When prices don’t steer

Mimicking ambitious carbon pricing with energy performance standards

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Climate policy: policy interactions

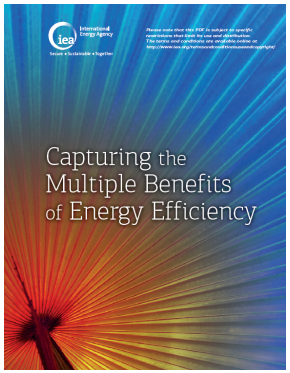
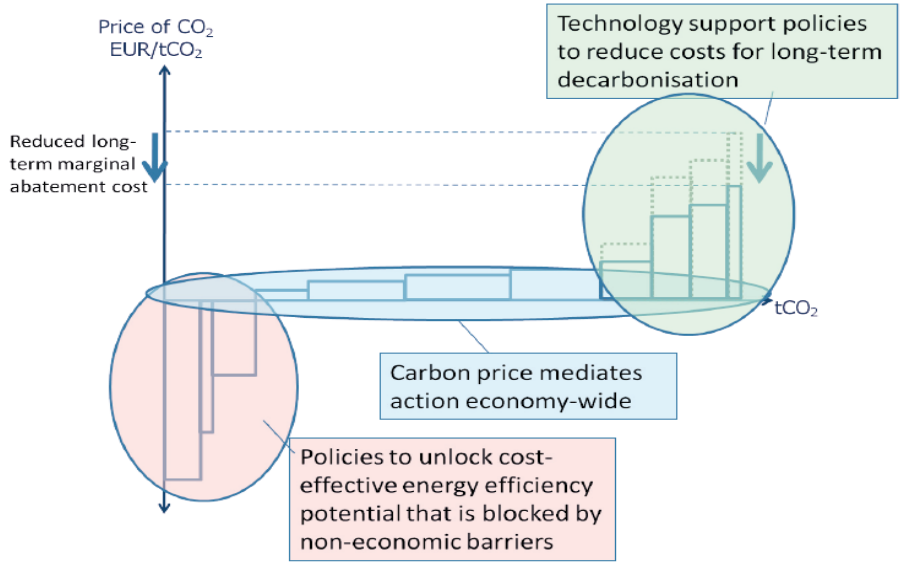


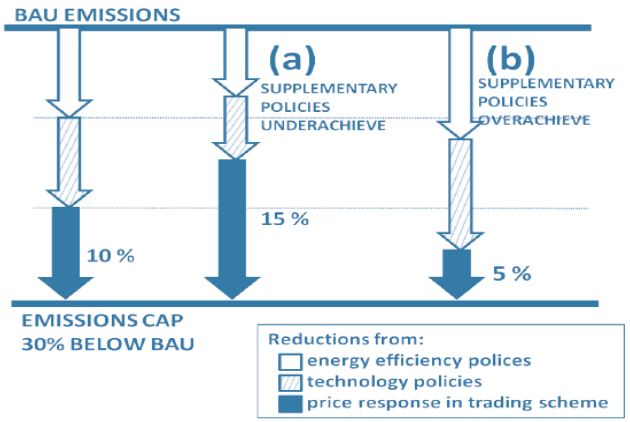
Figure 1 • The core policy mix: a carbon price, energy efficiency and technology policies



Source: Hood (2011)

Note: unless otherwise indicated, all material in figures and tables derives from IEA data and analysis.

Figure 6 • Policy interactions can significantly impact ETS prices



Source: Hood (2011)

