



## Where to Start

# Assessing Current Performance and Selecting MEPS

Session 3

Kevin Lane, IEA; Peter Bennich, SEA, Pretoria 15 October 2019

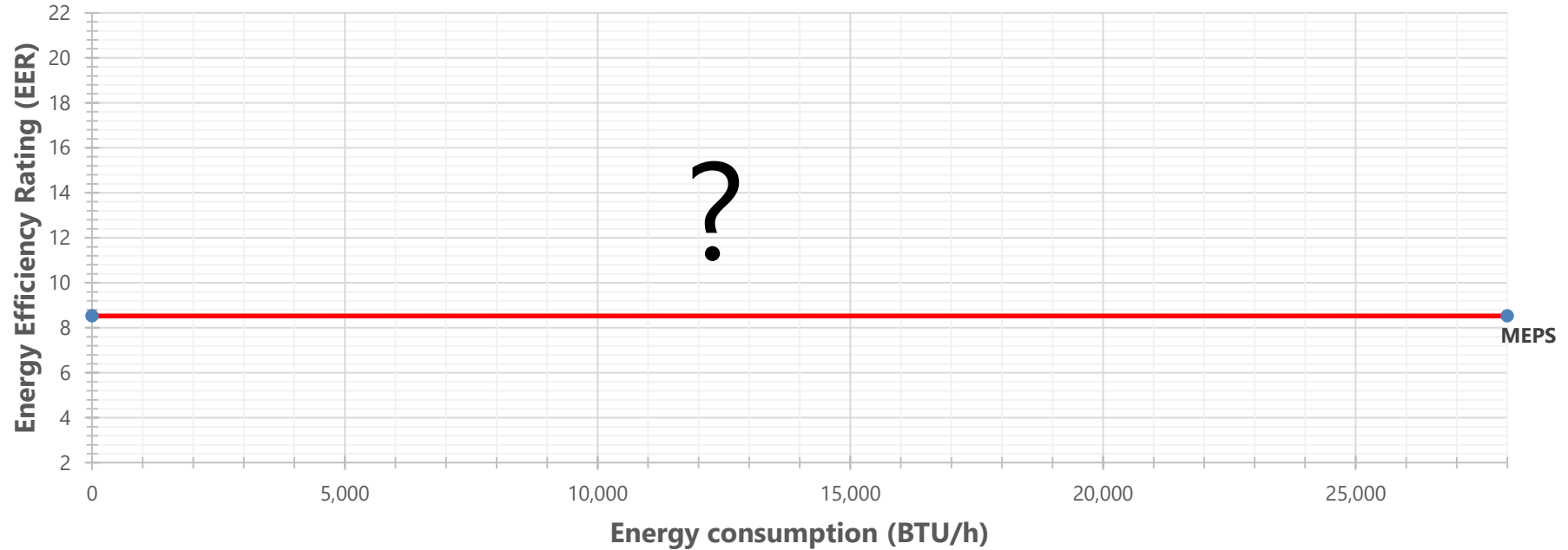
# Overview of the appliance training sessions

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 checked="" type="checkbox"/>
Tuesday 15 October 2019		
<b>3</b>	<b>Assessing efficiency performance and setting MEPS</b>	<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"/>

# Assessing performance

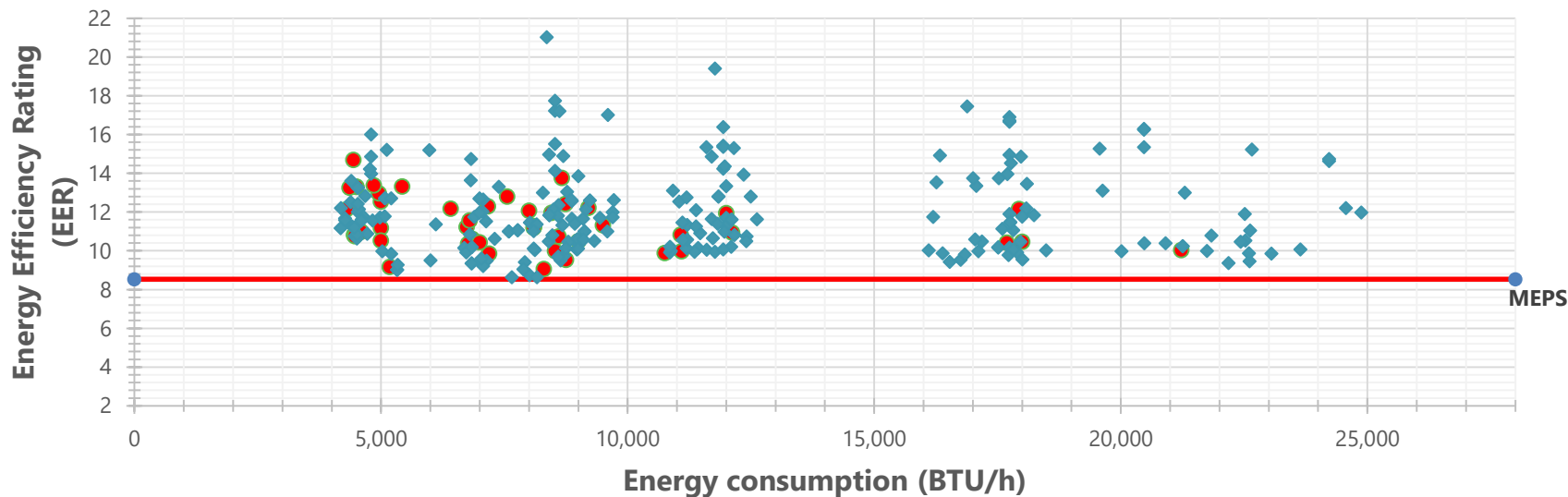
# Why does effective policy design require appropriate data?

Case study: defining MEPS in the absence of national market data



# Policy design without appropriate data may not be optimal

Efficiency rating of selected air conditioners in national/regional market – data collected after MEPS



Without appropriate data, minimum energy performance levels were set too low to impact the market

# Scenario

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A respected industry association claims that the MEPS level for a certain product are so out of date that all the products on your market easily comply

*How could you find information to test the claim?*



# Assessing Current Performance

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



# Information Sources

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- Registration system data
- Manufacturers/Trade Associations
- Purchased sales data
- Household surveys or Store Surveys
- Data from catalogues, and the internet – web crawling
- Test data
- Customs data



# What's on the market? Registration system data

Australian Government  
Department of the Environment and Energy

Greenhouse and Energy  
Minimum Standards Regulator

Energy Efficiency and  
Conservation Authority  
Te Tari Tiaki Pūngao

[Help on Headings](#) | [Data Dictionary](#)

Cost Calculator

Basic Search

Advanced Search

Product

**Air Conditioners**

Click the column header to sort the table. The table is currently sorted descending by Star Rating


Cooling

Calculator Result	Brand	Model	Installation Type	Indoor air distribution	Phase	Available	Country of Manufacture	Star Rating	Output (kW)	Power Input (kW)	Star Rating
N/A	MITSUBISHI HEAVY INDUSTRIES	SRK20ZSXA-W	Single Split System	Non Ducted	Single	Australia,Fiji,New Zealand	Thailand	7.0	2.00	0.31	7.0
N/A	DAIKIN	FTXZ25N / RXZ25N	Single Split System	Non Ducted	Single	Australia,New Zealand	Japan	7.0	2.50	0.42	7.0
N/A	MITSUBISHI HEAVY INDUSTRIES, LTD.	SRK20ZMXA-S / SRC20ZMXA-S	Single Split System	Non Ducted	Single	Australia,Fiji,New Zealand	Thailand	6.0	2.00	0.35	5.5


Registration data provides a complete snapshot of the market

# What's on the market? Registration data are available in many markets


**ข้อมูลผลิตภัณฑ์ที่ติดฉลากเบอร์ 5**




ผลการสุ่มทดสอบ




เครื่องรับโทรทัศน์




พัดลมชนิดสายรอบตัว




พัดลมระบายอากาศ




เครื่องซักผ้าแบบตั้งตั้ง ถึงเดี่ยว




เครื่องซักผ้าแบบตั้งตั้ง ถึงคู่



ตู้แช่เย็นแสดงสินค้า



กระแสไฟฟ้า



**LabelNo5**  
โครงการฉลากประหยัดไฟฟ้าเบอร์5

หน้าแรก    เกี่ยวกับโครงการ    ติดต่อเรา    ดาวโหลด

SEP  
**22**

0

## เครื่องรับโทรทัศน์

Posted by labelno5

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### ข้อมูลฉลากแสดงระดับประสิทธิภาพเครื่องรับ โทรทัศน์

ข้อมูล ณ วันที่ 30 มิถุนายน 2561

แสดง 10 แถวต่อหน้า
ค้นหา

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?

