



Where to Start Selecting Products for MEPS & Labels

Appliances & Equipment Course

Kevin Lane, IEA; Peter Bennich, SEA – Pretoria, 14 October 2019

Overview of the appliance training sessions

Monday 14 October 2019		
0	Introduction and roundtable	<input checked="" type="checkbox"/>
1	Planning energy efficiency programmes	<input checked="" type="checkbox"/>
2	Selecting products for MEPS and Labelling programmes	<input type="checkbox"/>
Tuesday 15 October 2019		
3	Assessing efficiency performance and setting MEPS	<input type="checkbox"/>
	Special - Regional harmonisation	<input type="checkbox"/>
4	Industry transformation	<input type="checkbox"/>
5	Stakeholder involvement and communication	<input type="checkbox"/>
6	The relationship between product efficiency and price	<input type="checkbox"/>
7	Modernising energy efficiency through digitalisation	<input type="checkbox"/>
Wednesday 16 October 2019		
8	Insights into energy labels	<input type="checkbox"/>
9	Monitoring, verification and enforcement	<input type="checkbox"/>
10	Evaluating policies and programmes	<input type="checkbox"/>
	Special - Available resources U4E	<input type="checkbox"/>
11	Roundtable discussion, review and report back	<input type="checkbox"/>

Scenario

You have been asked to expand the S&L programme to cover more products

What steps would you take to develop your recommendation?



The 3-Phase Approach

1. Initial Scoping

- Covering all potential products
- Simple analysis



2. Highest Priority Products

- More detailed analysis of the top 2-3 priorities
- Detailed analysis with higher data requirements



3. Cost-Benefit Analysis of Selected Product(s)

- Detailed modelling of cost-effectiveness

The 3-Phase Approach

1. Initial Scoping

- Covering all potential products
- Simple analysis

What do we need to consider for the initial scoping phase?

Based on the Scenario and indicating your assumptions:

How would you go about your initial prioritisation? What steps would you take?

Which 2-3 appliances would you select for the 2nd phase in this case? And why?



Scenario

- Existing S&L programme covers only CFLs (mandatory)
- Took five years to implement the S&L programme for CFLs
- Limited budget and staff for S&L implementation
- Large heavy industry with high energy consumption but also fast growing residential electricity consumption
- Limited local product manufacturing industry
- Good data set on residential and industrial energy consumption but outdated
- Testing facility available but would need investment to cover more products beyond lighting

Key Criteria for Selection of Products

Criteria	Initial Scoping (1 st Phase)	Highest Priority Products (2 nd Phase)
S&L Programme objectives and type	MEPS and/or labels Mandatory or voluntary	
Current and future impact of the product (e.g. greenhouse gas emissions, total energy consumption*, peak demand*, etc.)	Simple Analysis	Detailed Analysis
Level of ownership and turnover/lifetime	Simple Analysis	Detailed Analysis
Potential for energy efficiency improvement (detailed in annex)	Not Applicable	Applicable
Anticipated stakeholder impact and level of support*	Simple Analysis	Detailed Analysis
Coverage by existing test procedures (international / regional)*	Applicable	
Existing programme in trading / neighbouring economy	Applicable	

* Most relevant based on the Scenario presented in Slide 3
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REPUBLIC OF SOUTH AFRICA



US Dept of Energy – priority list

2002 Priority Setting for Standards and Test Procedure Rulemakings

Standards and Determinations (D)

High Priority Products	Page		Low Priority Products	Page
Air-Cooled Central Air Conditioners and Air-Source Heat Pumps, 65-240 kBtu/h	1		Clothes Dryers	3
Distribution Transformers	21		Clothes Washers*	5
Packaged Terminal Air Conditioners and Heat Pumps	33		Commercial A/C and Heat Pumps*	7
Residential Central AC/HP ¹	40		Commercial Furnaces & Boilers*	9
Residential Furnaces and Boilers	43		Commercial Water Heaters*	13
Small Electric Motors (D)	50		Cooking Products	15
			Direct Heating Equipment, Gas	17
			Dishwashers	19
Medium Priority Products			Electric Motors, 1-200 HP	23
Central Air Conditioners and Heat Pumps, 3 Phase, <65 kBtu/h	2		Fluorescent Lamp Ballasts*	25
Commercial Oil and Gas-Fired Packaged Boilers	10		High Intensity Discharge Lamps (D)	27
Tankless Gas-Fired Instantaneous Water Heaters	49		Lamps	29
			Mobile Home Furnaces	31
			Plumbing Fixtures/Fittings	34
			Pool Heaters, Gas	36
			Refrigerators*	38
			Residential Water Heaters*	45
			Room Air Conditioners*	47