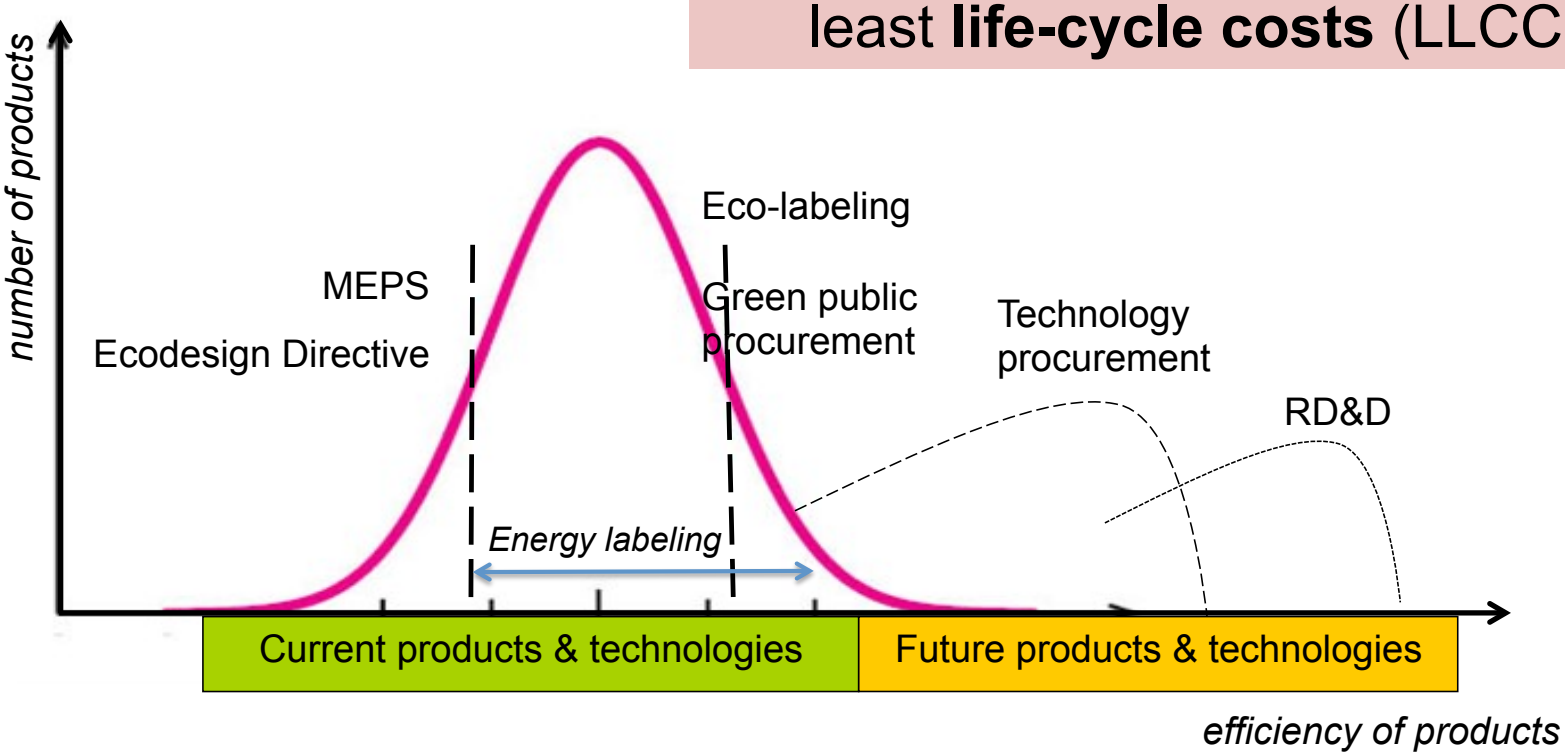
Background

- Demand side measures needed for **deep decarbonisation** (1.5 to 2°C target)
- The market for energy efficient appliances is characterized by various '**failures**'
  - » Market, behavioral, organizational
- Among them is the **external effect** of electricity use on climate change
- **Carbon pricing** is a common instrument to internalize this climate externality
- But it does not cover much of the world CO_2 emissions and **prices are low**
  - » most carbon prices < 25 USD
  - » WTP = 10 to 100+ USD
  - » social cost of carbon = 20 to 150 USD

It is easier to adopt stringent MEPS than to implement progressive pricing policies!

Minimum Energy Performance Standards (MEPS)

One way to set MEPS is to consider least **life-cycle costs** (LLCC)