# What's on the market? Registration data are available in many markets

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)	Cooling 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 Conditioner	RAV322HSD	2.8	2.0	6160	2200	26-12-2013	31-12-2015	

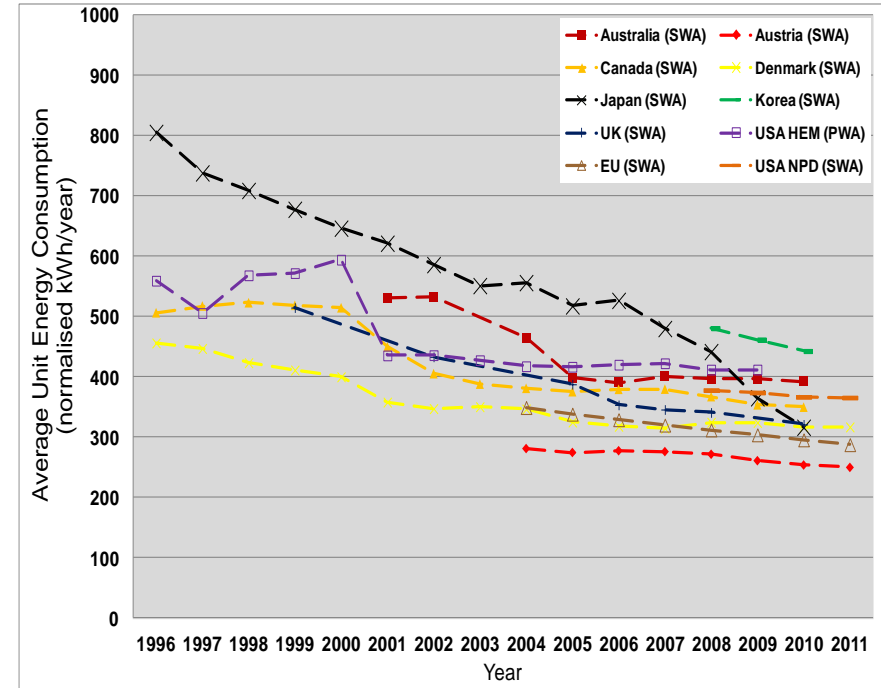
# Information Sources

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- Registration system data
- Manufacturers/Trade Associations
- **Purchased sales data**
- Household surveys or Store Surveys
- Data from catalogues and the internet
- Test data
- Customs data

# What's on the market? Market research data

- Purchase reports and/or data directly from market research companies
  - have consumer panels (many thousands),
  - links with retailers (and access to sales data)
  - Detailed data possible, but very expensive
- Subscribe to omnibus surveys
- Commission bespoke research



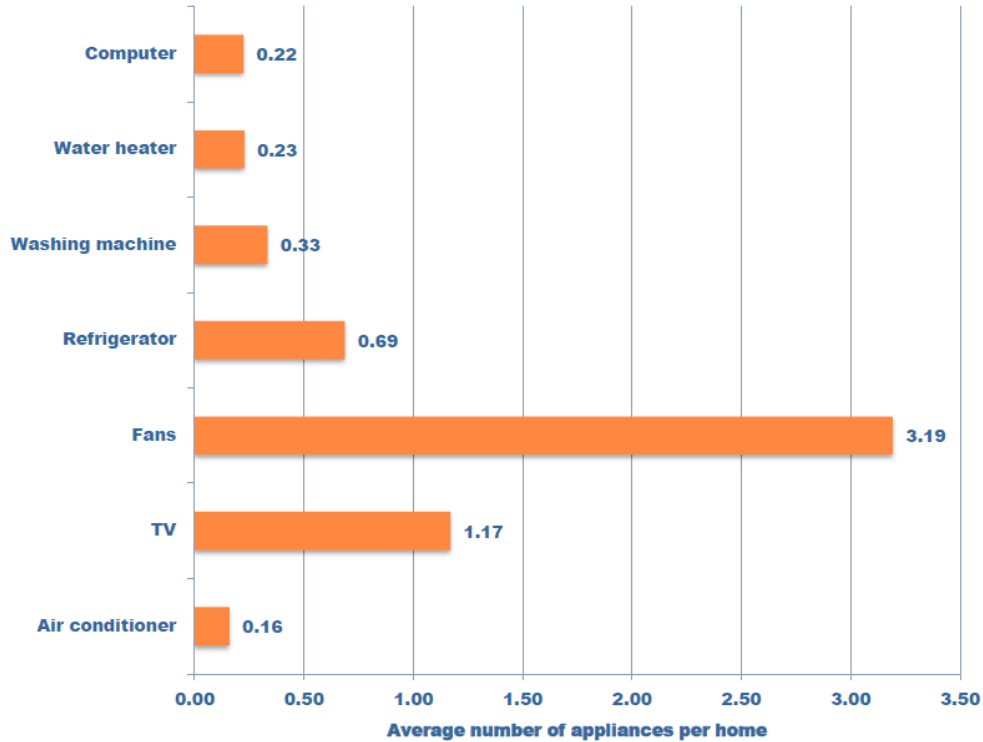
Source: IEA 4E Benchmarking Report for Air conditioners, 2011

# Information Sources

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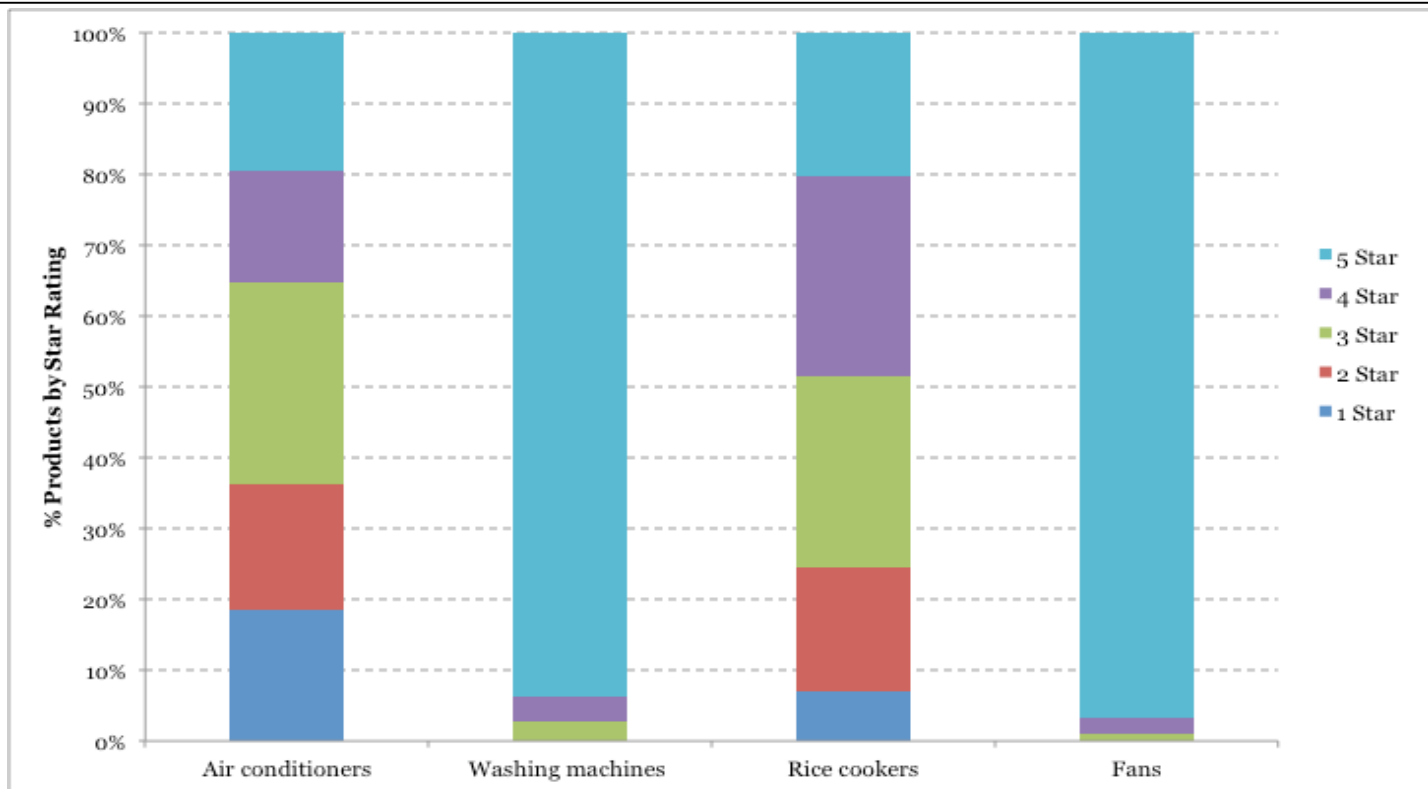
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# What's on the market? Household Surveys



Source: Vietnam Energy Efficiency Standards and Labelling Programme

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Source: Vietnam Energy Efficiency Standards and Labelling Programme



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# What's on the market? Data from catalogues



## 15 SERIES

HIGH-EFFICIENCY  
WALL-MOUNTED DUCTLESS SYSTEMS

PERFORMANCE:

- 15 SEER
- Up to 12.2 EER
- 8.2 HSPF



### Product Features

- Inverter Compressor
- 208/230/1 Power Supply
- Cooling Range: 50° - 115° F
- Heating Range: 5° - 75° F
- Pre-charged for up to 33 ft of Liquid Line
- Indoor Sound Pressure as Low as 19 dB(A)
- Outdoor Sound Pressures as Low as 46 dB(A)
- Washable Air Filter
- Econo Mode
- Program Dry Function
- Powerful Operation Mode
- Wireless Remote Controller
- Outdoor Unit Quiet Operation
- Auto Changeover (Heat Pump Only)
- Auto Fan Speed Control
- Self-Diagnostics with Digital Display
- Auto Restart after Power Failure
- Anti-Corrosion Treatment on Heat Exchanger
- Max Piping (09/12 MBH): 49' Length, 39' Height
- Max Piping (18/24 MBH): 98' Length, 66' Height

