Where to start:

Understanding minimum energy performance standards (MEPS)

Appliances & Equipment: Session 2

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Delhi, 10 December 2018

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Scenario

You've been asked to suggest a new MEPS level for residential air conditioners

What steps would you take to develop your recommendation?

What do we know about Minimum Energy Performance Standards?

Group exercise:

- *How do they influence the market in a country?*
- *Do they apply to just local manufacturers?*
- *How are products selected for MEPS?*

Main elements of MEPS

- Product definition
  - Which products are covered
- Energy efficiency metric
  - Definition of energy efficiency for this product
- Energy performance test method
  - Conditions for testing the product for the measurement of energy performance
- Performance requirement(s)
  - MEPS, HEPS, tiers
- Entry requirements
  - How to place products on market, information provision, fees
- Monitoring, verification and enforcement (MV&E)

MEPS Development Processes

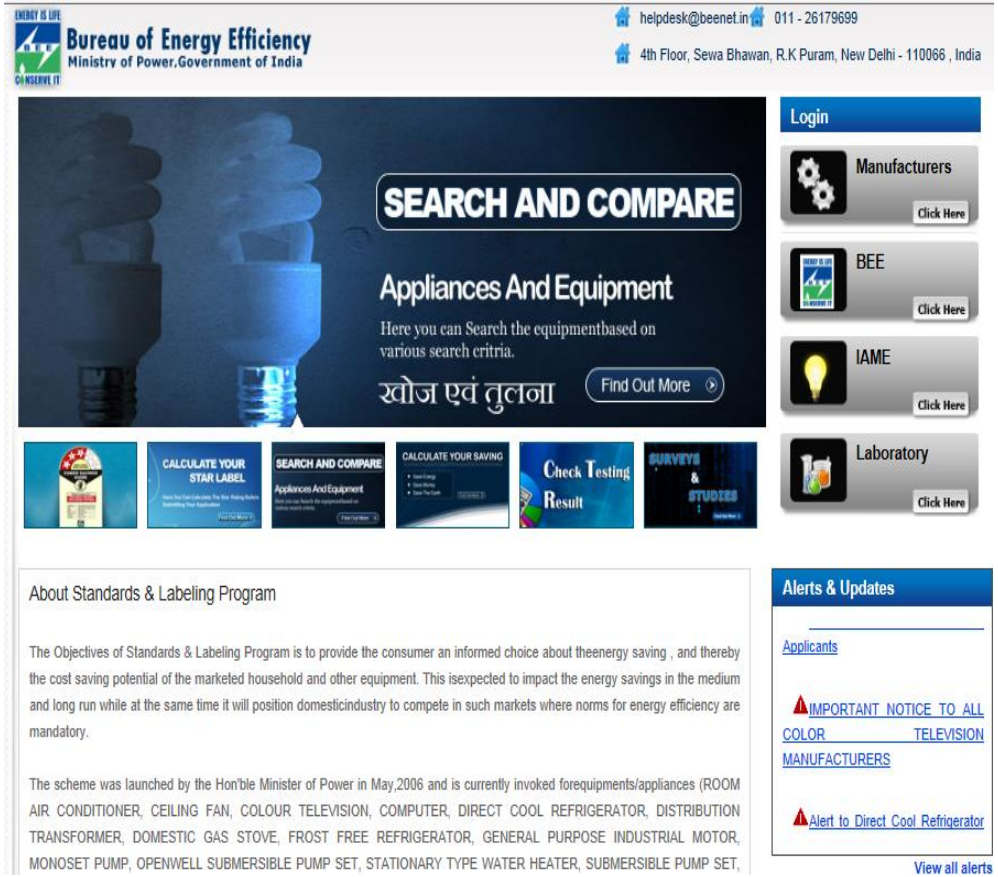
1. Assess performance range of current products, market size & potential for improvement
    1. Energy saving, peak demand, air quality, etc
2. Consider practicalities
    1. Existing test method? Capacity of test labs? Regulated by other countries?
3. Use criteria to rank and identify target products
4. Cost benefit analysis
5. Implementation

List some of the ways you might make an assessment of the performance of products on the market.

What's on the market?

- Registration system data?
- Manufacturers?
- Purchased sales data?
- Household surveys?
- Data from catalogues and the internet?
- Test data?

BEE Product Database - Portal



Source: Bureau of Energy Efficiency http://www.beestarlabel.com/Home/Searchcompare

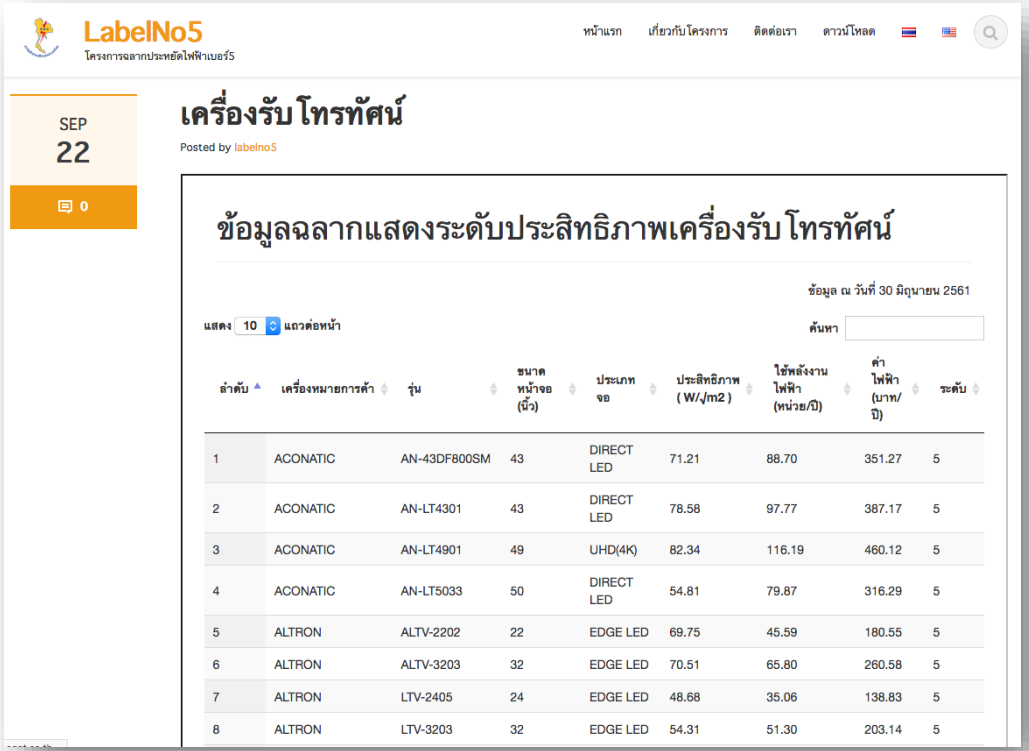
BEE Product Database – Product selection, extract