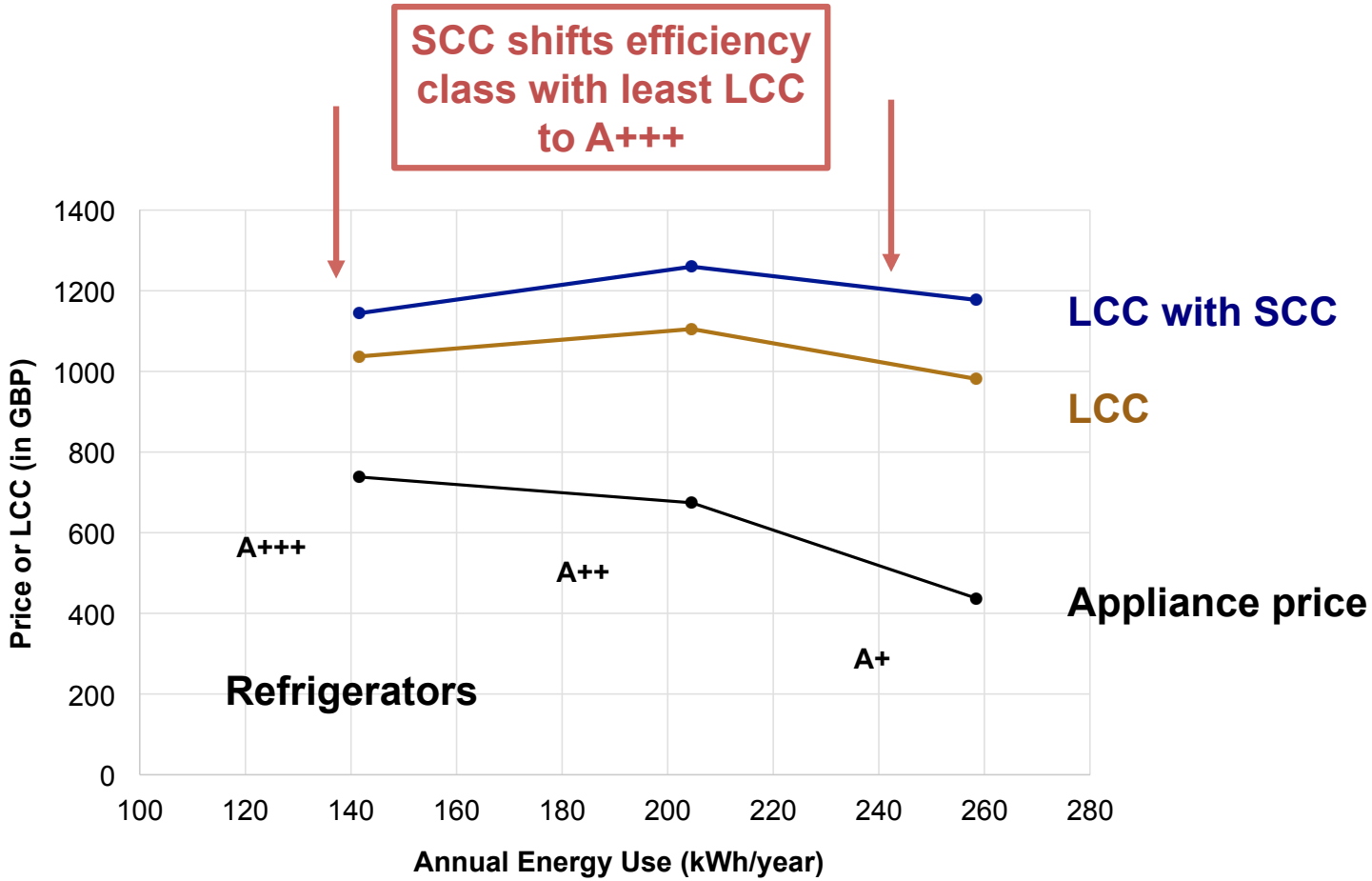
Purpose

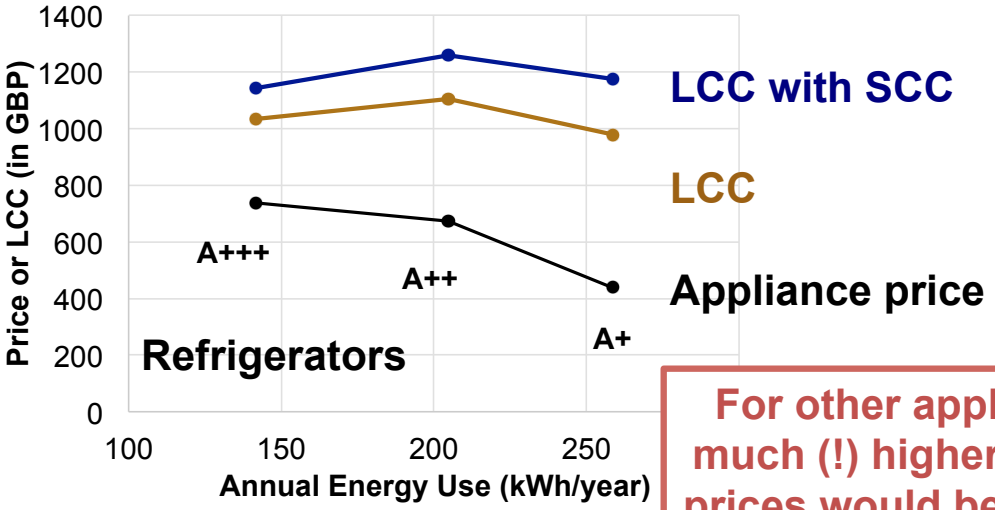
- model the market price of appliances in a UK market and how life cycle costs (LCC) shift when the social cost of carbon (SCC) is factored in.
- examine how the inclusion of the SCC affects the point at which least life cycle costs (LLCC) for an appliance class are reached.
- discuss the implications for mixed policy design when climate change externalities are addressed primarily through MEPS, as well as the merits of such a policy approach.

