UCL Institute for Sustainable Resources

# Implementing environmental fiscal reform in Europe

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# The rationale (1)

**For environmental taxation**

- Market failure leading to excessive pollution and environmental destruction
- More efficient than regulation; more effective than voluntary agreements and information
- The tax rate needs be set according to one of three aims:
  - Internalise external costs (Pigouvian tax 1932, need to know damage costs)
  - Achieve standards set on the basis of science and political feasibility (standards and pricing approach, Baumol and Oates, 1978)
  - Need to stimulate investment in desired alternatives (e.g. low-carbon, waste management technologies, cf UK Landfill tax)

# The rationale (2)

**For energy taxation**

- Energy demand increases with income (income elasticity +0.5)
- Energy demand decreases with price (industry elasticity -0.6)
- Market failures for some energy efficiency technologies
- Improvements in energy efficiency lead to a rebound effect, and therefore save less energy than anticipated (up to 70%)
- Humans are extremely ingenious at finding new ways to use energy (heating drives, gardens, making artificial snow etc.)

# The rationale (3)

## For carbon taxation

- Rich countries must achieve a minimum of 80% decarbonisation by 2050
- Only carbon pricing (taxing or trading) will stimulate the uptake and development of existing low-carbon and efficiency technologies, **and** reduction in the demand for carbon-based fuels

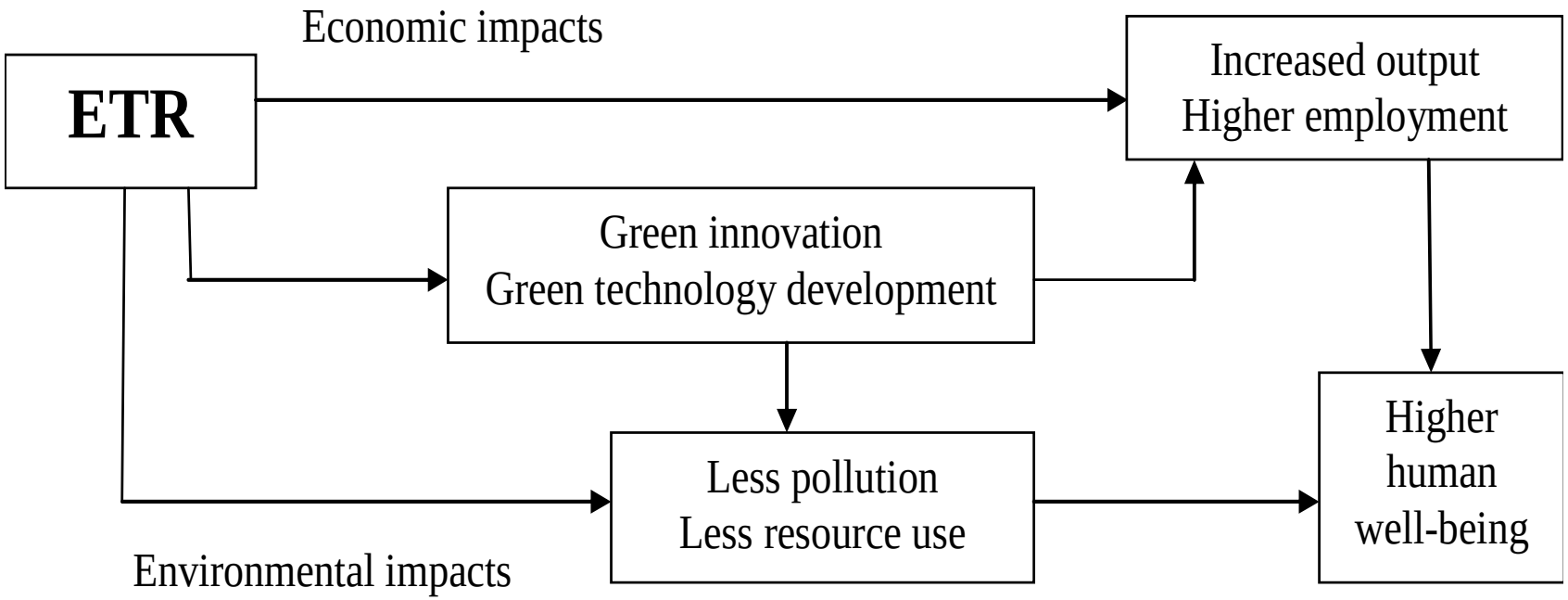
## Conclusions from the literature

- Without environmental taxation, the (macro-economic) cost of environmental improvement will be higher than it needs to be
- Without significant increases in energy prices, energy consumption will go on rising
- Where the energy is carbon-based this will lead to increased carbon emissions and a failure to stabilise the climate