# Webcrawling for market insights and policy development

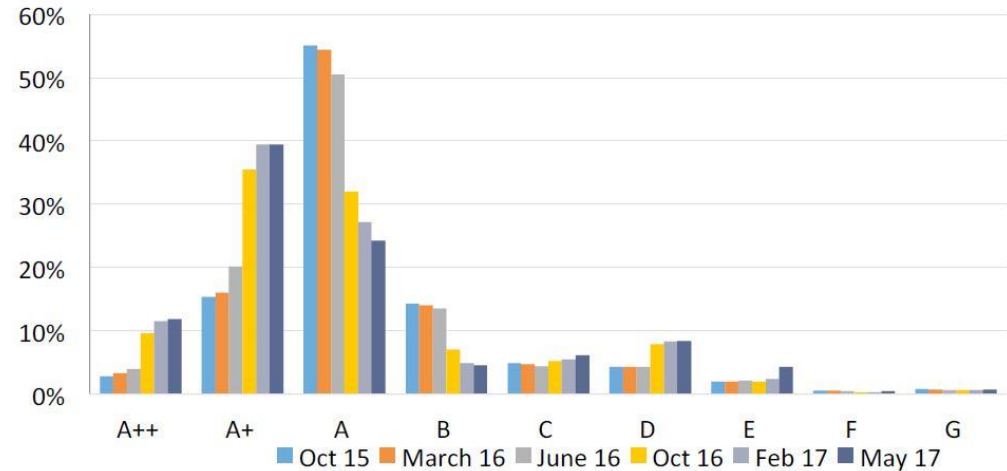
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- **Why?** Resources needed for extensive in-store surveys are high, as are market studies
- **Method:** Use of software to scan the web (online retailers, also be product data sheets) to find information (e.g. product type, model, specifications, price, energy performance)  
Then analyse data
- Applications:
  - Market insights (snap-shots, time series showing the development over time, market responses to changes such as policy interventions, campaigns etc.
  - Indication of compliance or non-compliance
  - Policy analysis and evaluation (adaptation patterns and rates, technology development, price development, correlation between price and efficiency)



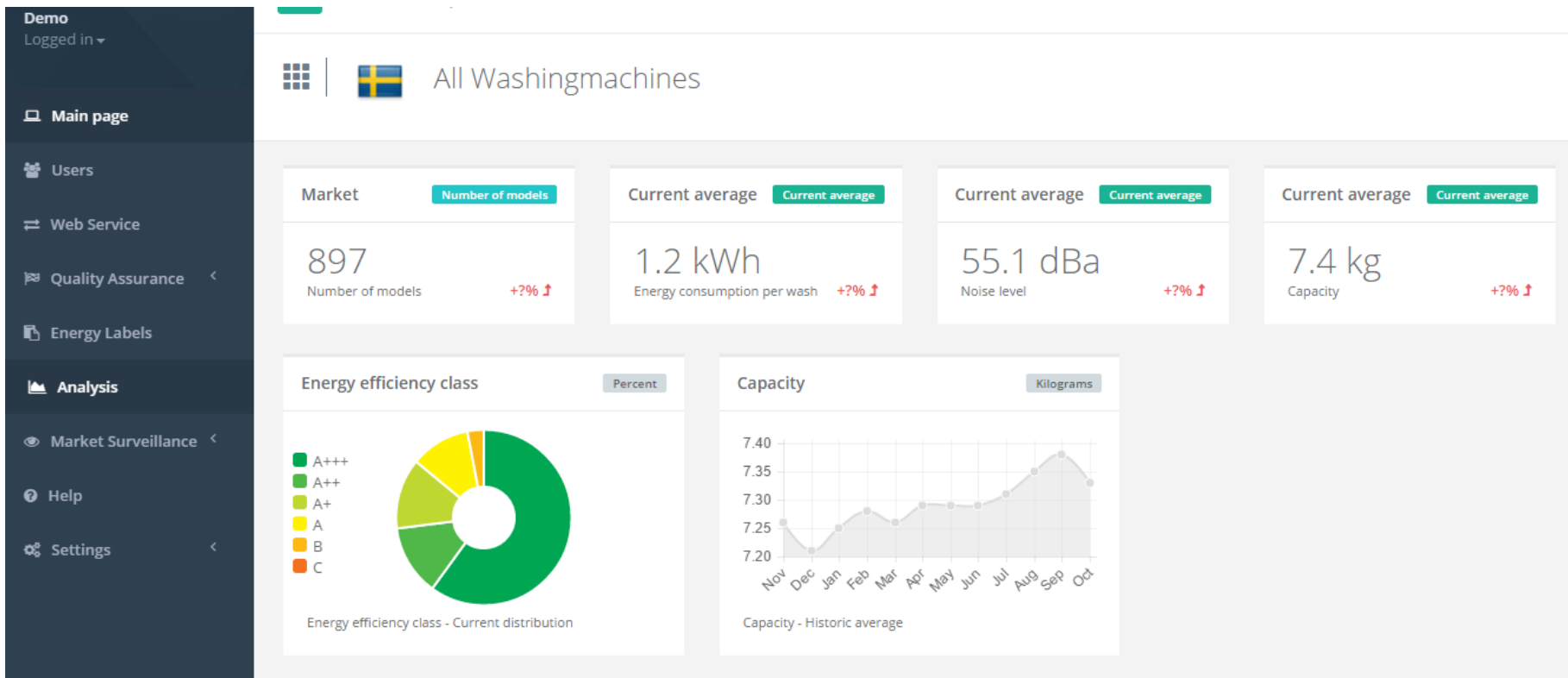
# What's on the market? Using Internet Data – Web Crawling

- Possible to follow the market in real time, and over time
- Information on
  - Adaptation patterns
  - Speed at which the market evolves
  - In-depth analysis



Source: Big2great

# Web-Crawling



# Webcrawling pilot in South Africa and Indonesia

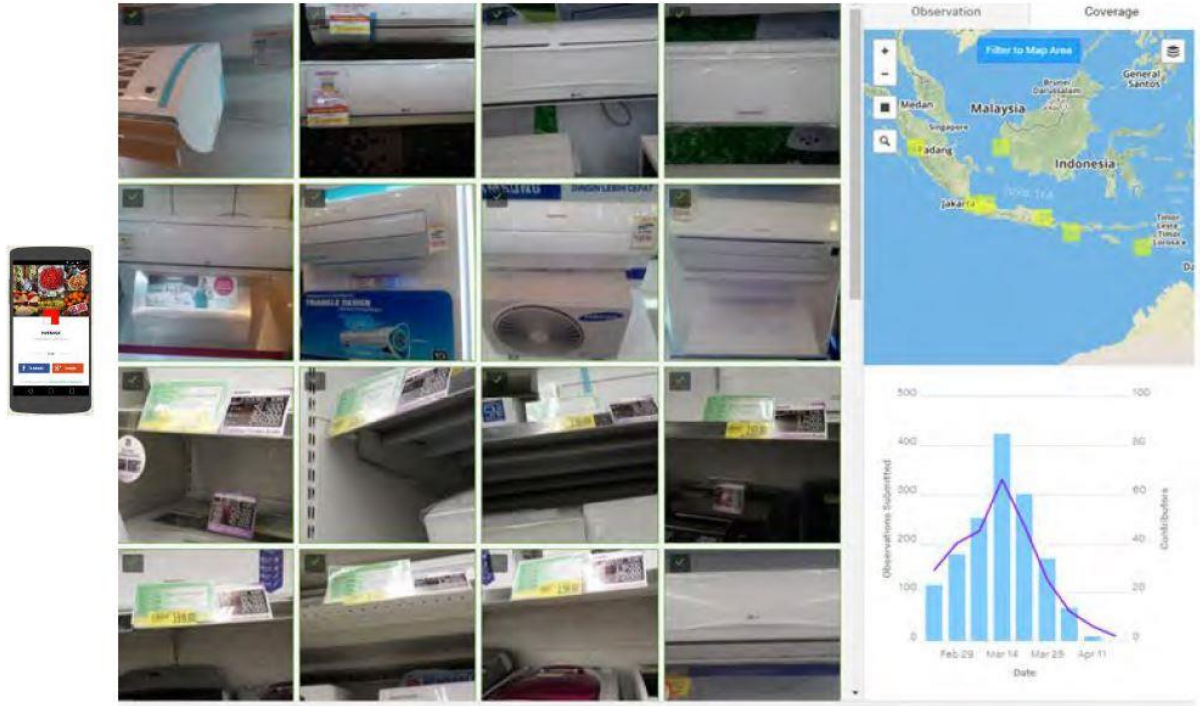
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- **Why?** Test replicability of method in emerging markets, get insights onto what data are available, what types of analysis are possible
- **Focus:** air conditioners and refrigerators
- **Results:** Variable coverage. Price highest cover.
- **Initial conclusions:**
  - Compared to more mature markets information found was less comprehensive
  - Product purchasing patterns need to be considered
  - Greatest added value is on price information, which can then be correlated with comprehensive information on energy performance from product registries
  - Also shows non-compliance where display of energy labels are mandatory for online retailers
  - Shows promise but in immature e-markets needs to be combined with other data sets

# Recent South Africa scraping of data

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# Applications – Data on-Demand