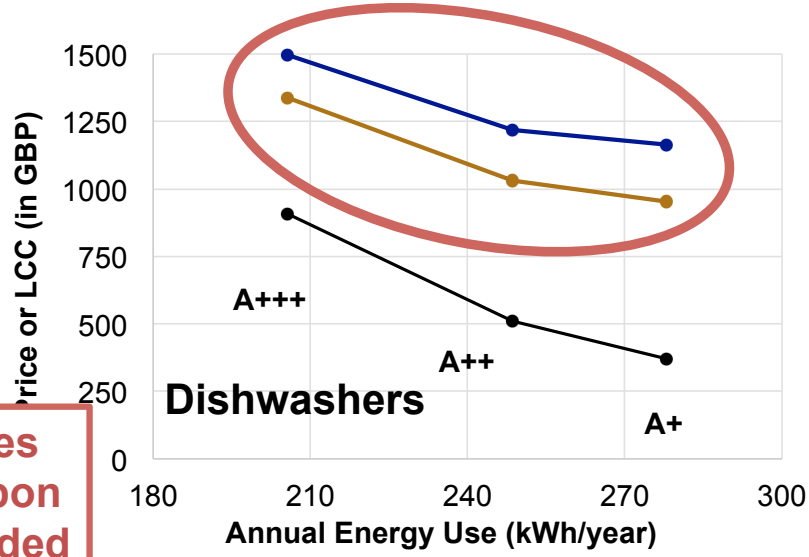
The Data

	n =		*A+++*	*A++*	*A+*	*A*	*B*	*C*
Refrigerators	978	Number of models	37	317	624	0	0	0
		% sales in EU 2014	4%	21%	72%	2%	0%	0%
Dishwashers[1]	358	Number of models	54	89	184	*31*	0	0
		% sales in EU 2013	3%	23%	35%	38%	0%	0%
Tumble Dryers[2]	148	Number of models	4	49	13	0	63	*19*
		% sales in EU 2014	2%	22%	16%	2%	34%	23%
Televisions[3]	232	Number of models	0	11	103	99	19	0
		% sales in EU 2013	0%	1%	23%	45%	13%	3%

