Toolkit

The relationship between product efficiency and prices

LAE Stream: Session number 6

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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 costs?

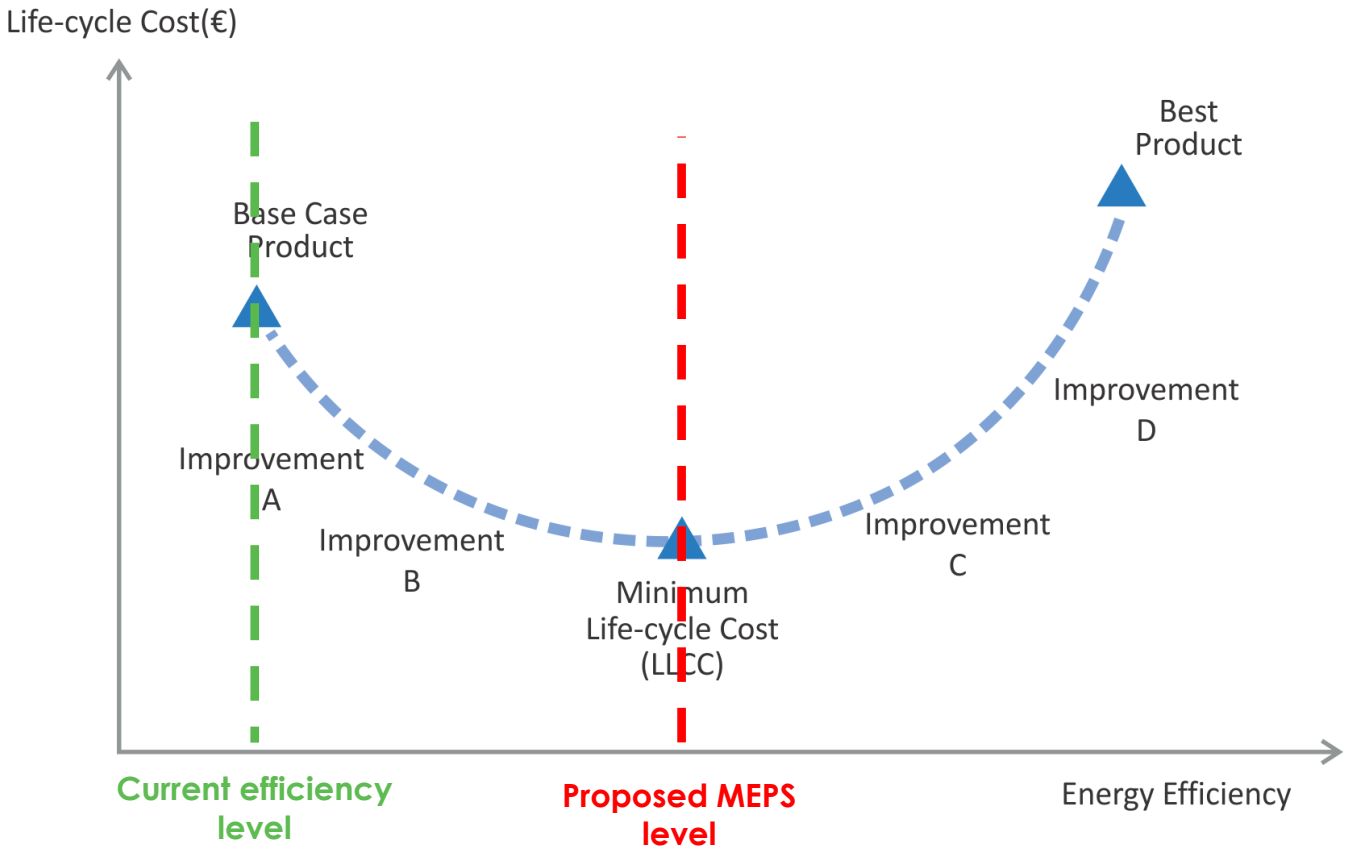
Why are appliance costs important?

