South African appliance labelling programme:

THE PROS AND CONS

By Theo Covary

The South African government aims to implement a programme that will phase out the use of inefficient residential appliances over the next few years. It is proposed that this will be done by introducing mandatory combination of two regulatory tools: Appliance Labelling and Minimum Energy Performance Standards (MEPS), or standard and labelling (S&L) for appliances selected by the South African Bureau of Standards (SABS) Working Group 941 and in line with the Department of Trade and Industry’s and the Department of Energy’s Joint Action Plan of 2010.

The appliances to be included in the programme are air conditioners up to 5kW, washers (dishwashers and washing machines), electric ovens, refrigerators and freezers (including combinations) and electric water heaters (geysers).

South Africa identified the energy-savings potential of efficient appliances as far back as 1998 and has targeted the introduction of a component of S&L since that time. In 2011 a five-year project with a budget of just over US$13-million was approved to implement S&L.

CONSISTENT ENERGY PERFORMANCE IMPROVEMENTS IN RESIDENTIAL APPLIANCES AND INDUSTRIAL EQUIPMENT ARE PROBABLY ONE OF THE MOST IMPORTANT ELEMENTS OF ANY COUNTRY’S ENERGY-EFFICIENCY AND CLIMATE CHANGE MITIGATION STRATEGY.
in SA. The project sponsors and co-financiers are the South African government, the Global Environment Facility (GEF) and the Swiss Economic Cooperation and Development (SECO). The action plan proposes that the programme comes into effect in 2013. However, government has not yet confirmed a final date.

**BETTER ENERGY PERFORMANCE**

Consistent energy performance improvements in residential appliances and industrial equipment are probably one of the most important elements of any country’s energy-efficiency and climate change mitigation strategy. If implemented effectively, they can result in huge energy savings – the seemingly small electricity savings per individual unit quickly add up to large savings as they are multiplied across millions of households. In a report published in 2005 by the then Department of Minerals and Energy (DME), it was estimated that the average refrigerator or freezer combination unit consumes 1,284kWh of electricity per annum and that a 5% improvement in the performance of new units would result in an annual saving of 27GWh. Table 1 provides a list of the estimated annual sale and penetration rates of the appliances selected for the South Africa S&L Programme.

An impact assessment study undertaken in 2012 looked at three key areas, namely:
- consumer response to the label;
- current efficiency levels of local and imported appliances; and
- an impact assessment.

The DME decided to adopt the European label for its voluntary programme in 2005. The label was customised for the South African market. However, now that it has been decided to make the programme mandatory, it has become important to ensure that the label is relevant across all LSM and race groups.

**FOCUS GROUPS**

Focus group sessions were intended help test consumer response to, perception of and understanding of the proposed appliance label. The key findings of the response to the label component of the sessions were:
- Most respondents showed a spontaneously positive response.
- Not one participant rejected the concept and less than 25% reacted neutrally (this was skewed towards males who were sceptical or suspicious of the government’s motives).
- Concerns were raised that appliances could increase in price to meet the imposed minimum energy performance standards (MEPS).
- More than 90% of respondents showed a satisfactory and immediate understanding of the label. However, there was some confusion where respondents confused the fresh food volume value as the electricity indicator.
- The graphic representation of the bar graph with colours was easily understood, attractive and considered useful. This is in line with existing international research which links attractiveness with comprehension.
- The “star” logo gave the label authenticity and credibility and assured the respondents that this was a government-supported programme.
- On the negative side – the noise levels and decibels were found confusing; it was found that the word “electricity” rather than “energy” was easier to understand and the word efficiency is ambiguous. It was suggested that direct the label uses direct language such as “less” and “more”.

The focus group findings that highlighted possible areas of distraction and concerns about language barriers especially amongst lower LSM groups can be addressed by the 2011 EU label design as shown below.

A few other key issues were identified during the study:
- The South African National Standards (SANS) issued by SABS do not extend “beyond A” and hence South Africa does not currently have the ability to recognise and differentiate between the additional A+, A++, A+++ classes. The current national standards will therefore have to be revised and updated accordingly.
- The option of implementing a flexible and dynamic rating scale that can accommodate ever-improving efficiencies, which overcomes the predicament the EU faces with constantly having to add +’s, should be given due consideration and mitigated if possible.

