REVIEW OF SOUTH AFRICA’S APPLIANCE ENERGY CLASSES AND RECOMMENDED CHANGES TO EXISTING MINIMUM ENERGY PERFORMANCE STANDARDS

Stakeholder workshop

30 November 2018
Presentation structure

1. Scope of work and boundaries
2. High-level recommendations
3. Detailed level assessment
4. Q&A
1. Scope and study boundary
Scope

1. Purpose:
   - Update and review existing information
   - Determine whether there is **scope for improvement** and identifying possible effects on testing capacities and the regulator

2. Data sources:
   - Euromonitor, 2017
   - AMPS data
   - In-house developed database of electric appliances (web crawling, brochures, etc.)
   - Interviews with the industry representatives

3. Approach:
<table>
<thead>
<tr>
<th>Compulsory specification</th>
<th>Appliance type</th>
<th>Mandatory MEPS level</th>
<th>Study boundary and approach</th>
</tr>
</thead>
</table>
| VC 9006                  | Audio and video equipment | Standby Power (<1 Watt) | ✓ | Review what is adopted in other countries  
                           |                             |         | Recommend reasonable level and additional items |
| VC 9008                  | Washer-dryer combinations | Class A | ✓ | Assess whether the existing Class A still stands  
                           |                             |         | Advise on any action required |
| VC 9008                  | Washing machines | Class A | ✓ | Assess whether the existing Class A still stands  
                           |                             |         | Advise on any action required |
| VC 9008                  | Tumble dryers | Class D | ✓ | Investigate improvement to Class C and Class B  
                           |                             |         | Engage with industry participants to gauge their views |
| VC 9008                  | Electric ovens | Class B – large Class A – s/m | ✓ | Investigate if Class B for large EO can be improved to Class A and if Class A for s+m still stands  
                           |                             |         | Engage with industry participants to gauge their views |
| VC 9008                  | Freezers | Class C | ✓ | Investigate improvement to Class B and Class A  
                           |                             |         | Engage with industry participants to gauge their views |
| VC 9008                  | Refrigerators | Class B | ✓ | Investigate improvement to class A  
                           |                             |         | Engage with industry participants to gauge their views |
| VC 9008                  | Dishwashers | Class A | ✓ | Assess whether the existing Class A still stands  
                           |                             |         | Advise on any action required |
| VC 9008                  | Air-conditioners and heat pumps | Class B | ✓ | Detailed assessment of split AC units (incl res and com)  
                           |                             |         | Determine potential to improve MEPS  
                           |                             |         | Engage with distributors and determine barriers |
| VC 9091/VC 8043          | Electric lamps | tbc | Excl | No approved national standard |
| VC 9006                  | Electric water heaters | Class B | Excl | Recently updated to Class B |
2. High-level recommendations
Summary of recommendations to MEPS levels

Audio-Visual
Current: SBP 1 W
YES: reduce to .5W

Electric ovens
Sm/Med: Class A
Large: Class B
NO: Small/Med - retain
YES: Class A for large by 2020

Dishwasher
Current: Class A
No: retain as is

Washer-Dryers
Current: Class A
No: Watch EU brief

Washing Machine
Current: Class A
YES: Class A+ by 2022

Tumble Dryers
Current: Class D
YES: Class C by 2020

Refrigerators
Current: Class B
YES: Class A by 2020 and A+ by 2026

Freezers
Current: Class C
YES: Class B by 2020, A by 2022, and A+ by 2026

Air conditioners
Current: Class B
YES: for split systems

Yes/No - Proposed changes
**Additional recommendations to non-affected EA**

### Dishwasher
- **Current:** Class A
- **No:** retain as is

- Specifying MEPS with a **benchmark for cleaning and drying performance** for new dishwashers
- Adopt a more **up to date test method** with the new reference machine and the measurement of low power modes
- **Realign labelling requirements** to include low power mode energy

### Washer-Dryers
- **Current:** Class A
- **No:** Watch EU brief

- Investigate **ways to differentiate between heat pump and conventional washer-dryers**. Possible considerations could include the development of a programme that endorses heat pump washer-dryers.
- **Maintain a watching brief** on regulatory activities in Europe (re-grading back to A and G)
3. Detailed level assessment
Refrigerators