- 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**
- Life-cycle cost = Capital cost + lifetime running costs
- Often used to set performance thresholds, i.e. via least life-cycle costs

Life-cycle costs

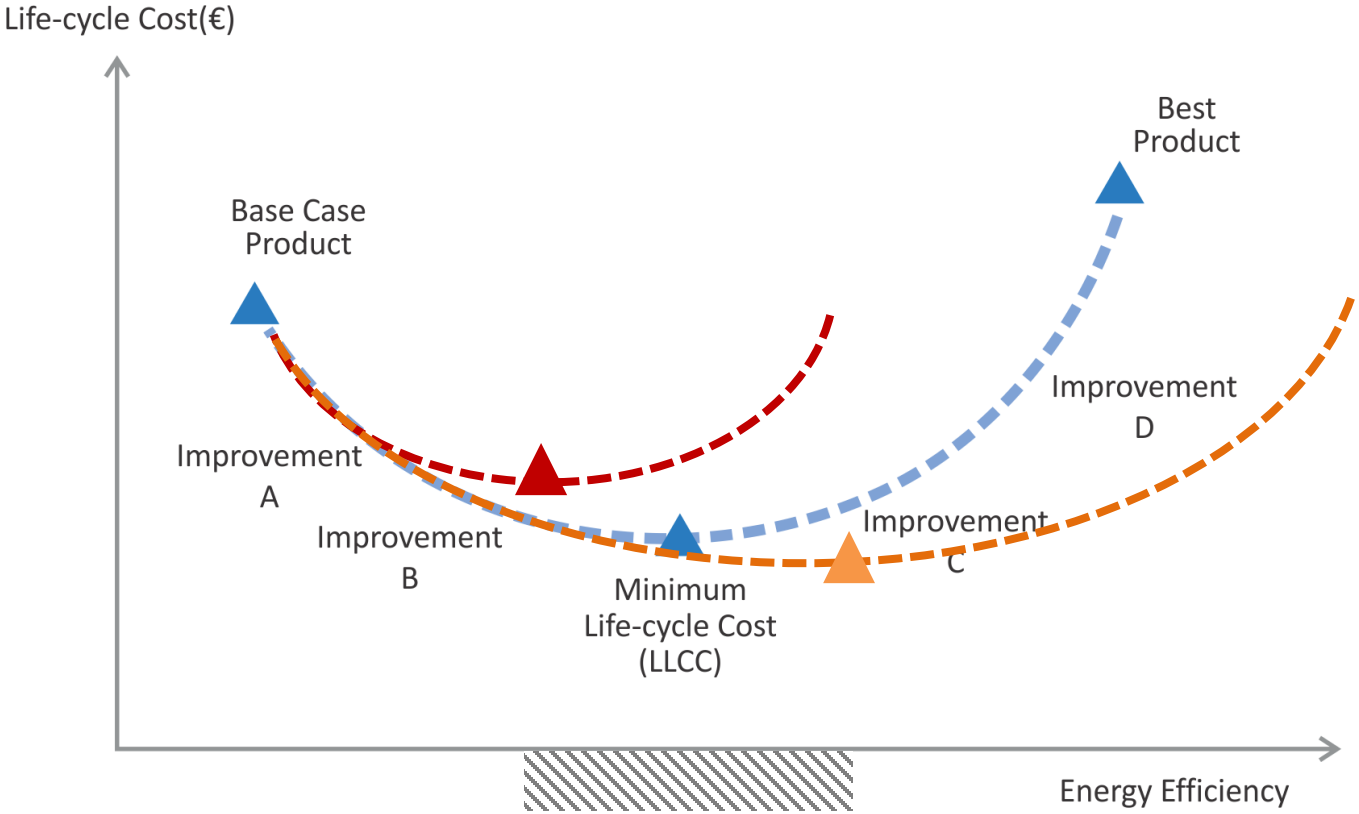
	Average product	Energy efficient product
Capital Cost ($)	$300	$350
Running cost per annum	=150kWh x 0.2$ = $30	=120kWh x 0.2$ = $24
Lifetime (yrs)	12	12
Total lifetime cost (LC)	= 300 + (30 x 12)	= 350 + (24 x 12)
LC	$660	$638

