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GROWTH AND EQUITY (FRIDGE)**

Energy Performance and Labelling Requirements for Specific
Electrical Appliances and Equipment

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Introduction

'There is a strong, profit-based business case for investing in more energy-efficient products and designs. Energy efficiency, however, often is viewed as something that businesses and individuals should do as good citizens. The reality is that using energy inefficiently is like walking past money on the ground - - - money that could be put to far better use than paying electricity bills. Investing in energy efficiency creates economic value.'

Lawrence Berkeley National Laboratory (LBL)

Report Objectives

The South African Government aims to implement a programme which will phase out the use of inefficient residential appliances over the next few years. It is proposed that this will be done through the introduction of a mandatory combination of two regulatory tools: Appliance Labelling and Minimum Energy Performance Standards (MEPS) for appliances selected by the 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 objective of this report is to address the outstanding issues identified in the Terms of Reference for the successful implementation of the *Energy Performance and Labelling Requirements for specific Electrical Appliances*

The report is structured in accordance with the required project deliverables of the Terms of Reference (Section 2 Item 11) and is divided into the following sections:

- **Report on Research of Selected Appliances** (*Literature review*): this provides the South African contextual background and desktop research. The ToR notes: '*Internationally, many countries have MEPR and / or labelling programmes as drivers of their energy efficient strategies to reduce electricity*'. It is therefore worthwhile to note how these programmes were implemented, whether they achieved their objectives and lessons learnt. This is done through the review of internationally accepted best practise and country specific case studies from developed and developing countries.

Appliances selected for the study:

- Air conditioners up to 5 kW, non ducted ones and heat pumps
 - Washers (dishwashers and washing machines)
 - Electric stoves and ovens
 - Refrigerators and freezers and combinations
 - Water heaters / geysers
- **Consumer Response:** to ensure that the envisaged programme benefits consumers, the proposed labels must provide the necessary information required by consumers to make an informed decision. The effectiveness of the labels is heavily dependent on how this information is presented. The label designed for the SA programme was presented to all LSM groups through the use of Focus Groups sessions. The outcomes, feedback and recommendations (if any) are provided in this section.

- **Database of Suppliers:** a standalone excel database provides the categories of the selected appliances using industry classifications.
- **Report on Energy Efficiency Levels:** using a combination of supplier information, desktop research and retailer interviews a profile of the existing energy consumption levels of the selected appliances is provided.
- **Impact Assessment:** this section provides a detailed analysis of the consequences (intended and unintended) of the introduction of Minimum Energy Performance Requirements (MEPR) and Appliance labels. The ToR requirement for a detailed consideration of the impacts on the business sectors, distribution channels, cost both direct and indirect as well as the benefits to society are addressed in this section
- **Implementation Approach:** this section consolidates and draws on all the previous sections and addresses the following:
 - Recommended MEPR for each appliance type
 - Recommended Labelling requirements for each appliance type
 - Recommended implementation schedule.
 - Recommendations with regards to compliance and monitoring

In completing this report the consultants have adopted decisions taken to date as final and did not revisit or raise such items unless they were specifically asked to do so by the project sponsors (Counter Party Group – CPG). For example, the Department of Energy designed and registered an appliance label in 2005. The Focus Group sessions which were conducted did not have ‘acceptability of the label design or format’ as an objective of the sessions. Their objective was to gauge consumer feedback and the level of understanding of the label by different LSM groups. If however the Focus Groups revealed that minor modifications would help improve the acceptance of the label then this was included in the report. In the unlikely event of an extremely negative feedback, then this was included in the report but it was not part of the scope.

Policy Objectives: Energy Efficiency

The Energy Performance and Labelling Requirements report is aimed at supporting the following short term goals:

- Provide recommendations and support to the strategy which will be adopted and ultimately implemented by the Government to phase out inefficient appliances
- One of identified deliverables from Government and Industry’s to the jointly funded UNDP/GEF ‘Market Transformation through the Introduction of Energy Efficiency Requirements and the Labelling of Appliances in South Africa’ which is due to commence 2011/2012
- To send a signal to the market of the imminent implementation of the MEPR & Labelling programme

Ultimately, achievement of the above will lead to:

- A market transformation of the selected household electrical appliances where the lowest performing units (highest consumers of electricity) are removed from the market
- Improve the energy performance of all appliances in the product class

- Deliver and support Government Policies and Objectives as per Table 2
- Create the basis and framework for the next set of appliances and industrial equipment which will be required to conform to the mandatory requirements
- Improve consumer understanding of and the need for energy efficiency
- Improve the economic welfare of households
- Reduce the country's electricity consumption and potentially delay the need for new generation plants
- Become a centre of excellence in the SADC, and the rest of Africa, and thus provide support and services to the regions

1 Literature Review

A literature review has been undertaken to provide the context for the development of the Energy Performance and Labelling Requirements for electrical appliances. (International convention refers to these two types of intervention, namely the introduction of MEPS and Labelling as Standards and Labelling, or S&L. The UNDP / GEF partnership with the government of SA for the implementation of energy performance and labelling uses the same terminology, therefore to avoid confusion and misunderstanding the report will from here-on refer energy performance and labelling as S&L.) This literature review provides the contextual background to the programme, overview of the best practise approach and draws conclusions and recommendation from international case studies from developed and developing countries.

Developed countries have mature S&L programmes and their experiences and challenges are worth noting, but these countries operate under very different circumstances from those faced in South Africa. They typically have more resources, both human and financial, and do not have the pressing service delivery needs and unemployment levels being experienced across South Africa. Their experience with, and approaches to, S&L programmes, have to be appropriately adjusted to the South African context.

This does not mean that S&L programmes are a developed country luxury - as the case studies from the developing countries clearly demonstrate there are numerous reasons why a mandatory S&L programme is an appropriate policy approach for developing countries such as South Africa.

1.1 Country Context: Energy and Climate Policy

The South African Government is acutely aware of the need to address and resolve the electricity supply side shortfall that became a national imperative after the 2008 blackouts. Eskom¹ estimates that SA needs to build 40,000MW of new generation capacity by 2025, of which over 13,100 MW are already under construction (mainly Medupi and Kusile power stations, return to service stations and Ingula power station). However the shortfall cannot only be addressed on the supply side and numerous demand side, or energy efficiency, initiatives are planned.

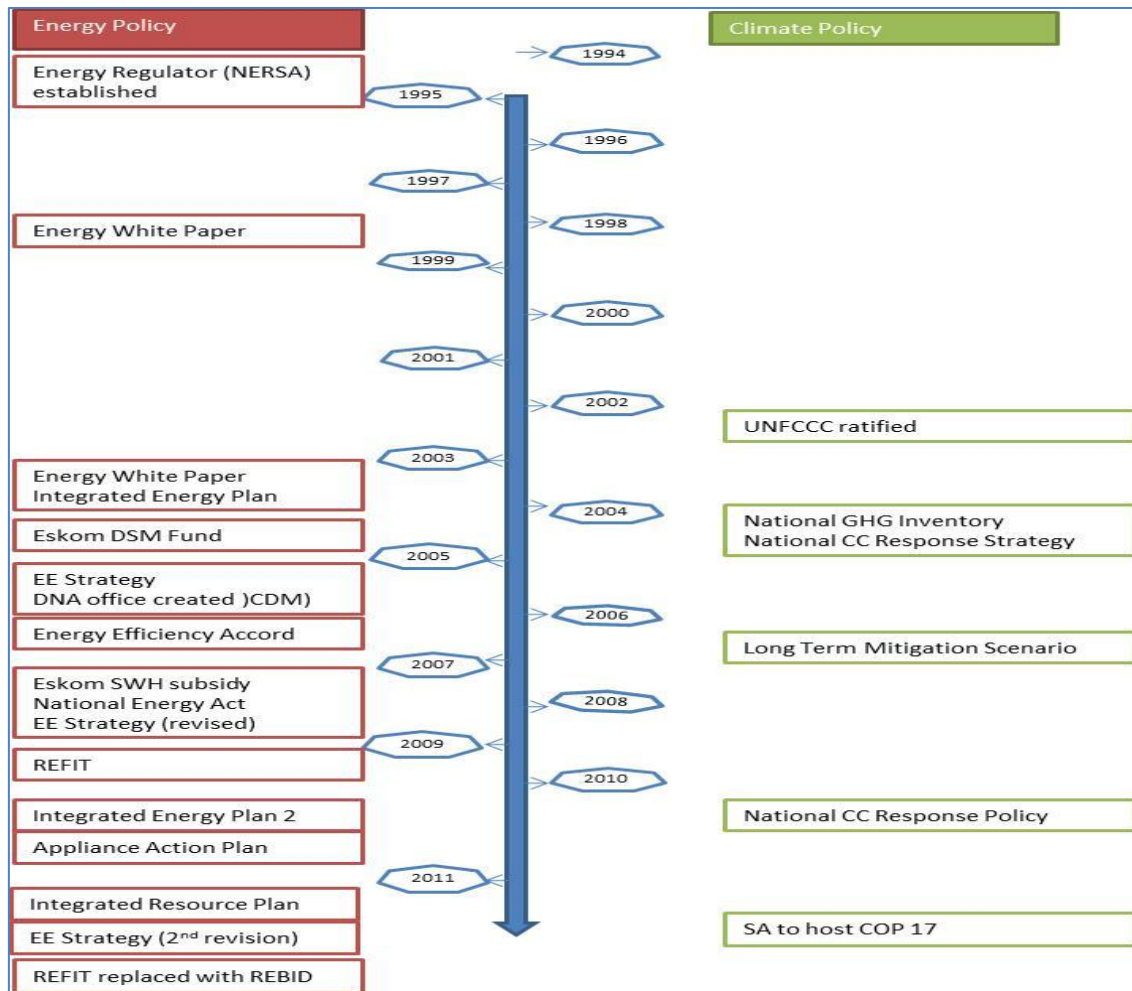
Simultaneously the Government is also aware of the threat posed by climate change and of its responsibility to act to reduce emissions. The national Greenhouse Gas (GHG) inventory (2009) showed that energy supply and consumption is responsible for

¹ Eskom Annual Report 2009, pXi

78.9%² of the country’s total GHG emissions, due to the country’s almost exclusive use of fossil fuels to drive an energy intensive economy. This prompted the government to conduct research and take policy action to determine the impact of climate change and how it can reduce its reliance on non-renewable energy - and the Long Term Mitigation Strategy (LTMS) of 2007 provided scenarios and possible climate change mitigation activities for the period to 2050.

Figure 1 provides an illustration of the development of the South African energy and climate change policy landscape since 1994.

Figure 1: SA Climate and Energy Policy Timeline



The need to align South Africa’s economic policy with its climate policy commitments is becoming increasingly relevant and urgent as time passes and the seemingly ‘far in the future’ deadlines or target dates approach. South Africa is a carbon intensive economy with a very high emissions footprint – in 2008 it was the world’s 13th largest emitter³. The Government is considering four economic policy areas to meet its policy mitigation objectives, namely carbon tax, industrial policy (IPAP2), New Growth Path (NGP) and Integrated Resource Plan (IRP) however concern has been raised that although these policies intend to align with the policy direction they do not consider quantification of

² Greenhouse Gas Inventory 1990 – 2000, Department of Environment and Tourism (2009), <http://www.pmg.org.za/files/docs/090812greenhouseinventory.pdf>

³ Carbon Dioxide Information Analysis Centre, 2011, US Department of Energy

emission reductions. The possibility of South Africa not meeting its targets could result in the country remaining locked in its carbon intensive trajectory which 'runs the significant risk' of stranding the economy as global economies invoke multi-lateral trade agreements, barriers or other measures for non-compliance⁴. The concerns around this misalignment were considered by the National Planning Commission in the Second Low Carbon Economy Workshop which took place in July 2011.

1.2 Key Concepts and Definitions

Energy Efficiency: the reduction in the energy used for a given service (lighting, refrigeration, heating etc)

Labels: are informative and affixed to the appliance to provide details about the product's energy performance to the consumer. Two types exist:

- *Endorsement* provide no information and purely serve as a 'seal of approval'
- *Comparative* labels allow consumers to compare performance among similar products

Standards or Requirements: define MEPR as well as categorising the individual energy classes

Energy Standards and Labels can be stand alone or combined. Experience has shown that the most effective programmes combine the two approaches.

Mandatory and Voluntary Programmes: Endorsement labels are inherently voluntary whereas comparative labels can be mandatory or voluntary. Most countries using the comparative label tend to implement mandatory programmes to reduce the risks of manufacturers and distributors of not complying with the requirements.

1.3 Standards and Labelling (S&L) Programmes: Overview

The increase in the use of lighting and the number of electrical appliances and equipment in households is the cause of the alarming growth of domestic electricity load. This phenomenon is more prevalent in developing countries for two reasons. 1) There has been an increase in the ownership of large appliances. In South Africa for example, the use of electricity for cooking increased from 47.1% in 1996 to 66.5% in 2007⁵ and the penetration of appliances in households over a five year period (2003 to 2008) for fridge / freezers increased from 45% to 55% and washing machines from 35% to 46%⁶. 2) The appliances in developing countries are normally less efficient than those sold in industrialised countries. For example, a study conducted in 2000 found that the average consumption of Chinese refrigerators was 2.5kWh/l compared with 1.5kWh/l in Europe⁷.

This rise in the household electric consumption can be partially controlled by introducing programmes which promote and improve energy efficiency. The most effective to date has been the introduction of MEPS and Labels – S&L Programmes.

Labelling Programmes are designed to modify the selection criteria of consumers by drawing their attention to the energy consumption of household appliances. Energy

⁴ Is SA Economic Policy aligned with our National Mitigation Policy Direction and a Low Carbon Future, 2011, Trollip and Tyler

⁵ Community Survey Report 2007, Statistics South Africa

⁶ Domestic Electrical Appliances in SA, Euromonitor International, 2009

⁷ Labelling programs and efficiency standards to control the energy consumption of household appliances: current situation, main results and recommendations, Menanteau, 2000

labels provide consumers with information, which enables them to compare the energy efficiency of the different appliances on sale.

Performance Requirements aim to improve the energy efficiency of new appliances either by imposing MEPR to remove the least efficient products from the market or by requiring sales weighted average energy efficiency improvements. Performance standards are drivers of market transformation.

It should be noted that energy efficiency does not imply or result in a reduced level of performance but accomplishes the same or higher level of performance while using less energy. This can be achieved through technological advances (higher efficiency motors or improved insulation material) or non-technical factors such as consumer behaviour⁸. The potential for sustained energy savings is maximised by combining performance standards and appliance labelling

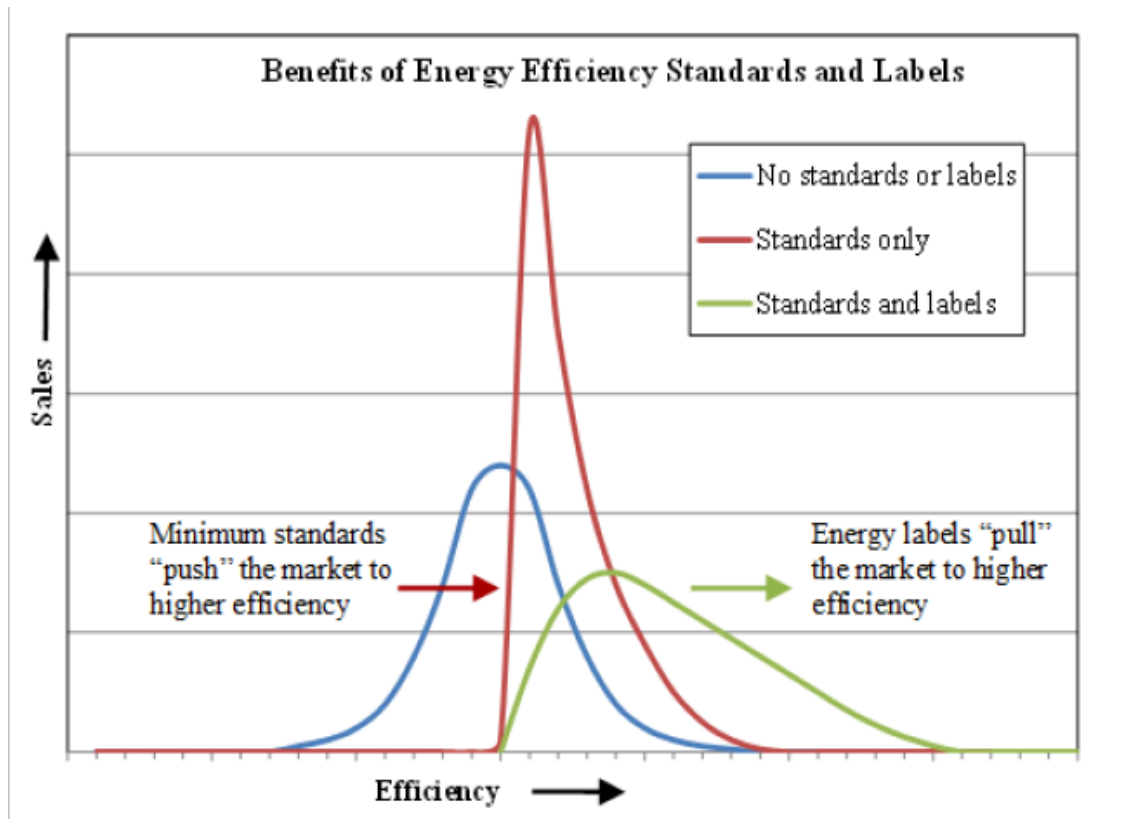
Rebates can also be used to influence consumers to opt for a higher efficiency model when purchasing a new appliance. The value of the rebate is normally calculated to offset the cost of the more expensive and higher efficient model to the consumer. Rebates can take multiple forms such as cash (discounted price), reward programme or tax incentives. For example, a 500DKK (ZAR750) subsidy offered on A rated refrigerators in Denmark resulted in their share of the total market increasing from just 7% in 1998 to 93% in 2007.⁹

As shown in Figure 2 each policy tool has its own advantages, ideal target groups and operational mechanisms but an individual tool is not able to address all the market barriers. Energy savings are maximised when tools are used in combination as the impact of the two is larger than the sum of the individual expected impact. However it is vital that the programme follows an overall and coordinated strategy as too many signals and instruments may also confuse the market.

⁸ World Energy Council
http://www.worldenergy.org/publications/energy_efficiency_policies_around_the_world_review_and_evaluation/1_introduction/1175.asp

⁹ Energy Efficiency Domestic Appliances and Lighting Conference, Denmark, May 2011, Lindevall Go'Energi

Figure 2: The impact of policy tools in shifting the market towards higher efficiency appliances



Source: CLASP

1.4 History of Appliance Labelling in SA

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. Table 1 below aims to provide a high level timeline of some of the actions taken to date and is meant to provide a contextual background for information purposes only. It is not a definitive account of the sequence of events.

Table 1: Timeline of Appliance Labelling in SA

Year	Event
1998	The White Paper on Energy Policy (1998) recognized that standards and appliance labelling should be the first measures to put in place in implementing energy efficiency
2004	Energy Efficiency Strategy (2004) states under the Residential Sector Programme 'Introduction of mandatory standards and labelling' A USAID funded report 'Results of the national consumer surveys relevant to labelling communications campaign is published
2005	The Department of Minerals and Energy (DME) announces the introduction of a voluntary labelling programme for refrigerators with mandatory participation expected to be legislated between 18 – 24 months SA decides to adopt the EU label with minor modifications
2006	The DME submit an application for UNDP/GEF funding for the 'Market Transformation through Energy Efficiency Standards & Labelling of Appliances in South Africa' programme
2008	The first review of the Energy Efficiency Strategy reconfirms its commitment to appliance labelling 'Mandatory appliance labelling for household appliances forms an important

Year	Event
	<i>element of the Strategy and will be promoted and implemented</i> The National Energy Act 34 (2008) is promulgated and makes provision for the Minister to pass regulations for appliances and MEPS
2009	SABS forms the Working Group 941 (WG941) who are mandated to develop SAN941 which provides measurement standard as well as labels
2010	National Standards (Test methods) are published for all appliances put forward by the WG941 The DTI and DoE issue the 'Action plan for introducing minimum requirements for specific appliances and equipment' for public comment. The action plan targets 2013 for the implementation of a mandatory S&L programme Project document is submitted to UNDP/GEF for review and approval
2011	The UNDP/GEF funding is approved with a total budget of USD13.125m (GEF contribution USD4.4m and SA USD8.75m) Eskom evaluated a rebate to promote efficient appliances but did not proceed due to lack of market information 'Energy Performance and Labelling Requirements for Specific Residential Electrical Appliances' study is commissioned by the IDC

Before a mandatory S&L programme can be implemented it is imperative for the necessary regulatory framework to be in place. This provides the implementing agency or department with the required mandate and the powers to pass the necessary laws. It also demonstrates to all stakeholders that the programme has 'established strong and clear political legitimacy'. Table 2 provides the timeline of the actions taken by the Government to transform the S&L tool into a mandatory programme to achieve its policy objectives and targets.

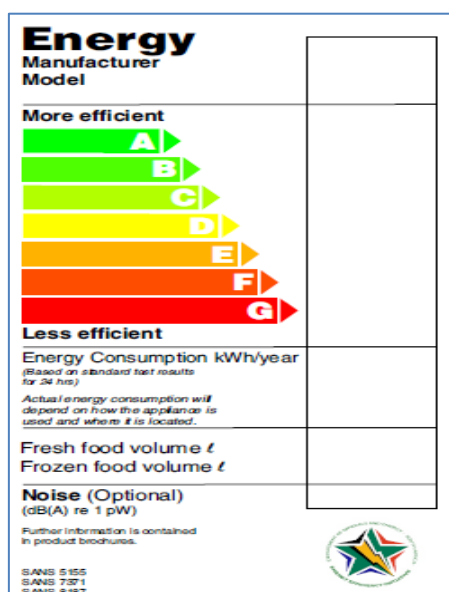
Table 2: Timeline of Key Policy and Regulatory Enactments to make Energy Performance and Labelling of Electrical Appliances Mandatory

Document and Year	Ministry	Reference / Wording
IPAP2 of 2010	DTI	section 9.1.4 Strengthen market standards: "2011/12 by Q4 – SABS to develop South African National Standards (SANS) and NRCS to introduce additional mandatory standards in the following key areas: energy and water buildings; energy efficient electrical appliances.."
National Appliance and Equipment Energy Efficiency Action Plan (2010)	DoE and DTI	purpose is to "outline a proposed action plan for introducing minimum requirements for specific appliances and equipment"
Energy Act 34 of 2008	DoE	section 19- l, "the Minister (of Energy) may make regulations regarding (i) labelling for energy efficiency purposes of household appliances, devices and motor vehicles and (ii) energy efficiency standards for specific technologies, processes, appliances, devices and motor vehicles"
National Climate Change Response Green Paper (2010)	DEA	5.4.13 Set ambitious and mandatory targets for energy efficiency and in other sub-national sectors. 5.4.14 Improve energy efficiency knowledge and understanding in the various sectors via awareness campaigns, demonstration programs, audits and education, and publicize corporate commitment programs, and public building sector energy efficiency implementation. 5.4.15 Develop and implement mandatory appliance labeling for household appliances.

Document and Year	Ministry	Reference / Wording
		5.4.16 Introduce Minimum Energy Performance Standards (MEPS) for appliances and equipment, as well as proposals for mandatory energy rating labeling.
National Energy Efficiency Strategy (1 st Revision 2008)	DoE	strategy stipulates "the introduction of appliance labeling as an approach to meet the objectives" and also states "it is an intention of the strategy to enhance decision makers' awareness of issues such as running costs and environmental costs. This will be achieved by the adoption of appropriate standards, awareness and education and by the use of instruments such as appliance labeling".
New Economic Growth Path (2010)	Economic Development	States "The New Growth Path targets 300,000 additional direct jobs by 2020 to green the economy, with 80,000 in manufacturing and the rest in construction, operations and maintenance of new environmentally friendly infrastructure. The potential for job creation rises to well over 400 000 by 2030"
International Agreements signed by SA	GoSA	<ul style="list-style-type: none"> • UNDP/GEF and GoSA co-financing of the "Market Transformation Through the Introduction of Energy Efficiency Standards and the Labelling of Appliances in South Africa" (2006-2011) • United Nations Framework Convention on Climate Change (UNFCCC), where SA committed in Copenhagen (2009) to reduce its CO2 emissions by 34% till 2020 and 42% by 2025; • Super Efficient Appliance Labelling Development (SEAD), which is a global collaborative effort that will assist national governments to accelerate the establishment, expansion and updating of equipment and appliance efficiency standards and labelling programmes. (2010)
Approval of Action Plan (2011)	DTI	The 'South African National Electrical Appliances Energy Efficiency Action Plan' is submitted to and approved by the Minister of Trade and Industry – Rob Davies

The Government of South Africa has decided to introduce a combination of **mandatory MEPR and Labelling** programme and has opted to use EU designed energy label to which it has made some minor modifications – Figure 3. The label is registered with the appropriate international authorities.

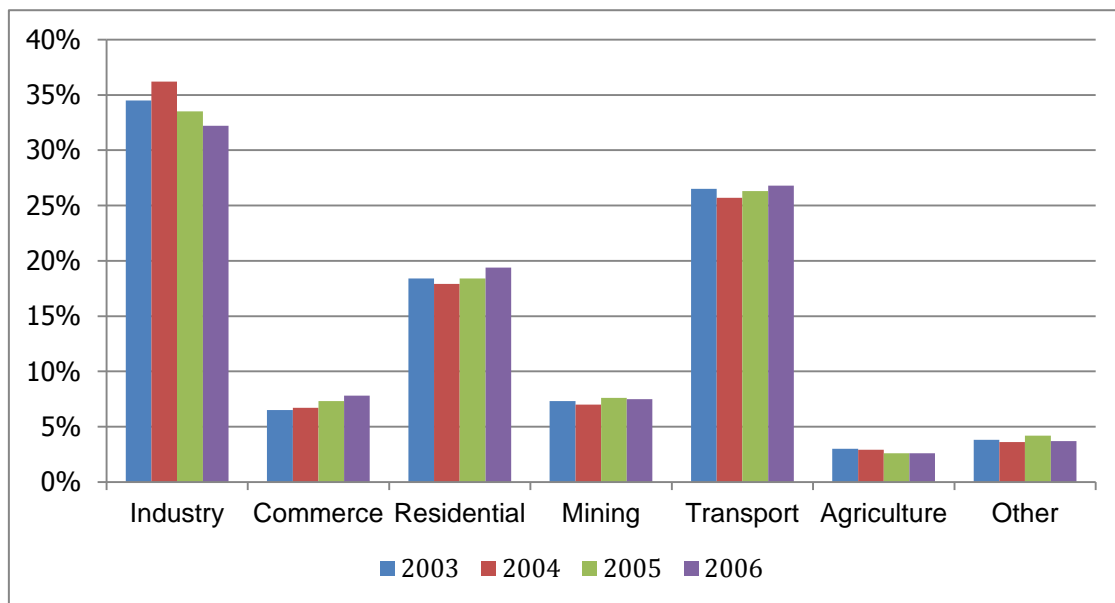
Figure 3: SA Comparative Label



1.5 Motivation for a Mandatory S&L Programme

The demand for energy from the residential sector continues to grow and now accounts for 19.40% of the total consumption (as shown in Figure 4) compared to 17% in 2000¹⁰. This is relevant in the context that of the two other primary users – industry has decreased from 34.5% to 32.2% and transport has increased slightly from 26.5% to 26.8%¹¹. Over the same period total energy consumption has increased by 25% from 4.5m TerraJoules (TJ) to 5.64m TJ. These figures suggest that energy consumption in the residential sector is growing at a significant rate and given the current supply side constraints measures must be considered to curb this growth while continuing to increase accessibility to all citizens.

Figure 4: Sectoral Consumption of Energy, 2006



Source: *Digest of Energy Statistics, Department of Energy (2009)*

Consistent energy performance improvements in residential appliances and indeed industrial equipment are probably one of the most important components 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 report¹² published in 2005 by the then Department of Minerals and Energy it was estimated that the average refrigerator / 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 3 provides a list of the estimated annual sale and penetration rates of the appliances selected for the South Africa S&L Programme.

¹⁰ Energy Efficiency Strategy of the Republic of South Africa, 2005, Department of Minerals and Energy

¹¹ Digest of energy Statistics, 2009, Department of Energy

¹² Capacity Building in Energy Efficiency and Renewable Energy, Appliance Labelling Study, Report Number 2.3.4-05, February 2003

Table 3: Selected Appliances – Annual Sales and Household Penetration Rates

Appliance	Annual Sales (2008) ¹³	Penetration (%) ¹⁴ Tot H/Holds: 13.3m	Replacement Cycles (Years)
Refrigerators	30,600	Not Available	10.8
Freezers	254,900	21.2%	8.5
Fridge Freezer Combination	555,600	80.4%	10.2
Clothes Washers	400,300	39.4%	7
Clothes Dryers (Tumble)	129,600	9.4%	6.9
Washer Dryer Combination	13,700	Not Available	6.4
Dishwashers	76,600	3.4%	9.5
Room Air Conditioner Units	211,600	3.8%	10
Hobs, Ovens and Cookers	670,100	62%	12.3
Electric Water Heaters ¹⁵	~400,000	33%	5-7

The Energy Efficiency Labels and Standards Guidebook¹⁶ identifies the following benefits which can be expected from a well implemented S&L programme..

1.5.1 Programme Advantages

This type of programme offers the following advantages compared to most other energy efficiency interventions:

- It can produce very large energy savings and although it takes time for S&L programmes to start yielding large energy savings once they do they tend to be sustainable due to long term lifespan of the appliances - as per Table 3
- It has the potential to be a cost effective way of limiting energy demand without impacting or limiting economic growth
- It requires change in the behaviour of a limited number of manufacturers rather than the entire consuming public
- All stakeholders across the value chain are treated equally
- Assuming compliance, the energy savings are assured, simple to quantify and easily verified

Experience has shown that these advantages will be quickly and easily nullified if the programme is not designed and implemented effectively. Please refer to the project risks category in the Impact Assessment section for more details

1.5.2 Programme Benefits

The S&L Programme is particularly well aligned to South Africa's energy and climate change policy and will offer significant benefits to South Africa:

- If successfully implemented it will contribute significantly towards alleviating the country's electricity shortfall over the medium to long term

¹³ Domestic Electrical Appliances in SA, Euromonitor International, 2009

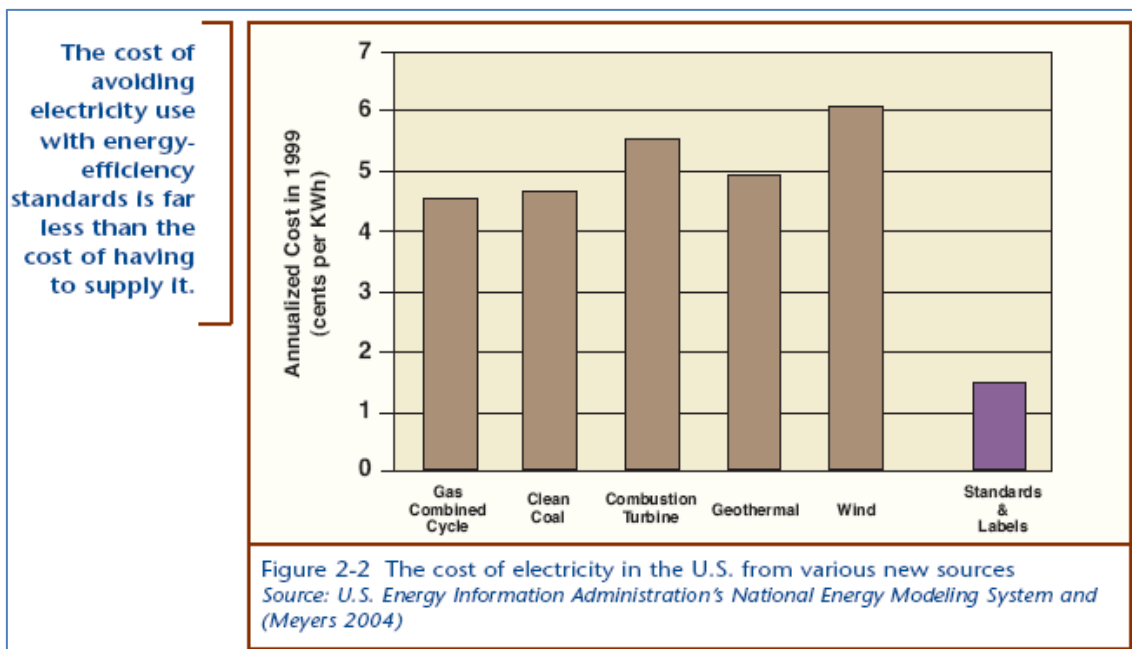
¹⁴ South African Advertising Research Foundation, 2010

¹⁵ National Solar Water Heating Conference, Development Bank of South Africa, November 2009

¹⁶ Energy Efficiency Labels and Standards Guidebook (2nd Edition), Wiel and McMahon, 2005

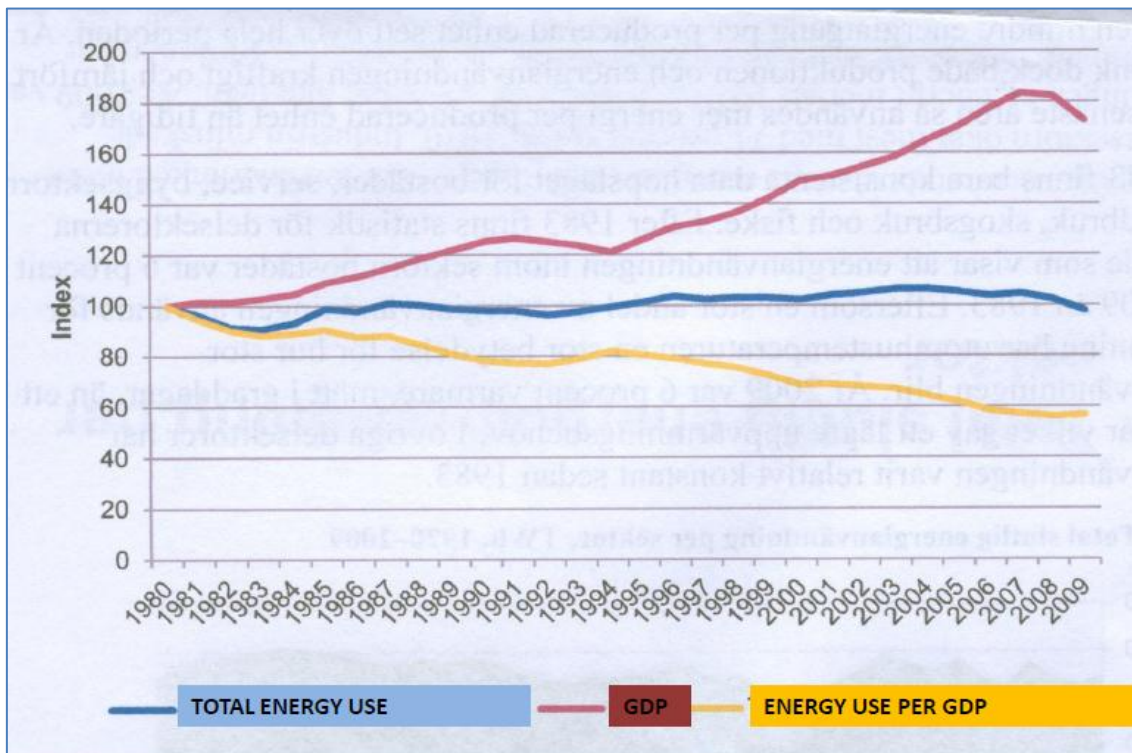
- Reduced capital investments in energy generation plants. The Integrated Resource Plan 2 sees a 'near doubling of electricity capacity by 2030' all demand side programmes which can be implemented now which can result in meaningful reductions will have two benefits 1) the capital investment will be significant given the high cost to build generation plants – especially post 2020, and 2) the capital can be used to fund other government projects
- Improving national economic productivity through higher efficiency. This is particularly relevant to South Africa's energy intensive economy and evidenced by the New Economic Growth Path objective of decoupling growth from reliance on fossil fuels and high carbon intensiveness. This is best demonstrated graphically in Figure 5 which shows that it is one of the lowest cost options and Figure 6 which shows that decoupling is possible as per the Sweden experience where GDP continued to grow over a 30 year period while energy consumption remained flat resulting in a net decrease in energy consumption per GDP.

Figure 5: Comparison of generation and generation avoidance costs



Source: CLASP

Figure 6: Decoupling energy consumption and GDP in Sweden



Source: International Foundation for Ecology, Sweden

- Enhancing consumer welfare by reducing monthly energy bills. In July 2011, Canada surpassed South Africa as the world's cheapest provider of electricity¹⁷. With further tariff increases, averaging 25%, already mandated until 2013 and similarly high increases expected to follow, consumers are expected to start to shift towards a life cycle rather than a capital cost financial evaluation. The prevailing mind-set, and the pitfall, of the upfront capital cost often being the only criteria in the decision making process is demonstrated in the following example from China.

*In 1980 China decided to distribute refrigerators throughout the capital city of Beijing. It did so with resounding success, supplying refrigerators to over 60% of Beijing households by 1990, where only 6% had them in 1980. The reconditioned refrigerators from Japanese factories were thought to be cheap. They were not cheap, however, when the costs of the electric power supply necessary to run these very inefficient machines became apparent. In fact, the purchase and supply of inefficient equipment cost more than three times what would have been the cost of supplying the most efficient refrigerators on the world market [in 1991]*¹⁸

- Improving the country's competitiveness. By manufacturing higher efficiency appliances local manufacturers will be more competitive and have access to bigger markets
- Assist SA towards achieving its emission reduction targets

¹⁷ 2011 International Electricity Report and Price Survey, NUS Consulting

¹⁸ Appliance Energy Efficiency Labels and Standards, David R Hodas

- Reducing pollution from fossil fuel energy generation plants. South Africa's grid emission factor in 2009 was 1.03kg / kWh¹⁹. If we revert to the estimated savings cited by the Department of Minerals and Energy of annual electricity savings of 27GWh per annum equates to 27,800 tons of avoided CO₂ emissions (per annum) just for combination refrigerator freezers – assuming no further efficiency improvements
- The programme supports the amendments to the National Building Regulations Act (1977) which requires compliance with the Deemed to Satisfy Standards - SANS 10400 Part XA Energy Usage in Buildings) and is expected to come into force during November 2011.

1.5.3 Programme Disadvantages

The advantages and benefits listed above refer to well-designed and effectively implemented programmes. However the converse is true if programmes are poorly planned and executed with negative consequences to consumers, manufacturers, the economy and environment. The primary risks or areas of concern are:

- Weak standards or poorly designed labels will not assist households in reducing their electricity bills. This will in turn lead to a disillusionment and mistrust of energy efficiency which will raise resistance or entrench indifference to future energy efficiency programmes
- Standards which are too high will in turn lead to consumers paying more for an appliance than they will recover from the electricity savings which in turn will impact on the national economic efficiency. It may also impact negatively on local manufacturers who have to invest in new plants to improve their products
- Regional harmonisation programmes must be carefully coordinated as they may increase bureaucracy and adopting the 'lowest common denominator' will restrict progressive countries from maximising the energy benefits

1.5.4 Effectiveness of S&L Programmes

Introducing S&L requirements on appliances aims to effect a market transformation. The intention is to implement appropriate policy tools and the market will be forced to respond if it is to remain competitive. It is also important to note that a poorly implemented programme will result in little or no energy savings and the capital, time and effort put into the programme is lost. Furthermore, the credibility of energy efficiency programmes with consumers is destroyed making it difficult and expensive to restore their credibility in the future.

The effectiveness of S&L programmes is quantified in one of three ways 1) Calculating the impacts prior to implementation. 2) Anecdotal feedback. 3) Monitoring the impacts once the programme is implemented. Regardless of when the calculations are made they are generally based on reliable market data which can be purchased from consumer goods sales reporting and market intelligence companies such as GFK (www.gfkr.com) or Euromonitor (www.euromonitor.com). Below are some examples of programmes from around their world and the impact they have had on the market.

China: A joint Chinese and US Energy Foundation Study estimates S&L programmes currently in place in China are expected to save a cumulative 1143 TWh by 2020, or 9% of the cumulative consumption of residential electricity to that year.²⁰

¹⁹ Eskom Annual Report, 2009

²⁰ Impacts of China's current appliance labelling programme to 2020, CLASP (Fridley et al), 2007

Korea: Figure 7 and 8 demonstrate the market shift to more efficient refrigerators as a result of the introduction of the labelling programme in Korea – Figure 7 shows how the market moved towards high grade (energy efficient) refrigerator modes and Figure 8 quantifies the savings showing that electricity consumption has decreased by 55%

Figure 7: The impact of energy efficiency labels on the distribution of refrigerators in Korea

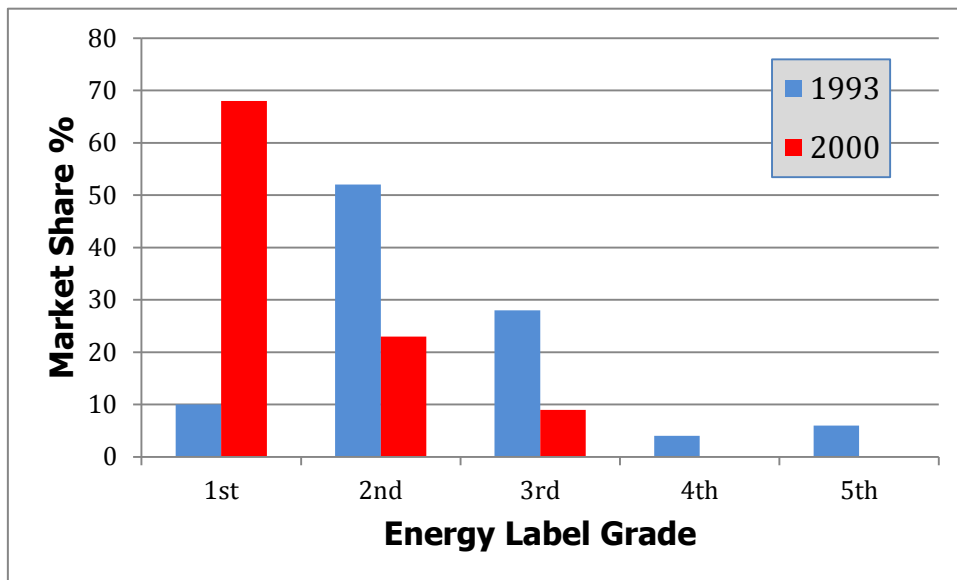
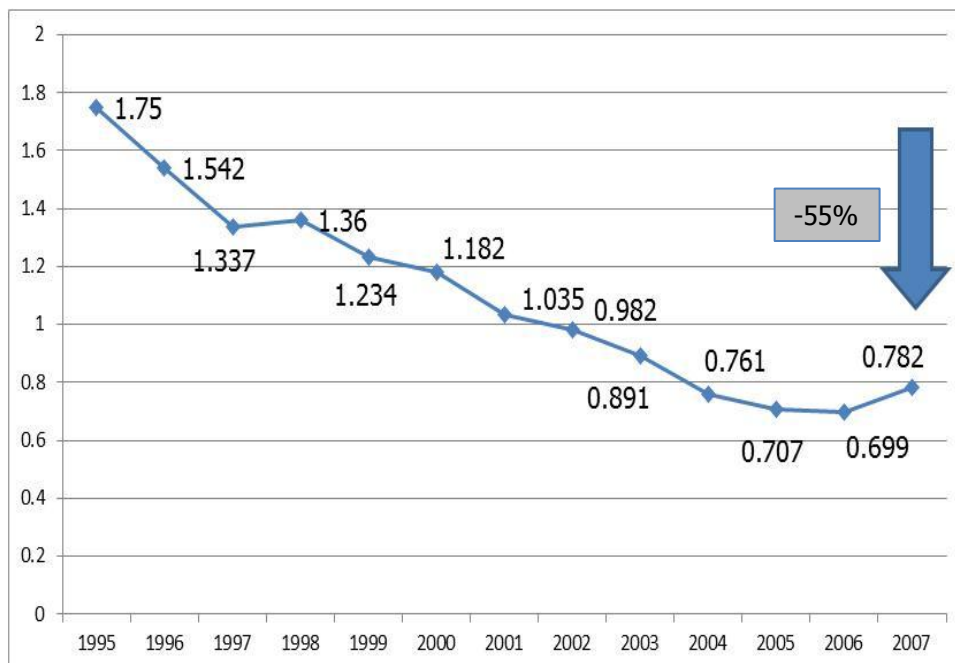


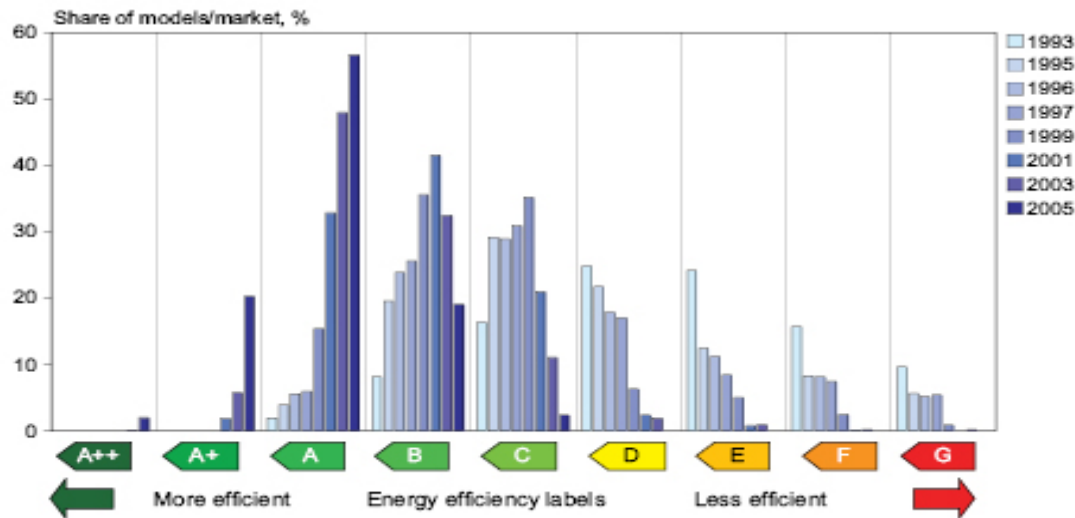
Figure 8: Annual electricity consumption per litre (kWh/L) for Korean refrigerators



Source: Korean Energy Management Corporation

Europe (EU): An evaluation of the impact of the EU appliance-labelling scheme showed a dramatic shift in the efficiency of refrigerators sold in the EU in the first decade of its S&L programme as demonstrated in Figure 9.