Current MEPS:
• Class B

Rationale:
• Market dominated by local assemblers (Class C and D)
• Imported appliances - Class A
• Local manufactures accepted the need to eliminate inefficient models

Regulated items:
• Fridges/single-door refrigerators
• Combined fridge-freezers
Market Description

- **Fridge-freezer combos are considered essential**
  - 70% penetration rate
  - 1.3 million units sold in 2017 (~R9 652m)
  - Steady growth projection, particularly among low to middle income HHs

Source: Analysis based on AMPS data, 2010-2016
Market Composition

- Dominated by locally manufactured/assembled fridge-freezers

<table>
<thead>
<tr>
<th>Appliance</th>
<th>Estimated annual inventory</th>
<th>Total units sold p.a.</th>
<th>Estimated value of the market (R’m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Imports</td>
<td>Locally manufactured or assembled</td>
<td></td>
</tr>
<tr>
<td>Fridges</td>
<td>4 100</td>
<td>37 300</td>
<td>41 400</td>
</tr>
<tr>
<td>Fridge-freezers</td>
<td>208 900</td>
<td>671 200</td>
<td>1 301 300</td>
</tr>
</tbody>
</table>

Source: Euromonitor, 2017

- Market shares:

![Brand Shares: Fridge (2017)]

![Brand Shares: Fridge-freezers (2017)]

Source: Euromonitor, 2017
Most Popular Fridge – Freezer Combo

- Most common:
  - Top freezer
  - Small sizes of <142 l and 142-340 l

Source: Euromonitor, 2017
Prices and Energy Efficiency

• Bulk of units available are of higher energy efficiency (Class A or better)

• Prices vary significantly:
  – Price = f(Size, Energy rating, Brand, Features)

Refrigerators

- **KIC**: Model P; Top freezer, Reversible bottom shelf, G 216L / N 215L (Energy rating A) - R2 999
- **Defy**: Model Q; Bottom freezer, Reversible doors, G 365L / N 350L (Energy rating A) - R6 499
- **Defy**: Model R; Side by side, G 625L / N 559 L (Energy rating A) - R9 999
- **Samsung**: Model S; Top freezer, with dispenser, G 629L G / N 618L (Energy rating A+) - R14 999
- **LG**: Model T; Bottom freezer, with dispenser, G 496L / N 440L (Energy rating A++) - R15 799
- **HiSense**: Model U; French door (3 door), with dispenser, G 720L / N 536 L (Energy rating A+) - R15 999
- **Bosch**: Model V; Side by side, with dispenser, G 608L / N 530 L (Energy rating A+) - R16 899

Source: Web-crawling and retail store visits, Q2 2018
MEPS Opportunities

• Most regulated product for energy efficiency globally

• Europe:
  – Class A in Europe was introduced in 2010
  – Europe took two years to increase from A to A+
  – Definitions for Class A+ tightened in 2014

• Europe tighter for smaller products, US – tighter for large products

• European markets are dominated by a wide range of high efficiency refrigerators and freezers, i.e. A+++
### Impact Analysis

**Fridge-freezer assumptions**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level B</th>
<th>MEPS level A</th>
<th>MEPS level A+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>93 to 203 l</td>
<td>220 – 233 l</td>
<td>219 l</td>
</tr>
<tr>
<td>Annual electricity consumptions</td>
<td>247 kWh</td>
<td>236 kWh</td>
<td>121 kWh</td>
</tr>
<tr>
<td>Average prices</td>
<td>R2 759</td>
<td>R3 149</td>
<td>R3 799</td>
</tr>
</tbody>
</table>

### Fridge-freezer savings and cost calculations

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level B</th>
<th>MEPS level A</th>
<th>MEPS level A+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost difference</td>
<td>-</td>
<td>R390</td>
<td>R1 040</td>
</tr>
<tr>
<td>Electricity savings – per annum</td>
<td>-</td>
<td>11 kWh</td>
<td>126 kWh</td>
</tr>
<tr>
<td>Electricity savings - %</td>
<td>-</td>
<td>4%</td>
<td>51%</td>
</tr>
<tr>
<td>Electricity savings – Rand value</td>
<td>R14</td>
<td>-</td>
<td>R 160</td>
</tr>
<tr>
<td>Change in cost vs savings payback period</td>
<td>-</td>
<td>28 years</td>
<td>6 years</td>
</tr>
<tr>
<td>Appliance lifespan</td>
<td>14-17 years</td>
<td>14-17 years</td>
<td>14-17 years</td>
</tr>
</tbody>
</table>

