looking, consumers generally could not identify a new versus and old label (unprompted). The basic icon for interpretation (stars) remained the same.

Old labels in stores: This was a major concern in the planning phase. So great care was taken in this area. The majority of products had new labels on at the end of the transition. A few products had labels on some time after the transition (one or two were around a few years after). Most suppliers did their best to change labels over, but there are always a couple that seem to escape (see below). In the end this did not generate any significant issues. Getting to all retail stock in the transition period was difficult and was resource intensive for suppliers.



Consumers receiving products with different star ratings: This was also of concern prior to the transition. If a consumer purchased a 5 star product on the old label but received a 3 star label from the warehouse, they may complain. Suppliers had the option of applying a version of the label that stated the old star rating at the base of the new label. Some suppliers used these transition labels on their warehouse stock to reduce consumer complaints. There was little evidence of complaints or confusion regarding the old/new label change of grade.

Stock turnover: Given that just in time manufacturing approaches are now almost universally applied, most suppliers now minimise the stock in warehouses as much as possible to reduce the capital tied up in storage. Several supplier internal studies have shown that the average age of products in warehouses is around 3 months. For popular models, 90% to 95% of products are installed within 1 year of manufacture. Less popular and bespoke models may have longer average times to installation and products imported from other regions can have a slightly longer period between manufacture and installation (90% local products within 6 months, two thirds of regional imports are installed within 6 months of the date of production). Old products >1 year do appear from a warehouse, but this is pretty rare. The problem with the transition is not the warehouse stock, but the stock on display in retailers. Australian experience indicates that retailers put a product on display and these units stay on display for quite a long time. If a consumer buys that model, a new one from the warehouse is delivered to them. So the key issue regarding stock turnover is not the warehouse stock, but making sure that the stock on display in retailers is changed over during the transition (or relabelled, but easier sell it and replace display stock with newly labelled version).

Old models: One practical issue is where a model is discontinued before the label transition, but there is still stock available for sale after the transition. This is particularly difficult where there is a change in test method associated with the new label – it is not practical to retest a hand full of products to a new test method (for example) and print and distribute new labels to a large number of retailers. The only practical solution is to ignore old labels on obsolete models that were manufactured before the transition period, after making best efforts to flush old stock from display.

2.5 Consumer Perspectives – what they see, what do they expect?

When consumers look at an energy label, in simplistic terms they interpret or understand that the lowest possible grade as the lowest efficiency available on the market and the highest possible grade as the highest efficiency available on the market. Policy makers know that this is rarely the case in practice. Sometimes the most efficient categories will be empty to leave space for the market to improve, sometimes the lowest grades will be empty due to efficiency standards (MEPS).

To be effective, categorical labels should be designed so that there is some space for new higher efficiency products into the future. Also the category definitions have to remain stable for some period (of the order of 10 years) to provide a pull incentive for manufacturers to improve their products. If grade definitions are changed regularly, the manufacturer incentive to achieve higher efficiency grades is greatly diminished. So the key question is: How to show the best and worst on the market (for a particular product category) while keep efficiency grade definitions stable for longer periods? (answer: product listings and smart phone apps)

Consumers only purchase a new consumer durable item once every 10 to 20 years (depending on the product). So what grades were on the market say in 1995 are of little interest to someone buying a new refrigerator today (some may still remember). However, consumers do want to be reassured that the product they purchase today is a lot more efficient than the one they are replacing. It would seem that the label grade is not the correct tool to do this (even though some consumers may remember the grade of their old appliance purchased many years ago). See discussion in the next section.

Even though the purchase of consumable durables is infrequent, given that a significant number of product types do carry energy labels, it does mean that consumers will have to look at and interpret the energy label on a regular basis (at least every few years). So the energy label interface needs to be consistent across all product types, as far as possible. There also needs to be consistent marketing and messaging about the energy label.

2.6 Focus Group Experiences

Australia has actively undertaken consumer research over many years in order to understand how consumers use energy labels and what components of the energy label work, and do not work. While there are many findings, a few appear to be quite important in the European context.

Consumers like to be able to see the available grades and where the model of interest sits in this range. The problem is that many consumers mistakenly believe that products in all grades are on the market. The EU label does show all available grades, but as is the case in Australia, many of these grades are empty.