Figure 9: The Impact of the EU Appliance Label on Refrigerators (A++ to G, with G being the least efficient) in EU-25²¹



Source: Intergovernmental Panel on Climate Change (IPCC) - UNEP

United States: An analysis completed in the US expects that the energy efficiency measures adopted up to 2005²², when the calculation was done, will result in \$130 billion cumulative present day savings over the lifetime of the products after subtracting any additional costs incurred for the additional costs of the more efficient appliances.

In all these positive examples of the benefits from implementing S&L programmes it does require that manufacturers invest heavily in upgrading their production lines in order to comply with the requirements. There are instances where this has resulted in the consolidation of manufacturers or the relocation of production to other countries. For example, prior to the implementation of MEPS for air-conditioners in the US almost all units were manufactured locally however only one manufacturer has survived. Research has also shown that in some instances standards have a varied impact and they can protect or overwhelm the local manufacturers. This is addressed in the impact assessment section of the report.

1.6 Harmonization

Given the high degree of international activity with respect to S&L schemes it is worthwhile to consider what lessons may be learnt from a better understanding of current practises among major economies and when it might be appropriate to consider a greater alignment, or harmonisation of practises and requirements.

The Collaborative Labelling and Appliance Standards Programme (CLASP) reported in 2010 that 'some 50 countries have elements of an S&L programme which cover as many as 40 product types'. Put differently S&L programmes are found in countries that account for 80% of the world's population and a higher share of its GDP, energy use and CO₂ emissions. This demonstrates that S&L programmes are a mainstream energy policy tool.

Countries are therefore increasingly noting developments in other countries and this raises the prospect for increased international cooperation and aligned policy settings

²¹ www.ipcc.ch/publications_and_data/ar4/wg3/en/ch6s6-8-2-1.html

²² Energy Efficiency Labels and Standards Guidebook (2nd Edition), Wiel and McMahon, 2005 pg22-23

which will lead to reduced programme costs. The International Energy Agency (IEA 2000) has identified several forms of cooperation – collaboration in the design of tests, labels and standards; harmonization of the test procedures, the energy classes used in standards and labels and coordinating programme implementation and monitoring efforts. It is believed that this type of collaboration offers five potential benefits:

- Increased market transparency
- Reduced costs for product testing and design
- Increased prospects for trade and technology transfer
- Reduced costs for developing government and utility efficiency programmes
- Enhanced international procurement

Harmonizing does not imply copying a programme wholesale from another country as this would not work either. Each country has its own unique landscape. In considering harmonization, the following elements²³ should be reviewed as they will have different advantages and disadvantages

Test procedures: Being able to harmonise test procedures can have a significant impact on reducing programme costs and making it more effective. By adopting test procedures which still satisfy all the programme requirements rather than creating new ones assists manufacturers in keeping their costs down as testing is expensive. A secondary benefit is that it will allow for the harmonisation of energy classes.

Energy classes / efficiency levels: Adopting the same energy classes across territories allows for the free movement of appliances. For example Canada, USA and Mexico (NAFTA) have the same energy classes for almost all energy classes. The same is true for Australia and New Zealand. Another benefit of adopting international levels is that it makes it harder for manufacturers to 'dump' low efficiency products in new markets when they are no longer allowed in their territories.

However care must be taken to carefully consider the levels before adopting them as if they are set at the wrong level, too high or too low, they can jeopardise the programme. Setting them too high may result in appliances prices going up by an amount which impacts the market. Conversely setting them too low will result in little or no energy savings. It is often useful to check the energy classes of major trading partners especially the ones from which the majority of appliances are imported.

Label Design: Having a well-known and easily recognisable label is always useful however it must be tested first to ensure that the local culture accepts it. Label costs are much cheaper than test costs however a label which is not accepted by the public and is then withdrawn will be expensive and a lot of time will be lost and with it years of energy savings.

















1.7 Components of an S&L Programme

Table 5 lists the 'best practise' components²⁴ that should be considered when implementing an S&L programme. The table identifies their status from the South African programme perspective and how they relate to this report. Three status categories are used in Table 5 namely: are used in Table 4 namely: **Addressed** (✓), **out of scope** (✗), and **to be addressed in this report** (📄).














²³ Reference document for Energy Efficiency Standards and Labelling in Central America, McNeil et al, 2007

²⁴ Energy Efficiency Labels and Standards Guidebook (2nd Edition), Wiel and McMahon, 2005

Table 4: Components of an S&L Programme

Recommended Steps	Description	Status	Comment / Note
Step 1: Decide Whether & How to Implement Energy Efficient Labels and Standards	<ul style="list-style-type: none"> • Asses how local cultural, institutional & political factors are likely to influence the adoption & effectiveness of the programme • Establish strong & clear political legitimacy for standards • Decide the extent on which to rely on existing test facilities, test procedures, label design & standards already established by international organizations • Assessing the data needs of the programme & the capability of the government to acquire & manage the data • Screening & selecting which types of products are the highest priority 	    	<p>This will be an outcome of the report & the response from the CPG members (labour, business & government)</p> <p>Exists as demonstrated in Section 1.1</p> <p>Assessment of current status and best practise recommendations only</p> <p>Best practise recommendations only</p> <p>As decided by WG941</p>
Step 2: Develop a Testing Capability	<ul style="list-style-type: none"> • Formulate and recommend approach • Adopt test protocols 	 	<p>Assessment of current status and best practise recommendations only</p> <p>To be addressed by the UNDP/GEF project</p>
Step 3: Label Design	<ul style="list-style-type: none"> • Which products will be covered • Endorsement or comparative labelling • How should endorsement & comparative labelling be linked • Is the programme mandatory or voluntary • Should comparative labelling be continuous or categorical • Consumer research & acceptance of label design (focus groups) 	  <p>N/A</p>   	<p>As decided by WG941</p> <p>As decided by WG941</p> <p>Decision made to implement a mandatory S&L programme</p> <p>As Above</p> <p>Recommendation to be made</p> <p>Report requirement</p>
Step 4: Analyse & Set Standards	<p>Will the standard:</p> <ul style="list-style-type: none"> • Eliminate inefficient models from the market • Avoid imports of inefficient products • Encourage importers & local manufacturers to develop more economically efficient models <p>Will the following be conducted</p>	   	<p>A function of MEPS</p> <p>A function of MEPS</p> <p>Report will address this issue</p> <p>Not a requirement of ToR</p>

Energy Performance and Labelling Requirements for Specific Residential Electrical Appliances

Recommended Steps	Description	Status	Comment / Note
	<ul style="list-style-type: none"> • Engineering analysis • Market analysis • Consumer analysis (focus groups) • Manufacturing analysis • Stakeholder and consumer engagement • Promulgation process 	    	Required by ToR with specific criteria Report requirement Report requirement Not a requirement of ToR – UNDP/GEF Project Not a requirement of ToR– UNDP/GEF Project
Step 5: Design & Implement a Communication Campaign	<ul style="list-style-type: none"> • Marketing campaign • Information campaign 	 	Not a requirement of ToR – UNDP/GEF Project Not a requirement of ToR – UNDP/GEF Project
Step 6: Programme integrity	<ul style="list-style-type: none"> • Develop a verification procedure & framework • Develop a compliance procedure & framework • Staff training 	  	Best practise recommendations only Best practise recommendations only Not a requirement of ToR – UNDP/GEF Project
Step 7: Evaluate the Labelling or Standards Setting Process	<ul style="list-style-type: none"> • Monitor programme performance • Review of procedures for improvements / enhancements • Lessons learnt for incorporation of additional electrical products 	  	Not a requirement of ToR – UNDP/GEF Project Not a requirement of ToR – UNDP/GEF Project Not a requirement of ToR – UNDP/GEF Project

Key:



Addressed



Out of scope



To be addressed in this report

1.8 Case Studies

Figure 10 shows the different labels from around the world.

Figure 10: Label designs



Source: CLASP

1.8.1 Developed Countries

The first efforts to introduce S&L in appliances started in the Organization for Economic Co-operation and Development (OECD) countries in the late 1970s as a response to the first oil crisis. It was one of the strategies implemented to improve energy security. Interestingly a similar effort was also introduced to improve the efficiency standards of passenger vehicles which proved to be far more successful. To start the US and Canada were the leaders in labelling and standards. There were efforts in Europe but they were not co-ordinated or terribly effective to start with and the programme only took off in the 1990's. Japan, however, was very active and introduced minimum efficiency standards for refrigerators and air conditioners as far back as 1979.

S&L programmes from most of the developed countries are in a mature stage, having been implemented between 20 – 30 years ago. It is therefore worthwhile reviewing the programmes to get a better understanding of lessons learnt from the programmes, benefits derived - social or economic, pitfalls and whether they have achieved the intended objectives. Furthermore these countries have contributed greatly towards the implementation of S&L programmes in developing countries by providing both financial assistance and technical know-how. For example Lawrence Berkeley National Laboratory in California (LBNL) has been very active in the Indian, Chinese and Mexican programmes and CLASP regularly commissions research reports which are publicly available.

Table 5 provides a high level summary of the findings of the case studies undertaken, the full analysis can be found under Annex 10.1.

Table 5: Summary of results of case studies

Country	Approach	Outcome
Developed		
Australia	After a slow & unsuccessful start the Government adopted the most stringent standards of its primary trading partners & focused its efforts on compliance	<ul style="list-style-type: none"> • Australian appliances now have the highest performance & can be sold in all countries • The dumping of inefficient appliances (especially A/C) has been largely eliminated • The programme continues to grow with new products being added regularly
Canada	<p>One of the pioneering countries – started its labelling programme in 1975 and regulation came into effect in 1995.</p> <p>The programme has been promoted heavily making energy efficiency highly prized by consumers – manufacturers cannot risk being non-compliant. The country also keeps a national register</p>	<ul style="list-style-type: none"> • The database allows to track performance • The programme is transparent & information is shared • The programme is constantly expanding to include new products
Japan	Japan has a unique programme titled 'Top Runner'. Essentially it adopts the highest performance level & through a consensus all manufacturers agree to achieve the level within a prescribed period	<ul style="list-style-type: none"> • The threat of public disclosure is a sufficient deterrent in Japan to ensure compliance • Programme demonstrates that a common target setting approach is possible & it can achieve tangible results • This programme has achieved some of the highest efficiency gains in the world
EU	The programme is well developed & its label is the most widely used label for other international country programmes. Compliance (or lack thereof) is an issue	<ul style="list-style-type: none"> • A study demonstrated that without the necessary compliance savings are eroded. It is imperative that budgets are made available for this function • For the first time since 1990 the electricity consumption in 2007 was lower than the previous year which can be attributed to the programme (but not exclusively)
USA	<p>The US started its programme as a response to the oil crisis.</p> <p>The programme showed that S&L works – US refrigerators improved their efficiency by 74% over a 30 year period without shrinking in size.</p> <p>A loss of momentum was exploited by manufacturers & there were widespread reports of non-compliant products entering the market</p>	<ul style="list-style-type: none"> • After a good start in 1970s efficiency improvements deteriorated due to a relaxation of compliance & failure to keep procedures updated • The programme is being revived by the US Department of Energy with new directives, upgrading of standards and new products entering the programme – more than 80% of household products must now comply to standards
Developing		
Brazil	<p>The introduction of the S&L programme resulted in a stalemate between manufacturers & government with little to no progress</p> <p>The energy crisis of 2000 resulted in a tough line being taken by Government. Industry responded in national interest &</p>	<ul style="list-style-type: none"> • Although negotiations with stakeholders is critical it can lead to programmes stalling • A national crisis resulted in decisive action being taken by Government and supported by the public • The industry had no option but to comply & energy efficiency is now a key decision criteria

Country	Approach	Outcome
	complied to the strict standards	when an appliance is purchased (one of the highest in the world)
China	<p>The programme was introduced in 2000 to 11 products which has increased to 33 by 2009. China opted to be assisted by the international community to implement the programme</p> <p>Significant attention was paid to the design of the label to ensure acceptance</p> <p>Savings have been achieved but the programme is suffering from bureaucratic delays & processes</p> <p>The programme also requires that a national database is maintained</p>	<ul style="list-style-type: none"> • It is estimated that the programme has resulted in 150TWh in energy savings since 2005. • The programme is suffering due to delays in the upgrading or issue of new standards. In most instances the energy performance of products has improved beyond the minimum standards due to the long implementation times • Monitoring & performance is compromising the programme • Awareness programmes to the public need to be improved & run more regularly
India	<p>India also made extensive use of the international community to assist with the design & implementation of its programme</p> <p>Due to a lack of testing facilities the programme opted for a phased approach with. Three facilities have now been built</p> <p>The country is harmonising its programme with the region to reduce trade barriers & increase regional trade</p>	<ul style="list-style-type: none"> • The programme got off to a slow start due to the lack of facilities & availability of funds • Manufacturers continue to resist the programme as they argue that consumers do not value the benefits • The programme is being compromised by a lack of awareness raising programmes & limited financial support from the Government
Ghana	<p>The programme was first considered in 1997. Significant effort was taken in choosing the label type & design. The label uses the colours of the national flag & the star</p> <p>The programme initially focussed on high ticket or luxury items (A/C) to minimise the impact on the poor. It has now been extended to a wider range</p>	<ul style="list-style-type: none"> • Legislation stopping the importation of used appliances has stopped dumping • The penetration of CFL has increased to 79% in 2009 from 20% in 2007 • The programme was extended to refrigerators in 2008

1.8.2 Key Observations and Best Practise Recommendations

The following conclusions and recommendations have been drawn from the case studies above:

- All countries, developed and developing, face the same issues when first implementing a component of S&L. Namely industry resistance and consumer apathy
- Without the necessary political will and regulations S&L programmes are unlikely to succeed. Involving all stakeholders at an early stage will aid and speed up the implementation significantly
- Consumer education and information campaigns are necessary and should not be overlooked or avoided to reduce the implementation costs. A high level of public awareness and buy in will also discourage transgressions from manufacturers and retailers as their brand and sales may suffer if they are named

- A centralised national database of regulated appliances should be created and maintained
- It is advisable to test the label on consumers before deciding on a design. The labels should not contain too much information as it confuses consumers – for example most Focus Groups have found that the ideal number of energy classes or ratings on the label should not exceed five
- Many programmes have started well but have faltered due to insufficient test facilities and weak compliance and enforcement. The market will exploit this programme weakness and programmes will falter as per the US, EU, China and Indian case studies. Therefore building technical capacity within the country for testing is one of the key early steps
- When properly implemented S&L programmes offer massive returns for long periods but they start slowly. In the US a \$2 investment per household yielded a return of \$600 over a 20 year period
- Manufacturers whose products exceed global MEPS averages and are in the top tier have found the investment worthwhile as their products do not face any embargoes and are more competitive. The introductions of standards has had the opposite effect to what was originally feared

The high number of common traits across all the programmes demonstrates that S&L programmes can follow a formula. Support and technical assistance from reputed international agencies has been beneficial.

On the whole, manufacturers are opposed to the introduction of S&L programmes citing disruption in manufacturing costs and limited scope to pass on these costs to consumers due to the fierce competition in the industry. There are multiple examples and studies which have found these concerns to be unfounded. However the issue remains and this topic is addressed in greater detail in the Impact Assessment section of the report.

In conclusion, the case studies confirm that despite their weaknesses, as would be the case with any new policy intervention, S&L programmes yield tangible and sizable energy savings which can be quickly leveraged, to other appliances and industrial equipment. To be effective performance standards and labelling programmes must be open-ended (regularly revised and updated) failure to do this will result in initial energy performance which will quickly stagnate if the standards become out-dated.

2 Consumer Response

Appliance labelling is aimed at the consumer. It is a conscious attempt to modify consumer thinking, attitude or belief as it relates to energy efficiency of household appliances, which will in turn influence their decision-making and action(s) when purchasing these appliances.

Stakeholder consultation, and specifically consumer consultation, is therefore an imperative of appliance label programme development.

2.1 Contextual Background

The primary aim of the appliance label is to provide appropriate and effective information to consumers that will enable a better, or at least, an informed product selection.

2.1.1 International Experience

Market research and specifically focus groups are used as a mechanism to obtain directional input from consumers and have been employed in the programme development and programme design phases for India, China and Ghana (refer case studies – Annex 10.1).

Research has shown that each country and culture has specific connotations to words, letters, numbers, symbols and colours. Appropriate handling of these subtleties and careful framing of energy information can enable better delivery of messages or, if ignored, impede effective interpretation of intended messaging.

As an example, a star rating system was identified by focus groups²⁵ as the most influential rating system for Ghana, as shown in Figure 11. A few international labels, most notably Australia and India, make use of stars as a rating system. But, the focus groups specifically highlighted that the star design, combined with red, yellow and green colours on the label, are perceived as reminiscent of the Ghana flag, thereby identifying the label as a national programme and influencing a favourable consumer response.

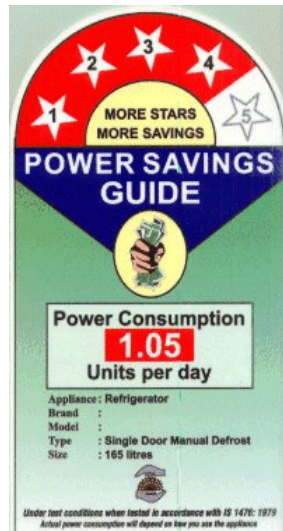
Figure 11: Ghanaian appliance label and Ghana flag



In India focus groups findings showed that the words "power" and "current" were associated with "electricity", but not "energy" and that "efficiency" was not understood in the context of electrical appliances, but most consumers understood "power savings". As a result the words "energy" and "efficiency" were avoided and labels were revised to read: "Power Savings Guide" – Figure 12

²⁵ Pushing the energy efficiency envelope through appliance standards around the world, Millihone, 2011

Figure 12: Indian label with “Power Savings Guide” terminology



Stakeholder consultation enables identification and mitigation of such potential barriers to comprehension.

But, importantly, all market research emphasised and corroborated the need for the label content to be specific, simple, easily understandable and highly credible.

A micro-level study²⁶ of American and Thai consumers conducted within the retail environment identified the five most significant aspects for label cognition as:

- **Simplicity:** All consumers interviewed stressed the need for a label that is simple to understand.
- **Single message:** To be effective, an energy label should have a large logo, or large, bold font conveying one primary message.
- **Compartmentalisation of details:** Rather than dumb down the label, structure the label with the detailed, technical, product information in separate compartments for those who want to interrogate the specifics.
- **Good formatting:** It is important to structure the label around a central message, good scale and contrast in scale, “white space” and size of typography that corresponds with importance of the label element.
- **Value for money:** Consumers indicated that cost comparisons (indicative operational costs), rather than comparisons of energy units would be preferred to guide their decisions and enable consideration of meaningful trade offs between models.

Stakeholder consultation therefore also assesses how well a label design performs against these requirements and enables minor refinements or communication and education support to improve comprehension.

²⁶26 The role of energy in the purchase of household appliances in the US and Thailand, du Pont, 1998

2.1.2 South African Experience to Date

Research into the energy savings potential of appliance standards and labels were already initiated in the late 1990s with contributions from the Danish funded CaBEERE²⁷ programme, Eskom Research and support from Canadian funding. These studies projected material energy and carbon emission benefits potential for such a programme.

Based on the findings of this research, the then Department of Minerals and Energy (DME) decided in 2004 to adopt²⁸ the European labelling system and in 2005 they introduced a **voluntary labelling scheme** for refrigerators/freezers with the help of the Bureau of Standards.

During 2005, after the launch of the voluntary label for South Africa, two consumer surveys were conducted under the CLASP (CLASP, 2004) initiative: a telephonic survey of 800 households and an omnibus survey²⁹ of 2,300 consumers. Both surveys extended nationally, but based on the assumption that voluntary participation would be predominantly by imported, high end product ranges, the surveys focussed on higher income consumers.

The primary objective of the study was assessing consumer knowledge of energy efficiency and appliance purchasing habits. The findings of the study would then serve as a baseline against which a subsequent change in consumer knowledge and behaviour could be measured in future.

The omnibus survey component of the study was structured as face-to-face interviews where comprehension of and response to the labels could be tested (labels were included as "show cards" during the interviews).

An important aspect of particularly the omnibus study, was therefore testing what information consumers lacked, what barriers they experienced to interpreting the new labels, and moreover, if consumers were receptive to the labels.

The study highlighted **consumer "ignorance" with respect to energy efficiency** as a primary barrier to a successful labelling programme, especially a voluntary programme.

A more detailed summary of the study findings is attached as Annex 10.2, but a few of the key findings pertaining to the label include:

- When the new label was tested in the target groups, in most cases, at least **half the population said they would need more than one minute** to understand the labels.
- Consumers furthermore expressed mistrust of product labels and product packaging, **ranking both very poorly in terms of honesty and credibility** as sources of information.
- In contrast, **points of sale** and sales people were considered highly credible as independent sources of information regarding product selection.

²⁷ The Appliance Labelling Study, report no. 2.3.4-05, CaBEERE (Capacity Building in Energy Efficiency and Renewable Energy) project, Department of Mineral and Energy (South Africa, 2003)

²⁸ The primary motivations for the adoption of the EU label were that the majority of appliances at the time were imported from Europe, European voltages corresponds with that of South Africa and therefore the standards and specifications were easily translated and relevant to South Africa.

²⁹ Incorporated into a national omnibus survey of consumers conducted three times a year by MarkData Pty Ltd.

The survey findings resulted in the development of a communication plan aimed at improving consumer education and addressing the identified barriers to label comprehension and consumer engagement. It will also serve as baseline for market research, as intended.

2.2 Introduction

There has been a significant shift in the electricity environment and the standards and labelling programme since 2005. Severe electricity supply constraints resulting in periods of interrupted supply, rising electricity prices and a growing global consciousness of climate change is assumed to have bolstered consumer awareness regarding energy efficiency. The focus of the appliance labelling initiative has also changed from voluntary to mandatory. As a result, the target market for the label and supporting communication has broadened significantly to include all South Africans that are likely to purchase, make or even influence a purchase decision regarding household appliances.

Consumers are the highest priority as they are the primary audience and end-user of the label. It was therefore of particular interest to (re-) assess the target market's understanding of energy efficiency and energy efficient appliances, as well as label cognition and understanding.

Formal qualitative research in the form of focus groups was decided upon as a great deal of information can be obtained from such groups where between 6-8 members are interviewed at the same time in an informal atmosphere.

A focus group is a carefully planned **discussion** designed to obtain group opinion on a defined area of interest - using the social dynamics of the group and the assistance of a skilled moderator/facilitator. This form of qualitative research is effective in revealing participants' underlying opinions, attitudes, and reasons for behaviour. And because focus groups seek to illuminate group opinion, they are especially suited for sociobehavioural research to develop and measure services that meet the needs of a given population - hence the application for this study.

Further motivation for the use of focus groups is that it produces valuable data and insights as a result of the group interaction and dynamics. The format also gives the moderator the flexibility to probe and explore unanticipated issues. And the approach delivers relatively fast results at a relatively low cost compared to other forms of primary research.

In summary, the benefits of using focus groups include:

- Homogenous, informal discussion groups of **6 - 8 respondents per group** that creates a comfortable environment for participation
- Provides an **ideal forum for respondents to openly discuss and debate issues** with other respondents
- Every respondent is given an **opportunity to express his or her views**
- The experience of one respondent may **trigger off an important discussion within the group format** which may not have otherwise been covered in an individual interview
- Anything **unanticipated can be explored**, unlike with a more structured quantitative questionnaire

The information obtained from this qualitative research will contribute as input towards the communication strategy and implementation plan that is to be developed in support of the introduction of the appliance label. It will also propose refinements that could significantly improve the understanding of consumers when reading the label.

2.3 Market Research and Focus Group Objectives

The focus group sessions were intended to assist with testing the consumer response to, and perception and understanding of the proposed appliance label. The specific research objectives are therefore defined as:

- Test consumer response to and their perception and understanding of the proposed appliance label
- Provide insight to barriers to comprehension of the energy efficient label, and explore whether there are any critical revisions / refinements to the label that would improve upon overall comprehension and impact
- Provide insight to consumer response to the initiative and label and assist with developing targeted communication and education material, with the intention of:
 - supporting the rollout of the labelling program
 - improving consumer understanding with regards to the label

Secondary objectives to be explored whilst the focus group consumers are a captive audience:

- Gauge the general understanding of the energy efficiency landscape in order to understand the market's motivation around the topic
- Explore consumer awareness, attitudes and behaviour with regards to energy efficiency
- Identify topics and 'hot spots' that grab consumer attention in order to obtain insights that will enable maximised communication take out)
- Consumer price sensitivity and price considerations will also be tested where possible

2.4 Approach / Methodology

KLA was used as specialist researchers to conduct the focus group sessions, while Unlimited Energy facilitated the process and provided the necessary support and input.

Liaison took place with KLA, a brief and background document were prepared and input was given on the development of the recruitment document and focus group questionnaire.

In response to the defined research objectives, the discussion outline was structured around five key focus areas:

- **Energy efficiency attitude.** Test the consumer's understanding of and attitude towards electricity conservation
- **Energy Efficiency behaviour.** Understand consumer's current behaviour in relation to electricity conservation

- **Attitude towards concept.** Understand consumer’s attitude towards the initiative at a concept level
- **Response towards label.** Understand consumer’s comprehension of the energy efficiency label, and identify any barriers to full comprehension
- **Communication strategy.** Understand the best communication strategy to educate consumer’s on this initiative

2.4.1 Sample Profile and Size

KLA determined the sample size based on the consumer groups likely to purchase or consider purchase of the short listed electrical appliances and shown in Table 6. Special care was taken to include respondents from appropriate age groups, to have gender representation, race representation and a mix of low, medium and high-income groups as represented by the respective LSM categories.

To be included in the research a respondent had to have electrical supply to his/her home, must have purchased one of the appliances of interest during the preceding 6 months (i.e. be able to recall their recent decision-making process when purchasing the appliance) and had to qualify for one of the following groups:

Table 6: Focus group composition

Group	Sample	Date
1	White Male, LSM 9 – 10, 22-34	Wed 5 Oct
2	Mixed Female, LSM 10+, 22-34	Thurs 6 Oct
3	Black Female LSM 9 – 10, 35+	Mon 10 Oct
4	Mixed Male, LSM 10+, 35+	Tues 11 Oct
5	White Female, LSM 7-8, 22-34	Wed 12 Oct
6	Black Male, LSM 7 –8, 35+	Thurs 13 Oct
7	Black Male, LSM 5 – 6, 22-34	Mon 17 Oct
8	Black Female, LSM 5 – 6, 35+	Tues 18 Oct

2.4.2 Recruitment of Attendants

KLA recruited the attendants according to a recruitment questionnaire (refer Annex 10.3 for a copy) and made the arrangements for their attendance. The recruitment questionnaire assisted in determining the correct sample profile and size (race, gender, age, and income bracket) and confirmed a recent purchase of one a relevant electrical appliance.

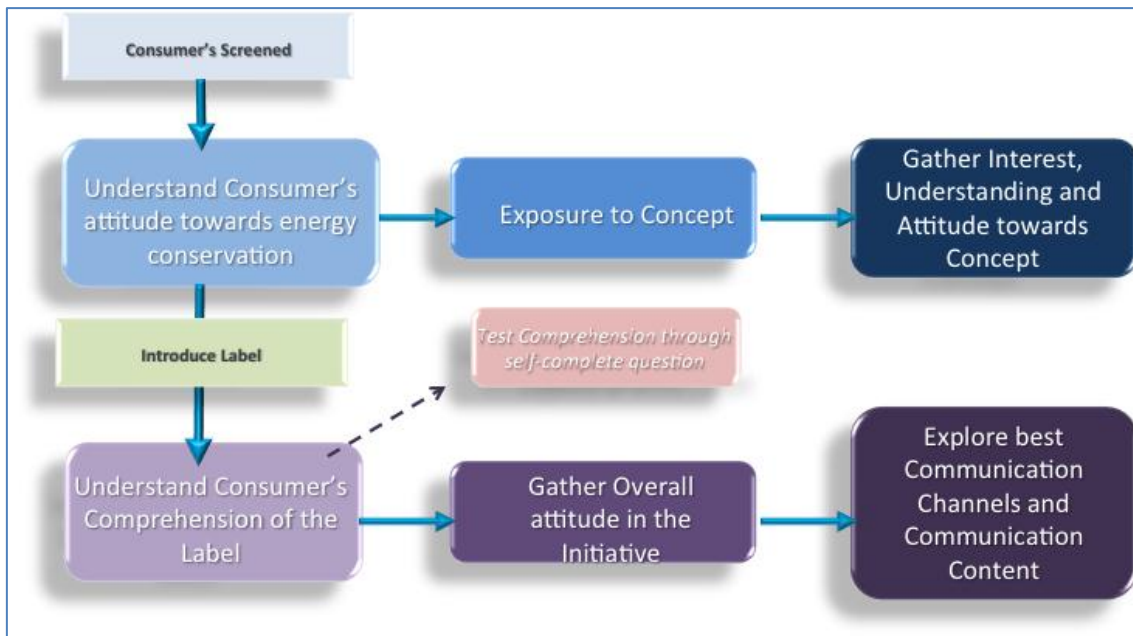
2.4.3 Discussion Guide for Focus Group Sessions

A discussion guide was developed for use during the interviews (refer Annex 10.4 for a copy). Eight facilitated sessions were held between 5 and 18 October 2011, each lasting about 2 hours. The sessions with about 8 participants (only one session had 7 participants) were held in an interview room with one-way glass in a round table fashion. The moderator encouraged a casual and relaxed atmosphere and refreshments were provided. The sessions were recorded and a scribe took notes and all the sessions were observed by Unlimited Energy.

Each session started with an introduction of the moderator and then an opportunity for an all-round introduction of the participants. The moderator then followed the discussion guide to steer the discussions, ensuring that all aspects were covered, but allowing open and spontaneous discussion. Throughout the session the moderator

also focussed on ensuring even participation. Figure 13 shows how the discussion guide was structured

Figure 13: Structure of focus group discussion



2.5 Findings

The results of the research were made available on *15 November 2011*. The research highlighted a number of interesting perceptions and attitudes amongst the general public, as follows:

2.5.1 Understanding of Energy Efficiency

Across all groups, participants demonstrated a very good understanding and awareness of what energy efficiency is and its relevance to them. This demonstrated a **significant shift in consciousness** about energy since the CLASP baseline study conducted in 2005.

A few of the key findings of relevance to **all participants** include:

- All participants in all groups **understood energy efficiency to mean saving electricity**
- Participants all understood that energy efficiency related to **what** electrical appliances are used **and how they are used**
- Across the board, participants recognised that switching off appliances, using appliances designed for greater energy efficiency or by being more conscious about appliance use would save electricity
- Participants all linked the saving of electricity to **saving money** and **avoiding load shedding**

Some of the findings were specific to or prevalent amongst certain groups:

- Across all participants, but more prevalent amongst higher income groups, where the recognition that energy efficiency also related to **saving the environment and reducing the environmental impact**

- The term 'energy' was only recognised by participants in higher income groups to relate also to **other energy forms** and potentially to the use of **alternate or clean energy sources to displace electricity**
- Amongst higher LSM groups and specifically female participants there were also a strong sense of **preserving resources and the planet for future generations**

It appeared as though the term '**efficiency**' caused some confusion amongst, especially lower income groups. Besides saving electricity, it was also understood to refer to quality and efficiency of performance. This is flagged as a possible concern and it is recommended that '**saving electricity**' may be a more generally understood term when communicating about this initiative.

A mapping of the responses against an ecosystemic model shown in Table 7, suggested possible differentiation of messaging and communication channels for various target markets:

Table 7: Ecosystemic analysis by LSM, age and race

Category	Description	Group focus	Messaging
Microsystem	Individual focus: family, school, church	Across all groups	Individual benefit
Mesosystem	Relational: Neighbours, friends	See below	See below
Exosystem	Community: Basic services, industry	Lower LSM, higher age and black focus	Strong focus on avoiding load shedding and inconvenience, community benefit using community channels for communication (e.g. SABC)
Macrosystem	Global: Politics, environmental change	Higher LSM and white focus	Focus on conserving energy and protecting the environment. May be best communicated via specific, niche, premium media channels.

Prior to the introduction of the appliance labelling concept, Government's role in promoting and driving energy efficiency in the country was tested with respondents. The majority of respondents felt that it was Government's role to encourage and educate South Africans about energy efficiency.

Participant's awareness levels and attitude towards energy efficiency indicated that their sentiments are aligned with government's intention to conserve energy and they are therefore **positively pre-disposed to support initiatives** such as this appliance labelling.

2.5.2 Energy Efficiency Behaviour

Interestingly, the majority of participants indicated that they were already engaged in activities to conserve electricity – shown in Table 8. It was also apparent that South Africans have a good understanding of how appliances consume energy, demonstrated through the activities they consciously undertake to save electricity.

Below follow some of the main aspects that were revealed during these focus group sessions:

- Respondents indicated that a significant percentage (5 – 15%) of their monthly income was spent on electricity. Whilst most felt that they received sufficient benefits for this expenditure, most expressed a strong desire to pay less

- Respondents indicated that they already consciously act to save electricity in order to save costs. But, electricity saving was also prompted by load shedding, environmental concerns and Eskom communication and scandals
- Activities already being implemented include:

Table 8: Current electricity saving activities (from most mentioned to least mentioned)

Prevalence	Description
Highest number of mentions across all groups	Switch geyser off
Highest number of mentions across all groups	Don't fill kettle to the top
Highest number of mentions across all groups	Turn off lights when not in the room
Highest number of mentions across all groups	Turn off plugs (**Standby power**)
Mentioned by half of the groups	Use gas heaters
Mentioned by half of the groups	Energy saving light bulbs
Mentioned by half of the groups	Install pre-paid meter to enable monitoring of usage
Few mentions	Solar panels
Few mentions	Solar geysers
Few mentions	Geyser blankets

The majority of participants recognised that **appliances with resistive elements consume the most electricity**. The appliances that were identified by participants as the most electricity intensive aligned directly with the group of appliances identified for the first phase of the appliance energy requirements and labelling programme. **Stoves and geysers** were however the two appliances that were **associated most with high electricity usage** and communication initiatives may want to use these appliances as the vehicle for introducing the labelling initiative.

In spite of this high level of general awareness and activity, **energy efficiency/consumption does not currently inform decision-making** when selecting or purchasing electrical appliances.

2.5.3 Attitude towards Labelling Concept

In response to the initial introduction of the South African appliance labelling and efficiency concept, most respondents' showed a spontaneously positive response.

None of the respondents rejected the concept and less than 25% of the respondents reacted neutrally to the concept (this reaction was skewed towards male respondents who were more sceptical or suspicious about the motives behind the programme).

The majority of respondent were motivated by the idea of having a kind of 'energy indicator' that would inform decisions and ultimately help people save money through saving electricity and becoming more energy conscious.

The concerns that were raised related to the **perceived price increase** of appliances with the introduction of the initiative and the **possible restriction in consumer choice**. Curiously respondents also raised a concern for the possible impact on manufacturers.

It would therefore be important for launch communication to address the **'buy in' from manufacturers** and how this initiative will **impact on prices and brand / appliance availability**. Ideally the awareness programme should start before the programme comes into effect.

Table 9 lists the questions and comments raised that would have to be adequately addressed during introductory communication about the labelling programme:

Table 9: Questions relating to the labelling programme

Question	Possible mitigation
Do I need to get rid of my old appliances?	Communication needs to provide clarity that the initiative ONLY relates to the purchase of new appliances after a particular date
Will there be some kind of rebate associated with me purchasing an energy efficient appliance?	This question possibly relates to rebates on solar geyser installations → either should be negated OR considered as an incentive
Where will the cost be borne?	NB to communicate role players and their responsibilities.
How will Government benefit from this initiative?	Very important for government to say specifically WHAT they hope to get out of this initiative or what their objectives are.
The price of electricity must drop because of this initiative.	NB to use clarity and transparency to manage expectations
If the demand for electricity goes down, so should the price?	As above.

2.5.4 Understanding of Label

Label comprehension was tested using two approaches. The first approach asked consumers to review two labels and then complete a questionnaire about the labels without any prior discussion or explanation.

The second approach was structured as a discussion following the discussion guide, similar to the rest of the focus group session.

More than 90% of the respondents demonstrated good immediate comprehension of the label without prior introduction or education. Only 6 people answered the questionnaire incorrectly.

Amongst the incorrect responses, the **fridge/freezer volume values** were most frequently mistaken as indicator of the efficiency of the appliance. This highlights a **point of distraction on the label** that is causing some **confusion and miscomprehension**.

The research team recommended that either the “volume” information could be **displayed differently so as to clearly differentiate** it from Energy Efficiency information **OR** it may be best to **remove it all together** based on the premise that the appliance’s manual will contain product specific information. Other industry and stakeholder interviews however highlighted that **accurate volume data** is critical information and has often been the source of false claims. It is therefore strongly recommended that **verified volume information be retained**³⁰, but that the **prominence of the value be scaled down relative to the energy value**.

The **graphic component of the label**, i.e. coloured grading bars and arrows, **was well received**, was considered useful, easy to read, attractive and quick to understand. It is considered the most salient piece of information on the label. This finding substantiates previous labelling research insights that link attractiveness with comprehension.

The project team had concerns about the colour conventions used and the symbolism of specific colours in the South African environment (refer Ghana case study), but the

³⁰ The comprehensive 1998 Pont study on label comprehension concluded that the level of detail on the label should not be ‘dumbed down’, but rather be compartmentalized. This supports a recommendation to consider the new EU label where data is fact ‘compartmentalized’ and displayed graphically..

focus groups showed that the respondents all liked the colours and **could easily relate to the colour conventions** / symbolism (i.e. red = “negative” and green = “positive”)

The colour, together with the graphic grading scale, are the key elements driving comprehension of the label. A suggested improvement raised by the groups was to **colour code the indicator arrow** (currently black) in the corresponding colour of the relevant grading.

The energy efficiency ‘star’ logo was perceived by participants to add to the authenticity and credibility of the label and was well perceived by all respondents. Most respondents recognised that this meant that the South African Government endorsed the programme. Many of the respondents however, thought the logo referred to “Proudly South African”. Some respondents stated that they understood the logo to mean that the appliance was made in South Africa. Figure 14 shows the two logos.

Figure 14: Logo comparison



Proudly South African logo

Energy Efficiency Logo

The energy efficiency logo will have to be updated to reflect the departmental restructuring from the Department of Minerals and Energy to the Department of Energy. This presents an opportunity to address the mix up with the proudly South African logo by increase the font size around the star to more clearly communicate that it represents the national energy efficiency initiative. Alternatively the logo design could be reconsidered entirely if building a strong independent energy efficiency brand is important.

A few potential areas of confusion were identified on the label:

- The indication of noise levels and the indication of decibels were not understood by participants. The necessity of having this information on the label was questioned
- As indicated also in Section 4.5.1, the word “electricity” is considered easier understandable than “energy” and suggestions from the group were to rather use electricity on the label
- Again as per Section 4.5.1, the word “efficiency” is potentially ambiguous and again participants suggested the use of “electricity savings” or “more electricity” and “less electricity”

These findings correlate with earlier international studies. Alternatives may include “energy level” or “uses less electricity” vs. “uses more electricity”. On the grading

scale it is suggested that the lower and top scale be replaced with “more electricity” and “less electricity” respectively.

All the groups indicated their **preference for the savings potential or difference in energy usage per appliance rating to be expressed as a monetary value**. Most respondents did acknowledge that this would be difficult to implement because of price differences and price changes. This did however emphasize the importance of supporting the initiative with appropriate material and tools (e.g. savings calculators, calculation sheets, typical savings values for different tariff values) that can facilitate / enable calculation and comparison of savings potential.

With respect to the **ideal placement of the label** on the appliance no clear consensus emerged. The following could be determined:

- Some suggested placing the label on the front, some on the side, and others still said the label should go inside, next to the volume sticker that is inside a fridge
- One respondent suggested having the label on the back of the fridge as one of those screwed on steel labels so that you cannot remove it
- None of the respondents were opposed to having a permanent label, however, the label would need to then go inside the fridge, next to the capacity information, or on the back of the fridge and would possibly have to be smaller in size.
- If the label was on the front of the fridge, then it would need to be ‘peelable’

Following discussion of the concept and the label, all respondents agreed that they were willing to pay more for an energy efficient appliance, with suggestions ranging from 2% more, to double the original price³¹. Respondents **understood the notion of ‘life-cycle-costing’** and recovering the additional initial expenditure over the life of the appliance through reduced electricity bills. However, a less efficient appliance will be bought if they do not have extra money for an ‘A’ grade item.

A further suggestion amongst several of the focus groups was to also have the label in **local languages**. This may be challenging and costly, but the need could be addressed by increasing the use of visual components on the label and reducing the need for text.

In conclusion, it is strongly suggested that consideration be given to the adoption of the recently revised EU label, shown in Figure 15, as it effectively addresses several of the potentially confusing aspects of the current label and therefore represents an opportunity to adopt an immediate improvement. Based on the discussions with manufacturers, it is believed that this decision will be welcomed by the manufacturers who would be able to benefit from harmonization and will not have to have different labels for different markets which is associated with greater complexity and costs.

³¹ Respondents almost all volunteered that an approximate premium of R500 – R1,000 more for an efficient appliance would be appropriate, but after some thought some respondents indicated that although considered a fair amount, they may be unlikely to actually pay that much more.

Figure 15: EU label (revised 2011)



This design could alleviate some of the issues and concerns that were raised over the design of the label, including:

- Volume information is less distracting as it is smaller than the kWh/annum information and less emphasised
- The label furthermore has less writing and makes better use of symbols. This could potentially avoid any issues regarding language barriers and comprehension
- The overall label appears simplified and potentially easier to understand

2.5.5 Supporting Communication Strategy

Participants were specifically asked what type of communication should support the rollout of this initiative. Responses highlighted the following as important messages to communicate:

- It should be emphasised that this is an initiative designed to assist South Africans to save electricity in their homes so that the growing demand for electricity can be met without the need for loadshedding.
- Transparency from government is important to garner public support, and communication should preferably address:
 - What are Government's objectives and what does Government hope to achieve from this initiative (what is government getting out of this?)
 - How this initiative may or may not affect the price of electricity (especially the expectation that electricity prices may reduce as a result)

- Who the role players are in this initiative, their responsibilities and their motivation for participating
- It should be stressed that the new energy efficient appliances will still **function in the same way** as previous appliances have done, with the only difference that they use less electricity for the same or improved performance through new technology
- The notion of **life cycle costing** and comparing the additional upfront investment with the electricity cost savings over time
- Acknowledge / explain the **price implication** of this initiative on the **price of appliances**
- Address the expectation of **associated rebates**
- Provide **reassurance that old appliances can stay in use** and that the initiative will only impact new appliances sold in the country
- Education about **how to read the label** and an explanation of what each part of the label means, specifically what the grade and colour of the label means
- Based on the earlier indications about appliances recognised as most energy 'hungry', consider using either a geyser or a kettle to demonstrate how the label works. As these are very relevant items respondents actively engage with in energy saving initiatives in the home, it may be possible in this way to leverage relevance to optimise attention and comprehension

The financial benefit of saving electricity was universally appreciated and should form the essence of any communication campaign. Should there however be a need to tailor or differentiate communication themes to drive the resonance with specific groups; the most relevant differentiation would be across LSM groups. Table 10 lists the direct messages that could be communicated.

Table 10: Recommended structure of tailored messages

Group	Specific messaging focus
Higher LSM (above LSM 7)	<ul style="list-style-type: none"> • Global warming and environmental issues were emphasised more in the higher LSM groups, for example: <i>"ozone depletion"</i> <i>"clean environment"</i> <i>"biodegradable"</i> • Communicate that the new initiative will assist to reduce the degree of pollution caused by coal burning and help reduce their personal carbon footprint. • Helping future generations in relation to saving energy was also mentioned more in higher LSM groups <i>"help our future generations"</i> • Fine to talk about 'energy efficiency' and the 'energy efficiency labelling' initiative • Communications on more premium channels such as DSTV could focus more on helping the environment.
Lower LSM (below LSM 6)	<ul style="list-style-type: none"> • Community or collective conscious sentiments emerged more in relation to lower LSM groups. <i>"if we save electricity, more will be available for everyone"</i> <i>"saving electricity might help other departments like health or education"</i> • Some risk in referring to 'energy efficiency' given potential lack of comprehension. Recommend talking about 'electricity saving labelling initiative'. • Communication on community channels such as SABC could focus more on individual benefit and cost saving.

Participants were also asked to recommend channels for communication and shown in Table 11. The responses clearly indicated that the initiative should be communicated as broadly as possible making use of a variety of media channels to reinforce the message and ensure all consumers are reached and educated.

Table 11: Media channels

Channel	Specific group of interest	Recommendation
Television	All respondents recommended television	<ul style="list-style-type: none"> Participants all recommended television adverts to be screened after prime time viewing, such as after soap operas in the evening. This is likely to be the most effective medium for explaining the initiative by using videography and graphics to demonstrate how the label works.
Radio	Most respondents recommended radio	<ul style="list-style-type: none"> Suggested, in the morning and evening when people are driving to work and coming home. Stations such as 5FM, 94.7, 94.2, Metro FM (key regional and national stations) would be the most suitable stations to air the advert. Whilst radio would be effective in building awareness of the initiative, it is not appropriate for showing how the label itself works.
Print	Community newspapers were highlighted repeatedly by lower LSM groups	<ul style="list-style-type: none"> Magazines and newspapers were also suggested as a way to communicate this initiative. Magazines could be a good way to allow consumers to study the label and have time to internalise how it works.
Outdoor	Select mentions	<ul style="list-style-type: none"> Although billboards were mentioned as 'getting respondents' attention' the medium is not able to provide the in depth information required to explain both the label and the initiative.
Point of purchase	Scepticism raised mainly by younger (aged between 22 – 34) white males of medium income (LSM 7 – 10)	<ul style="list-style-type: none"> Pamphlets at stores such as Game or Makro will have a captured market in store of people intending to purchase. The success however hinges upon the knowledge and training of sales people around the initiative as well as their willingness to distribute the pamphlets. Some respondents are sceptical about trusting the advice or information given by sales people.

3 Broader Labelling Concerns

A labelling issue that could not be tested with the consumer group, but has been increasingly identified as a concern internationally, is the adjustment of the rating scale and hence the labels to reflect (and encourage) the on-going efficiency improvement of appliances.