**CURRENT ENERGY-EFFICIENCY LEVELS OF LOCAL AND IMPORTED APPLIANCES**

With over 25 different brands represented in the large appliance market, consumers are literally spoilt for choice. In 2010 there were 691 active refrigerator and 385 active washing machine models in the market. Of these only 270 refrigerator (19%) and 162 (25%) were “coded” with an energy label. However, the proliferation of brands made available to consumers with the opening up of the economy in 1994 and increased globalisation has made the industry highly competitive but at the expense of the local manufacturing sector. In this time:
- KIC became a loss-making manufacturer and was purchased by Whirlpool of the USA. The company continues to manufacture refrigerators and freezers for the local market.
- The Kelvinator manufacturing plant had a short stay of execution through a management buy-out, but the plant was finally closed in 1999.
- Frigde Master experienced spectacular growth in the 1990s, but closed down in 2000. Its fridge-manufacturing plants in Swaziland and cookware plant in Germiston were auctioned.
- SVA bought UNIVA from the liquidators (Fridge Master). Univa continues to manufacture cookware for Kelvinator, KIC and other smaller brands.
- SVA manufactures laundry equipment for Defy and other smaller brands at its SAR Wash factory.
Table 2: Summary of findings for each appliance

<table>
<thead>
<tr>
<th>Category</th>
<th>Comment/Finding</th>
</tr>
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<tbody>
<tr>
<td>Cooling (refrigeration)</td>
<td>The largest category in terms of sales and local manufacturing also has the biggest variance across the efficiency levels. The range starts at “A+++” but goes as low as an “F”. Chest freezers do not have energy ratings, as almost all units are locally manufactured.</td>
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<tr>
<td>Cooking</td>
<td>Similar to cooling, almost all imported products are rated “A”, while the local products have a lower rating. However the difference is not as pronounced as it is with cooling.</td>
</tr>
<tr>
<td>Laundry</td>
<td>Most of the washing machines surveyed were rated “A” or better, approximately 21% of models were not yet rated. Most tumble driers were rated “C”. Washer-drier combinations rated mostly “B”. This category represents only 12% of the total laundry category, while the bulk of models are washing machines (61%) and the remaining 27% tumble driers.</td>
</tr>
<tr>
<td>Dishwashers</td>
<td>Dishwashers are rated “A” or better. All appliances in this category are imported.</td>
</tr>
<tr>
<td>Air conditioners</td>
<td>The use of domestic A/C units is still relatively new in SA but growing rapidly. In a closely contested market more than 60% of sales are made by major manufacturers, while no name brands represent the rest of the market. While data was collected from several leading A/C manufacturers. EER (cooling) rated between “D” and “A” and heating (COP) rated between “A” and “E”. Manufacturers indicated that energy labels should state nominal capacity and the EN rating to minimise the possibility of companies overstating efficiency using the allowed tolerances. All of the manufacturers interviewed agreed that higher MEPS would be preferable to minimise dumping of inefficient models.</td>
</tr>
<tr>
<td>Geysers</td>
<td>Geysers are the lowest hanging fruit that will deliver the greatest savings, for the lowest investment and the least effort. The UNDP/GEF report estimated that geysers would save 176 000MWh in the programme’s first year compared to 67 000MWh from all cooling. The savings will be from reduced standing losses and not from any efficiency improvements in the heating process.</td>
</tr>
</tbody>
</table>

- Defy bought some of the production equipment from Kelvinator and Master Fridge plants – and with it most of their market share. A local consortium bought the company in 1997, but it was subsequently sold to Swiss-based Franke. Turkey’s Arcelik group bought the company in 2012.

Over the past 15 years the country has stopped manufacturing washing machines and medium- to high-end stoves, ovens and refrigerators. It continues to manufacture tumble driers, twin tubs, chest freezers, entry-level refrigerators and stoves but this is largely because these appliances are protected by import tariffs. There is limited production from original equipment manufacturers (OEMs), taking place at UNIVA and SVA Electronics, who supply ovens to Kelvinator and KIC and twin tubs to Defy. The components used in the local manufacturing process are also largely imported, with the figure being more than 50% for refrigerators. Almost all medium- to high-end appliances are fully imported. The only industry that has not been impacted by imports and comprises almost entirely of local manufacture is the electric geyser market.