Model	ALL
EER	ALL
Nominal marketing capacity	ALL
star rating	ALL

Export to PDF

S.No	Brand Name	Type	Model Number	EER (W/W)	Nom. Marke. Cap. (Ton)	Coling Cap. (W)	Power Cons. (W)	Approval Date	Valid Till Date	
1	HITACHI	Split air conditioner	RAU518HSDG	3.4	1.5	5410	1590	19-12-2013	31-12-2015	
2	HITACHI	Split air conditioner	RAU318KSD	3	1.5	5200	1735	26-12-2013	31-12-2015	
3	HITACHI	Split air conditioner	RAU312KSDC	3.09	1.0	3371	1090	26-12-2013	31-12-2015	
4	HITACHI	Cassette air conditioner	MRAG518HSD	3.2	1.5	5400	1685	27-02-2012	27-02-2015	
5	HITACHI	Split air conditioner	RAU318KSD-CH	3	1.5	5200	1735	26-12-2013	31-12-2015	
6	HITACHI	Split air conditioner	RAU318KSD-GD	3	1.5	5200	1735	26-12-2013	31-12-2015	
7	HITACHI	Split air conditioner	RAU324HSDA	3	2.0	6950	2320	24-12-2013	31-12-2015	
8	HITACHI	Split air conditioner	RAU318KSDC	3.09	1.5	5275	1705	26-12-2013	31-12-2015	
9	HITACHI	Window air Conditioner	RAV322HSD	2.8	2.0	6160	2200	26-12-2013	31-12-2015	

Registration data is available in many markets

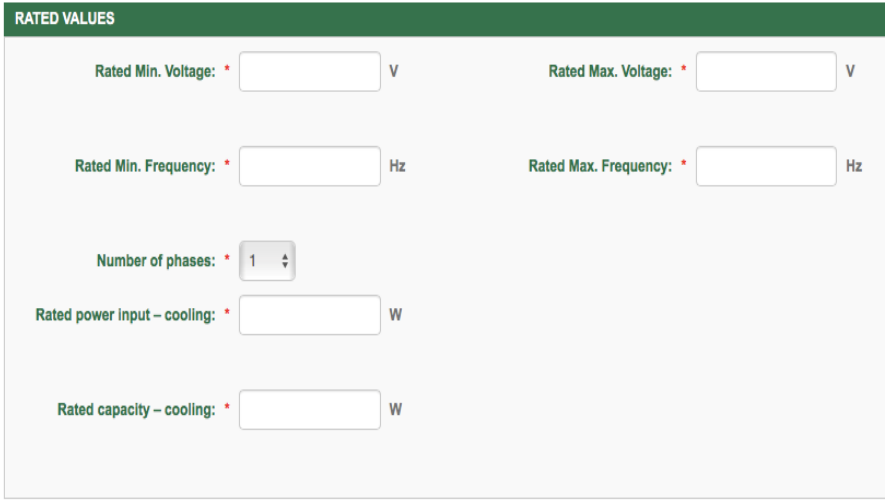


ลำดับ	เครื่องหมายการค้า	รุ่น	ขนาดหน้าจอ (นิ้ว)	ประเภทจอ	ประสิทธิภาพ (W/,/m2)	ใช้พลังงานไฟฟ้า (หน่วย/ปี)	ค่าไฟฟ้า (บาท/ปี)	ระดับ
1	ACONATIC	AN-43DF800SM	43	DIRECT LED	71.21	88.70	351.27	5
2	ACONATIC	AN-LT4301	43	DIRECT LED	78.58	97.77	387.17	5
3	ACONATIC	AN-LT4901	49	UHD(4K)	82.34	116.19	460.12	5
4	ACONATIC	AN-LT5033	50	DIRECT LED	54.81	79.87	316.29	5
5	ALTRON	ALTV-2202	22	EDGE LED	69.75	45.59	180.55	5
6	ALTRON	ALTV-3203	32	EDGE LED	70.51	65.80	260.58	5
7	ALTRON	LTV-2405	24	EDGE LED	48.68	35.06	138.83	5
8	ALTRON	LTV-3203	32	EDGE LED	54.31	51.30	203.14	5

How similar is your market?

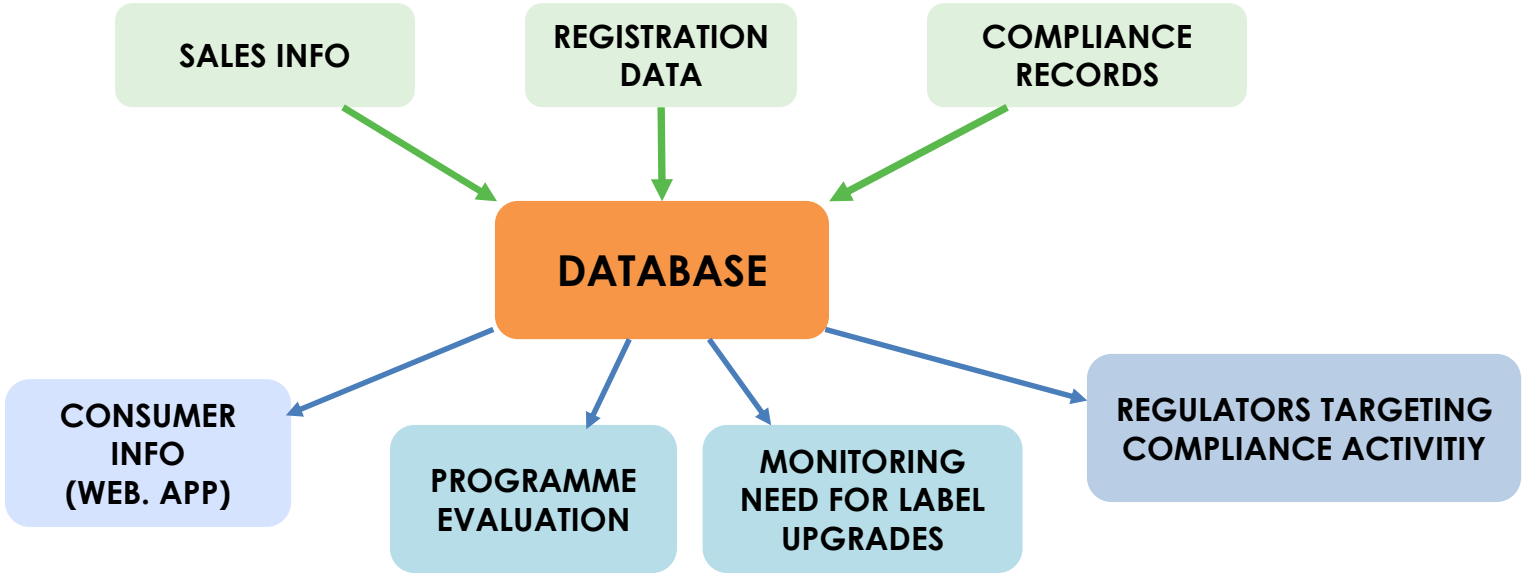
U4E-en.lighten - prototype registration system

- Initial compliance gateway
- Elements
  - Searchable database of registered products
  - Compliance requirements and contact information
  - Notifications of non-compliance, enforcement actions, upcoming changes
- Voluntary or mandatory
- Administered by government, industry or others



https://united4efficiency.org/resources/prototype-lighting-product-registration-system

