International Energy Agency

Toolkit:
The relationship between product efficiency and price

Session 6

Kevin Lane, IEA – Pretoria, 15 October 2019

#energyefficientworld

Overview of the appliance and equipment training sessions

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

Scenario

You have been asked to prepare an impact statement for your regulations, including the effect on product prices.

How would you go about the task of estimating future product prices?

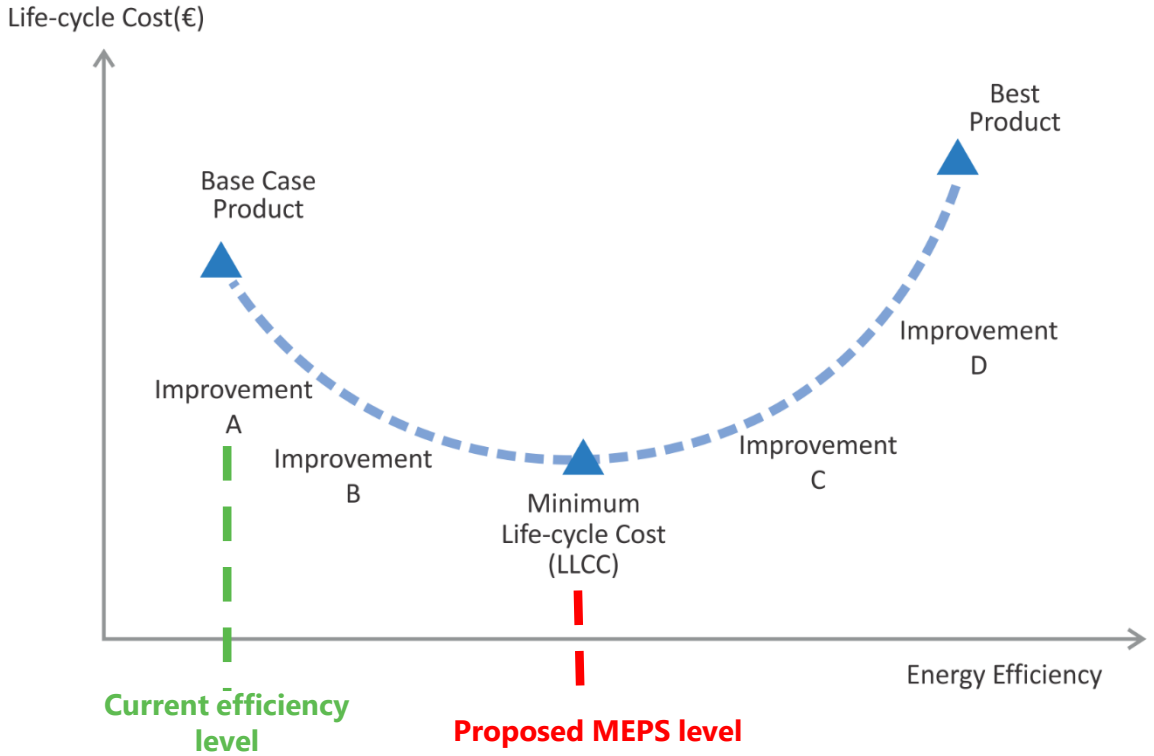
Why are appliance costs/prices important?

- A core aim of energy efficiency programs is to deliver cost benefits to consumers
- In principle, any **additional costs** of more efficient equipment is offset by lifetime **savings in fuel bills**
- Consumer Life-cycle cost = Capital cost + lifetime running costs
- Often used to set performance thresholds, i.e. via least life-cycle costs

Consumer life-cycle costs

	Average product	Energy efficient product
Capital Cost ($)	$300	$350
Running cost per annum	=150kWh x 0.2$ = $30	=120kWh x 0.2$ = $24
Lifetime (years)	12	12
Total lifetime cost (LC)	= 300 + (30 x 12)	= 350 + (24 x 12)
LC	$660	$638