Consumers like the label to be simple – VERY SIMPLE. In Australia, everyone sees and understands the stars. Only a small proportion of consumers see other information shown lower on the label – including the energy consumption, capacity, test standards and so on. While this detailed information can and should be included on the label, it needs to be understood that few consumers will use this data. More information is potentially more confusing for most consumers. The philosophy adopted in Australia is to include the minimal performance information on the label. Where there are important performance parameters (such as cleaning, drying, spinning, cooling), these should be included as mandatory minimum benchmarks and not

included as separate parameters on the label for the consumer to interpret. The EU has started to follow this approach in many of their EcoDesign requirements.

In Australia, the original label design was based on 1 to 6 stars. This approach was maintained through the 2000 regrade. In the lead up to 2000, the option of more stars was tested as an alternative to regrading of stars. This was not very well received by consumers in focus groups. The biggest questions in the case where there were more stars were: What is the best efficiency? What is the maximum number of stars? Having an open ended scale degraded the value of the existing stars.

In 2008 a political decision was taken to extend the star rating scale to 10 stars. This was not based on any consumer testing or research and was not supported by stakeholders. This change has only been applied to refrigerators, air conditioners and televisions. There is currently a comprehensive labelling review under way. While this is far from complete, one of the options being considered is reverting back to the standard 1 to 6 star scale for all products. Many consumers find the additional stars (crown) quite confusing, even though this was the least confusing way to depict it.

2.7 Manufacturer Perspectives

There is no doubt that there have been huge advances in appliance energy efficiency over the past 20 years or more. Many products, such as refrigerators, use less than one third of the energy that products 20 years ago would use.

The energy label is designed to compare the energy efficiency of current products on the market. Its purpose is not to compare a product now with one that was purchased many years ago. However, it would be useful to illustrate to consumers (and to give manufacturers due credit) that the product being purchased today is a lot more efficient (and uses a lot less energy) than the one it may be replacing. Clearly the current label grades are not the best tool to convey this type of information. But some other indicator or mechanism may be able to convey this important concept in a clear manner. This is not something that has been proposed yet in Australia, but a general indicator of the relative energy of this model compared to models it is replacing may provide some consumer reassurance. This could be worded something like – “Uses 60% less energy than a product purchased in <YEAR>”.

2.8 Overall Outcomes

The energy label in Australia has extremely high recognition – over 90% of consumers can recall the energy label and most can recall some of the information displayed. It also has very high credibility with consumers. The label re-grade and the transition to a new design maintained and even enhanced these aspects.

While there has been limited evaluation done on the impact of the label re-grade, it would appear that efficiency trends were maintained or enhanced in the periods following. Evaluation of the label regrade itself is somewhat difficult for refrigerators and air conditioners, as there were multiple MEPS changes on or after the label transition, so attributing impacts to each program element is challenging. Changes for televisions are too recent to be able to assess the impact, but the 2013 label regrade was also accompanied by new MEPS levels in 2013, thus clouding the impact of each.

For clothes washers, dryers and dishwashers, the following trends can be discerned from the historical data around 2000.

Clothes washers: there was an acceleration in efficiency of clothes washers, primarily driven by a larger market share of front loading washers (which in turn was

influenced by water prices and water scarcity). But the re-grade improved efficiency trends.

Dishwashers: Rate of improvement was maintained after the re-grade (accelerated if the overall energy reductions are considered), but this slowed from 2006 as technology limits on energy, water and performance were reached by the majority of machines.

Clothes dryers: trends in efficiency were similar before and after, but it needs to be noted that the available efficiency range is very narrow in any case. It is not until the advent of affordable heat pump dryers in recent years that the market could be expected to shift significantly (noting that dryer usage in Australia is extremely low compared to Europe).

The effect of bunching before re-grading is illustrated in Figure 2, which shows the sales weighted share by star rating using the original labelling algorithm. This shows that by 1997, 45% of dishwashers were 4 star and 35% were 5 star. If no label regrade had been undertaken (ignoring any impact that the label re-grade had on the market), by 2009 55% would have been 5 star and nearly 30% would have been 6 star.