Database serves as the HUB

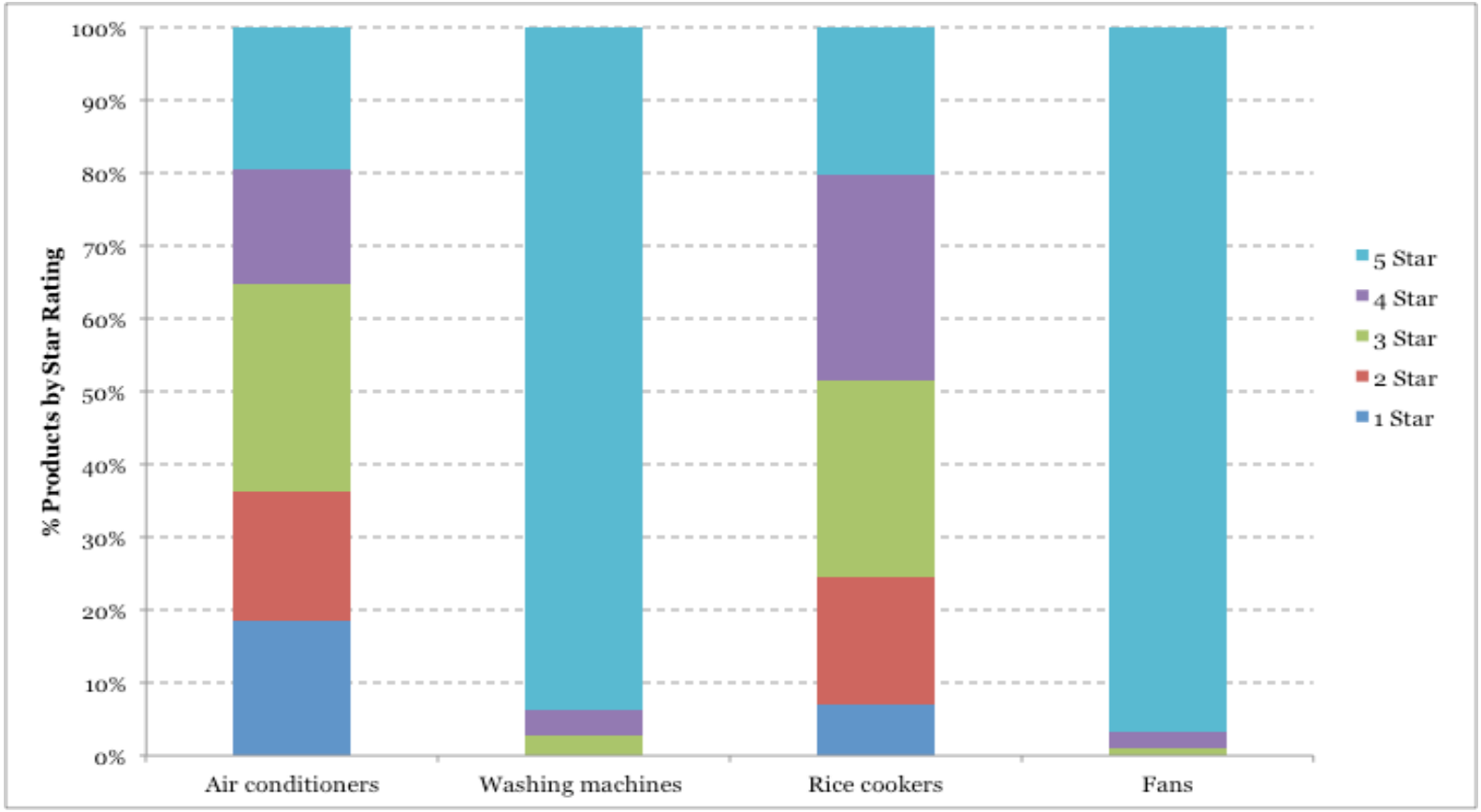


Useful outputs for Consumers, Programme Managers and Regulators

What's on the market? Market research data

- Purchase reports and/or data directly from market research companies (e.g. GfK, Mintel)
  - have consumer panels (many thousands)
  - links with retailers (and access to sales data)
- Subscribe to omnibus surveys
- Commission bespoke research

What's on the market? Store survey Vietnam



What's on the market? Data from catalogues

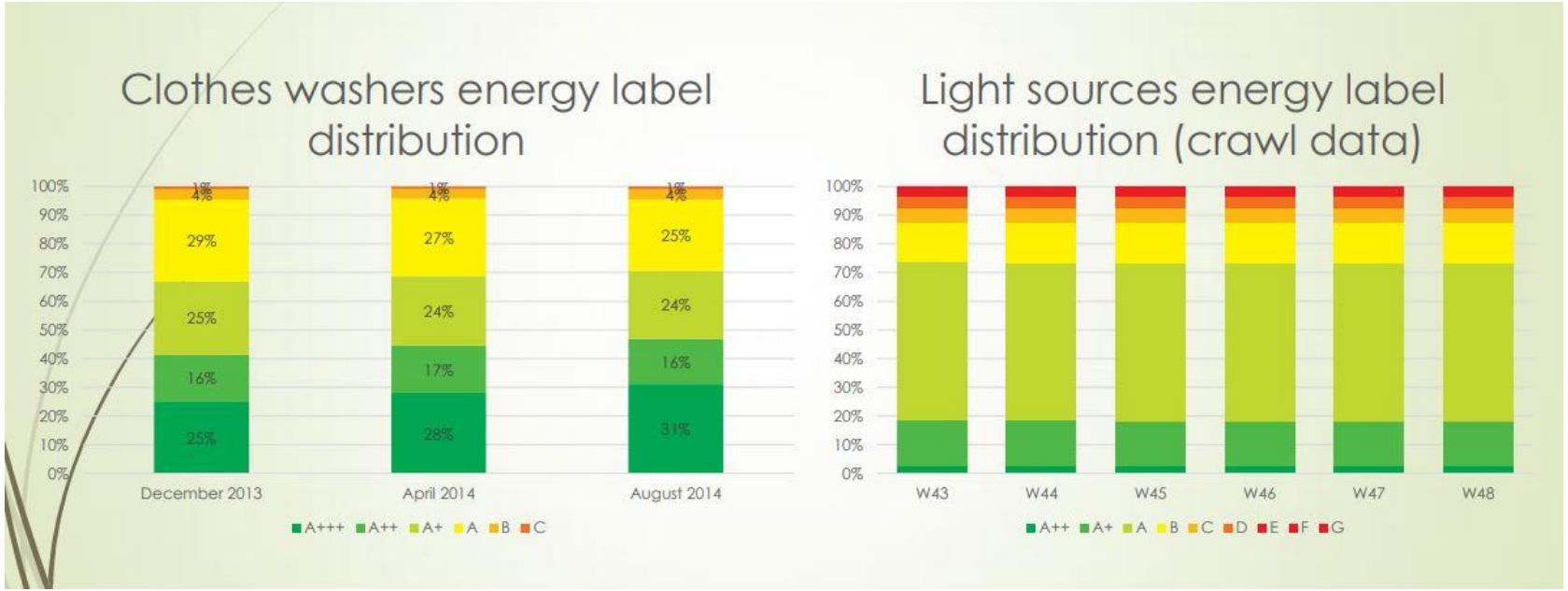
TECHNICAL DATA

	Electrical data	Photometrical data						Dimensions & weight		Temperatures & operating conditions	Lifespan
Product description	Nominal wattage	Color rendering index Ra	Luminous flux at 25 °C	Luminous flux at 35 °C	Light color (designation)	Luminous flux	Color rendering index Ra	Tube diameter	Length with base excl. base pins/connection	Rated ambient temp.w. max. luminous flux	Lifespan
NATURA T5 28 W/76 [1)]	28.00 W	≥85	1950 lm	2150 lm	NATURA	1950 lm	≥85	16 mm	1149.00 mm	35.0 °C	24000 h