Since the mid-1990s when the European Standards and Labelling initiative was first introduced, appliance energy consumption have continuously improved and appliances continued to move up the A – G scale. An average washing machine in 2007 consumed 44% less energy and 62% less water compared to the average machine of 1985 for example and 1997's best refrigerator consumes only one fourth (25%) of the electricity used by a typical 1990 model (CECED, 2007).

Appliance efficiencies also improved beyond the originally defined A efficiency level with more than 90% of appliances sold in Europe qualifying for an A rating. This

necessitated the addition of 'Beyond A' categories (A+, A++, A+++)³² to further differentiate between efficiency levels within the A category. This solution was however never considered ideal and several alternatives have investigated to better respond to improving efficiency levels without compromising the integrity, credibility and comprehension of the label.

Several studies investigated an open ended approach that could better support and promote efficiency continuous improvements, accommodate a dynamic scale adjustment and phasing out of inefficient appliances. In spite of the evidence, the 2011 revised EU label stuck with the established rating approach and did not adopt an open-ended label. Discussions with representatives from the Swedish Energy Agency (SEA)³³ test laboratories indicated that this decision was prompted by intense pressure and lobbying from manufacturers. Manufacturers opposed the suggestions for both a dynamic regrading and open-ended approach because they believe a move down the scale (i.e. an appliance model that previously rated high on green, but after regarding or with a shift in an open-ended label, now appear farther down the 'new' scale) may be interpreted negatively by consumers and may impact on sales.

But, the concerns regarding an appropriate solution to address ever-improving efficiency levels remain and have been echoed by several other labelling programmes globally (including the Australian Energy Rating Labels, Thailand's labelling campaign and Brazil's labelling initiative, amongst others).

The 2007 CECED³⁴ (Conseil européen de la construction d'appareils domestiques) investigation of an appropriate solution to accommodate the ongoing efficiency improvements of appliances, recommended an open-ended label that could be dynamically updated to reflect both improving efficiency ratings and phased out efficiency levels as illustrated in Figure 16.

Figure 16: CECED open-ended label proposal



As indicated earlier, this approach was not adopted during the recent revision of the EU label, but it effectively demonstrates two of the **key issues relating to efficiency improvements:**

- A need for a dynamic or flexible rating system, label or approach that can accommodate continuous efficiency improvements; and

³² Has caused significant controversy and criticism as sub optimal. Refer to Energy Efficiency Standards and Labels 2nd Edition, CLASP, 2005, Comment page 130

³³ Meeting held with Carlos Lopes, Senior Policy Adviser, November 29, 2011

³⁴ CECED represents the household appliance industry in Europe.

- An appropriate way to treat / reflect phased out ratings (if this should at all be shown).

In South Africa, we have the opportunity to learn from international experience and to consider an appropriate solution before commencing our labelling initiative.

3.1 Rating Options to Support Improving Efficiencies

The need to create a flexible and dynamic label that allows for updating in the light of market developments and in particular, improved efficiency of appliances is universally accepted.

Effectively three options have been identified for doing this:

- Option 1: Add label classes such as A+, A++ or A+++ as the EU did
- Option 2: Re-grade the existing scale to the higher efficiency levels as Brazil did for air conditioners.
- Option 3: Develop and implement an open-ended rating system as suggested by the CEDCED study (refer Figure 37).

Each of these options, shown in Table 12, has both advantages and disadvantages associated:

Table 12: Options for accommodating efficiency advancements

Option	Description	Advantages	Disadvantages
Option 1: EU system	Extension of the scale with addition of labelling classes	Similar to EU so may be easier to adopt	The current SABS standards do not incorporate these additional classes. Globally consumers indicated a preference for a simpler version without the additional classes Possible confusion as a result of the additions Not sustainable beyond a reasonable number of additions
Option 2: Regrading of scale	Regrading of the scale as required to reflect current efficiency levels	Consistency in the visual treatment of the scale	Transition from one grading system to the revised may be challenging. Regrading may be costly Likely to be opposed by manufacturers
Option 3: Open-ended scale	Revise scale to be able to evolve indefinitely with the efficiency improvements	Offers flexibility. May encourage manufacturers to chase a higher category and may therefore drive efficiency improvements.	Ever changing label may have comprehension implications. Likely to be opposed by manufacturers

Without more detailed studies, the costs associated with each of the three options are considered roughly equivalent and hence not explicitly included in the analysis.

Of these options, Option 2 is the preference of this team for the following reasons:

- A consistent visual treatment of the scale/label and the benefits it offers in terms of consumer comprehension is believed to outweigh the other considerations.

- Brazil has effectively managed to move the scale (regrade) for air conditioners towards higher energy efficiency levels in 2009, so it has been proven.
- Transition periods following a regrading of the scale can be addressed by identifying the relevant grading system by date i.e. dating the label. An appliance that qualified under the 2008 grading system for an A, may only qualify for a B under the 2012 grading system. The appliance performance would not require retesting, but the qualifying rating for that performance level will be adjusted. It is therefore suggested that for a transition period the appliance carries both labels and after a specified period all old labels are phased out. Ensuring that **actual consumption values are reflected** as well as the **date of the relevant grading period** should facilitate accurate comparisons and appliance selection.

The dating of labels and transitioning is illustrated in Table 13.

Table 13: Proposed transition of re-graded labels

Before Re-grading	After Re-grading	Comments
Appliance 1: 200x label; A rating	Appliance 1: (same model) 200y label; B rating	During the transition period the model carries both dated labels.
No relevant model	Appliance 2: (new model introduced only after regrading) 200y label; A rating	During transition period carries only the new label.

3.2 Options to Eliminate Defunct Energy Classes

The second question relates to how the phased out grades should be treated. Irrespective of which of the above approaches are adopted, the way that phased out ('illegal') grades are indicated on the label need consideration.

Especially in the South African context, where it is expected that the minimum performance requirement may be different for different appliances, this is an important concern. For example, the minimum performance requirement for fridge's and freezers may be set as a D and phased out more slowly to accommodate local manufacturers. On the other hand, the requirement for washing machines that are all imported may be set as a C.

The options for handling the phased out grades is summarised in Table 14.

Table 14: Options for showing phased out grades

Option	Description	Advantages	Disadvantages
Option 1: No differentiation	Do not indicate on the label which grades have been phased out. This can be communicated through other channels.	No risk of creating confusion with consumers. Do not have to manage variations between appliance types	The comparative value of the label may be compromised i.e. consumers may not recognise the real worse performers in the market if the 'redundant' grades are shown.
Option 2: Keep scale, but grey out phased out rates	The scale is printed in full, but redundant grades are greyed out.	The scale remains familiar and consistent. Consumers can clearly see where the minimum energy performance requirement (MEPR) for the appliance type is set.	Would require updating as MEPRs are revised

Option	Description	Advantages	Disadvantages
		Comparison of actual performance against other models and the minimum performance level is facilitated.	
Option 3: Remove phased out grades from scale	Revise graphical scale to only show relevant grades	No ambiguity	Variances in the scale reflected for various appliance types. Inconsistent treatment may negatively impact consumer comprehension.

Of the considered options, Option 2 is again the preference of this team because of the advantages stated above.

3.3 Concluding Remarks regarding the Labelling Approach

When the label designs were sourced from the DOE for use in the focus groups, it was found that the only finalised label design was for fridges and freezers. Further design work will therefore be necessary before rollout.

A few other considerations regarding the label design need to be considered:

- The South African National Standards (SANS) issued by SABS (Annex 10.5) 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, as well as the possible options discussed in the preceding section, should be given due consideration and mitigated if possible
- The focus group findings that highlighted possible areas of distraction and concerns about language barriers especially amongst lower LSM groups
- The example of design refinements recently introduced by the EU with the 2011 update of the label

South Africa may therefore see this as an opportunity to refine the current label design for optimal comprehension and consumer understanding, whilst mitigating some of the pitfalls other countries have already encountered.

A further concern relates to the eco and green labels used by manufacturers to support claims of energy (and water) efficient appliances. It is recommended that communication with manufacturers be formalised and structured to direct a common approach and to avoid any confusion with consumers at the time the South African label is launched.

4 Database of Suppliers (Excel)

This deliverable takes the form of a standalone excel database which was submitted to Department of Trade and Industry. Due to the confidential nature of the data it is not publicly available.

5 Current Energy Efficiency Levels of Local and Imported Appliances

5.1 Objectives

With over 25 different brands³⁵ represented in the large appliance market, consumers are literally spoilt for choice. In 2010 there were 691³⁶ 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 globalization has made the industry highly competitive but at the expense of the local manufacturing sector. In the last 15 years:

- 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
- Fridge Master which experienced spectacular growth in the 1990s, closed down in 2000. It's fridge manufacturing plants in Swaziland and cooking plant in Germiston were auctioned
- SVA bought UNIVA from the liquidators Master Fridge group. 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.
- 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 was subsequently sold and it is now owned by Swiss based Franke. At the time of writing this report an offer is being considered by the competitions commission for the company to be purchased by Turkey's Arcelik group.

Over the last 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 (OEM), taking place at UNIVA and SVA Electronics, who supply ovens to Kelvinator and KIC and twin tubs to Defy. Components used in the local manufacturing process are also largely imported, with the figure being more than 50% for refrigerators.³⁷ Almost all medium to high end appliances are fully imported. The only industry which has not been impacted by imports and comprises almost entirely of local manufacture is the electric geyser market.

³⁵ Domestic Electrical Appliances in South Africa, Euromonitor International, 2009.

³⁶ Statistics supplied by GFK International (South Africa) – May 2011.

³⁷ An Overview of the SA White Goods Manufacturing Industry, A Bezuidenhout, 2002

This report's objective is to test a representative sample of locally produced and imported appliances to determine the median energy efficiency levels and the penetration of efficient models, or lack thereof, of each product class. This data is to be consolidated and delivered in the form of an excel database which will provide the basis for the recommendations made, and ultimately, the decision on the Energy Performance Requirements to be adopted in South Africa.

5.2 Approach

For the appliances selected by the WG941, for mandatory Energy Performance Requirements and Appliance labelling, the Euromonitor report of 2009 reports that in all instances six companies control in excess of 90% of the market share. Electric water heaters were not covered by the study but there are fewer than 10 manufacturers and one company controls in excess of 70%³⁸ of the market. As such it was decided to contact these companies directly for information and input – please refer to 1.2.1 of the Literature Review for details. To ensure that an over reliance was not placed on this single source and as a way corroborating the data provided by them the methodology also used:

- Desktop research using reports, including but not limited, to Euromonitor, Stats SA, Academic reports and DTI trade statistics
- Retail interviews. The consultants visited shop floors where they viewed appliances and had informal discussions with the sales staff. Formal discussions were also held with head office managers. A meeting was held with Massmart management and a presentation was hosted by the Consumer Goods Council of SA where all its retail members were invited to attend
- The Energy Efficiency technical data sheets supplied by the manufacturers / suppliers were checked against the calculations provided in the SANS standards. The sample size was statistically representative and randomly chosen.

5.2.1 Data Collection

The companies were approached directly, informed about the purpose of the study and why it would be beneficial for them to participate. They were given written assurances that all sensitive information provided, in the form of market data, would be kept confidential and only made available to the Department of Trade and Industry. The information was gathered over two meetings, the first was a teleconference and the follow up was a physical meeting. The companies were advised from the outset that they were not obligated to participate but the consequence of choosing not to could jeopardise their ability to do so at a later date. Almost all of the manufacturers who were approached were helpful and agreed to share information freely with the research team. However, in reality less information was provided in the end - the key reasons identified were:

- They underestimated the effort required and only managed to provide high level and superficial data by the deadline date. The primary reason cited was that they were under pressure with other commitments at their companies

³⁸ Exploring the possibility of the insurance industry as a SWH driver in SA, Kritzing, 2011

- Felt they had to show that they supported the study but had little intention of providing meaningful data.
- Were concerned that confidential information would be publically available and despite assurances to the contrary refused to provide this data.

Table 15 shows the level of participation from the companies approached.

Table 15: Manufacturer Participation

	LG Electronics	Bosch Siemens	Electrolux AEG	Defy	Whirlpool KIC	Kelvinator	Samsung	Kwikot, Franke & Cobra	WE Geysers & XStream	Carrier Air
Cooling	☹️	😊	😊	✓	😊	✓	☹️			
Cooking	☹️	😊	😊	✓	😊	✓	☹️			
Laundry	☹️	😊	😊	✓	😊	✓	☹️			
Dishwashers	☹️	😊	😊	✓	😊	✓	☹️			
Air conditioners	☹️				😊		😊			✓
Water Heaters								✗	✓	
	Full Co-operation					✓				
	Most Questions answered					😊				
	Limited questions answered					☹️				
	Opted not to participate					✗				

5.2.2 Appliance Categories

The appliances were divided as per the categories shown in Annex 10.6. As an illustrative example, cooling appliances were divided into refrigerators, freezers and refrigerator / freezer combination. These were then sub-divided further into Big, Medium & Small – with each sub-category having a clear definition as shown in Table 16. This breakdown was adopted in agreement with the CPG as it was deemed to be the most practical approach for the purpose and objectives of this study. For the data collection actual categories referring to dimensions and capacity were used for accuracy.

Table 16: Breakdown of Sub-Categories for Refrigerators

Big (>511 litres)
Medium (341-510 litres)
Small (<340 litres)

5.3 Market Characteristics

5.3.1 Introduction

The large kitchen appliance (LKA) market surveyed in the study is highly competitive with a few companies controlling the lion's share of the market. Smaller companies either occupy a niche market due to their price, or they are fighting for survival.

Imported models are however highly sensitive to exchange rate fluctuations. Although they have had a good run over for close to ten years this has not always been the case and were under extreme pressure in the late 1990s and early 2000 when the Rand was weak. In recent months the Rand has once again depreciated by as much as 30%³⁹ between January and November 2011. This does favour local manufacturing, and if it is believed that the exchange rate weakness is part of a longer cycle it may entice manufacturers to expand their existing operations or even develop new production facilities. This benefit is somewhat offset by the high level of imported components.

In some interviews manufacturers referred to incentives, or SPIVs as they are referred to in the industry. This practise started as far back as the 1980s and took the form of a direct payment to the salesperson on the retail floor as a way of motivating them to promote their appliance over a competing one. The amount paid is typically between R10 and R20 per unit but it can be higher. In recent years this practise has been formalized by certain of the retailers and the 'incentive' is now paid to them directly to specifically market a particular brand of appliance. This practise puts additional pressure on the manufacturers who operate in a tight (low margin) and highly competitive market. One manufacturer suggested that retailers pass the SPIV on to the consumers if it is not being passed on to the salesperson.

While most of the interviewees acknowledged the need for the responsible disposal of end-of-life appliances, none of their companies had 'take-back' programmes in place. Many of them were not even aware of the National Environmental Management Waste Act of 2008 (NEMA) and the published Hazardous Waste Classification regulations and Consumer Protection Act that was promulgated in 2011, which calls for extended producer responsibility.

5.3.2 Market Breakdown and Local Manufacturing

Table 8 gives a breakdown of the market share per manufacturer, in addition to the process being a voluntary one which meant that figures had to be accepted with little scope for interrogation or detailed analysis; the study also encountered the following challenges:

- Due to the on-going investigation being conducted by the competition commission Defy was only willing to provide us with a range. Legal advice was sought and it was confirmed that this was not an unreasonable condition given the sensitive stage of the hearings
- Electrolux / AEG would not give their 2010 figures due to a restructuring process and felt the 2011 figures is a more accurate representation
- Kelvinator figures are based on total sales figures (2010), provided by Kelvinator as a percentage of total sales in each category using the Euromonitor estimate.

³⁹ <http://www.moneyweb.co.za/mw/view/mw/en/page296405>

- Samsung provided estimates for 2011 and not actual figures for 2010

Note: In order to report the most up to date figures the market shares shown in Table 17 were supplied by the manufacturers. They were then compared against the 2008 Euromonitor figures for large variances. In almost all cases the figures are in line but there are a few instances where the difference was considerable. The manufacturer reporting the higher figure was contacted and the increase has been attributed to the launch of new models and increased marketing.

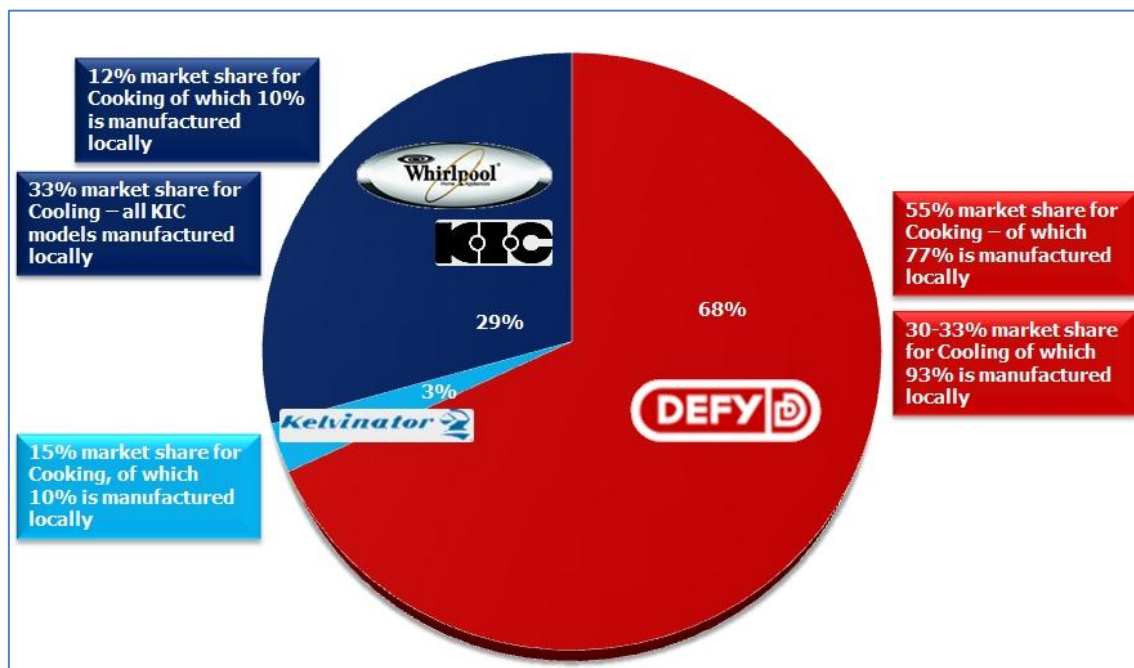
Table 17: Market share of LKA brands for selected appliances (as a % of retail volume - 2010)

	LG Electronics	Bosch Siemens	Electrolux & AEG (2011)	Defy	Whirlpool/KIC	Kelvinator	Samsung	Total Market Share
Cooling	14	2	2	30-33	33	11	3	95 – 98
Cooking	3	5	5	55	12	15	NA	95
Laundry	23	15	4	28-30	2	6	13	91 -93
Dishwashers	21	25	3	18-20	2	18	NA	87 -89

Source: Industry Interviews and Euromonitor

Figure 17 shows a breakdown of the local manufacturing of LKA in the country

Figure 17: Local Manufacture



Source: Industry Interviews and Euromonitor

5.3.3 Cooling

Market Size

The refrigerator appliance category is the biggest in terms of units sold with more than half of the units manufactured locally. Approximately 900 000 units are sold in this sector annually. The bulk of these falls into the medium top freezer, fridge freezer combination and small chest freezer categories. Refrigerators are marketed to all LSM groups who have access to electricity (4 -10) and they are one of the first appliances that new homeowners or recently employed individuals will purchase. This was determined at the Focus Group sessions.

Market Dynamics

Most consumers in the low LSMs prefer to buy a small chest freezer which has the ability to operate as a refrigerator or freezer based on the users’ requirements – it has the functionality to be switched between the two operating modes by the household. Chest freezers are also more affordable and carry more volume than the upright fridge/freezer combinations.

On the other end of the LSM scale aspirational models have more functions, such as wine racks, water and ice dispensers and the latest development is to have a reflective (mirror) surface and some units even come with a screen! All of these models have higher efficiency levels compared to the entry level models; however it quickly becomes evident that these extra features quickly add up to more than the cost of higher quality rubber seals or a more efficient compressor as illustrated in Table 18. Interviews with the industry (manufacturers and retailers) confirmed that in most instances price still remains the most important sales driver, with function and energy efficiency levels a secondary consideration.

Table 18: Comparison of extra features offered by higher priced models

Model 1	Model 2
Size: Medium (341-510 litres) Type: Double door freezer bottom Energy Efficiency Rating: A+++ RRP: R10 499	Size: Medium (341-510 litres) Type: Double door freezer bottom Energy Efficiency Rating: A RRP: R 3 999
Additional Features: <ul style="list-style-type: none"> • 100% CFC/HFC Free • Freezer compartment • No Frost • Anti-Bacteria - permanent barrier against fungi for fresher food • AirFresh Filter • Twin LED electronic control • Two cooling systems • Acoustic / Visual alarm • Storage time in event of power failure: 18 hours • Freezing capacity: 22kg in 24 hours • Door hinged, reversible • Height adjustable front feet • High-door, cambered • Vertical bar handle: Aluminium • Interior with metal applications • SUPER cool function with automatic switch • Multi Airflow system • Near 0°C BIG Chiller on telescopic rails 	Additional Features: <ul style="list-style-type: none"> • Mono Cooling system • Recessed handle • Inside & Outside LED lights • Clean back • Vegetable & Fruit Drawers -1EA • Total # of shelves 4EA • Materials of shelves - Tempered Glass • Number of Door Pocket 3EA • Egg Container Yes • Interior light (W*EA) 1.6W x 1EA

<ul style="list-style-type: none"> • 3 safety glass shelves of which 2 are height adjustable • HydroFresh drawer with humidity control • Bottle Grid • LED interior light in fridge section • SUPER freeze function with automatic switch • 3 freezer drawers incl. 1 Big Box 	
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Manufacturers are responding to a more recent demand from retailers to include energy efficiency levels in the marketing material. Some manufacturers are also embarking on an awareness drive by working with their retail partners to highlight energy efficiency. As a direct consequence of energy efficiency starting to become a pull rather than a push factor, Defy responded by launching its Eco Range to compete with imported models which carry an energy rating.

A meeting held with the Massmart group on 24 October, 2011 confirmed this shift in consumer requirement but added that it is still at an early stage. However small it may be it did prompt the group to respond. It is systematically going through all its stores and advising the floor managers to start placing energy labels on the refrigerators. Where the energy class is not known a label is still placed on the appliance but purposefully left blank, which in itself sends a strong message about the efficiency of the unit to the consumer. The group gave two reasons 1) it is in line with its environmental and sustainability policies 2) it has noted a positive response from its consumers since its introduction.

Site visits to retail stores found that the display of Energy Efficiency labels varied greatly from store to store even within the same retail chain. It appeared that the decision to use EE as a marketing tool was at the store manager’s discretion. There was a strong correlation of sales staff being more informed on the content of the label in the stores where EE information was displayed than in the stores that didn’t display EE.

Manufacturers did bemoan that retailers’ regularly remove the EE, and other, labelling from their appliances as only some models display them. In some instances the retailer justifies their actions by saying that they are displayed twice – once as a label (sticker) and then in the instruction booklet. One specific manufacturer received complaints that the stickers were difficult to remove and they are now investigating to find the label with a milder adhesive which will stay intact for display purposes, but will be easy to remove after purchase. Several manufacturers suggested that only display models carry the required label, while the EE information can be contained in the User’s manual for the consumer’s reference.

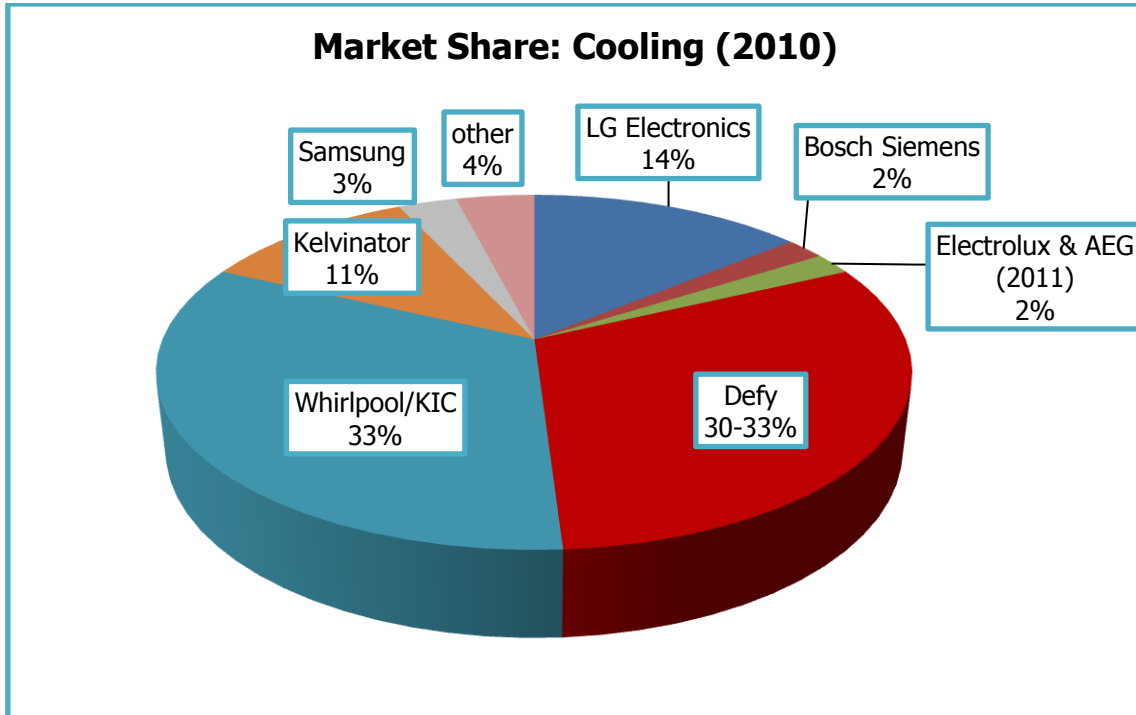
Several of the manufacturers who import their appliances raised the issue of the unfair advantage that the local manufacturers enjoy as their products are protected by tariffs – imported refrigerators have to pay between 20 – 25% depending on their classification.

Market Share and Average Price

Figure 18 gives a breakdown of the market share of each manufacturer and Figure 19 provides the average recommended retail price (RRP) for each appliance category based on size and function. In general more energy efficient models tend to be more expensive, and although this is true it is also misleading as the bulk of the cost is related to the extra functions as illustrated in Table 4 above.

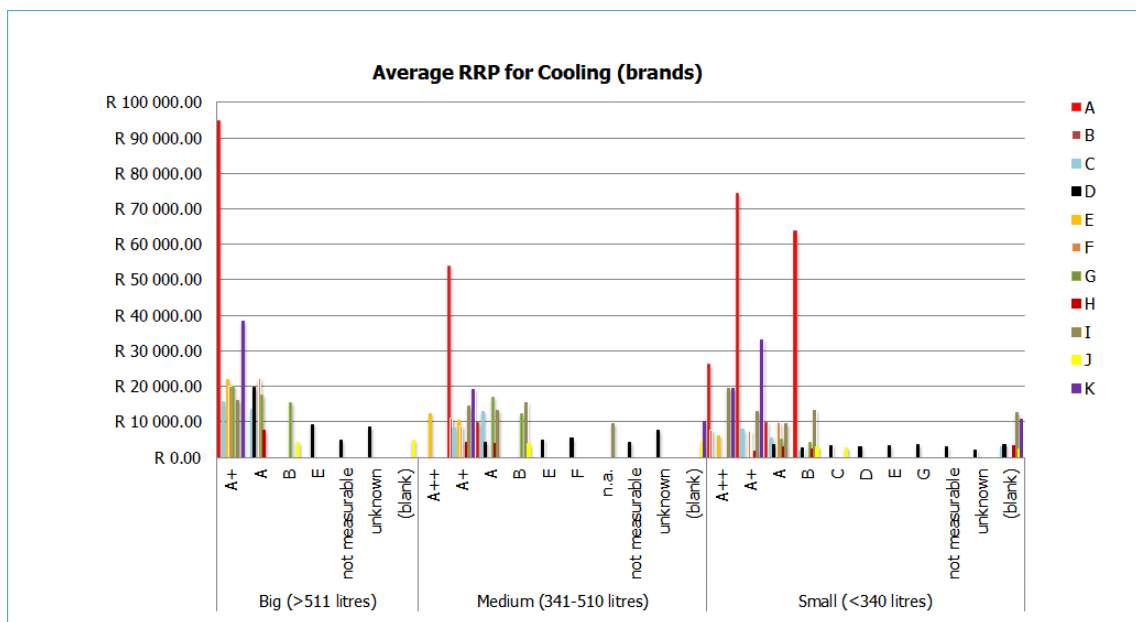
Figure 19 also illustrates quite clearly that there is a very wide spread EE models available – the most efficient ones are at an A++ and they drop right down to a G and possibly lower. The graph also clearly illustrates that the bulk of the refrigerator market is positioned in the A energy class.

Figure 18: Market Share of Refrigerator Manufacturers



Source: Manufacturer Data

Figure 19: Average RRP for Cooling by Brands

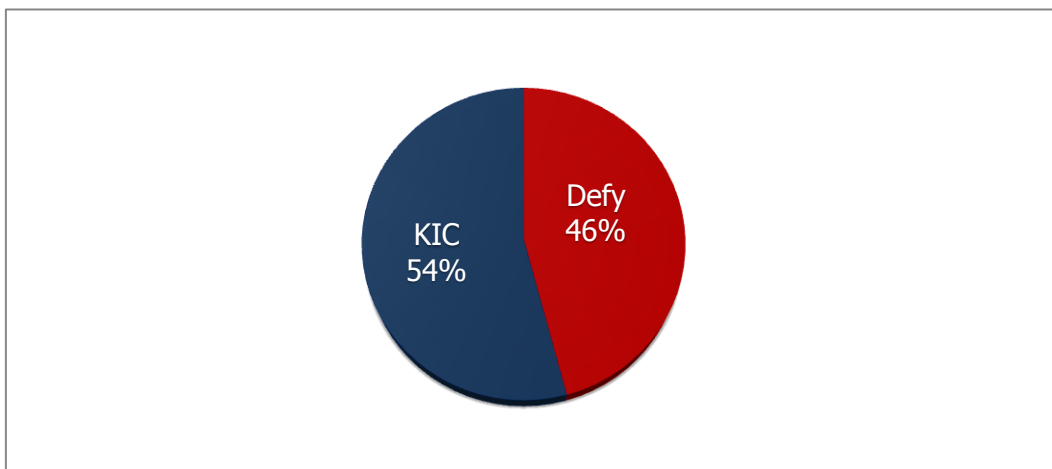


Source: Manufacturer Data

Local Manufacture

Local manufacturing of refrigerators accounts for approximately 1 900 manufacturing jobs at the KZN and Eastern Cape plants. Locally manufactured products account for about 65% of the models sold in the market. Figure 20 shows the breakdown of volumes between the two local manufacturers. Additional local manufacturing facilities exist for beverage and snack coolers used for commercial purposes, such as supermarkets, restaurants and delis. These manufacturers may in the future want to expand into the residential market and should therefore be kept advised of developments. The companies are Stay Cold, Just Refrigeration and PalFridge – which has taken over the old Fridge Master plant in Swaziland.

Figure 20: Breakdown of Local Manufacturing by Volume



Source: Defy and KIC

Table 19 shows the number of manufacturing jobs in the cooling sector as at November 2011

Table 19: Local Manufacturing Jobs for Cooling

Appliance type	% local manufacturing	% imported	Market share	Manufacturer	No of employees
Cooling	93	7	30-33%	Defy	1 000
Cooling	100	-	30%*	KIC	900

Source: Defy and KIC

Conclusion

The cooling appliance market is the biggest in terms of unit volumes and therefore the most competitive sector. Profits are regularly compromised for market share – with at least two manufacturers stating that they operate several unprofitable models to maintain their market share. Internationally the energy performance of refrigerators has improved significantly and as a result the prices of the components have decreased in price. 'A' rated refrigerators can now be imported and priced more

competitively, after transport and payment of an excise duty⁴⁰ of 25%, than a lower rated locally manufactured refrigerator. This issue is further addressed in the impact assessment.

5.3.4 Cooking

Market Size

Large cooking appliances represent about 20% of the total LKA categories surveyed, and are also an important sector for local manufacturing. Euromonitor estimates that 670,100 units were sold in 2010. As SANS 50354 only has a testing methodology and corresponding EE classes for ovens the report did not consider hobs. As with refrigerators, ovens are purchased by new homeowners and consumers who have moved into a higher LSM group. Free standing stoves are marketed to LSM4 – 10 consumers, while ovens start from LSM 6.

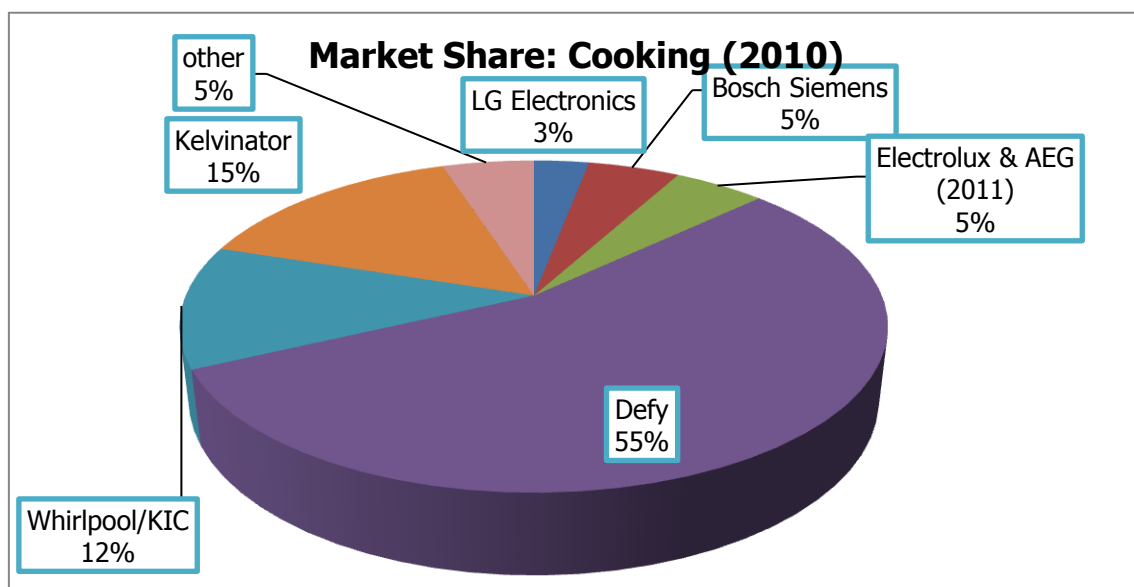
Market Dynamics

Most of the high-end units are direct imports, while entry-level freestanding stoves and smaller ovens are still manufactured locally. Univa dominates the market OEM for local manufacturing with KIC & Kelvinator using most of the facility’s capacity. Defy has its own manufacturing facility for ovens and freestanding stoves.

Market Share and Average Price

Defy, Kelvinator & Whirlpool/KIC control around 80% of this market as illustrated in Figure 21. The remaining manufacturers target the higher end of the market which focusses on function, style and to a lesser extent energy efficiency.

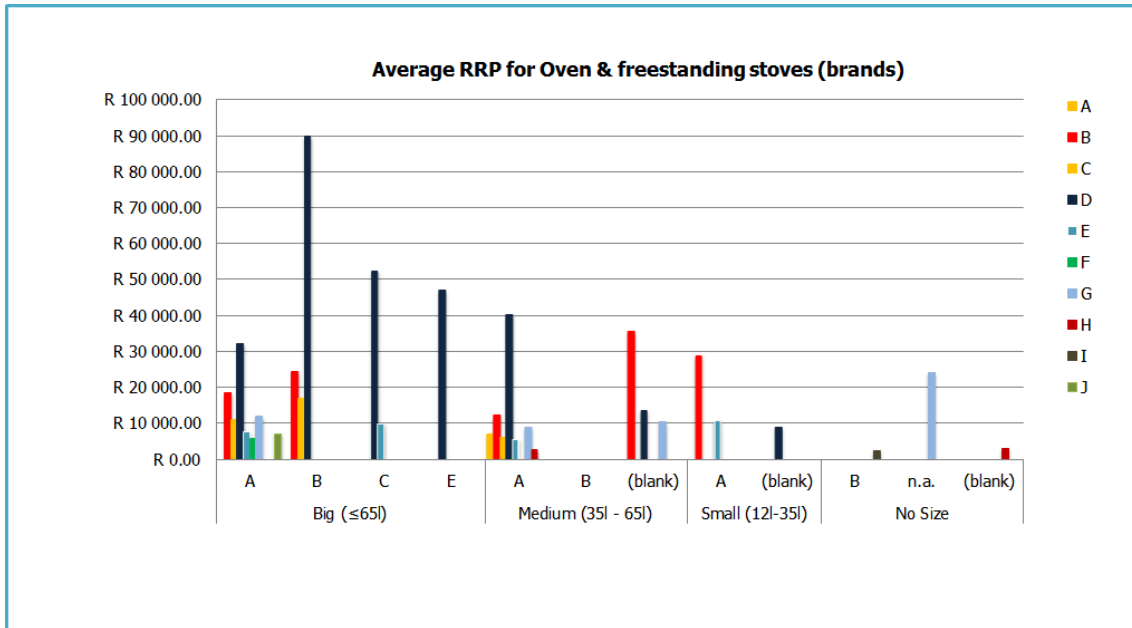
Figure 21: Market Share of Cooking Manufacturers



Source: Manufacturer Data

⁴⁰ Report No 283: Revision of the customs duties applicable to machinery and capital equipment classifiable under chapters 84 and 85 of the customs tariff, International trade commission of South Africa, 2008 <http://www.itac.org.za/docs/Report%20No.%20283.pdf>

Figure 22: shows the average RRP for Ovens and the average efficiency



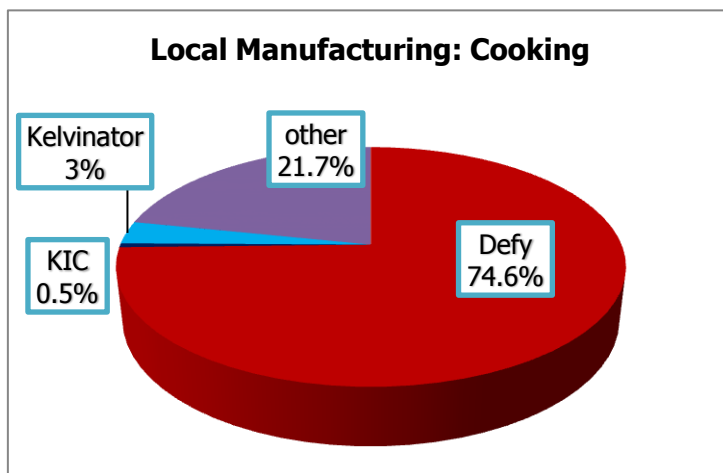
Source: Manufacturer Data

Local Manufacture

Both KIC and Kelvinator use Univa as OEM to manufacture its cooking appliances (mainly freestanding stoves). Defy has a large manufacturing capacity for this type of stove. These models are a popular choice for a first time buyer from the lower LSMs groups - testimony to this is the Defy models which were designed in the 1970s and 1980s, and which have had little or no improvements made to them but continue to be their top selling models.

The pie chart in Figure 23 below illustrates manufacturing capacity as a percentage of total local manufacturing in this sector and Table 20 the local manufacturing as a percentage of total units sold for each company, the market share for each and the number of manufacturing jobs.

Figure 23: Local Manufacturing by Brand



Source: Manufacturer Data

Table 20: Local Manufacturing Jobs for Cooking

Appliance type	% local manufacturing	% imported	Market share	Manufacturer	No of employees	OEM
Cooking	10	90	15%	Kelvinator	220	UNIVA
Cooking	77	23	55%	Defy	900	
Cooking	10 (KIC)	0	<1%	KIC	220	UNIVA
Cooking	100			Other	220	UNIVA

Source: Manufacturer Data

Conclusion

Ovens by their very nature are high consumers of electricity – the best way to reduce the electricity consumption of all appliances which make use of resistive elements, such as ovens, electric heaters and kettles, are through behavioural changes or technological advances. The cooking appliances have a much lower energy class spread than cooling and energy performance requirements can be more readily accepted and implemented by the local manufacturers.

5.3.5 Laundry

Market Size

Laundry appliances represent a significant share of large domestic appliances and in 2008 more than 685,000 units were sold. The sector is divided between automatic (60%) and twin tubs machines (20%). Tumble driers, which are considered a luxury purchase, make up a further 19% of the total market. Twin tubs are marketed to the lower LSMs, while front and top loader washing machines and tumble driers are aimed at LSM6 and up.

Market Dynamics

All manufacturers interviewed agreed that the twin tubs are an increasingly important part of the market. The machines are very versatile and robust and offer their users many advantages:

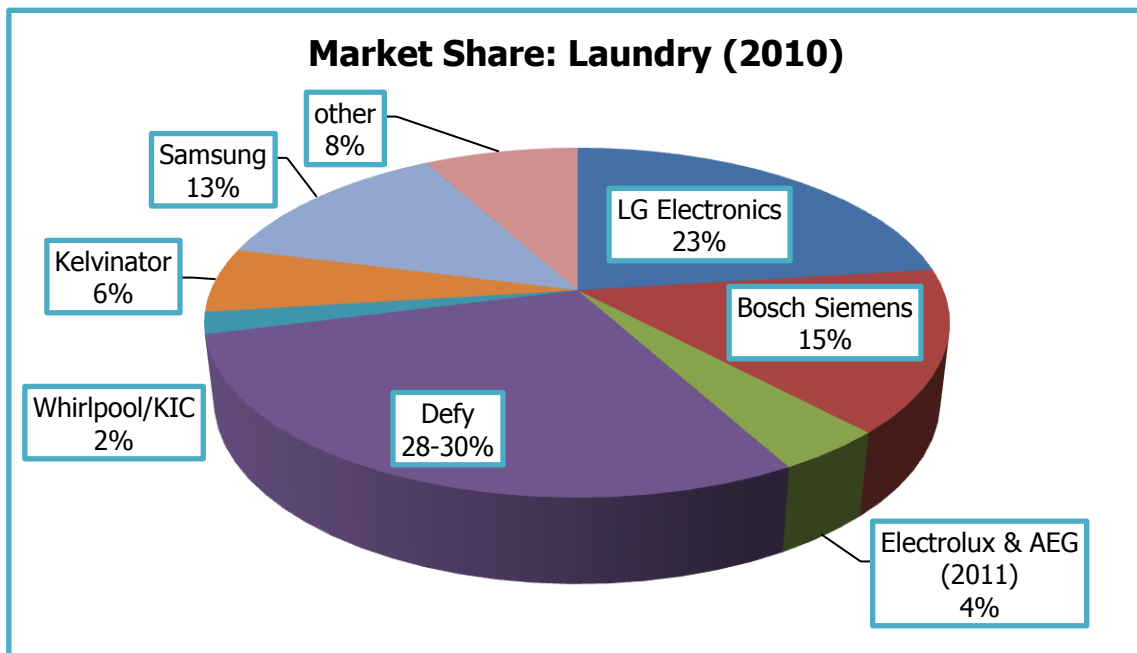
- They do not need a fixed water supply and the required water can be added with a bucket before the cycle is started
- They do not make use of pumps to drain the water as they use a gravity drainage system
- They do not have an element (cold wash) and are therefore inexpensive to run from an electricity perspective
- They take large loads
- They are robust but if they do break repairs are inexpensive and quick

Top loaders remain a machine of choice for larger families, while younger consumers appear to prefer front loaders that fit into modern kitchens in the absence of a dedicated laundry room. All manufacturers agreed that although front loaders are more effective (better wash) and efficient (use less water) consumers in SA perceive top loaders to be superior.

Market Share and Average Price

While Defy remains the biggest player in this sector, LGE, Kelvinator, Samsung & the Bosch Siemens Group are constantly reducing their market share as shown in Figure 24. All these companies sell models which are aspirational, stylish and innovative. For example Samsung has launched 'EcoBubble'⁴¹ which generates bubbles that produce hot water results using cold water and thus saving large amounts of electricity. LG has introduced Direct Drive Technology, or "DD", which offers a 10 year warranty on the motor and an A+++ rating. This type of warranty is an industry first. What Defy lacks in cutting edge technology is makes up in service and national footprint – the company guarantees that it will stock spare parts for a minimum of 10 years from the time a model is discontinued. Coupled with its extensive dealer network, which means parts are readily available, becomes a very compelling feature. This view was corroborated in the lower to middle income groups during the Focus Group sessions undertaken during this study.

Figure 24: Market Share of Laundry

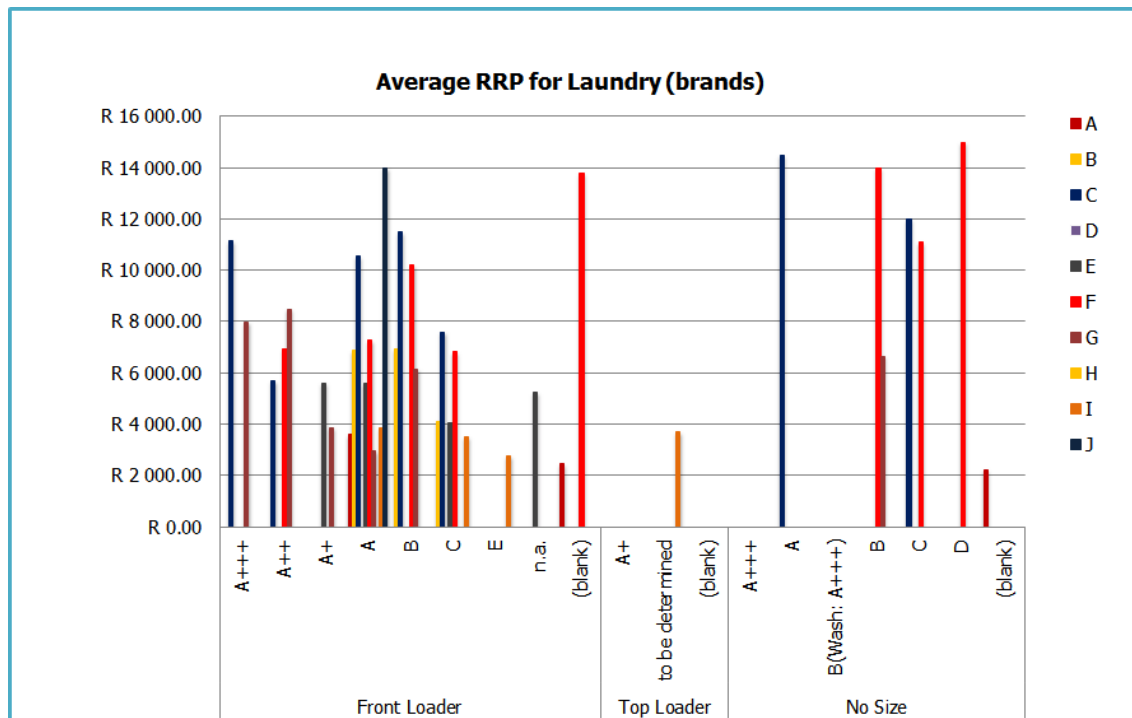


Source: Manufacturer Data

This market segment appears to be driven by new innovation and the prices can vary significantly as a result – as demonstrated in Figure 25. There is a smaller variance between EE classes than what the graph suggests as the lower rated appliances refer to tumble dryers which are notoriously big users of electricity.