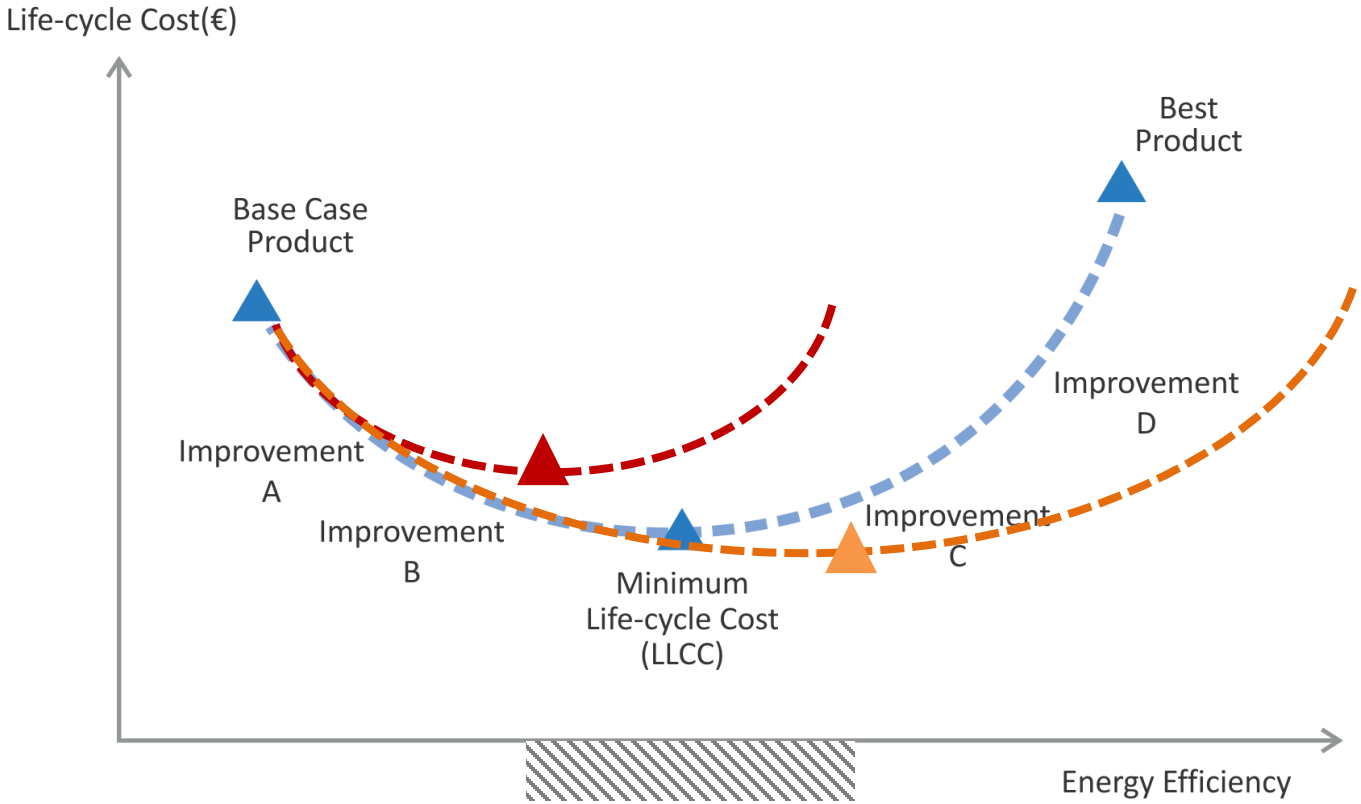
Setting MEPS at Least Life-cycle cost



Impact of product prices on setting MEPS

- If you are setting MEPS based on least life-cycle cost….
- What impact is there if efficient products costs are higher/lower?

