Outline of the talk

• Harmonisation of carbon prices.
  – Show how one could reach the government’s target price.
  – Principle of the reform applies whatever the target price is.

• Distributional effect of harmonisation.

• Potential compensation package.
  – Show how one could compensate poorer households in a practical way.
  – Provide compensation only using revenue raised from the higher domestic carbon price.

• Reforms to other policies.
Distribution of energy budget shares

- Energy makes up 16% of spending for poorest 10%; 3% of spending for richest 10%.

Source: Figure 3.6 of "Household energy use in Britain: a distributional analysis"
Outline of the talk

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• Reforms to other policies.
Harmonisation of carbon prices
Background

• DECC publish an estimated “non-traded carbon price” consistent with meeting the government’s carbon emissions reduction targets.
  – For 2013 this “target price” is £59/tCO$_2$e.

• Carbon price faced by households is significantly below government target.
  – Businesses already around this level for electricity, although significant variation.

• Carbon price from gas use is lower than from electricity use.
  – Seen already that electricity would be close to target if full-rate VAT were levied.
Potential reform to carbon prices

• Potential reforms:
  – Introduce a gas tax of 0.8p/kWh (average retail price is 4.8p/kWh).
  – Introduce full rate VAT on both electricity and gas.

• Combined effect takes us close to target price for both fuels.

• A similar structure of reform could be used to achieve a different “target” if desired.
Current prices

<table>
<thead>
<tr>
<th></th>
<th>2013–4 unit price (p/kWh, estimate)</th>
<th>Post-reform unit price (p/kWh)</th>
<th>Change (%)</th>
<th>Pre-reform carbon price (£/tCO₂e)</th>
<th>Post-reform carbon price (£/tCO₂e)</th>
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<tbody>
<tr>
<td>Electricity</td>
<td>15.60</td>
<td></td>
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<tr>
<td>Gas</td>
<td>4.83</td>
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<td></td>
<td>‐18.92</td>
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</tr>
</tbody>
</table>

- At the moment implied carbon prices for households are below the £59/tCO₂e non-traded carbon price.
Effect of proposed reform on energy prices

<table>
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<tr>
<td>Electricity</td>
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<td>17.83</td>
<td>14.3%</td>
<td>5.92</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>4.83</td>
<td>6.47</td>
<td>34.0%</td>
<td>-18.92</td>
<td></td>
</tr>
</tbody>
</table>

- Clearly this change is large, so wouldn’t want to do it all at once.
  - Also a case for pre-announcing, to give people time to install measures.
- For comparison:
  - Electricity prices rose by 15% between August 2011 and May 2013.
  - Gas prices rose by 33% between November 2010 and May 2013.
Harmonisation of carbon prices

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<td>58.65</td>
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<td>6.47</td>
<td>34.0%</td>
<td>-18.92</td>
<td>56.05</td>
</tr>
</tbody>
</table>

- Reform takes us close to £59/tCO₂e.
Implications - initial

• Price rises similar to those seen in recent years.
  – But, can use the revenue raised to provide compensation.

• If one assumes no change in energy demand, this raises £8.3 billion.
  – For comparison, the OBR estimates energy-related taxes raised £3.0 billion in 2012-13.
  – This is composed of CCL, EU ETS, CRC, RO, FITs, WHD.
Implications – short term

• Price rise reduces household demand.
  – Around 4% for electricity.
  – Around 10% for gas.

• Also raises average bills by £300.

• Expect to raise £7.5 billion accounting for this.

• Emissions to fall by eight million tonnes of CO$_2$ e per year.
  – 1.4% of total annual UK emissions.
Implications – long term

• Over longer horizon people will replace boilers and other appliances.
  – Some replacement would happen anyway...
  – ...but higher energy prices encourage both production and take-up of more efficient models than without this.

