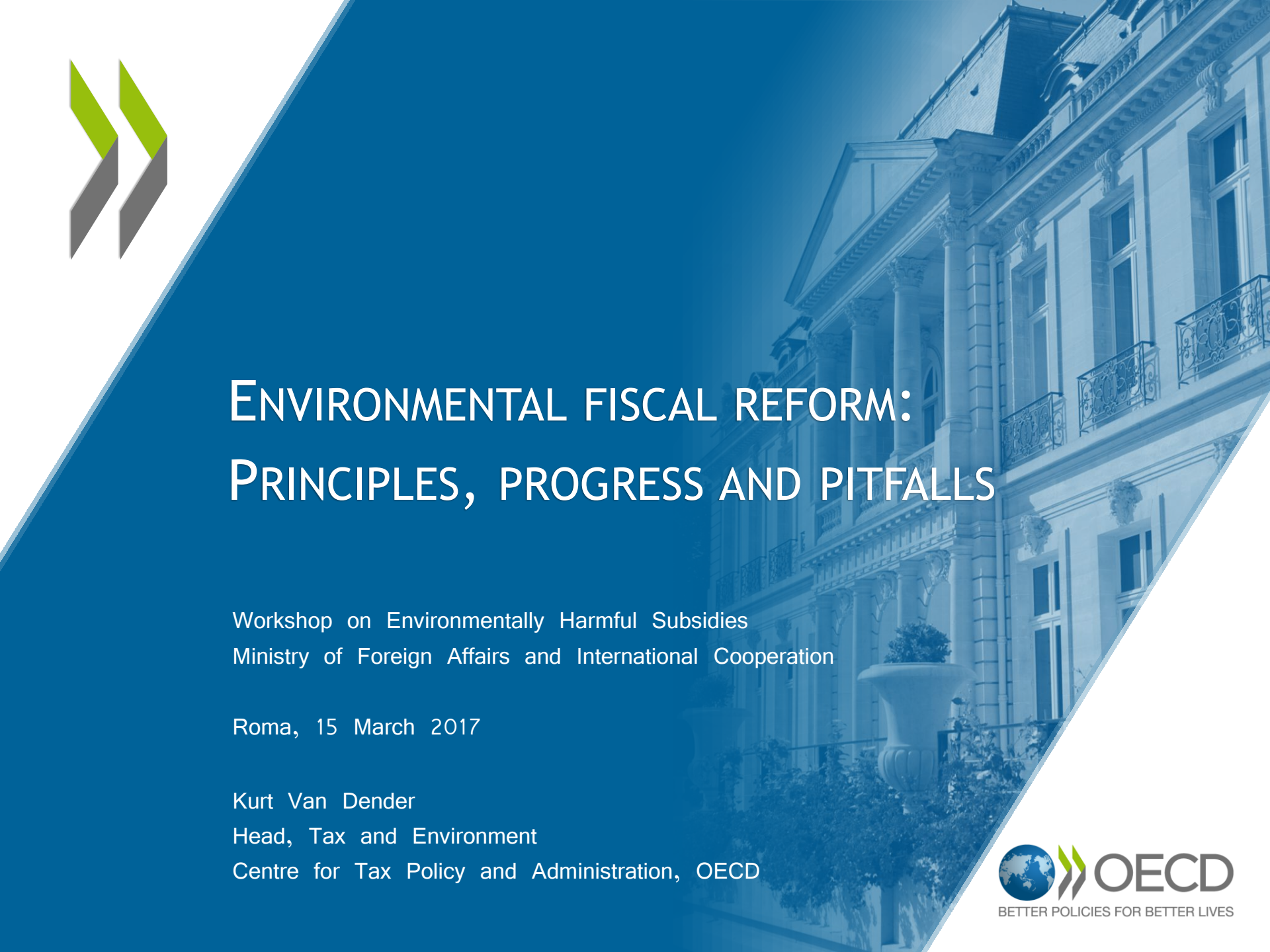

ENVIRONMENTAL FISCAL REFORM: PRINCIPLES, PROGRESS AND PITFALLS

Workshop on Environmentally Harmful Subsidies
Ministry of Foreign Affairs and International Cooperation

Roma, 15 March 2017

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OECD
BETTER POLICIES FOR BETTER LIVES

Environmental fiscal reform

What is it?