	Additional product data		Certificates & standards		
Product description	Base (standard designation)	Show WEEE picto	Energy efficiency class	Energy consumption	Energy efficiency class
NATURA T5 28 W/76 [1)]	G5	Yes	A	31 kWh/1000h	A

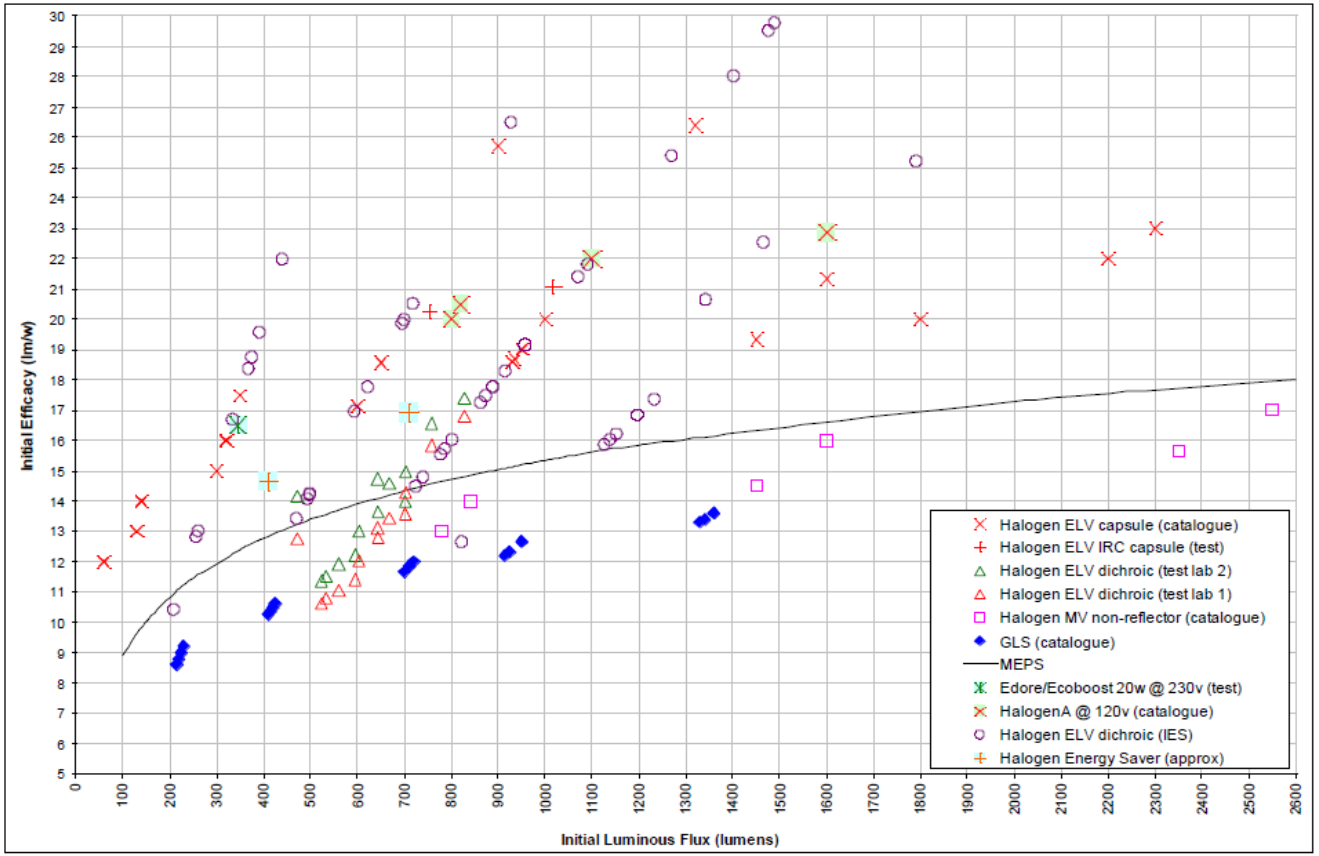
A lots of information on product technical specifications – available online

