



energy

Department:  
Energy  
REPUBLIC OF SOUTH AFRICA



## REVIEW OF SOUTH AFRICA'S APPLIANCE ENERGY CLASSES AND IDENTIFICATION OF THE NEXT SET OF ELECTRICAL EQUIPMENT FOR INCLUSION IN THE NATIONAL STANDARDS AND LABELLING PROJECT: NEW ELECTRICAL APPLIANCES

### Pool Pumps Stakeholder Workshops

4 April 2019

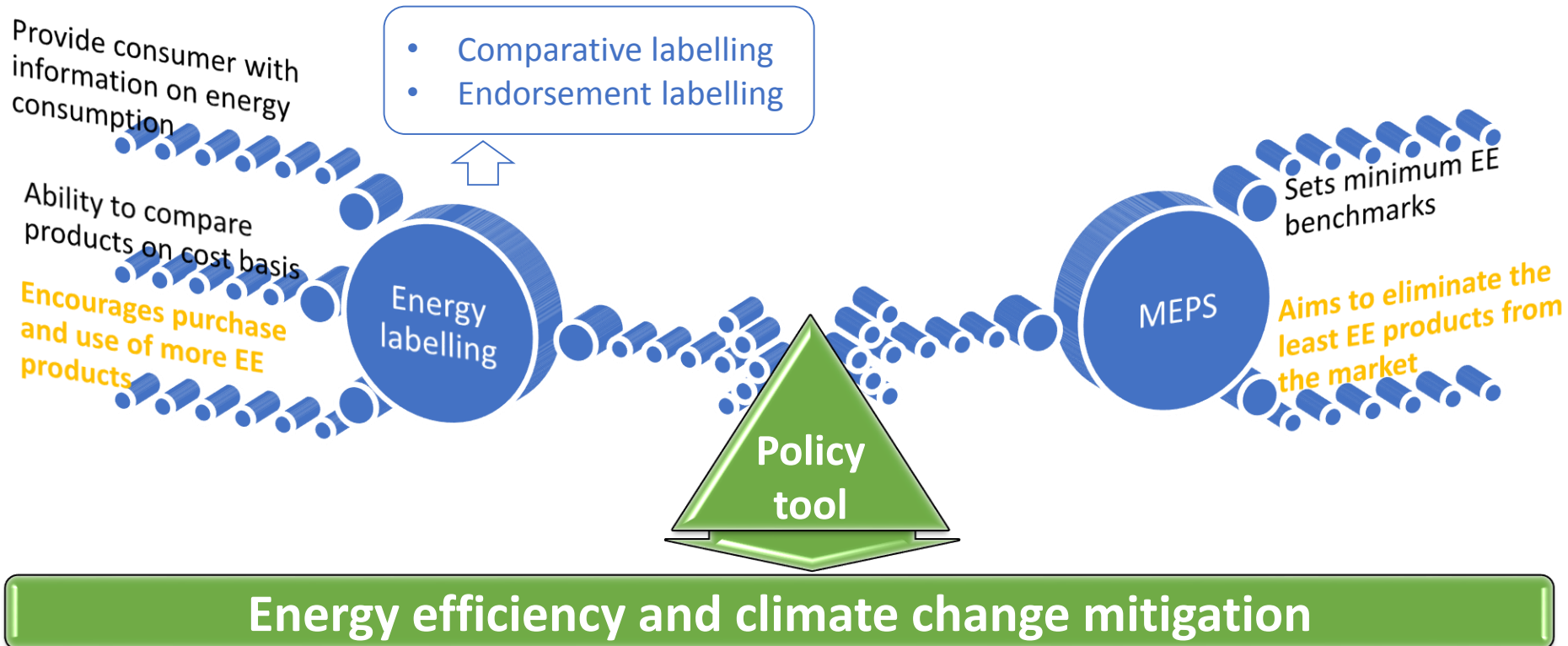


# Agenda

1. Policy tools considered
2. Scope of work and boundaries
3. Screening process
4. Methodology
5. International MEPS trends
6. SA analysis
7. Recommendations
8. Open discussion