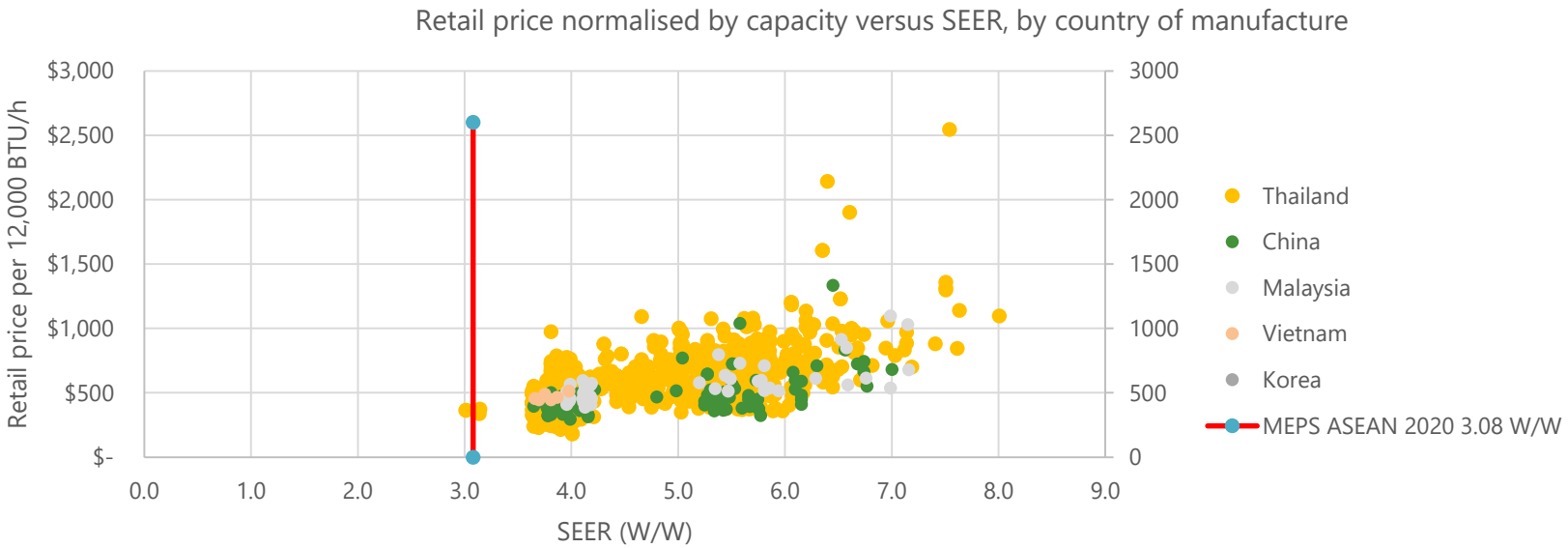
Setting MEPS at Least Life-cycle cost



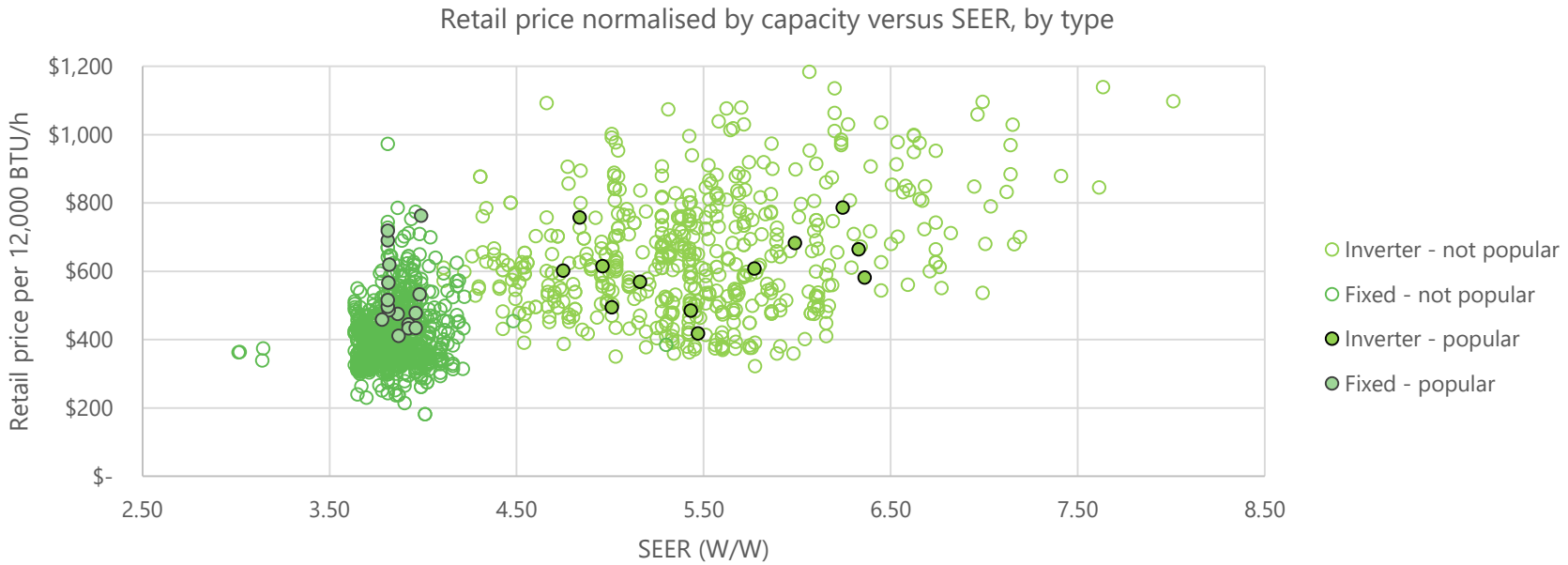
What is actually happening to product prices?

- So that is the theory
- Now lets look at what is actually happening……..