⁴¹http://www.samsung.com/africa_en/consumer/home-appliances/washing-machine/front_loader/WF1124XAC/XFA/index.idx?pagetype=prd_detail

Figure 25: Average RRP for Laundry by Brands



Source: Manufacturer DataLocal

Manufacture Only Twin Tubs and Tumble driers are manufactured locally at Defy and SVA Electronics factories and sold under the Defy brand. Washing machines with a capacity larger than 7kg but not exceeding 13kg (tariff code 84.50)⁴² carry an import duty of 30% that makes it more cost effective to manufacture the bigger models locally (especially at the entry level of the washing machine market, where the upfront price far outweighs function and energy efficiency when consumers make purchase decisions).

Importers complained about the high tariff which makes their products, which they feel are of a higher quality, uncompetitive. Conversely the local manufacturers raised concerns that the intended purpose of the import duty has been diminished as the imports are not being adequately monitored by the authorities and are entering the market without the tariff being paid or they are being declared as 13.2kg in size and therefore exempt. Table 21 shows the number of jobs in the local twin tub manufacturing sector.

Table 21: Local Manufacturing Jobs for Laundry

Appliance type	% local manufacturing	% imported	Market share	Manufacturer	No of employees	OEM
Laundry	84	16	28-30%	Defy	200	SVA

Source: Manufacturer Data

⁴² Date: 2011-11-10

Conclusion

Local manufacturing in this sector has reduced significantly. Defy stopped manufacturing washing machines locally several years ago as it was cheaper to pay the excise duty (20%) and import. The only reason that twin tubs continue to be manufactured locally is because of the excise duty is slightly higher but it is almost certain that should this duty be dropped so too will the manufacture of local machines.

5.3.6 Dishwashers

Market Size

With only around 80 000 units sold annually this is the smallest of all the LKA categories surveyed. Dishwashers are considered luxury items and are marketed to LSM 6 and up. Only 12.2% of households use dishwashers. It appears that these appliances are aspirational purchases with a significant portion of the market in younger households, who might not employ domestic help.⁴³ Industry interviews indicated that style is an important selling feature for this market.

Market Dynamics

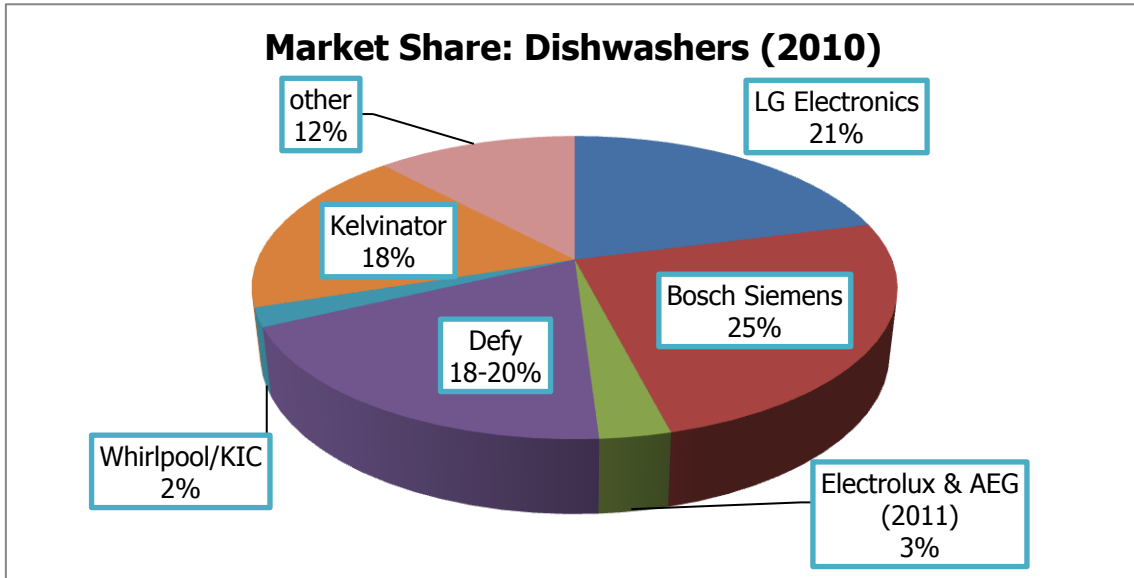
All the models in this category are imported and have high energy efficiency levels (mostly rated A or better using the EU label). A major selling point is based on lifecycle analysis that proves that less energy, water & soap is required to wash dishes with a machine (at the Eco cycle, if the machine is full) than washing dishes by hand.

Market Share and Average Price

As shown in Figure 26, the Bosch Siemens Group is the top-seller in the dishwasher market, which corroborates the assertion that these appliances are purchased by the higher LSM groups. Bosch, which is a premium brand, is followed by LGE, Defy and Kelvinator, while Whirlpool & Electrolux have marginal shares in the market.

⁴³ Domestic Electrical Appliances in South Africa, Euromonitor, 2008

Figure 26: Market share for Dishwashers by Companies

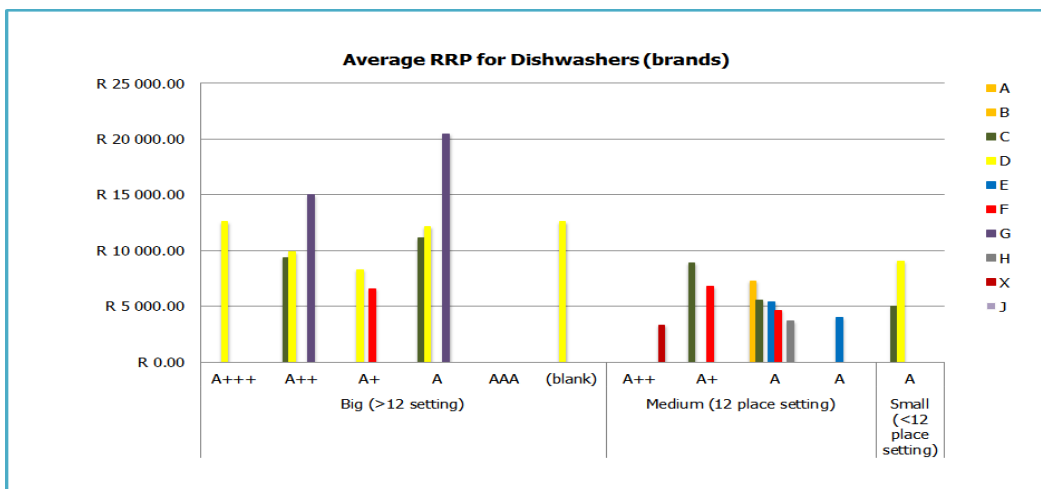


Source: Manufacturer Data

In general dishwashers are priced as a luxury item, as can be seen in Figure 27, however in recent years prices have come down due to the strength of the Rand as well as entry level models having been introduced into the market to attract the LSM 6 households. Currently Kelvinator are running a seasonal special selling an A rated dishwasher for R1,999. Manufacturers indicated that prices will be increasing in January due to exchange rate fluctuations that have forced margins down in the last quarter of 2011.

Kelvinator has confirmed that their strategy is working and that they are making inroads into the lower LSM groups however they did point out that this is the first appliance to suffer in an economic downturn.

Figure 27: Average RRP and Energy Efficiency for Dishwashers by Brands



Source: Manufacturer Data

Conclusion

While the impact of total energy savings could be small because of the small size of the market, manufacturers feel the 'green' benefits of automatic dishwashing is underestimated and could be used as a marketing tool to increase sales – these are that they use considerably less water and electricity (hot water) compared to hand washing.

5.3.7 Air Conditioners (A/C)

The A/C market is unique in many respects in that originally it was dominated by a different set of specialist manufacturers, such as Carrier and Daikin, as most installations were large industrial or commercial installations. These companies also manufacture and supply residential A/Cs along with Samsung and LGE for example. However there are many manufacturers of small and no-name brands which enter the market directly in the form of direct imports.

According to interviews held with the industry, the market in SA is split between the established manufacturers and direct imports. Industry experts⁴⁴ suggest that container loads enter the country and once the contents of the container are sold the seller closes shop, leaving the customer without any support. The big brand companies or installers affiliated to them are then called in when something goes wrong with the installation.

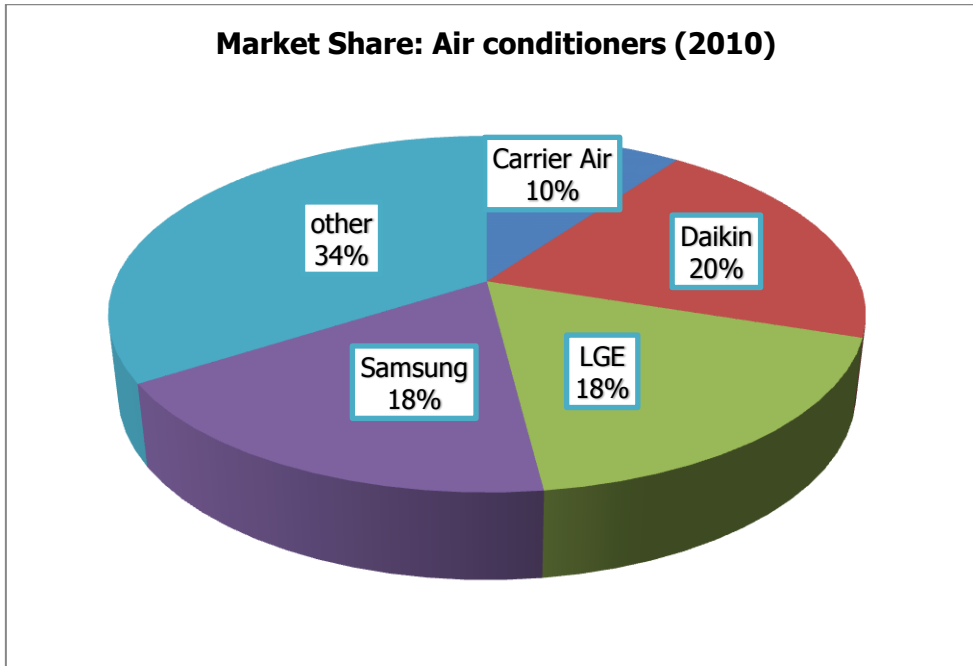
While data was collected from several air conditioning manufacturers only LGE, Carrier, Whirlpool and Samsung agreed to face-to-face or telephonic interviews, so the market share shown in Figure 28 is based on this limited information. This market sector seemed reluctant to provide information in comparison with other appliance categories. Discussions with retailers and other industry experts indicated that the market is very closely contested as can be seen from the market share table and thus very competitive with each manufacturer not willing to divulge or participate in the study. A study undertaken in 2010 experienced similar difficulties⁴⁵.

What was ascertained is that the established manufacturers tend to focus on business or industrial installations rather than domestic installations and therefore represent a smaller part of their business.

⁴⁴ Philip Theunissen, Air-conditioning Product & Marketing Manager, METRACLARK – meeting 9 November 2011

⁴⁵ Market Study on Standby Power Plugs and Air Conditioners for the Residential Sector, Eskom, 2010

Figure 28: Market Share of Residential AC Suppliers in SA



Source: Manufacturer Data

Market Size

While the market is the smallest of the surveyed categories and mostly aimed at the upper LSMs it is a fiercely competitive market. Only 2.3% of South African household use room air conditioners.⁴⁶

Market Dynamics

Most Air Conditioners are sold through a network of installer partners rather than retail stores. Apart from the big players, industry sources suggest that 'grey' imports are nothing other than sophisticated dumping of less efficient machines into a market that has not yet regulated EE for models. Often these units are imported by the container load and the importer disappears as soon as all of the units are sold, leaving the major manufacturers and their installer network to do the inevitable repairs on low quality models. It appears that consumers often have to make an additional investment after purchasing a so-called bargain.

Market Share and Average Price

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. Whirlpool noted that it started to import Air Conditioners in 2011, but it was too early to have an indication of market share. Defy entered the market and withdrew after short time citing the cut-throat nature of the business.

A high level and superficial survey of the price point for Air Conditioners appears to be around R10 000 with most room units' prices in this vicinity.

⁴⁶ Domestic Electrical Appliances in South Africa, Euromonitor, 2008

With a wide variety of different models and classes it can be confusing to group models as ducted, non-ducted or heat pumps as shown in Table 22 . All models that can heat as well as cool contain the heat pumps (air) that are referred to in the SANS Standard. Therefore a model can be ducted or non-ducted and have a heat pump.

Table 22: Categories of Residential A/C Units

Non-Ducted Air Conditioners	Window Unit
	Console
	High-wall split
	Cassette/ Cassette Split
Ducted Air Conditioners	Ducted Unit (hide-away)
Heat Pumps	Integrated
	Split

Source: MetraClark

Conclusion

Based on industry sources this sector would benefit from strict MEPs to restrict 'dumping' of models that are not energy efficient. This would have an impact on electricity consumption as A/C can use a large amount but it would also help to protect households from inferior models. Please refer to the Australian case for more details on how the dumping of A/Cs in a country impact electricity consumption.

5.3.8 Electric Water Heaters (Geysers)

The electric geyser market is dominated by one manufacturer (Kwikot), who by their own admission, stated that they control about 70% of the market. The rest of the manufacturers are left to fight over the remaining 30%. Almost all manufacturing takes place in South Africa for the following reasons:

- The local manufacturing and distribution is well developed and it would be very difficult for an imported product or foreign supply to enter the supply chain in any meaningful manner
- Local geysers are manufactured to satisfy local conditions – such as water quality. Imported geysers would have a high risk of failure as they are not designed for the local conditions
- Most sales take place directly through installers, either plumbers, builders or the geyser replacement market. Because a homeowner cannot install their own geyser due to the complexity and the requirement of an electrical certificate of compliance (CoC) which can only be issued by an electrician, the product choice is not made by the household

Electric geysers are the only product on the WG941 list of appliances which have a National Standard and which can be tested by the SABS. A new standard, the SANS 151 has recently been completed and is currently being circulated for public comment. It is expected to come into effect during the first half of 2012. The standard does consider labelling and energy performance requirements in the form of the 'standing loss' test. This is defined as *'energy consumed by a full water heater connected to the electrical supply (after steady state conditions have been reached) during any 24 h period when no water is withdrawn'*. Basically what this test determines is how

effective the insulation of the geyser is at maintaining the temperature of the water stored in the vessel – the better the insulation the lower the losses.

An electric geyser must meet or exceed the minimum losses as specified in the Standard (SANS151). The minimum performance which was decided upon in consultation with the industry has been published in the SANS 151 and shown in Table 23. However the performance levels agreed upon have resulted in little, if any, efficiency improvements. In other words the minimum was set based on what was acceptable to the manufacturers. This outcome is that, at best there will be limited and at worst there will be no electricity savings with the introduction of the new standard - as it is a business as usual scenario.

Table 23: EU Proposed Directive Labelling for SANS 151 Standing Losses (kWh/24 hours)

Capacity	Label A	Label B	Label C	Label D	Label E	Label F	Label G
25	0.12	0.26	0.40	0.50	0.62	0.74	5.90
50	0.12	0.26	0.40	0.50	0.62	0.74	5.90
75	0.12	0.26	0.40	0.50	0.62	0.74	5.90
100	0.12	0.26	0.40	0.50	0.62	0.74	5.90
125	0.12	0.26	0.40	0.50	0.62	0.74	5.90
150	0.12	0.26	0.40	0.50	0.62	0.74	5.90
175	0.12	0.26	0.40	0.50	0.62	0.74	5.90
200	0.12	0.26	0.40	0.50	0.62	0.74	5.90
225	0.12	0.26	0.40	0.50	0.62	0.74	5.90
250	0.12	0.26	0.40	0.50	0.62	0.74	5.90
275	0.12	0.26	0.40	0.50	0.62	0.74	5.90
300	0.12	0.26	0.40	0.50	0.62	0.74	5.90
325	0.12	0.26	0.40	0.50	0.62	0.74	5.90
350	0.12	0.26	0.40	0.50	0.62	0.74	5.90
375	0.12	0.26	0.40	0.50	0.62	0.74	5.90
400	0.12	0.26	0.40	0.50	0.62	0.74	5.90
425	0.12	0.26	0.40	0.50	0.62	0.74	5.90
450	0.12	0.26	0.40	0.50	0.62	0.74	5.90
475	0.12	0.26	0.40	0.50	0.62	0.74	5.90
500	0.12	0.26	0.40	0.50	0.62	0.74	5.90
525	0.12	0.26	0.40	0.50	0.62	0.74	5.90
550	0.12	0.26	0.40	0.50	0.62	0.74	5.90

Source: SANS 151

Market Size

Sales figures are closely guarded by the four manufacturers who control the market. There are two conflicting references on the size of the market. The first published by the Department of Energy at the National Solar Water Heating⁴⁷ conference held 2009 where it was estimated that 'some 600,000 geysers are installed annually in South Africa. Of these, 40% are replacement geysers and 60% are geysers installed in new houses.' The second, a study conducted by the Central Energy Fund⁴⁸, cites a figure of

⁴⁷ Building consensus on accelerating the rollout of SWH, Department of Energy and Renewable Energy Market Transformation Unit of the Development Bank of South Africa, 2009

⁴⁸ Market Survey of SWH in SA, Holm, 2005

400,000 units per annum. This lower figure was also confirmed by the largest independent plumbing call centre which processes electric geyser insurance claims.

Market Dynamics

The key to gaining and maintaining a foothold in the market is by being the supplier of choice to the limited installation channels which are controlled by the installers – plumbing companies, insurance companies and residential builders. All these channels require a standard product, which is reliable and readily available nationally as they install high volume. None of these market players have any incentive to install the most efficient unit and their only criterion is to install an SABS approved geyser. As such the household is left to pay the higher running costs resulting from higher standby losses of less efficient geysers.

Table 24 gives the standing losses of the manufacturers who made their SABS report available. The other manufacturers chose not to participate and did not supply any information – the conclusion drawn is that their products have a lower performance but without access to the test report this cannot be confirmed. The SABS is legally obligated to keep manufacturing test results confidential however they did supply some test results on a graph but withheld the manufacturer details shown in Figure 23

Table 24: Standing Loss figures for Selected Geysers

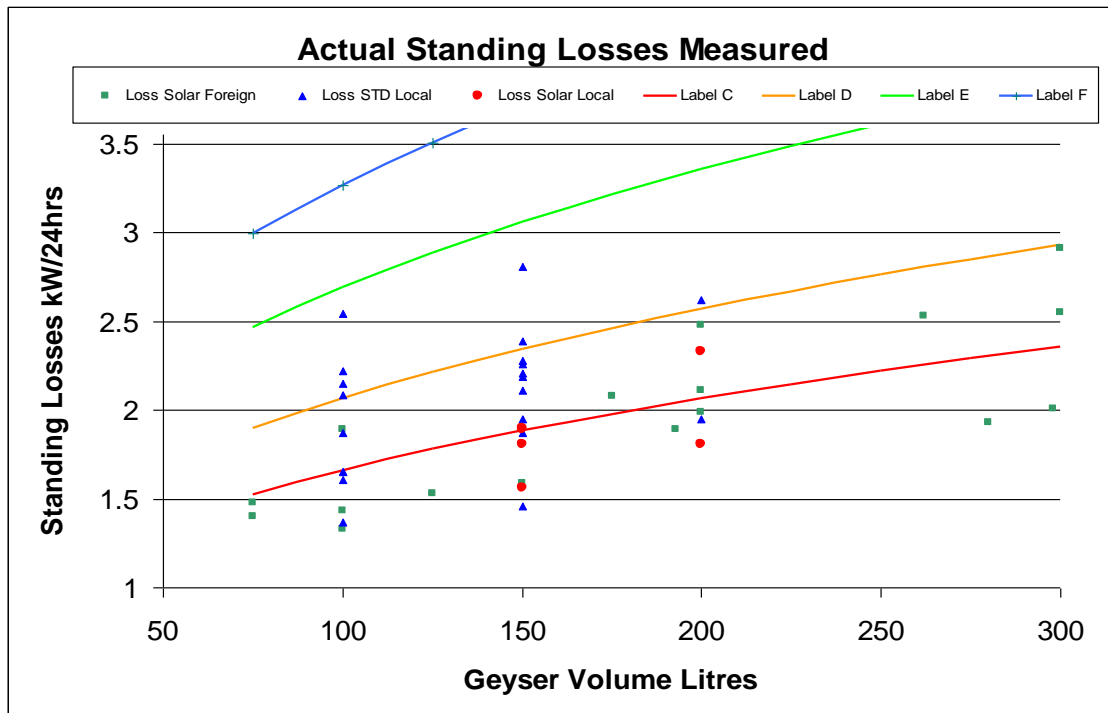
Geyser Size (L)	Standing Loss (kWh/24 hours)			
	XStream	WE Geysers	Market Average*	SANS 151 Minimum
150L	2.22	1.65	2.25	2.59
200L	2.24	2.51	>2.57	3.02

Source: SABS

*Estimated based on figures supplied by SABS and shown in Figure 29

Figure 29: Actual Standing Losses Measured

Results of Standing loss tests done at the SABS over the past 2 years.
The results were for products that passed or failed the minimum SANS 151 requirements. Only the Label curves are shown.



Source: SABS

Market Share and Average Price

Figure 30 gives the estimated market share of each manufacturer and Table 16 demonstrates the influence that Kwikot is able to exert on the market given its ability to manufacture large volumes coupled with a very strong distribution network it is able to charge a sizable premium and still maintain market share.

Figure 30: Estimated Market Share

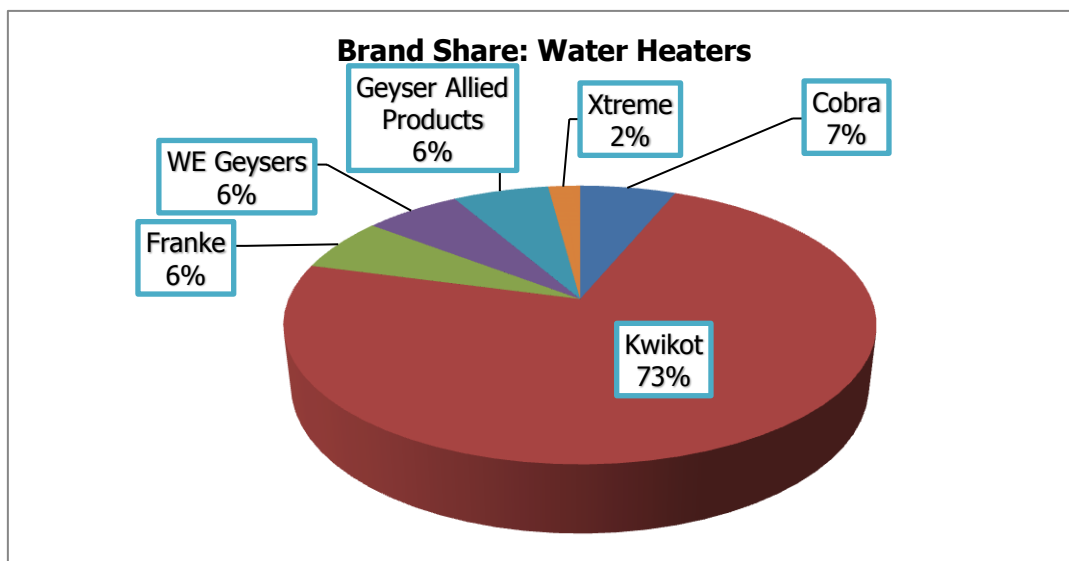


Table 25: Geyser Prices of Selected Manufacturers

Geyser Size (L)	Duratherm	Kwikot	XStream	Franke
150	3,736	5,350	3,933	3,556
200	5,600	7,700	5,130	5,111

Source: RRP sourced from directly from suppliers

Conclusion

Electric geysers are the by far the biggest consumers of electricity in the SA household and the large volumes of annual installations (400,000 - 600,000) means that they offer the greatest potential for large electricity savings which can be delivered quickly. The structure of the market is also favourable – few manufacturers with limited models the most popular size for the average SA household is the 150L unit. Other favourable benefits are that the SABS has the necessary testing procedures and no investment or training is required. Given that the manufacturers decided on the minimum performance requirement it is likely that they have not adopted an overly stringent level so improvements should be easily achievable. Finally the structure of the market means that by changing the behaviour of a few manufacturers the whole market will be transformed as the households on the whole do not participate in the decision making process.

5.4 Collection of Data

5.4.1 Energy Efficiency Levels of Models in the Market

For the five appliance categories being reviewed, data was collected for 773 different models. Of these 664, or 86%, of them were rated under the EU Energy Label standard. This is in stark contrast to the initial assessment from GfK which only had labels for 19% of refrigerators and 25% of the washing machines they had on their database. Admittedly their database comprises of models from all suppliers and included many entry level appliances from lesser known brands which are more likely to not have been tested. However the difference is significant and this is probably attributed to the following:

- This data field is not required by the GfK clients and as such the company does not focus on collecting this information
- Until recently there has been little or no interest in the SA market place, both from consumers and retailers, and as a result even though this information was available it was not utilized. There are signs that this is now starting to change
- Manufacturers and retailers remain unclear about which label to use. A common question raised in most meetings, by manufacturers and retailers, was whether the EU label is indeed the correct label to use or would another label be adopted by SA? The confusion is made worse with several

manufacturers introducing their own energy and eco labels into the market – as shown in Figure 31. Therefore it is surmised that in the absence of an official label limited energy rating is reported even if it is available

- The Energy Efficiency technical data sheets supplied by the manufacturers / suppliers were checked against the calculations provided in the SANS standards. Most of the supplied data was correct, accept in a few cases where the SANS rating scale only allows for an A, but the appliance was rated A⁺, A⁺⁺, or A⁺⁺⁺ (as per the EU standard). A few of the ratings were slightly out, but within the allowed tolerances provided in testing methodology
- Table 26 provides the energy class of the top selling models of each of the manufacturers who participated in the study.

Figure 31: Samsung Ecobubble and Kelvinator Eco Label



Table 26: Top Selling models in each category with EE ratings

Appliance Category	Sub-category	Manufacturer				
		1	2	3	4	5
Refrigerators	Big (>511 litres)	NR	NR	NS	NR	NR
	Medium (341-510 litres)	E	A+	NS	A	A+
	Small (<340 litres)		A+	A	NR	NR
Refrigerator/ Freezer	Big (>511 litres)	F	A	NS	A	A
	Medium (341-510 litres)	F	A	NS	A+	NR
	Small (<340 litres)	B	A+	NS	A+	C
Freezer	Big (>511 litres)	not measurable	NR	NS	NR	D
	Medium (341-510 litres)	not measurable	A+	NS	NR	D
	Small (<340 litres)	not measurable	A+	NS	A	D
Ovens				NS		
built-in	Big (>65litres)		A	NR	NR	A
	Medium (35 – 65 litres)	NR	A	A		B
	Small (<35 litres)	NR		NR	NR	NR
stand alone	Big (>65litres)	C	A	NR		NA
	Medium (35 – 65 litres)	B	NR			NR
Washing Machine	Top Loader		NR	NS		n.a.

	Front Loader	A	A	A+	A	A+
Tumble Dryer	Top Loader	NR	NR	NS	NR	NA
	Front Loader	E	C	NS		C
Combo drier	Top Loader	NR	NR	NS	NR	NR
	Front Loader	NR	C	NS	A	NR
Twin tubs		NA	NR	NS		NR
Dishwashers						
floor standing (standard)	Big (>12 setting)	NR	A+++	A	A	A+
	Medium (12 place setting)	A	A	NS	A	A+
	Small (>12 place setting)	NR	A	NR	NR	NR
Integrated	Big (>12 setting)	NR	A	NS	NR	A+
	Medium (12 place setting)	NR	A+	NR	NR	NR
table-top (compact)	Small (<12 place setting)	NR	A	NR	NR	NR

Source: Manufacturer Data

NR = Manufactured not represented in the category

NA = Not Applicable

NS = Data not submitted by manufacturer

not measurable = Local product which has not been tested and due to its design does not conform to the minimum specification required for testing

5.4.2 Data Collection Shortcomings

The data collection process was a voluntary process as detailed in Sections 1.2.1. Although every effort was made to ensure the accuracy of the data the following challenges were encountered:

- Manufacturers stated that some models did not comply to the basic test criteria and could therefore not be rated
- Most locally manufactured models have not been tested as there are no certified test facilities in the country and no legal requirement to do so
- In some instances manufacturers provided a test rating but no evidence (test certificate or printed user manual) to support the claim. It was therefore not possible to confirm the authenticity of the information supplied
- Visits to major retail stores confirmed that labels are the exception rather than the rule, and awareness of sales staff varied greatly from store to store even within the same group. Many retailers remove all labels placed on the outside of the appliances in an attempt to have a uniform or standard display
- Manufacturers could not provide the Standby Consumption figure, as they did not have it available
- Some manufacturers were reluctant to provide Recommended Retail Price, total sales figures and market share figures because of confidentiality concerns
- Some models were listed in online catalogues but not on lists provided by manufacturers and while every effort was made that all end-of-line models

were removed from the lists, some manufacturers did not finalise the lists provided to them by the consultants.

5.4.3 Summary of Findings

In general it can be said that the more expensive models have a higher efficiency, but more expensive does not always mean higher efficiency. An extreme example of this is a Gaggenau refrigerator, which is only available on request, has a B rating and a RRP of R77,000. 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:

- Kelvinator is selling an A rated dishwasher for R1,999⁴⁹. Similar sized dishwashers with an A rating from competing manufacturers start from R3,500
- Defy is selling A rated and much lower rated combination refrigerators at similar prices. KIC which competes directly with Defy has similar pricing points for different varying efficiency performance
- Whirlpool offers three A+ rated washing machines in the same category size – however one is priced at R3,799, the second at R5,699 and the third at R6,699

The study can conclude that locally manufactured in almost all cases are less EE 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 cost and consequences of this is dealt with in the impact assessment section of this report. In the case of refrigeration and local dryers - this will / could have impact on costs, staffing, employment and most importantly consumer price - as the price will have to go up in the medium term to recover the investment needed to reach the EE levels required. For cooking products the difference is less pronounced and the local production is a lot closer to the world standards - in some cases better. The investment required should be addressed by a detailed cost benefit analysis – please refer to section 7.5.

The interviews, field trips and focus groups undertaken have demonstrated a much higher awareness of energy efficiency as compared to what was reported in the USAID study undertaken in 2004⁵⁰ and the UNDP/GEF project document undertaken in 2010⁵¹. These are promising signs however this early momentum will be easily lost if regular and clear communications are not made to all stakeholders about the status and implementation timelines of the programme.

Table 27 provides a concluding summary for each appliance.

⁴⁹ <http://www.kelvinator.co.za/special.php>

⁵⁰ Results of the National Consumer Surveys relevant to the Labelling Communications Campaign, MarkData, 2004

⁵¹ Market Transformation through Energy Efficiency Standards and Labelling of Appliances in SA, UNDP/GEF, 2010

Table 27: Summary of each Appliance Type

Category	% local manufacturing
Cooling	The biggest category in terms of sales and local manufacturing also has the biggest variance across the efficiency levels. The range starts A ⁺⁺⁺ but goes as low as an F. Chest freezers do not have energy ratings as almost all sales are from local plants
Cooking	Similar to cooling, almost all imported products are rated A but the local products are lower. However the difference is not as pronounced as it is with cooling
Laundry	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.
Dishwashers	Dishwashers represents 8% of the total appliances surveyed and were mostly rated 'A' or better. All appliances in this category are imported
Air Conditioners	While data was collected from several air conditioning manufacturers only LGE, Whirlpool and Carrier Air agreed to interviews. 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
Geysers	Geysers are most likely the lowest hanging fruit which will deliver the greatest savings, for the lowest investment and the least effort. The UNDP/GEF report estimated that geysers would save 176,000 MWh in the programmes first year compared to 67,000 MWh from all cooling ⁵²

6 Impact Assessment

The introduction of a mandatory S&L programme aims to bring about a market transformation. This topic has been covered extensively in Section 1 (Literature Review) but primary objectives are:

- Introduce higher efficiency electrical appliances and by so doing reduce consumption at both a national and household level
- Eliminate inefficient appliances
- Increase public awareness around energy efficiency and allow consumers to make informed choices when purchasing new appliances
- Electricity consumption of appliances are a major component of any country's total energy profile and savings achieved appliances can become meaningful with benefits such as
 - Deferring or eliminating the need for new power plants
 - Reduced pollution and a reduction in Greenhouse Gas emissions
 - Increase in disposable income for households through lower utility bills

⁵² Building consensus on accelerating the rollout of SWH, Department of Energy and Renewable Energy Market Transformation Unit of the Development Bank of South Africa, 2009

- Lay the foundation for the development of effective Energy Efficiency Programmes

The introduction of any mandatory programme will impact the current status quo of the market. The following impact assessment seeks to identify

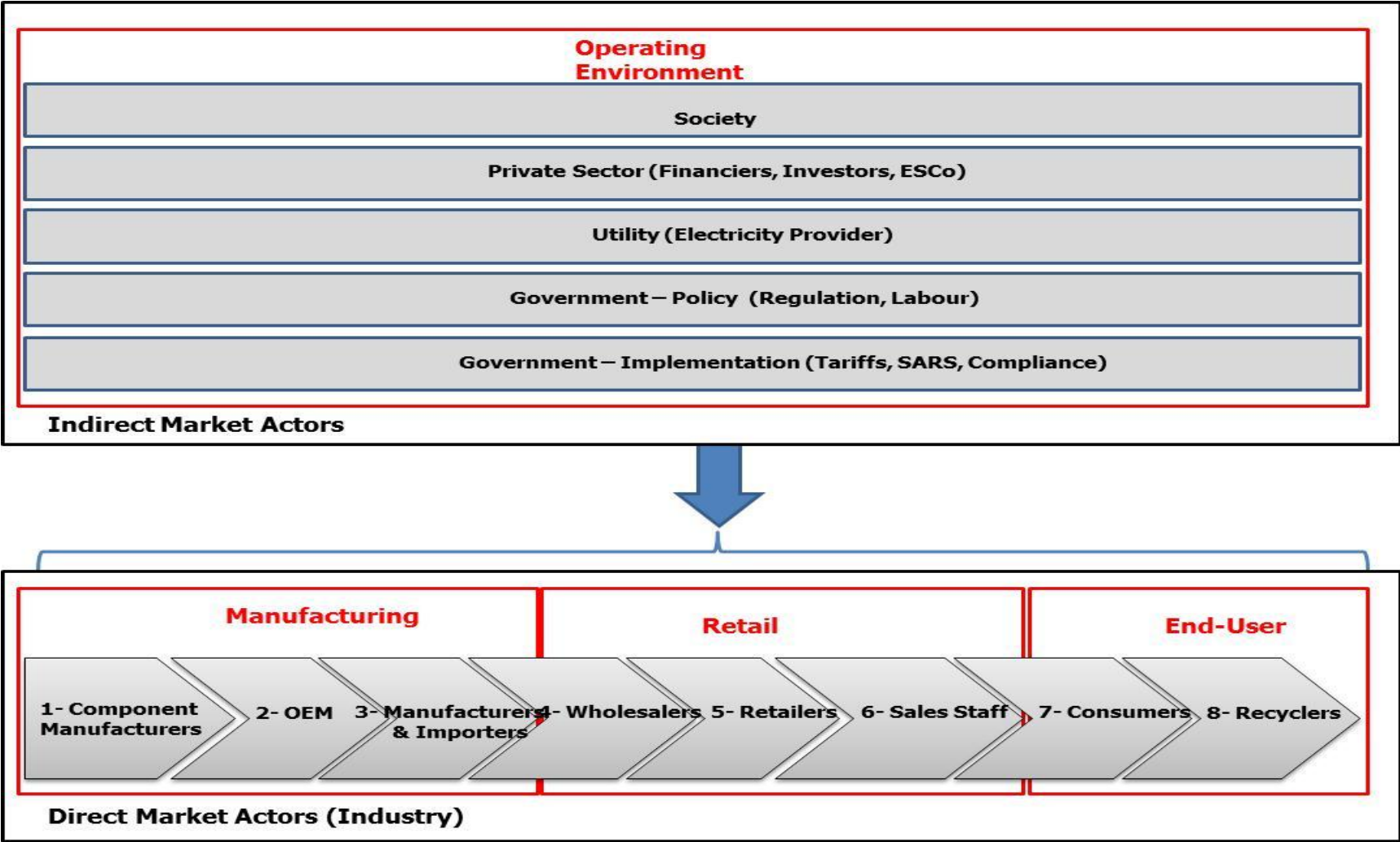
- The sectors which will be affected
- The distributional impacts, such as transfer of income, redistribution of opportunities
- The sectors which will bear the costs and benefits for each option
- Identify unintended consequences and indirect costs that may arise with the implementation of a mandatory S&L programme

6.1 Sectors – Industry Supply Chain

To identify which sectors will be affected it is worthwhile analysing the appliance supply chain, shown in Figure 31. The direct market actors were identified from a study undertaken by the Wuppertal Institute⁵³ and the indirect actors were agreed upon in consultation with the local industry

⁵³ Combining theoretical and empirical evidence: Policy packages to make energy savings in appliances happen: Tholen, Thomas, 2011

Figure 32: Residential Appliance Supply Chain



6.2 Role of Supply Chain Actors

Before making recommendations it is worthwhile to note why each actor has been included in the supply chain and their expected role and obligations.

6.2.1 Indirect Market Actors

This is the enabling environment which influences and is influenced by the economic activity created by the residential appliance market.

Government Policy: The implementation of a mandatory S&L programme seeks to reform the appliance market through a market transformation. A study conducted by USAID⁵⁴ identified three success factors for a successful implementation; 1) how laws are implemented, 2) the burdens placed on business and the relationships in which business can engage and, 3) the incentives that drive business decisions.

A secondary benefit of a successful S&L programme is the efficiency improvements of locally manufactured appliances. This upgrade can assist in improving export opportunities as the appliances will be more likely to meet international performance criteria making them more competitive which will result in higher prices as foreign consumers are generally more willing to pay for quality. This can create new jobs and increase foreign earnings for the country. The converse also applies – failure to invest and upgrade local manufacturing ultimately leads to higher quality and lower priced imports increasing market share resulting in local manufacturers lacking the cost competitiveness to survive without tariff protection.⁵⁵

Government Implementation: The risks associated with the poor implementation of a mandatory S&L programme were highlighted in Section 1 (Literature Review) and can result in the programme not only failing to attain its objectives but may also damage the industry, especially the local manufacturing sector. Therefore if the programme is not properly implemented so that it changes the way in which consumers and industry make decisions it may be preferable to consider other alternatives.

The implementing Government department would also need to keep an updated and detailed database of all the appliances present in the South African market

Utility: Eskom's Demand Side Management (DSM) has a vested interest in a successful programme and could provide direct support through its mandate from the National Energy Regulator of SA (NERSA) to reduce electricity consumption by incentivising energy efficiency and renewable energy projects. Reducing the electrical demand of appliances is of particular interest to the utility as many of them are operated during peak consumption times.

Private Sector: This covers all the actors, except the actual households, whose support and involvement will ultimately result in the large scale adoption of energy efficient appliances. Examples include financiers (willingness to offer preferential rates and/or finance for these appliances which in some instances may be more expensive); energy consultants and ESCo (recommending and promoting – for example the purchase of energy efficient refrigerators for every room of a new hotel); insurance (instituting a policy which promotes higher efficiency replacements on claims); investors who are not users (landlords and employers)

⁵⁴ Business enabling environment and the value chain, USAID, 2008

⁵⁵ An Industrial Strategy for the Electrical Durables Sector, Baumann, 1995

Society: This focuses on indirect costs which society has to carry as a result of the ever-increasing use of fossil fuels such as; the construction of new power plants to meet demand, the health costs borne largely by the state as a result of pollution from fossil fuel plants, subsidies paid by Government to fossil fuel producers as well as environmental degradation and increased Greenhouse Gas (GHG) emissions. A 2009 study undertaken in the United States found that the burning of fossil fuels cost the taxpayer \$120 billion a year in health costs.⁵⁶ A study⁵⁷ undertaken by Greenpeace on Kusile, the new 4,800MW coal fire powered station being built and which is due to come into production in 2015, found the externality costs to be a minimum of R31 billion per year.

Increased investments to improve quality and technical performance of any product will benefit society as a whole. Examples include reduction or elimination of low quality products being dumped and appliances which continually keep track of international improvements.

6.2.2 Direct Market Actors

Component Manufacturers, Original Equipment Manufacturers (OEM) and Manufacturers and Importers (Manufacturing): The global appliance market is expected to grow at a rate of 3.4% annually up to 2015. Annual volumes for refrigerators and freezers, washers and dryers, cooking appliances and dishwashers totalled 334.2 million units in 2010⁵⁸. This demonstrates just how competitive the global market is and it is no different in SA where the large kitchen appliance market, before the economic downturn of 2008, was 3.2 million units in 2007⁵⁹. Although this figure dropped in 2008, discussions with manufacturers have confirmed that the market has now recovered. The result is that manufacturers are fiercely competitive, operate on very large volumes with tight margins and will employ a variety of tactics to gain an advantage over one another. Their dealings with each other are often acrimonious and this was confirmed during consultations where claims were made about competing products including accusations of unfair advantages for local manufacturers who enjoy tariff protection. Conversely, there are claims that importers bypass the tariffs by declaring volumes which do not attract a tariff. They get away with it because the units are rarely, if ever, checked by customs officials. There were also allegations of inaccurate claims of unit sizes or performances. These claims are based on actual measurements taken as manufacturers regularly purchase their competitors appliances to compare sizes, performance and features. It was not a requirement of this study to investigate or verify these issues but they are worth noting as such claims have a long history. A previous study reported a claim that an importer was selling its appliances below cost as it was able to draw from a subsidy provided by the Korean Government however this was not verified independently⁶⁰.

Manufacturers should be the primary input source into the Government's database. For accurate and effective decisions to be made this would have to include production data, not just model numbers with energy ratings.

⁵⁶ National Academy of Sciences, 2009, <http://www.nytimes.com/2009/10/20/science/earth/20fossil.html>

⁵⁷ http://issuu.com/greenpeaceafrica/docs/true_cost_of_coal/search

⁵⁸ World Major Household Appliances to 2015, Freedonia, 2011

⁵⁹ Domestic Electrical Appliances in SA, Euromonitor, 2009

⁶⁰ Overview of the SA white goods market, Bezuidenhout, 2002

Wholesalers, Retailers and Sales Staff (Retail): The retail section is the facilitator of a successful programme and the uptake of energy efficient appliances. A 2004⁶¹ study in South Africa found that >25% of consumers source their information from the retailer and a further 7% from the sales person when purchasing a new appliance. As reported in Energy Efficiency Levels of Local and Imported Appliances section of the report, some retail chains have responded to the first signs of consumer demand for appliance labelling, however the labelling remains disparate across its stores and there is conflicting information which is counterproductive. There are also multiple labels used with varying information making like-for-like comparisons difficult.

End User: This refers to the beneficiary who may or may not have been the investor in the appliance. This sector includes both households (which need to be broken-down demographically) and businesses who make use of domestic appliances. To maximise energy savings the programme must, as far as is possible, convey the benefits of buying a higher energy efficiency appliance to:

- The regular users who are not responsible for the monthly electricity bills
- The investors who are not the regular users of the appliance but are responsible for the monthly electricity bills
- The investors who are not responsible for the monthly electricity bills

Recycle: At the time of writing this report there are no recycling facilities available for the recycling of appliances. However an informal industry exists whereby appliances are stripped of any metal which has value and then sold to second hand scrap dealers. Refrigerant gases are not recovered.

There are also no mandatory requirements for recycling but the National Environmental Management Waste Act of 2008 (NEMA) and the published Hazardous Waste Classification regulations and Consumer Protection Act that was promulgated in 2011, are the first steps. Currently there are several proposals for the construction of a refrigerator and other e-waste recycling plant.

6.3 Cost Benefit Analysis

Section 2.1 has been written by Michael McNeil from the Energy Analysis Department - Lawrence Berkeley National Laboratory (LBL) and facilitated by the Super-Efficient Appliance and Equipment (SEAD) Deployment Programme

6.4 Why a Cost-Effectiveness Analysis

Determination of the targets of MEPS requires careful consideration and analysis. There are several important criteria that need to be balanced. The goal of any efficiency program is to reduce energy consumption or slow its growth. The primary benefits of energy reduction are many, and include financial savings to rate payers, reduction of greenhouse gas emissions and other pollutants, reduction of environmental impacts caused by energy extraction and energy security. On the other hand, implementation of energy efficiency is not without cost. Primary among these is the additional cost needed to improve appliance efficiency, and the costs to manufacturers to retool and modify production lines. These costs are generally passed on to consumers in the form of increased retail prices. Price impacts have further

⁶¹ Results of the National Consumer Surveys relevant to the National Communications Campaign, CLASP, 2004

consequences on manufacturers. They can reduce competitiveness with imports if imported products already meet efficiency requirements. They can also reduce overall sales, leading to a loss of revenues and jobs. A complete analysis of proposed minimum efficiency performance standards (MEPS) should take careful consideration of the following impacts:

- Energy Demand Reduction
- Peak Load Reduction
- Environmental Impacts
- Consumer Impacts
- Manufacturer and Employment Impacts
- Trade Impacts

Of these, one of the most important criteria for setting an efficiency target for MEPS is the *Consumer Impacts* analysis. Generally speaking, mandatory standards which impose a net financial penalty to consumers are undesirable and will be politically untenable. On the other hand, MEPS that can be demonstrated to provide large financial benefits provide a strong justification for the program. Therefore, cost-effectiveness analysis is ideally the primary determinant of MEPS targets. For example, MEPS can be chosen to maximize net financial savings or to maximize energy savings while still providing a net benefit.