2. Impact of the Product - Examples

Linked to the objectives of the programme

Greenhouse gas emissions

- Air conditioners + Refrigerators – important to account for refrigerant removal
- Contribution to NDCs

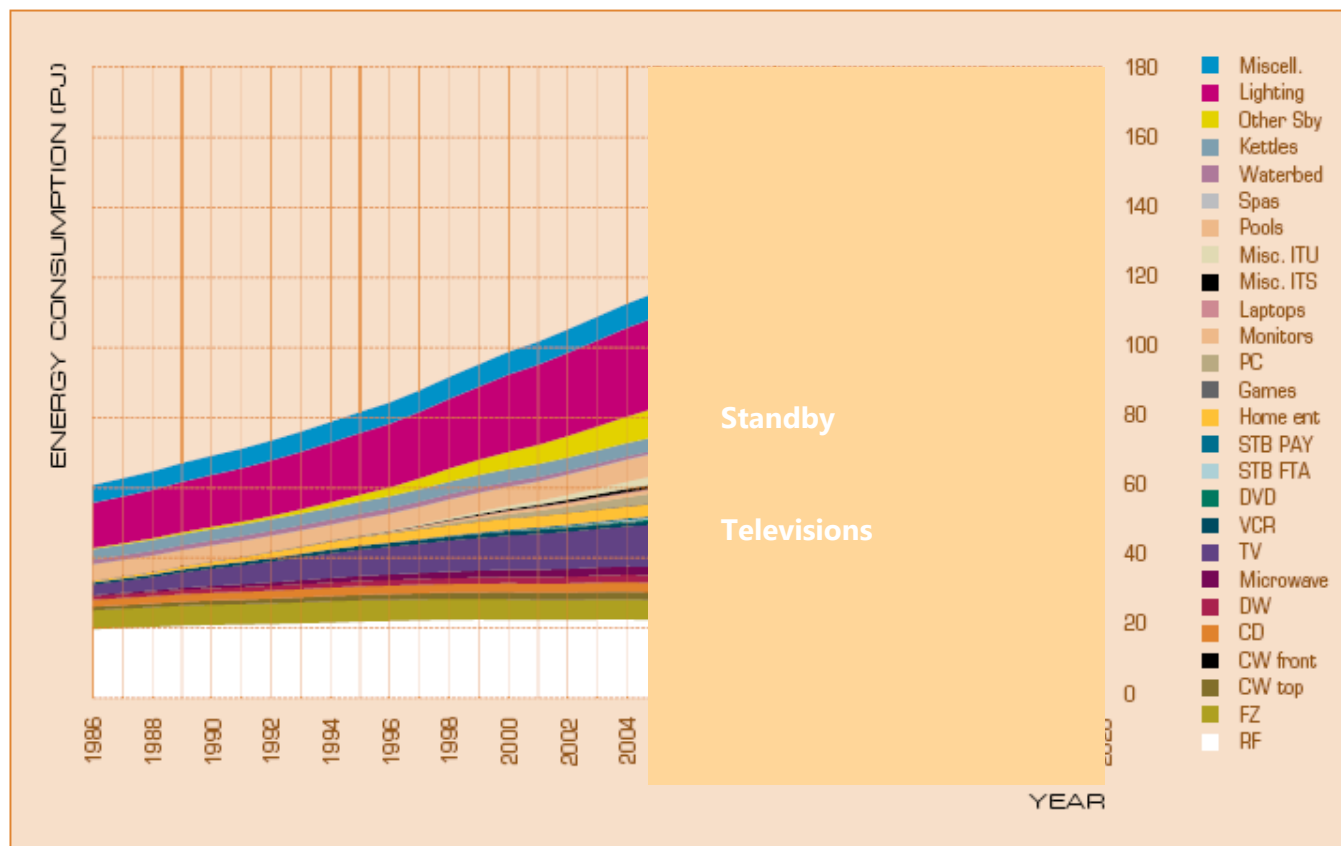
Total energy consumption

- Current and future (next slide)