What's on the market? Internet Data – web crawling

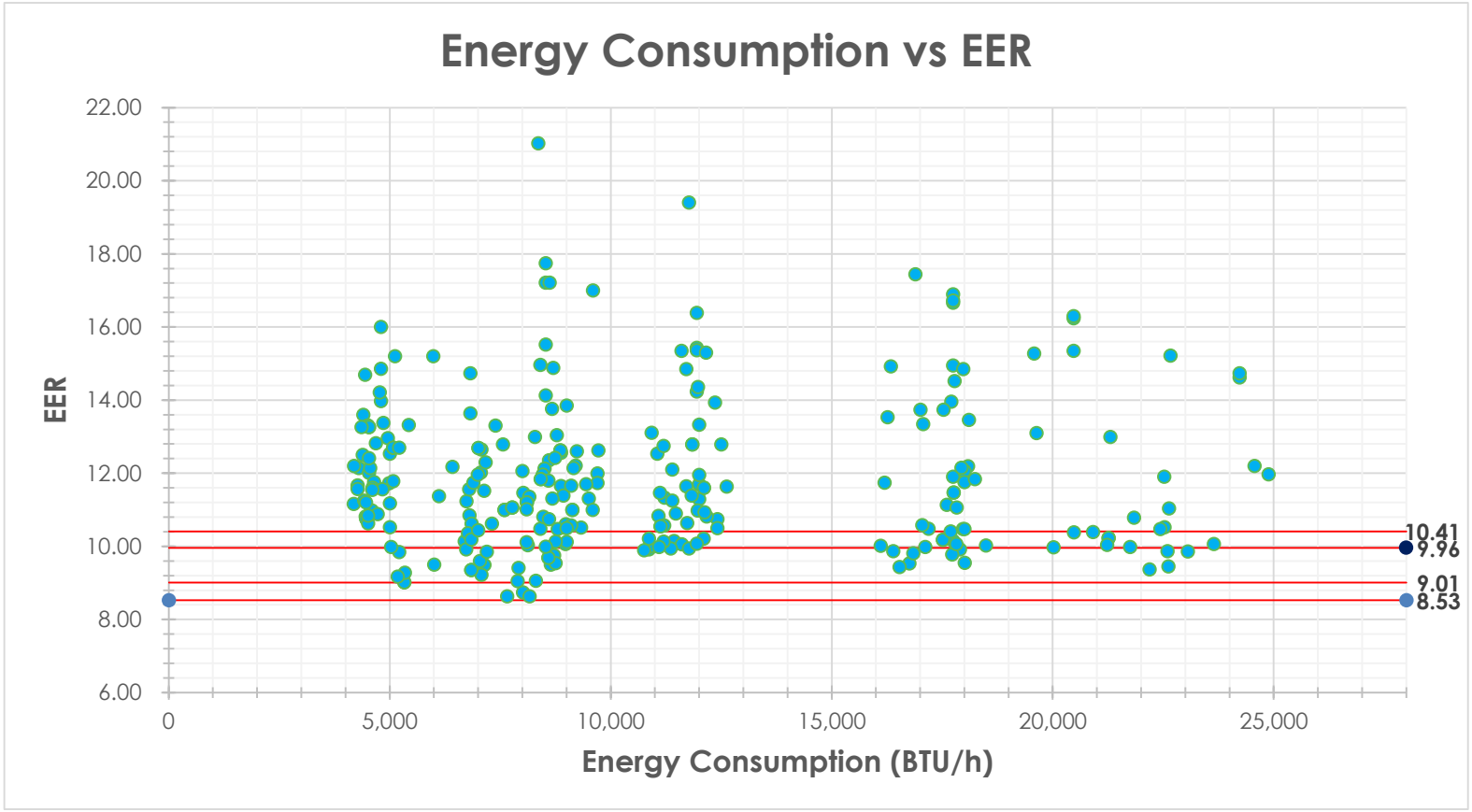


Source: Big2Great
https://www.iea.org/media/workshops/2015/productsdec15-16/3.2_KasperMogensen_WebcrawlingGatherDataOnlineMarketSurveillance.pdf

What's on the market? Test data (catalogue comparison)



Ideal Information – Air conditioner example



Opportunities for using New Technologies and Approaches

- Web crawling
- Quick Response (QR) Codes
- Smart meters
- Real-time energy monitoring systems

- See later presentations……

For more information: https://www.iea.org/workshops/21st-century-energy-efficiency-standards-and-labelling-programmes.html

Potential for Energy Efficiency Improvement

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

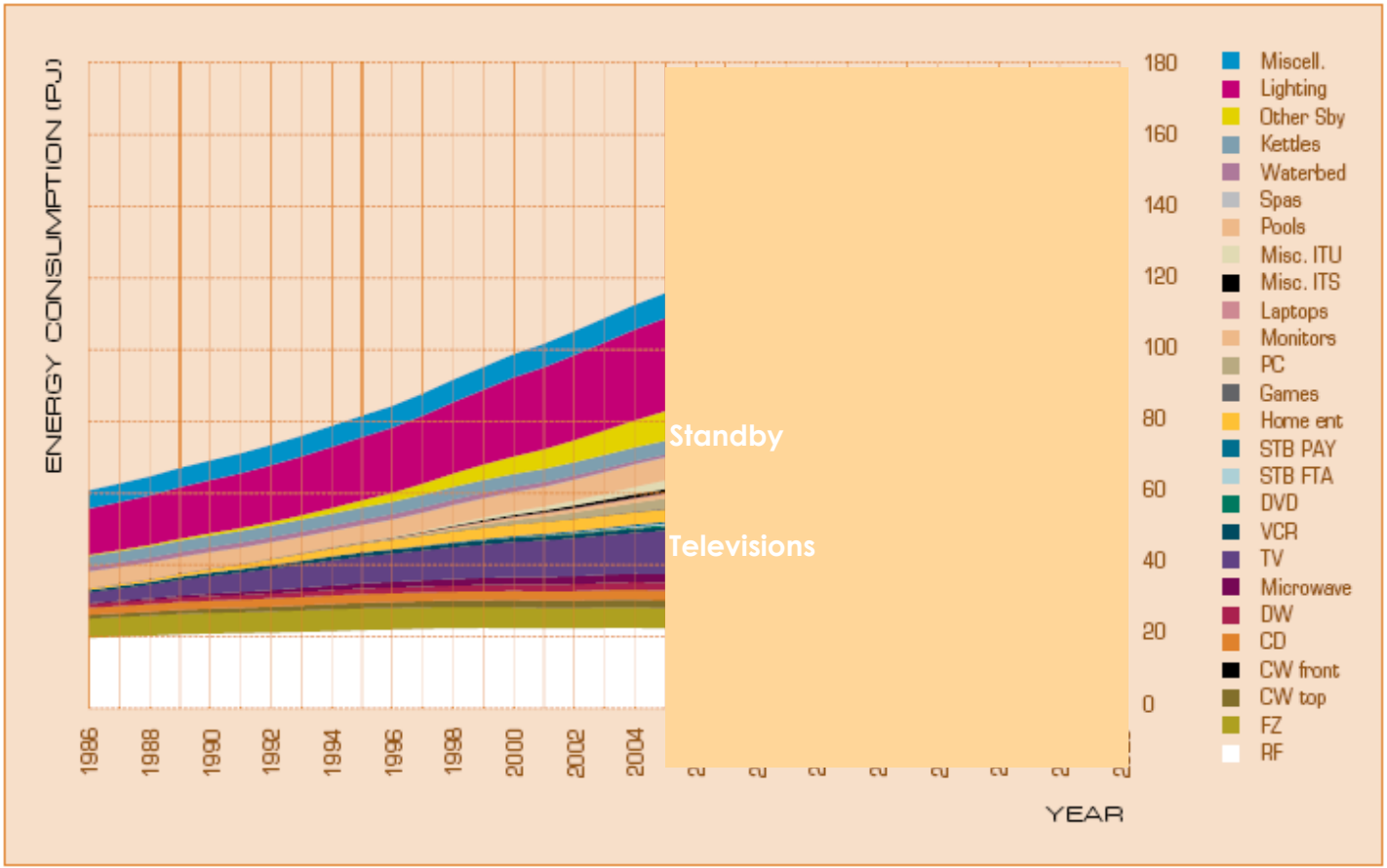
Description	Annual kWh	Energy Saving (%)	Manufacturer Cost (USD)	Retail Cost (%)
Base case (Refrigerator)	255	-	-	-
Add 1 cm insulation	234	8.2	1.0	1.5
Add 2 cm insulation	227	11.0	2.5	3.0