**➔What is the potential of environmental tax reform (ETR)/ green fiscal reform (GFR)?**

# The potential of ETR/GFR:

ETR/GFR is the shifting of taxation from 'goods' (like income, profits) to 'bads' (like resource use and pollution) (EEA)



# Taxes on labour constitute the main source of revenue in every country of the sample, despite considerable variation

Poland, Spain and the UK are low-taxing, France, Germany and Hungary high-taxing states

*Figure 1.* **The composition of tax revenue varies strongly across the sample, with labour taxes ranging from 38 to 57% of total tax revenue**

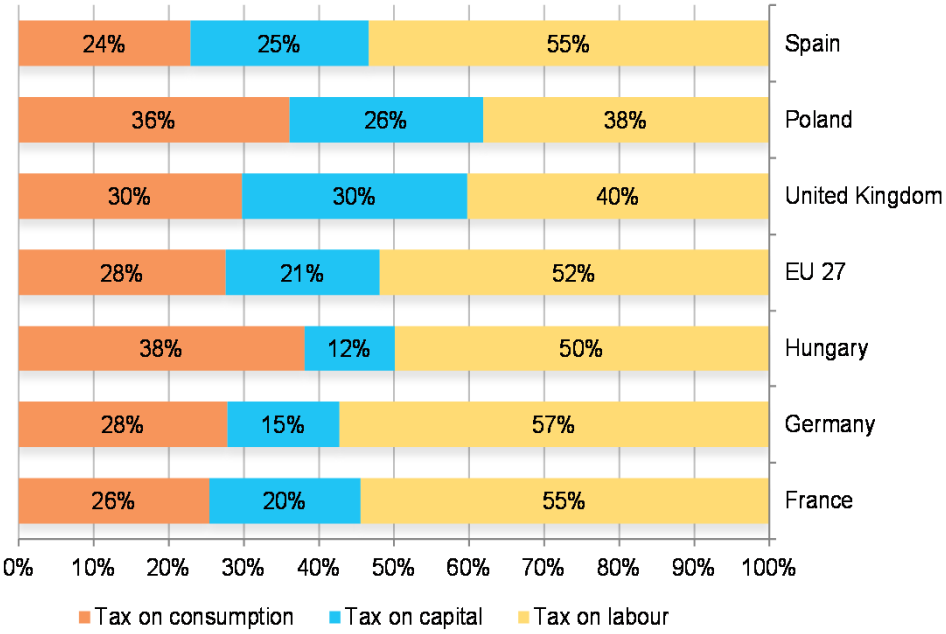
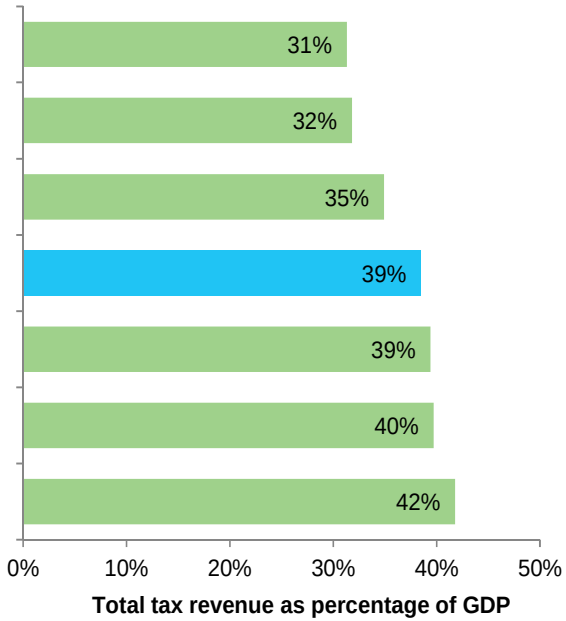



*Figure 2.* **The total tax revenue as a share of GDP varies from 31% in Spain to 42% in France**