Source: <http://eedal2017.uci.edu/wp-content/uploads/Wednesday-07-Letschert-smaller.pdf>



# Information Sources

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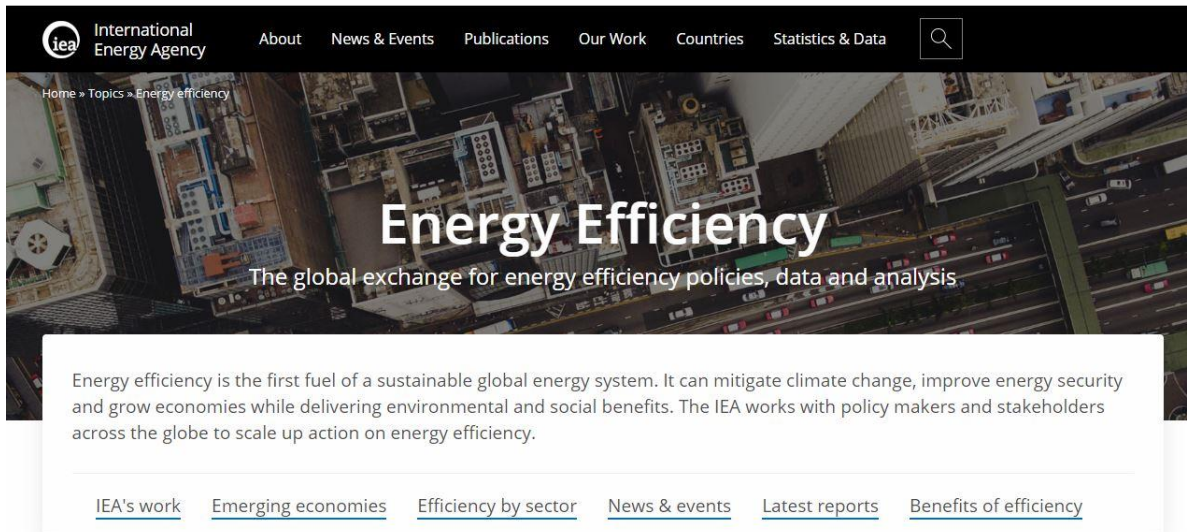
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- Registration system data
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- Purchased sales data
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- Data from catalogues and the internet
- Test data
- **Customs data**

# Global Exchange for Energy Efficiency



The screenshot shows the top section of the IEA Energy Efficiency website. At the top is a dark navigation bar with the IEA logo and the text 'International Energy Agency'. To the right of the logo are links: 'About', 'News & Events', 'Publications', 'Our Work', 'Countries', and 'Statistics & Data'. A search icon is on the far right. Below the navigation bar is a large banner image of a city street with buildings and cars. Overlaid on the banner is the text 'Energy Efficiency' in large white letters, followed by 'The global exchange for energy efficiency policies, data and analysis' in smaller white letters. Below the banner is a white box containing a paragraph of text. At the bottom of the white box are six links: 'IEA's work', 'Emerging economies', 'Efficiency by sector', 'News & events', 'Latest reports', and 'Benefits of efficiency'.

International Energy Agency

About News & Events Publications Our Work Countries Statistics & Data

Home » Topics » Energy efficiency

## Energy Efficiency

The global exchange for energy efficiency policies, data and analysis

Energy efficiency is the first fuel of a sustainable global energy system. It can mitigate climate change, improve energy security and grow economies while delivering environmental and social benefits. The IEA works with policy makers and stakeholders across the globe to scale up action on energy efficiency.

[IEA's work](#) [Emerging economies](#) [Efficiency by sector](#) [News & events](#) [Latest reports](#) [Benefits of efficiency](#)

## Energy efficiency is being outpaced by growth in energy demand, but a more efficient world is possible

Global energy demand rose by 1.9% in 2017 – the fastest annual increase since 2010. The forces driving up energy demand, led by strong economic growth, outpaced progress on energy efficiency. As a result energy intensity – primary energy use per unit of GDP – fell by just 1.7% in 2017, the slowest rate of improvement this decade.

# Setting MEPS

# Scenario

---

A respected industry association claims that the MEPS level for a certain product are so out of date that all the products on your market comply.

*After checking what is on the market, you believe this to be correct*

*What would you do next? How would you update/set MEPS?*



# Setting MEPS – wider process



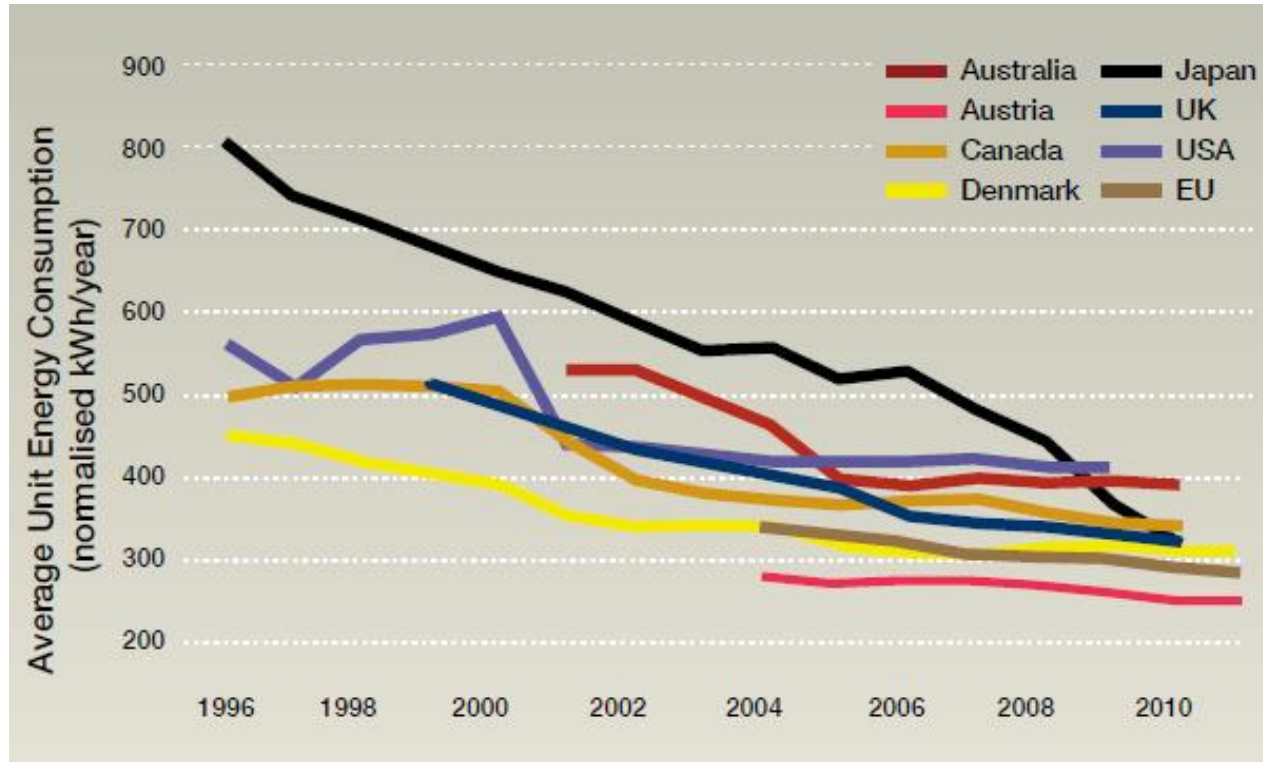
Source: United4Efficiency

# Defining new MEPS

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- Consider specifications in similar markets
- Consider global or regional harmonisation
- Cost-benefit analysis
  - Use a market analysis (e.g. eliminate worst 20%)
  - Undertake an engineering analysis (least life cycle cost)

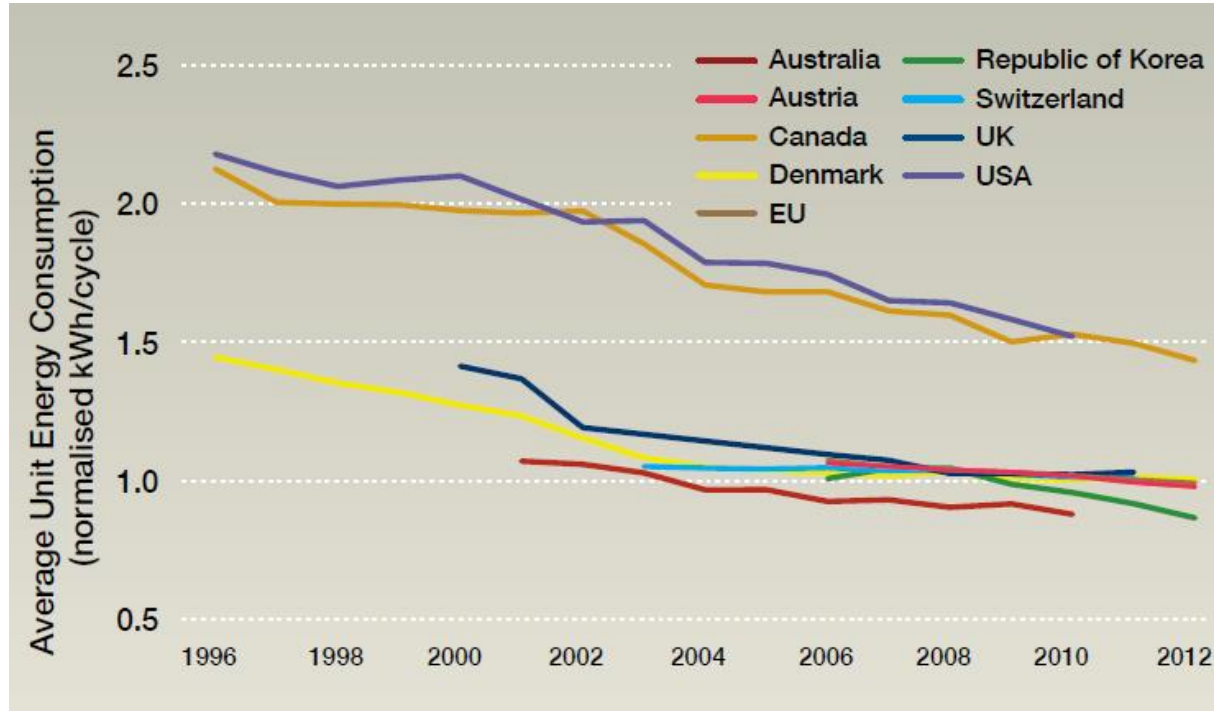
# Defining new MEPS – checking current market performance



