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Carbon taxation and fiscal consolidation:

the potential of carbon pricing to reduce Europe's fiscal deficits

Executive summary

The benefits of carbon pricing for closing deficits

The overriding challenge for many European governments today is to reduce major fiscal deficits with the least collateral damage to the economy. This report shows that carbon fiscal measures may raise significant revenues while having a less detrimental macro-economic impact than other tax options. This gives them an important potential role in fiscal policy; a role that is currently widely overlooked. This benefit arising from carbon fiscal measures goes beyond the usual arguments in their favour – namely that they are crucial, cost effective instruments to reduce Europe's greenhouse gas emissions.

Carbon fiscal measures offer two specific opportunities for governments:

1. They can introduce and/or increase national taxes on energy consumption. We explore these national tax reform opportunities through case studies of Hungary, Poland and Spain. These countries were selected for their fiscal deficits, their diverse locations, their different sizes, as well as for the range of economies that they represent. The analysis of these three countries may therefore provide insights for other member states even though particular circumstances, and hence policy, vary from member state to member state.
2. They can support reform of the European Union Emission Trading System with the potential to generate significant revenues.

We also present a detailed review of the existing carbon energy tax structure in the following six countries: France, Germany, Greece, Italy, Portugal, and the UK.

Energy taxes: an attractive way to raise fiscal revenues

In each of the three countries that we examine – Spain, Poland and Hungary – modelling suggests that energy taxes would cause less economic harm per unit of revenue than direct (i.e. income) or indirect taxes, while also producing other benefits.

- Direct taxes could have twice as much negative impact on GDP as energy taxes which raise the same revenues between 2013 and 2020. Indirect taxes (VAT) appear less damaging than direct taxes but still tend to perform slightly worse than energy taxes. In many cases, a key factor is that energy taxes lead to a reduction in imported energy. In other words, the decline in production and economic activity takes place outside the country (and in these cases often outside Europe). This has the added benefit of improving energy security.

- All taxes have similar employment impacts, although indirect taxes (VAT), which particularly penalise the retail sector (which is labour-intensive), tend to perform worst.

- Of course, energy taxes are also much more effective at reducing emissions. By 2020, the packages examined cause CO_2 emissions to fall by between 1.5 and 2.5 per cent relative to the baseline. The other taxes make no meaningful impact on emissions.

A valid concern regarding energy taxes is that they are regressive. Our analysis confirms this in one respect: energy taxes reduce the spending power of lower income households and other disadvantaged groups by proportionally more than the spending power of higher income households. However, the evidence also indicates that lower income and disadvantaged households may suffer even greater losses under direct or indirect taxes, as the greater squeeze on overall economic activity affects all social groups, including the most disadvantaged.

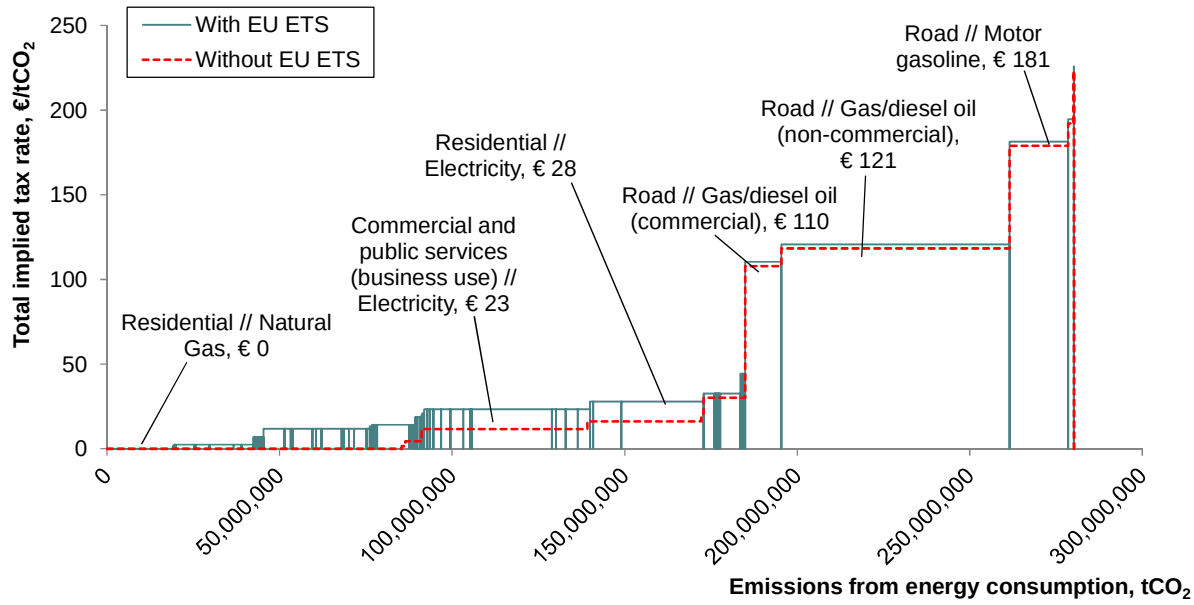
The report suggests that concerns over the regressive impact of energy taxes can be alleviated, with preferred options likely to vary from country to country. None is perfect, but each largely resolves the problem by using a small proportion of the revenue raised to off-set negative impacts on low income groups.