- Nation-wide electricity savings of 9 -10 GWh per annum
Recommendations

• Introduce **Class A for refrigerators by 2020 and Class A+ by 2022**
  – Option 2: Class A+ for 2021

• **Review the calculation methodology** by considering:
  – removal of the built-in, chiller and climate factors in the reference equation
  – reducing the frost-free factor

• **Conduct a detailed review of refrigerator requirements**
  – SA’s requirements are not aligned with Europe
  – Europe considering a change to the new IEC test method and label re-grading by 2020
Electric ovens

Current MEPS:
• Small/Medium - Class B
• Large: Class C

Rationale:
• Dominated by locally produced units (av. Class B)
• Imported product – Class A

Regulated items:
• Small oven: 12 litres - 35 litres
• Medium oven: 35 litres - 65 litres
• Large oven: cavity volume ≥ 65 litres
Market Description and Composition

• The market is subdivided into built-in and free-standing (cooker) types
  – Cookers are the most common in SA
  – Ownership: 3 out of 4 households
• Collectively, 576 300 units were sold in 2017 (~R2 930.8m)
• Future growth:
  – Sales are expected to increase to 736 700 units in 2022
  – Cookers CAGR – 5.4%
  – Ovens CAGR – 4.2%
• Dominated by local manufacturers:

<table>
<thead>
<tr>
<th>Appliance</th>
<th>Estimated annual inventory</th>
<th></th>
<th>Total units sold p.a.</th>
<th>Estimated value of the market (R’m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Imports</td>
<td>Locally manufactured or assembled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cookers</td>
<td>126 200</td>
<td>459 000</td>
<td>409 600</td>
<td>1 006.3</td>
</tr>
<tr>
<td>Ovens (Built-in)</td>
<td>42 400</td>
<td>158 200</td>
<td>162 800</td>
<td>1842.2</td>
</tr>
<tr>
<td>Range cookers</td>
<td>Unknown</td>
<td>Unknown</td>
<td>3 900</td>
<td>82.3</td>
</tr>
</tbody>
</table>

Source: Euromonitor, 2017
Market Composition

- Defy dominates both cookers and built-in ovens market

Source: Euromonitor, 2017
Prices

- Cookers (R) > Built-in (R)
- Convection ovens (R) > Static configuration (R)

- **Defy**: Model P; Freestanding, static oven, 57 L (Energy rating A) - R5 499
- **Sunbeam**: Model Q; Freestanding, convection oven, 88 L (Energy rating unknown) - R7 999
- **Defy**: Model R; Built-in, Static oven, with removable door 81L (Energy rating A) - R2 599
- **Whirlpool**: Model S; Built-in, convection oven, 60 L (Energy rating A) - R2 999
- **Bosch**: Model T; Built-in, eye-level, convection oven, 67 L (Energy rating A) - R2 999
- **AEG**: Model U; Built-in, eye-level, thermic hot air cooking, 72 L (Energy rating A) - R6 099

Source: Web-crawling and retail store visits, Q2 2018

- Most large-size ovens – Class A
MEPS Opportunities

• Relatively few countries have MEPS for ovens
  – Brazil, Costa Rica, Israel, Switzerland, North America (Mexico, USA, Canada), Russia (outdated)

• European new MEPS timetable is as follows:
  – 20 February 2015: EEI < 146 (eliminates bottom half of Class C)
  – 20 February 2016: EEI < 121  (eliminates bottom half of Class B)
  – 20 February 2019: EEI < 96  (eliminates bottom half of Class A)

• In Europe, there are very few models that can achieve an efficiency significantly better than Class A
## Impact Analysis

### Large electric ovens assumptions

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MELS level B</th>
<th>MEPS level A</th>
<th>MEPS level A+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>80 – 86 l</td>
<td>60 - 78 l</td>
<td>60 - 76 l</td>
</tr>
<tr>
<td>Annual electricity consumptions</td>
<td>221.2 kWh</td>
<td>156 kWh</td>
<td>143.5 kWh</td>
</tr>
<tr>
<td>Average prices</td>
<td>R5 932</td>
<td>R5 419</td>
<td>R10 549</td>
</tr>
</tbody>
</table>