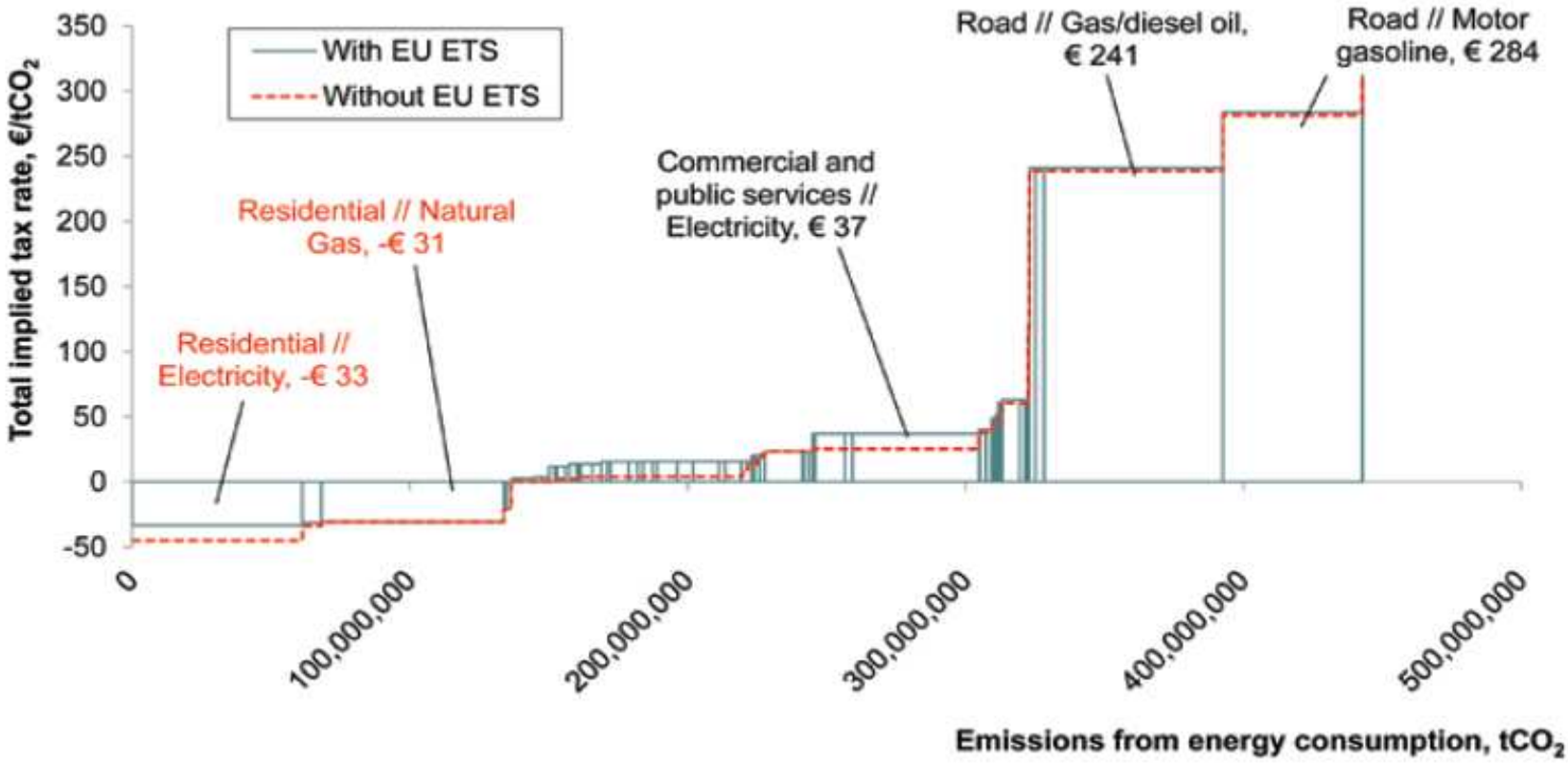



*Source: Vivid Economics and Eurostat*

# Energy Tax Curve – UK (2011)

UK´s energy taxation system is characterised by a particularly large range of different rates:

- Taxes on transport are among the highest thorough the EU
- Residential energies use is heavily (implicitly) subsidised, resulting in substantially negative tax rates for more than a quarter of all emissions.