Scope for improving tax design

The amount of revenue that can be raised depends on which energy taxes are raised and by how much. The impacts described above reflect packages of reform chosen on the basis of a detailed review of the current profile of national energy taxes in Spain, Poland and Hungary. The same detailed review of national energy tax profiles was completed for a further six European countries: France, Germany, Greece, Italy, Portugal, and the UK.

The entire tax schedule for each country is presented as an energy tax curve, in which the tax revenue for each piece of the tax base is represented as a rectangle. The profile of the tax curve is shown in the charts below both with and without the EU ETS, so that it is clear how much the EU ETS contributes. A broad pattern is visible across all nine curves: a block of low, negative or zero-taxed energy consumption followed by gradually rising tax rates for business and residential use, and then much higher tax rates for transport fuels. There are around half a dozen different tax rates applied to business and residential use, and usually at least three for the principal transport fuels. The higher tax rates for petrol stand out. The energy tax curve for Spain is included below as example.

Figure 1. **There is wide variation in the implied CO2 tax rate for different energy sources in Spain**



Source: *Vivid Economics*

The figure illustrates shows the complex Spanish system with a large number of tax levels outside transport. Nevertheless, approximately 30 per cent of Spain's emissions face no domestic taxation, and approximately half of those are not covered by the EU ETS either. Electricity tax is an exception to this pattern, both on business and residential use.

For each tax, we converted current energy taxes into a rate per tonne of carbon dioxide. Economic analysis suggests that for maximum effectiveness and efficiency, the implicit rate should be sufficiently *high* that the tax induces changes in behaviour and be sufficiently *similar* across sources of emissions to ensure that behaviour changes wherever it is most cost effective to do so. In addition, taxes should focus on economic activity that is not covered by the EU ETS, to prevent double-burdening certain activities. In this way, the costs of raising revenue can be kept minimal.[1]

Judged against these two criteria, the report finds that current fiscal practice is far from optimal. In the three chosen countries, significant sources of emissions, including emissions from household energy consumption, are not taxed at all. Moreover, the pattern of taxes on commercial and industrial energy use is highly irregular, and in transport the implied CO_2 tax rate on diesel is much *lower* than that for petrol, despite its higher CO_2 content. If progress was made towards removing these discrepancies (as is broadly suggested by current proposals for reform of the European Union Energy Tax Directive) the effect would be to raise substantial amounts of revenue: between 1.0 per cent and 1.3 per cent of GDP in 2020 could be raised in each of the three countries (focussing on sectors not covered by the EU ETS).[2] This equates to more than €10 billion per annum in Spain, more than €5 billion per annum in Poland and more than €1 billion per annum in Hungary. With regards to current budget deficits, and in light of the need for fiscal consolidation, these revenues can make a

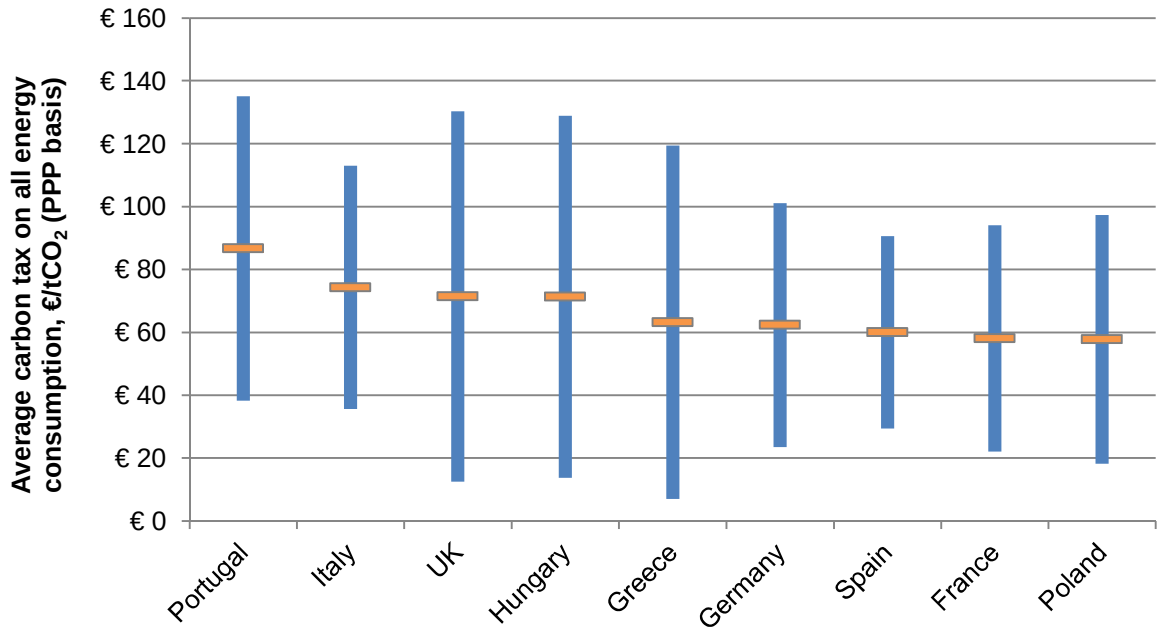
[1] As discussed in the body of the text, there are other externalities that can also justify energy taxation, most notably in relation to the consumption of transport fuels. The tax rates across fuels should reflect the magnitude of the externalities they cause.