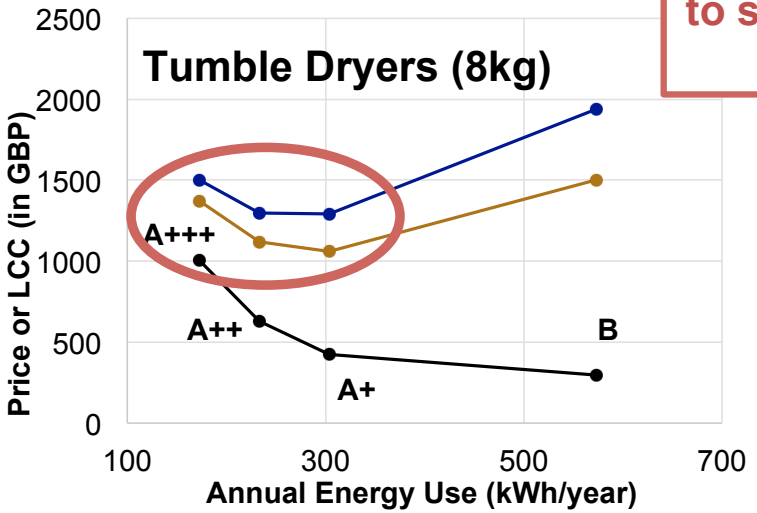
$$LCC = P_A + PWF * P_E * UEC$$

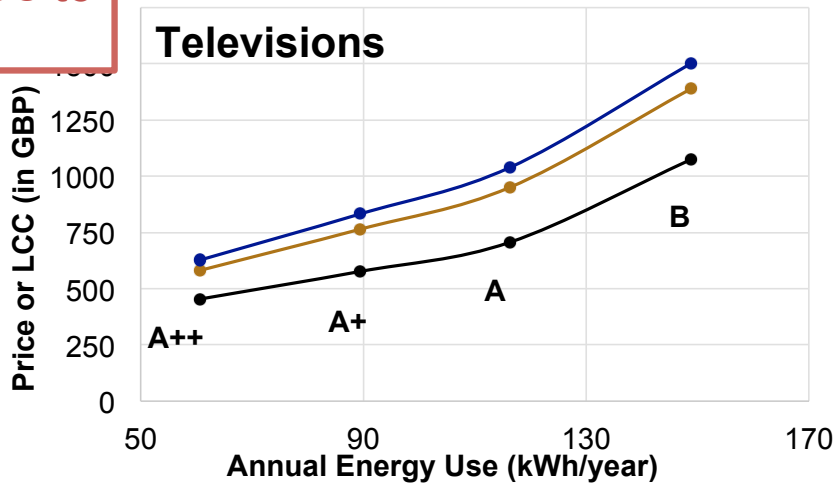

SCC shifts efficiency class with least LCC to A+++
1400
1200
1000
800
600
400
200
0
Price or LCC (in GBP)
100
120
140
160
180
200
220
240
260
280
Annual Energy Use (kWh/year)
LCC with SCC
LCC
Appliance price
A+++
A++
A+
Refrigerators