Why do we think it is a good idea?

What progress is being made?

Environmental fiscal reform

Some terminology

Taxes as environmental policy instruments

Environmental taxes within the tax system

Revenues raised

Sectors

Environmental fiscal reform – what?

Market-based instruments for environmental policy

- Market-based instruments seek to address the market failure of 'environmental externalities' either by incorporating the external cost of production or consumption activities through taxes or charges on processes or products, or by creating property rights and facilitating the establishment of a proxy market for the use of environmental services.
- **Polluter pays principle**

Environmental taxes

- A tax whose tax base is a physical unit (or a proxy of it) that has a proven specific negative impact on the environment. Four subsets of environmental taxes are distinguished: energy taxes, transport taxes, pollution taxes and resources taxes.
- **A subset of market-based instruments, i.e. an *environment* policy instrument**

Environmentally related taxes

- Environmentally related taxes are defined as **any compulsory, unrequited payment to general government levied on tax-bases deemed to be of particular environmental relevance**.
- **Taxes that 'particularly 'affect the environment, whether *intended or not***.

Environmental fiscal reform – what?

Environmental fiscal reform – differing definitions

- EFR refers to "**a range of taxation or pricing instruments that can raise revenue, while simultaneously furthering environmental goals**. This is achieved by providing economic incentives to correct market failure in the management of natural resources and the control of pollution."
- We define Environmental Fiscal Reform (EFR) as a **tax shift from labour towards environmental use, supplemented by the reform or removal of environmentally adverse subsidies**.
- EFR is frequently discussed as a means of bringing about a so called '**tax shift**' in which a progressive increase in the revenues generated through environmental taxes provides a rationale for **reducing taxes derived from other sources**, such as income, profits and employment, the taxation of which is less desirable. [However], **even where there are no explicit offsetting reduction in other forms of taxation, fiscal consolidation through increasing environmental tax revenue might implicitly keep the level of other taxes below that which might otherwise have prevailed**.

Environmental fiscal reform – what?

Environmental fiscal reform – pragmatic framework

- Environmental policy using market-based instruments (‘move in the direction of polluter pays principle’ – implies removing EHS)
- Revenue raising
- Socially productive revenue use

Environmental fiscal reform

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Instrument choice

Environmental externalities – markets result in too much pollution

Available policy instruments:

- command and control

e.g. energy efficiency standards, emissions limits, activity constraints

- market-based instruments (incentive-based instruments)

e.g. subsidies, taxes, tradable permits

Static efficiency

Tax instruments are more cost-effective than (all, most) other environmental policy instruments.

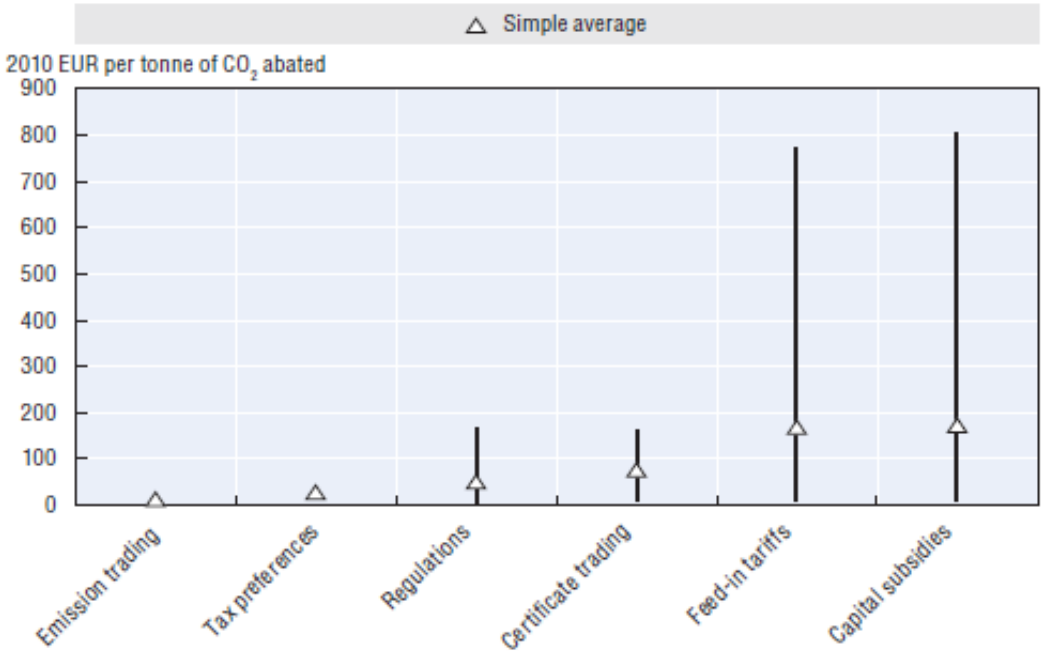
Why? Decentralise choices on how to abate, leaving the choice to those best informed to make them