Setting MEPS at Least Life-cycle cost



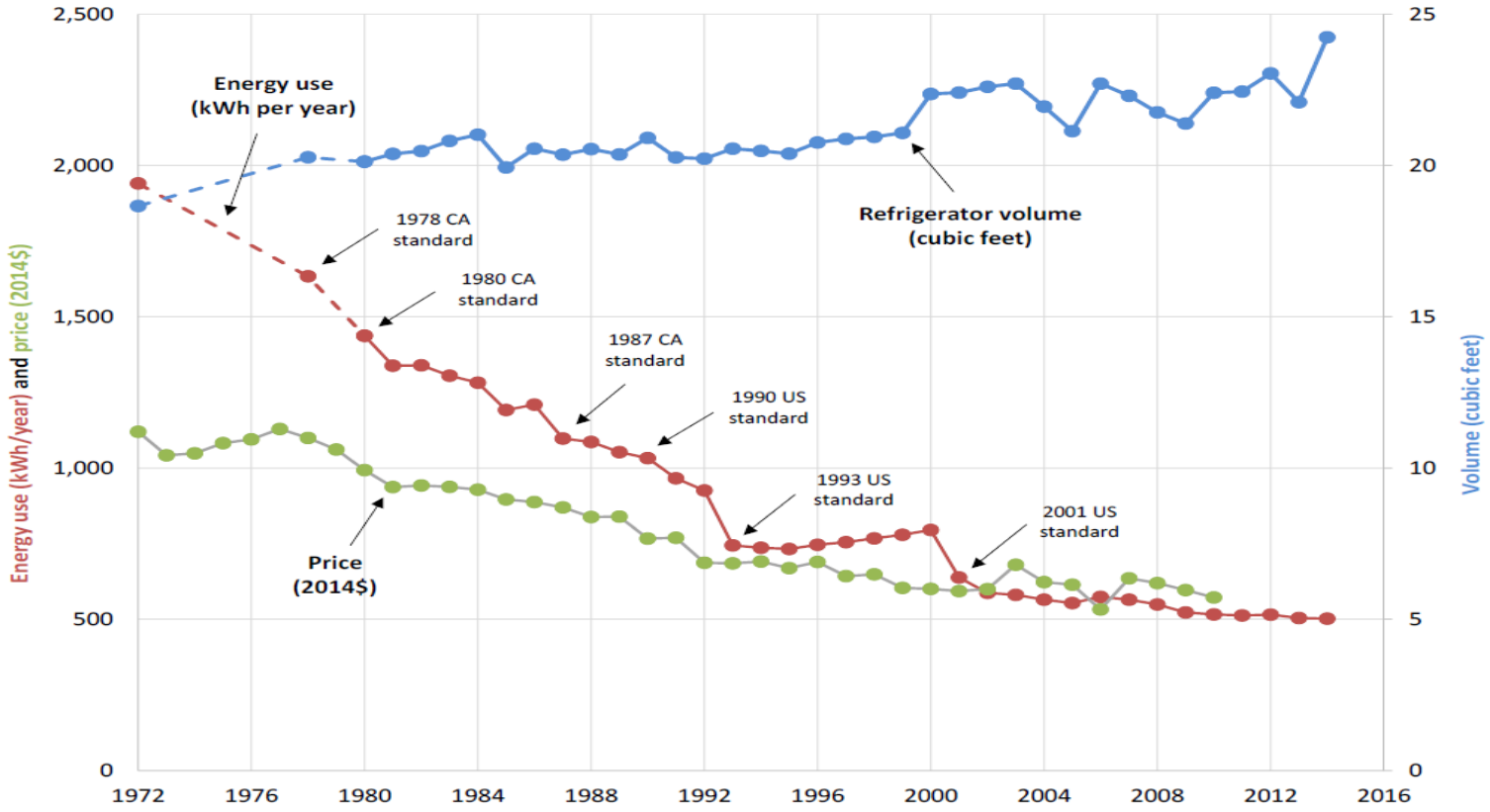
- If you are setting MEPS based on least life-cycle cost….
- what impact is there if efficient products costs are higher/lower?