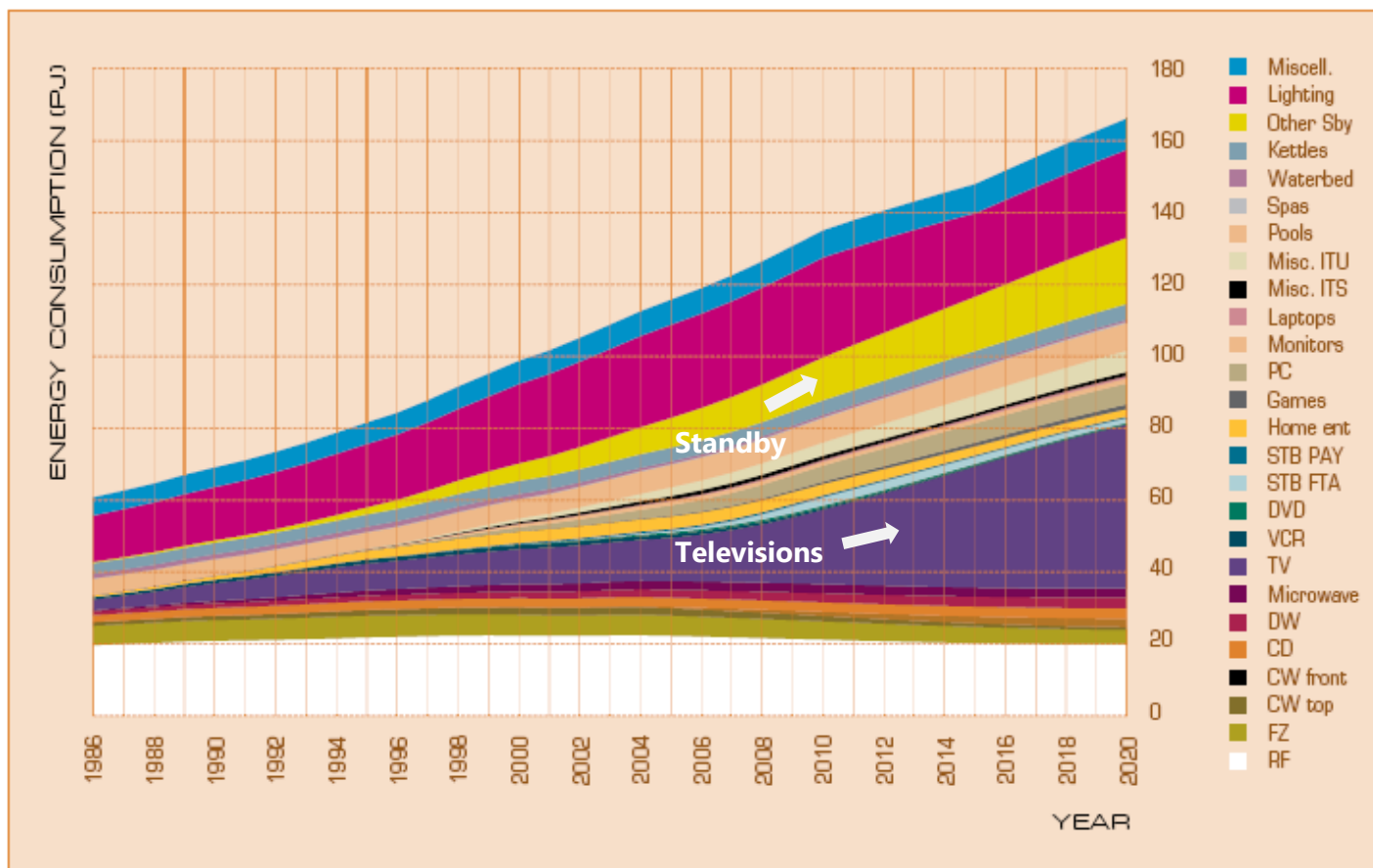
Peak power demand

- Reducing demand for new electricity generation capacity
- Cost of peak power to utilities