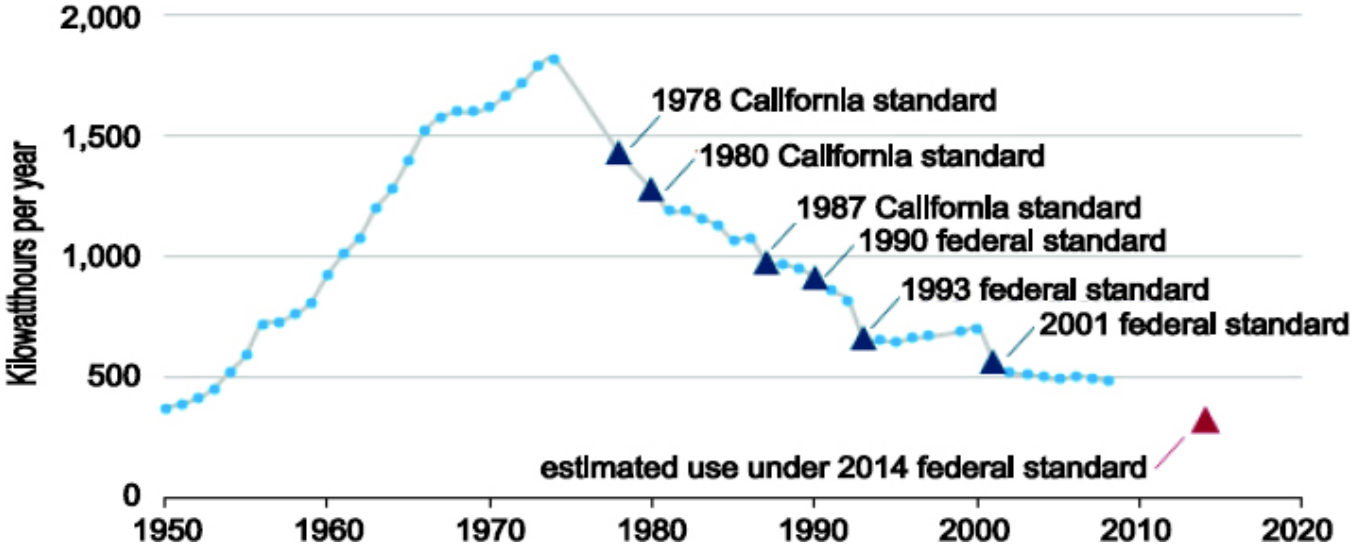
Thailand – Retail price vs capacity (and country manufacture)



Thailand - Retail price vs capacity (and technology)



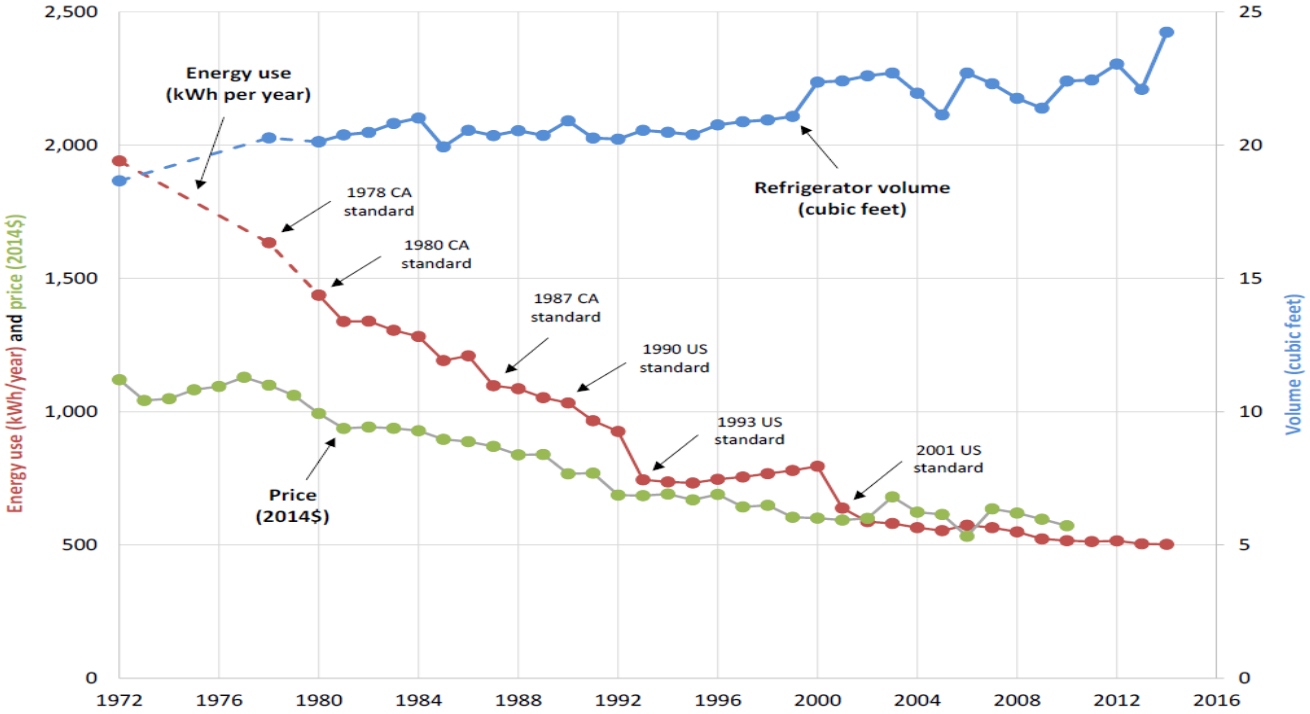
Analysis: Impact of Refrigerator Standards: Energy Consumption in the USA