A variety of metrics are used to evaluate cost-effectiveness of appliance efficiency standards. These include *payback period*, *benefit-cost ratio*, *life-cycle cost* and *cost of conserved energy*. Of these, the life-cycle cost calculation is most appropriate for capturing overall net financial impacts to consumers. Life-Cycle Cost is given by:

$$LCC = I + \sum_{n=1}^L \frac{OC}{(1+d)^n}$$

In this equation, I is the initial investment (equipment price), OC is the annual operating cost, L is the equipment lifetime and d is the discount rate. The life-cycle cost includes the full cost to the consumer of purchasing and operating an appliance over its lifetime. Annual operating cost is the annual energy use multiplied by the energy price. In general, efficiency improvements reduce operating cost, but increase the initial investment. The change in LCC relative to the base case can therefore either be positive or negative. If the operating cost decrease outweighs the initial investment increase the standard imposes a net savings to consumers and is determined to be cost-effective. If, on the other hand, the initial investment increase outweighs the operating cost decrease the standard imposes a net cost to consumers and is determined not to be cost-effective. The discount rate parameterizes the difference in present value of initial investment, which is immediate and operating cost, which is deferred.

6.4.1 Data Needs

In the above calculation of appliance life-cycle costs, the key financial dependency on efficiency arises through the correlation between efficiency and retail prices. There are two main methods for determining this relationship.

Retail Price Analysis Option: In principle, this correlation is observable in the market before implementation of standards if the efficiency and retail price of various models is known. In practice however, this correlation is not easily observed, for several reasons. First, if efficiency is not a strong market driver, difference in price will be dominated by capacity and other features. Second, in the absence of a mandatory regulation, efficiency ratings may not be measured, or the measurements may be unreliable. Finally, pricing may not directly reflect costs because profit margins may vary between brands and between 'baseline' and 'luxury' models.

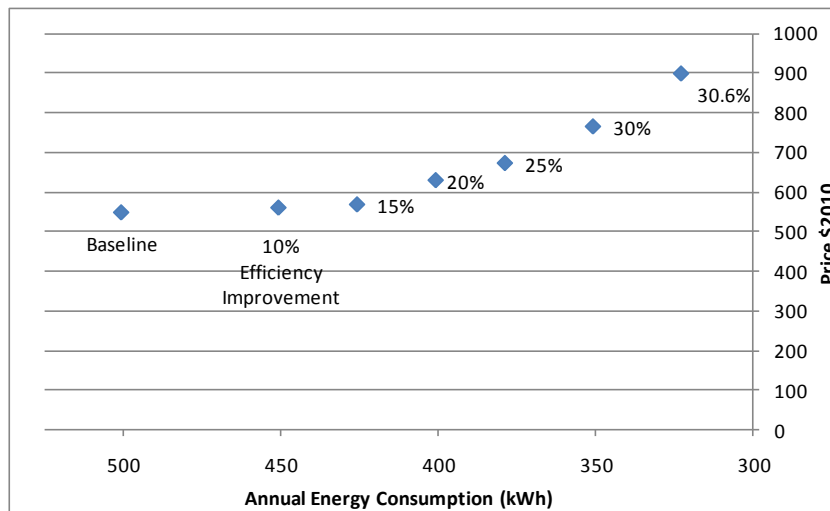
Engineering Analysis Option: A more reliable method of determining is often to assess manufacturer costs based on component costs needed to achieve a specific efficiency level. Mark-ups from manufacturers, distributors and retailers are then applied to these costs to arrive at expected retail prices. This method has the advantage that it is technically justifiable and that it provides manufacturers with a clear way to evaluate the validity of the analysis, and an example of options to improve efficiency. An example of this type of analysis is shown in Table 28, which describes a main product class of U.S. refrigerators

Table 28: Usage Profile

Efficiency Improvement	Design Option
Baseline	Technical specifications given in Table 5-A.2.1 of USDOE (2010e)
10%	Increase Condenser Size by 100% & Increase Compressor EER from 5.55 to 6.1
15%	Increase Compressor EER from 6.1 to 6.26 & Use Brushless DC Condenser Fan Motor
20%	Increase Evaporator Size by 14% & Use Adaptive Defrost & Use Variable Speed Compressor
25%	1.1 m ² Vacuum Insulated Panel (VIP) in Freezer (FZR) Cabinet
30%	0.27 m ² VIP in FZR Door & 7.1 ft ² VIP in Fresh Food (FF) Door & 6.7 ft ² VIP in FF Cabinet
30.6%	0.17 m ² more VIP in FF Cabinet

Source: Table 5-A.3.1 of USDOE Refrigerator, Refrigerator-Freezer and Freezers Rulemaking Technical Support Document⁶².

Using these engineering design options and the costs associated with them, a set of composite designs of increasing efficiency can be constructed. Starting from the baseline configuration, alternative refrigerator designs are constructed by replacing or adding components in turn, in order of cost-effectiveness. Each of these options is represented by a point in Figure 33. The resulting cost-efficiency curve has a typical shape with increasing costs per unit efficiency improvement.

Figure 33: Equipment Price vs. Efficiency for Top-Mount Refrigerator-Freezers

6.4.2 Analysis Effort for this Study

For this study, an attempt was made to evaluate cost-effectiveness of appliance efficiency options in order to determine optimized efficiency targets. More than half of the products considered for MEPS are imports-dominated. These product models tend to be marketed towards a higher-income customer base, and are of generally high efficiency, due to their presence in highly-regulated markets such as the European Union. Other products, in particular refrigerators, water heaters and ovens have a substantial domestic manufacturing base. These products are more likely to be sold to lower and middle income households. For this reason, buyers of these models were considered to be more sensitive to financial impacts, and cost-efficiency evaluation was considered to be more crucial. Therefore, a financial analysis was attempted for these products.

No known engineering-based data were available specific to South African refrigerator, water heater or oven models. Therefore, we attempted to perform a cost-benefit analysis using the *retail price analysis option*. Price and efficiency data were available for a total of 52 domestically produced refrigerators (including freezers), two water heaters and fewer than 12 ovens.

Unfortunately, these samples were not sufficient to establish the relationship between efficiency and price. Part of the reason for this is that it is difficult to compare prices across different product classes and different capacities and between imports and domestic production. For example, for the main class of refrigerators, refrigerator-freezer combinations, domestically produced models tend to be smaller than imports, with not much overlap in efficiency classes. Within each sub-category, however, the statistical sample was not sufficient to establish a meaningful relationship between price and efficiency.

A second reason for the inadequacy of the data is the lack of an 'efficiency price signal'. Since efficiency is not yet a strong enough selling point in the South African appliance market, differences in efficiency are not reflected in retail prices.

6.5 Impacts and Benefits

In line with the requirements of the ToR, an impact analysis was undertaken based on the data provided by the manufacturers, the views of the Focus Group participants and desktop research.

6.5.1 Consumer

The Financial Case for Efficient Appliances

The Consumer Survey undertaken in 2005 and the Focus Groups which formed part of this report identified that price carries the most weight in the decision making process for most consumers – especially in middle to lower LSM groups. Although the upfront cost of the appliance is what matters most to consumers, the high tariff increases over the last five years and a greater awareness for energy efficiency due to the blackouts of 2008 has resulted in consumers considering the running, or life cycle costs, of an appliance. The implementation of a mandatory S&L programme is the next logical step to build on this move by providing the consumers with the necessary decision to make an informed decision. There are two key consumer perceptions which need to be addressed before they give a greater weighting to energy efficiency in their decision making process:

- Higher efficiency appliances are more expensive and that this premium far exceeds the electricity savings making it an unattractive investment
- What assurance do they have that the electricity savings claimed by the manufacturer or sales person are accurate?

A robust S&L programme which provides clear and accurate information will provide accuracy and certainty to consumers. This will allow them to determine for themselves whether any premium paid for an appliance is financially attractive to them based on their usage patterns and budget.

Based on the information supplied by the manufacturers, a simple exercise was completed which attempts to compare the appliances in the database which are closest in price but have the biggest difference in terms of the energy rating.

Appliances which are imported and locally manufactured are highlighted in blue in Table 29 and they are refrigerators, freezers, tumble dryers, ovens and electric geysers.

The findings were supplemented by the output from the Focus Groups industry specialists, academics and research.

Table 29: Comparison of Appliances

Appliance	Inefficient Appliance		Efficient Appliance		Difference	
	Rating	Price	Rating	Price	kWh saved (annum)	Premium Paid (R)
Refrigerator	G	3 170	A	2 910	437	-260
Chest Freezer	E	4 299	A++	7 700	363	3 401
Washing Machine	A	4 050	A++	6 799	125	2 749
Tumble Dryer	E	2 293	A+	3 799	520	1 506
Dishwasher	A	3 814	A+	6 199	29	2 385
Oven	C	3 040	A	4 099	No Data	1 059
Geyser	E	7 700	D	5 130	120	-2 570
A/C Unit Lounge	C	7 200	A	10 265	728	3 065
A/C Unit Bedroom	C	5 300	A	6 000	612	700
A/C Unit Office (Large)	C	7 200	A	10 265	1 456	3 065
A/C Unit Office (Small)	C	5 300	A	6 000	1 223	700
Local Manufacture						

Analysis of Results

Refrigerators

From the data provided and from our consultations with the local manufacturers it has been ascertained that the technology improvement for efficient refrigerators has reached a level where little or no premium is demanded for an A rated unit. An imported A rated unit can be sold for less, including the 25% import duty tariff, than a locally manufactured refrigerator⁶³. This was confirmed in the analysis, which found that an A rated refrigerator could be purchased for R260 less than an E-rated equivalent which consumes 437kWh per annum less electricity. Under these circumstances, there is no pay-back period required and this may be one of the reasons new entrants, such as Hi-Sense, which sell entry level refrigerators with high energy ratings, have captured 10% of this segment of the market in less than three years.⁶⁴

Chest Freezers

The analysis found that almost 100% of chest freezers purchased in SA are locally manufactured. The reason supplied by one of the manufacturers is that there is little or no requirement for sophisticated functionality or design when it comes to chest freezers, therefore 'importing a shell amounts to importing air'. Unfortunately, the energy ratings of local units are extremely low with the majority having a C or a D rating with some dropping as low as E or less. The data collected found only one imported product, which is an AEG high-end chest freezer. This particular model is internationally recognised as the most efficient chest freezer in its category in the world and therefore is targeted to a niche market locally. It also costs almost twice as

⁶³ Mark Hobbs, Defy, October 2011

⁶⁴ Based on a discussion held with a local manufacturer who quoted the GfK market report 2010

much as its locally manufactured equivalent and therefore it is not financially viable for consumers to pay this large premium for the energy costs.

This product category is targeted to the lower LSM groups, who can least afford high monthly electricity bills. A market transformation which eliminates the poorest performing models from the market is strongly recommended.

Washing Machines and Dishwashers

Both these appliances are fully imported and the analysis suggests that an A rating is now the baseline. Any improvement in the energy rating, from A to A+ or higher, comes at a high premium with a relatively small, even insignificant electrical savings, as demonstrated with the dishwasher example. It is believed, but has not been confirmed, that this is because these higher rated models offer a significant number added features.

Tumble Dryers

These appliances use a significant amount of energy and although the locally manufactured units are on average less efficient than the imported models, the difference is not as large as it is with refrigerators. The examples used in the analysis are both imported models and the finding is that it is worthwhile to pay a premium for an A or A+ rated model.

Ovens

Most of the ovens sold to the lower LSM groups are locally manufactured. There was a significant amount of concern raised about the ability to measure consumption for three reasons: 1) a small increase in the cavity size of the oven has a disproportionate effect on the electricity required to supply to heat it to the same temperature; 2) different meals (and their size) require different cooking temperatures and times; 3) every household has different cooking habits.

The above makes it very difficult to define a standard test. Internationally the performance of ovens is measured by using specially designed 'bricks' and not food but as there are no test facilities in South Africa, the local manufacturers do not have reliable figures of the electrical consumption required to complete the standard test. The only information which could be sourced is that the ratings start from C and go up to A. Due to the lack of data, no financial analysis was possible other than to confirm that a C rated oven costs less than an A rated oven.

Electric Geysers

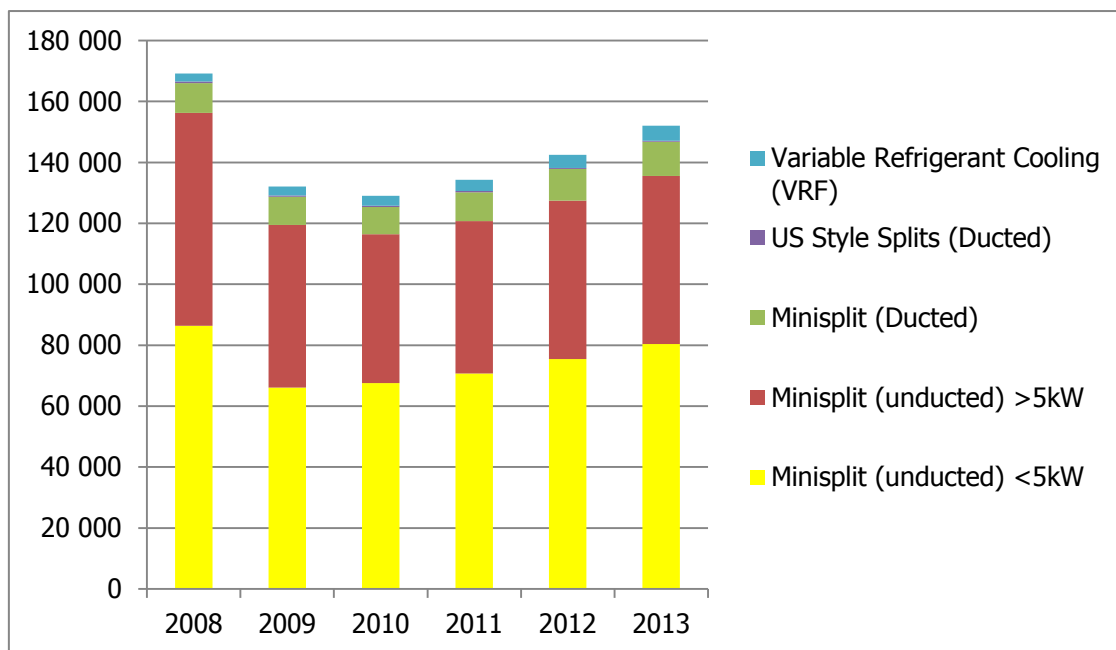
The SANS 151 test for electric geysers only caters for standing losses and does not consider usage as is done in other markets. The geyser which has the best performance in the market is also the cheapest in the market. However, as mentioned in Section 2, the decision making on which geyser brand to install does not lie with the household but with the installer who has no interest in the running costs of the unit and is more concerned with product availability and accessibility as all products in the market must comply with minimum health and safety requirements as per the National Standard. Therefore the introduction of MEPS will go a long way to realizing large electricity savings due to the annual installation volumes, estimated at 400,000 per annum⁶⁵.

⁶⁵ Exploring the possibility of the insurance industry as a SWH driver in SA, Kritzingler, 2011

Air Conditioning (AC) Units

Large efficiency improvements have been made in AC units due to the introduction of new technology which has relegated the traditional fixed speed units to C and D energy class ratings. Even though the new inverter and heat pump units are more expensive, the reduction in energy consumption is such that the extra investment is warranted as shown in Table 29, especially in an office environment where the usage will be higher. It is estimated that two thirds of installations are commercial installations such as offices, shops and restaurants⁶⁶. The market size of this section of the AC market is around 150,000 units per year, as shown in Figure 34 and there are as many 75 split system suppliers⁶⁷ in the market, many of whom are importing low efficiency imports to compete on upfront costs only. The introduction of a MEPS programme will result in large electricity savings. It is also worth noting that these units use approximately 15%⁶⁸ more electricity when operated in the heating mode.

Figure 34: AC Splits Market Analysed by Product Outdoor Units



Source: BSRIA, 2010

Note: Based on the analysis undertaken, the following came to light which warrants a rethink of the classification of 'Air Conditioners up to 5kW'.

Normally, in residential settings a 2.5kW or 3.5kW units are installed in bedrooms and these tend to be high-wall split systems. In lounges or larger rooms the standard practice is to install 5kw – 7kw and sometimes even as high as 8kW

It is therefore suggested that the cut-off should not be 5kW but a minimum of 8kW. A secondary factor is that most units in the 5kW range are actually slightly above this in capacity (5.2kW – 5.5kW). Finally, the heating function always uses a higher capacity than cooling so if there is a unit of 5kW cooling and 5.5kw heating, the importers would argue that it does not fall into the 5kW category but rather above 5kw and

⁶⁶ Philip Theunissen, Metraclark Product and Marketing Manager (20 January, 2011)

⁶⁷ Split Systems South Africa, World Air Conditioning (issued by BSRIA), 2010

⁶⁸ Philip Theunissen, Metraclark Product and Marketing Manager (20 January, 2011)

thereby avoiding any need to comply to MEPS. This is a loophole that all importers will exploit.

The following suggestions/recommendations were put forward by Philip Theunissen of Metraclark:

- Importers should be rewarded for importing and marketing energy efficient units by paying less on customs duties (currently duties are 17% + 7% on all units below 8.8kw) Duties on energy efficient R410a Inverter units should be lower in order to make them more affordable as price is the only driver in this market. Duties should not be more than 10% on energy efficient units
- The best way to regulate the market and to see that eco-friendly and efficient R410a units are imported, is to make them more affordable to the public and to decrease the amount of cheap, inefficient R22 refrigerant units imported.

6.6 Local Manufacturing

In the review undertaken by NUMSA⁶⁹ in 2002, it was asserted that the local white goods manufacturing sector has enjoyed protectionist policies from as far back as the 1920s primarily for two reasons. First, the boom periods after the First and Second World Wars resulted in increased competition for local manufacturers and, second the 'inegalitarian income distribution' which existed in South Africa meant that dedicated mass production technology was not viable due to the small size of the market. The local industry therefore evolved into one with little innovation but with a focus on mass manufacturing with dedicated machinery geared towards long runs of similar parts. The local manufacturers took design models from European and US technology partners and licensors and the appliances produced locally 'were geared towards the growing market of lower to middle income white urban dwellers', and 'the smaller upper income with market was served by imports of sophisticated products from technology partners'⁷⁰

The research undertaken for this report as well as the Project Document for the UNDP Appliance Labelling Study⁷¹ found sufficient evidence to suggest that the above strategy changed little during the latter part of the nineties until today. The result has been the closure of many local manufacturing plants and the loss of market share to new entrants, such as LG, Hi-Sense and Samsung as detailed in the Energy Efficiency Levels of Local and Imported Appliances section of the report.

The lack of investment in upgrading and retooling local manufacturing plants has resulted in locally produced appliances, on average, having the lowest energy efficiency performance in the market as shown in Figure 35 which is a breakdown of the locally manufactured combination refrigerators, EU category 7 &10, which makes up between 65-70% of the total market. Although this was not verified, it is supported by Figure 3 where the D, E, F and G rated models make up 50% of the total models on offer but account for only 24% of sales, whereas the B and C rated models, which make up 47% of models, are responsible for 75% of sales. The above is in contrast to the performance of imported refrigerators in the same category as shown in Table 30.

⁶⁹ Overview of the SA white goods market, Bezuidenhout, 2002

⁷⁰ An Industrial Strategy for the Electrical Durables Sector, Baumann, 1995

⁷¹ Market Transformation through Energy Efficiency Standards & Labeling of Appliances in South Africa, UNDP, 2011

It is also likely that these imported models have superior or added functionality compared to their local counterparts.

Table 30: Energy Rating of Imported Combination Refrigerators, EU Category 7 & 10

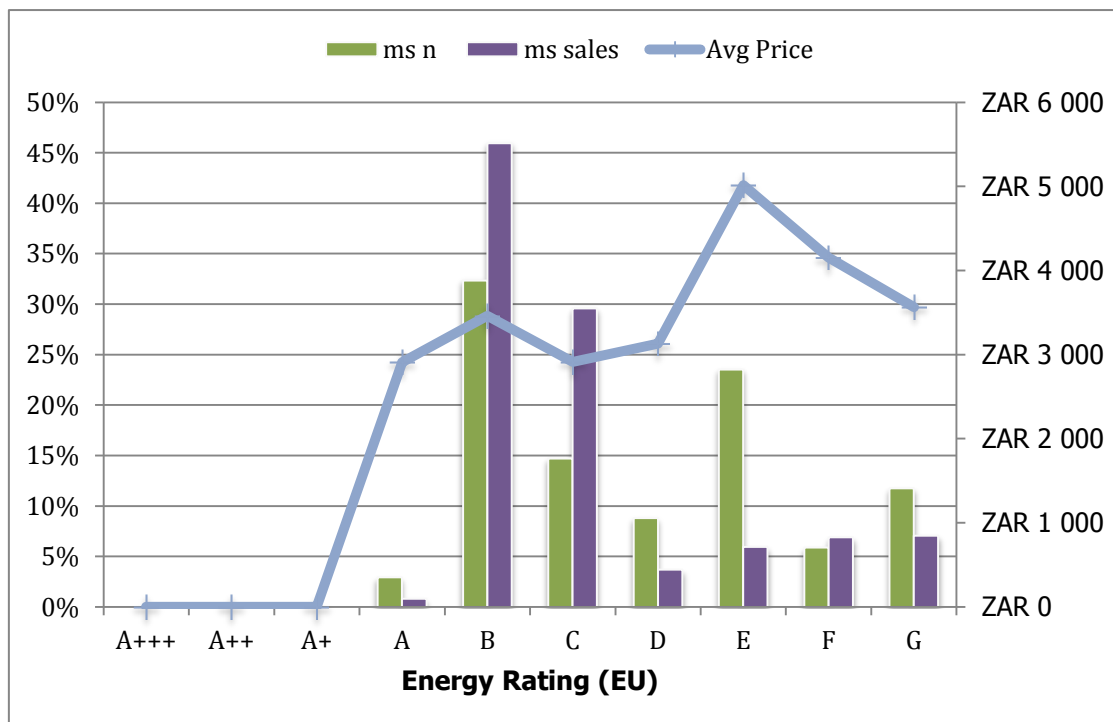
	A++	A+	A	B	Blank	Total
Number of Models	5	70	82	11	15	183

Source: Participating Manufacturers

Figure 35: Breakdown of Locally Manufactured Combination Refrigerators, EU Category 7 & 10

ms n = Market Share Number of Models

ms sales = Market Share Sales



Source: Participating Manufacturers

As a result the locally manufactured appliances have increasingly become uncompetitive and less attractive to consumers. To counter the widening quality and performance gap between local and imported appliances, the following are some of the steps taken:

- There has been an increase in the number of imported appliances which are being imported and sold under the local manufacturer's brand name. For example in 2010, Defy manufactured 95% of its refrigerators and freezers locally, this number was set to drop to around 70% in 2011. This new imported range is titled the 'eco-range' and comprises of nine models across the three size categories and all but one of the models have an A energy rating
- In December (2011) the Competition Commission approved the takeover of Defy by the Arcelik group, which is a Turkish manufacturer. The approval was conditional on certain commitments and investments being made to ensure that the local manufacturing will not only continue but that they will be upgraded. However at the time of writing this report the conditions were still confidential.

Locally manufactured⁷² refrigerators (~60%), chest freezers (~99%), ovens (~50%) and tumble dryers (unknown) continue to dominate the local market. If local manufacturers opt not to retool their manufacturing plants and continues with its 'long run of similar parts', it will only be able to maintain, not grow, its market share over the short term of locally manufactured appliances. It will be forced to reduce these and replace them with cheaper but better performing imported models. This cycle is already complete with washing machines, where all models are now fully imported. In cooking, a greater number of components as well as most of the higher end models are now imported. It is only refrigeration, especially electric geysers and chest freezers, which still has a strong local manufacturing base but even here, the erosion has started. The only factor that will protect and delay the complete demise of local manufacturing is a weakening of the currency which will make imports more expensive. However even this may be limited as such a large component of the local manufacturing of components has been lost and replaced with imports. The Industrial Strategy Handbook notes 'South Africa does not have a significant white goods component industry. Components are generally imported, and this makes the industry vulnerable to currently fluctuations'.⁷³

The Focus Groups and discussions with the manufacturers themselves have confirmed that, on the whole, the average consumer does not consider where an appliance is manufactured in their decision making process. The key factors, which are not necessarily in order of priority, remain: 1) price; 2) brand name; 3) functionality and performance; and 4) after sales-service and support. The analysis undertaken during this study has provided significant evidence to assert that local consumers are shifting towards buying higher efficiency appliances, the level of this being a conscious is unclear and could be due to one of the following:

- The increased and wide variety of imported appliances which are now available to consumers. The trend of the international appliances market has seen a reduction in costs at the expense of quality. The expected lifespan of certain appliances has gone down by as much as 25%⁷⁴. Note: Quality refers to the physical composition of the product, for example where steel is replaced with plastic and does not refer to mechanical and functionality improvements
- A stronger currency which has made imported appliances more affordable
- A growing middle class entering the market and buying appliances
- The large number of international mandatory S&L programmes has resulted in a global shift towards higher efficiency appliances or market transformation. The older, inefficient appliances have either been discontinued or are being 'dumped' in markets which do not have S&L programmes
- The introduction of new innovations from imported products; Samsung has introduced EcoBubble™ which claim a 70% reduction in electricity consumption, LG has introduced a direct drive motor to its washing machines which reduces electricity consumption. These motors carry a 10 year warranty, which is double the norm offered

⁷² Figures sourced from local manufacturers and supplied on condition that individual volumes would be kept confidential

⁷³ Industrial Strategy Handbook, COSATU Policy Unit, 2001

⁷⁴ Domestic Electrical Appliances in SA, Euromonitor, 2009

- Finally, a small minority of consumers do consider the environmental performance (energy consumption being a key component of this) as one of the primary factors in their decision making process

The change in market dynamics is steadily weakening the hold that the local manufacturers have enjoyed both with the consumer and government. Previous attempts to introduce mandatory MEPS and Labelling programme, without incentives, were contested fiercely with threats of manufacturing being migrated to overseas plants where labour is more flexible and affordable⁷⁵. The net result would be the closure of the local plants resulting in several thousand job losses. Government incentives could be used to assist the local manufacturers and this is addressed Section 4 - where some suggestions are put forward. However the fact that neither Industry nor Government, have taken the initiative up until now has resulted in Government losing large cumulative energy savings during a period where the country has experiencing a electricity supply crisis as well as failing to recognise a more competitive manufacturing industry with the potential for increased exports. Furthermore, they now find a situation where local manufacturing of certain appliances are facing severe pressure. From the local manufacturers' perspective, the investment to retool a manufacturing plant is sizable, estimated to be in excess of R100 million⁷⁶ just for refrigeration, failure to do so could result in a review of current local manufacturing options that in turn could lead to a preference of importing product rather manufacturing locally. This may however introduce other risks, such as certainty of supply, exchange rate fluctuations and possibly alienating parts of its customer base

6.7 Importers and Retailers

A well implemented S&L programme, which is able to provide clarity and regulate the market effectively, will ensure support and compliance. A meeting held with several retailers and importers at a meeting hosted by the Consumer Goods Council⁷⁷ of SA, as well as a meeting held with MassMart, where the S&L programme was introduced and explained to its members was well received with the following items raised:

- Concerns were raised about the ability to verify claims made by the manufacturers about the performance of the appliances. Also, retailers and importers have to trust that what the manufacturers state is accurate as there is no independent means of asserting the information supplied by them
- The importers and retailers have the relationship with the consumer and are most likely to be contacted first if there are concerns that the appliances are not meeting consumer expectations. Of greater concern is if a complaint against them reaches the National Consumer Council. In this instance, how would they proceed?
- Large retailers, such as MassMart, Checkers and Pick 'n Pay, who are listed companies, operate in accordance with regulations but concerns were raised that the 'independents', who control a significant portion of the market, may not. This would create an unfair advantage. Retailers and importers wanted assurances that Government would have the proper infrastructure and trained resources to monitor and control the regulations on an on-going basis

⁷⁵ Confirmed in meetings held with the Department of Energy (Energy Efficiency Division) and the National Energy Efficiency Agency

⁷⁶ Mark Hobbs, Marketing Manager Defy Appliances, October 2011

⁷⁷ Meetings held October 2010 and September 2011

- The cycle for appliances can take up to three years; reviewing, sourcing, importing, promoting and sales. There are also costs incurred in ensuring that they are complying with new regulations. The retailers and importers proposed that revisions of the MEPS and Labels happened less often, but the changes or energy improvements could be bigger
- Retailers also felt that inconsistent messages were being sent by Government on the timing and implementation of the programme, as they need to time to do their internal planning, training and buying. The sooner they are advised by Government, the better, but they would require a minimum of one year's advance warning
- There is no objection to the programme, in fact it is encouraged because consumers have now started to ask questions and show an interest in energy ratings and electricity consumption. However, the retailers have had little consultation and as a result, have many questions. These include: Which labels to use? Is there a standard design? Do the labels need to be positioned in a specific place? When is the programme coming into effect? As a result, many retailers have embarked on internal communication campaigns which may ultimately lead to further confusion

6.8 Government and Society

The appliances chosen by the SANS 941 specifically targeted high volume electrical equipment where real and meaningful energy savings can be achieved.

However, to fulfil its role and implement a programme which will deliver a market transformation by removing the most inefficient appliances while ensuring that local manufacturing not only survives, but can use this as an opportunity to expand its production, Government will need to consider the following:

- Formulate regulations which are clear and which reduce confusion as well as opportunities to circumvent them
- Ensure that the test standards are up to date as the current ones, which were adopted from the IEC, are out-dated and have energy class A as the highest level. There are now over 70 refrigeration models with an A+ and 5 models with an A++ rating
- There are no test facilities in South Africa. This has the potential to marginalize severely the programme, especially at the lower end of the market which is supplied by local manufacturers who will not be able to measure the performance of their appliances by an independent and accredited test facility. This also raises concerns as to how the NRCS will be able to enforce and ensure compliance. Consumers will also be adversely impacted as complaints cannot be verified. (Please refer to Section 4 for a detailed analysis of the Consumer Protection Act)
- Although out of scope for this study, some investigations were made to determine the costs of testing equipment. The following are indicative costs (millions):
 - Calorimeter Room for the testing of A/C ZAR8m (\$1m)

- Refrigerator Test Room ZAR2,3m (\$0.3m)

Note: The above estimates have been sourced from a feasibility study being conducted by another country looking to implement a mandatory S&L programme. The information has been provided on condition that they are kept confidential. The quotes provided are specific to the country programme and may not be relevant to the South African programme – however they do provide a useful guideline. The quotes do not include any negotiated discounts, special add-ons, import duties or taxes. It does include commissioning.

It is expected that testing facilities for washing machines, dishwashers and ovens will be significantly lower but it was not possible to source quotes.

- The voluntary collection of model specifications undertaken during this report has highlighted the need for the implementation of a mandatory database, which will assist with surveillance, M&V and as well as providing a basis for future upgrades of MEPS. The following issues were encountered during the collection process:
 - Voluntary generally results in data being provided late, incomplete and in most instances, the most valuable data is purposefully omitted as it deemed sensitive
 - In many instances the data could not be relied upon as it was inaccurate and contradictory. For example, Table 31 shows the information received from one manufacturer of the energy ratings and consumption of their range of washing machines

Table 31: Manufacturer Supplied Energy Ratings for Washing Machines

	Energy Rating	Consumption kWh/cycle
Model A	A++	0.95
Model B	A++	1.03
Model C	A++	1.05
Model D	A	1.02
Model E	A	0.96
Model F	A++	0.95
Model G	A	0.95
Model H	A	1.05

Models A, B and C are rated A++: the most efficient uses 0.95 kWh / cycle and the least efficient 1.05 kWh / cycle. Model D which uses 1.02 kWh / cycle which by definition implies that it is in the A++ category is rated as an A. Model F and G use the same amount of electricity to complete a cycle (1.05 kWh) yet the one is rated an A and the other an A++.

The above was queried with the individual appointed internally by the manufacturer to represent the company in this study and he was not able to provide satisfactory answers. In fact, the answers provided suggested that there was little understanding or comprehension of what was being queried and why.

This is one of many such examples. It was noted that the local manufacturers appeared to take the most care in providing accurate and credible data. This raises the risk that international manufacturers, who have not been required to

maintain accurate energy performance data, are providing inaccurate and misleading data to consumers. Whether this is by design or in error is not known.

- Concerns were raised from both direct and indirect actors in the supply chain about Government's commitment to the implementation of and ability to administer a successful programme. The key issues were around limited and disparate communication, lack of clarity (when, where, what, who and how) and concerns about the regulation creating an unlevel playing field

6.9 Incentives

Section 4 has been written in collaboration with Stephane de la Rue du Can and Greg Leventis of the Energy Analysis Department - Lawrence Berkeley National Laboratory (LBL) and facilitated by the Super-Efficient Appliance and Equipment (SEAD) Deployment Programme.

Once regulatory policies establish MEPS and information labels have provided a market accepted specification of energy efficiency, incentive instruments are the next logical policy type, as they build on these foundations, and encourage consumers to buy beyond what the standards require. Incentives should not be viewed as a permanent instrument and can be phased out as the cost of efficient products decreases over time. This will occur through streamlined production and economies of scale. The efficiency gains achieved through the incentive program can then be cemented by more-ambitious standards, in a virtuous cycle of improvement. Furthermore, with proper design and implementation, financial incentives can be a source of cost recovery on electricity subsidies.





There are multiple options available for the introduction of financial incentives, which can take the form of direct or indirect incentives. These can be directed to manufacturers (upstream) or consumers (downstream). Table 32 provides a breakdown of the different incentive types and possible implementing agencies or programmes and Table 33 gives examples of different approaches and programmes from around the world.

Table 32: Incentive Types

Incentive Type	Description	Implementing Agency
Tax Incentive	Upstream - To encourage manufacturers to produce qualifying appliances Downstream - A tax credit or deduction is given for the purchase of specific appliances	<ul style="list-style-type: none"> • Treasury • South African Revenue Service (SARS)
Rebates	Upstream – Rebate is paid directly to manufacturers to promote the appliance. The advantage with this approach is that administrative costs can be reduced, a specific and large consumer section can be targeted and manufacturers are encouraged to shift their focus Downstream – A rebate to consumers is by far the most popular tool used to promote the purchase of energy efficiency appliances. Here rebate programmes can use different mechanisms from cash discounts at point of sale, to extra points in a loyalty programme, which can then be used to purchase other items, (indirect incentive), or rebates that act as after-purchase refunds on completion and submission of a claim form.	<ul style="list-style-type: none"> • Eskom Demand Side Management Programme – Standard Product • Department of Energy / DTI in response to Green Economy Accord
Low or zero interest rate loans	Upstream – Subsidized interest rates to perform upgrades and retooling at manufacturing plants Downstream - Purchases of energy efficient	<ul style="list-style-type: none"> • Industrial Development Corporation (IDC) • Development Bank of

	appliances on credit can be given more attractive loan rates and/or terms.
	South Africa (DBSA) <ul style="list-style-type: none"> Private banks

Table 33: International Appliance Rebate Programmes

	Energy Points	Rebate (in-store)	Discount (subsidy)	Competition
Description	Loyalty cash back / rewards programme	Rebate paid after purchase (claim form)	Price discounted or redeemed in store	Lucky draw of qualifying purchase
Beneficiaries	Consumers	Consumers	Consumers	Manufacturers Retailers Consumers
Swop out (old appliance)	Not mandatory	Not mandatory OR Mandatory for a higher rebate	Not mandatory OR Mandatory for a higher rebate	Not mandatory
Process	Earn points for qualifying purchase	Tax rebate Cash back claim Rebate on loan	Retailer administers subsidy payout	Enter draw for significant payout
Country				

Source: Appliance Rebate Feasibility Study (Eskom 2010)

6.9.1 Manufacturer Incentive Programmes (Upstream)^{78 79 80}

Upstream incentives consist of financial incentives directed to manufacturers for producing qualifying efficient appliances. The goal is to reduce the cost of energy efficient appliances to stimulate accelerated market transformation. In some cases, the goal is also to encourage local manufacturers to sustain the market by directing the incentive to the local manufacturers. Manufacturer Incentive Programs have the advantages to limit administrative costs, accelerate the introduction and sale of efficient equipment models, and can have spillover effects to other appliances that share some technology aspects (e.g. compressors used in both air conditioners and refrigerators). Examples of successful programmes include:

- United States of America (USA):** A national programme offers a tax credit direct to manufacturers. The Manufacturers’ Energy Efficiency Appliance Tax Credit applies for certain dishwashers, clothes washers, and refrigerators. The money for this program is a revenue reduction in the amount of tax the appliance manufacturer would otherwise have paid. The Internal Revenue Service (IRS) administers the program and the goal is to influence manufacturers to produce increasingly energy efficient appliances in order to transform the market. One of the successes of the programs is the involvement and education of the stakeholders in negotiations as to how to use the incentives. The incentive program also revealed to be very well-timed as it pushed the efficiency standard forward so that the next set of incentives achieve ever higher levels of energy savings.
- California (USA):** The state has gained notable experience in implementing Manufacturer Incentive Programs as the State Energy Regulatory Commission

⁷⁸ Country Review of Energy Efficiency Financial Incentives, de la Rue du Can, Shah, Phadke, 2011 <http://www.osti.gov/bridge/servlets/purl/1026816/1026816.PDF>

⁷⁹ Eliminating Electricity Deficit through Energy Efficiency in India: Evaluation of Aggregate Economic and Carbon Benefits, Sathaye and Gupta, 2010 <http://ies.lbl.gov/node/429>

⁸⁰ The SEAD Initiative, 2012, <http://superefficient.org/>

has mandated the utilities to reduce their energy sales. One of the largest upstream programmes implemented, which targeted 100 million CFLs, is the California Upstream Lighting Program (2006-2008). A ~R12,50 (\$1.57) per bulb resulted in an average discount for consumers at the register of ~R22 (\$2.70).

- **China:** The CFL promotion program (2008) gave subsidies to manufacturers to provide a 30% discount on wholesale purchases and a 50% discount on retail sales. A total of 210M subsidized CFLs were sold to consumers between 2008 and 2009. In June 2009, the Chinese government extended the program to air conditioners. An interesting result is that sales of efficient models dramatically increased and local manufacturers stopped producing the less efficient models.
- **India:** The Bureau of Energy Efficiency (BEE) is developing a national upstream program called the Super-Efficient Equipment Programme (SEEP). This programme will offer tax incentives to manufacturers in order to reduce production costs and eventually the market price of efficient appliances. SEEP will cover ceiling fans and LEDs production in a first phase and will be extended to other products, such as televisions and refrigerators in a second phase. The goal is not only to reduce the cost of energy efficient appliances to stimulate accelerated market transformation, but also to encourage domestic manufacturing to sustain the market.

6.9.2 Consumer Incentive Programmes (Downstream)^{81 82 83}

Downstream programs target consumers by offering incentives for buying more efficient products or replacing old inefficient appliances with more efficient ones. These types of program also support the production of more efficient products indirectly. A few examples include:

- **Point-of-Sale Rebates:** A price reduction is given to consumers to purchase new energy-efficient appliances. It has the advantage of having spill over effects to other customers (announcement effect). These programmes are popular in Europe and especially in the US where 76% of financial incentives in the US are point-of-sale rebates.
- **Early Replacement:** Consumers are encouraged to dispose of their inefficient appliances before the end of their useful lives with significantly more efficient appliances. Mexico provides a working example of how these incentive mechanisms are being used for refrigerators and what the potential savings are.
- **On-Bill Financing:** On-Bill Financing programs provide an ingenious way to offset the incremental cost of more efficient equipment with the monetary savings realized on the energy bills. Loans are provided by the utilities who recoup the cost on the energy bills. Mexico's appliance replacement program uses this incentive mechanism.

⁸¹ Country Review of Energy Efficiency Financial Incentives, de la Rue du Can, Shah, Phadke, 2011 <http://www.osti.gov/bridge/servlets/purl/1026816/1026816.PDF>

⁸² Eliminating Electricity Deficit through Energy Efficiency in India: Evaluation of Aggregate Economic and Carbon Benefits, Sathaye and Gupta, 2010 <http://ies.lbl.gov/node/429>

⁸³ The SEAD Initiative, 2012, <http://superefficient.org/>

6.10 National Consumer Protection Act (CPA)

The introduction of a mandatory S&L programme raises risks for manufacturers and retailers under the newly implemented NCPA. It will also be a new challenge for Government who will have to consider how to deal with complaints made by the public. The following provides a qualified legal opinion. The full opinion with references is provided in Annex 10.7.

Introduction

The Electrical Appliances Energy Efficiency Action Plan (Plan) recognises, as a key purpose, the ability of consumers to compare the energy efficiency performance of electrical appliances in making purchasing decisions, and have confidence in the performance of energy efficiency products.

The Plan states that the National Regulator for Compulsory Specifications will be tasked (by way of amendment to existing legislation) with the regulation and enforcement of compulsory electrical appliance labelling and minimum energy performance requirements for manufacturers, retailers and importers of electrical appliances. The Consumer Protection Act (CPA) which seeks to promote and protect the consumer interest is an important complementary tool to the National Regulator for Compulsory Specifications Act (Specifications Act). The right to redress that it affords consumers is potentially an important mechanism for encouraging and enforcing compliance with the energy efficiency standards for electrical appliances when these come into force.

What follows is a high-level overview of the principles and mechanisms of the CPA with a view to assessing its relevance and effectiveness in the implementation and enforcement of the labelling and performance requirements for electrical appliances envisaged by the Plan.

6.10.1 Principles & Mechanisms of the CPA

Principles

- The CPA seeks to promote fair business practices and protect the consumer interest in line with international best practiceⁱⁱ and the principles of our Constitution. It does so by establishing a comprehensive legislative framework that extends to all consumer-facing businesses that supply goods or services in the ordinary course of business, and inter alia, regulates a wide variety of market practices, introduces controls over the fairness of contracts and a modified product liability regime, and establishes substantial administrative machinery for consumer protection and redress in the form of the National Consumer Commission (NCC) and the National Consumer Tribunal (Tribunal).
- The CPA is broad in its application. In respect of product labelling and MEPS of electrical appliances, the following is noteworthy;
 - the CPA specifies a non-exhaustive list of goods to which the Act applies
 - a “consumer” is defined broadly as a person (including juristic persons) to whom goods are marketed in the ordinary course of the supplier’s business; actual users of goods (irrespective of whether a person was a party to the transaction or paid for the goods) and persons who enter into transactions with suppliers in the ordinary course of that supplier’s

business. Transactions involving the promotion or supply of goods to the Stateⁱⁱⁱ or where the consumer is a juristic person^v whose asset value or annual turnover at the time of the transaction equals or exceeds R2 million are exempt from the provisions of the CPA

- it extends to all consumer-facing businesses. In particular it applies to all persons who market, promote or supply goods^v. Foreign suppliers active in South Africa or suppliers that are not-for-profit entities or organs of state are specifically stated to be subject to the provisions of the CPA
- it applies to all transactions for the supply (or potential supply) of goods in South Africa that are entered into in the ordinary course of business for consideration; the promotion of the goods, or of the supplier of the goods in South Africa; and the goods themselves. Certain transactions are exempt from application of the act including credit agreements under the National Credit Act. However, goods that are the subject of the credit agreement remain subject to the provisions of the CPA
- it sets out prohibited conduct and a number of fundamental consumer rights and the corresponding obligations of suppliers, producers, importers, distributors or retailers (as applicable in the context) including the consumer's right to:
 - information in plain and understandable language which the ordinary consumer with average literacy skills and minimal experience as a consumer of the relevant goods can be expected to understand without undue effort
 - product labelling and description of the goods which must not be misleading or deceptive
 - fair and responsible marketing which must not be false or misleading in any way

Mechanisms and Right to Redress

- The consumer's right to redress is arguably the most important right afforded by the CPA. Enforcement of the CPA is, in principle, also broad and far-reaching in;
 - the range of persons who may seek redress to enforce any right in terms of the CPA, a transaction, or otherwise resolve any dispute with a supplier, from the consumer himself to a person acting in the public interest or as a member of a group of affected persons
 - that action may be taken against a person (defined broadly by the CPA as including a juristic person) that has acted in a manner inconsistent with the act, whether for infringement or threatened infringement of consumer rights or for prohibited conduct
 - that it provides for numerous ways in which redress can be sought, including the NCC, the Tribunal, a consumer court, an applicable ombud

- with jurisdiction, an alternative dispute resolution agent, a court of appropriate jurisdiction and the National Prosecuting Authority
- that it provides for proactive monitoring by the NCC of the realisation and enjoyment of consumers' rights in practice (including the obligation to promote legislative reform to achieve the fulfilment of these rights where necessary) and the ability of the NCC to directly initiate a complaint concerning any alleged prohibited conduct on its own motion
- the standard of proof in proceedings before the Tribunal and any consumer court is on a balance of probabilities
- the Commissioner of the NCC has broad powers to issue a summons for investigation purposes
- The Tribunal has the power to impose hefty penalties. The NCA provides that an administrative fine of up to 10% of the respondent's annual turnover for the preceding financial year or R1 million (whichever is the greater) may be imposed where the respondent is guilty of prohibited conduct or has not acted in accordance with required conduct. Contravention of the CPA may also result in, in certain instances, in a criminal conviction or imposition of a penalty or both.

6.10.2 Going Forward: Application of the CPA in Practice

Although the CPA is considered to embody international best practice in its protection of the consumer interest in principle, its value as an enforcement tool for the energy efficiency standards for electrical appliances is dependent on the effectiveness and affordability of the enforcement mechanisms of the CPA.

The CPA has arguably not been in operation for long enough for its effect, or the implementation thereof to be properly assessed and understood. However, a number of challenges are evident at this stage. These must be taken into account in the finalisation and implementation of the Plan, and in the proposed amendments to the Specifications Act, if the CPA is to play an effective complimentary role in the implementation and enforcement of labelling and performance requirements for electrical appliances. These challenges are:

- **Development of the principles of the CPA** The CPA, and the enforcement thereof through the NCC, the Tribunal and our courts alike, is in its infancy. A development of an understanding of the act and its provisions is required to be developed through its application and the development of the common law over time. This will hopefully lead to an improved realisation and enjoyment of consumer rights in practice.
- **Awareness and education** Although there is arguably a broad awareness of the existence of the CPA, there is a general lack of education around what this means for consumers and suppliers alike in their day-to-day operations and dealings. What obligations are imposed and protections afforded by the CPA? An effective implementation of the Plan requires that consumers and suppliers be educated about their rights, obligations and the potential liabilities imposed by the CPA; and that suppliers inter alia, evaluate their position in the supply

chain, apportion risk contractually with their own suppliers, and consider whether their insurance cover is appropriate.