### Large electric ovens savings and costs calculations

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MELS level B</th>
<th>MEPS level A</th>
<th>MEPS level A+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost difference</td>
<td>-</td>
<td>-R513</td>
<td>R4 617</td>
</tr>
<tr>
<td>Electricity savings – per annum</td>
<td>-</td>
<td>65 kWh</td>
<td>78 kWh</td>
</tr>
<tr>
<td>Electricity savings - %</td>
<td>-</td>
<td>29%</td>
<td>35%</td>
</tr>
<tr>
<td>Electricity savings – Rand value</td>
<td>R83</td>
<td>R99</td>
<td></td>
</tr>
<tr>
<td>Change in cost vs savings payback period</td>
<td>-</td>
<td>-</td>
<td>99 years</td>
</tr>
<tr>
<td>Appliance lifespan (years)</td>
<td>13-20</td>
<td>13-20</td>
<td>13-20</td>
</tr>
</tbody>
</table>

- Nation-wide electricity savings of 11 to 13 GWh per annum
Recommendations

• Leave MEPS at Class A for small and medium ovens
• Increase MEPS for larger ovens to Class A by 2020
• Rectify the typo in oven sizes in VC 9008
Audio-visual Appliances

Current MEPS:

- Audio & video equipment (passive standby mode): $\leq 1\, W$
- Set top box (passive stand by mode): $\leq 3\, W$

Regulated items:

- TV sets
- Projectors
- Video recording equipment
- Simple set top boxes (SSTBs)
- Audio equipment
- Multi-function equipment for consumer use
## Sales of Home Video Equipment

### 2017 Market Share

<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home video</td>
<td>1,220</td>
<td>100%</td>
</tr>
<tr>
<td>TVs</td>
<td>1,163</td>
<td>95.3%</td>
</tr>
<tr>
<td>Analogue TVs</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>LCD TVs</td>
<td>1,163</td>
<td>100%</td>
</tr>
<tr>
<td>Plasma TVs</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>TV Combis</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Video Players</td>
<td>57</td>
<td>4.7%</td>
</tr>
<tr>
<td>Blu-Ray</td>
<td>32</td>
<td>57%</td>
</tr>
<tr>
<td>DVD players</td>
<td>25</td>
<td>43%</td>
</tr>
<tr>
<td>Video players</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### 2017 Growth and 2012-2017/2017-2022 CAGR

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth</th>
<th>CAGR 2012-2017</th>
<th>CAGR 2017-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home video</td>
<td>▲ 4.9%</td>
<td>▲ 3.4%</td>
<td>▲ 8.7%</td>
</tr>
<tr>
<td>TVs</td>
<td>▲ 6.9%</td>
<td>▲ 5.7%</td>
<td>▲ 9.4%</td>
</tr>
<tr>
<td>Video Players</td>
<td>▼ 24.3%</td>
<td>▼ 17.4%</td>
<td>▼ 13.8%</td>
</tr>
<tr>
<td>Blu-Ray</td>
<td>▼ 3.3%</td>
<td>▲ 7.8%</td>
<td>▼ 4.2%</td>
</tr>
<tr>
<td>DVD players</td>
<td>▼ 41.0%</td>
<td>▼ 27.8%</td>
<td>▼ 7.5%</td>
</tr>
</tbody>
</table>

Source: Euromonitor, 2017
The market is dominated by three global brands
- Samsung
- LG
- Hisense

The three top brands doubled their market share between 2008 and 2017
- 41.3% to 83.7% in 2017

Source: Euromonitor, 2017
## Distribution of LCD TVs by standby mode (sample of 61 models)

<table>
<thead>
<tr>
<th>Standby mode</th>
<th>Number of models (LCD TVs)</th>
<th>Brands</th>
<th>% Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 W</td>
<td>3</td>
<td>Panasonic, Sharp</td>
<td>5 %</td>
</tr>
<tr>
<td>0.45 W</td>
<td>1</td>
<td>Sharp</td>
<td>2 %</td>
</tr>
<tr>
<td>0.5 W</td>
<td>40</td>
<td>Samsung, LG, Telefunken, Sinotec, HiSense, Philips, Panasonic, Skyworth, Sansui</td>
<td>66 %</td>
</tr>
<tr>
<td>0.6 W</td>
<td>1</td>
<td>Sharp</td>
<td>2 %</td>
</tr>
<tr>
<td>1.0 W</td>
<td>16</td>
<td>HiSense, Blaupunkt</td>
<td>26 %</td>
</tr>
</tbody>
</table>

Source: Sample database compiled by project team, Q1-Q2 2018
MEPS Opportunities

• Most comprehensive regulations → Europe
  – @ 0.5W and looks at reducing to below 0.3
  – A comprehensive list of items:
    • Household appliances (14 types nominated)
    • Information technology equipment used in the domestic environment
    • Consumer equipment (primarily audio and visual equipment)
    • Toys, leisure and sports equipment.