[2] For illustration, 1 per cent of EU-27 GDP in 2011 was approximately €130 billion; 1 per cent of German GDP approximately €26 billion; 1 per cent of UK GDP approximately £15 billion; and 1 per cent of French GDP approximately €20 billion.

significant contribution: in the short run (by 2013), they could reduce deficits by 4 (Poland) to 8 (Hungary and Spain) per cent of 2011 deficits; over the medium run (by 2020) the annual reduction increases to: 50 per cent of the 2011 deficit for Hungary, 25 per cent for Poland, and 15 per cent for Spain.

Figure 2 shows the average implied CO_2 tax rate on energy consumption in nine countries and a measure of the variation in rates within the country. To our knowledge, this is the first time these calculations have been made.

Figure 2. **Energy taxation: there is significant variation both within and between European countries**



Note: *Yellow bars indicate the weighted average for each country; blue boxes indicate the size of a standard deviation for each country, not minimum and maximum tax rates. PPP is purchasing power parity and takes account of the relative purchasing power of a euro/domestic currency converted to euros at market exchange rates.*

Source: *Vivid Economics*

The figure shows substantial variation in tax rates between and within countries. Between countries, Portugal taxes CO_2 more heavily than any other country, at around 50 per cent more than Poland or France. Within countries, the discrepancy in implied carbon tax rates is largest within the UK and Greece. This suggests further significant revenue raising potential from energy taxes in these countries as well.

EU ETS reform is a similar opportunity

There is a similar opportunity to reduce deficits through reform of the EU Emissions Trading System (EU ETS). Up to now, the debate on whether the EU should increase its emissions reduction target[3] has centred on whether the additional emissions reductions are worth the additional cost, given the wider international context. An alternative perspective is to ask whether the macroeconomic impacts of raising government revenues in this way are better or worse than the alternatives.

This report examines that question, and yields important insights. First, substantial revenues are available. By tightening the EU ETS cap and thus raising the carbon price, a further €30bn (0.20 per cent of 2013 EU GDP) of additional auction revenues might be raised across Europe on average per annum. Second, the macroeconomic costs of raising revenue in this way may be smaller than the costs of levying direct taxes of the same size: over the period 2013-2020 modelling analysis suggests that the cumulative loss in GDP from raising direct taxes could be around 50 per cent greater than from reforming the EU ETS. Employment losses from a tightening of the EU ETS might be only around one third of those that would result from higher direct taxes.

Beyond 2020: Longer term EU ETS reform options

The main focus of this report is on options for deficit reduction in the period to 2020. But carbon pricing can be used to raise revenues beyond 2020, indeed through to 2050. The EU's ambitious objectives for 80-95 per cent decarbonisation by 2050 will involve further tightening of the EU ETS cap. Already, the EU ETS Directive states the intention of moving to full auctioning of allowances by 2027. This is a significant fiscal prize: were it possible to introduce full auctioning earlier, by 2020, the amount of revenues raised by the EU ETS in 2020 would be more than €30 billion greater per annum (around 0.17 per cent of 2020 EU GDP).[4]

However, without a global agreement on emissions reduction which requires other economies to introduce comparable measures, further tightening of the cap will be hard to implement without additional measures. Some sectors have legitimate concerns about carbon leakage and declining competitiveness. Adjustments to the prices of traded goods, based on a measure of the greenhouse gases embodied in the goods, sometimes known as border carbon adjustments (BCAs), could alleviate these concerns. At present concerns over competitiveness are addressed by giving free allowances to potentially affected sectors. As mentioned above, a fiscal prize of up to €30 billion is thereby foregone; a cost which might be avoided partly by replacing free allocation with BCAs as the policy instrument to address competitiveness issues. BCAs could also preserve competitiveness more effectively than free allowance allocation: the modelling indicates that BCAs might cut output losses from carbon leakage in affected sectors by up to two thirds.

BCAs in their currently-discussed forms are not welcomed by some of Europe's major trading partners. Their concerns may be addressed through better design. This report proposes a new *smart* form of BCAs. Smart BCAs are calibrated to a trading partner's income level and take into account capacity to mitigate emissions. They also benchmark against other countries, comparing their carbon prices. The report explains some relatively simple mechanisms that could achieve these benefits.

[3] From a 20 per cent reduction of greenhouse gases compared to 1990 levels by 2020, to a 30 per cent reduction by 2020.

[4] In the case that the EU ETS cap was also tightened.