# 1. Policy tools considered

# Energy labelling and MEPS



# Policy options to improve energy efficiency

- Two main policy options considered are energy labelling and Minimum Energy Performance Standards (MEPS)
- These are typically enacted through government legislation and regulations
- When is labelling most effective?
  - When consumers purchase products and pay the energy bills
  - When products are on display at purchase and can be compared
  - Where there is a wide range of energy efficiency on the market
- Labelling creates *market pull* to encourage suppliers to offer more efficient products to the market

# Policy options to improve energy efficiency

- When is MEPS most effective?
  - When product purchasers do not pay energy bills (can be different parts of a company, landlord and tenant)
  - When products are not on display for sale (purchased on specifications or from catalogues)
  - When there is a significant range of efficiency available (internationally) but this is not always present on the local market
- MEPS is a *market push* to ensure that all products offered for sale meet a minimum efficiency level

## 2. Scope of work and boundaries

# Study objectives (as per TOR)

1. To identify a new set of electrical equipment (residential or commercial) to which compulsory minimum energy efficiency MEPS and/or labelling could be introduced
2. To recommend timelines for implementation of improved and new minimum energy performance levels for the next set of electrical equipment
3. To conduct an impact assessment analysis of the proposed mandatory requirements for each appliance on consumers, retailers, South African manufacturers, and importers
4. To quantify the potential energy and greenhouse gas emission savings that could be achieved through new MEPS and/or labelling over a 10 and 30-year period



# Project Scope (UNDP and DOE)

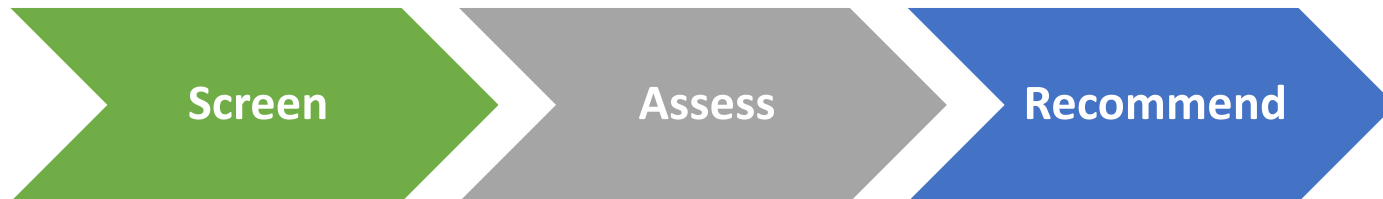
## 1. Purpose:

- Identify new electrical appliances that could be considered for a Standards & Labelling Programme