• Most countries integrate low power mode energy consumption into their total energy consumption estimates (instead of having a separate requirement)
  – Europe, N. America, Japan, Australia
Recommendations

1. Lower the current standby power level to 0.5 W by 2020
2. Align requirements for simple set top boxes with EC No 107/2009 by 2020

<table>
<thead>
<tr>
<th>Product and function where present</th>
<th>Standby mode</th>
<th>Active mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple set top box</td>
<td>0.5 W</td>
<td>5.0 W</td>
</tr>
<tr>
<td>+ adder for display function</td>
<td>0.5 W</td>
<td>-</td>
</tr>
<tr>
<td>+ adder for hard disk</td>
<td>-</td>
<td>6.0 W</td>
</tr>
<tr>
<td>+ adder for second tuner</td>
<td>-</td>
<td>1.0 W</td>
</tr>
<tr>
<td>+ adder for decoding HD signals</td>
<td>-</td>
<td>1.0 W</td>
</tr>
</tbody>
</table>

3. Consider expanding the scope of standby power limits to a wider range of products, for example:
   - Kitchen appliances: microwaves; toasters; grinders, coffee machines and equipment for opening or sealing containers for packages; electric knives
   - Grooming and beauty: Appliances for hair cutting, tooth brushing, shaving, massage and other body care appliances; scales
   - Toys: Electric trains or car racing sets; hand-held video game consoles; and sports equipment with electric or electronic components
Washing Machines

Current MEPS:
• Class A

Rationale:
• Market exclusively dominated by imports
• Average energy class of appliances was equivalent to proposed

Regulated items:
• Automatic washing machines for household use
  ○ Front loading
  ○ Top loading

Excludes: Twin Tub
Market Description & Composition

- Perceived as non-essential items in lower-income and some middle-income households, but high market penetration at middle to high income
  - LSM 6, 7, and 9 show the greatest growth in use
- About 475 000 automatic washing machines sold in SA per annum
  - Sales anticipated to increase to 616 800 units in 2022
  - Front loading to top loading – 2 : 1 ratio
- Locally assembled machines dominate the market
  - Ratio of 7 : 2 (locally assembled versus imported)
- Most popular in SA: front loader (6-10kg)

Source: Web-crawling and retail store visits, Q2 2018
Market Shares and Stock

**Most popular:**
- Defy and LG
- Samsung and BSH group

**Stock:**
- Top loaders – dominate the market
- Dominated by LSM 7-10
- Largest absolute growth: LSM 6, 7 and 9
- Fastest growth: LSM 4-6

Source: Euromonitor, 2017
Source: Analysis based on AMPS data, 2010-2016
MEPS Opportunities

• Over 20 countries have MEPS for washing machines
  – Countries like Australia and Japan have a labelling programme and not MEPS

• Majority of countries use European requirements

• Europe has the most stringent MEPS levels globally (2014)
  – A+ (EEI of <59) for machines with rated capacity ≥ 4kg

<table>
<thead>
<tr>
<th>2015 European market share</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>21%</td>
</tr>
<tr>
<td>A++</td>
<td>21%</td>
</tr>
<tr>
<td>A+++</td>
<td>55%</td>
</tr>
</tbody>
</table>
Recommendations

• **SA MEPS level is comparable** to most stringent level in countries with MEPS for washing machines

• Retain the **current Class A for the next few years**
  – Efficiency gains between A and A+ are about 13% (front loaders)
    • In SA this may be even lower – lower temperatures and smaller loads
  – Top loaders are less EE and an increase to A+ may take them off the market (and limit consumer choice)

• **Increase the MEPS level to Class A+ by 2022** to align with current European requirements