- **Limited redress for consumers in practice** Dispute situations may often boil down to a “he said/she said” scenario, with no proof on either side. This has the practical effect of the consumer’s right of redress being limited or difficult to access. In considering the implementation of the Plan, consideration must be given as to how compliance with the energy efficiency and performance standards to be imposed by the Specifications Act are to be measured and verified, and how this information is to be made publically available. This also requires consideration of access to testing facilities and the costs involved, an understanding of how the Specifications Act and CPA mechanisms are to work together to police the energy efficiency and performance standards (and how any conflicts between the two are to be addressed), sufficient capacity and competence of staff to administer and monitor the implementation of the energy efficiency and performance standards.
- **Capacity and finances of the CPA** Although the Commissioner, Ms Mamodupi Mohlala, has attempted to address a number of alleged contraventions of the CPA by various companies over the last couple of months, allegations have surfaced in the public domain regarding a lack of capacity and sufficient funds for the NCC to carry out its mandate. On 11 November 2011 it was announced by the Department of Trade and Industry that an independent investigator has been appointed to look into the state of affairs at the NCC. This is concerning, given the pivotal role that the NCC will necessarily play in ensuring the success of the CPA, and must be addressed if the CPA is to play an effective role in the implementation of energy efficiency and performance standards.

6.11 Impacts and Benefits (International Experience)

Table 34 provides an analysis of the actor specific barriers and incentives. A better understanding of the needs and characteristics of each of the actors, makes it possible to adapt the approach to increase the possibility of meeting their requirements and thereby implementing a successful programme. The following has been based on a paper written by the Wuppertal Institute⁸⁴ and adapted to focus on the South African context. The items highlighted in yellow are deemed to be the most pertinent based on the findings.

⁸⁴ Combining Theoretical and Empirical Evidence: Policy Packages to make energy savings in appliances happen, Tholen and Thomas, 2011

Table 34: Actor Specific Opportunities and Barriers

Opportunities	Manufacturer	Retailer	Investor & User
Match or exceed competitors product offering which may lead to market differentiation	✓	✓	
Increased direct earnings and profits as higher EE specification appliances are more expensive – this assumes end-user is willing to pay a premium	✓	✓	
Align with government policy, including but not limited to: <ul style="list-style-type: none"> • Mandatory S&L Programme • Transition to a lower carbon economy • GHG emission reductions 	✓	✓	✓
Contribution to environment	✓	✓	✓
Enhance company / personal environmental credentials	✓	✓	✓
Offer added economic benefit to consumers through lower operational costs	✓	✓	
Knowledgeable sales staff can enhance customer experience		✓	
Increased resale value of the appliance		✓	✓
Reduced running costs			✓
Increased awareness and need to use energy more efficiently	✓	✓	✓
Increased environmental awareness (carbon footprint) especially amongst higher LSM groups			✓

Barriers	Manufacturer	Retailer	Investor & User
Technical			
Component / product unavailability	✓	✓	✓
Upgrade of manufacturing facilities	✓		
Upskilling of employees and job retention	✓	✓	
Performance uncertainties specifically with no local testing facilities	✓	✓	✓
Supply of energy efficient appliances may be in short supply or limited product range offered by manufacturers		✓	
Economic / Financial Barriers			
Lack of financing / capital for upgrade manufacturing facilities	✓		

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Barriers	Manufacturer	Retailer	Investor & User
Unwillingness to upgrade due to real or perceived costs	✓		
View that payback period of investment is too long <ul style="list-style-type: none"> • Retooling and upgrade of production facilities • Premium paid is not warranted by operational savings 	✓		✓
Hesitancy to promote a new product range which may not be popular. Although it may offer higher profit margins, inefficient tried and tested appliances offer higher margins per hour		✓	
Risk of stocking and marketing - will the cost and time associated to convince consumers to buy the higher efficiency appliance whereby the changeover pays off, minimum sales volumes are reached and prices are kept at competitive levels		✓	
Risk that uptake will be insufficient & that new product will not be priced at a competitive level i.e: consumer only considers first cost and life cycle costing	✓	✓	
Price distortions due to subsidised electricity prices	✓	✓	✓
Uncertainties around future electricity prices i.e NERSA announced 3 annual 25% tariff increases however recently the Dept of Energy has stated that it may intervene & reduce the rate – this action punishes consumers who invested in EE equipment	✓		✓
Exchange rate fluctuations. Higher efficiency imported components cost more and a deterioration in the exchange rate will result in a disproportionate increase in the price of the appliance	✓	✓	✓
High profitability requirements for new product ranges caused by lack of capital and insecurity about continuity		✓	
Hidden or additional costs associated with higher efficiency appliances such as maintenance or servicing			✓
Organization Barriers			
Long held practises of doing business are often difficult to discard such as policy of first cost or payback times as investment criteria	✓	✓	✓
Lack of Interest for EE improvement			
Prevailing price competition or predominance of other product features or appearance over energy efficiency	✓	✓	
Consumer aversion to EE appliances due to perceived risks of new technology or uncertainty that stated savings will	✓	✓	
Inseparability of product features: The difficulty of acquiring EE appliances without also acquiring (and paying for) other undesirable features which increase the price of the appliance beyond what the consumer is willing or able to pay for just the added EE features alone	✓	✓	✓
Perceived lack of motivation of consumers to buy energy efficient appliances due to the demand side barriers faced which results in the production and marketing issues mentioned above		✓	
Small size, low priority: Is it worth saving such a small amount of electricity perhaps bigger savings can be			✓

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Barriers	Manufacturer	Retailer	Investor & User
made elsewhere. Savings are too small to warrant the effort			
Other functions (appearance or features) are more highly valued			✓
Knowledge / Information Barriers			
Unavailability of information about product efficiency (labelling, energy consumption figures)		✓	✓
Lack of knowledge about efficient appliances: Is it worth investing in training employees? Industry has high staff turnover rates and appliances may not be popular with consumers		✓	
Lack of knowledge about efficient appliances: Where to start? Can you quantify the savings? Can you trust what the manufacturers and retailers claim?			✓
Asymmetric information and opportunism: Often difficult to compare appliances. Sellers generally have more information and knowledge than consumers about the appliances which creates the incentive to provide misleading information		✓	✓
Information and search costs: Are the new appliances as good as the old ones? Is it in the interest of the seller to inform the buyer?		✓	✓
Consumer satisfaction: Does the new product offer the same functionality and performance as the old product?		✓	✓
Unavailability of attractive loans / finance			✓

Notes to Table 34: The investors are not always the users and the users are not always the investors. This is commonly known as the investor-user barrier and is a major barrier for the adoption of efficient technology. For these extra categories the criteria listed above do hold but the following dynamics should be noted:

- Users who are not investors and who pay the running costs (e.g. renting a furnished apartment)
- General unwillingness of investor to pay a higher price for an efficient appliance as he will not benefit financially from the reduced operating costs. There is almost no possibility of the user being able to influence the investor in his decision making process
- Users who are not investors and who do not pay the running costs (e.g. hotel guest, employees). The user has no incentive to operate appliance in an energy saving manner
- Investors who do not use the technology but pay the operating costs (e.g. hotel owner, employer)
- Often a lack of knowledge about the market situation. Do employees/guests value efficient appliances and will they make the effort? Or is it of no consequence to them so many potential energy savings are lost due to inefficient usage habits?

6.12 Unintended Consequences and Project Risks

Table 35, lists the project risks, identifies mitigation steps and attempts to identify the most probable unintended consequences which may occur in the category.

Table 35: Project Risks and Unintended Consequences

Risk	Assessment	Reason for Ranking	Unintended Consequences
Legislative risk	Med	The South African parliament has passed and adopted the Energy Act (2008) and the EE Strategy was adopted in 2005 (reviewed 2008). It stipulates the mandatory implementation of a S&L programme for household appliances to reach the target of 10% of energy demand reduction in the residential sector. The DoE and DTI have also developed a mutual energy efficiency action plan. The document has been made public and is out for stakeholder comments. Delays may occur during the process due to individual industrial interests but the regulatory framework	1) As this is one of the kick-off tasks and a strong signal to the market to prepare for the introduction of the programme any delays experienced in the drafting of the legislation will create another 'false start'. This may jeopardise the entire project for a lengthy period as per the 2005/6 experience. Most of the funding is being sourced from international donors and delays may result in the withdrawal of the funding. 2) Significant work still needs to be done – Standards need to be updated, decision on the label design need to be made and a framework developed 3) The regulations must be comprehensive and clear to ensure that the rate of compliance is maximised.
Institutional risk	Low - Med	For an S&L programme to have a measurable impact, experience has demonstrated that a multi-sectoral approach is required. The risk remains that institutional rivalries, or lack of communication, will slow down cooperation among ministries. A further concern is the capacity issues being experienced at the DoE. This is being addressed within the department and they have committed to rectifying the situation. Further resources and project prioritization within the department have been pledged.	As highlighted in the literature review a poorly implemented S&L programme has the potential to cause significant damage to the market. It has the potential to undo most of the work being done by Government to raise awareness and promote energy efficiency.
Technical and compliance risk	Low - Med	The successful implementation of this project requires an increase in the technical capacity of DoE, SABS and NRCS employees, as well as public and private sector testing capacity. The DoE will also be required to have the necessary skills and will coordinate stakeholders and ensure that the information campaign is neutral and communicates the objectives of the project accurately.	There are no accredited and independent test facilities in South Africa. To date the SABS has not received a clear signal from the dti to develop and submit a funding application. The construction of these laboratories takes time and is expensive. SABS management have also raised concerns that the throughput will be low and as such will be loss making centres. The lack of test facilities will compromise the programme and will disadvantage the local manufacturers the most
Funding risk	Med	The S&L project has strong backing from the government, but much of the funding pledged is either in-kind, for specific studies or available via levies introduced after the regulations come into effect in year 3.	S&L programmes require dedicated and consistent funding. It is strongly recommended that one or more of the ministries secure medium to long term funding for this programme
Business risk	Low	Although there is still some resistance from industry to the implementation of the programme it is far less than what it was a year ago. Defy has been purchased by Arcelik and indications are that the manufacturing facilities will be upgraded and the work is to start in 2012. KIC already have plans to upgrade their facilities although a	Although unlikely, based on discussions, the local manufacturers may opt not to upgrade their plants, reduce local manufacture and import their appliances

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		<p>final decision has not been announced.</p> <p>It is believed that market forces are now intervening and the appliance industry has realised that they cannot avert or postpone any longer as they risk losing market share</p> <p>However this is not the case with the electric geyser manufacturers who refused to participate or correspond and have vowed to fight any attempt to introduce mandatory MEPS which are higher than what has been agreed to in the SANS 151</p>	
Consumer risk	Low	<p>While it is true that consumers have a poor understanding of energy efficiency in general, this is starting to change because of the electricity crisis and high tariff increases. A sustained communications campaign and financial incentives to purchase efficient appliances, as well as the decision to make the program mandatory, will mitigate this risk.</p>	<p>A poorly planned and / or confusing communications campaign will result in consumers opting for the mandatory minimum rather than being motivated to buy higher energy classes</p>

7 Recommendations

7.1 Impact Assessment and Consultation Approach

7.1.1 Recommended MEPS for each appliance type

The recommendations in Table 36 are based on consultations held with the five major manufacturers/imported in each category, except for electric geysers where the three manufacturers who control in excess of 80% declined to participate in the study due to their opposition of the introduction of MEPS which may be higher than what is being proposed by the industry in SANS 151. Where there is local manufacturing, the appliances have been split between local and imported. The blocks marked in yellow show the baseline or average energy class for that appliance. The X denotes the recommended MEPS to be introduced in the first round. The recommendations made for each appliance are supported in the next section

Table 36: Energy Performance Baseline and Recommended MEPS

Rating	Refrigerator & Combi		Freezer	Washing Machines	Tumble Dryers		Dishwashers	Ovens		A/C	Geysers	Rating	
	Local	Imported	Local	Imported	Local	Imported	Imported	Local	Imported	Imported	Local		
A+++										Insufficient data provided		A+++	
A++													A++
A+													A+
A				X			X	X	X				A
B	X	X											B
C			X		X	X						X	C
D													D
E													E
F													F
G													G
Blank			N/M										Blank
N/M = Not Measured / Unknown													
Baseline													
X Proposed MEPS													

Refrigerators

Although there are a significant number of refrigerators manufactured locally by Defy with a D rating or less (the number has been withheld as a condition of participation), the sale of Defy to Arcelik and the expected investment to upgrade the manufacturing plants is a high priority and expected to commence in 2012. Discussions with KIC have revealed that on average their refrigerators have a mid-table performance. Both manufacturers understand the need for a MEPS to be set at a level where a market transformation occurs and that the least efficient models in the category are eliminated. It is therefore recommended that the MEPS for all refrigerators and combination units is set at a C level. This level has not been opposed by KIC and Defy.

All manufacturers who import their products supplied data where none of the models were below a C energy rating and therefore this recommendation does not impact on them.

Freezers

This market segment is dominated by chest freezers, almost all of which are manufactured locally. The performance of the products is very poor, dropping to as low as an F rating and many have never been tested. Again both manufacturers agreed to a MEPS rating of C

Note: In order for the local manufacturers to meet these commitments, it is imperative that they are given sufficient time to retool their manufacturing plants and that testing facilities are available to ensure that the performance of the units meet the minimum specification.

Washing Machines and Dishwashers

There is no local manufacture of these two appliances and all importers agreed that an A energy rating is currently the market norm, except for a few isolated models. Therefore there were no objections to an A rating.

Tumble Dryers

There is still local manufacturing of tumble dryers however they are at least one energy class below the imported products they compete with. In the interests of assisting local manufacturers and avoiding the termination of local production, it is recommended that the MEPS for tumble dryers is set at D.

Ovens

As per the explanation for tumble dryers, it is recommend that these appliances have a B MEPS

Air Conditioners

A rating could not be made due to insufficient data, therefore the recommendation made is as per the BUENAS analysis.

A recommendation⁸⁵ made is that the minimum COP (heating) must be set at 3.2 and EER (cooling) at 3.0 and not lower as many decent (R22 fixed speed) but inefficient units have a COP of 2.8 – 3.0.

Electric Geysers

Due to the lack of participation from the sector the following is the view of Barry Paul⁸⁶ from SABS: 'There should be no technical problem in requiring Standard (electrical only) geysers to be labeled "D" and phasing them out over time to meet label "C". Banning "D" geysers will have a significant effect on the production plant of the "D" level manufacturers. You will have to decide on any phase in period. There will be a few manufacturers that will not make level "D" and no chance of making level "C".

It is therefore recommended that the MEPS for electric geysers are set at C. However, more detailed research is required, such as a cost benefit analysis to test the arguments of the manufacturers who claim it is not financially or technically possible. The implementation of the MEPS can be done in two phases, a D level in 2013 with an upgrade to C in 2015.

⁸⁵ Metraclark South Africa

⁸⁶ In response to a question put forward about what MEPS the market can bear. Barry Paul, SABS Commercial 12 October 2011

7.2 Bottom-Up Energy Analysis System (BUENAS)

The BUENAS analysis and results (Section 8.2) was conducted by Virginie Letschert, Greg Leventis, King Ke and Michael McNeil from the Energy Analysis Department – Lawrence Berkeley National Laboratory (LBL) and facilitated by the Super-Efficient Appliance and Equipment (SEAD) Deployment Programme

BUENAS is used to determine the potential savings of planned South African Minimum MEPS. The BUENAS methodology is described in *Bottom-Up Energy Analysis System – Methodology and Results* (McNeil, Letschert et al. 2011). BUENAS was highly customized in order to suit South African government priorities.

The full analysis is provided in Annex 10.8 and describes the inputs into the model and presents the national impacts of a possible set of MEPS based on the South African National Energy Efficiency Strategy⁸⁷. Table 37 summarizes the assumptions used in BUENAS:

Table 37: Average market weighted Unit Energy Consumption (UEC) in the Base Case and Efficiency Case, and corresponding efficiency target level.

End Use	BAU UEC (kWh/yr)	EFF UEC (kWh/yr)	Target Level
Clothes Washers	181	166	A+
Dishwashers	291	268	A+
Dryers	294	269	B
Freezers	406	320	C
Ovens	121	114	A
Refrigerators	347	289	B
Split ACs	476	469	B
Reversible Split ACs	2,241	2,063	B
Water Heaters	1,111	852	C

BAU = Business as Usual

EFF UEC = Efficient Unit Energy Consumption

7.2.1 Results and Conclusions

The results are shown in Table 38. Carbon savings are calculated using a carbon factor value of 1.03 kg/kWh⁸⁸. The outputs of the BUENAS model are the following:

BAU (TWh): Final electricity used by each end use in the Business as Usual (Base Case) in 2010, 2020 and 2030.

Growth (%): Average annual growth rate (AGR) of energy consumption of each end use between 2010-2020 and 2010-2030.

Savings (TWh): Difference in energy consumption between the BAU and efficiency case.

⁸⁷ Department Of Energy and Industry 2011

⁸⁸ Eskom Annual Report 2009 www.eskom.co.za

Savings %: Percentage decrease in energy consumption for each end use.

CO₂ Emission Savings – CO₂ Emission mitigated between the BAU and efficiency case.

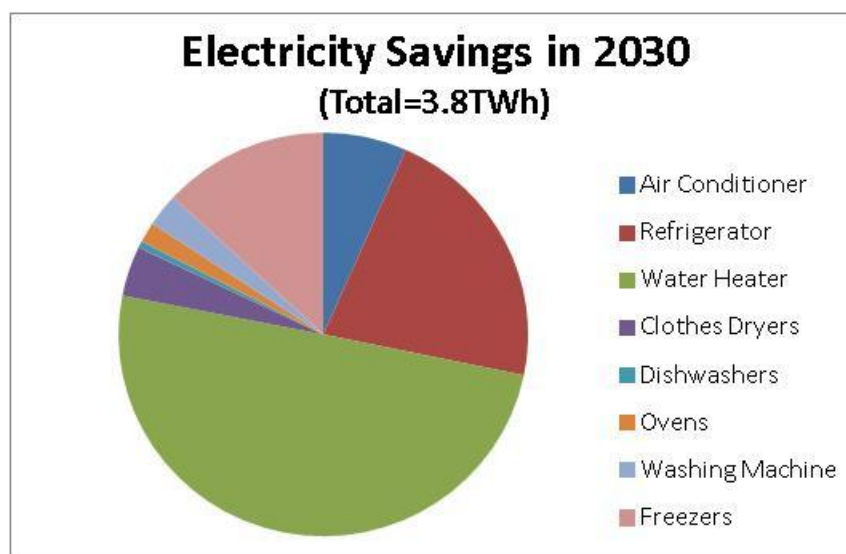
End Use	2010		2020				2030				
	BAU	BAU	AGR 2010- 2020	Savings	% Red.	CO ₂ Em	BAU	AGR 2010- 2030	Savings	% Red.	CO ₂ Em
	TWh	TWh		TWh		Mt	TWh		TWh		Mt
Air Conditioner	1.7	2.6	4%	0.1	5%	0.1	3.5	8%	0.3	7%	0.3
Refrigerator	2.0	4.2	8%	0.4	10%	0.4	5.2	10%	0.8	16%	0.9
Water Heater	3.9	7.0	6%	0.9	13%	0.9	8.8	8%	1.9	22%	2.0
Clothes Dryers	0.3	1.1	12%	0.1	6%	0.1	1.8	18%	0.2	8%	0.2
Dishwashers	0.1	0.2	6%	0.01	5%	0.01	0.3	10%	0.02	8%	0.0
Ovens	0.5	0.9	6%	0.03	3%	0.03	1.2	9%	0.1	5%	0.1
Washing Machines	0.5	0.9	7%	0.0	5%	0.0	1.3	10%	0.1	8%	0.1
Freezers	0.6	2.0	13%	0.3	13%	0.3	2.5	15%	0.5	20%	0.5
Total	9.1	19.8	8%	2.1	11%	2.2	26.4	11%	4.3	16%	4.4

Table 38: Results Summary

The set of MEPS presented in this report is expected to achieve **1.9 TWh savings by 2020 and 3.8 TWh by 2030**. 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**.

Figure 36 shows the repartition of the savings in 2030. Water heaters and refrigerators/freezers represent over 75% of the potential savings.

Figure 36: Electricity Savings in 2030



- **Water Heaters:** Given its relatively high diffusion in the South African households, high usage and low baseline efficiency, water heater provides the largest potential for savings.
- **Refrigerator and Freezers:** Imports being already efficient, we find a moderate potential for efficiency improvement by bringing domestically produced products close to the level of imports. Because of the wide penetration of refrigerator and freezers, they represent the 2nd largest potential for savings.
- **Air Conditioners:** In our forecast, the penetration of ACs stays low, while efficiency improvements are moderate. Given their high per unit usage (for reversible units), ACs are the 3rd appliance in terms of potential savings.
- **The remaining appliances** have a low penetration, a low usage and a high baseline efficiency level, so the impacts of MEPS are small, with the possible exception of dryers for which the growth in ownership makes it the 4th in terms of potential savings.

7.3 Comparison of Recommendations

Table 39 lists the recommended MEPS for each appliance put forward by the two approaches

Table 39: Comparison of Recommendations

Appliance	Consultation	BUENAS
Refrigerators	B	B
Freezers	C	C
Washing Machines	A	A+
Tumble Dryers	C	B
Dishwashers	A	A+
Ovens	A	A
Electric Geysers	C	C
A/C (Split)	B	B
A/C (Reversible Split)	B	B

7.4 Recommended Energy Classes for each Appliance Type

The current SANS standards are updated and need to be updated to reflect the efficiency improvements which have been made.

7.5 Recommended Labelling Requirements for each Appliance Type

Please refer to the labeling section of this report as several concerns were raised with the current label which needs to be updated. The opportunity should be taken to upgrade to the new European design which actually has incorporated many of the suggestions made by the public in the Focus Groups. The opportunity to regrade should also be considered.

7.6 Recommended Implementation Schedule

Ideally the programme should come into effect as per the stated target date of 2013. However, this may not be possible as there are many outstanding items to be addressed and Government UNDP/GEF country project, which will be responsible for implementation, has still not appointed a project management team. It is therefore recommended that a realistic time is set, which is

committed to by all participating Government departments. This must be communicated to all actors in the supply chain with regular progress updates.

Two sets of MEPS recommendations have been proposed: 1) From the impact assessment and consultation process; and 2) the BUENAS model. Further consultation, during the public participation stage, will be required between the Government, manufacturers and importers to reach a final consensus. Where it can be convincingly shown that the adoption of the more stringent MEPS will result in adverse consequences for manufacturers and / or consumers then agreement should be reached that the MEPS is implemented in the second round of upgrades, which should not be longer than two years after the introduction of the mandatory S&L programme. This will provide sufficient time for all actors to adjust and prepare.

7.7 Recommended Focus Groups on Incentive Programmes

In parallel to the standard and level development, Focus Group should be considered as a means to elaborate on the possibility of implementing incentive programmes to prepare the appliance market for the next update of standards. Incentive programmes could not only incentivize consumers to buy more efficient models but would also incentivize manufacturers to produce more efficient models.

7.8 Public Access to Test Results

Currently it is not SABS policy to make results of mandatory testing publicly available. It is recommended that this policy is reviewed and reversed as it would increase transparency and make it easier for the public, consumers and NGOs to apply pressure on manufacturers and distributors to comply with MEPS. The Swedish Energy Agency publishes all test results on its website and this practise has resulted in fewer failures as the manufacturers ensure that more stringent controls are in place when supplying appliances to this market.⁸⁹ The Japanese case study also corroborates the effectiveness of this practise – refer to case studies Annex 10.1.

8 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 that will 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.

⁸⁹ Discussion held with Carlo Lopes, Swedish energy Agency, November 2011

9 Annexes

9.1 Case studies

The following case studies help illustrate some best practices found in developed countries.

Country	<i>Australia</i>
Type	<i>Combination: Comparative Label (Mandatory) & Endorsement Label (Voluntary)</i>
Inception	1986
Primary Source	Energy Efficiency Policies for Appliances, McMahon J

Profile



In Australia labelling and MEPS programs were initially controlled by State rather than national legislation. Energy labelling was introduced in some states in Australia in 1986 and now all states have the necessary regulations in place. However during the 1990s the programme stalled - this was largely blamed on the domestic debates which took place amongst all the stakeholders who could not reach consensus on the labelling options and standards.

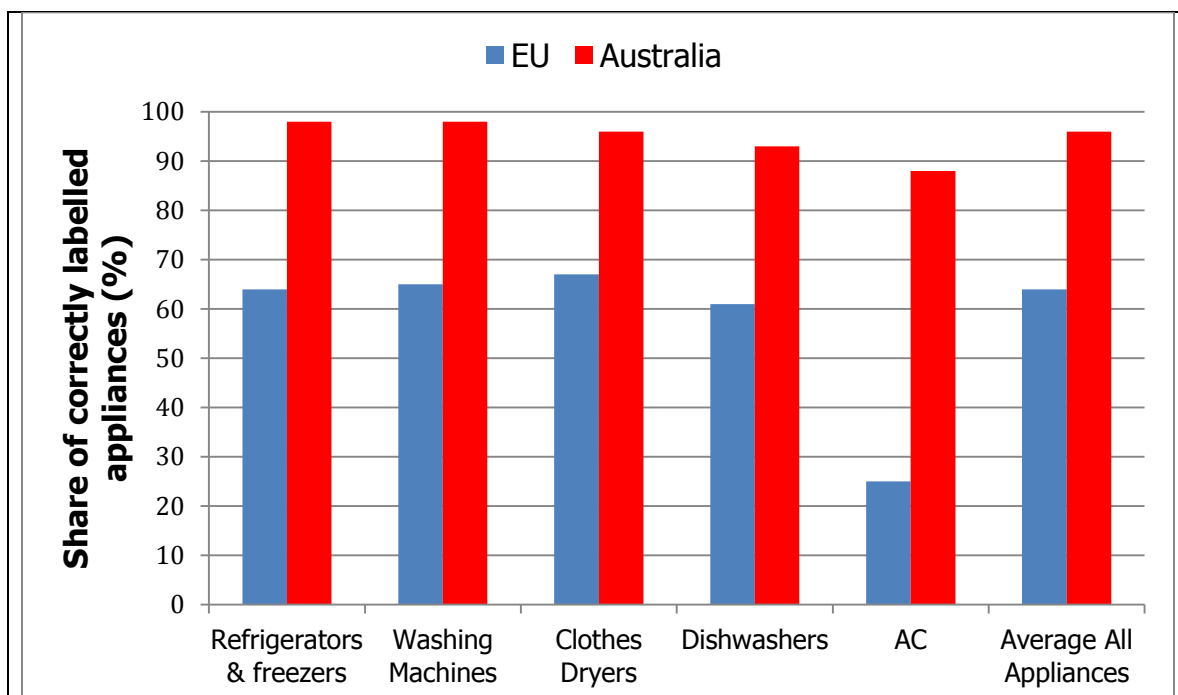
To overcome this, the scheme changed its approach with the States and Territories adopting uniform regulations and by matching the most stringent performance requirements used by Australia's primary trading partners. Under the new legislation the Government reviews global standards on a regular basis and uses these as a benchmark to revise the local standards. A benefit of this approach is that Government and industry avoid the significant costs of technical, feasibility and impact assessment studies undertaken before an efficiency level is decided. This approach also expedites the implementation.

The programme is now a partnership between industry and Government to improve end user efficiency and has ended the divisive debates about what is and is not possible that was a feature of the 1990s. This policy has also stopped the dumping of non-compliant appliances which was taking place, specifically with Air Conditioners, because if an appliance does not meet the requirements of its trading partner it cannot sell (dump) them in Australia. It has also benefitted local manufacturers as their products can be sold in any and every market throughout the world.

The Australian Government has implemented four forms of testing to ensure compliance:

- **Verification:** Post market surveillance by accredited independent facilities – 1,000 since 1991
- **Labelling inspections:** Conducted in stores to verify that labels are affixed to appliances. Testing started in 2000
- **Standards development testing:** Pre-market testing by accredited independent facilities to confirm proposed levels (4,500 in 2009 but averages 300-400 per annum)
- **Standby power in-store measurements:** market testing – 7,500 since 2000

These measures have resulted in a very high level of compliance as shown in the graph below. These activities are funded by a trust which has an annual budget of AUD\$2m which funds 10 independent consultants and the Government also contributes with an in-kind contribution of a further 10 officials.



Lessons Learned

- After a difficult start, a change in approach resulted in the Australian S&L programme becoming one of the most successful in operation
- Australian manufactured appliances are now world class
- Dumping of inefficient appliances has to a large extent been eliminated from the market
- Standards are revised regularly and the programme aims to cover 50 product types by 2010

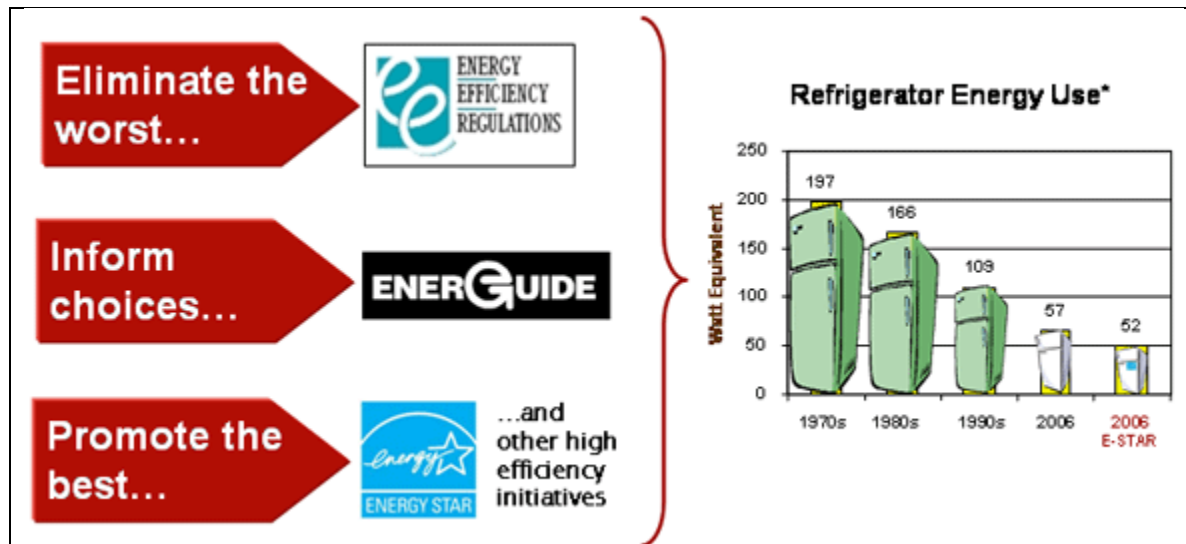
Country	<i>Canada</i>
Type	<i>Combination: Mandatory (MEPS & Labels) and Voluntary (Labels)</i>
Inception	<i>First Label Introduced in 1978</i>
Primary Source	Canada's Energy Efficiency S&L Programme, N MacLeod

Profile



The country introduced the EnerGuide Label in 1978 which was then supported by the Energy Efficiency Act (1992) which provided the legal authority to introduce 1) MEPS 2) Labelling and 3) Collection of Statistics. The first regulations were passed in 1995 and covered 22 products made up of household appliances, lighting and industrial electric motors. To date the Act has undergone at least five amendments where either new appliances or products are introduced and / or more stringent MEPS are introduced for certain appliances. Both mandatory and voluntary labels are used – the latter through agreement with product manufacturers. The strategy uses a multi- level approach⁹⁰ to achieve market transformation – all appliances in the regulated category must carry a comparison label (EnerGuide), MEPS are used to improve the efficiency of the lowest performers and at the same time it is expected that the top performers will continue to improve and are promoted by the additional use of Energy Star Labels – which are 10-15% more efficient than the average.

⁹⁰ National Energy Board, Canada http://www.neb.gc.ca/clf-nsi/rnrgynfntn/rnrgyrprt/nrgdmnd/cdstndrdrgltn2008/cdstndrdrgltn-eng.html#s3_3



National Energy Board, Canada

Residential housing accounts for approximately 17% of the energy consumed in Canada – which coincidentally is the same in South Africa, and is a key component of the energy efficiency strategy of the Canadian Government. In October 2006, the federal government announced new energy efficiency regulations on 20 additional and previously unregulated products which included refrigeration, heating, and lighting products, and introduced more stringent requirements on ten previously regulated products. The anticipated effect of these changes is to save an estimated 61.9 PJ annually by 2030

	2010	2015	2020	2025	2030
Residential (PJ)	3.2	35.5	46	54.75	61.9

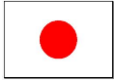
A multi-tiered compliance regime has been implemented to ensure that appliances comply with the regulations. 1) the programme promotes energy efficiency as a highly prized attribute in which the country has invested heavily. Consequently companies may not want to risk being caught selling non-compliant appliances for a short term market advantage. Competing brands are also vigilant on each other. 2) The Canadian Customs and Excise Agency checks incoming appliances to ensure that they are compliant. 3) A reporting system has been set up to confirm compliance. 4) Periodic and random testing of appliances is carried which is independent of the verification agencies. 5) The Act allows for severe financial penalties and / or recalls.

Lessons Learned

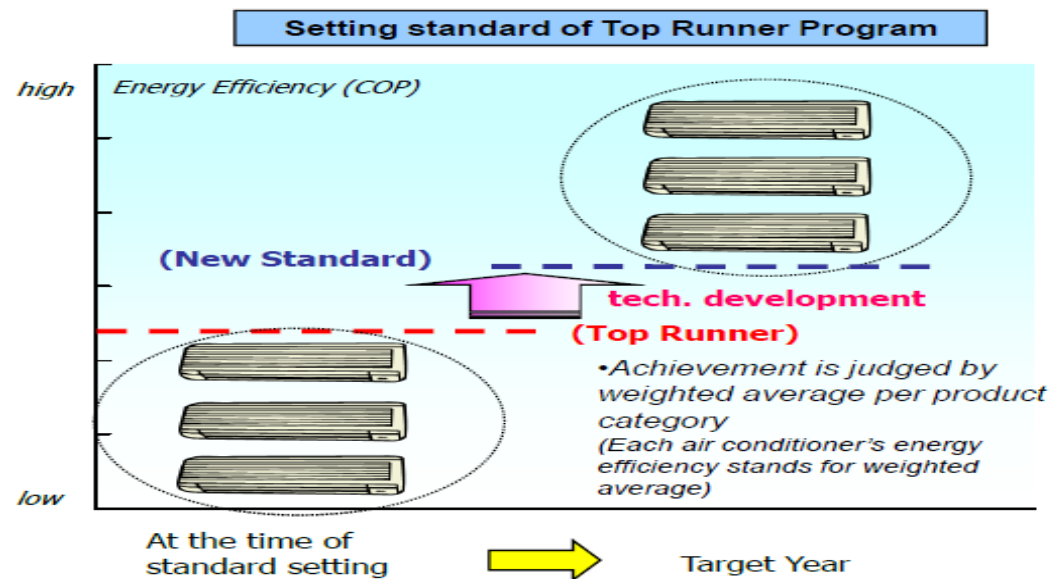
- Data availability and quality are essential to assess the impact on consumers and to determine if the programme is meeting its objectives
- Analytical transparency with interested parties on the methods, data and results
- Compliance is a pre-requisite if results are to be achieved. The threat of non-compliance must be assessed (is there a competitive advantage to not complying), the likelihood of detection and distribution chain effects. Compliance should enhance consumer confidence and create a level playing field for all suppliers
- Harmonisation is beneficial due to the global nature of S&L programmes.

Country	<i>Japan</i>
Type	<i>Combination: Mandatory Energy Performance and Voluntary Labelling</i>
Inception	<i>1998</i>

Profile



Japan's Top Runner programme is a mandatory scheme which falls under the Energy Conservation Law. All manufacturers and importers of appliances need to comply. Top Runner is unique from most other programmes in that it incentivizes the supply and not the demand side of the market – retailers and households are not targeted. The programme is designed to stimulate continuous improvement, through recurring revisions, of energy consumption for household appliances, office equipment and vehicles – 21 products in total. The concept is to set efficiency standards which are higher than the best performing products currently in the market, in other words the 'Top Runner' sets the standard. The objective is to push companies to commercialise technologies which they may have only planned to introduce in the future.



The targets set must be achieved by all suppliers and manufacturers by a mutually agreed to date. The standard setting, where levels and compliance periods are agreed to, is a robust consultative and consensus based process with the industry associations which takes between 1-2.5 years to complete. Working groups are formed to resolve issues which may arise.

A major success story of the programme is the example of passenger vehicles. In 1999 a fuel economy improvement of 22.8% by 2010 was set. A year later all manufacturers committed to meeting the target before the deadline date. The target was met in 2005 – five years ahead of schedule. The table below provides an indication of the scale of energy efficiency improvements achieved by the programme.

Appliance	Improvement	Period	Enforcement Date
Refrigerators / Freezers	21%	2004-2010	2006
Air Conditioners	22.4%	2004-2010	2006
TV Sets (incl LCD & Plasma)	15.3%	2004-2008	2006

Labelling of products is voluntary but is becoming increasingly popular with retailers and consumers. As shown in the diagram below two labels exist one for products which have achieved the yellow (green) and one for products which have not yet achieved the target (yellow).

Energy-saving symbol(Standard achieved)
Green
White

Energy-saving symbol(Standard not achieved)
Orange (yellow/red)
White

Label description(Specific energy-saving label image)

Energy-saving symbol
Energy conservation standard achievement percentage
155%
Annual power consumption
250 kWh/year

Target fiscal year
Target fiscal year, 2004
Indicates by when the product should achieve the standard. Target fiscal year is determined per product.

Energy conservation standard achievement percentage
Indicates by how much the product has achieved the standards. Greater the value, greater the energy saving. Target energy conservation standard values are set per product.

Energy consumption efficiency [Annual power conservation]
The numeric value is acquired using the measurement method prescribed per product.

Should a manufacturer fail to meet the prescribed requirements by the agreed date the Ministry can take the following actions:

- A confidential meeting with manufacturer requesting that corrective actions be taken
- Failure to take corrective action will result in a public announcement of naming and shaming
- A further step is to impose a levy or fine

Due to the receptiveness of the 'naming and shaming' threat in Japan this action is highly effective

Lessons Learned

- The programme demonstrates that a common target setting approach is possible and can deliver substantial results
- The success of the programme is largely reliant on the stakeholder consultation process where all manufacturers participate and agree to the targets
- The approach is consensus oriented and works well in the Japan where the market is dominated by local manufacturers and the cultural environment lends itself to the programme attributes

Country	<i>European Union</i>
Type	<i>Combination: Mandatory MEPS and Labelling</i>
Inception	<i>Individual states started as far back as the late 70s but the EU programme commenced in the early 1990s</i>
Primary Source	<i>Appliance Testing for Energy Evaluation, Energy Efficiency Centre, Czech Republic</i>



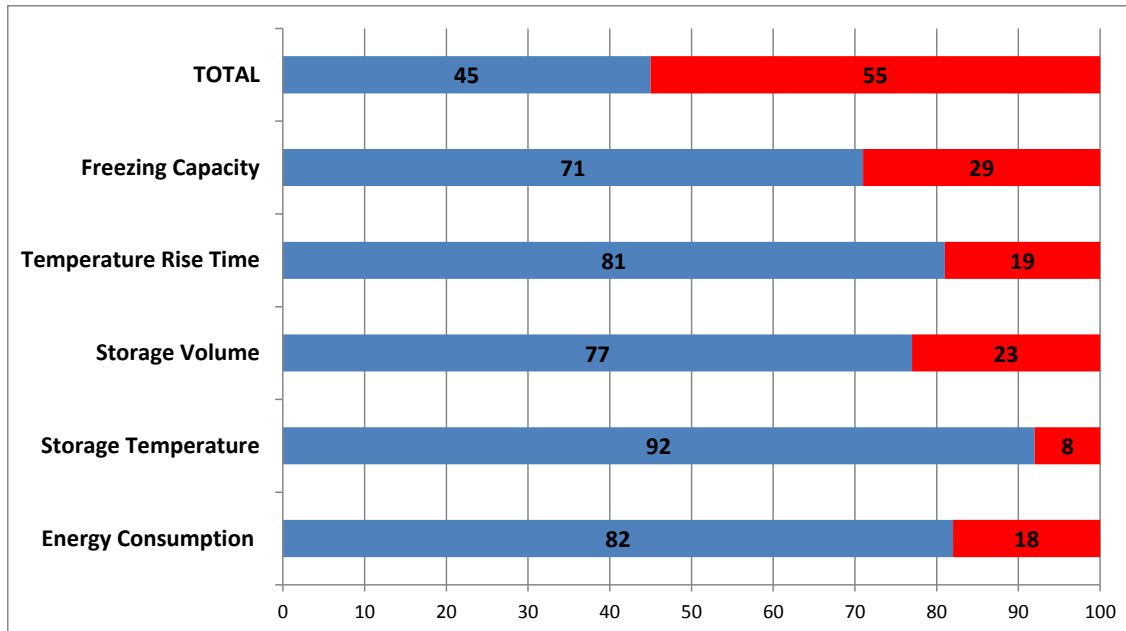
Though appliance labels were used in several European countries as early as the mid-1970s, their widespread use began only in the 1990s with the implementation of the European Union programme. The EU is made up of 27 member states

This case study will not focus on the development of S&L in the EU but will cover how the programme is being monitored in the EU based on a two year study which was completed in June 2011 and whose objective is to increase the European-wide implementation and control of energy labelling and eco-design implementing measures for appliances. Salient points from the final report are:

- Only 12 countries mention verification tests in their legislation and in 3 countries there is no mention of sanctions

- In practise only 13 countries perform appliance tests in practise and is < 200 per year. In 7 countries testing was done only after complaints were received
- In only 5 countries are the test results made public – reason cited is that it is not required by law
- Only warnings and fines were applied for non-compliance. Product withdrawal is rare
- Main reason for not testing is high costs, limited test facilities and controlling institution is over-burdened

The testing undertaken by the study was identical to the requirements required by the European Standards and tested 5 parameters: energy consumption, storage temperature, storage volume, freezing capacity and temperature rise time. The study only looked at refrigerators and targeted the top selling models in four product categories. 80 models were selected from 25 countries. Manufacturers were invited to participate and given an opportunity to respond to test results if their product did not meet the minimum standards – the study also allowed for the relevant tolerance. The results show that only 45% of the refrigerators tested complied with all five of the mandatory prescribed performance requirements.



Source: ATLETE

Lessons Learned

- Although the EU programme is successful and has resulted in large energy savings since it was first introduced the study highlights that without the regular testing and stringent compliance the energy savings are eroded
- It also demonstrates the need for political will and adequate funding
- Despite the programmes shortcomings, for the first time since 1990 the final electricity consumption in 2007 was lower than the previous year⁹¹ which may be attributed to the regions energy efficiency policies but cannot be concluded conclusively.

Country	USA
Type	Combination: Mandatory MEPS and Voluntary Labels

⁹¹ Electricity Consumption and Efficiency Trends in the EU, 2009, Paolo Bertoldi

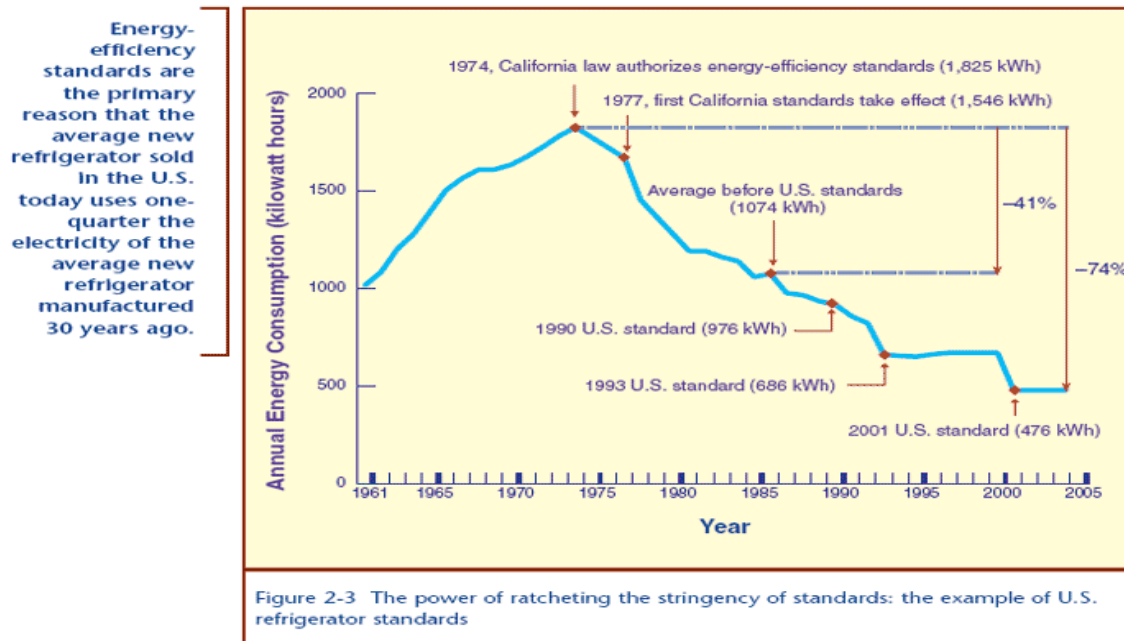
Inception	<i>First Label Introduced in 1975</i>
Primary Source	<i>US DOE Appliance Standards Programme, D Rodgers</i>

Profile



The US programme is very similar to the one adopted by Canada and therefore this case study will only address differences between the two. The first mandatory standard was introduced in 1978 and by 2002 there were 28 commercial and residential products standards. During this time the US Government has spent between US\$200-250 million developing and implementing the standards or US\$0.20 per household per year⁹² (or \$2 per household). This \$2 investment has resulted in savings of \$600 per household.

The objective of the programme is for standards to become increasingly more stringent over time and thereby encourage the development and adoption of energy efficient technology into the market – this ratchet effect is best demonstrated in the US success story of refrigerators illustrated below.