*Source: Vivid Economics, Eurostat and European Commission, 2012*

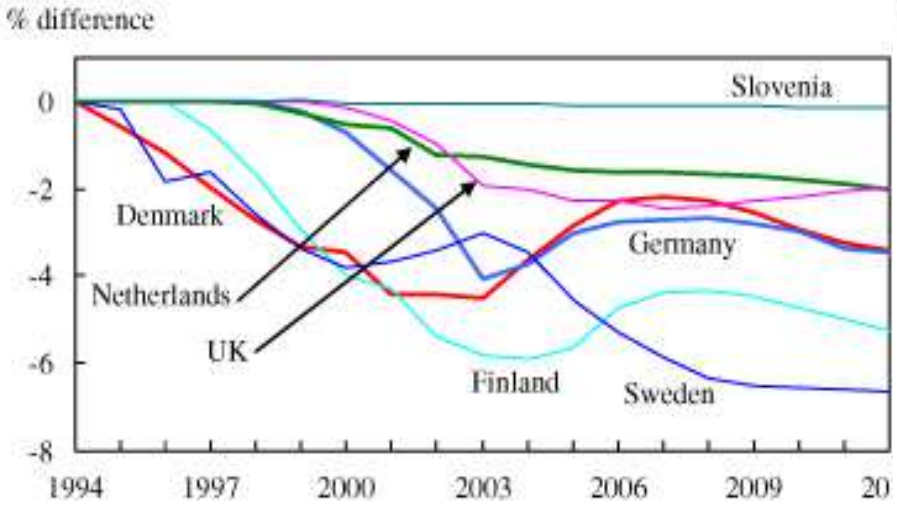
# Experience to date of ETR in Europe

- Six EU countries have implemented ETRs: Denmark, Finland, Germany, Netherlands, Sweden, UK
- The outcomes – environmental and economic – have been broadly positive: energy demand and emissions are reduced; employment is increased; effects on GDP are very small
- Effects on industrial competitiveness have been minimal

- See Andersen, M.S. & Ekins, P. (Eds.) *Carbon Taxation: Lessons from Europe*, Oxford University Press, Oxford/New York, 2009

# Environmental and economic impacts of ETR, from COMETR study, 2007

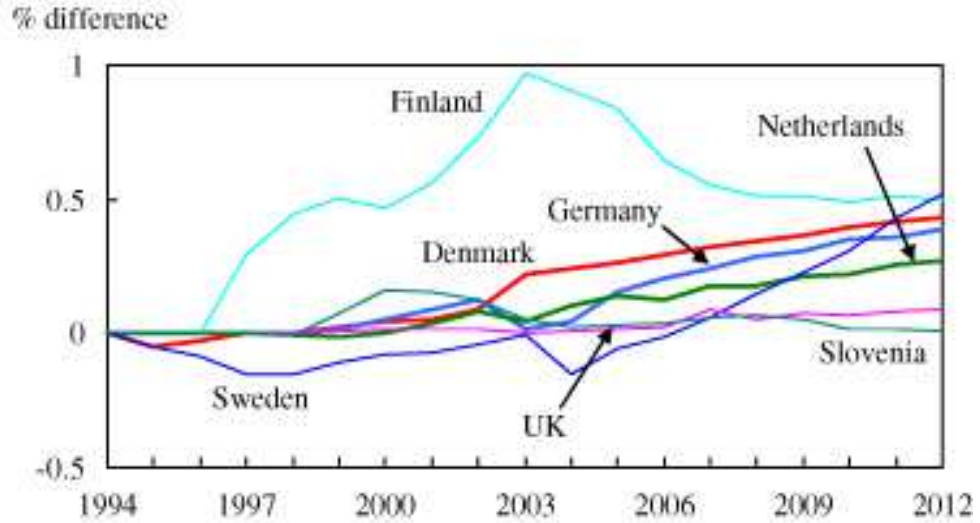
CHART 2: THE EFFECT OF ETR ON GHG EMISSIONS




Note(s) : % difference is the difference between the base case and the counterfactual reference case.

Source(s) : CE.