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

Criteria for Selection of Products

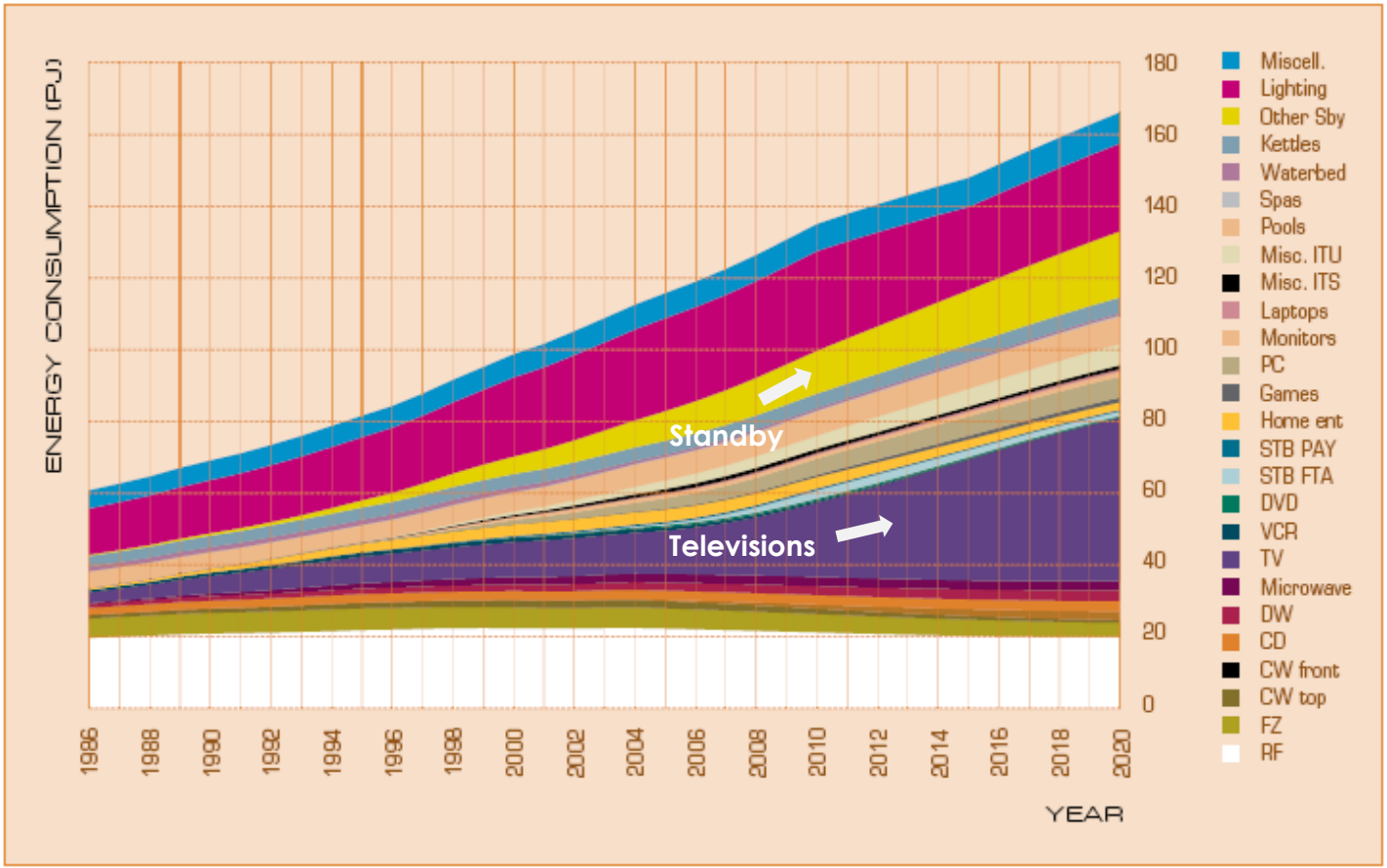
Criteria – not exhaustive
Current and future impact of the product in terms of the Programme objectives (e.g. greenhouse gas emissions, total energy consumption, peak demand, etc.)
Level of ownership and turnover/lifetime
Potential for energy efficiency improvement
Anticipated stakeholder impact and level of support
Coverage by existing test procedures (international / regional)
Existing programme in trading / neighbouring economy

Share of Total Energy Consumption in Australia – Today & Future



Source: Energy Use in the Australian Residential Sector 1986-2020 – Part 1, 2008

Share of Total Energy Consumption in Australia – Today & Future



Source: Energy Use in the Australian Residential Sector 1986-2020 – Part 1, 2008

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

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

Example - US Dept of Energy

2002 Priority Setti
for
Standards and Test Pr
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
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

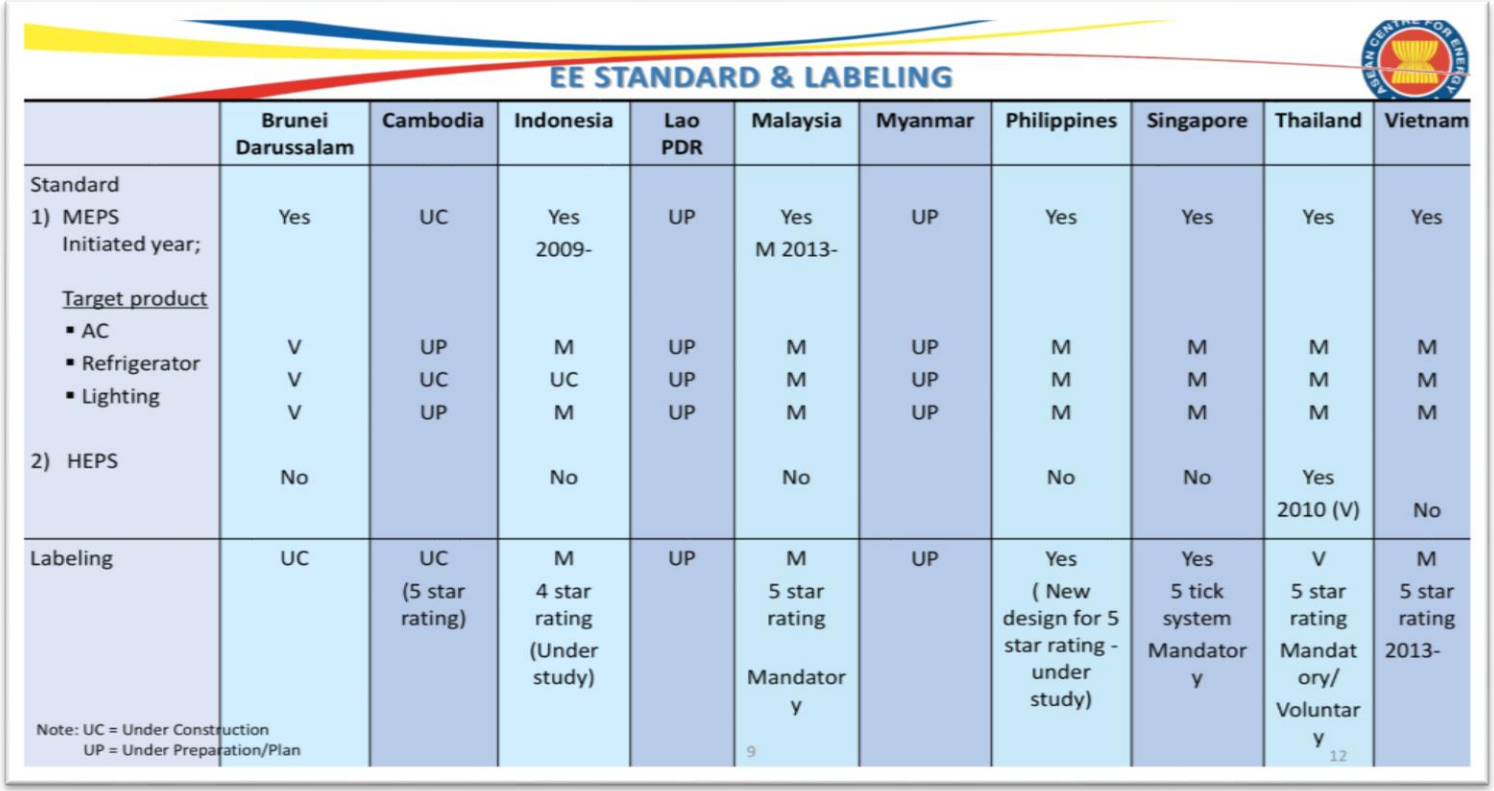
Example - India's Prioritisation Exercise