• Monitor development in Europe regarding regrading (return to A to G)
Tumble dryers

Current MEPS:
• Class D

Rationale:
• Market was saturated by locally produced tumble dryers with average MEPS of Class D
• Imports were at Class C
• Class D recommended to safeguard local industry

Regulated items:
• Tumble dryers for household use
Market Description and Composition

- Tumble dryers are **secondary to washing machines**
  - Sales ratio of 1:6 (tumble dryer versus washing machine)

- Tumble dryers:
  - 82,100 tumble dryers sold in 2017 (~R624m)
  - Stock is expected to decay in the future (replaced by washer-dryer combo)

- The **market is still dominated by local manufacturers/assemblers**
  - Only 3.3% of annual stock is imported

- Prices:
  - Air ventilated < Condenser
  - Locally assembled < Imported
  - More EE approach costs of a washer-dryer combo

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Defy: Model P; Air vented, 5kg capacity (Energy rating D)  
Bosch: Model Q; Condensing, 8kg capacity (Energy rating B)  
Samsung: Model R; Condensing, 8kg capacity (Energy rating B)  
LG: Model S; Condensing, 9kg capacity (Energy rating B)

Source: Web-crawling and retail store visits, Q2 2018
Market Shares and Stock

- **Most popular:**
  - Defy
  - BSH group
  - Samsung and LG

- **Stock:**

  ![Bar chart showing market shares]

  **Historical stock - Tumble dryers**
  - 2010: 1,251,330
  - 2011: 1,276,557
  - 2012: 1,254,986
  - 2013: 1,240,486
  - 2014: 1,232,776
  - 2015: 1,129,866
  - 2016: 1,139,079

  **Projected stock**
  - 2017*: 1,121,375
  - 2022*: 1,036,898
  - 2027*: 958,784
  - 2032*: 886,555

Source: Euromonitor, 2017

Source: Analysis based on AMPS data, 2010-2016
MEPS Opportunities

- Tumble dryers *rely mostly on resistance heating*
  - Differences in energy consumption between resistance heating dryer models are generally small (and can only achieve up to Class B)

- **Greater efficiency achieved with new technology – heat pumps**
  - Invented in 1997 but was expensive
  - Widely used since 2009 with prices falling dramatically

- Heat pump dryers are more energy efficient than conventional resistance dryers
  - Heat pump dryers mostly A++ and above; resistance heating dryers - Class D to B
  - In Australia, revealed energy savings ~60%

- **Few countries outside of Europe have MEPS levels for dryers**
  - US has the most stringent MEPS level but their test method is somewhat questionable
  - Switzerland is the only country with a MEPS level that can only be met through heat pump dryers
Impact Analysis

Tumble dryer assumptions

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level D</th>
<th>MEPS level C</th>
<th>MEPS level B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>5 kg</td>
<td>6-8 kg</td>
<td>7-9 kg</td>
</tr>
<tr>
<td>Energy usage per cycle</td>
<td>4.7125 kWh</td>
<td>-</td>
<td>4.7125 kWh</td>
</tr>
<tr>
<td>Annual electricity consumptions</td>
<td>754 kWh</td>
<td>635 kWh</td>
<td>567 kWh</td>
</tr>
<tr>
<td>Average prices</td>
<td>R3 249</td>
<td>R4 744</td>
<td>R8 899</td>
</tr>
</tbody>
</table>

Tumble dryer savings and costs calculation (without economies of scale cons.)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level D</th>
<th>MEPS level C</th>
<th>MEPS level B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost difference</td>
<td>-</td>
<td>R1 495</td>
<td>R5 650</td>
</tr>
<tr>
<td>Electricity savings – per annum</td>
<td>-</td>
<td>119 kWh</td>
<td>187 kWh</td>
</tr>
<tr>
<td>Electricity savings - %</td>
<td></td>
<td>16%</td>
<td>25%</td>
</tr>
<tr>
<td>Electricity savings – Rand value</td>
<td></td>
<td>R152</td>
<td>R 238</td>
</tr>
<tr>
<td>Change in cost vs savings payback period</td>
<td>-</td>
<td>10 years</td>
<td>24 years</td>
</tr>
<tr>
<td>Appliance lifespan</td>
<td>14 years</td>
<td>14 years</td>
<td>14 years</td>
</tr>
</tbody>
</table>