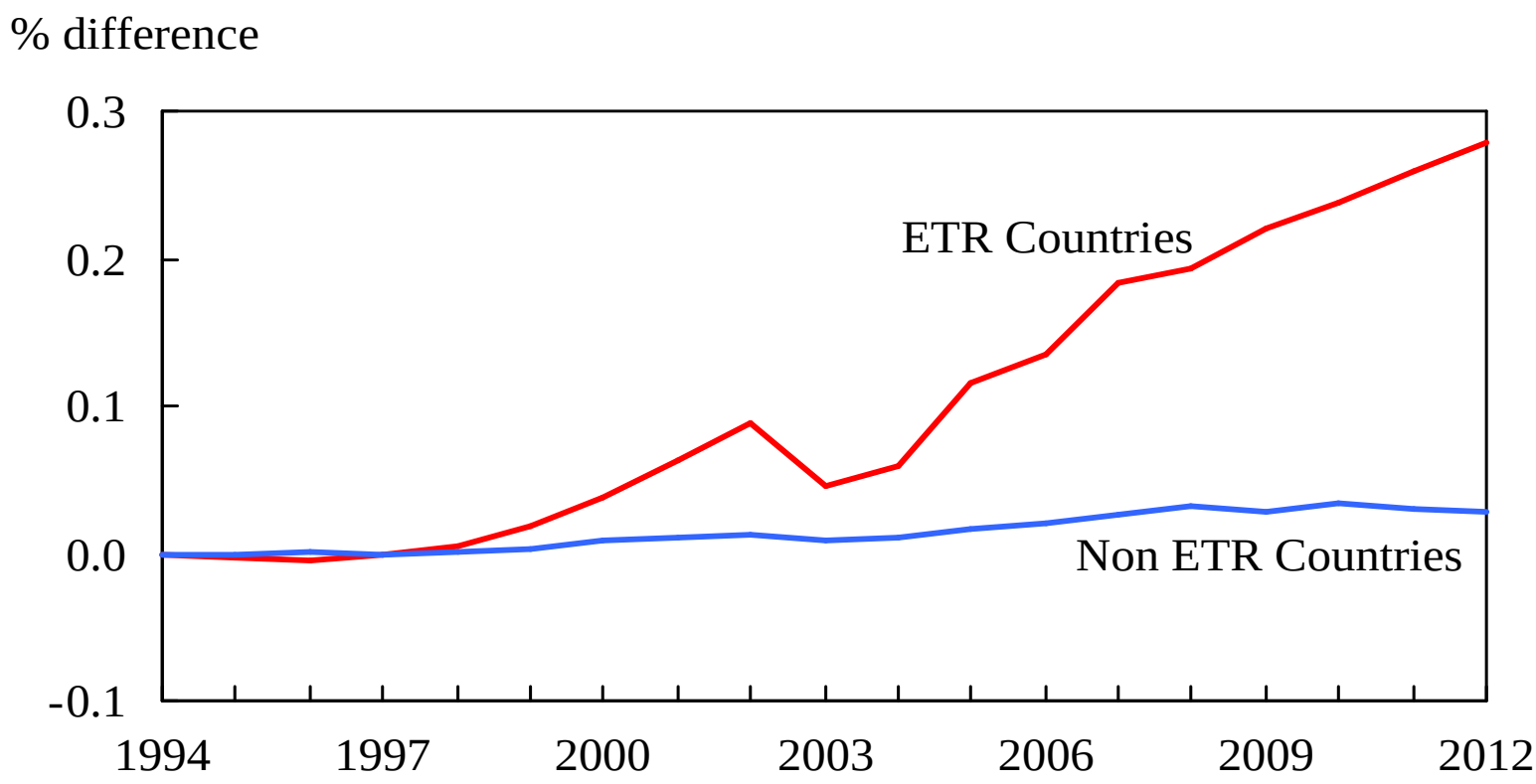
CHART 3: THE EFFECT OF ETR ON GDP




Note(s) : % difference is the difference between the base case and the counterfactual reference case.

Source(s) : CE.

# CHART 7.28: THE EFFECTS OF ETR: GDP IN ETR AND NON ETR COUNTRIES




Note(s) : % difference is the difference between the base case and the counterfactual reference case.

Source(s) : CE.

# Environmental effectiveness (1)

| Country and tax | Period evaluated | Impact |
|---|---|---|
| Finland carbon/energy tax | 1990-2005 | •CO2 emissions 7% lower than would have otherwise been<br>•Shift from carbon tax to output tax on electricity in 1997 may have lessened impact |
| Norway carbon dioxide and sulphur dioxide taxes | 1991-2007 | •21% reduction in CO2 from power plants by 1995<br>•14% national reduction in CO2 in 1990s, 2% attributed to carbon tax<br>•12% reduction in CO2 emissions per unit of GDP |
| Denmark - carbon tax and energy tax | 1992-1997 | •CO2 emissions in affected sectors down by 6% in a context of economic growth of 20% between 1988 and 1997<br>•5% reduction in emissions in one year in response to tax increase<br>•In the 1990s, 23% reduction in CO2 from business as usual trend, and 26% increase in energy efficiency Subsidy to renewables may have accounted for greater proportion of emissions reductions than tax |