## 2. Key considerations:

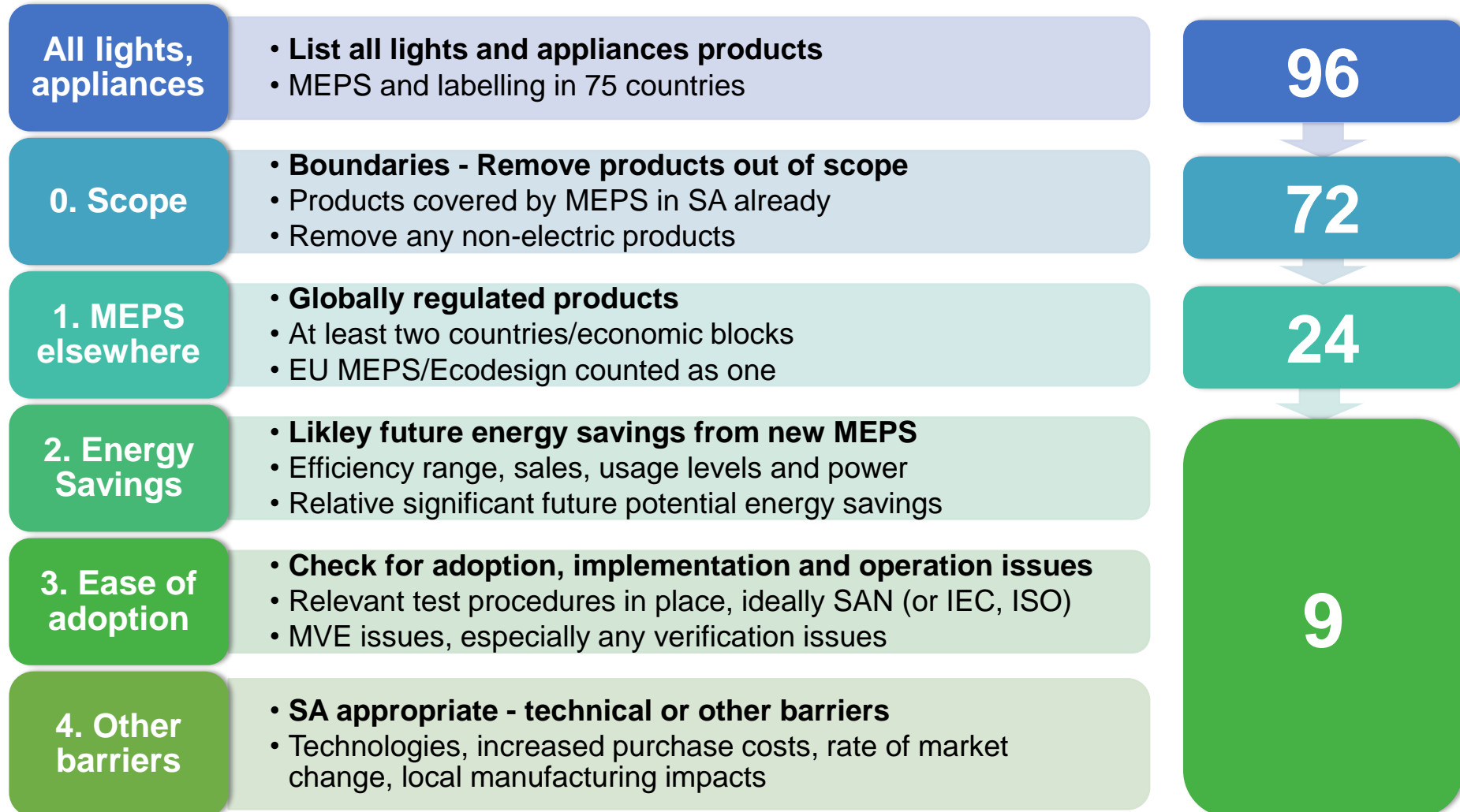
- 4-10 products (residential and commercial)
- Must include distribution transformers
- Main goal – reduce electricity usage and GHG emissions

## 3. Approach:



# 3. Screening

# Screening process



# Shortlisted electric equipment



Heating and  
cooling equipment

Chiller systems



Household  
appliances

None



Office equipment  
and electronics

Computers  
Televisions  
External Power Supplies



Other equipment  
(mostly commercial  
and industrial)

Motors - 3 Phase  
Pool Pumps  
Refrigerators – Commercial  
Distribution Transformers

