
Finding the most energy efficient TV in China and Europe: not such an easy job...

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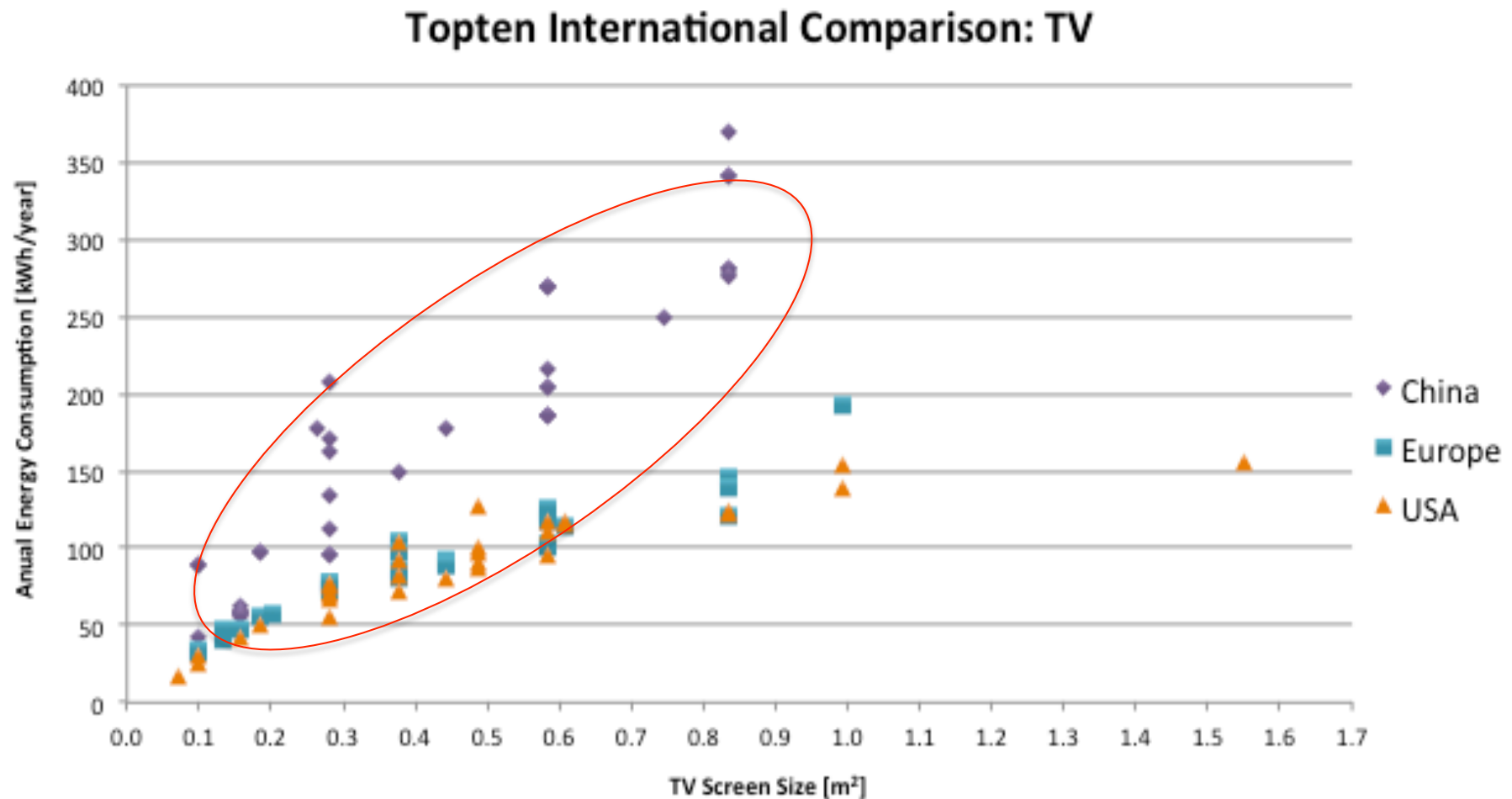
Why an international TV test

- Topten: shows the most energy efficient appliances online, based on official regional standards
- Global presence of Topten allows comparing apparent Best Available Technology (BAT): in China, Europe and the USA
- Data from Topten: Energy Consumption of Chinese TVs seemed to be significantly higher than of EU- and US TVs

→ **A test project was launched, including a high efficiency TV from China and one from Europe:**

- “Are Chinese TVs less efficient than European TVs, or is it only the declaration that differs?”
- “What are differences in testing and declaring?”