Setting MEPS at Least Life-cycle cost



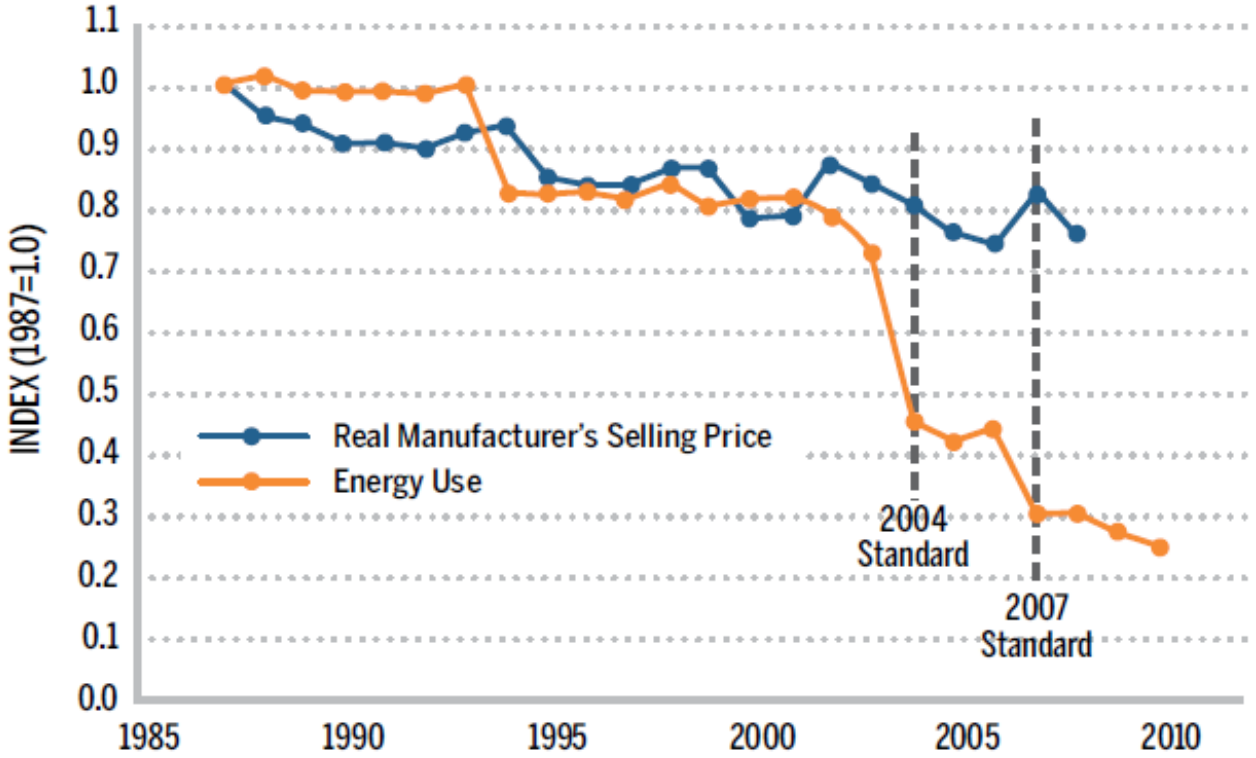
- So that is the theory
- Now lets look at what is actually happening……..

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



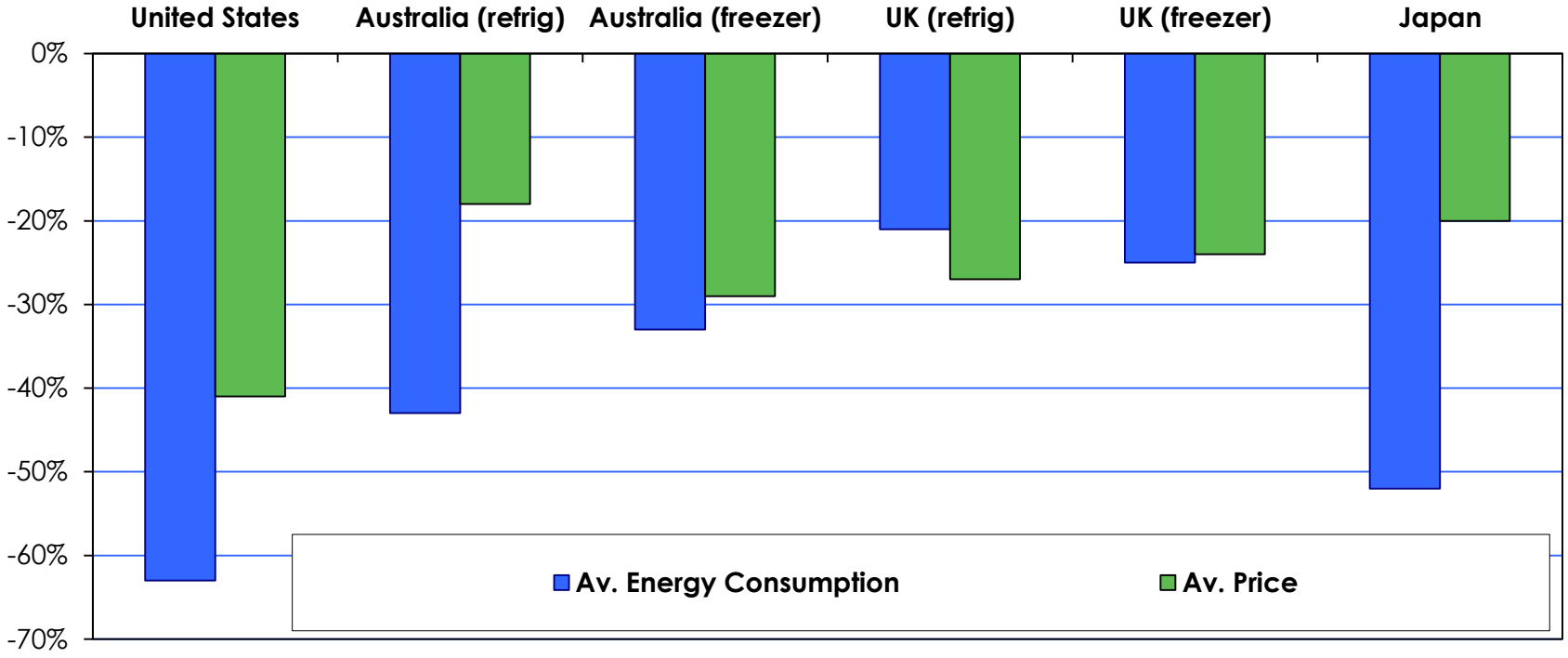
ACEEE, 2017. Energy-Saving States of America: How Every State Benefits from National Appliance Standards