Ratcheting MEPS have has reduce energy consumption of new US refrigerators by 75%

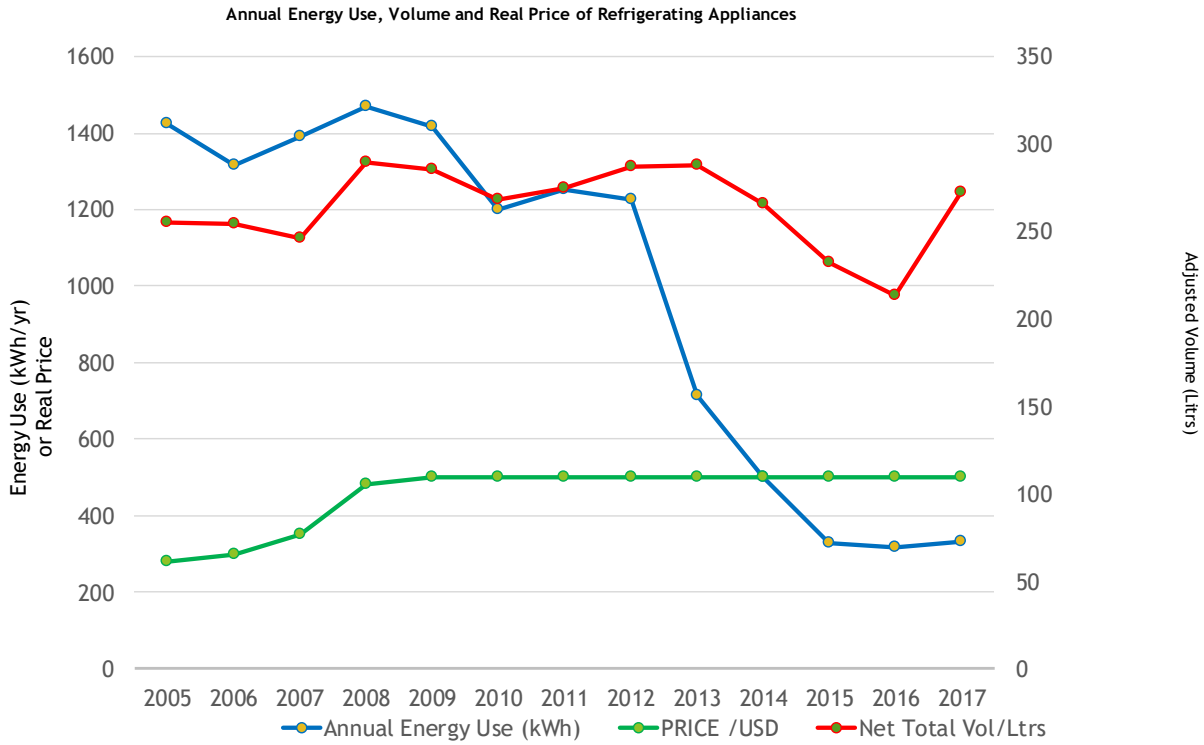
Source: EIA, 2013

Analysis: Impact of Refrigerator Standards: Energy Consumption in the USA



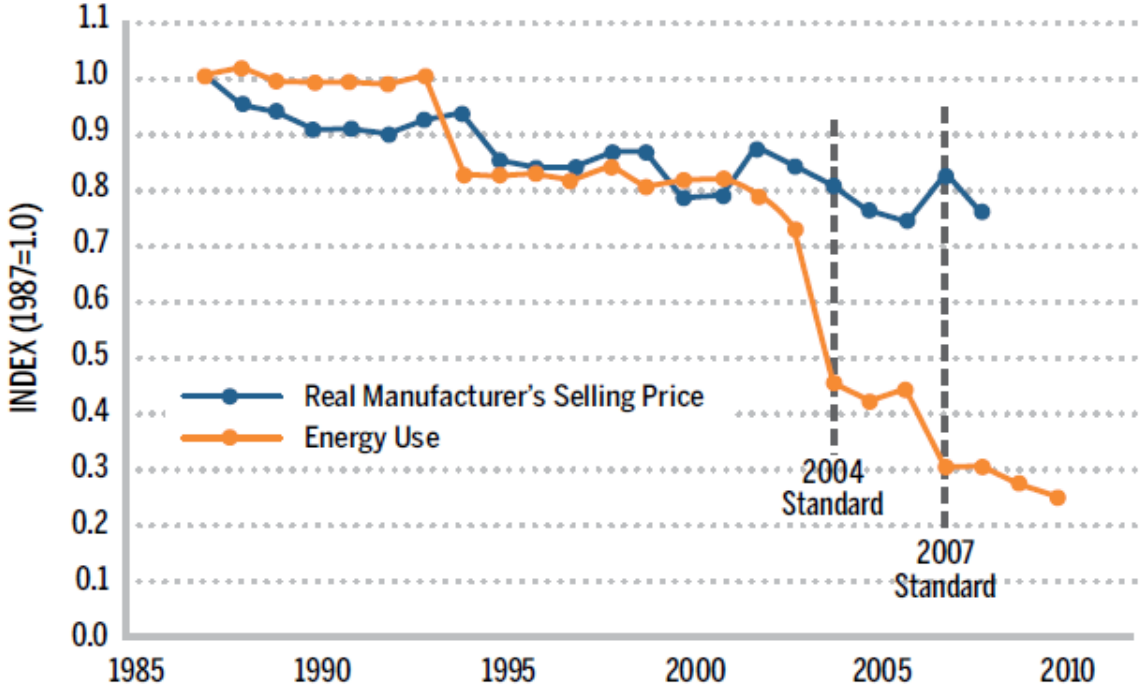