# Environmental effectiveness (2)

| | | |
|---|---|---|
| Sweden energy and carbon taxes | 1990-2007 | •Emissions reductions of 0.5 million tonnes per annum<br>•Emissions would have been 20% higher than 1990 levels without tax |
| The Netherlands energy tax | 1999-2007 | •Emissions 3.5% lower than would have otherwise been<br>•Low tax rates may have resulted in limited impact |
| Germany - green fiscal reform, taxes on transport, other fuels and electricity | 1999-2005 | •CO2 reduced by 15% between 1990 and 1999 and 1% between 1999 and 2005<br>•CO2 emissions 2-3% lower by 2005 than they would have been without tax<br>•German re-unification also an important factor in reductions |
| UK - industrial energy tax | 2001-2010 | •UK CO2 emissions reduced by 2% in 2002 and 2.25% in 2003 and cumulative savings of 16.5 million tonnes of carbon up to 2005<br>•Reduction in UK energy demand of 2.9% estimated by 2010 |

# Policy starting point

- Theory and evidence suggest that environmental tax reform is a good idea in principle
- Consideration needs to be given to:
  - A substantial tax shift – approx. 20 per cent of tax revenues from green taxes by 2020 – quite a challenge
  - Use of the tax revenues: revenue neutrality, amplify environmental benefits (technology and behaviour change – hypothecation, earmarking), fiscal consolidation
  - Impact on already disadvantaged groups
  - Negative and positive effects on business (energy intensive industries, new sources of comparative advantage as the basis for new businesses)
  - Overall level of taxation

**The politics is difficult: need to develop a compelling narrative**

# Narrative 1 - Targets and the role of price

The imperative of reducing GHG emissions:

- Legally binding targets to reduce GHG emissions (aside from other motivations for action)
- 2020 targets will have to be met through renewables, energy efficiency and demand reduction – not CCS and nuclear - can't contribute in time
- Current rate of emissions reduction is too slow – so need new policies.

Inconvenient facts about energy use:

- Energy use increases with income
- So energy efficiency alone unlikely to deliver targets, i.e. absolute reductions.
- Increasing energy price reduces demand
- Increasing price also promotes renewables, efficiency and demand reduction

# Narrative 2 - How to increase prices?

By government intervention (e.g. taxes) *or* leave to the market (price set by supply/demand)

- Both approaches reduce demand for energy
- But green taxes keep revenues in country and generate tax receipts that allow other taxes to be reduced
- Market increase in oil price incentivises development of high-carbon substitutes
- Tax can target carbon

# Narrative 3 – The public is not convinced

- Evidence suggests green fiscal reform should lead to widespread aggregate economic, environmental and welfare benefits, but ...

- People seem to dislike green taxes more than other taxes. Why?
  - Do not believe they substitute for other taxes
  - Impact on highly valued forms of consumption
  - Not related to ability to pay
  - Green taxes should change behaviour not raise revenue
  - Think they are extra rather than replacement taxes
  - Think they affect business competitiveness negatively
  - Are seen as unfair
  - Perceive them as ‘stealth’ taxes

- So how to move forward? Need to address above points

# Factors that reduce impacts on competitiveness

- National competitiveness:
  - Most sectors not energy intensive
  - Ability of relatively untraded sectors to pass on price increases
  - Increased energy efficiency
  - Increased innovation: Porter hypothesis; low-carbon industrial transition
  - Revenue-recycling
- Sectoral and firm competitiveness:
  - Only a few sectors – those with high energy and trade intensities, and low market power – are vulnerable to carbon/energy taxes
  - These sectors have been protected by special tax provisions (which also have the effect of reducing the effectiveness and efficiency of the taxes)
  - Even these sectors have shown that they have significant opportunities to improve their energy efficiency to offset the effect of the tax
  - Taxes and EFR measures implemented so far have been relatively small – protection measures will need to be intensified with larger ETRs.