Topten international comparison



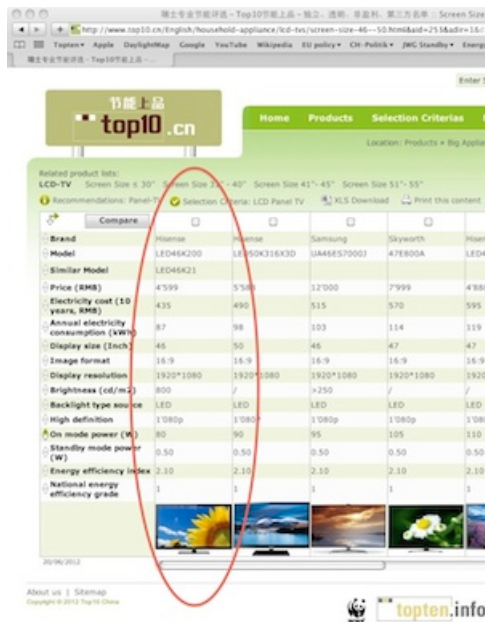
The project

- 1 efficient TV from China, 1 from Europe
- TV models selected from Topten product lists in July 2012
- Both TVs tested in 2 Chinese and 1 European testing institutes
- Both TVs tested and rated according to the
 - Chinese Energy label and relevant measurement standards
 - EU Energy label and relevant measurement standards



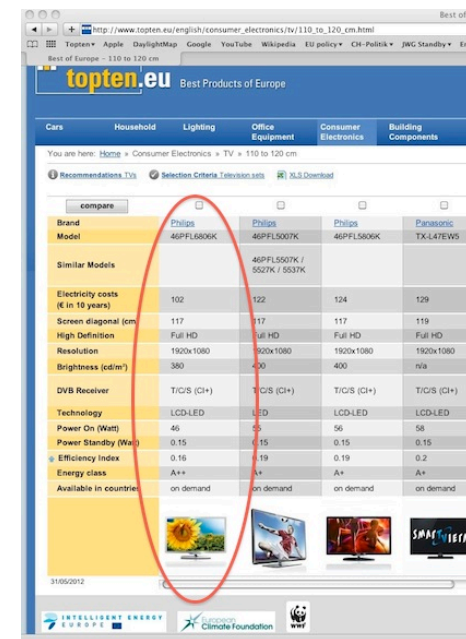
Selection of TVs from Topten lists

- Screen diagonal: 46 inch / 117 cm
- Selected were those TV models with lowest On mode power



Brand	Hisense	Hisense	Samsung	Skyworth	Hisense
Model	LED46K200	LE50K316XD	UA46E57000	47E800A	LED4
Similar Model	LED46K21				
Price (RMB)	4599	5799	12000	7999	4888
Electricity cost (10 years, RMB)	435	490	515	570	595
Annual electricity consumption (kWh)	87	98	103	114	119
Display size (inch)	46	50	46	47	46
Image format	16:9	16:9	16:9	16:9	16:9
Display resolution	1920*1080	1920*1080	1920*1080	1920*1080	1920
Brightness (cd/m²)	800	/	>250	/	/
Backlight type source	LED	LED	LED	LED	LED
High definition	1080p	1080p	1080p	1080p	1080
On mode power (W)	30	30	95	105	110
Standby mode power (W)	0.50	0.50	0.50	0.50	0.50
Energy efficiency index	2.10	2.10	2.10	2.10	2.10
National energy efficiency grade	1	1	1	1	1

Topten **China**:
Hisense LED46K200, **Grade 1**



Brand	Philips	Philips	Philips	Panasonic
Model	46PFL6806K	46PFL5007K	46PFL5806K	TX-L47EW5
Similar Models		46PFL5507K / 5527K / 5537K		
Electricity costs (€ in 10 years)	102	122	124	129
Screen diagonal (cm)	117	117	117	119
High Definition	Full HD	Full HD	Full HD	Full HD
Resolution	1920x1080	1920x1080	1920x1080	1920x1080
Brightness (cd/m²)	380	400	400	400
DVB Receiver	T/C/S (CI+)	T/C/S (CI+)	T/C/S (CI+)	T/C/S (CI+)
Technology	LCD-LED	LCD-LED	LCD-LED	LCD-LED
Power On (Watt)	45	45	56	58
Power Standby (Watt)	0.15	0.15	0.15	0.15
Efficiency Index	0.16	0.19	0.19	0.2
Energy class	A++	A+	A+	A+
Available in countries	on demand	on demand	on demand	on demand

Topten **Europe**:
Philips 46PFL6806K, **A++**

TV test: Participating test institutes



CVC: Guangzhou Vkan Certification & Testing Institute, China National Center for Quality Supervision & Test of Electrical Appliances. Guangzhou, China.