Source: ACEEE, 2017. Energy-Saving States of America: How Every State Benefits from National Appliance Standards

Analysis: Impact of refrigerators standards in Ghana



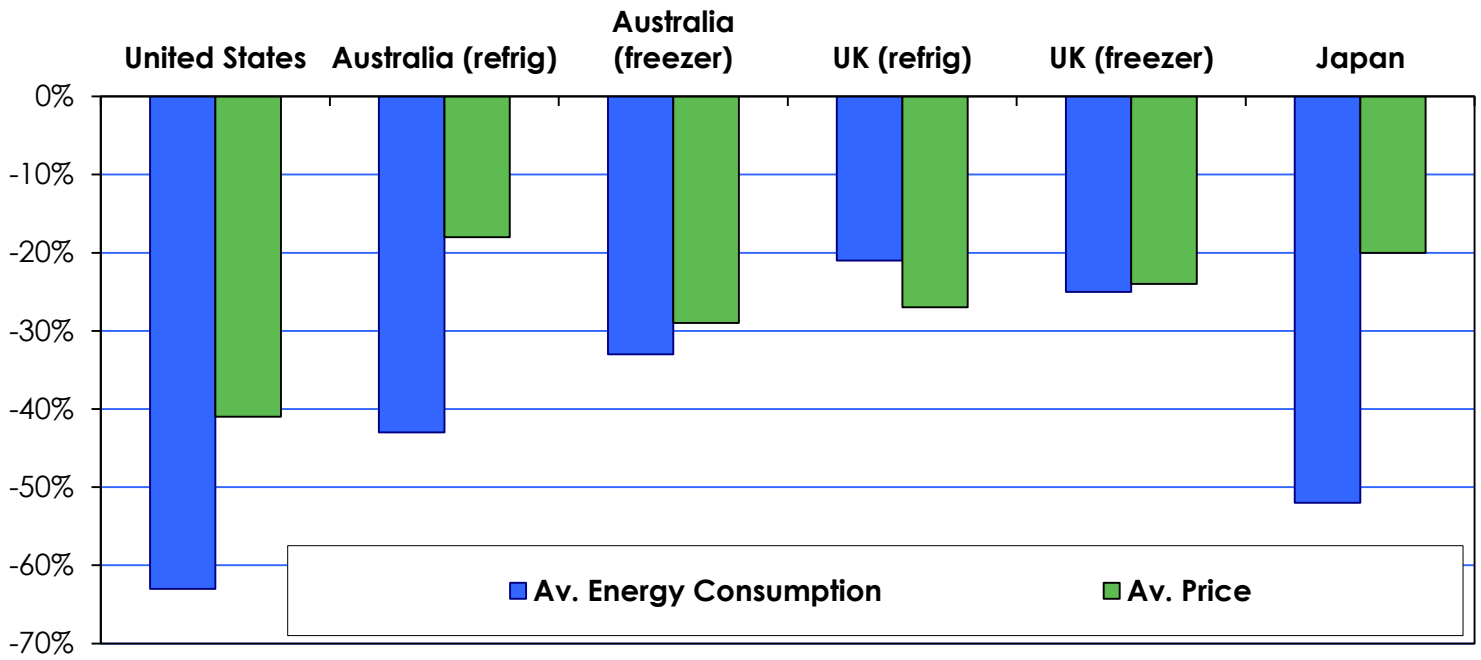
Source: Kofi Agyarko, IEA EE Global 2018

