

Decarbonising the UK's energy mix and meeting emission targets

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Basic Theoretical and Evidence based summary of EMR so far...

- **CfDs** - misunderstand theory of finance and don't involve auctions. Currently under investigation by EU for inconsistency with direction of EU policy.
- **CM** – an unnecessary political instrument already captured by Secretary of State who chooses (a predictably high) level of capacity.
- **CPF** and **EPS**....?

Carbon Price Floor (forward EUA price + CPS)

The reform has already introduced a carbon price support (CPS) based on the existing climate change levy (CCL). This effectively increases the price of carbon emissions from the electricity sector in the UK above that in the rest of the EU.

Began April 2013 with a target CO₂ price is £30/tonne (in 2009 terms) – forward EUA price + CPS - by 2020 (possibly £70/tonne (2009) by 2030). *However CPS now capped at £18 /tCO₂ (not yet binding).*

Note: UK CPI inflation between 2009 and May 2014 is 15%

CPS – a theoretical analysis

- The CPS is fundamentally a tax policy. It needs to be analysed in the light of the principles of optimal tax theory.
- It is a carbon tax implemented on electricity, not on domestic gas or any other source of CO₂, and hence distorts the use of electricity relative to other energy carriers.
- The CPS distorts international competition and trade in electricity. Energy intensive industry will shift to continental Europe and electricity imports (which cant be taxed on trade grounds) will be encouraged. This is simple tax arbitrage. Diamond and Mirrlees (1971) show that industry should be exempted.
- The CPS directly impacts the wholesale price via raising the price of marginal fossil generation.

Emissions Performance Standard

New supercritical coal fired generation has average CO₂ emissions of around 790g/kWh; a modern gas-fired power plant about 360g/kWh. The emissions performance standard (EPS) for all new power plants is 450g/kWh, designed to rule out the building of new coal-fired power plants without carbon capture and storage (CCS) technology fitted (to a substantial part of a new plant).

Note: that new peaking plant will be permitted as maximum emissions are calculated at an 85% load factor.

May be reduced but current plants protected to 2044.

EPS

- This is a backstop command and control approach to environmental regulation.
- It appears to be innocuous in that no-one currently wants to build the plants that it rules out.
- However it does introduce an instrument which could be ratcheted up to eliminate the building of new CCGT plants.
- Given the problems that California, Italy, Germany and Japan have had from environmental standards ruling out ‘any’ timely new build/operation of large conventional power plants. It is a significant threat.
- Given that it serves no useful function in terms of renewables or decarbonisation, it has no place in an EMR package.

How have the CPF and EPS contributed to low-carbon energy generation?

- No.
 - No impact on total CO₂ emissions within the EUETS.
- CPF: has not done anything to change existing mix of coal and gas plant on system, because of cheap price of coal and planned plant closures.
 - CPF has however increased the cost of CCS demonstration plants, helping to worsen their economics.
- EPS: no-one was planning to build any fossil plant other than gas or coal with CCS, so irrelevant.
 - EPS does prevent any investment in new coal which might have helped lower cost of energy and improve energy security, at no cost to the global environment.

What more can be done to ensure continued investment in the long-term to 2030?

- Wrong question. Solving the climate problem is not about investment but about targets and instruments.
- Only if the policy looks achievable at low cost will it be credible, otherwise seems certain to be abandoned as has already happened with CPF.
- This means a single (binding) environmental target is required to give a clear signal of intent.
- The subsidies offered should be auctioned and should be designed to share risks between consumer, taxpayer and investor.

What other approaches to decarbonising our electricity generation can be pursued?

- Need to raise price of carbon (or restrict quantity) in the EU across all sectors.
- Then it won't just be about electricity, it will be about least cost across all sectors.
- **Some** learning subsidies still justified but these can be auctioned to the lowest bidder.

Conclusions

- The four EMR elements individually and collectively lack a theoretical or evidence based rationale.
- Basically, we know how to solve the problem of decarbonisation in the EU and we already have the mechanism to do it at least cost.
- We are in the process of discovering how costly it will be to solve it locally in the absence of an overarching framework that makes sense both economically and politically.
- Unfortunately, rather like the current Eurozone (or HS2?), economically illiterate ideas can persist for a long time at great cost, relative to more sensible alternatives.

Further reading

Chawla, M. and Pollitt, M. (2013), 'Energy-efficiency and environmental policies & income supplements in the UK: Their evolution and distributional impact in relation to domestic energy bills', *Economics of Energy and Environmental Policy*, Vol.2, No.1, pp.19-38. On the distribution of the rising cost of energy policy.

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Pollitt, M. (2010), 'UK renewable energy policy since privatisation', in Mozelle, B., Padilla, J. and Schmalensee, R. (eds.), *Harnessing Renewable Energy in Electric Power Systems*, Washington DC: RFF, Earthscan, pp.251-282. On the need to auction renewable subsidies.

Pollitt, M. and Haney, A.B. (2013), 'Dismantling a Competitive Electricity Sector: The UK's Electricity Market Reform', *The Electricity Journal*, Vol.26, No.10, pp.8-16. A more recent critique of EMR for an international audience.



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