Figure 3 shows the star rating distribution for the same years but according to the 2000 star rating algorithm. After the regrade (nominally 2002 on the chart), 37% were 1 star, 33% 2 star and 30% 3 star. By 2009, almost 10% of sales were 4 star. For dishwashers, sales weighted energy consumption improved at around 3% per annum from 1993 to 2009. Note that the energy reduction per additional star for dishwashers is exceptionally large at 30%. Given the slowing of energy reductions since 2007, a small energy reduction per additional star is probably now warranted.

Figure 2: Distribution of Dishwasher Star Ratings 1993 to 2009 – 1988 Algorithm

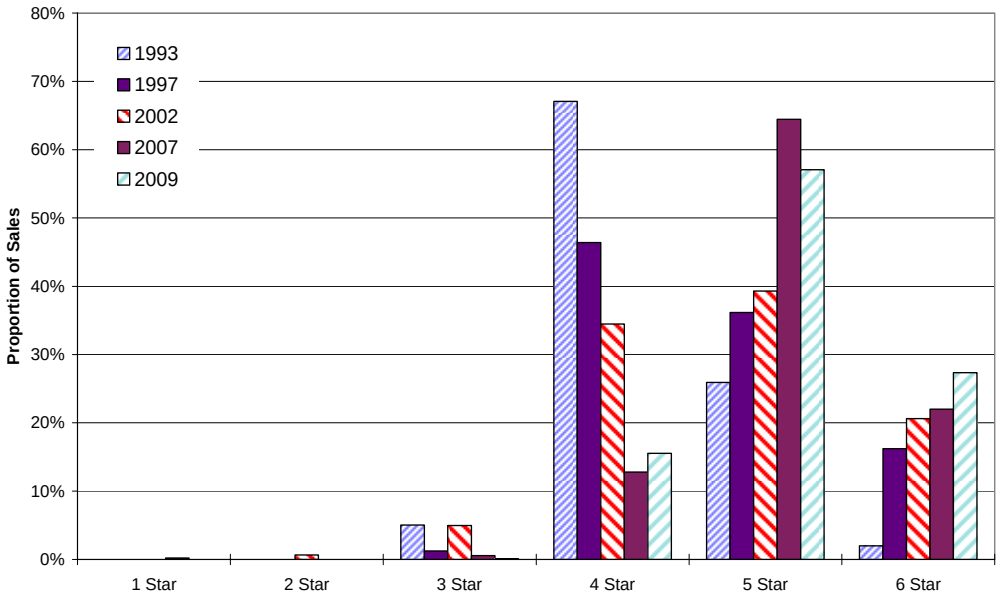
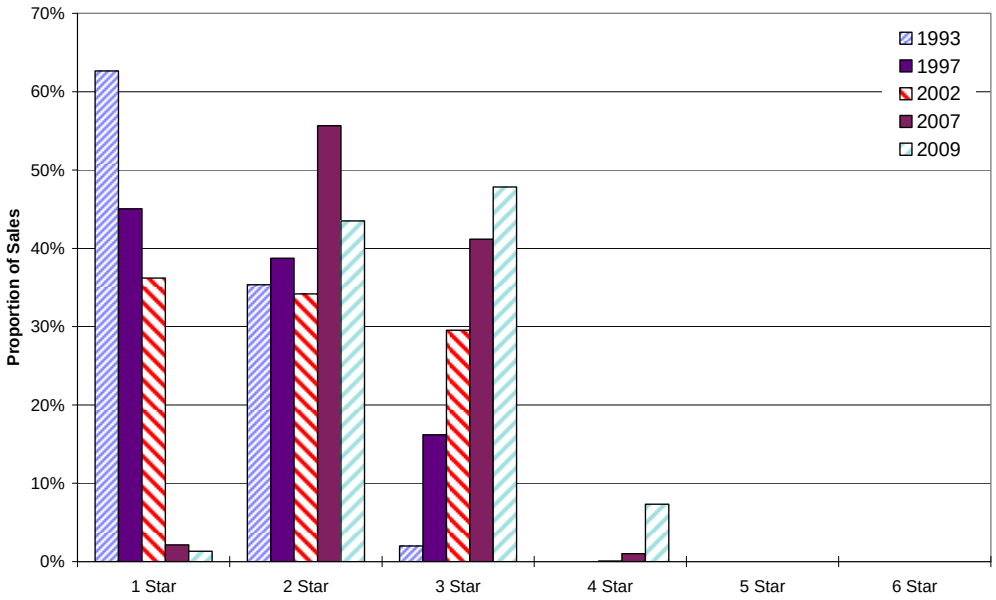