NIM: National Institute of Metrology. Beijing, China.



VDE: Association for Electrical, Electronic and Information Technologies VDE. Offenbach, Germany.

Results 1: EEI and Class

EU Energy Label

	Philips 46PFL6806K		Hisense LED46K200	
	EEI*	Class*	EEI	Class
CVC	0.161	A++	0.302	B
NIM	0.163	A++	0.302	B
VDE	0.169	A++	0.301	B
*Incl. the 5% discount for the ABC, the A++ (EEI< 0.16) was confirmed by all institutes				

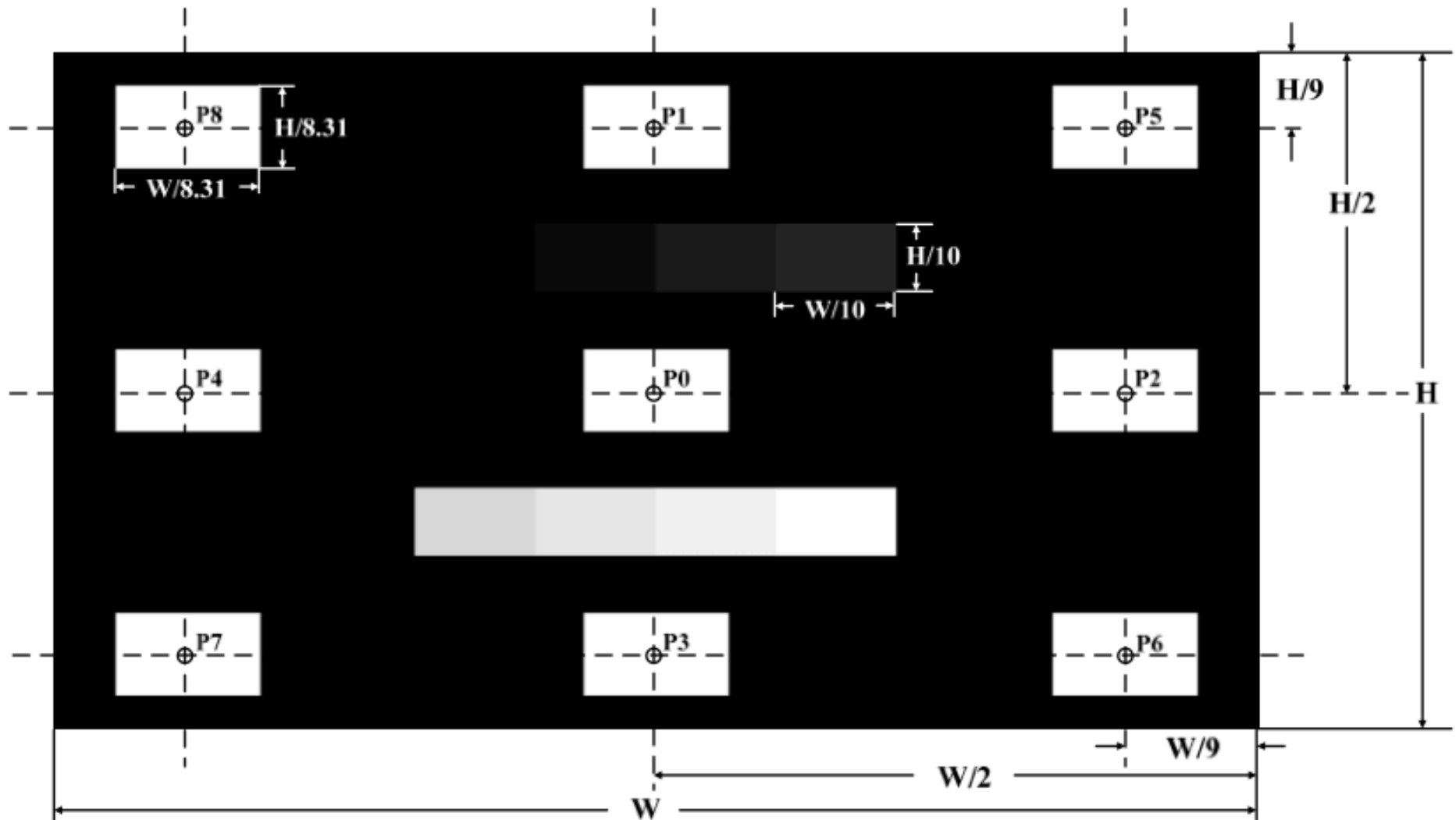
China energy labelling standard

	Philips 46PFL6806K		Hisense LED46K200	
	EEI	Class	EEI	Class
CVC	1.15 (1.34**)	2 (2**)	1.36 (1.50**)	2 (1**)
NIM	-	-	2.33	1
VDE	1.43**	1**	2.86**	1**
*Measured with HDMI input terminal. ** Officially RF should be used.				