*Note: Large ACs (>7.1kW) to be covered in a separate study*

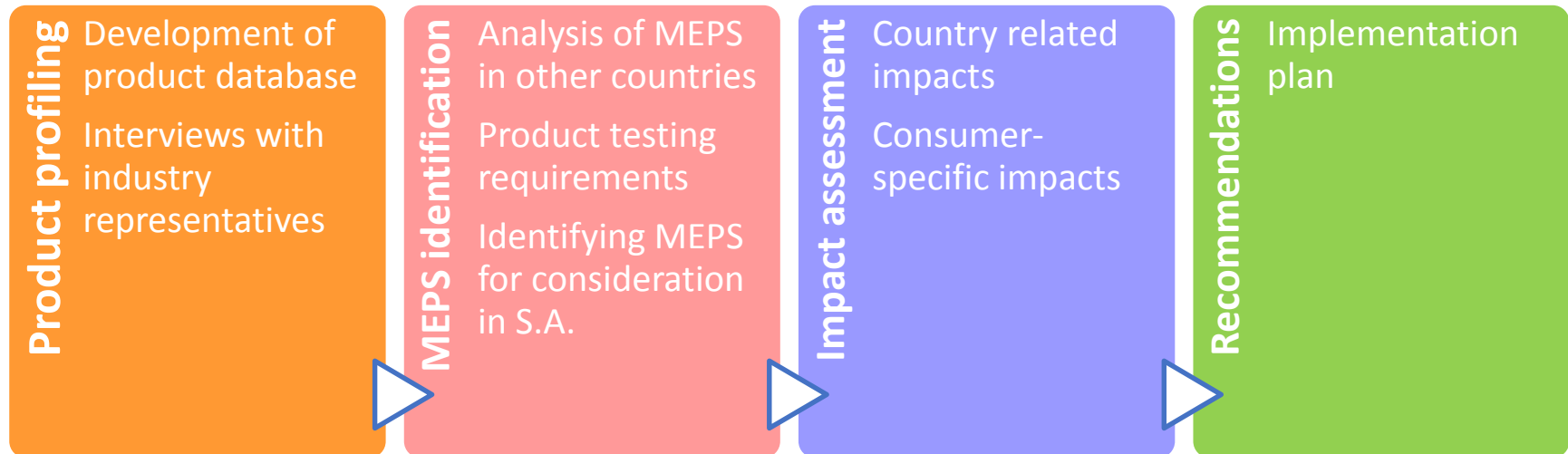
# 4. Methodology

# Methodology

## 1. Data sources:

- In-house developed database of electric appliances (web crawling, brochures, etc.)
- Interviews with the industry representatives

## 2. Approach:



# Data sources

- Stakeholder engagements
- International MEPS programs covered
- **Field data collection**

- Online shops
- Web crawling/brochures

## In-house product database:

- 240 models of pool pumps
  - Suppliers, supplier type and contact details
  - Brand info
  - Model and model description
  - Flow rates, maximum water temperature and casing pressure
  - Power supply, power input and output, rated current
  - Motor speed
  - Weight, price, and pool pump applications

Supplier	Supplier type	Contact type	Application	Brand	Model Name	Model Description	Flow rate (l/s)	Motor speed (rpm)	Power input (kW)	Power output (kW)	Rated current (A)	Weight (kg)	Price (USD)	Year	Supplier country	Year of data collection			
Beko Pump Tech AKCo Pty Ltd	Manufacturer/Supplier	+27 21 968 2242	back/side panels	Beko	Beko P121	Beko P121 Back Panel	1.2	1400	0.15	0.15	0.5	1.2	150	2010	SA	2010			
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# 5. International MEPS trends