Figure 3: Distribution of Dishwasher Star Ratings 1993 to 2009 – 2000 Algorithm



More data is available from the report: Greening Whitegoods:

http://www.energyrating.gov.au/wp-content/uploads/Energy_Rating_Documents/Library/Washing_and_Drying/Household_Appliances/201008-greening.pdf

http://www.energyrating.gov.au/wp-content/uploads/Energy_Rating_Documents/Library/Washing_and_Drying/Whitegoods/gfkapp09.pdf

2.9 Conclusions

While rescaling requires some effort and planning, overall the benefits of reducing bunching in higher grades, keeping the label grades relevant and allowing the label to continue contributing to market transformation outweigh these costs. Consumer preference is to keep a simple scale (in the case of Australia, 6 stars), with clearly defined end points that is easy to understand and stable. These positives have fully justified the re-grading decision in Australia, despite the temporary transition issues. The negative aspects of re-grading, can be contained and ameliorated.

Re-grading a label scale is not something that should be undertaken lightly, or regularly. Once every 10 to 20 years is the sort of time frame that seems to be workable (but clearly this depends on how quickly the market moves and the design of the labelling scale). Australia has ventured down this pathway several times with reasonable success. However, we have not always got everything right. The key to success is ongoing research and evaluation of the scheme, especially consumer interpretation and understanding in order to keep the system relevant and useful for consumers. At the end of the day, if consumers like and use the label, it will be effective.

3. Higher Level Issues to Consider

3.1 What is the purpose of the energy label?

Energy label is intended to convey to prospective purchasers the relative difference in the energy consumption (and efficiency of products). To do this effectively;

- Labels must be present on products on display.
- Consumers need to understand how to interpret the energy label – this should be consistent across product types.
- Supporting tools and information can be useful – website lists, smart phone apps.

A label's success can be assessed by its continuing ability to stimulate market transformation. Where the label can no longer differentiate products (where there is a significant difference in efficiency), rebasing will be necessary from time to time.

3.2 Label Grade Sizes

One of the key lessons learned from almost 30 years of experience with energy labelling in Australia is that the label grades need to be meaningful to consumers i.e. each additional grade should indicate a significant improvement in efficiency, but not too large or small. Experience in Australia suggests that an energy reduction of the order of 20% per additional grade is very workable and meaningful for consumers. Under this structure, additional grade equates to 0.8 of the energy, 2 additional grades is 0.64 of the energy, three additional grades is 0.512 of the energy and so on. Energy reductions per grade in the range 0.15 to 0.25 appear to be workable. It is important to recognise that fixed energy reductions become increasingly more difficult to achieve at low energy consumption levels.

To some extent label grade sizes need to take into consideration the actual or potential range of energy consumption on the market. However, if there is naturally a narrow market range (say variation in energy max to min of 10%) then it is meaningless to divide this into 5 by 2% grades. It is important to ensure that grades are significantly larger than the uncertainty of measurement for the parameter (e.g. EU washer cleaning performance grades were very small and were half the size of the uncertainty of the parameter, making it both meaningless and unenforceable – this is obsolete now that minimum cleaning performance levels are mandated).

As an observation, some of the EU energy grades are very uneven. These range from quite small changes per grade in some cases, to very large and almost unachievable steps in other cases.

3.3 Product Lists

Having a list of products available on the website shown on the energy label is a useful tool. While not all consumers use this data, a significant minority will examine this information and it certainly heightens competition amongst suppliers. Suppliers cannot ignore consumers that are actively seeking efficient products. To do this, an up to date central list of available products needs to be maintained.

Lists like Top Ten are useful, but these generally only cover a very limited range of the available products. Consumers want information on the products that they see in retail outlets.