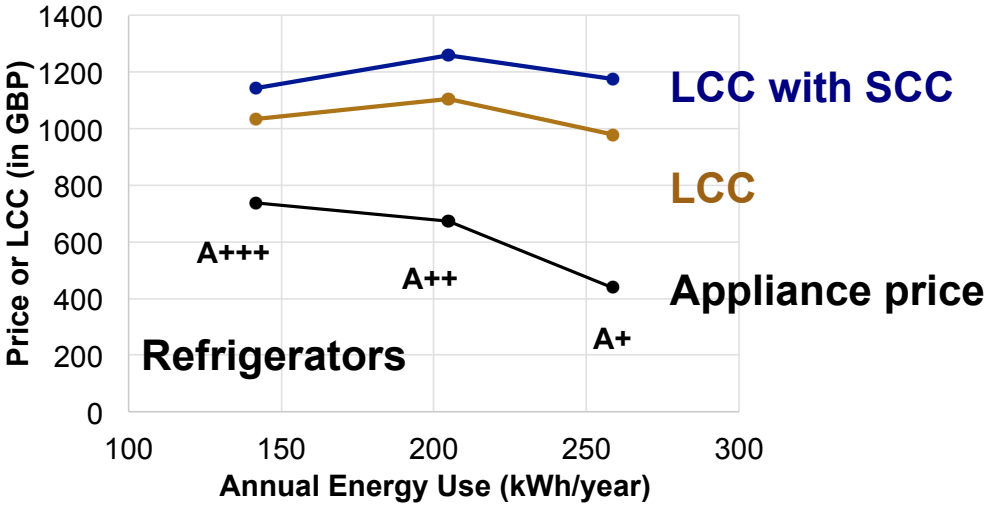


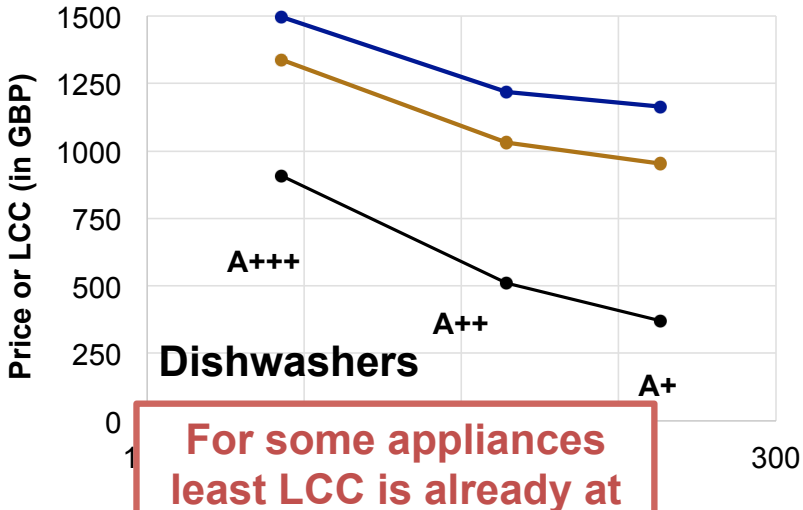


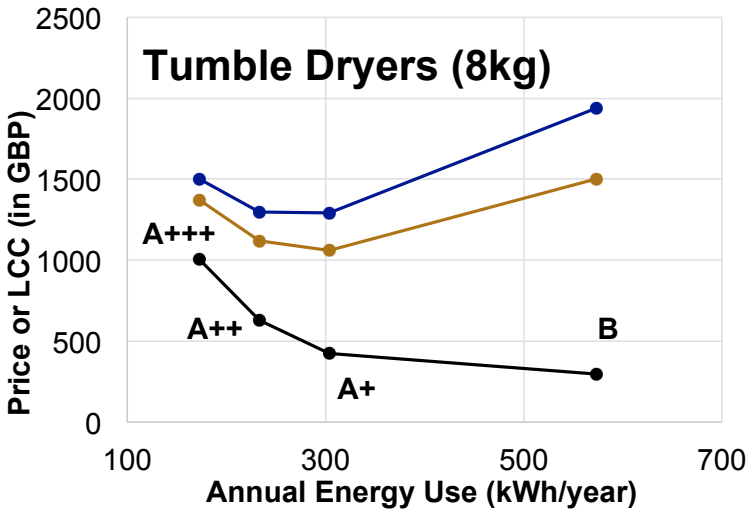
For other appliances much (!) higher carbon prices would be needed to shift the least LCC to A+++