Since 2002 the US Government under the Energy Policy ACT (EPACT, 2005) and Energy Independence and Security Act (EISA, 2007) has formulated the following rollout and strategy:

- Prescribed 33 new conservation standards and set 21 new test procedures
- Set 16 new or revised test procedures to replace out-dated ones
- Mandatory rulemaking reviews for conservation standards (6 years) and test procedures (7 years)
- Standby power to be considered in all residential product standards from July 2010.

The Energy Star label has lost credibility in recent years due to manufacturers taking advantage of out of date test procedures, loopholes, low barriers for accreditation and no requirement for independent verification of test or performance results. For example the test procedures do not include the energy required to make ice and manufacturers have categorised large amounts of energy as 'ice maker energy', resulting in an average or poor performing label achieving an energy star endorsement.

Lessons Learned

- The US was one of the pioneers of performance standards and achieved huge energy savings but over time it failed to keep its procedures up to date and compliance was lax – this was quickly

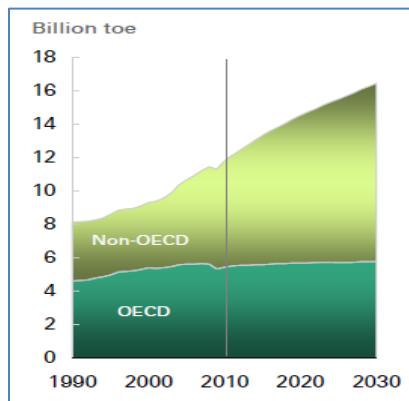
⁹² Governments should implement energy efficiency programmes carefully, Wiel and McMahon, 2003

exploited by the manufacturers. The result was a loss of confidence in the label by consumers as well as reduced energy savings

- The DOE is now addressing these problems and has once again made energy efficiency a priority. As at 2011 Standards affect >80% of household appliances
- The latest refrigerator standards (2010) call for a further 25% efficiency improvement and will result in a typical refrigerator in 2014 using about one-fifth as much electricity as one from the mid-1970s. Even as refrigerator energy use drops, the average units are both larger and less expensive. The average new fridge in 2010 is about 20 percent larger and costs about 60 percent less than a 1970s-era unit

Developing Countries

Figure 37: Energy Consumption Forecast



Source: BP⁹³

In its 2011 energy review, BP forecast that energy efficiency will continue to grow at significantly faster rate than it is currently; however this will only partly restrain the estimated energy consumption growth that will come from non-OECD countries – as illustrated in Figure 37. Non-OECD energy consumption will be 68% higher by 2030, averaging 2.6 p.a. growth from 2010 and will account for 93% of global energy growth

Country	<i>Brazil</i>
Type	<i>Mandatory S&L</i>
Inception	<i>1993 Endorsement Label 1997 Comparative Label</i>
Primary Source	<i>Energy Labelling and Standards Programmes Throughout the World, Harrington L</i>

Profile



Brazil entered into the labelling arena with a voluntary endorsement scheme in 1993. The government then expanded the programme by implementing a mandatory labelling (endorsement) for a set of specified appliances and a voluntary comparative labelling programme for a second of set of appliances. Air conditioners and refrigerators were included in both schemes. Under this regime, standards and labels in Brazil were the result of political compromises between industry and government and the results were less than optimum as compared to mandatory programmes. However this all changed in early 2000 when the country experienced severe droughts and as a result acute energy shortages. To avoid blackouts it implemented emergency measures aimed at reducing consumption by 20% with stiff financial penalties for non-compliance. It also passed a law making MEPS and Labels mandatory.

Before introducing the mandatory programme the government undertook a detailed analysis of its institutional capacity and data needs to ascertain whether it was able to successfully maintain the programme. As shown by the graphs⁹⁴ below Brazil now has one of the most successful S&L programmes

⁹³ BP Energy Outlook 2030, January 2011

⁹⁴ Harmonising Energy Efficiency Requirements, 2010, Janssen

which can be attributed to the energy crisis and the Brazilian's Government immediate and bold action taken to address the programme.

Figure 1: Relevance of EE when purchasing an appliance (1= low; 10 very important)

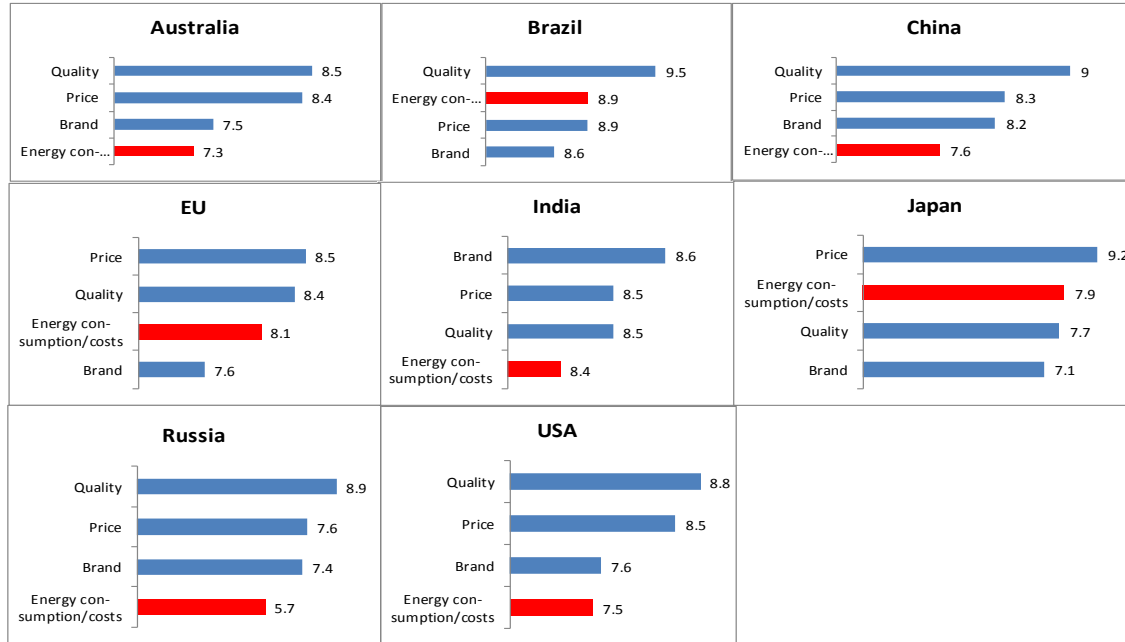


Figure 2: Is the energy label understood by the consumer?

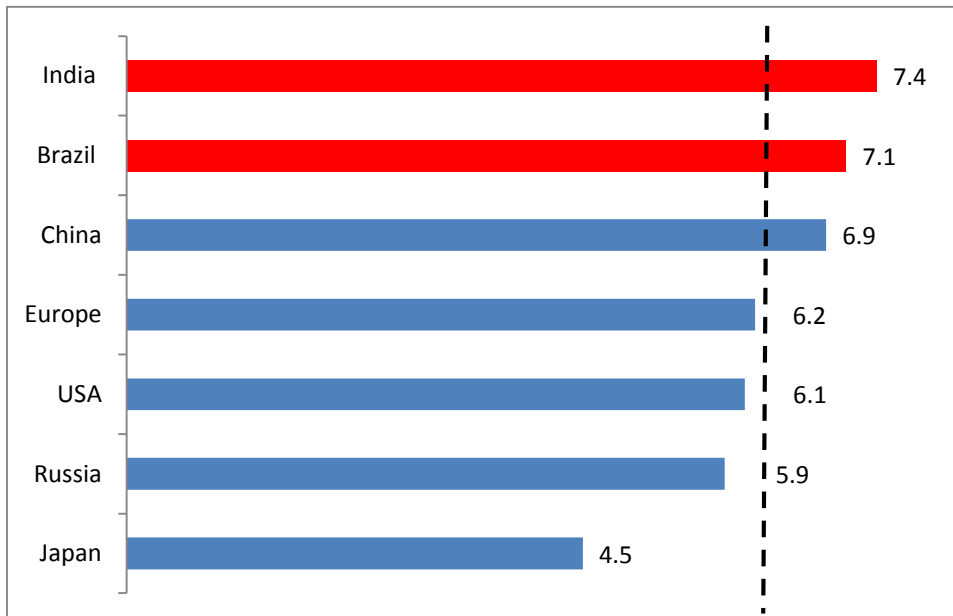
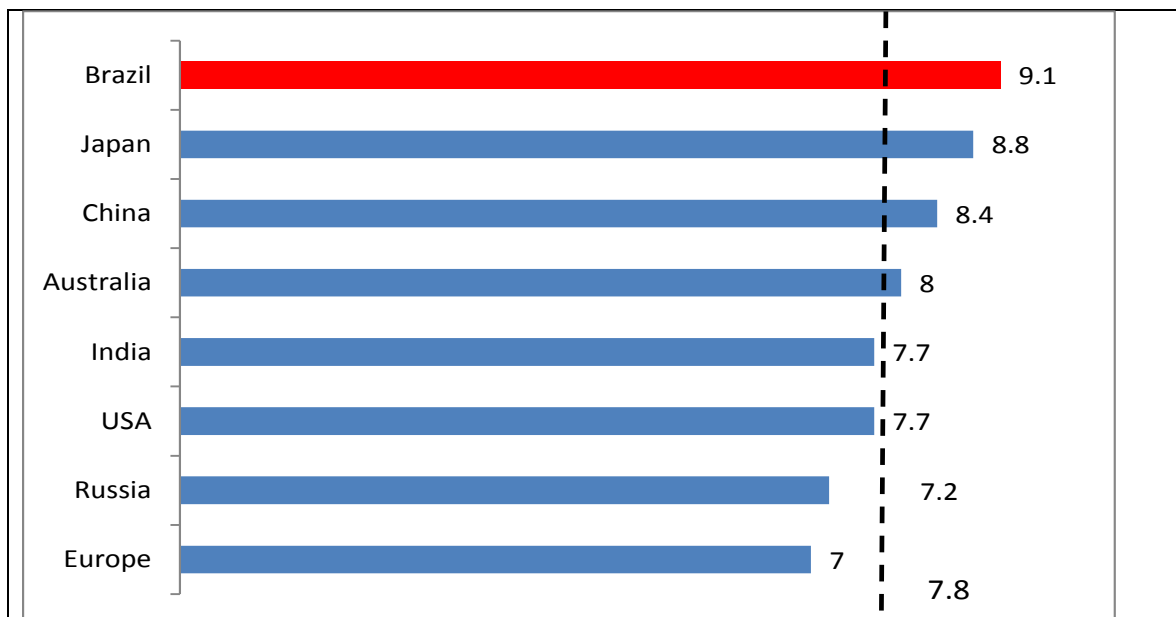


Figure 3: Does the label support the sales of energy efficient appliances?



Lessons Learnt

- It took a national crisis to break the deadlock between the government and industry
- The research clearly demonstrates that if all stakeholders work together they can implement a successful programme and outperform regions which have long established programmes
- Energy efficiency is a key decision factor in all countries and thus labels help consumers in their choice

Country	<i>China</i>
Type	<i>Combination: Mandatory MEPS & Labels and Voluntary Standards for Energy Efficiency Conservation</i>
Inception	<i>1989</i>
Primary Source	<i>Current Status of Energy Conservation in China, Zhou Kudo and Tanaka</i>

Profile



China is a primary example of a country collaborating and accepting assistance from developed countries to implement its S&L programme. It has worked most closely with the US but has collaborated with Australia and the EU. In 2000, China received a GEF grant of just under US\$10 million to implement a energy efficient refrigerator project. By 2006, CLASP in association with LBNL as its implementing partner had assisted the Chinese government in implementing MEPS for nine products and endorsement labels for 11 products. It is estimated that by 2020 China's S&L programme will save 11% of its residential energy use and avoid the need for \$20 billion in power plant investment.⁹⁵ However China has not managed to maximise its energy savings.

Current Status

China promulgated its first energy efficiency standards for nine products in 1989 and implemented them a year later. The law stated that any products which did not meet these minimum requirements would be eliminated from the market. Currently there are both mandatory (MEPS) and voluntary performance

⁹⁵ China Case Study, CLASP, 2006

standards (quantify the energy savings). By December 2009 had implemented MEPS and voluntary standards for 33 appliances and equipment.

The law requires that all products which appear on a national list must have an energy label (shown below) affixed on the product. Manufacturers and importers are also obligated to register their products with the authorities who maintain a national database. Products which do not have a label affixed may not sell their products. By 2010 energy efficiency labels had to be displayed on 22 household and commercial product categories – which equated 86,831 products from 1,667 manufacturers.



Before being adopted as the mandatory label the design underwent the following: a consumer intercept survey, consumer focus groups, and semi-structured interviews with consumers, retailers, manufacturers, and policymakers. Key findings:

- Retailer and manufacturer responses were consistent
- Consumers associated red with high consumption and blue/green with efficiency
- A or number 1 was the most efficient
- Most consumers found labels with more than 5 efficiency categories confusing
- Large bold characters were preferred to smaller ones

The Chinese Government estimates that in the five years since the introduction of the label (2005) the cumulative saving of electricity is 150 TWh.

Programme Issues and Shortcomings

It takes about 1-2 years to develop standards and implement them, but due to the fast rate at which technological advances are achieved, that by the time the standard is set it is often out of date making it lower than the average. This means that very few products are phased out. This is also exacerbated by the long interval taken to update the standards, although some have been revised, many still have standards set during the 1990s. For example, revisions for lighting ballasts and televisions have not been revised since 1999 and 1990 respectively. Both these technologies have had huge technology advances in terms of energy efficiency.

The evaluation methods are not consistent – for example there is no method set to compare the same products which use different technology. Consumers are therefore unable to compare the performance of the products fairly.

Standards do not consider climate and regional differences which determine usage patterns.

As stated above 33 products have mandatory performance standards but only 22 of these are required to have a label affixed to them.

Although there are some isolated education and promotion programmes to retailers and consumers they are not co-ordinated and as a result energy savings are not maximised.

The programme is heavily focused on technical requirements but is weak and lacks monitoring and enforcement of the legally binding standards resulting in uneven compliance.

Lessons Learned and Recommendations

The studies which have reviewed and detailed the above shortcomings in China's programme have suggested the following actions:

- The creation and implementation of a regularized monitoring system for tracking and enforcing progress on mandatory standards and information labelling should be updated every 3 -5 years
- Accelerating the adoption of the 'second tier reach' or improved standards
- Develop a stronger system for monitoring and performance
- Evaluation methods should be standardised across products
- Regional and climatic differences must be considered in the evaluation methods
- Energy awareness education campaigns must be increased

⁹⁶ Multi-Country Comparative Evaluation of Labelling Research, Egan and Waide, `2005

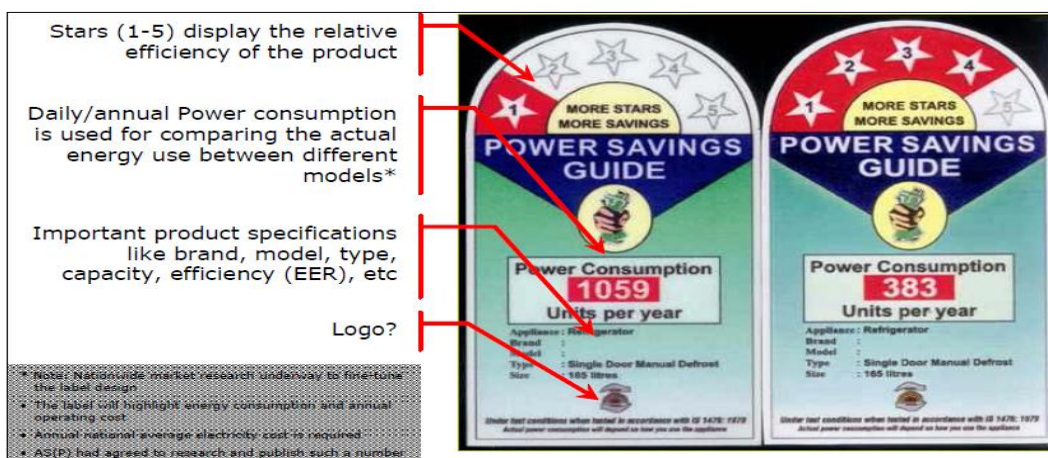
Country	<i>India</i>
Type	<i>Combination: Mandatory MEPS & Labels and Voluntary Schemes</i>
Inception	<i>2002/3</i>
Primary Source	<i>India Labelling Programme Impacts: Case Study. T Tathagat (2007)</i>

Profile



India is a further example of a developing country working closely with the international community to implement its S&L programme. The development and implementation process followed is the one prescribed by CLASP and as outlined in section 1.7 (Components of an S&L Programme) of this report. The timeline of events were as follows:


- The label design research took place in 1999 as part of a USAID project in India



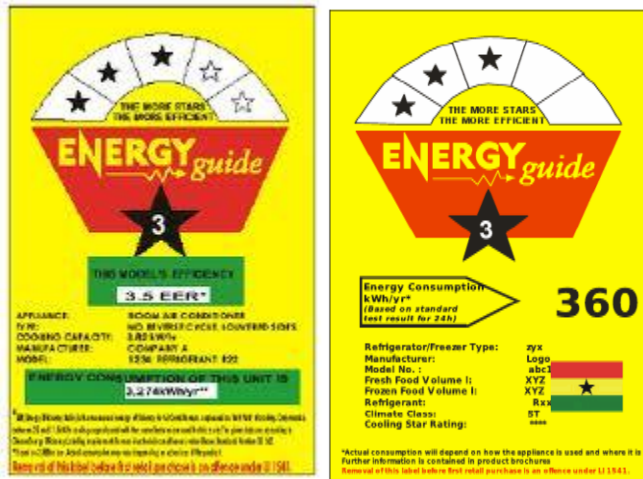
- The Energy Conservation Bill was passed in 2001 which created the legal framework and authority necessary for the Bureau of Energy Efficiency (BEE) to implement a S&L programme
- The BEE developed an action plan in 2002/3 which identified the appliances which would be included in the programme. A market based approach was used which was consultative and consensus driven. 13 products were identified for the initial 5 year programme based on pre-determined criteria
- The necessary institutional arrangements were put in place which was made up of industry, user groups, government & NGOs and funders. A technical and steering committee consisting of members from each group was formed and they agreed to their roles and responsibilities in the implementation process
- Rather than introduce stringent standards to start a phased approach was agreed to were the rating plan would be upgraded every three years
- The Bureau of Indian Standards (BIS) was made responsible for setting the test standards. The programme required that all appliances be tested by international laboratories – which did not exist and resulted in rollout being delayed. With international assistance three test laboratories have been developed – Bangalore, Vadodara and New Delhi
- India has decided to work closely both regionally and internationally to harmonize standards in order to reduce trade barriers and programme costs
- Compliance is done by an external independent agency which is responsible for implementing and verifying the programme and their duties include
 - Collecting samples from manufacturing facilities to conduct spot checks

<ul style="list-style-type: none"> ○ Provide support for cases where the advisory committee has recommended that a finding be reviewed based on a challenge from a manufacturer ○ Review of accreditation of testing facilities ○ Ensure labels are correctly affixed to appliances at retail level ▪ A branding and promotion programme was developed ▪ Methodology developed to track energy savings using the labelling programme <p><i>Current Status</i></p> <p>As at May 2011 a mandatory scheme is in place for frost free refrigerators, Room A/C, fluorescent lamps and distribution transformers. A voluntary scheme is in place for direct cool refrigerators, ceiling fans, industrial motors, pumps, TV's, washing machines, gas stoves, geysers and computers/laptops.</p> <p><i>Lessons Learned</i></p> <ul style="list-style-type: none"> ▪ Policy barriers: Limited capacity to implement the programme and the programme is not adequately funded ▪ Finance barriers: Consumers and industry remain unwilling to invest in energy efficiency ▪ Business: Manufacturers remained unconvinced about the demand for high efficiency models ▪ Information barriers: Lack of awareness and information regarding residential energy use, saving potential and product design ▪ Technology barriers: Lack of testing facilities and access to latest technology due to limited R&D
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Country	<i>Ghana</i>
Type	<i>Combination: MEPS and Voluntary Labelling</i>
Inception	<i>2001</i>
Primary Source	<i>Transforming the West African Market for Energy Efficiency, Ghana leads the way</i>

<i>Profile</i>	
	<p>Initial attempts during the late 1980's to introduce energy efficiency in Ghana failed due to low energy prices and weak Government skills in programmes which required specialist knowledge. The Ghana Energy Foundation (GEF), a public private partnership, was formed in 1997 to meet the country's growing energy requirements. Although it has no authority to enforce regulations it was tasked with implementing the energy efficiency programmes approved by the Ministry of Energy. The first issues tackled by GEF were to overcome 1) poor understanding of energy use and 2) disinterest across all sectors in conserving energy. After the rolling blackouts of 1999 one of the steps taken was to introduce an appliance labelling programme and standards programme. This was done in collaboration with CLASP and followed the following sequence of events:</p> <ul style="list-style-type: none"> ▪ The Ghana Standards Board is responsible for setting the standards ▪ The programme was delayed when the newly elected Government raised concerns about the effect the programme would have on low income groups. This resulted in a re-allocation and timing with the Room A/C standards coming being pushed up the list (as it is a product purchased only by high income households), then lighting and finally refrigerators and freezers ▪ A technical committee with representation from all stakeholders (industry, Government, NGO, Universities and engineers) was set up to develop the standards ▪ Four sample labels were tested on 10 Focus groups before the label was adopted ▪ The output from the committee was then submitted to LBNL and Ghana was the test case of the

new analysis model and the results showed the benefits would be higher than expected



Left Ghanaian Room A/C label and right the new refrigerator label

Results

- To avoid dumping legislation was passed in 2008 which prohibits the manufacture, sale or importation of incandescent light bulbs, used refrigerators and freezer and used air conditioners
- CFL penetration increased from 20% in 2007 to 79% in 2009
- MEPS for refrigerators were introduced in 2009 and must conform to tropical or sub-tropical climate specifications
- Ghana slogan is: **NO LABEL, NO GOOD!**

9.2 Summary of CLASP study / consumer survey findings

The full CLASP study titled "Results of the National Consumer Surveys relevant to the Labelling Communications Campaign" compiled in 2004 incorporated results from two processes:

- a telephone survey of 800 sample size that took place between May to June 2004; and
- a national omnibus survey of 1,300 sample size that took place between June to July 2004.

The initial telephone survey and subsequent National Omnibus survey were funded by the United States Agency for International Development (USAID) and CLASP to augment the government's program to introduce the new energy efficient appliance labels to the South African populace in the coming months.

The full report is available with all the detail of the two surveys. The following intends to provide only a very brief summary of the relevant key findings of the two surveys of South African appliance buyers:

- Some sensitivity regarding energy efficient products existed amongst respondents, but the generalized knowledge of energy efficiency tactics, practices and definitions were low.
- Most consumers reported that they had **never seen a label** of any type on most of the products they buy. While this may be **more a case of not recollecting** such things as "caution" labels, it speaks volumes about the **need to institute a comprehensive communications campaign** that targets the right consumers and emerging markets

with **correctly-targeted messages** that fill their vast **information gaps** and speak to their **intrinsic and extrinsic barriers** to label use.

- When the new label was tested in the target groups, in most cases, at least **half the population said they would need more than one minute** to understand the labels. This factor will come into play once the communications campaigns begin television spots, which at the outset, must consider the learning curve expressed by most consumers.
- Consumers expressed a **willingness to pay more** for an energy efficient appliance than a standard appliance. And this willingness to pay more was **found in a majority across all races**. Still, South Africa's consumers do **have limits as to how much** more they would be willing to spend.
- Most people felt that **visiting the appliances sales stores** was the most **honest and credible** ways to obtain information, next to word-of-mouth from friends. Purchasers tend to have a strong need to see the appliance for themselves and talk to someone in the shop prior to purchase. Once they were in the stores, consumers reported that they tended to speak with sales people about the appliances to gather information but reported that salespeople seldom mentioned Energy Efficiency. Consumers also commented that labels and product packaging were poor sources of information
- Consumers expressed **mistrust of product labels** and **product packaging**, ranking both very poorly in terms of honesty and credibility as sources of information.

Both surveys examined South African consumer awareness and understanding of energy efficiency, consumer motivations for buying appliances, and receptivity or aversions to the new appliances label so that baselines have now been derived. Subsequent surveys and consumer consultation efforts (such as the focus groups conducted for this study) can now reveal changes, identify more or less successful communication efforts and also possible avenues by which to reach all markets based on the responses relative to the CLASP baseline.

9.3 Recruitment Questionnaire

RECRUITER NOTES AND INSTRUCTIONS PROJECT AMBER OCTOBER 2011
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Project Structure

- This project will be conducted in the form of regular 2 hours focus groups.
- Respondents are incentivised at:
 - LSM 5 – 6: R250 (focus group)
 - LSM 7 – 8: R300 (focus group)
 - LSM 9 – 10 and 10+: R350(focus group)

Group demographics

MARKET RESEARCH CONTACTS:

- All respondents must not have any contacts, friends / family that work for a market research company or advertising, media or public relations company

- Please ensure that respondents do not work for, know or have friends or family who work for the Department of Energy
- A manufacturer, retailer or distributor of any electrical appliances
- Respondents must not be studying anything related to marketing, advertising or communications

GENDER:

- Respondents must be both male and females who have electricity supply in their homes
- Respondents must have bought one of the following items on the past 3 months
 - Refrigerators and freezers
 - Washing machines
 - Tumble driers –electric
 - Stoves- fixed electric
 - Dish washers
 - Air conditioners (domestic)
 - Electric geysers

AGE:

- Respondents need to fall into one of the two following age groups:
 - Age 34 and younger: Groups 1, 2, 5 and 7
 - Age 35 and older: Groups 3, 4, 6 and 8

AREA / REGION:

- Groups will be conducted in the following areas only:
 - Johannesburg

LSM:

- Respondents will be split as followed:
 - LSM 5 – 6: Groups 7 and 8
 - LSM 7 – 8: Groups 5 and 6
 - LSM 9 – 10: Groups 1 and 3
 - LSM 10+: Groups 2 and 4

INCOME

- Respondents will be split as follows:
 - R3000 – R5999: Groups 7 and 8
 - R6000 – R14 999: Groups 5 and 6
 - R15 000 – R24 999: Groups 1 and 3
 - R25 000 and above: Groups 2 and 4

RACE:

- Respondents will be Black, White, Indian and Coloured, split at follows:
 - Black only: Groups 3, 6, 7, and 8
 - White only: Groups 1 and 5
 - Mixed (Black, White, Indian and Coloured): Groups 2 and 4

LANGUAGE:

- White Coloured, Indian and mixed groups will be conducted in English, while the Black groups would be conducted in Vernacular.

**PROJECT AMBER
RECRUITMENT QUESTIONNAIRE
October 2011**

NAME OF RESPONDENT : _____
 ADDRESS : _____

 SUBURB : _____
 TOWN / CITY : _____
 TELEPHONE NO : (H) _____ (W) _____
 (Cell) _____
 OCCUPATION : _____

INTRODUCTION AND FILTER QUESTIONS :

Q1. Hello, my name is..... I am working on behalf of Kaufman Levin Associates, a strategic market research company. We are doing some interesting research on behalf of a client where we need to speak to you about electricity usage and electrical appliances in order to understand your views and perceptions. The research will be in the form of a **2 hour focus group** which will be held at a central venue where refreshments and snacks will be served.

Would you be willing to participate in a research group? **SINGLE MENTION ONLY**

Yes	-1
No	-2

- CONTINUE
- THANK RESPONDENT AND CLOSE

Q2. Would you be comfortable expressing your views and opinions in the company of other people during a 2-hour discussion in English?

Yes	-1
No	-2

- CONTINUE
- THANK RESPONDENT AND CLOSE INTERVIEW

Q3. We are looking for people who work for certain companies. Do you or any member of your family or close friends work for any of the following companies? **READ OUT OPTIONS. MULTIPLE MENTIONS POSSIBLE**

	YES	NO
A market research company / Marketing company/ media/ PR company	-1	-2
An advertising agency	-1	-2
The Department of Energy/The DTI/any other governing body	-1	-2
A manufacturer, retailer or distributor of any electrical appliances	-1	-2

- IF YES TO ANY, CLOSE INTERVIEW

Q4. Which of the following have you done in the past six months? **READ OUT OPTIONS. MULTIPLE MENTIONS POSSIBLE**

	YES	NO
Been to a movie	-1	-2
Eaten out at a restaurant	-1	-2
Attended a group discussion / ad test or been interviewed for market research	-1	-2
Been to a wedding	-1	-2

- IF YES, CLOSE INTERVIEW

Been on holiday	-1	-2
-----------------	----	----

Q5. How long have you lived in South Africa?

All their life / they are South African citizen(s)	-1
Longer than the past 12 months	-2
Less than the past 12 months	-3

] ■ CONTINUE

] ■ CLOSE INTERVIEW

PURCHASE BEHAVIOUR:

Q6. Have you personally bought any electrical appliances in the last 3 months

Yes	-1
No	-2

■ CONTINUE

■ CLOSE

Q7. Which of the following appliances have you bought in the last 3 months? **READ OUT. MULTIPLE MENTIONS POSSIBLE**

Refrigerators and freezers	-1
Washing machines	-1
Tumble driers-electric	-1
Stoves-fixed electric	-1
Dishwashers	-1
Air conditioners(domestic)	-1
Electric geysers	-1

] ■ IF NO TO ALL , CLOSE INTERVIEW

NOTE: RESPONDENTS MUST HAVE BOUGHT AT LEAST ONE OF THE ABOVE APPLIANCES TO QUALIFY

Q8. When it came to the decision around which appliance to purchase, who ACTUALLY made the decision as to what/ which appliance to buy?

Me	-1
Someone else	-2

■ CONTINUE

■ CLOSE

Q9. How many market research group discussions or interviews or immersions, if any, have you attended or participated in over the past 5 years? _____ **RECRUITER TO WRITE OUT NUMBER OF GROUP DISCUSSIONS AND TO MARK THE APPROPRIATE BLOCK BELOW. DO NOT PROMPT**

None	-1
One – Three	-2
More than three	-3

] ■ CONTINUE

] ■ CLOSE INTERVIEW

DEMOGRAPHICS:

Q10. Which age group do you fall into? **MULTIPLE MENTIONS POSSIBLE**

21 years and younger	-1	■ CLOSE INTERVIEW
22- 34 years	-2	■ RECRUIT FOR GROUPS 1, 2,5 AND 7
35 -60 years	-3	■ RECRUIT FOR GROUPS 3, 4, 6 AND 8
60 years and older	-4	■ CLOSE INTERVIEW

Q11. Record gender. **DO NOT READ OUT. SINGLE MENTION ONLY**

Female	-1	■ RECRUIT FOR GROUPS 2, 3,5 AND 8
Male	-2	■ RECRUIT FOR GROUPS 1, 4, 6, AND 7

NOTE: BOTH MALES AND FEMALES TO TAKE PART IN THIS STUDY

Q12. For statistical purposes, please can you tell me your race?

Black	-1	■ RECRUIT FOR GROUPS: BLACK 2, 3, 4, 6, 7 OR 8
White	-2	■ RECRUIT FOR GROUPS: WHITE 1, 2, 4 OR 5
Indian	-3	■ RECRUIT FOR GROUPS 2 OR 4
Coloured	-4	■ RECRUIT FOR GROUPS 2 OR 4

NOTE: ENSURE REPRESENTATIVITY

HOUSEHOLD INCOME:

Q13. Could you please tell me what your total monthly household income is? This is solely for market research purposes and we guarantee confidentiality.

INTERVIEWER: PLEASE EXPLAIN MONTHLY HOUSEHOLD INCOME →The total combined income of all household members.
SINGLE MENTION ONLY, DO NOT READ OUT. INTERVIEWER TO RECORD BELOW.

Less than R3000	-1	■ CLOSE INTERVIEW
Between R3000 – R5999	-2	■ RECRUIT FOR GROUPS 7 AND 8
Between R6000 – R14 999	-3	■ RECRUIT FOR GROUPS 5 AND 6
Between R15 000 – R24 999	-4	■ RECRUIT FOR GROUPS 1 AND 3
Between R25 000 and above	-5	■ RECRUIT FOR GROUPS 2 AND 4

LSM:

Q14. **ASK ALL:** I am going to read out a list of questions to you. These might sound strange, but we ask them in order to understand a bit about the lifestyles of different groups of people. Please tell me, which of the following do you have in your home? Do you ... **(READ OUT ATTRIBUTE)?**

ATTRIBUTE/ QUESTION	YES	NO
Have hot running water in home	18	-
Have a working fridge/ freezer	12	-
Have a working microwave oven	12	-
Have a flush toilet in home or on plot	11	-
Have a working VCR in home	11	-

Have a working vacuum cleaner or floor polisher	14	-
Have a working washing machine in home	15	-
Have a working computer in home	29	-
Have a working electric stove in home	15	-
Have at least one working TV set in home	12	-
Have a working tumble dryer in home (separate from washing machine)	16	-
Have a working telephone (landline) in home	9	-
Have a built in kitchen sink in home	13	-
Use a home security service	14	-
Have a working deep freezer in home (separate from fridge)	9	-
Have access to running water in home or on stand	13	-
Have access to watch DSTV or M-Net	14	-
Have a working dishwasher in home	16	-
Live in a metropolitan area	8	-
Live in a house or cluster home or townhouse	12	-
Have 1 or more working motor vehicles in home	17	-
Have a domestic worker	-	-29
Have 2 or more working radios in home	-	-25
Live in a non-urban area outside of Gauteng or Western Cape	-12	-
Have 3 or more cell phones in home	16	-
Have only 2 cell phones in home	11	-
Have a working DVD player in home**	9	-
Have a working Hi-fi or music centre in home**	6	-
Have a home theatre system in home**	10	-
Totals of each column		
SUB TOTAL: "Yes" PLUS "No"		
ADD CONSTANT		+100
TOTAL SCORE		

SCORE BREAKDOWN	RECORD BELOW:	FROM	TO	
LSM 1	25-1	Less than	36	■ CLOSE
LSM 2	-2	37	58	
LSM 3	-3	59	81	
LSM 4	-4	82	114	
LSM 5	-5	115	154	■ CONTINUE – RECRUIT FOR GROUPS 7 AND 8
LSM 6	-6	155	219	
LSM 7	-7	220	259	■ CONTINUE – RECRUIT FOR GROUPS 5 AND 6
LSM 8	-8	260	293	
LSM 9	-9	294	343	■ CONTINUE – RECRUIT FOR GROUPS 1 AND 3 (ENSURE INCOME BRACKET IS BETWEEN R15 000 – R24 999); RECRUIT FOR GROUPS 2 AND 4 (ENSURE INCOME BRACKET IS R25 000 AND ABOVE)
LSM 10	-10	More than	343	

NOTE TO RECRUITER:

• REFER TO GROUP SCHEDULE:

- LSM 5 – 6: GROUPS 7 AND 8 (ENSURE INCOME BRACKET IS BETWEEN R3000 – R5999)
- LSM 7 – 8: GROUPS 5 AND 6 (ENSURE INCOME BRACKET IS BETWEEN R6000 – R14 999)
- LSM 9-10: GROUPS 1 AND 3 (ENSURE INCOME BRACKET IS BETWEEN R15 000 – R24 999)
- LSM 10+: GROUPS 2 AND 4 (ENSURE INCOME BRACKET IS R25 000 AND ABOVE)

I hereby certify that this interview has been carried out by me according to the instruction I received from KLA.

DATE :

SIGNED:

9.4 Focus Group – Discussion Guide

Discussion Guide for Pr Amber – version 3 – 30 September 2011

Key Objectives

- *To assist with testing consumer response to and their perception and understanding of the proposed appliance label*
 - *To assist with critical revisions/ refinements to the label to improve understanding and / or effectiveness*
- *To assist with developing targeted communication and education material, with the intention of*
 - *Supporting the rollout of the labelling program*
 - *Improving consumer understanding of the label*
- *General understanding of the energy efficiency landscape in order to understand the market's motivation around the topic*
 - *Identify topics and 'hot spots' that grab attention (→ help generate insights to maximise communication take out)*

Material requirements for each group

- Concept story (x 9 copies)
- 2 x comparative labels (x 9 copies) → printed each on A5 card, labelled '1' and '2'
- Self completion questionnaires (x 9 copies)
- Flip chart and various coloured pens
- Pencils x 9

Introduction (15 mins)

Thank you for your time today in coming to talk to us. We are conducting research about appliances in your home and a new rule about appliances that the government is introducing in South Africa. Before we start talking about that I would like to tell you how our discussion will work for the next hour and a half to two hours.

My job is to make sure we get the information that we need for the government to make the right decisions that are in line with your thoughts and opinions. So I have a lot of questions for you. Please could you just be as honest as you can with me. But do not feel like you have to answer a question that in any way makes you feel uncomfortable. I do need to hear from everybody. So if one of you is too quiet, I may start asking you questions directly. Likewise, if one of you talks too much, I will request that you let other people have their turn too.

We tape record all sessions and we have our clients on the other side of this one way piece of glass so that they can hear what you think first hand. Please be assured that our Client only knows you by the tag your wear with your first name on. Further than that, we at KLA keep your identities completely confidential. I promise no-one will try to sell you anything in the next

few weeks! We conduct a number of similar discussions with people like yourselves, and the results of each discussion are reported as main themes, not your individual responses.

Please can you turn your cell phones off as they interfere with the recording equipment. If you are watching out though for a particular call, please could you just turn it to silent. But I do prefer that it's off if you can manage that.

Any questions before we introduce ourselves?

- Moderator introduce her/himself
- ICE BREAKER → I'd like you to chat to the person next to you and find out as much as you can about them in 1 minute → what they do, their family, things they are interested and passionate about. Then, your partner has 1 minute to find out about you. After that, you will tell the rest of the group about your partner and then your partner will introduce you to the group. Ready? (if an odd number, then there will be one group of 3 respondents)
- Respondents to introduce their partner → partner can fill in any 'gaps' afterwards

Broad understanding of energy efficiency (10 mins)

The South African government wants to promote the efficient use of energy in the country and is looking at ways to do this. We are going to explore a programme that the government is launching and we would like your feedback – what you honestly understand about it and how you feel. Before I take you to that part of the discussion, please could you tell me what you think 'energy efficiency' means?

MIND MAP ASSOCIATIVE EXERCISE (USE FLIP CHART TO RECORD)

What immediate thoughts, feelings, pictures – anything at all – come to mind when I say 'energy efficiency'?

MODERATOR TO GET A SPONTANEOUS SENSE OF UNDERSTANDING

PROBE EACH WORD SEPARATELY IF NECESSARY TO CREATE MORE MEANING IF NOT IMMEDIATELY COMING THROUGH

IF COMPREHENSION IS LOW EVEN AFTER PROBING, PROMPT BY SAYING, THE GOVERNMENT WANTS TO INTRODUCE WAYS TO 'SAVE ELECTRICITY'

What reasons do you think are driving the government to focus on energy efficiency?

MODERATOR PROBE AROUND RESPONSES → SEE IF ANYTHING COMES THROUGH AROUND SOCIAL, ENVIRONMENTAL AND ECONOMIC BENEFITS

What are your feelings and opinions around these reasons? MODERATOR PROBE AROUND EACH REASON ABOVE TO ESTABLISH 'PUBLIC OPINION'

To what extent may you personally benefit from programmes that could save energy?

Do you do anything at the moment in your own life to save energy? What do you do and how?

EXPLORE ANY INITIATIVE RESPONDENTS HAVE IMPLEMENTED IN THEIR LIVES

Appliance purchase decision and usage (20 mins)

Before we go more in depth on energy efficiency, I'd just like to talk to you a little about the electrical appliances you have in your home ...

What was the very first appliance you bought? What reason did you have for buying this appliance over another? When did you buy it?

And the second appliance? Third? (REPEAT PROBES)

Now think back to the last appliance you bought, what was it?

When did you buy it?

How did you go about deciding which model to buy? If a couple of you could explain the process – from when you decided you needed it, where and how you looked for what you wanted, who was involved in the decision, all the way to actually paying for it and getting it home ...

Who in the group followed a similar process?

Who did something different? If you could explain the difference?

Now think back to the actual moment when you are looking at the appliance

In a comparative situation, when you are comparing one product or model against another ... what criteria did you compare? For example, I imagine price played a role? What about the dimensions (height, width, etc)? What other information do you think is important? Does it make a difference to you whether the appliance is manufactured locally (in South Africa) or overseas? Why does this make a difference to you?

MODERATOR TO PROBE PERFORMANCE CRITERIA IF IT DOESN'T COME UP SPONTANEOUSLY, e.g. capacity (fridge/freezer), noise factor, amount of water used (washing machine / dishwasher)?

If you are not comparing products against each other, I.E. you are looking only at one specific model or you've done your comparison and now you are looking in detail at your final choice, does the information you look for differ in any way? MODERATOR TO GUAGE IF ANY INFORMATION IS DROPPED OR ADDED WHEN NOT COMPARING PRODUCTS

Ok, I'd like to quickly get a list of important information for all the following appliances – the information that you think is important when you make a decision to buy, e.g.:

Fridge; freezer; fridge/freezer (CHOOSE WHICH EVER MOST COMMON TO THE GROUP ... BUT ALL TO INCLUDE A FRIDGE COMPONENT)

Washing machine

Tumble dryer

Stove

IF NOT SPONTANEOUSLY MENTIONED, PROBE ABOUT IMPORTANCE OF KNOWING HOW MUCH ELECTRICITY AN APPLIANCE USES

As you sit here today, what is your general opinion about the main appliances like this in your home and how much or how little electricity they use?

What kind of appliance do you think uses the most electricity?

Vs. what uses the least?

What do you think makes one appliance use more electricity than another? PROBE

Function of appliance → how does this influence electricity consumption?

Quality of appliance → how does this influence

Brand name → how

Do you do anything specifically in your home to manage how much electricity you use?

PROBE WIDER THAN JUST MANAGING APPLIANCES → TRY TO EXPAND ON EARLIER DISCUSSION ABOUT INITIATIVES FOR ENERGY SAVING

What is your key reason for watching how much electricity you use? ESTABLISH (BUT DON'T PROBE IF DOESN'T COME UP SPONTANEOUSLY) WHETHER MOSTLY COST IMPLICATIONS OR ENVIRONMENTAL CONCERNS

What percentage of your monthly salary, more or less, would you say you spend on electricity each month? **Do you feel that this is a lot/ a little to be spending on electricity?**

[MODERATOR TO PROPOSE BANDS OF SALARY % - I.E. 1 – 5% OF MONTHLY SALARY, 5 – 10% ETC]

Exploration of appliance labelling concept (15 mins)

I am going to read you a brief story about the particular programme that the government will be launching. Once I've read it to you, I'll ask you a couple of questions and then we will read it again and talk about it in detail. As soon as I've read it to you the first time, please will you give this idea a thumbs up, thumbs down or thumbs in the middle? In other words, if you think it's a good idea (thumbs up), a bad idea (down) or you are unsure (middle). MODERATOR TO READ THE CONCEPT ONCE

Is this idea a thumbs up, down or in the middle?

Just quickly, tell me what your reasons are for rating it like you did? MODERATOR RECORD ALL KEY THEMES ON FLIPCHART and ENSURE THAT EVERYONE HAS A CHANCE TO SHARE THEIR THOUGHTS BUT DO NOT PROBE IN DETAIL AT THIS POINT

Now I'll hand you each a copy and we'll read it again together and then discuss it in detail MODERATOR TO READ ONCE MORE.

IN THE REMAINING INDEPTH EXPLORATION IT IS CRITICAL TO GUAGE THE LEVEL OF APPEAL, RELEVANCE and COMPREHENSION OF THE CONCEPT

APPEAL

What do you think of the government's plan to introduce minimum energy standards for all appliances?

MODERATOR REFLECT BACK INITIAL THEMES AROUND LIKES AND DISLIKES

Establish key motivation or barrier around each theme

RELEVANCE

Who is going to benefit from this new standard?

How will the benefits be experienced?

Do you think there is any other benefit of this standard?

COMPREHENSION

Is there anything that you find confusing or difficult to understand?

Imagine that you talk to a friend when you leave here tonight how would you explain this idea to them?

MODERATOR REFLECT BACK INITIAL THEMES AROUND UNCERTAINTY (IF THEY EXIST)

What information would be helpful to understand this more?

Exploration of appliance label designs (40 mins)

I'm going to give you each two labels to look at which will give you a better idea of what the government has in mind. These labels would be on every appliance in time, but for now, they will start on washing machines, tumble dryers, fridges and stoves. They will be smaller than this, but still big enough to read. I've made them bigger for today just for our discussion. MODERATOR TO HAND EACH RESPONDENT LABEL 1 and LABEL 2 WITHOUT EXPLANATION AS WELL AS A SELF COMPLETION QUESTIONNAIRE. LET RESPONDENTS LOOK AT THE LABELS FOR A WHILE AND THEN INSTRUCT THEM TO ANSWER THE 3 QUESTIONS ON THE QUESTIONNAIRE

Draw a circle around the most energy efficient appliance, i.e. uses the least amount of electricity (is it label number 1 or label number 2)

Draw a circle around the bit of information that helped you to decide which label uses the least amount of electricity?

What kind of appliance do you think these two labels will be attached to? What tells you this?

Which of these labels uses the least amount of electricity? Show me what told you this on the label?

What is the main message you get about each label? Tell me first about label 1? What about label 2?

What is the main difference between each label? Where do you see that?

MODERATOR TO OBSERVE THE LEVEL OF COMPREHENSION EMERGING AND WHETHER OR NOT THE COMPARATIVE GRADING IS TELLING A CLEAR STORY

So if you were to explain to a friend the difference between the two appliances from looking at these labels, what would you tell them?

What are the key elements of design that help you tell the difference?

Let's just focus on label 1. When you first looked at it, what did you notice most? Was there anything that really stood out or grabbed your attention? Where did your eye go to first?

MODERATOR TO NOTE ANY PATTERNS IN MOST NOTABLE ELEMENTS

And what did you understand from what you looked at?

Was this the same or different in label 2? MODERATOR TO PROBE FOR ANY DIFFERENCES AND UNDERSTAND WHY

Let's look at each element of the label and try to understand what its role is and the information it is telling us MODERATOR TO PROBE EACH OF THE FOLLOWING

Function of each column (left parameter vs. right value)

Role of the arrow

Role of various font sizes (big vs. small)

Meaning of letters A to G

Meaning of colours

Information on top part of label (energy efficiency) vs. information on bottom part of label (additional product performance features)

Endorsement logo → Meaning? Role?

Overall, how do you feel about the labels ability to be understood?

Is there anything AT ALL that you find difficult to understand or is in some way confusing?