Share of Total Energy Consumption in Australia – Today & Future



Share of Total Energy Consumption in Australia – Today & Future



3. Level of Ownership & Turnover/Lifetime

- Focus on products with high level market penetration today or rapidly increasing
- Example of factors, depending on data availability and quality:
 - Operation hours per day & lifetime
 - Energy consumption / Energy performance
 - Population, economic growth, household size
- Typical appliances selected:
 - Refrigerators
 - Air Conditioners
 - Motors
 - Lighting

Potential for Energy Efficiency Improvement

- Can product efficiency be improved? What is the range on the market?
- Bigger, higher consuming, appliances have greater opportunities
- Use existing studies – e.g. IEA 4E, SEAD, LBNL, UN Environment
- Most appliances efficiency potential are well understood today

Description	Annual kWh	Energy Saving (%)	Manufacturer Cost (USD)	Retail Cost (%)
Base case (Refrigerator)	255	-	-	-
Add 1 cm insulation	234	8.2	1.0	1.5
Add 2 cm insulation	227	11.0	2.5	3.0

Source: Wiel et al., Energy-Efficiency Labels and Standards: A Guidebook for Appliances, Equipment, and Lighting. 2nd Edition. 2005

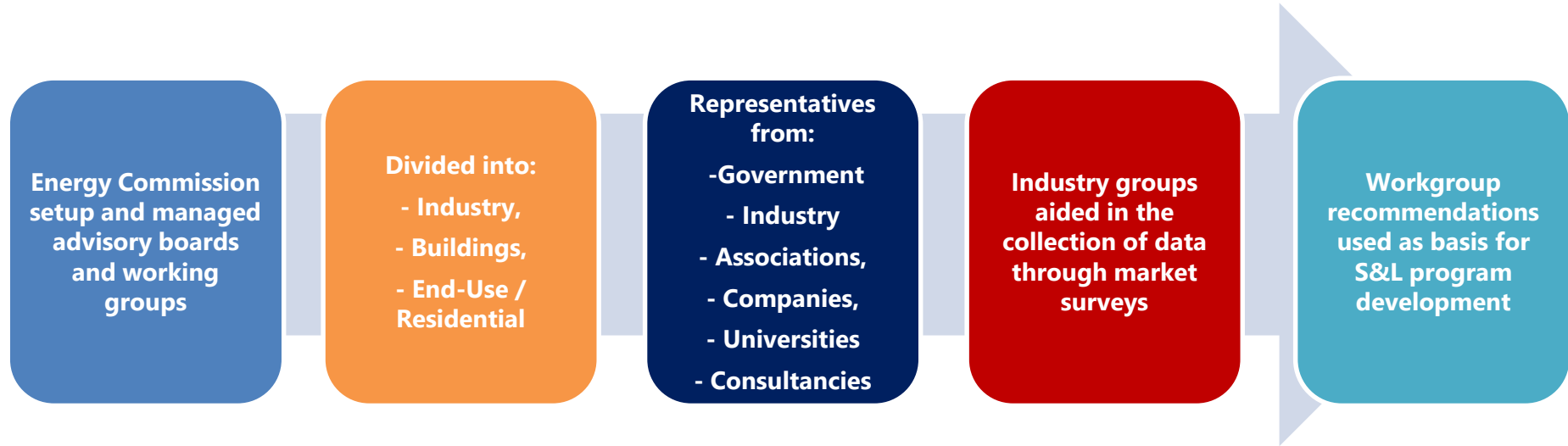
India's Prioritisation Exercise

- All products and equipment possible = 81!
- Prescreening = 57
- Prioritisation Criteria:
 1. **GHG abatement potential - 75%** (surviving stock, annual energy consumption, energy savings potential & emission factor)
 2. **Market implementability index - 25%** (test procedures & standards, number of stakeholders, % organised sector, implementing partner)
- Top 25 appliances identified
- Motors and residential air conditioners had highest:
 - annual energy demand and peak demand reduction
 - energy savings and annual GHG abatement potential
 - existing standards and test procedures