• Expected saving of 22 million tonnes of CO$_2$e per year.
  – 4% of total annual UK emissions.
  – Worth around £1 billion a year.
Interactions with announced future policy

• Built into current policy are changes that would, in the absence of these reforms, increase the electricity carbon price to £27/tCO$_2$e.

• Removing the VAT subsidy gives carbon price of £126/tCO$_2$e by 2020.
  – Well above the non-traded carbon price of £66/tCO$_2$e.

• Certainly wouldn’t want this.
  – But, important to note that businesses will face these sorts of prices unless some reforms are made.
Interactions with announced future policy

Implicit carbon price (£/tCO\textsubscript{2}e)

- Gas 2013
- Electricity 2013

With VAT subsidy

Removing VAT subsidy
Interactions with announced future policy

Implicit carbon price (£/tCO$_2$e)

- Gas 2020
- Gas 2013
- Electricity 2020
- Electricity 2013

With VAT subsidy

Removing VAT subsidy
Interactions with announced future policy

• Many reasons to introduce a uniform rate of VAT.
  – VAT has undesirable properties as a form of carbon price subsidy (if one were wanted) since it depends on price not quantity.

• But if were to do this, would want to reduce extent to which other policies are funded through bills.
  – Impact on prices is therefore lower, in medium term, as policy would be raising prices even in absence of this reform.
Distributional effects of harmonisation
Gas tax adds 0.6% to average total expenditure.
• VAT adds an additional 0.9% to average total expenditure.
Distributional effects without compensation

- Combined reform adds around 1.8% to middle of distribution.
Distributional effects without compensation

- Combined reform adds around 3.7% to bottom 10% of households.
- Energy is large share of budget for these households.
• In absence of compensation, reform is ‘regressive’ in the sense that poorer households pay more as a share of expenditure.

Source: Figure 8.1 of “Energy use policies and carbon pricing in the UK”
Potential compensation package
Compensation for inflation

• These price increases therefore feed through noticeably to inflation (one-off effect).
  – CPI inflation rises by 1.2 percentage points.

• There is a degree of “automatic compensation” that comes from uprating of tax and benefit thresholds.
  – Estimated cost of this is £2.6 billion.

• Since energy makes up much larger share of budget for poorer households, even after this change they are most likely to be worse off.
Additional compensation for poorer households

- We increase the size of some means-tested benefits, to provide compensation.
  - This reform is illustrative and broadly revenue neutral (spend £7.2 bn).
  - Many alternatives are available depending on distributional priorities.
  - We consider a strongly progressive option, to see how well one could compensate poorer households if that were the aim of policy.

- Groups targeted:
  - Poor pensioners.
  - Unemployed.
  - Low-income employed.
  - Individuals receiving disability benefits.
Average effect by decile

Relative spending/income impact (%)

Equivalised non-housing expenditure decile

Cost as % of spending

Poorest

2

3

4

5

6

7

8

9

Richest

All

© Institute for Fiscal Studies
Average effect by decile

- Relative spending/income impact (%)
  - Cost as % of spending
  - Gain as % of spending

Equivalised non-housing expenditure decile

© Institute for Fiscal Studies
Average effect by decile

Source: Figure 8.1 of “Energy use policies and carbon pricing in the UK”
Within-decile variation

Source: Figure 8.2 of “Energy use policies and carbon pricing in the UK”
Potential compensation - conclusions

• It is possible to harmonise household carbon prices whilst compensating poorer households *on average*.

• Within poor households there is significant variation.
  – Those who consume relatively large amounts of energy will still be worse off.

• Reform shown is illustrative.
  – Precise implementation depends on a government’s distributional preferences.
  – We target poorer households particularly.
  – Also need to consider the interaction with work incentives.
Reforms to other policies
Preview

• Rationale for Feed-In Tariff and Renewable Heat Incentive is unclear.
  – Also consider whether bill levies are the best way to fund it.

• Make the Energy Company Obligation less prescriptive.