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

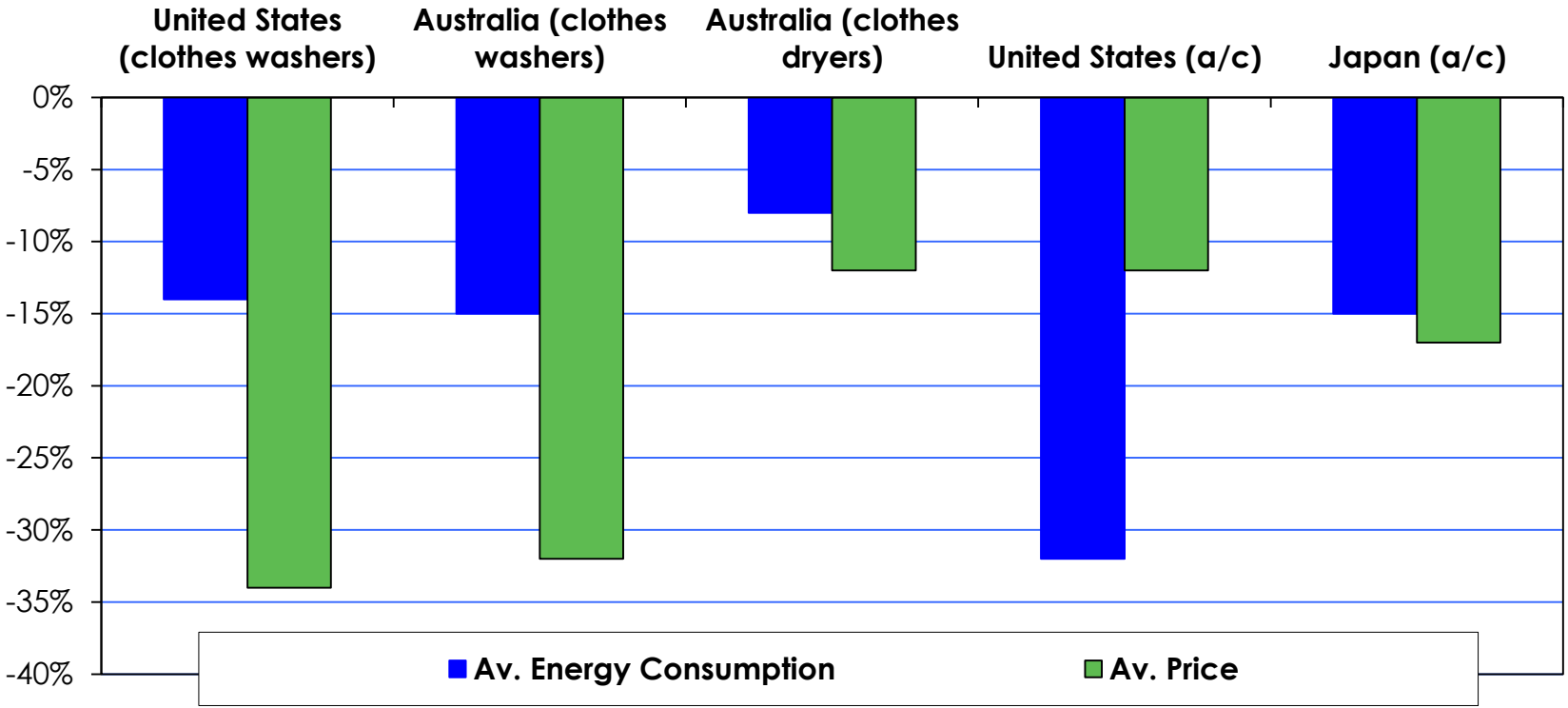


IEA 4E, Achievements of appliance energy efficiency standards and labelling programs - A Global Assessment in 2016

Examination of MEPS impacts: Cold appliances: % change



Examination of MEPS impacts: other appliances: % change



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
- 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 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?