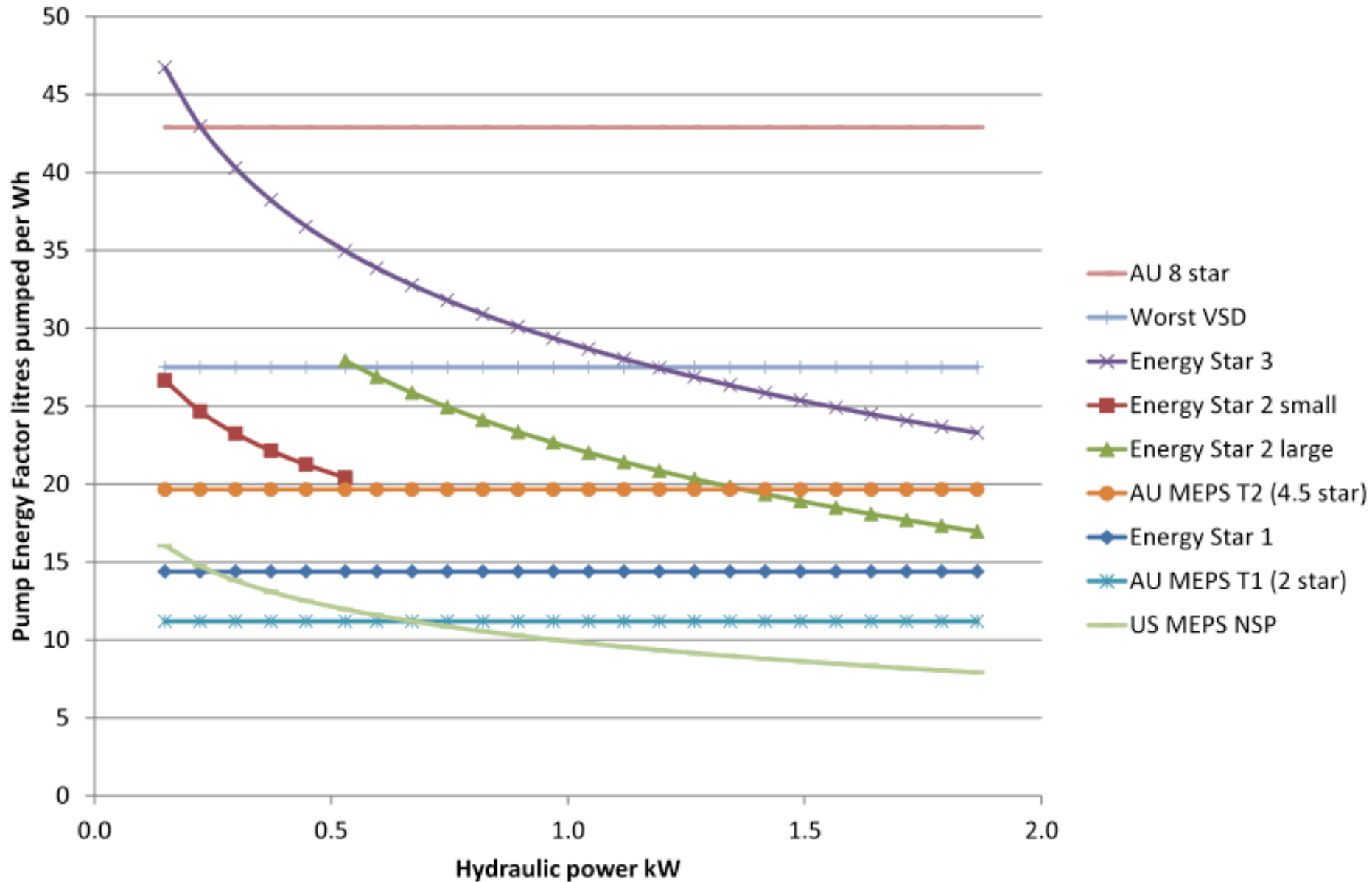
# Product Overview

- Water pumps used to circulate pool water for filtration and hygiene
- Market comprises single speed and variable speed drive pumps
- Large energy savings can be achieved by reducing flow rates
- Larger pipe diameters and low loss fittings also helpful to reduce friction losses
- Mix of private (smaller) and communal systems (larger) – poor data in South Africa

# International Review of MEPS for pool pumps

- US and Australia have test methods
- **No countries with MEPS at this stage:**
  - California requires two speed or multi-speed pump with default to lower speed (quasi-MEPS)
  - Australia has labeling and is considering MEPS
  - US has MEPS from 2021
  - Europe have pump MEPS but exclude pools – looking at pools under Lot 29 EcoDesign
- Energy Star defines high efficiency levels

# Comparison of pool pump requirements



# 6. SA analysis

# Market Overview

- Different ranges:
  - Power output range: 18W (small pumps) - 18.4kW (large pumps)
  - Flow rate range: 500l/h (small pumps) – 63 000l/h (large pumps)
- Single phase vs multi-phase electricity
- Sales:
  - 60%-300% price difference between single speed and VSD pumps
  - Industry rep estimates 100000 units sold p.a.
  - Local market dominated by single speed pumps