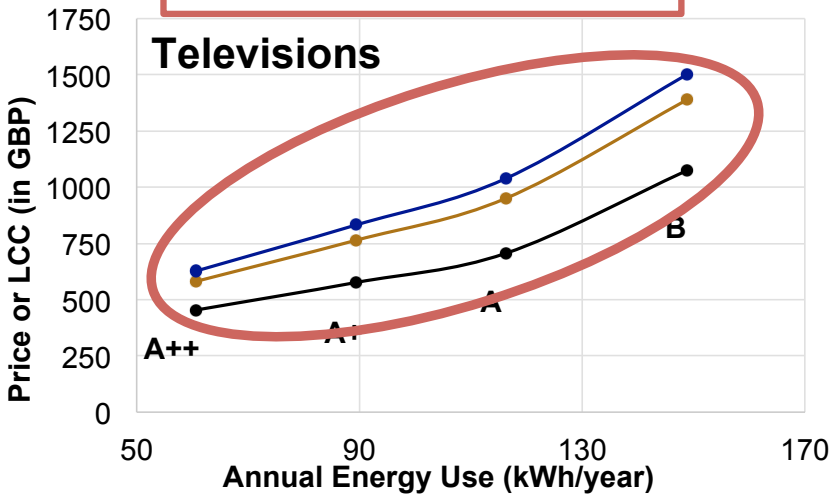








For some appliances least LCC is already at A+++

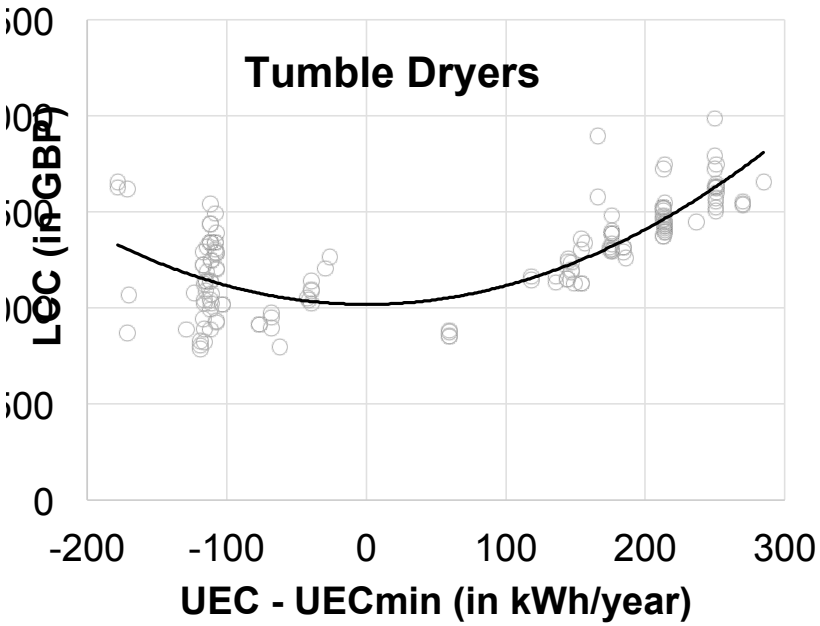


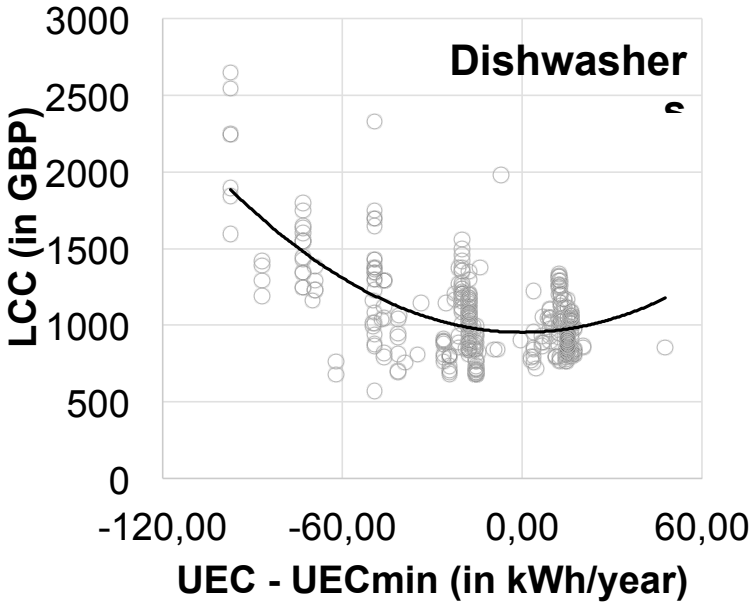
Appliance	*Shift from*	*Minimum carbon price needed to trigger the shift (in GBP/ ton)*				
		EF=413; P_E=0.14	*EF=413; P_E=0.10*	*EF=413; P_E=0.20*	*EF=700; P_E=0.14*	*EF=200; P_E=0.14*
Refrigerators	A+ to A++	372	468	226	219	767
	A+ to A+++	77	174	0	46	159
Televisions	A to A+/A++/A+++	0	0	0	0	0
	A+ to A++/A+++	0	0	0	0	0
	A++ to A+++	0	0	0	0	0
Tumble dryers (condenser, 8kg)	B to A+/A++/A+++	0	45 (to A+++)	0	0	0
	A+ to A++	136	233	0	81	281
	A+ to A+++	382	479	237	226	789
Dish washers (12 place settings)	A+ to A++	429	526	284	253	885
	A+ to A+++	862	959	717	509	1780

EF= emissions factor (in gCO_2/kWh); PE = price of electricity (in GBP/kWh)

Country energy mix very important!

Main message: including the SCC in the LCC calculation implies a minor shift of the optimum unit energy consumption





Optimal UEC shifts if SCC included:

38.9 kWh/ year

3.9 kWh/ year

Key findings

- MEPS can internalize the climate externality as well as carbon pricing, BUT (!)
- Consumers do not act like rational market actors, so that MEPS – in contrast to carbon pricing – warrant effectiveness
- Even without SCC, LLCC-thinking implies tighter MEPS for some appliances
- For other appliances including the SCC does not change the LLCC optimum or causes only marginal changes
- There are other (good) reasons to tighten caps, which – over time – have shown to be compatible with lower (!) prices and higher quality
- MEPS easier to implement than pricing, but recently some ‘backlash’

Merci!!!

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