- 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

Defining new MEPS

- Consider specifications in similar markets
- Consider global or regional harmonisation
- Use a market analysis (eliminate worse 20%)
- Undertake an engineering analysis (least life cycle cost)

Explore synergies within the region



EE STANDARD & LABELING

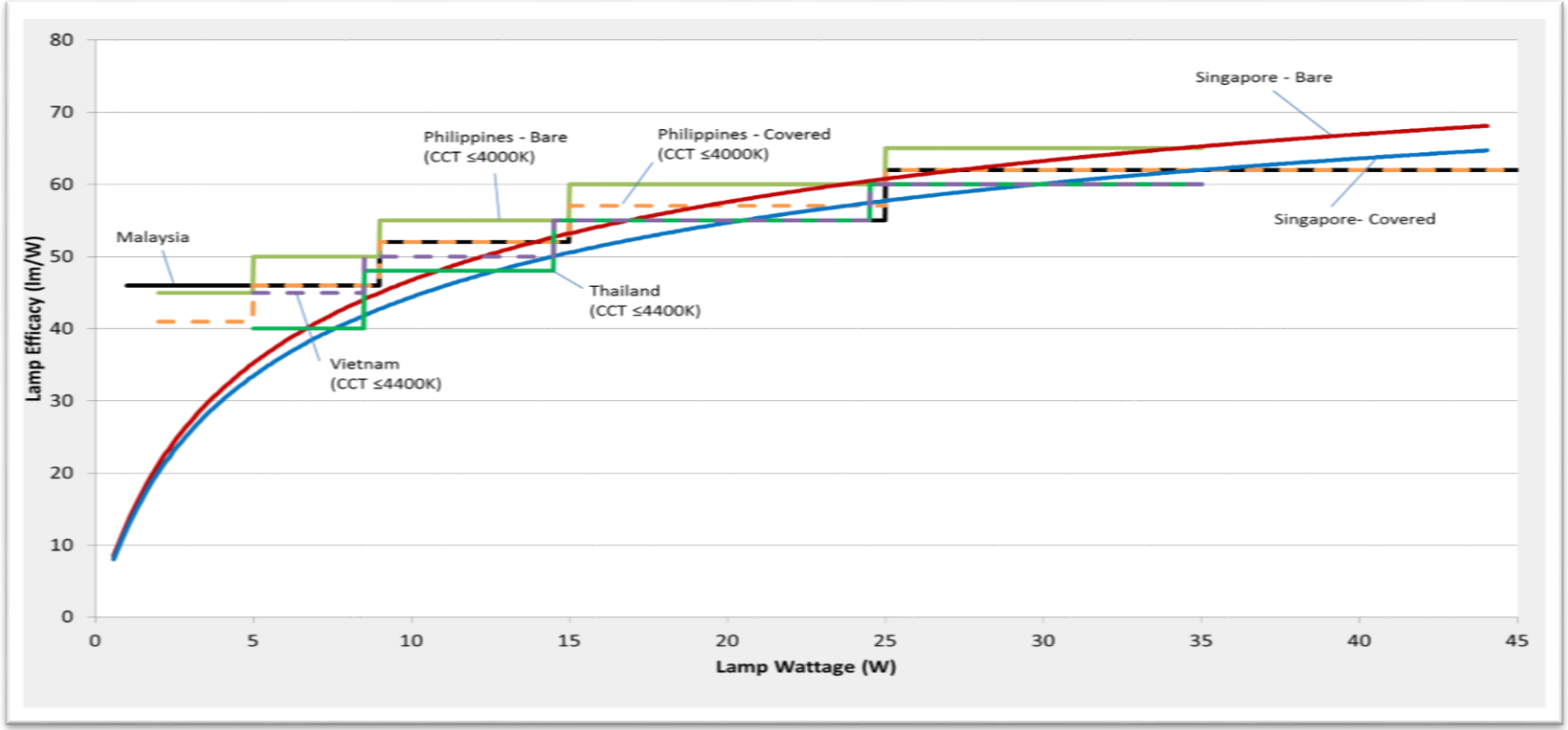
	Brunei Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam
Standard										
1) MEPS Initiated year;	Yes	UC	Yes 2009-	UP	Yes M 2013-	UP	Yes	Yes	Yes	Yes
Target product										
▪ AC	V	UP	M	UP	M	UP	M	M	M	M
▪ Refrigerator	V	UC	UC	UP	M	UP	M	M	M	M
▪ Lighting	V	UP	M	UP	M	UP	M	M	M	M
2) HEPS	No		No		No		No	No	Yes 2010 (V)	No
Labeling	UC	UC (5 star rating)	M 4 star rating (Under study)	UP	M 5 star rating Mandatory	UP	Yes (New design for 5 star rating - under study)	Yes 5 tick system Mandatory	V 5 star rating Mandatory/ Voluntary	M 5 star rating 2013-