# Market overview cont.

- Over 12 pool pump brands available
- Popular suppliers:
  - Speck Pumps, Fluidra Waterlinx, Uni Pumps, Pentair, Zodiac, Earthco Pump, Emaux, Espa, and Glong
  - Market dominated by Fluidra Waterlinx, Earthco, and Speck Pumps
- Local assemblers dominate the market
  - Local assemblers (70%) and importers (30%)
  - Local assemblers: use imported motors and locally molded wet ends
  - Importers: Italy and China

# Impact Analysis – Assumptions

- Total sales: estimates derived during industry engagements
- Other market and technical data drawn from Australia
- Single product configuration used for modelling

Sectoral focus	Residential only
Total annual pool pump sales (residential)	30 000
Projected per annum sales growth post 2018	2%
Average pool size	45,000L
Intensity base	8 L/Wh
Intensity (Highly Efficient)	27 L/Wh
Number of turnovers per day	1
Year days	365
Product life	12

# Impact Analysis – Energy Savings

$$\text{Annual kWh} = \left( \frac{\text{Pool size} * \text{Turnover}}{\text{Intensity}} \right) / 1000 * 365$$

Annual energy (kWh)		Savings (kWh)
<i>BAU</i>	<i>MEPS</i>	
2053	608	1445



# Impact Analysis – Consumer-specific impacts

Supplier	Pump type and efficiency	Energy Savings	Pump price	Price difference
<b>A</b>	0.75kW single speed pump (i.e. less efficient)	20-40%	R2,000 – R7,500	60 – 300%
	0.75kW variable speed drive pump (i.e. more efficient)		R8,000 – R12,000	
<b>B</b>	Ordinary pump (i.e. less efficient)	Not stated	R2,000	150%
	Eco-touch pump (i.e. more efficient)		R5,000	

- More energy efficient pool pumps will come at a cost (short-term)
- The relatively higher purchase costs envisaged to drop over time
  - Economies of scale
  - Other market corrections

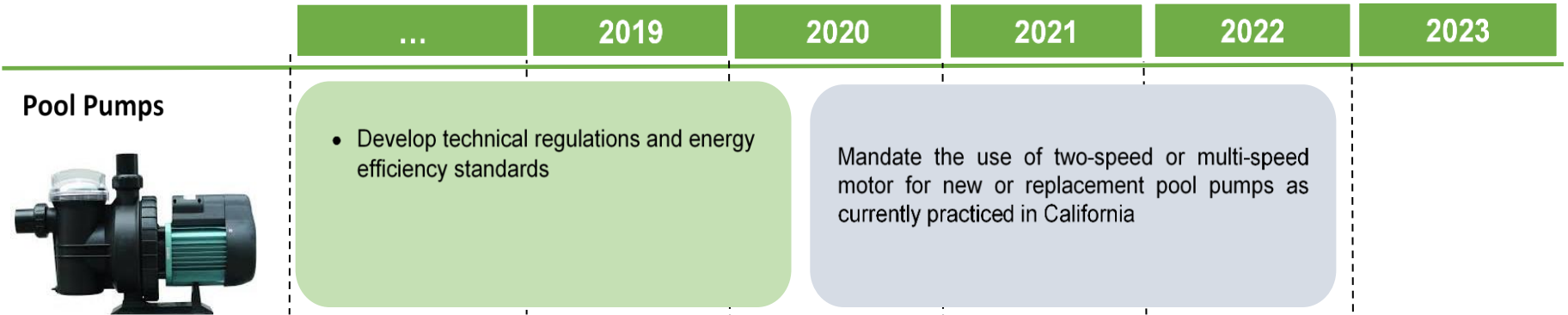
# Impact Analysis – other macro-economic impacts

- MEPS might adversely impact local manufacturing in the short-term
  - Sales might be affected depending on the elasticity of demand
  - Smaller companies might be forced out of business

# 7. Recommendations

Celebrate **Development** Diversity

# Recommendations for swimming pool pumps



- **Option 1:** align with US MEPS 2021 – fairly weak
- **Option 2:** align with California – require 2 or more speed pumps
- **Option 3:** align with proposed Australian MEPS levels
- **Option 2 is simple and more effective in terms of energy impact**

# 8. Discussion

Celebrate **Development** Diversity

# Thank you

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