TV test: Regulations, standards & definitions

	China	Europe
Labelling regulation	GB 24850: 2010	Regulation No 1062/2010
	MEPS, labelling scale and measurement standard in 1 document	Only basis for Label. No clear reference to measurement standard
Efficiency: On mode power	I_v/P_{On} [cd/W]	$P_{On}/P_{On\ ref}(dm^2)$ [W/W]
On mode power		
Test video	IEC 62087:2011, average 10 min.	IEC 62087:2011, average 10 min.
TV settings	GB 24850: 2010	1062/2010
	Luminance adjusted to 8-greylevel-signal	Out of the box / 'Home' mode
	ABC off	ABC off
Typical Luminance	adjusted to 8-greylevel-signal	Out of the box / 'Home' mode

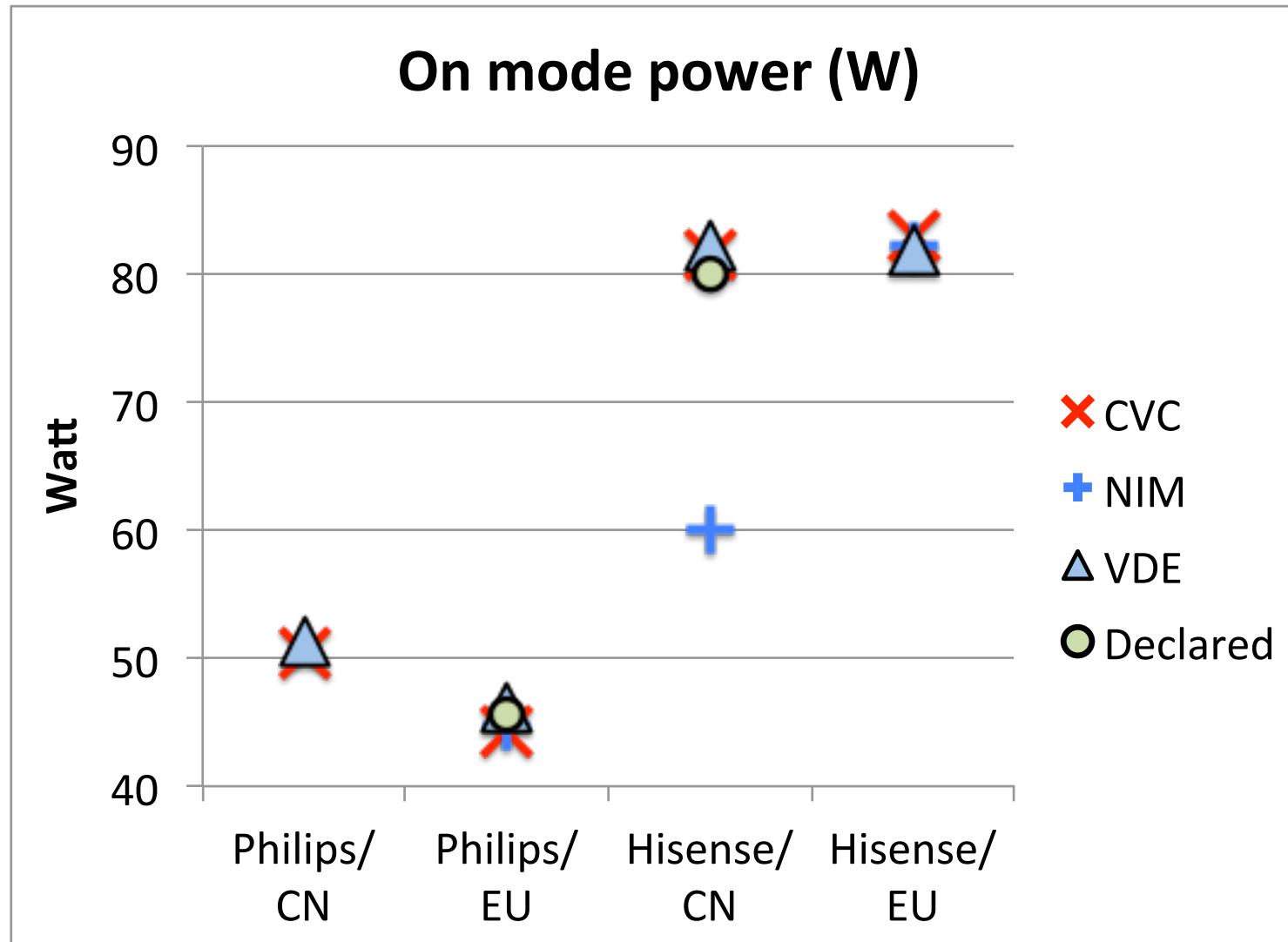
8 grey-level adjustment and luminance testing points