E.g. increase transport fuel tax → increase efficiency, switch fuel, drive less (more public transport or fewer trips or bike or…) – heterogeneity, ambition

Static efficiency

Evidence for cost-effectiveness

Figure 3.7. **Estimated effective carbon prices in the electricity sector, by instrument category**

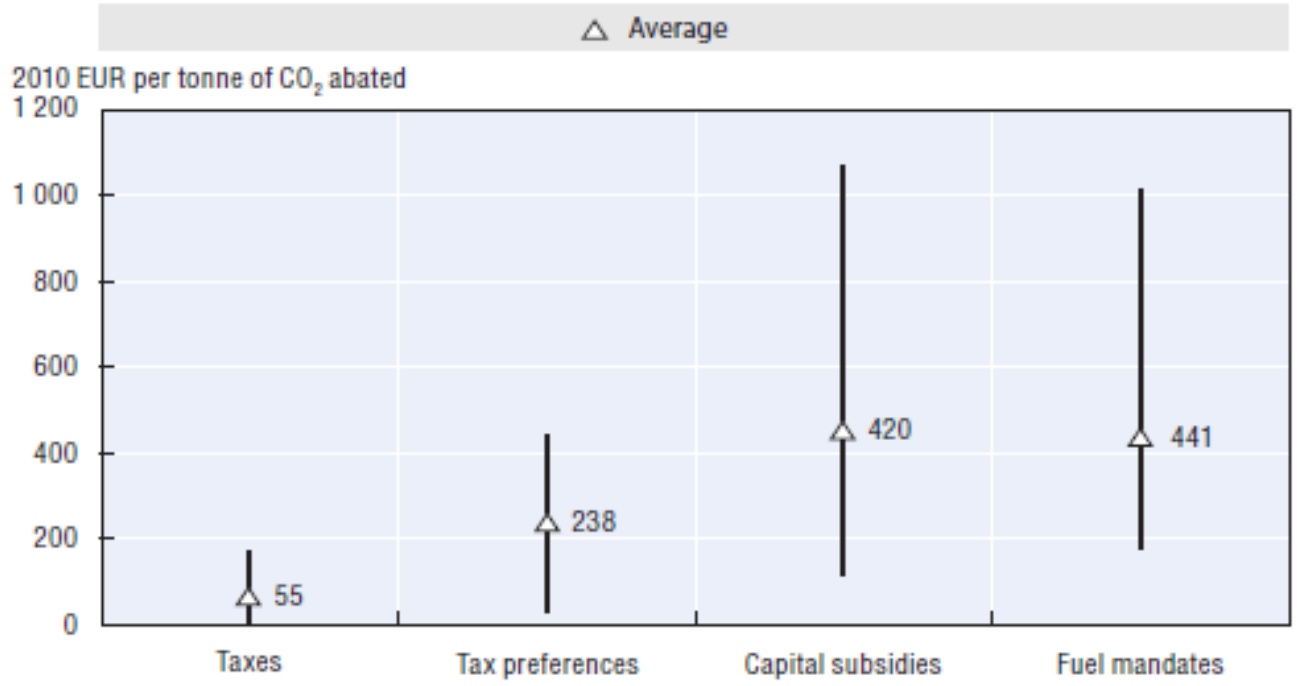


Note: The height of the bars represents the range of effective carbon price estimates found for the different instrument categories; the triangles represent a simple average of these estimates. "Regulations" refers to renewable portfolio standards.