• Harmonise eligibility criteria for energy bill support.
  – Also improve information sharing where possible.
Support for small-scale renewable generation

• **Feed-in Tariff (FIT) and Renewable Heat Incentive (RHI):**
  – Households or businesses install small amounts of electricity (FIT) or heat (RHI) generating capacity.
  – Paid a subsidy based on how much they generate (and for FIT also paid based on amount sold to the grid).

• **They are expensive.**
  – Spend about £0.5 billion per year on FITs.

• **They are poor value for money.**
  – Implied carbon price for FITs of £380/tCO$_2$e.
  – Not an efficient way to reduce emissions.
Location of FIT installations

- Installations are geographically concentrated in rural areas.
  - Particularly in SW England and Wales.

Source: Figure 2 of Grover (2013)
Who benefits?

- Benefits concentrated in relatively better-off areas.

Source: Figure 3 of Grover (2013)
Support for small-scale renewable generation

- Feed-in Tariff (FIT) and Renewable Heat Incentive (RHI):
  - Expensive.
  - Poor value for money.
  - Concentrated in better off areas.

- Rationale for this policy is unclear.

- Also, in future FITs contribute to carbon price that is above target price.
  - If policy remains in place, case for funding through taxes rather than levies.
Support for domestic energy efficiency

• Green Deal:
  – Offers loans to pay for home energy efficiency improvements.
  – Loans paid off through electricity bill.

• Energy Company Obligation (ECO):
  – Provides energy efficiency measures for free to poor households and those in hard-to-treat properties.
  – Three sub-policies, setting individual targets, some in cash terms, others in carbon terms.
Support for domestic energy efficiency

- Energy efficiency take up doesn’t vary significantly with income.
  - If anything richer households slightly less likely to have some measures.

Source: Figure 4.2 of Leicester and Stoye (2013)
Support for domestic energy efficiency

- Tenure is important in take up of such measures.
  - Similar pattern for loft insulation and double glazing.

Source: Figure 4.1 of Leicester and Stoye (2013)
Support for domestic energy efficiency

• Evidence that Green Deal does not target the key constraints.
  – Main barrier is not financial.
  – Tenure is an important constraint.

• Additional incentives provided e.g. cashback, reduce cost-saving compared with financing measures directly.

• Case for having more measures directly funded.
Support for domestic energy efficiency

• Energy Company Obligation (ECO) provides direct funding for measures.

• But, it is unnecessarily prescriptive reducing efficiency.
  – Should just set carbon reduction targets.
  – May vary for different groups e.g. poorer households.
Support for energy bills

• Warm Home Discount (WHD)
  – Electricity bill rebates to low income and vulnerable households.
  – £135 a year bill rebate to poor pensioners (“core group”).
  – “Broader group” – defined individually by suppliers – may get rebate.

• Cold Weather Payment (CWP)
  – Payment to households who are poor and vulnerable.
  – £25 payment for each winter period of seven consecutive days below 0°C.

• Winter Fuel Payment (WFP)
  – Annual tax-free payments to households with individual above female state pension age.
Support for energy bills

• Multiple policies with different eligibility criteria.
  – Eligibility criteria for WHD can even vary depending on which energy company a household is with.

• Take up could be improved if information sharing between DWP and energy companies is legislated for.
  – Information sharing already done for Pension Credit.

• Aim of WFP should be made clearer.
  – Costs £2.2 billion a year.
  – If the aim is to support bills for vulnerable households, the policy could be better targeted.
  – If the aim is to provide additional support for older households, there is a case for combining it with existing state pension provision.
Conclusion
Conclusion

• Energy use policy is currently incoherent and inefficient.
  – This comes from having multiple conflicting objectives.
  – However, not clear we are tackling these in the best way.

• Have shown it is possible to introduce reforms which rationalise the price and compensate most of those with low incomes.
  – Whilst reforms can be progressive on average, can’t ensure every low income household is compensated.

• This would reduce emissions substantially at no additional economic cost.

• Other policies also in need of reform.