Main results - summary

1. According to the **EU Energy Label**, the **Philips 46PFL6806K is more energy efficient** than the Hisense LED46K200
2. According to the **Chinese Energy Label**, the **Hisense is more energy efficient** than the Philips TV
3. The **Hisense TV has a higher On mode power** than the Philips, for all measurements
4. The institutes reached **different results according to the Chinese standard**. Especially the (European) Philips TV was difficult to measure
5. For the **luminance** the institutes reached also different results according to the EU standard.
6. All institutes failed to include the 5% discount for ABC for the EU Energy Label

Results 2: On mode power



Conclusions 1: TV efficiency

Efficiency:
relative
power

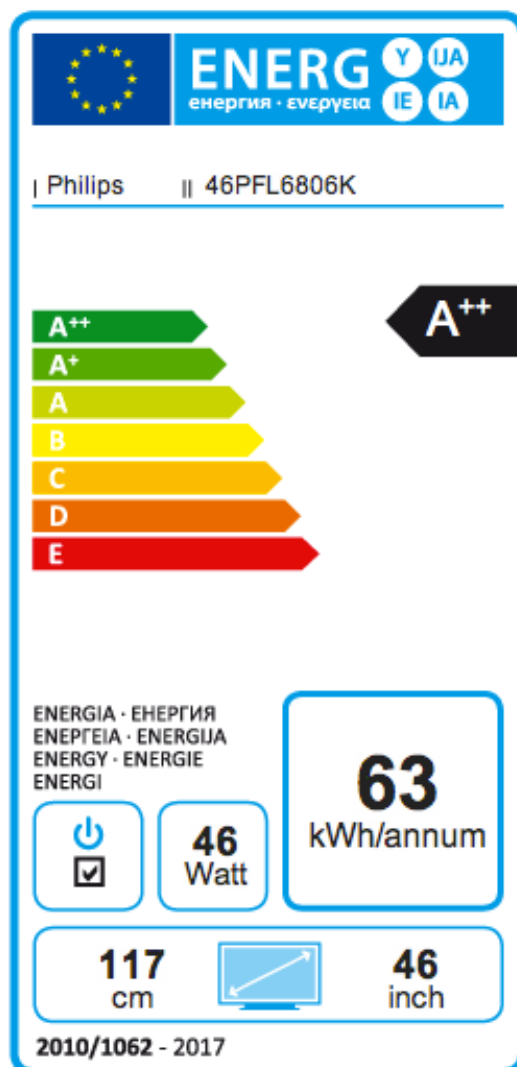
**China: power relative to screen size +
brightness**

EU: power relative to screen size

Sufficiency:
absolute
power

power

First insights: labels



Conclusions 2: standards influence products

- Our results show: manufacturers optimise products very much according to (regional) standards and labels. Standards and labels strongly influence product design!
- Hence precise definitions of these are key
- There is no global agreement on the definition of 'TV efficiency'
- Harmonisation would facilitate performance comparison and trade of efficient products

Conclusions 3: Strengths and weaknesses of the two labels

EU Energy Label and Ecodesign regulation:

- + Favours low power relative to size
- + Considers the factory settings and maximum brightness of TVs
- Favours large TVs
- Compliance cannot be checked from declaration (tuners, ABC)
- Unclear references to standards, 7 documents needed for test

China Labelling Standard

- + 'All in one' – 1 document contains all info, clear references to standards
- Favours large and bright TVs
- Only Label grade is declared – compliance check impossible
- Power measurement based on adjustment to 8-greylevel-signal not fully repeatable; different settings are possible

Thank you for your attention!

Aspects for discussion:

- **What is an energy efficient TV?**
- **Harmonisation of labels and standards vs regional differences**