Source: [http://mappingandbenchmarking.iea-4e.org/shared\\_files/509/download](http://mappingandbenchmarking.iea-4e.org/shared_files/509/download)



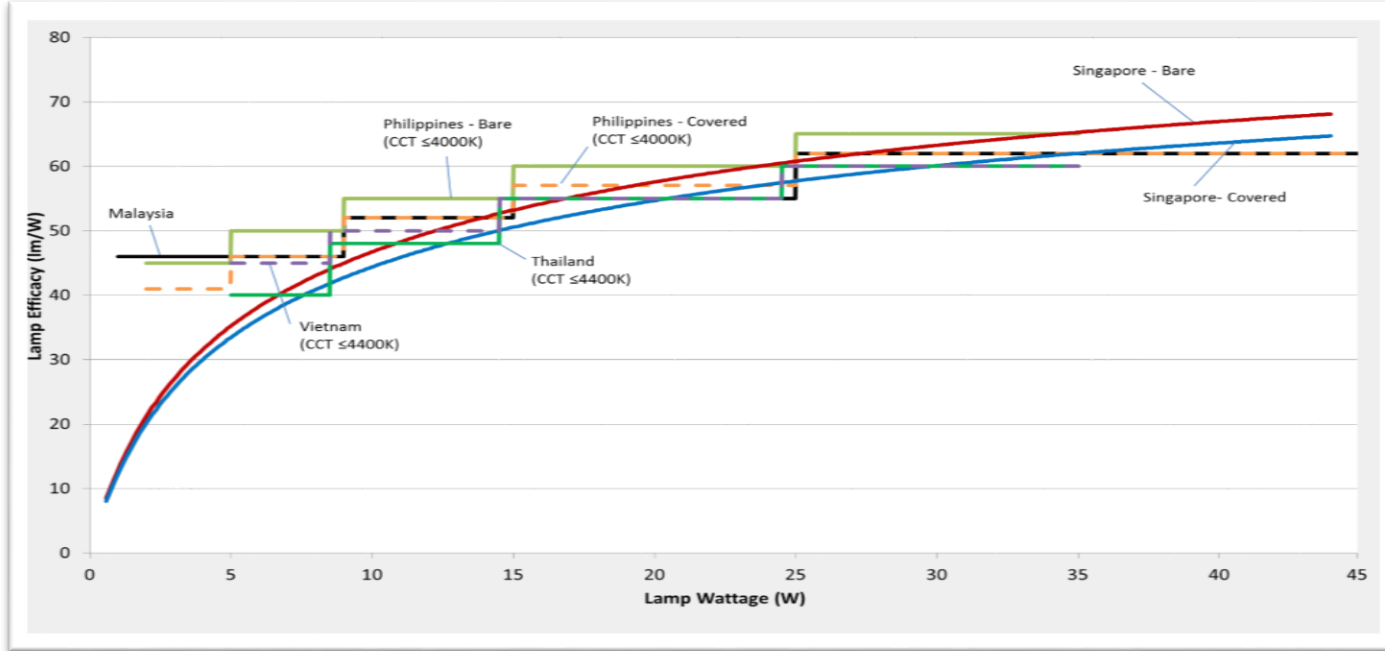
# Defining new MEPS – performance - comparing like with like



Source: [http://mappingandbenchmarking.iaea-4e.org/shared\\_files/555/download](http://mappingandbenchmarking.iaea-4e.org/shared_files/555/download)

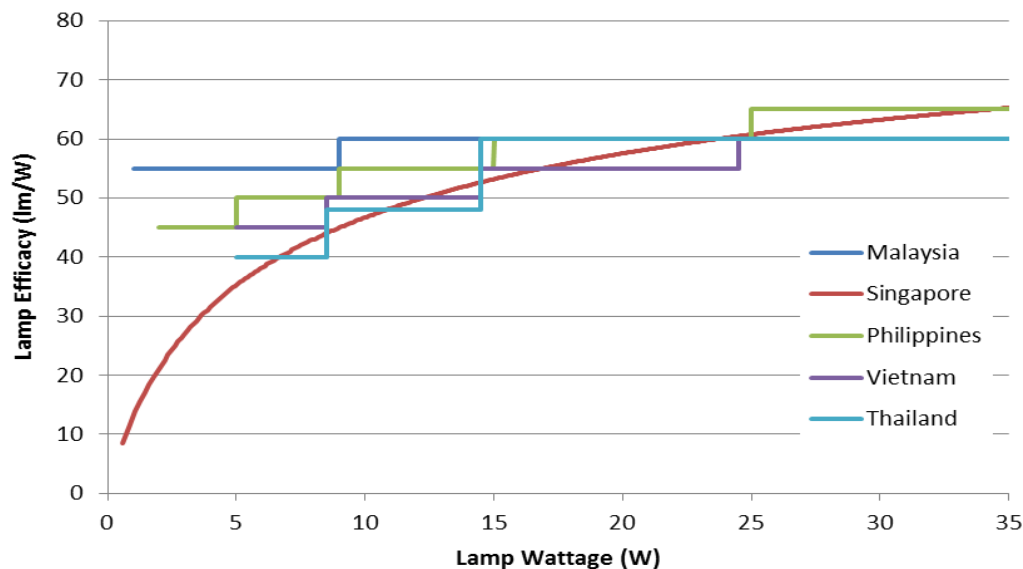
# New MEPS: Consider specifications in similar markets

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



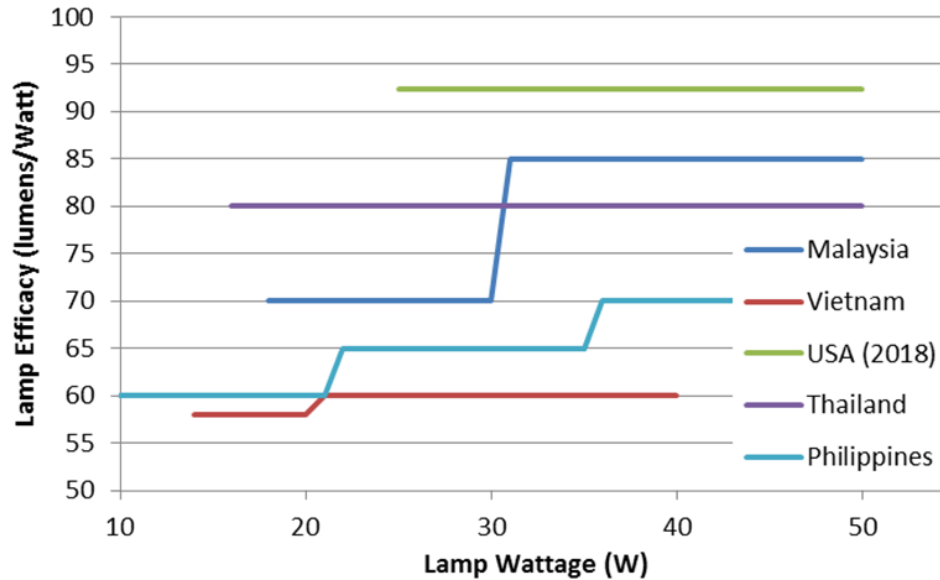
# Current MEPS – CFLs (ASEAN SHINE Lighting)

- Large market share product with increasing sales, BUT not a great deal of energy saving benefit to be gained from aligning performance standard and harmonising test standard at this stage. (other benefits though are: trade, MVE)