4. Anticipated Stakeholder Impact

- Impact will depend on the level of stringency
- Impact of economy and society (e.g. loss and creation of local jobs)
- Important to have stakeholder input:
 - Government agencies
 - Energy utilities
 - Private businesses
 - Major appliance importers, suppliers, wholesalers, retailers, distributors
 - Major accommodation operators
 - Consumer and Environmental Groups

Malaysian Approach to Stakeholder Involvement & Data



Source: Wiel et al., Energy-Efficiency Labels and Standards: A Guidebook for Appliances, Equipment, and Lighting. 2nd Edition. 2005

5. Coverage by Test Procedures

- Do not reinvent the wheel – learn from others
- Refer to international standards and test protocols for minimum energy performance standards such as:
 - International Electrotechnical Commission (IEC)
 - International Organisation for Standardisation (ISO)
 - Regional standards or in neighbouring countries
- Explore synergies within the region

Explore synergies within the region

EE STANDARD & LABELING										
	Brunei Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam
Standard										
1) MEPS	Yes	UC	Yes	UP	Yes	UP	Yes	Yes	Yes	Yes
Initiated year;			2009-		M 2013-					
<u>Target product</u>										
▪ AC	V	UP	M	UP	M	UP	M	M	M	M
▪ Refrigerator	V	UC	UC	UP	M	UP	M	M	M	M
▪ Lighting	V	UP	M	UP	M	UP	M	M	M	M
2) HEPS	No		No		No		No	No	Yes	No
									2010 (V)	
Labeling	UC	UC	M	UP	M	UP	Yes	Yes	V	M
		(5 star rating)	4 star rating		5 star rating		(New design for 5 star rating - under study)	5 tick system	5 star rating	5 star rating
			(Under study)		Mandator y			Mandator y	Mandator y/ Voluntar y	2013-
Note: UC = Under Construction UP = Under Preparation/Plan										

Many opportunities for harmonisation (policy and technical) are already available!

6. Existing Programme in Trading Partner / Neighbouring Economy

- This can simplify market acceptance by domestic and international manufacturers
- Can help simplify MEPS adoption

Pacific Islands Case Study

- Limited data on household energy use and appliance uptake
- Issues with customs classification for appliance
- Limited capacity and resources available
- Opted to adopt S&L based on main country of origin and focusing on highest consuming appliances

<https://www.reeep.org/news/reeep-commissioned-report-sets-sl-baseline-pacific-island-countries>

The 3-Phase Approach

2. Highest Priority Products

- More detailed analysis of top 2-3 priorities
- Detailed analysis with higher data requirements
(see examples in Annex)



3. Cost-Benefit Analysis of Selected Product(s)

Detailed modelling of cost-effectiveness
(see examples in Annex)

Detailed Analysis for Highest Priority Products

Energy Sector

- Energy consumption and demand
- Investment in generation capacity
- Electricity tariffs and sales
- CO₂ emissions

Government

- Taxation on appliances and manufacturers
- Resources and funding available

Consumers

(usage and behavioural data)

- Attitude towards energy efficiency
- Appliance ownership and operating expenses (e.g. Census)
- Equipment prices

Manufacturers, Suppliers, Distributors, Wholesalers and Retailers

- Number of companies and employees,
- Annual sales and profits, growth rate...

Summary

- Do not reinvent the wheel
- Determine the key criteria and work with stakeholders to gather the data
- Prioritise data needs using the 3-Phase approach
- Explore synergies and opportunities with neighbouring countries and trade partners
- Make use of existing studies, policies, standards and new digital technologies and approaches
 - E.g. Use of existing framework for CFLs to expand to linear fluorescent and LEDs depending on market characteristics
- Do not prioritise too many appliances (success will drive more support)

Resources

www.iea.org/efficiency

- UN United for Efficiency (U4E)
 - Country Savings Assessments
- CLASP handbook
- See recent South Africa Assessment

Model Regulations – Latest published September 2019

Five newly available model regulations:

- Lighting
- Distribution transformers
- Electric motors
- Refrigerators
- Air conditioners

With supporting information reports