- Nation-wide electricity savings of 168 - 216 GWh per annum

Costs almost as much as WDC
Recommendations

• **Increase MEPS level from Class D to C**
  – Technical efficiency among conventional resistance dryers is small
  – In Europe Class B since 2015

• **Monitor heat pump tumble dryers market**:  
  – Other countries’ approaches and trends  
  – Introduction of this technology in SA  
  – Revisit the MEPS levels accordingly

• Consider a supplementary **programme to endorse heat pump technology tumble dryers**
Freezers

**Current MEPS:**

- Class C (domestic industry consulted and agreed)

**Rationale:**

- Most freezers were manufactured locally
- Most freezers had low efficiency (F)
- Some were not even tested
- Proposed MEPS was set to afford manufacturers time to improve their plants and set up testing capabilities

**Regulated items:**

- Household freezers
Market Description and Composition

• The freezer market is smaller than that for refrigerators
  – Low penetration of 28.7%
  – 329 000 units sold in 2017 (~R1.2bn)
  – Sales are projected to decline (325 600 units in 2022)
• The market is dominated by the chest freezer format (2:1 ratio)

Source: Euromonitor, 2017
• Whirlpool/KIC and Defy supply most of the units
• Bulk of units - MEPS Class B or better
• Prices - relatively uniform for the same type
  – Upright (R) > Chest freezer (R)

Source: Euromonitor, 2017

HiSense: Model P; Chest Freezer, G 130L/ N 100L (Energy rating A) - R2 199
KIC: Model Q; Chest Freezer, G 210L/ N 207L (Energy rating B) - R2 399
Defy: Model R; Chest Freezer, G 260L/ N 254 L (Energy rating A) - R3 899
Samsung: Model S; Upright, with Reversible door, G 306L/ N 277L (Energy rating A) - R13 099

Source: Web-crawling and retail store visits, Q2 2018
# Impact Analysis

## Freezer assumptions (chest freezers)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level C</th>
<th>MEPS level B</th>
<th>MEPS level A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Difficult to find on the market</td>
<td>194 – 292 l</td>
<td>130 – 330 l</td>
</tr>
<tr>
<td>Annual electricity consumptions</td>
<td>419.5 kWh</td>
<td>282.5 kWh</td>
<td></td>
</tr>
<tr>
<td>Average prices</td>
<td>R2 899</td>
<td>R3 032</td>
<td></td>
</tr>
</tbody>
</table>

## Freezer savings and costs calculations

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level B</th>
<th>MEPS level A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost difference</td>
<td>-</td>
<td>R133</td>
</tr>
<tr>
<td>Electricity savings – per annum</td>
<td>-</td>
<td>137 kWh</td>
</tr>
<tr>
<td>Electricity savings - %</td>
<td></td>
<td>33%</td>
</tr>
<tr>
<td>Electricity savings – Rand value</td>
<td></td>
<td>R174</td>
</tr>
<tr>
<td>Change in cost vs savings payback period</td>
<td>-</td>
<td>1 year</td>
</tr>
<tr>
<td>Appliance lifespan</td>
<td>12-20 years</td>
<td>12-20 years</td>
</tr>
</tbody>
</table>

- Nation-wide electricity savings of 46-54 GWh per annum
Recommendations

• Introduce Class B by 2020, Class A by 2022, and Class A+ by 2026
  – Option 2: Class A by 2020 (can manufacturers adapt?)

• Consider adopting new IEC test method and eventual alignment with future European requirements from 2020 onwards

• Investigate new policy instruments once all appliances on the market are Class A and above
  – The role of energy label diminishes if consumers think Class A and above are all equally energy efficient
Air conditioners

Regulated items:

- Wall mounted split air conditioners,
- Window air conditioners, and
- Portable air conditioners with a cooling capacity of 7.1 kW (24 000 btu/h)

Rationale:
- MEPS recommended based on BUENAS analysis
- Excludes ceiling mounted split-type air-conditioners of upto 7.1 kW

Current MEPS:
- Class B
- Window and Portable exempted
Market Description and Composition

• Air-cons usage is still dominated by the high-end market
  – 745 000 in stock
  – LSM 9-10 are dominant customers
  – Expected CAGR – 6.4%

• Around 294 100 air conditioners were sold in 2017
  – 98% were wall mounted split type
    • With a penetration of 18.5%
  – The use of portable units is on the rise
  – Sales of window units are declining
    • 90% of these units are for commercial application
Spatial penetration