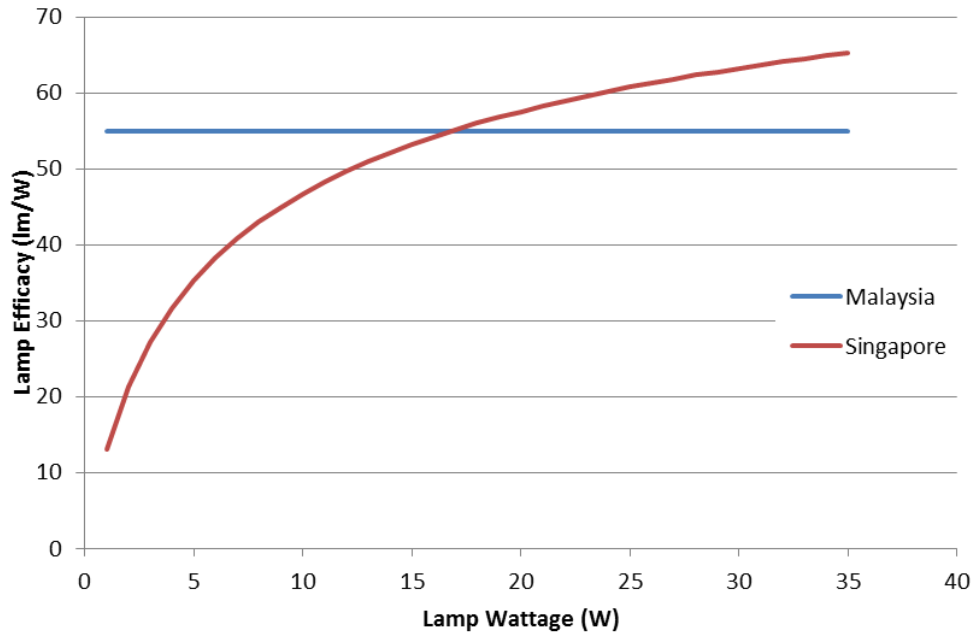
# Current MEPS – LF (ASEAN SHINE Lighting)

- Significant energy saving benefit to be gained from harmonising test standards and aligning performance standards

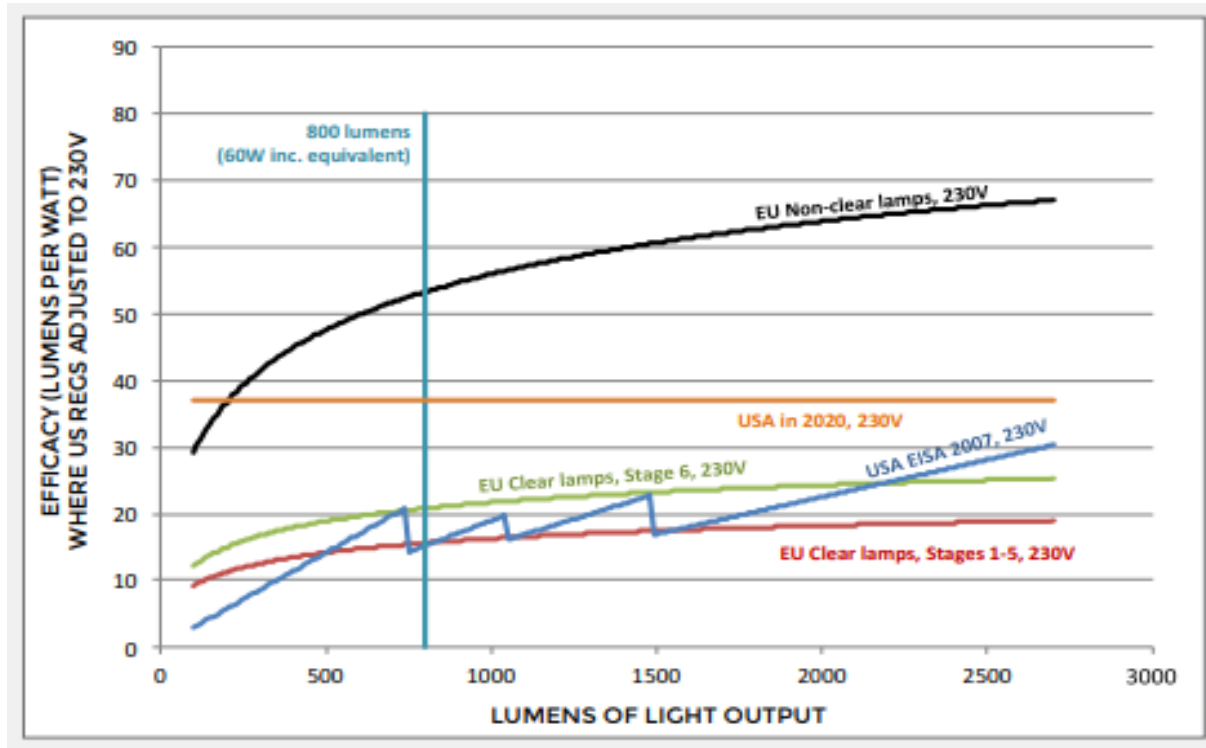


# Current MEPS – LEDs (ASEAN SHINE Lighting)

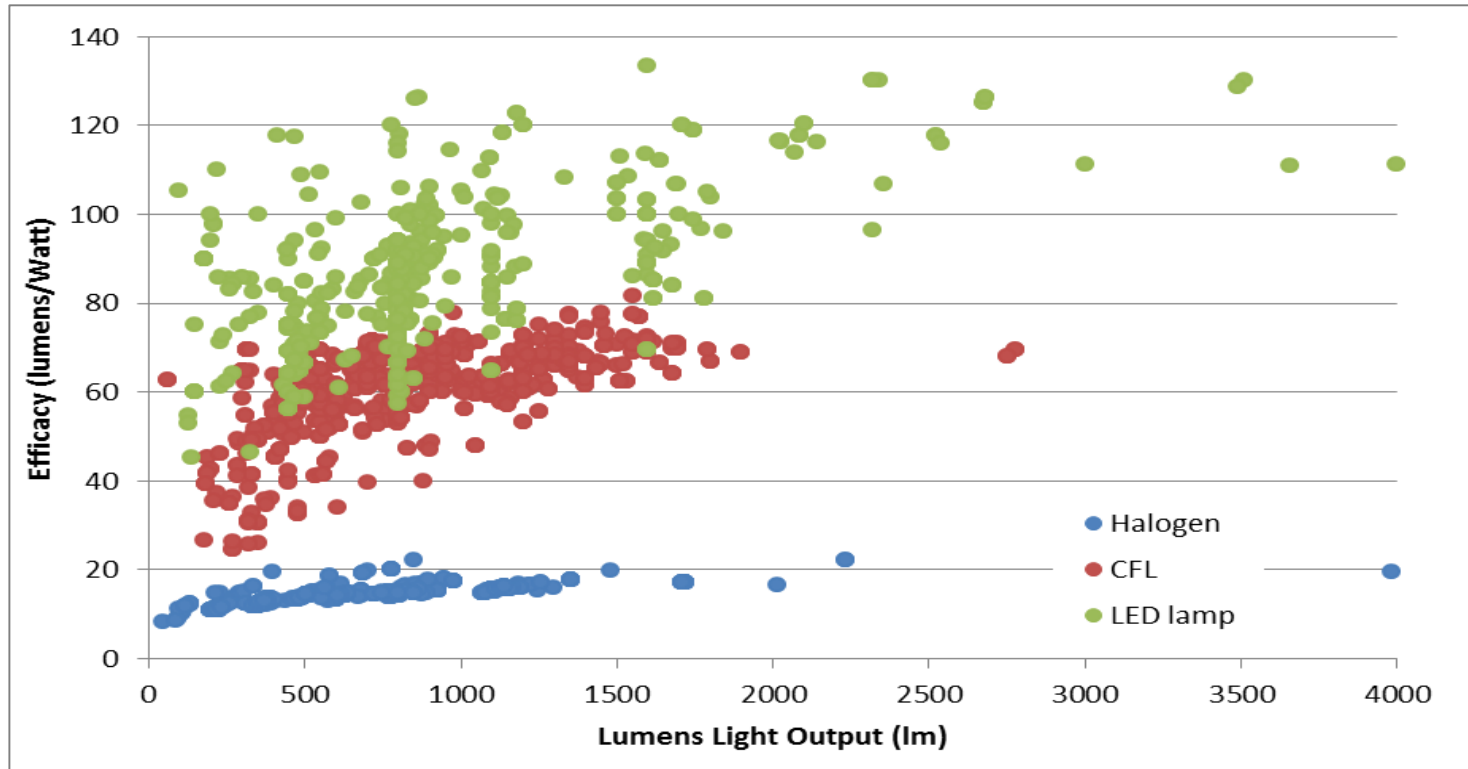
- Significant energy saving benefit to be gained from harmonising test standards and aligning performance standards