To assess the make-up of the market, the study contacted the top six manufacturers of each appliance category for data – with the exception of air conditioning the manufacturers per appliance category that jointly controlled more than 90% of the local market. This input was supported and cross-referenced against:

- desktop research;
- retail interviews; and
- the data sheets supplied by manufacturers where checked against the calculations that were provided in the SANS standards.

The study found that in general it can be said that the more expensive models have a higher efficiency, but more expensive does not always mean higher efficiency. As technology has improved significantly in recent years function has become the cost driver and not efficiency. This assertion is supported by the following examples as at December 2011:

- Brand 1 was selling an “A”-rated dishwasher for R1 999. Similar-sized dishwashers with an A rating from competing manufacturers start from R3 500 (it is acknowledged that this appliance was on special but nevertheless it was available).
Brand 2 was selling "A"-rated and much lower-rated combination refrigerators at similar prices. Brand 3 which competes directly with Brand 2 has similar pricing points for varying efficiency performances.

Brand 4 offered three "A+"-rated washing machines in the same category size – however one was priced at R3 799, the second at R5 699 and the third at R6 699.

Locally manufactured appliances in almost all cases are less energy efficient than the imported equivalents. The local manufacturers will need to upgrade and retool their manufacturing processes if they are to improve the efficiency performance of their appliances.

**THE TABLE BELOW PROVIDES A SUMMARY OF FINDINGS FOR EACH APPLIANCE:**

**Impact assessment**
The study analysed the industry supply chain, local manufacturing, importers and retailers, incentives as well as risks. The outcome of this was to determine the baseline for each appliance category and to recommend MEPS:

- Based on the research and participation of industry during the study
- Using an internationally recognised model – Bottom-Up Energy Analysis Model (BUENAS) developed by the Lawrence Berkeley Laboratory (LBL) in California. The model was customised to consider the South African market environment (based on the data collected in the study) and Government priorities.

The recommended MEPS for the SA S&L programme are shown in Table 3. The baseline column represents the average efficiency rating of each appliance currently being sold.

**Note:** A requirement of the BUENAS model is that the MEPS is always higher than the baseline in order for savings to be achieved. For certain appliances the consultants opted to stay with the baseline having considered local socio-economic factors and primarily the cost differential of moving to a higher energy class.

Based on the MEPS used in the BUENAS model it is expected that 1.9TWh savings by 2020 and 3.8 TWh by 2030 will be achieved. This represents a reduction in residential electricity demand of 10% of the end uses covered by MEPS by 2020 and 16% by 2030. Overall, the MEPS could reduce electricity consumption in the residential sector by 3.3% in 2020 and 5% in 2030.

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**Table 3:** Appliance baseline and recommended MEPS for SA S&L programme

<table>
<thead>
<tr>
<th>Appliance</th>
<th>Baseline</th>
<th>Consultation</th>
<th>BUENAS</th>
</tr>
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<tbody>
<tr>
<td>Refrigerators</td>
<td>Between C &amp; D (Local) A (Imported)</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Freezers</td>
<td>F</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Washing machines</td>
<td>A</td>
<td>A</td>
<td>A+</td>
</tr>
<tr>
<td>Tumble dryers</td>
<td>D (Local) C (Imported)</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Dishwashers</td>
<td>A</td>
<td>A</td>
<td>A+</td>
</tr>
<tr>
<td>Ovens</td>
<td>B (Local) A (imported)</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Electric geysers</td>
<td>E</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>A/C (split)</td>
<td>Insufficient Data</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>A/C (reversible split)</td>
<td>Insufficient Data</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>
CONCLUSION

To increase the probability of a successful S&L programme, this study has highlighted issues which must be addressed and issues which need to be considered carefully before a final decision is taken. These issues are not insurmountable and can be addressed with proper planning and skilled resources. More importantly the study has demonstrated that despite previous setbacks a mandatory S&L programme will still yield significant electricity savings.

This will benefit the Government by reducing capital spending and help it achieve its environmental objectives, households through lower operating costs and increased awareness and society as a whole through reduced pollution. All this can be achieved and should not only maintain but potentially increase local manufacturing opportunities and also create new ones, such as testing, compliance, awareness and training.

A successful S&L programme does require an upfront capital investment but if the return is considered, as much as 3.8TWh by 2030, then it is probably one of the best energy efficiency investments which can be made – especially if this programme lays the groundwork for additional appliance types in the future.


* The opinions expressed in this article are that of the contributor and not of the publisher.

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