- Life span at the coast: 4-5 years
- Lifespan inland: 15-20 years

Source: Analysis based on AMPS data, 2010-2016
Market Description and Composition

• **Local manufacturing of air conditioners was discontinued**

• Suppliers are categorised into 3 main groups:
  – International brands (Samsung, LG, Daikin)
  – Representatives or agencies (MS Aircon, Airco, Fourways, etc)
  – Independent distributors (Midea, Alliance, GMC, Jet-Air, Aux) – very competitive market

• **International brands dominate the market in general**
  – LG has 31% and 57% market share within the split and window a/c markets respectively

Source: Euromonitor, 2017
MEPS Opportunities

- Air-cons are widely regulated globally.
- Korea had the most stringent MEPS levels in 2011 but it has now been surpassed by many countries – Europe, Australia.
- It's difficult to compare MEPS levels in SA and Europe as most air-cons have MEPS defined i.t.o seasonal performance (SEER).
Impact Analysis

Air-conditioners assumptions

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level B</th>
<th>MEPS level A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>12 000 BTU</td>
<td>12 000 BTU</td>
</tr>
<tr>
<td>Energy usage</td>
<td>1.14 kW</td>
<td>1.06 kW</td>
</tr>
<tr>
<td>Annual electricity consumptions</td>
<td>591.7 kWh</td>
<td>550.14 kWh</td>
</tr>
<tr>
<td>Average prices</td>
<td>R5 797</td>
<td>R11 499</td>
</tr>
</tbody>
</table>

Air-conditioners savings and costs calculations

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MEPS level B</th>
<th>MEPS level A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost difference</td>
<td>-</td>
<td>R5 702</td>
</tr>
<tr>
<td>Electricity savings – per annum</td>
<td>-</td>
<td>42 kWh</td>
</tr>
<tr>
<td>Electricity savings - %</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Electricity savings – Rand value</td>
<td></td>
<td>R53</td>
</tr>
<tr>
<td>Change in cost vs savings payback period</td>
<td>-</td>
<td>108 years</td>
</tr>
<tr>
<td>Appliance lifespan</td>
<td>15-20 years</td>
<td>15-20 years</td>
</tr>
</tbody>
</table>

- Nation-wide electricity savings of 12 - 15 GWh per annum

Inverter technology and pricing strategies
Recommendations

• Increase **MEPS levels for split systems from the current EER/COP of 3.0 (Class B) to a level of 3.2 (current Class A)**

• Set up a **local testing facility at the sea level**

• **Lift the exemption applied to window and portable systems**

• Label grades should allocate an efficiency class based on an absolute EER/COP value across all air-conditioning types

• Include low power mode energy into the annual energy consumption value displayed on the energy label and adjust the operating EER and COP to give an annual value for rating purposes (to determine the MEPS class)

• Include heating energy for 500 hours use on the energy label for reverse cycle model

• **Revise wording in the regulations to be inclusive of all split types**
4. Q&A
Comments submission

• **During a workshop:**
  – Verbal comments
  – Written comments (refer to the print outs)

• **By e-mail:**
  Marcia Lephera  [Marcia.Lephera@energy.gov.za](mailto:Marcia.Lephera@energy.gov.za)
Summary of MEPS levels and GWh savings

Audio-Visual
SBP 1 W → 0.5W (2020)

Washer-Dryers
Current: Class A
No: Watch EU brief

Refrigerators
Class B → Class A (2020) → Class A+ (2022)
SA electricity savings: 9-10 GWh /a

Electric ovens
Large:
Class B → Class A (2020)
SA electricity savings: 11-13 GWh /a

Dishwasher
Current: Class A
No: retain as is

Washing Machine
Class A → Class A+ (2022)
SA electricity savings: 11-13 GWh /a

Tumble Dryers
Class D → Class C (2020)
SA electricity savings: 168 - 216 GWh /a

Freezers
Class C → Class B (2020) → Class A (2022) → Class A+
SA electricity savings: 46-54 GWh /a

Air conditioners
Split systems: EER/COP of 3.0 (B) → COP of 3.2 (A)
SA electricity savings: 12-15 GWh /a

SA electricity savings:
168 - 216 GWh /a
Thank you

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