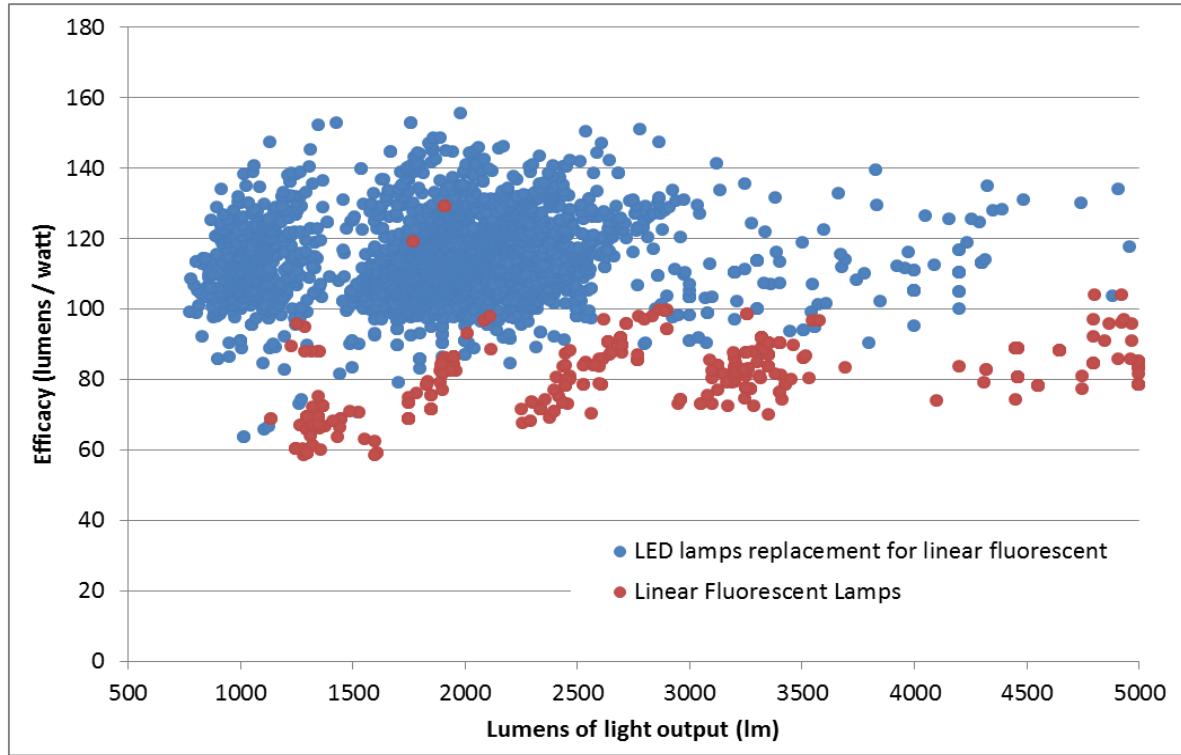
# Make sure you are comparing similar things



# Market analysis

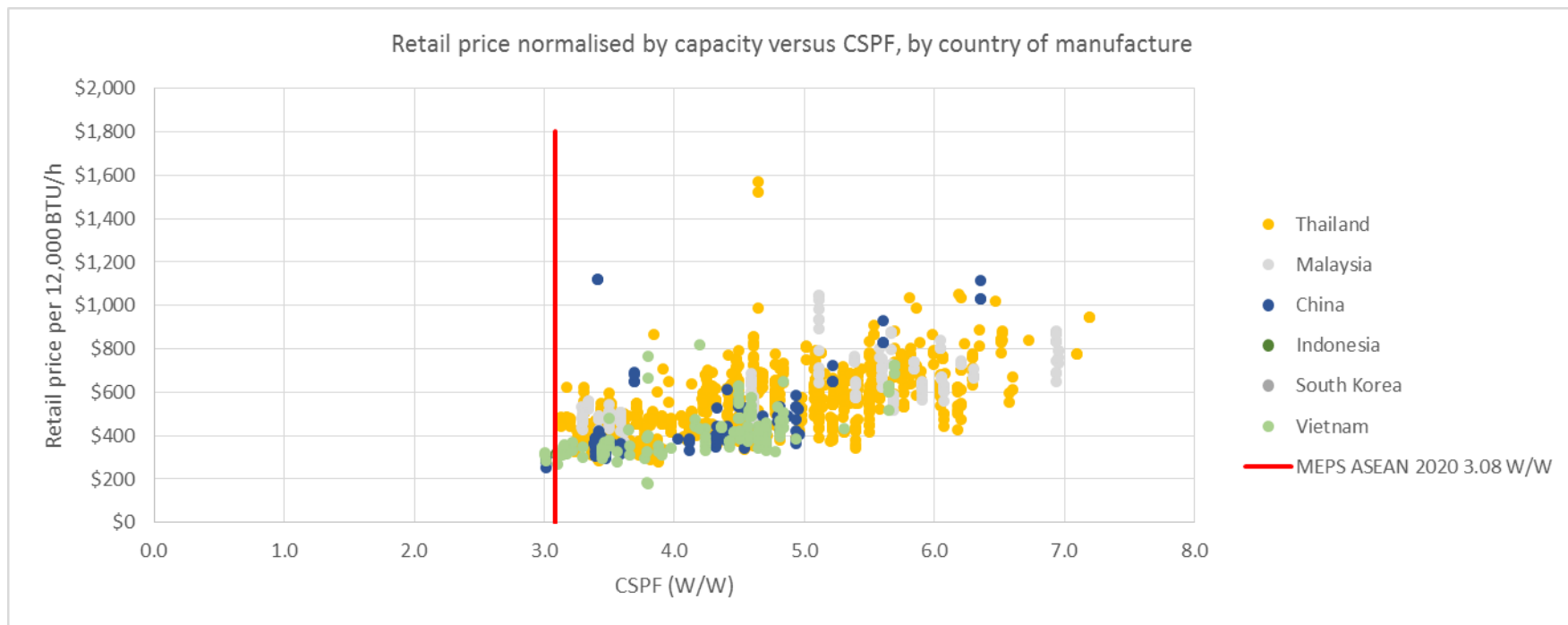


# Technical assessments of technologies available on the market

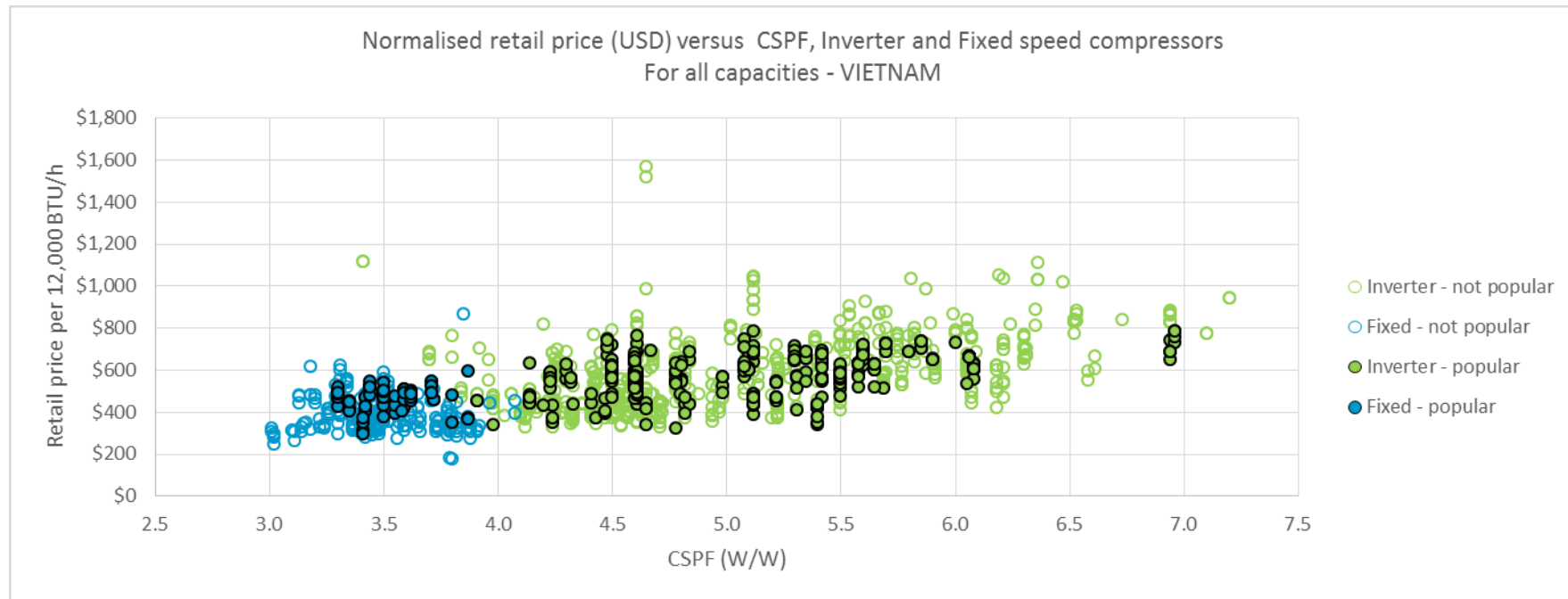




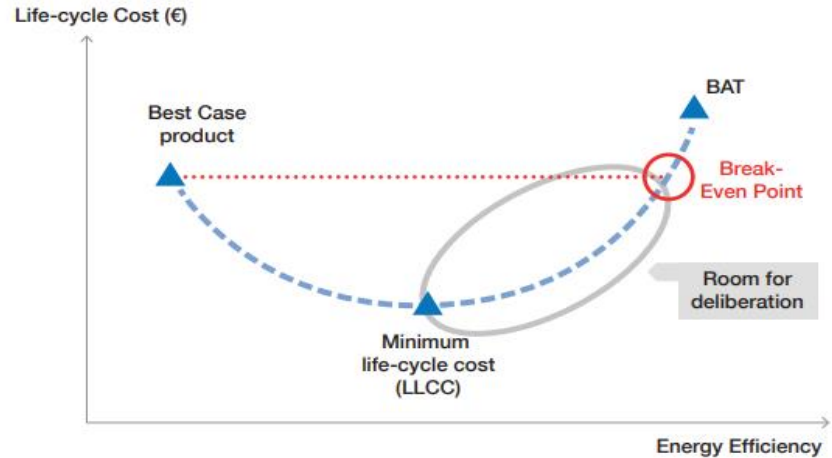
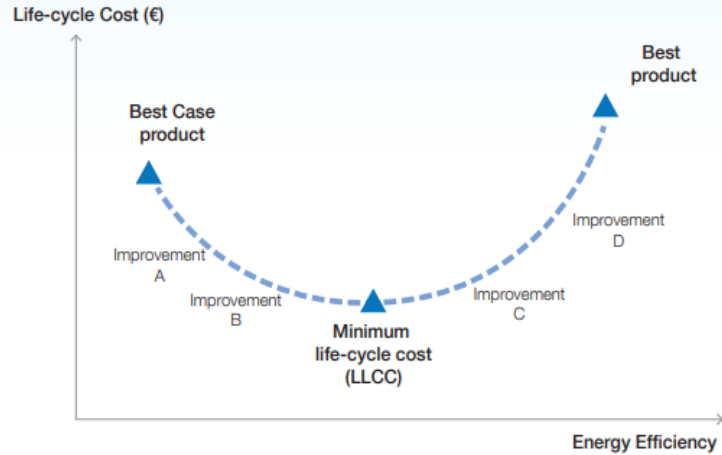
# Vietnam – Retail price vs capacity (and country manufacture)