How do you think we could make this easier to understand? Is there a way of showing any information in another way?

[PROBE ENDORSEMENT LABEL – WHAT DOES THIS MEAN TO RESPONDENTS]

How do you feel about the balance between 'easy to understand' and technical information?

Is there too much or too little technical information?

Is the overall label attractive or not to look at?

Which part looks nicer in your eyes vs. may put you off in any way?

When you look at these 2 labels, do you believe that label 'x' will help you save money or not?

What parts of the label are saying you will save money?

Do you think any information is missing on this label? Anything that you would like to see that isn't there? MODERATOR TO SEE IF ANNUAL ENERGY CONSUMPTION OR ACTUAL COST SAVING AMOUNT COMES UP SPONTANEOUSLY. IF NOT ALREADY MENTIONED, PLEASE PROBE

How would you feel about having the actual SAR amount that the appliance would cost you to run over e.g. 1 month that the unit of energy? Would this make it easier or more difficult to make a decision between models?

How do you think that including this information will help communicate the overall message about the energy efficiency of the appliance?

Have you ever seen a label like this on any kind of appliance? If yes, where, when and on what appliance?

How does this one compare? Are you able to remember?

MOTIVATION

Be absolutely honest with me now, having read the story on energy efficiency standards for appliances, and having seen the labels in mind for appliances, how do you feel about the governments idea?

[MODERATOR NOTE: IF QUESTIONED, CLARIFY THE FOLLOWING:

*THE GOVERNMENT IS NOT DOING THIS TO MAKE MONEY, BUT RATHER TO MAKE WHAT WE HAVE LAST LONGER (FOR THE BENEFIT OF THE PEOPLE)
THIS WILL BE INTRODUCED IN 2013]*

The recommendation is to always have the label on the same place on the appliance, so that manufacturers cannot "hide" this information. Where would you say this label should be placed [i.e. on a fridge]. Do you think that this label should be able to be peeled off once purchased, or should it remain on the appliance? Why?

You mentioned all the criteria you look for when you are buying appliances (MODERATOR TO RECAP)

When the labelling idea is up and running, do you think that you will add a new criterion to your list how much electricity an appliance uses? MODERATOR TO ESTABLISH POTENTIAL OF LABELLING INITIATIVE TO TRANSFORM PURCHASE BEHAVIOUR

Thinking now about the cost of an energy efficient appliance, do you think they will cost more or less than the appliances that you have recently bought?

If yes, for what reason would it cost more? How much more would it cost to what you have just recently spent?

MODERATOR TO PROBE WHETHER EXTRA COST OF AN EXPENSIVE MODEL IS DUE TO ENERGY EFFICIENCY OR TO ADDITIONAL FEATURES ON THE APPLIANCE

These appliances will last for approximately 10 years ... how do you feel about that?

Would you be prepared to pay more for an energy efficient appliance knowing you will have the benefit of paying less for the electricity over the full ten years? **OR** If you pay less now for a less efficient model, you may pay more for the electricity it uses over the full ten years. How do you feel about that?

How much more would you be prepared to pay now for savings you will only have in small amounts over several years?

Communication about energy efficiency labelling initiative (10 mins)

The government plans to use the media, like TV and radio, to explain the appliance labelling initiative and help people understand what it is about.

From what you have learnt today, what are the most important things the government needs to communicate to people like yourselves to help them understand the idea?

Where would the best places be to reach people like yourselves so that you hear about the idea?

TV, radio, billboards, magazines, newspapers, email, internet, mobile telephones?

What times of the day are you most receptive to information? Where?

Appliance outlets → pamphlets, sales people?

Would you feel comfortable trusting a sales person's advice? How will you know that you are receiving the correct information?

Which parts of the concept / story should we keep and which should we take away?

Should we add anything more into the story to help it be clearer?

Should we be showing any parts of the label?

If so, which have the most impact to help you understand?
 Is there anything at all that you feel you would like to know more about?
 Or less about?
 Any particular questions or comments you have for our Client?

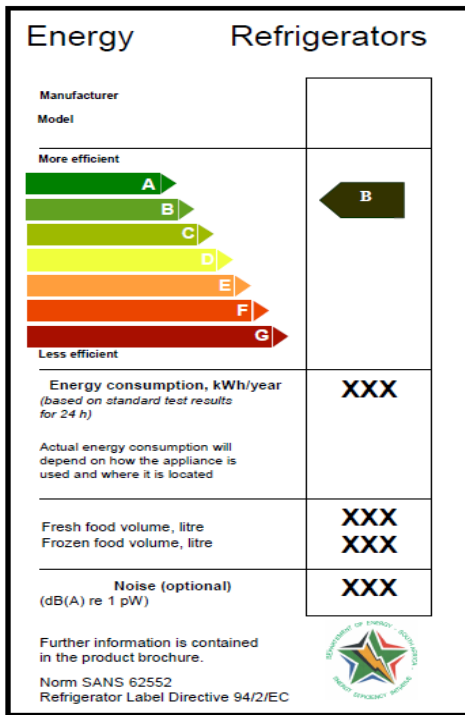
Q & A from observing team (5 mins)

Thank respondents and close
Total duration= 2 hours

9.5 Extract from SANS 62552: Household Refrigerator Appliances – Label Design

AA.2 Label design

AA.2.1 The label shall be in accordance with the following illustration:



AA.2.2 The colours that are used, are CMYK: cyan, magenta, yellow, and black.

EXAMPLE 07X0: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

Colours shall be used on the label as given in (a) to (e).

- a) Arrow colours: A: X0X0
 B: 70X0
 C: 30X0
 D: 00X0
 E: 03X0
 F: 07X0
 G: 0XX0

b) All text is in black.

c) The background is white.

d) The colours of the star should visually be the same as the colours used for the South African national flag.

e) The text around the star is in green.

9.6 Appliance Categories

Table 40: Appliance Categories

Appliance type	Category	Sub-category	
Cooling	Refrigerator	Big	
		Medium	
		Small	
	Freezer	Big	
		Medium	
		Small	
	Combination	Big	
		Medium	
		Small	
Cooking	Ovens	Big	
		Medium	
		Small	
Laundry	Washing machines	Top Load	
		Front Load	
		Twin tub	
	Tumble driers	Top Load	
		Front Load	
		Combination	
			Top Load
			Front Load
Air conditioners	Ducted		
	Non-ducted		
	Heat pumps		
Dishwashers	Floor standing	Big	
		Small	
	Table top		
	Built-in	Big	
		Small	
Geysers / water heaters	Storage tank		

9.7 Consumer Protection Act

M e m o r a n d u m

To: Unlimited Energy (Theo Covary)

From: Aimee Girdwood

Re: A high-level overview of the principles and mechanisms of the Consumer Protection Act as applicable to the labelling and performance requirements of electrical appliances envisaged by the Electrical Appliances Energy Efficiency Action Plan - Does the CPA provide consumers' with the regulatory support required to assist them in making responsible purchasing decisions of energy efficient electrical appliances and effectively enforce their rights to access energy efficient electrical appliances?

Date: 24 January 2012

I. INTRODUCTION

The Electrical Appliances Energy Efficiency Action Plan (the "Plan")^{vi} recognises as a key purpose the ability of consumers' to compare the energy efficiency performance of electrical appliances in making purchasing decisions, and have confidence in the performance of energy efficiency products.

The Plan states that the National Regulator for Compulsory Specifications will be tasked (by way of amendment to existing legislation^{vii}) with the regulation and enforcement of compulsory electrical appliance labelling and minimum energy performance requirements for manufacturers, retailers and importers of electrical appliances alike. The Consumer Protection Act (the "CPA"^{viii}) which seeks to promote and protect the consumer interest is an important complementary tool to the National Regulator for Compulsory Specifications Act ("Specifications Act")^{ix}. The right to redress that it affords consumers is potentially an important mechanism for encouraging and enforcing compliance with the energy efficiency standards for electrical appliances when these come into force.

What follows is a high-level overview of the principles and mechanisms of the CPA with a view to assessing its relevance and effectiveness in the implementation and enforcement of the labelling and performance requirements for electrical appliances envisaged by the Plan^x.

II. PRINCIPLES & MECHANISMS OF THE CPA

PRINCIPLES

The CPA seeks to promote fair business practices and protect the consumer interest in line with international best practice^{xi} and the principles of our Constitution^{xii}. It does so by establishing a comprehensive legislative framework that extends to all consumer-facing businesses that supply goods or services in the ordinary course of business, and *inter alia*, regulates a wide variety of market practices, introduces controls over the fairness of contracts and a modified product liability regime, and establishes substantial administrative machinery for consumer protection and redress in the form of the National Consumer Commission ("NCC") and the National Consumer Tribunal (the "Tribunal").

The CPA is broad in its application. In respect of product labelling and minimum performance standards of electrical appliances, the following is noteworthy:

the CPA specifies a non-exhaustive list of goods to which the Act applies^{xiii};
a “consumer” is defined broadly as a person (including juristic persons) to whom goods are marketed in the ordinary course of the supplier’s business; actual users of goods (irrespective of whether a person was a party to the transaction or paid for the goods) and persons who enter into transactions with suppliers in the ordinary course of that supplier’s business^{xiv}. Transactions involving the promotion or supply of goods to the State^{xv} or where the consumer is a juristic person^{xvi} whose asset value or annual turnover at the time of the transaction equals or exceeds R2 million^{xviii} are exempt from the provisions of the CPA^{xix};
it extends to all consumer-facing businesses. In particular it applies to all persons^{xx} who market, promote or supply goods^{xxi}. Foreign suppliers active in South Africa or suppliers that are not-for-profit entities or organs of state are specifically stated to be subject to the provisions of the CPA^{xxii};
it applies to all transactions for the supply (or potential supply) of goods in South Africa that are entered into in the ordinary course of business for consideration; the promotion of the goods, or of the supplier of the goods in South Africa^{xxiii}; and the goods themselves^{xxiv}. Certain transactions are exempt from application of the act^{xxv} including credit agreements under the National Credit Act. However, goods that are the subject of the credit agreement remain subject to the provisions of the CPA^{xxvi};
it sets out prohibited conduct and a number of fundamental consumer rights and the corresponding obligations of suppliers, producers, importers, distributors or retailers (as applicable in the context) including the consumer’s right to^{xxvii}:
information in plain and understandable language which the ordinary consumer with average literacy skills and minimal experience as a consumer of the relevant goods can be expected to understand without undue effort^{xxviii};
product labelling and description of the goods which must not be misleading or deceptive^{xxix};
fair and responsible marketing which must not be false or misleading in any way^{xxx}.

MECHANISMS AND RIGHT TO REDRESS

The consumer’s right to redress is arguably the most important right afforded by the CPA. Enforcement of the CPA is, in principle, also broad and far-reaching in:

the range of persons who may seek redress to enforce any right in terms of the CPA, a transaction, or otherwise resolve any dispute with a supplier - from the consumer himself to a person acting in the public interest or as a member of a group of affected persons^{xxxi};
that action may be taken against a person (defined broadly by the CPA as including a juristic person^{xxxii}) that has acted in a manner inconsistent with the act – whether for infringement or threatened infringement of consumer rights or for prohibited conduct;
that it provides for numerous *fora* in which redress can be sought – including the NCC, the Tribunal, a consumer court, an applicable ombud with jurisdiction, an alternative dispute resolution agent, a court of appropriate jurisdiction and the National Prosecuting Authority;
that it provides for proactive monitoring by the NCC of the realisation and enjoyment of consumer’s rights in practice^{xxxiii} (including the obligation to promote legislative reform to

achieve the fulfilment of these rights where necessary^{xxxiv}) and the ability of the NCC to directly initiate a complaint concerning any alleged prohibited conduct on its own motion^{xxxv};
the standard of proof in proceedings before the Tribunal and any consumer court is on a balance of probabilities^{xxxvi};
the Commissioner of the NCC has broad powers to issue a summons for investigation purposes^{xxxvii};
the Tribunal has the power to impose hefty penalties. The NCA provides that an administrative fine of up to 10% of the respondent's annual turnover for the preceding financial year or R1 million (whichever is the greater) may be imposed where the respondent is guilty of prohibited conduct or has not acted in accordance with required conduct^{xxxviii}. Contravention of the CPA may also result in, in certain instances, in a criminal conviction^{xxxix} or imposition of a penalty or both^{xl}.

III. GOING FORWARD: APPLICATION OF THE CPA IN PRACTICE

Although the CPA is considered to embody international best practice in its protection of the consumer interest in principle, its value as an enforcement tool for the energy efficiency standards for electrical appliances is dependent on the effectiveness and affordability of the enforcement mechanisms of the CPA.

The CPA has arguably not been in operation for long enough^{xli} for its effect, or the implementation thereof to be properly assessed and understood. However, a number of challenges are evident at this stage. These must be taken into account in the finalisation and implementation of the Plan, and in the proposed amendments to the Specifications Act, if the CPA is to play an effective complimentary role in the implementation and enforcement of labelling and performance requirements for electrical appliances.

Development of the principles of the CPA - The CPA, and the enforcement thereof through the NCC, the Tribunal and our courts alike is in its infancy. A development of an understanding of the act and its provisions is required to be developed through its application and the development of the common law over time. This will hopefully lead to an improved realisation and enjoyment of consumer rights in practice^{xlii}.

Awareness and education - Although there is arguably a broad awareness of the existence of the CPA, there is a general lack of education around what this means for consumers and suppliers alike in their day-to-day operations and dealings. What obligations are imposed, and protections afforded by the CPA? An effective implementation of the Plan requires that consumers and suppliers be educated about their rights, obligations and the potential liabilities imposed by the CPA; and that suppliers *inter alia*, evaluate their position in the supply chain, apportion risk contractually with their own suppliers, and consider whether their insurance cover is appropriate.

Limited redress for consumers in practice - Dispute situations may often boil down to a "he said/she said" scenario, with no proof on either side. This has the practical effect of the consumer's right of redress being limited or difficult to access. In considering the implementation of the Plan, consideration must be given as to how compliance with the energy efficiency and performance standards to be imposed by the Specifications Act are to be measured and verified, and how this information is to be made publically available. This also

requires consideration of: access to testing facilities and the costs involved; an understanding of how the Specifications Act and CPA mechanisms are to work together to police the energy efficiency and performance standards (and how any conflicts between the two are to be addressed); sufficient capacity and competence of staff to administer and monitor the implementation of the energy efficiency and performance standards.

Capacity and finances of the CPA - Although the Commissioner, Ms Mamodupi Mohlala, has attempted to address a number of alleged contraventions of the CPA by various companies over the last couple of months^{xliii}, allegations have surfaced in the public domain regarding a lack of capacity^{xliv} and sufficient funds for the NCC to carry out its mandate^{xlv}. On 11 November 2011 it was announced by the Department of Trade and Industry that an independent investigator has been appointed to look into the state of affairs at the NCC^{xlvi}. This is concerning given the pivotal role that the NCC will necessarily play in ensuring the success of the CPA, and must be addressed if the CPA is to play an effective role in the implementation of energy efficiency and performance standards.

9.8 South Africa BUENAS Analysis

*Virginie Letschert, Greg Leventis, Jing Ke and Michael McNeil
Lawrence Berkeley National Laboratory*

BUENAS is used to determine the potential savings of planned South African Minimum Efficiency Performance Standards (MEPS). The BUENAS methodology is described in *Bottom-Up Energy Analysis System – Methodology and Results* (McNeil, Letschert et al. 2011). BUENAS was highly customized in order to suit South African government priorities.

The following describes the inputs into the model and presents the national impacts of a possible set of MEPS based on the South African National Energy Efficiency Strategy ([Department Of Energy and Industry 2011](#)).

The version of BUENAS described in (McNeil, Letschert et al., 2011) included refrigerators, room air conditioners, televisions, fans, standby power and lighting. The first step of the analysis was to supplement these appliances with priority products taken from the National Energy Efficiency Strategy of the South African Department of Energy ([Department Of Energy and Industry 2011](#)). The following appliances were added:

- Reversible Split Air Conditioners (with a heating mode)
- Water Heaters
- Washing Machines
- Clothes Dryers
- Ovens
- Dishwashers
- Freezers

Sales Forecast

The second step of the analysis was to create a sales forecast for each of the appliances modeled in BUENAS.

Refrigerator/Freezer Sales

.Refrigerator/Freezer are separated into four product classes. Based on the EU labeling program ([EC 2010](#)), we divide the Refrigerator/Freezer into the following categories:

- Refrigerator, EU Category 1-6
- Refrigerator Freezer, EU Category 7 & 10
- Upright Freezer, EU Category 8
- Chest Freezer, EU Category 9

Sales data of refrigerators and freezers are provided between 2003 and 2008 by Euromonitor ([Euromonitor 2009](#)). The growth rate between 2003 and 2006 is found to be 12% for refrigerators and 9% for freezers. Sales drop in 2007 and 2008 due to what is thought to be a recession. Based on the sales data and lifetime profiles, we determine the stock of appliances in every year. By comparing the stock values to the recent saturation data found in the households ([AMPS 2010](#)), we are able to adjust historical sales data to reflect the number of appliances in use in the country. Before 2003, we find a growth rate twice lower than between 2003-2006 reflects the number of appliances in the stock in 2010 (refrigerators are found in 80% of households and freezers in 21%). Sales in 2011 have been estimated by different manufacturers to be around 1.2 million. We find that the recession has ended and that the growth rate found between 2003 and 2006 has prevailed after 2008. However, in order to keep a reasonable number of appliances in the stock, this high growth rate is not believed to be sustainable. After 2012, we assume a 1% growth in sales.

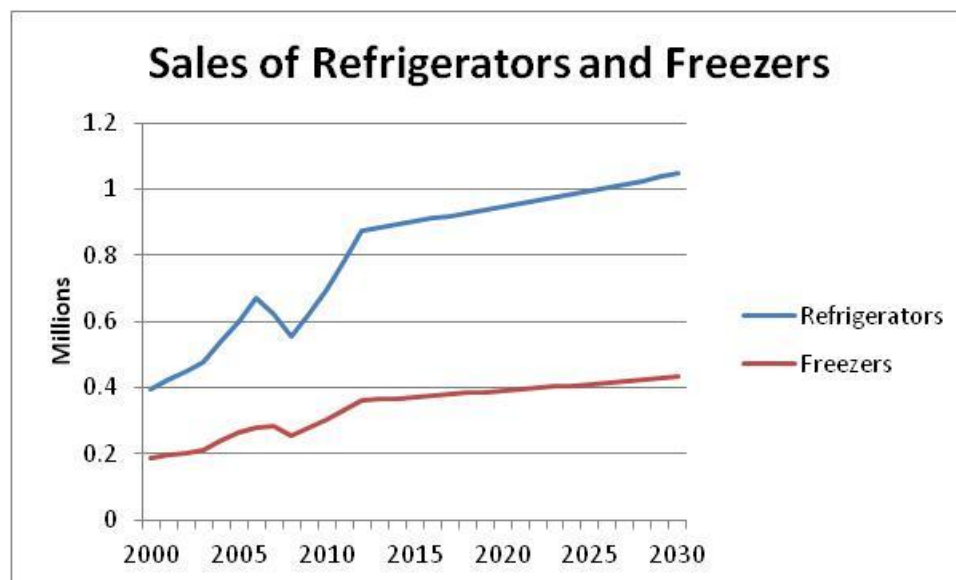


Figure 1 Sales of Refrigerators and Freezers: Historical data and Forecast

With these, we project an average of 1.55 refrigerator/freezers and 0.62 freezer per household in 2030. The rate of 1.55 refrigerators per household in 2030 may be acceptable, since a sizeable number of refrigerators may actually be installed in offices and small hotels. Refrigerators and freezers are modeled assuming a lifetime of 15 years.

Air Conditioners Sales

Air Conditioner sales between 2009 and 2014 are taken from BSRIA ([BSRIA 2010](#)). A constant growth rate based on the 2009-2014 growth rate is used to extrapolate the sales after 2014. The product classes considered are split units, and reversible split units. According to BSRIA, those product classes represent over 90% of the market. In our forecast we assume that by 2013 the whole market has shift to split units. By 2030, there are 2.3 million ACs in use in both commercial and residential sectors. Air conditioners are modeled assuming a lifetime of 10 years.

Water Heaters Sales

Water heater sales are estimated to be around 400,000 units per year in 2010⁹⁷. We find that if sales were growing at a steady rate between 1980 (year of introduction) and 2010, the number of water heaters in the stock would imply that 52% of households have a water heater, while the penetration in the residential sector was found to be 40% in 2010 (AMPS 2010). We attribute the difference in the calculated stock and the 2010 survey to sales going to the commercial sector. We find that 20% of the sales are going to commercial applications. In the forecast, we assume that sales will grow at a rate of 2% per year. In 2030, we estimate that 66% of households will have an electric water heater in their house (while the rest of them may have solar water heaters which are not covered in BUENAS). We find that 1.5 millions water heaters will be in use in the commercial sector by 2030. Water heaters are modeled assuming a lifetime of 15 years.

Washing Machine Sales

In order to match the current stock of washing machine we find that sales data provided by Freedonia have to be reduced by half. According to the Freedonia sales forecast, washing machine sales have been growing at a rate of 4.4% since 2002. By keeping this rate constant through 2030, we find that households have 0.72 washing machines per household by 2030. Washing machines are modeled assuming a lifetime of 15 years.

Clothes Dryers Sales

In order to match the current stock of clothes dryers we find that sales data provided by Freedonia have to be reduced by 20%. According to the Freedonia historical sales, clothes dryers sales have been growing at a rate of 6.8% since 2002. By keeping this rate constant through 2030, we find 0.65 clothes dryers per household by 2030. Clothes dryers are modeled assuming a lifetime of 15 years.

⁹⁷ Communication with Theo Covary. Figure was confirmed by the largest independent plumbing call centre which processes electric geyser insurance claims

Ovens Sales

Freedonia provides sales data for a wide range of cooking products. In order to disaggregate electric ovens from the rest of the products we use the stock data from the 2010 household survey⁹⁸. 62% of households own an electric oven in 2010. By keeping the Freedonia sales growth rate constant through 2030, we come up with an average penetration of 80% by 2030. Ovens are modeled assuming a lifetime of 19 years.

Dishwashers Sales

Freedonia sales are calibrated using the ([AMPS 2010](#)) penetration data in 2010. By keeping a constant growth rate to 2030, we find that 10% of households have a dishwasher by 2030. Dishwashers are modeled assuming a lifetime of 15 years.

Baseline UEC and Savings Assumptions:

Savings potential is modeled as arising from implementation of MEPS. The date of implementation of MEPS is assumed to be 2013. Unless noted otherwise, the base case we assume no improvement of efficiency in absence of standards.

Refrigerators

Refrigerator model characteristics are provided into two datasets for imported and locally manufactured models. We find that there is no significant domestic production of stand-alone refrigerators (EU Category 1-6) or upright freezers (EU Category 8). Conversely, there is little market for imported chest freezers (EU Category 9). In order to generate the weighted averages for refrigerator-refrigerator/freezers and freezers, we use the following matrix (determined with number of models in each category). The two databases are then brought together using estimated share of imports and domestic sales provided by Freedonia:

Table 1 Market Shares in Import and Local markets for each product class.

	Domestic	imports	overall
Refrigerator PC 1-6	0%	27%	8.7%
Refrigerator PC 7&10	100%	73%	91.3%
All Refrigerator/Freezers	68%	32%	100%
Freezer PC 8	0%	100%	31.8%
Freezer PC 9	100%	0%	68.2%
All Freezers	68%	32%	100%

Efficiency market shares are derived separately from the two datasets. UECs were not available for most of the domestically produced models, therefore we rely on average UEC derived from

⁹⁸ Penetration rates are provided for electric stoves in the survey. We assume that each electric stove comes with an electric oven.

imported models. We determine the UEC of the domestically produced models from the EEI ratings in combination with the average volumes found in both databases. For refrigerator/freezers (91% of the refrigerators market), the domestic market has an average size of 280L vs 360L for imports. We use the average UEC of the most representative efficiency level in order to determine the UECs in every efficiency level by using the Energy Efficiency Index (EEI) definitions of the labeling program to calculate a scaling factor ([EC 2010](#))⁹⁹.

In determining the MEPS target, we try to bring domestic manufacturers close to the level of imports. Because local manufacturers have indicated their efficiency target as being a B or a C,, we think that a level B for refrigerators and a level C for freezers is achievable.

The following tables show the base case results along with the targets (**in bold**) for the four product classes:

Table 2 Efficiency Market Shares and corresponding UEC for Refrigerators EU Category 1-6

	Imports	
	MS	UEC
	%	kWh
A++	8%	139
A+	38%	186
A	23%	232
B	6%	317
C	3%	401
D	3%	464
E	14%	528
F	3%	633
G	2%	739
Average		286

Table 3 Efficiency Market Shares and corresponding UEC for Refrigerators-Freezers EU Category 7 and 10.

Domestic		Imports		All	
MS	UEC	MS	UEC	MS	UEC
%	kWh	%	kWh	%	kWh

⁹⁹ The EEI is a dimensionless metric of the efficiency of the appliance. By using the EEI instead of the reported UECs, we eliminate the variations in the data due differences in capacity variation or other factors.

A++	0%	132	5%	170	2%	144
A+	0%	177	44%	226	14%	192
A	1%	221	41%	283	14%	240
B	46%	301	8%	386	34%	328
C	30%	381	0%	488	20%	415
D	4%	441	0%	565	3%	481
E	6%	502	1%	643	4%	546
F	7%	602	0%	771	5%	656
G	7%	702	2%	900	5%	765
Average		390		274		353

Table 4 Efficiency Market Shares and corresponding UEC for Upright Freezers EU Category 8.

	Imports	
	MS	UEC
	%	kWh
A++	15%	195
A+	56%	260
A	15%	325
B	7%	443
C	0%	561
D	0%	650
E	0%	738
F	7%	886
G	0%	1,034
Average		320

Table 5 Efficiency Market Shares and corresponding UEC for Chest Freezers EU Category 9.

Domestic	
MS	UEC
%	kWh

A++	0%	114
A+	0%	151
A	0%	189
B	0%	258
C	0%	327
D	0%	378
E	100%	430
F	0%	516
G	0%	602
Average		430

By combining table 1 and tables 2-5, we come up with market average UECs for refrigerators and freezers in the Business As Usual (BAU) and Efficiency scenario (EFF). In the EFF scenario, the market shares of inefficient appliances are rolled up to the level of the MEPS, while the more efficient products remain unaffected. For example, 70% of the refrigerator-freezers are at level B, while the shares of A, A+ and A++ remain the same (table 3).

Table 6 Market average UECs in the base case and the standard case.

	BAU market weighted UEC	EFF market weighted UEC
Refrigerator PC 1-6	286	233
Refrigerator PC 7&10	353	294
All Refrigerator/Freezers	347	289
Freezer PC 8	320	296
Freezer PC 9	430	327
All Freezers	406	320

Air Conditioners

In order to determine the consumption of air conditioners in South Africa, we calculate the average cooling and heating capacity of split ACs and split ACs with a reversible mode. It was found that Split ACs are 4kW on average, while Split ACs with a reversible mode are 4.5kW. We combined these capacities with hours of usage taken from other temperate climate countries like Australia or the EU. We assume 310 hours of cooling per year and 1464 hours of heating. Based on EERs and COPs associated with each efficiency rating, we calculate the average UEC associated with each efficiency level. We consider that an effective policy should affect at least 50% of the market, while some currently available models comply with the future standard. Therefore, we propose a MEPS at a level B for air conditioners.

Table 7 Efficiency Market Shares and corresponding UEC for Air Conditioners.

	Split Reversible		Split	
	MS	UEC	MS	UEC
	%	kWh	%	kWh
A++	6%	1798	0%	390
A+	6%	1895	0%	413
A	24%	2003	0%	439
B	12%	2124	75%	468
C	12%	2260	25%	501
D	18%	2415	0%	540
E	24%	2593	0%	585
Average		2241		476

Washing Machines

The average UEC for the rating with the largest sample size was calculated and the EEI defined in the EU labeling program for washing machine was used in order to generate the UECs for every efficiency level (EC 2010). Based on the market distribution we assume that a level A+ is a reasonable target level in order for the MEPS to have any impact on the market. The resulting market average UEC is 165 kWh (a 8% improvement over the base case)

Table 8 Efficiency Market Shares and corresponding UEC for Washing Machine.

	MS	UEC
	%	kWh
A+++	6%	132
A++	10%	150
A+	25%	170
A	58%	196
Average		181

Water Heaters

The market data for water heaters is pretty limited and therefore it is not meaningful to generate efficiency distribution. Based on tests done at the SABS over the past 2 years, it is known that most models are at least a level D. Using this, we calculate standard losses for the BAU and target levels according to the EU labeling program definition for the most common sizes (100L, 150L and 200L respectively 20%, 60% and 20% of the market). Given that some models already achieve the D level, we estimate that moving the whole market to a level C is achievable by 2013, which represent a 23% improvement over the baseline. In our analysis we also take into account the standard SANS 10400, which mandates that new commercial and industrial buildings use at least 50% less electricity for electric resistive water heaters (through the use of

solar or other sources). An estimated 17% of sales are installed in new buildings¹⁰⁰. Since the commercial sector accounts for 20% of sales, the impact of SANS 10400 is estimated to be a 1.7% reduction¹⁰¹ of the savings from a MEPS targeting appliances (assuming the standard is properly enforced by 2013)¹⁰².

Table 9 UEC for Water Heaters.

Capacity	UEC BAU at level D (kWh/year)	UEC EFF at level C (kWh/year)
100L	983	755
150L	1116	855
200L	1224	937
Average	1111	852

Dishwashers

The average UEC for the rating with the largest sample size was calculated assuming 280 cycles per year. The EEI defined in the EU labeling program for dishwashers was used in order to generate the UECs for every efficiency level ([EC 2010](#)). In order for the MEPS to have any impact on the market, we find that a level A+ is a reasonable target level. The resulting market average UEC is 268 kWh (a 6% improvement over the base case).

Table 10 Efficiency Market Shares and corresponding UEC for Dishwashers.

	MS	UEC
	%	kWh
A+++	2%	219
A++	15%	246
A+	26%	277
A	58%	312
Average		291

Dryers

We use the definition of the labeling program in order to calculate UECs for each efficiency level ([EC 1995](#)). The labeling program defines a variable of specific consumption C (kWh/kg/cycle). The number of cycles per year is calculated from the manufacturers reported data (57.5 cycles per year) and the average capacity of dryers has been found to be 8kg. Based on the market share distribution, and in order for the MEPS to have a sizable impact, we consider

¹⁰⁰ Communication with Theo Covary

¹⁰¹ Calculated as the product of a 50% reduction, 20% commercial market shares and 17% market segment for new constructions.

¹⁰² BUENAS only covers standby losses, not total water heating consumption. The SANS 10400 standard will have a higher impact on heating consumption.

the level B as our target level. The resulting market average UEC is 269 kWh (a 9% improvement over the base case).

Table 11 Efficiency Market Shares and corresponding UEC for Dryers.

	MS	UEC
	%	kWh
A	7%	235
B	38%	271
C	48%	308
D	0%	345
E	7%	382
Average		294

Ovens

Based on the different size categories found in the model database, an average consumption per cycle has been calculated as defined by the labeling program ([EC 2002](#)). Assuming 135 cycles per year, we are able to calculate the UEC for each efficiency level. Given that 79% of the market is already complying with a level A MEPS, we consider that a level A is a reasonable target level. The resulting market average UEC is 114 kWh (a 6% improvement over the base case).

Table 12 Efficiency Market Shares and corresponding UEC for Ovens.

	MS	UEC
	%	kWh
A	79%	114
B	19%	141
C	2%	168
D	0%	195
E	1%	222
Average		121

The following table summarizes the assumptions used in BUENAS:

Table 13 Average market weighted UEC in the Base Case and Efficiency Case, and corresponding efficiency target level.

End Use	BAU UEC (kWh/yr)	EFF UEC (kWh/yr)	Target Level
Clothes Washers	181	166	A+
Dishwashers	291	268	A+
Dryers	294	269	B
Freezers	406	320	C
Ovens	121	114	A
Refrigerators	347	289	B
Split ACs	476	469	B
Reversible Split ACs	2241	2063	B
Water Heaters	1111	852	C

Results and Conclusions

Results are shown in Table 14. Carbon savings are calculated using a carbon factor value of 1.03 kg/kWh in 2005, as provided by the Eskom annual report ([Eskom 2009](#)). The outputs of the BUENAS model are the following:

BAU (TWh)– Final electricity used by each end use in the Business as Usual (Base Case) in 2010, 2020 and 2030.

Growth (%) –average annual growth rate (AGR) of energy consumption of each end use between 2010-2020 and 2010-2030.

Savings (TWh)– difference in energy consumption between the BAU and efficiency case.

Savings % - percentage decrease in energy consumption for each end use.

CO₂ Emission Savings – CO₂ Emission mitigated between the BAU and efficiency case.

Table 14 Results Summary

End Use	2010		2020				2030				
	BAU	BAU	AGR	Savings	%	CO ₂	BAU	AGR	Savings	%	CO ₂
	TWh	TWh	2010-2020	TWh	Red.	Em	TWh	2010-2030	TWh	Red.	Em
Air Conditioner	1.7	2.6	4%	0.1	5%	0.1	3.5	8%	0.3	7%	0.3
Refrigerator	1.9	4.2	8%	0.4	10%	0.4	5.2	10%	0.8	16%	0.9
Water Heater	3.9	7.0	6%	0.9	13%	0.9	8.8	8%	1.9	22%	2.0
Clothes Dryers	0.3	1.1	12%	0.1	6%	0.1	1.8	18%	0.2	8%	0.2
Dishwashers	0.1	0.2	6%	0.01	5%	0.01	0.3	10%	0.02	8%	0.0

Ovens*	0.5	0.9	6%	0.03	3%	0.03	1.2	9%	0.1	5%	0.1
Washing Machines	0.5	0.9	7%	0.0	5%	0.0	1.3	10%	0.1	8%	0.1
Freezers	1.1	2.1	7%	0.3	12%	0.3	2.5	9%	0.5	20%	0.5
Total	10.0	18.9	7%	1.9	10%	1.9	24.6	9%	3.8	16%	4.0

The set of MEPS presented in this report is expected to achieve 1.9 TWh savings by 2020 and 3.8 TWh by 2030. 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.

The following figure shows the repartition of the savings in 2030. Water heaters and refrigerators/freezers represent over 75% of the potential savings.

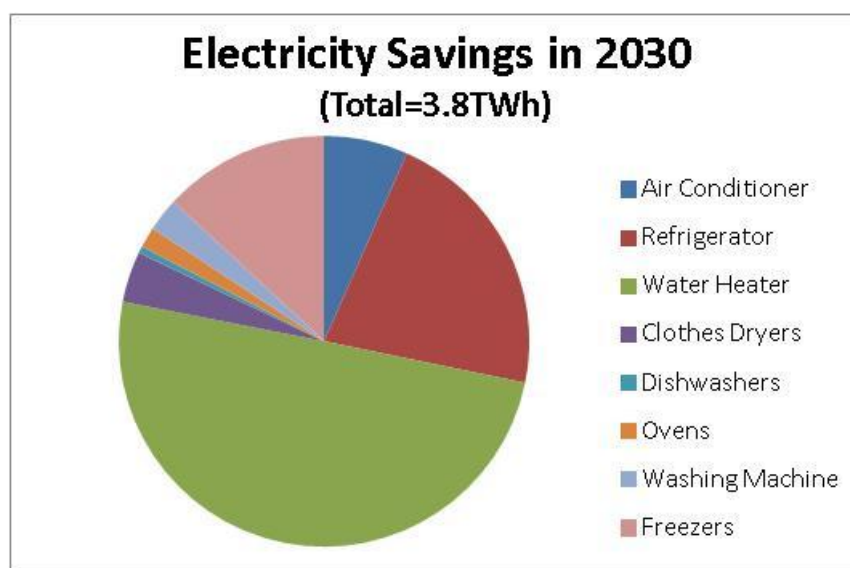


Figure 2 Electricity Savings in 2030

- **Water Heaters:** Given its relatively high diffusion in the South African households, high usage and low baseline efficiency, water heater provides the largest potential for savings.
- **Refrigerator and Freezers:** Imports being already efficient, we find a moderate potential for efficiency improvement by bringing domestically produced products close to the level of imports. Because of the wide penetration of refrigerator and freezers, they represent the 2nd largest potential for savings.
- **Air Conditioners:** In our forecast, the penetration of ACs stays low, while efficiency improvements are moderate. Given their high per unit usage (for reversible units), ACs are the 3rd appliance in terms of potential savings.
- The remaining appliances have a low penetration, a low usage and a high baseline efficiency level, so the impacts of MEPS are small, with the possible exception of dryers for which the growth in ownership makes it the 4th in terms of potential savings.

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Department Of Energy and D. O. T. A. Industry (2011). South African National Electrical Appliances Energy Efficiency Action Plan

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EC (2002). Commission Directive 2002/40/EC of 8 May 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric ovens.

EC (2010). Commission Delegated Regulation (EU) No 1059/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of household dishwashers.

EC (2010). Commission Delegated Regulation (EU) No 1060/2010 of 28 September 2010 with regard to energy labelling of household refrigerating appliances.

EC (2010). Commission Delegated Regulation (EU) No 1061/2010 of 28 September 2010 of the European Parliament and of the Council with regard to energy labelling of household washing machines.

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McNeil, M., V. E. Letschert, et al. (2011). Bottom-Up Energy Analysis System – Methodology and Results.

9.9 FRIDGE Workshop - Comments and Responses

The draft report was circulated to key stakeholders and a workshop was held where comments and concerns were raised. The following table provides a summary of the items raised and the responses and outcome.

Number	Source	Comment	Outcome / Response
1	KIC/ Whirlpool (Local Manufacturer)	Stated that it is not the case that a refrigerator of the same size and function but with a higher efficiency rating can be sold for less than its inefficient counterpart. This is because thicker (higher quality) insulation and/or compressors cost more	The consultants responded by saying that they agree that this generally is the case for most appliances but that the efficiency improvements for refrigerators have evolved to the extent now that an A rated appliance appears to be the global norm. This assertion is made based on actual information supplied by Defy and it is not a supposition
2	UNDP/GEF Representative	Stated that the 2013 MEPS being set now may be different by the time they come into effect in 2013 due to technology improvements. For example, a B rated refrigerator may be different to what it is now	The consultants stated that it is not likely that any regarding will take place in the EU standards between now and 2014. If there are improvement then a new category (A++++) will be introduced but the range of the B energy class will remain the same
3	KIC/ Whirlpool (Local Manufacturer)	Stated that KIC would be willing to comply with an A MEPS rating for refrigerators (rather than the B rating which is what has been recommended in this study)	The consultant responded that the level had been set based on the outcome of the research and the BUENAS modelling, however if all manufactures/distributors agreed to this higher level then the dti could consider this when they make their final decision. The dti (Anna-Marie Lotter) stated that this offer can only be included as a suggestion for consideration and that the findings of the report cannot be influenced by one party
4	UNDP/GEF Representative	How will the energy classes which fall below the MEPS be represented on the label?	The consultants said that this is an issue which has been raised in the report and that several viable options to address this issue have been put forward in Section 3.2
5	UNDP/GEF Representative	Would it be possible, as it may be more appealing to the consumer, if the savings were represented as a Rand (monetary) value and not just a kWh (electricity) saving	This suggestion had been considered and also discussed during the Focus Groups as is powerful however it was decided not to consider it as it has too many drawbacks. The key issues 1) each municipality charges a different tariff 2) the electricity tariffs increase every year which will mean that the labels will have to be reprinted annually which would unnecessary costs 3) The monetary savings would be different for each household due to different consumption patterns and this would create confusion. It was suggested that this information could be provided in percentage terms. For example, an A rated appliance is 10% more efficient than a B rated one.
6	UNDP/GEF Representative	Recycling could be part of the programme. This is happening in Brazil where the refrigerators are collected and ozone harming gases are safely removed. An incentive is also provided.	The suggestion was supported by all
7	Department of Trade and Industry	What investment would be required to improve the efficiency of locally manufactured models	KIC answered that based on what is required to upgrade their manufacturing plant and their sales volumes it would equate to an increase of approximately R50 / unit. The consultants said that Defy had indicated during the consultation process that it would result of an increase of approximately R100 / unit for them to upgrade
8	Department of Energy	What is the penetration rate of appliances?	The information is in the report. The KIC representative said that approximately 60%

			of the refrigerator market is below B but that the recommended MEPS could be achieved by 2013
9	Department of Trade and Industry	What would the real cost to manufacturers and consumers be if recommended MEPS were introduced?	The consultants said that this can only be ascertained by doing a comprehensive Cost Benefit Analysis. A CBA was attempted by LBL but insufficient data was supplied by the manufacturers. If one was required this could only be done if they agreed to cooperate fully. It was agreed by all present that this would be a worthwhile exercise.
10	KIC/ Whirlpool (Local Manufacturer)	Enquired about the cost of an awareness and promotion campaign and what is being planned	No decision has been made at this time. However, the KLA consultant stressed the importance of having everything in place before a message is sent to the consumer – the comparison was made between the Consumer Protection Act which was very successful and the e-tag which was not
11	South African Bureau of Standards	What is the benefit of having a centralised database	By keeping a detailed record of all the data of appliances in the marketplace, it would improve M&V tracking, performance of the programme, keep a detailed record of declarations made by distributors / manufacturers, guide future policy decisions and assist in information sharing with other countries
12	KIC/ Whirlpool (Local Manufacturer)	Would incentives be introduced to support the programme?	The consultants stated that this is the next step (after S&L) to encourage households to buy higher efficiency appliances. However no decisions had been made public at this stage. Eskom had considered a rebate scheme but decided not to proceed as effective M&V was not possible due to the lack of available data
13	National Regulator for Compulsory Specifications	Why the discrepancy between the EU MEPS for electric geysers and RSA MEPS?	The consultant's findings were that the local industry is using the lack of progress in the EU on this appliance to support their argument that no action be taken locally. The research has shown that these markets are very different and should not be compared. SA has a single energy source and a standard product so an upgrade is easily attainable
14	Unknown	Why do the same models have different model numbers in different countries?	KIC representative explained that this is normal practise. For example, an appliance in the EU market has a different plug fitting to one in the SA market they therefore have to adjust the model number for their internal purposes so that they are certain they are tracking the appropriate appliance for each territory

Notes to Consumer Protection Act (CPA)

- vi South African National Electrical Appliances Energy Efficiency Action Plan, Department of Energy & Department of Trade & Industry, August 2011
- vii (a consideration of which falls beyond the scope of this note)
- viii Act 68 of 2008
- ix Act 5 of 2008
- x Capitalised terms not defined or quoted in this memorandum are as defined in the CPA
- xi A Guide to the Consumer Protection Act; Evert van Eeden; 2009
- xii The Constitution of the Republic of South Africa; 1996
- xiii Section 1 of the CPA
- xiv (and where the transaction is not exempt)
- xv Section 1 of the CPA
- xvi Section 5(2)(a) of the CPA
- xvii This includes a company, close corporation, body corporate, partnership, association and trust
- xviii Section 5(2)(b) of the CPA. This is the threshold value determined by the Minister in terms of section 6 of the CPA as set out in GN 294 of 1 April 2011 (Determination of threshold in terms of the Act)(*Government Gazette* No. 34181)
- xix Refer to section 5(2) of the CPA for a full list of the categories for exemption. It is important to note that even if a transaction is exempt, where the goods are supplied in South Africa, certain provisions of the CPA will nevertheless apply to the goods themselves and the importer, producer, distributor and retailer of the goods (section 5(5) of the CPA). This relates to the safety monitoring and recall of the goods and liability for damage caused by the goods
- xx Including juristic persons
- xxi Section 1 of the CPA
- xxii Section 5(8) of the CPA
- xxiii This includes the display or marketing of the goods, expressing a willingness to supply the goods, or inducing a consumer to enter into a transaction
- xxiv Section 5(1) of the CPA
- xxv Sections 5(2), (3) and (4) of the CPA
- xxvi Section 5(2)(d) of the CPA
- xxvii Note that this memorandum does not set out an exhaustive list of the consumer's rights as set out in the CPA – but sets out on a high-level basis, those that are most relevant in the context of product labelling and minimum performance standards of products
- xxviii Section 22 of the CPA
- xxix Section 24 of the CPA. Note that this obligation applies to a “person” and therefore applies to a far wider ambit of persons than a supplier alone ie. this provision potentially applies to a retailer, manufacturer, importer etc of the relevant goods
- xxx Section 29 of the CPA. This section is specifically stated to apply to producers, importers, distributors, retailers and service providers alike. Section 41 of the CPA sets out in detail what is meant by the term “false, misleading or deceptive representations”
- xxxi Section 4(1) of the CPA
- xxxii ie. this potentially applies to a retailer, manufacturer, importer etc of the relevant goods
- xxxiii Section 3(2) of the CPA
- xxxiv Section 94 of the CPA
- xxxv Section 71 of the CPA
- xxxvi Section 117 of the CPA
- xxxvii Section 102 of the CPA
- xxxviii Section 112 of the CPA
- xxxix Resulting in a prison sentence of up to 10 years (section 111 of the CPA)
- xl Section 111 of the CPA
- xli since 1 April 2011 (the CPA came into effect in its entirety on 31 March 2011)
- xliv For example, some of the provisions and definitions in the CPA may be open to differing interpretations at this stage

^{xliii} www.madeasy.co.za/index.php?news_article+20686+home published 5 December 2011; www.madeasy.co.za/index.php?news_article+20356+home published 7 October 2011 in the Business Report; www.madeasy.co.za/index.php?news_article+20268+home published 4 September 2011 in the Sunday Times;

www.madeasy.co.za/index.php?news_article+19635+home published 18 July 2011 in the Business Report

^{xliv} For example, a search of the www.hellopeter.com complaints website reveals a number of complaints that have been levied against the NCC itself in the period October to December 2011 for failure to address and respond to the complaints of consumers

^{xlv} On 10 November 2011, the Department of Trade and Industry issued a statement that the NCC has been allocated R33 million for the current financial year, and that it will assist the NCC with additional donor funds should a shortfall in funding occur

(www.info.gov.za/speech/DynamicAction?pageid=461&sid=23135&tid=48737)

^{xlvi} www.info.gov.za/speech/DynamicAction?pageid=461&sid=23135&tid=48737;

www.businessday.co.za/articles/Content.aspx?id=158435 published on 11 November 2011. It was stated that the findings of this report would be made available within 3 weeks from 11 November 2011 – however, I have not been able to find any statements regarding the findings as at the date of preparing this memorandum.