# Distributional concerns

- Environmental, particularly household energy, taxes, when introduced on their own, are very likely to have regressive impacts, exacerbated by low housing energy efficiency.
- Not true for transport takes, but rural/urban considerations.
- Need to assess implications for tax reduction/expenditure elements of ETR (e.g. some groups, such as pensioners, may not be paying income or labour taxation, and so will not benefit from reductions, while being subject to the extra tax).
- Green taxes, and compensating tax reductions, also influence the prices of other goods and services – need modelling to estimate these. Imports unaffected.
- The impact of EFR design, including exemptions or tax allowances, will sometimes make an important difference to the distributional impact.
- Any extra employment will benefit those who get the new jobs.
- There can be a distributional effect of the environmental improvements brought about from an EFR, e.g. if urban air quality is improved it may be that lower-income groups, who had suffered the worst health effects, will get more benefits from cleaner air than other groups.

# Revenue stability

- Objection: if the objective is to reduce emissions, and emissions are also the source of government revenues, then if the fiscal reform is successful it will also undermine the tax base, so reducing the revenue to the government.
- Need to distinguish between two types of green tax:
  - High elasticity, e.g. plastic bags, chlorinated solvents, CFCs, and industrial greenhouse gases. Taxes in this category may be desirable because of the environmental improvements , but will not generate stable, long-term revenues, and so are not suited for ETR.
  - Low elasticity, with large tax bases, e.g. energy, water, bulk materials
  - E.g. if a 10% increase in an environmental tax produces an 8% reduction in the tax base (carbon emissions, say), then revenues from the tax will *increase* (by 2%), along with the emissions reduction. The fact that many environmental tax bases (e.g. energy, car ownership) have elasticities between 0 and -1 means that revenues from tax increases on these bases can increase even while the environmental damage is reduced.
- If corresponding reductions in labour taxes bring about increased employment, this will generate extra tax revenues as well.
- Desirability of ongoing tax increases to counter rebound effects from efficiency improvements
- Other taxes, e.g. on alcohol, tobacco, have yielded large revenues over long periods even while they reduce demand

# Narrative 4 - Implementing Green Fiscal Reform

- Need to increase support for reform in two areas:
  1. The need for emissions reduction
  2. That a large price increase is necessary to achieve emissions reductions
  3. Good for the economy and for energy security to do this through taxation rather than wait for international oil price rises
  4. The best time to increase energy taxes is when energy prices are low or falling

- Political consensus is required on green fiscal reform
  - Carbon targets *must* be met
  - Will require *strong* measures

When/if agree this consensus implementation likely to require

1. Fiscal neutrality to be monitored by an independent body
2. Needs of vulnerable economic sectors and households must be addressed
3. Some revenues to be spent on improved environmental measures

# Narrative 5 - Accompanying measures and clear messages

- Reward perceived good behaviour – e.g. in UK Council Tax cuts for energy efficiency (needs financing)
- Raise awareness of people's energy use and its impacts - meter, labels, etc
- Address infrastructural barriers to behaviour change
- Use regulatory policies to reduce energy use

- Need strong consistent message that energy prices will increase over time to meet carbon targets and drive low carbon investment
- When taxes go up, increase green taxes
- Will stabilise energy markets – security and stability
- Agenda is about change – doing nothing is not without costs
- There is no high-carbon, high-growth, high welfare future available

# The role of Green Tax Commissions

(see Mori, M., Ekins, P., Speck, S., Lee, S. and Ueta, K. Eds. 2013 *The Green Fiscal Mechanism and Reform for Low Carbon Development*, Routledge, London/New York

- Chapter based on a review of 19 different Green Tax Commissions for European countries: Austria, Belgium, Demark, Finland, France, Germany, Ireland, Netherlands, Norway, Sweden, UK (many countries had more than one Commission)
- Findings:
  - Commissions were mainly formed in 1990s
  - Almost exclusively formed by government (17 out of 19, not Germany, UK)
  - Commission Membership: Varied, including inter-ministerial working groups of civil servants (Ireland, Denmark), Parliamentary Committees with expert input (Sweden), groups formed of external experts (Belgium), groups with fuller stakeholder representation (Austria, France, Germany, The Netherlands and Norway).
  - Varied size of commissions, with Norway having the largest membership (116 members), but the typical size much smaller