Note: UC = Under Construction
UP = Under Preparation/Plan

9 12

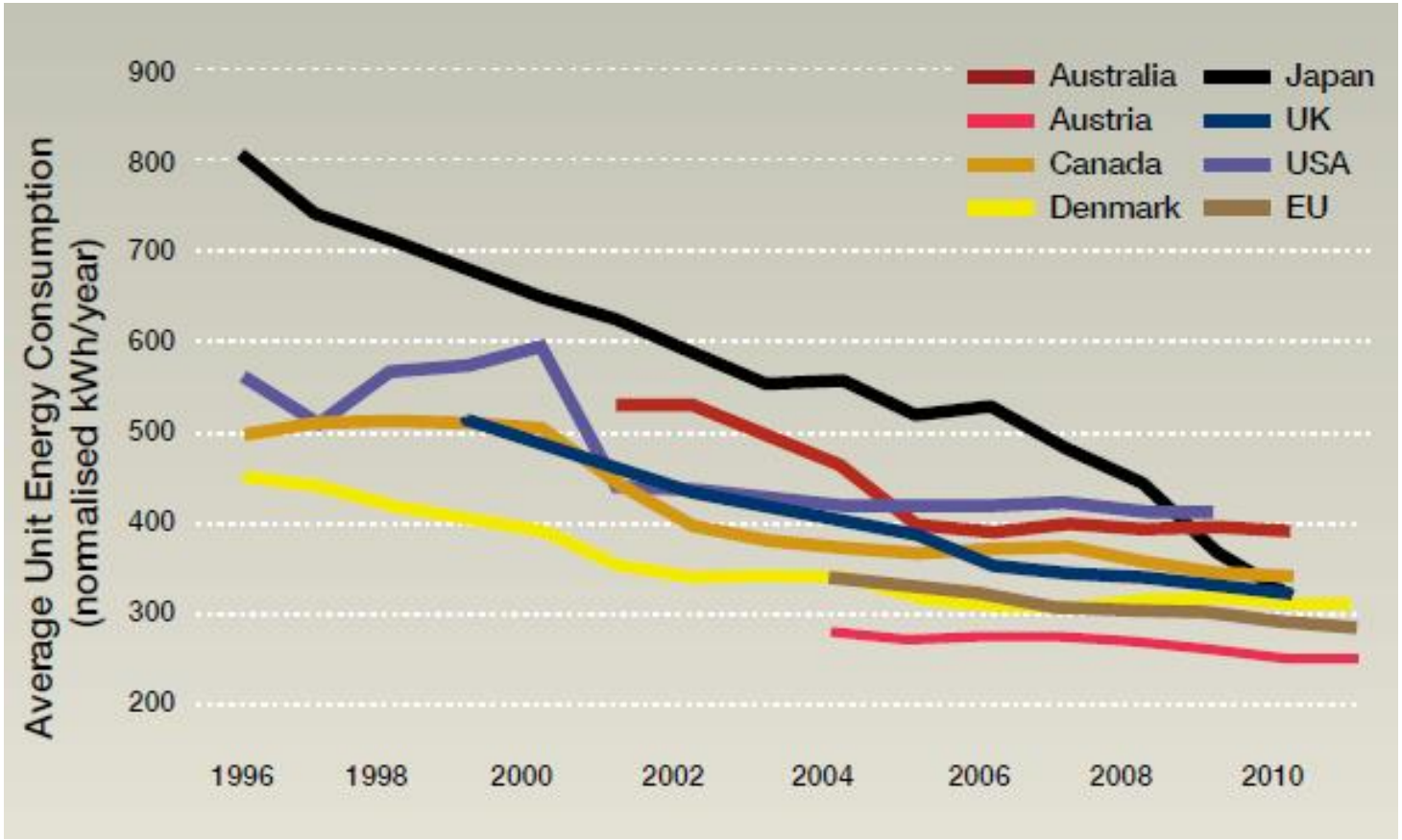
Many opportunities for harmonization (policy and technical) are already available!

Consider specifications in similar markets



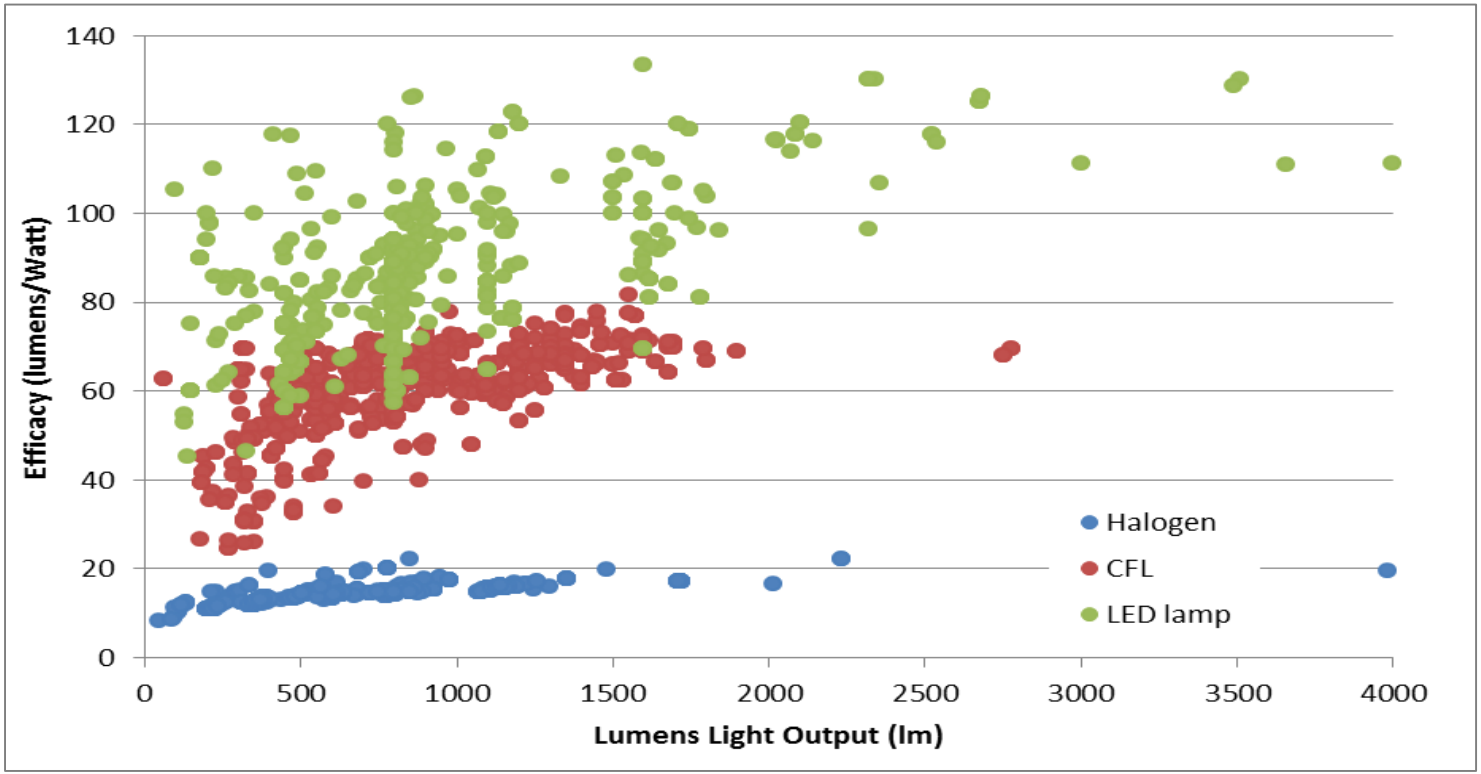
Minimum energy performance standards for low CCT compact fluorescent lamps in ASEAN

Defining new MEPS



Source: http://mappingandbenchmarking.iea-4e.org/shared_files/509/download

Market analysis



Summary

- Do not reinvent the wheel
- Determine the key criteria and work with stakeholders to gather the data
- Explore synergies and opportunities with neighbouring countries and trade partners
- Make use of existing studies, policies, standards and new digital technologies and approaches
- Do not prioritise too many appliances (success will drive more support)

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