# Vietnam - Retail price vs capacity (and technology)



# What about least life cycle costs?



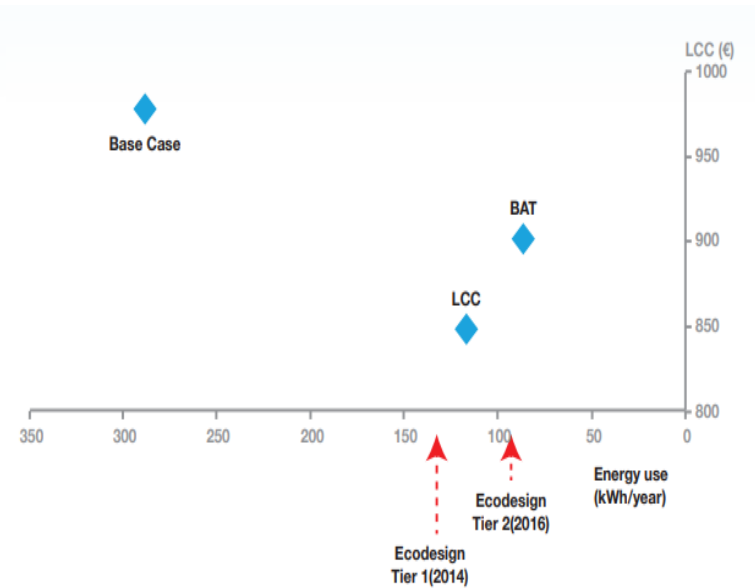
Source: Cool Products

# Take into consideration rate of technology change

## Televisions

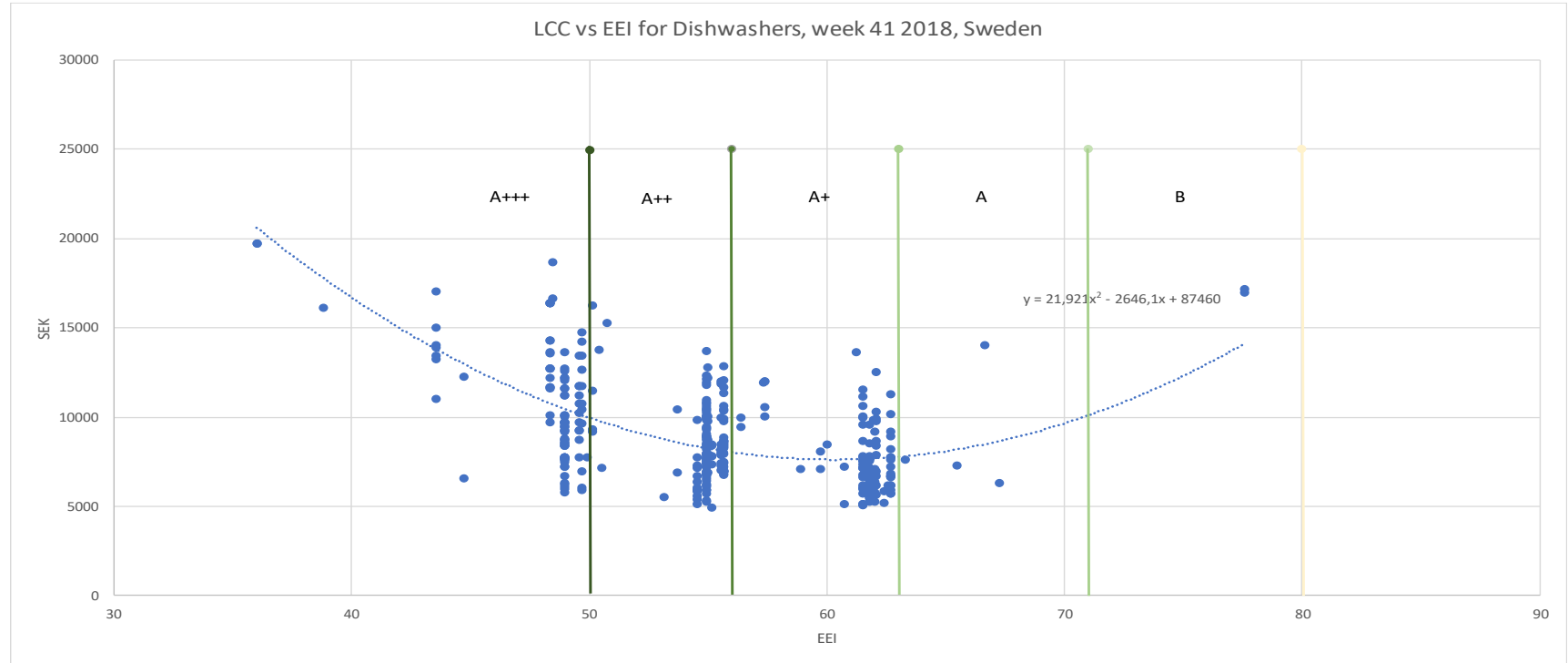


## Desktop computers



Source: Cool Products

# Crawled data on dishwashers for LLC



# Value of being ambitious

Estimates of additional energy savings in case of BAT-level requirements in EU

	Ecodesign level (2nd tier)	BAT level	EU savings from Ecodesign measure (TWh/year by 2020)	Additional savings if the level had been BAT (TWh/year by 2020)
Fridge-freezers	A+	A++	4	6
Condenser dryers	B	A++ <sup>13</sup>	3.3	5 <sup>14</sup>
Washing machines	A+	A++ <sup>15</sup>	1.5	2.5 <sup>16</sup>
Dishwashers	A+	A++	2	1.5 <sup>17</sup>
Televisions	D	E (changed to C)	28	14 <sup>18</sup>
Mobile air-co.	A	A+++ (changed to A+)	0.1 (estimated) <sup>19</sup>	0.2 <sup>20</sup>
<b>Total</b>			<b>39.3TWh</b>	<b>29.2TWh</b>

Source: Cool Products

IEA 2019. All rights reserved.

# Impact assessments

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- Governments undertake Impact assessments
  - Ideally numerical assessment
  - Also qualitative
- Usually based on financial assessments
  - Consumer impact
    - Purchase price
    - Running costs
  - Manufacturer impacts
  - Other costs/benefits
    - Value of carbon
- Impact assessment end-use model usually used
  - Discounting future values
  - Net present value, cost-benefit ratio

# Resources

<https://united4efficiency.org/countries/country-assessments/>

<https://www.premise.com/>

<https://www.aseanshine.org/asean-shine-task-force/c/air-conditioners>



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# U4E - 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

**RATED VALUES**

Rated Min. Voltage: *	<input type="text"/>	V	Rated Max. Voltage: *	<input type="text"/>	V
Rated Min. Frequency: *	<input type="text"/>	Hz	Rated Max. Frequency: *	<input type="text"/>	Hz
Number of phases: *	<input type="text" value="1"/>				
Rated power input – cooling: *	<input type="text"/>	W			
Rated capacity – cooling: *	<input type="text"/>	W			

**GENERAL SPECIFICATIONS**

Type of air distribution? *	<input type="text" value="Non Ducted"/>	Type of refrigerant? *	<input type="text" value="R152A"/>
Does the air-conditioner have variable output capacity (eg inverter)?	<input type="text" value="No"/>		

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

# Resources

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Lighting <https://united4efficiency.org/resources/accelerating-global-adoption-energy-efficient-lighting/>

ACs <https://united4efficiency.org/resources/accelerating-global-adoption-energy-efficient-air-conditioners/>

Refrigerators <https://united4efficiency.org/resources/accelerating-global-adoption-energy-efficient-climate-friendly-refrigerators/>

Distribution Transformers  
<https://united4efficiency.org/resources/accelerating-global-adoption-energy-efficient-transformers/>

Electric Motors <https://united4efficiency.org/resources/accelerating-global-adoption-energy-efficient-electric-motors-motor-systems/>



Supplement to the Lighting Policy Guide:  
"Accelerating the Global Adoption of  
Energy-Efficient Lighting"

## Model Regulation Guidelines

Energy Efficiency and Functional Performance  
Requirements for General Service Lamps

UN Environment – Global Environmental Facility  
United for Efficiency (U4E)  
21 May 2018