# Recommendations on Green Tax Commissions

- **Stakeholder representation:** broad representation recommended: main political parties for impartiality, civil servants, business, NGOs, academics, other experts (e.g. on tax and fiscal policy and issues of tax design)
- **Independence:** mixed evidence on independence from government is mixed: pro - better able to set own agenda, explore sensitive issues, get broader political representation; anti - may struggle to gain influence with government;
- **Relevance of outputs:** outputs must be relevant to local political context, identify and address key concerns; range of outputs required for communication on different issues, e.g. the structure of ETR, options for ETR, impact on competitiveness and social equity
- **Opening up not closing down the debate:** focus on developing possible options for ETR and understanding their implications, opening up rather than narrowing down the debate on ETR.
- **Methods:** important potential areas for work:
  - Collation of evidence on the operation and implementation of green taxes, modelling of their effects
  - Work to understand stakeholder and public attitudes to green taxes
  - Early engagement with potential users of outputs
  - Communication of work and findings of commissions: needs to be transparent about methods/conclusions, appropriately targeted to different audiences
- **Establish links with other existing commissions:** currently Green Budget Germany, Green Budget Europe and France, and the Irish Government who have an active policy debate on these issues.

# UK Green Fiscal Commission – Summary of Findings

- Environmental taxes work: they reduce environmental impacts
- Environmental taxes are efficient: they improve the environment at least cost
- Environmental taxes can raise stable revenues
- The public can be won round to Green Fiscal Reform (GFR)
- GFR would stimulate investment in the low-carbon industries of the future
- GFR can mitigate the impact of high world energy prices: unlike GFR, high world energy prices are bad for the UK economy
- The impacts of GFR on competitiveness can be mitigated: concerns of relatively few economic sectors can be addressed.
- Low-income households need special arrangements
- Green Fiscal Commission: can explore options, build consensus and work out the details (modelling)

# Green Fiscal Commission research

- 8 Briefing Papers, see http://www.greenfiscalcommission.org.uk/index.php/site/about/publications_and_presentations/) on:
  - Public opinion; modelling of economic, environmental and social implications of a major tax shift; distributional issues; international comparisons on the effectiveness of economic instruments; ETR and innovation; ETR and competitiveness; border tax adjustments; ETR and transport; revenue stability

# Relevant projects on environmental tax reform

- COMETR: Competitiveness effects of environmental tax reforms, 2007. http://www2.dmu.dk/cometr/ (see Andersen, M.S. & Ekins, P. (Eds.) *Carbon Taxation: Lessons from Europe*, Oxford University Press, Oxford/New York, 2009)
- petrE: 'Resource productivity, environmental tax reform (ETR) and sustainable growth in Europe'. Anglo-German Foundation programme 'Creating Sustainable Growth in Europe'. Final report published October 29, Berlin, November 25, London. www.petre.org.uk (see Ekins, P. & Speck S. Eds. 2011 *Environmental Tax Reform: A Policy for Green Growth*, Oxford University Press, Oxford)
- UK Green Fiscal Commission. Final report published October 26, London. www.greenfiscalcommission.org.uk
- Carbon and Energy Tax Reform in Europe (Vivid Economics and Green Budget Europe) http://www.foes.de/internationales/green-budget-europe/gbe-projekte/cetrie/?lang=en
- FRE-COMMUNICATE! - Communicating and realising the benefits and potential of Environmental Fiscal Reform in Europe http://www.foes.de/internationales/green-budget-europe/gbe-projekte/fre-communicate/?lang=en
- The Ex' Tax project (Netherlands): http://www.ex-tax.com/

# The wider evidence base

- Handbook on Research in Environmental Taxation (Milne & Skou Andersen, 2012)
- Environmental tax reform in Europe: opportunities for eco-innovation (European Environment Agency, 2011)
- Carbon Taxation and Fiscal Consolidation: the potential for carbon pricing to reduce Europe's fiscal deficits (Vivid Economics, 2012). This report was prepared for the European Climate Foundation and Green Budget Europe

# What might be a way forward for ETR in Europe?

- Unless EU unanimity requirement is removed, there will be no EU ETR
- 'Coalition/alliance of the willing' is possible: fiscal coordination?
- Carbon tax very similar to permit auction
- Energy Tax Directive in place – proposal to split between energy and carbon
- Carbon tax would put floor on permit price
- EU-wide carbon tax would dilute concerns about competitiveness (cf China)
- At national level:
  - Need for substantial new sources of tax revenue (tax pollution, not incomes)
  - Need for substantial new sources of employment (make employment cheaper)
  - Work through Semester process

# Thank you

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