Analysis: Impact of Clothes Washer Standards on Annual Energy Consumption in the US



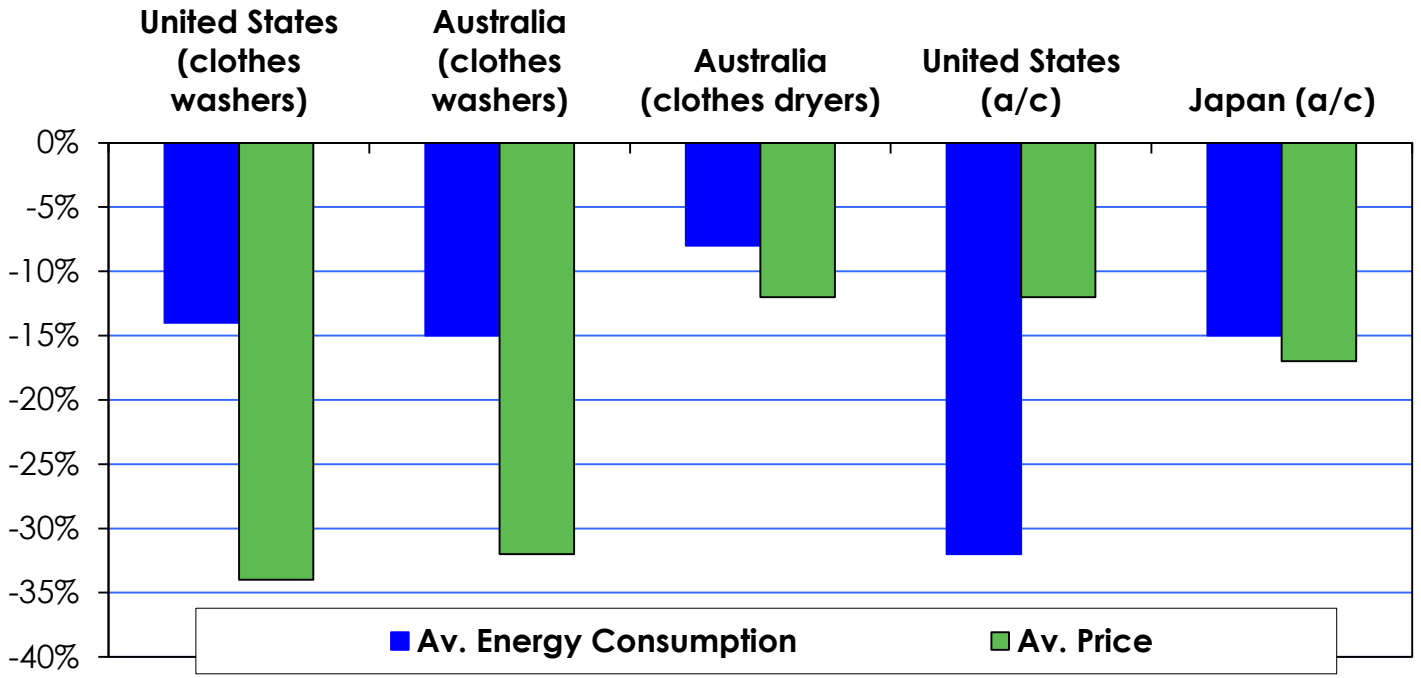
Source: IEA 4E, Achievements of appliance energy efficiency standards and labelling programs - A Global Assessment in 2016

Examination of MEPS impacts: Cold appliances: % change



Source: IEA 4E, Achievements of appliance energy efficiency standards and labelling programs - A Global Assessment in 2016

Examination of MEPS impacts: other appliances: % change



Source: IEA 4E, Achievements of appliance energy efficiency standards and labelling programs - A Global Assessment in 2016

What does this tell us?

- No evidence that Standards and Labeling policies have increased real prices to consumers
  - Some minor movements, usually explained by other factors
- Generally average real prices for studied products have fallen *faster* than for other goods in these markets
- No correlation with energy/electricity prices
  - increasing energy price is a less effective policy, and has inequity issues
- Manufacturers confirm that, given notice, energy efficiency requirements can be absorbed into design process with little or *no extra cost*

What does this tell us?

- No correlation between product price and efficiency
- However, sometimes the most efficient products are also the most expensive, because:
- High priced products differentiate through:
  - branding
  - quality of materials
  - design
  - energy efficiency is a further indicator of quality

Implications for policy

- So how does this impact on our policy settings?