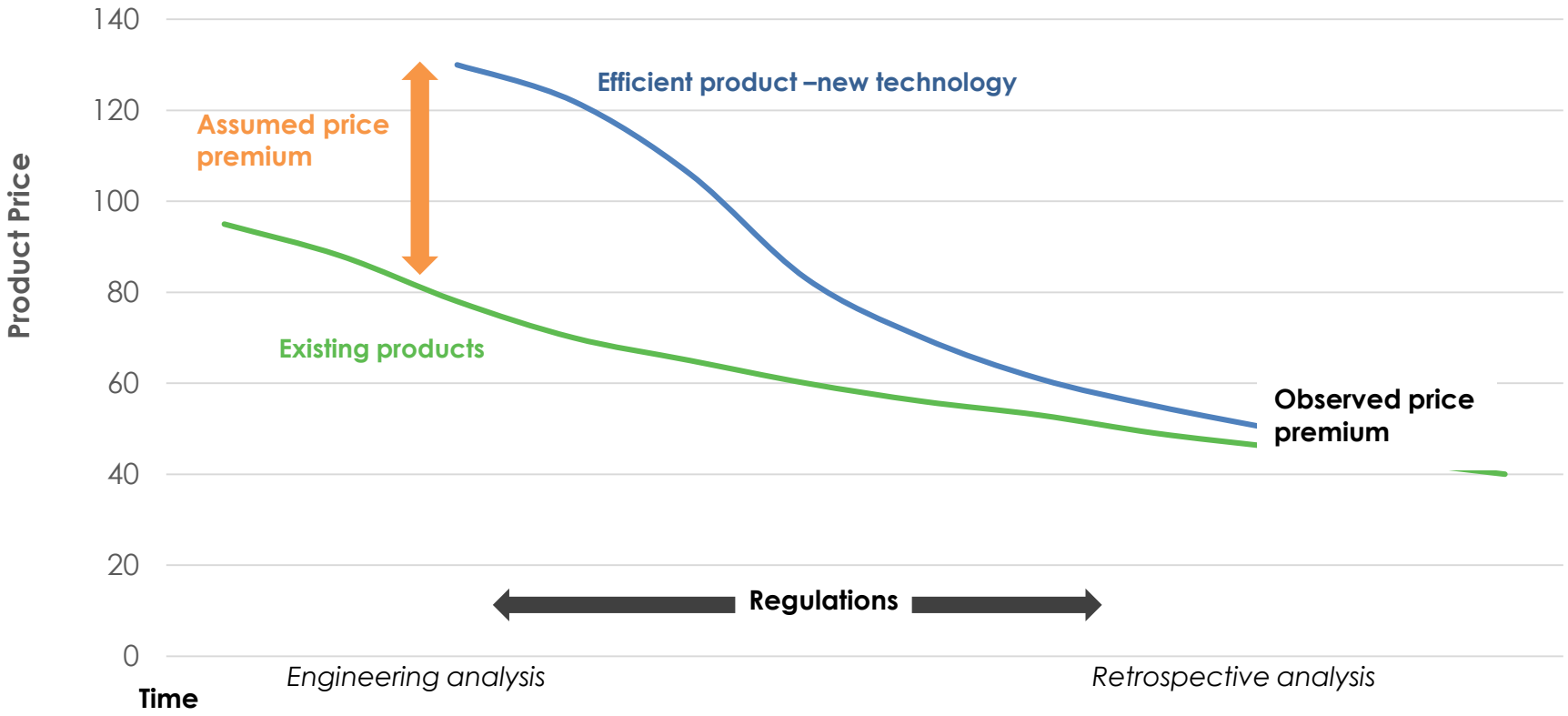
What happened?

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 CO2
- Policies could be more stringent and still show positive benefits
- Some countries now reduce estimates for future cost impacts

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