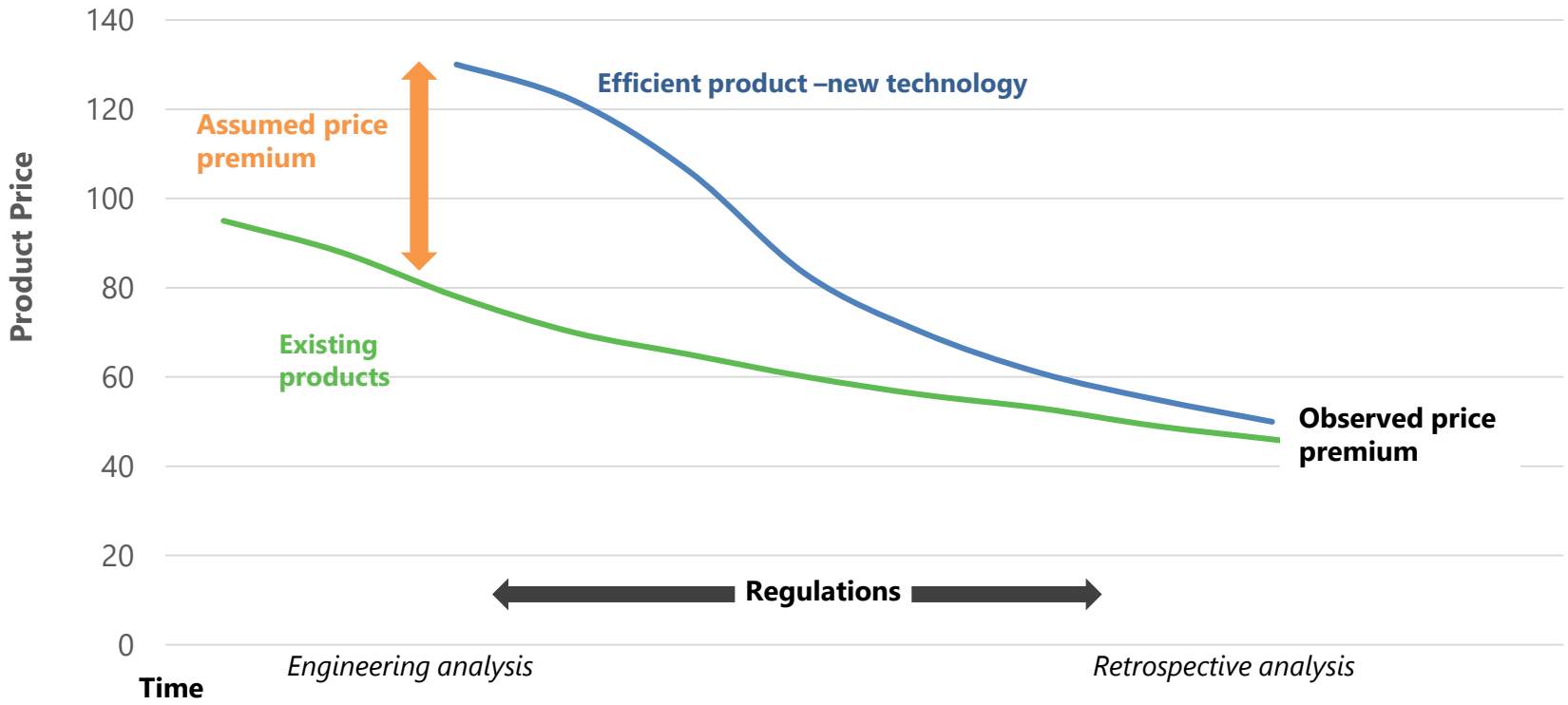
What happened? (increase in purchase cost, expected, actual)

Appliance Type	DOE estimate price BEFORE	Census prices AFTER
Refrigerators	56	37
Clothes washers	54	-35
Clothes washers	199	10
Electric water heaters	108	28
Non-electric water heaters	121	34
Central ac	267	207
Room ac	13	-162
Commercial ac	512	-224
Ballasts	6.73	-1.78
Average	**148**	**-12**
Median	**108**	**10**

Why did we get it wrong?

- Predictions made prior to regulations based on engineering analysis
- Observed prices may be 5-10 years later
- In the meantime:
  - Regulations stimulate growth in the market
  - Costs have reduced as the market share has grown
  - Some shift to offshore manufacturing
  - Companies find innovative solutions
  - *Technologies rarely predicted*

Price changes over time



Conclusions

- Current cost-benefit analysis tends to overstate the future costs of efficient appliances
  - Politically conservative
- Observations fit *'learning-by-doing'* model
- Suggests that we have not been optimising policies to reduce energy and CO_2
- Policies could be more stringent and still show positive benefits
- Some countries now reduce estimates for future cost impacts

Resources

- www.iea.org/efficiency
- www.iea-4E.org