Static efficiency

Evidence for cost-effectiveness

Figure 3.16. **Estimated effective carbon prices in the road transport sector, by instrument category**



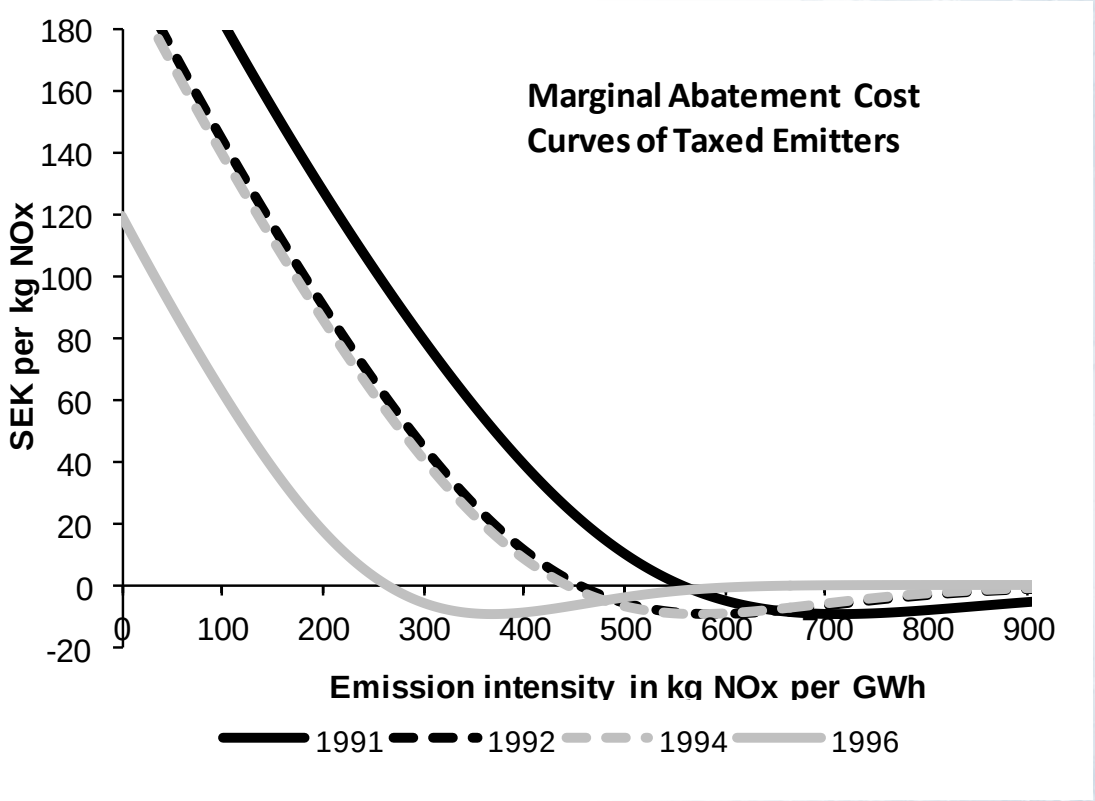
Dynamic efficiency

Compliance with a standard: no further incentive to reduce emissions or pollution

Subsidy or tax: incentives to abate continue as long as there is a cost or benefit associated with abatement; strong incentive to innovate

Example: Swedish NOx charge

- Downward shifts in marginal abatement curves for plants under the NOx charge in early years of application



- Drop in NOx emissions intensities at individual plants

Source: OECD, *Taxation, Innovation & the Environment* (2010). Available at http://www.oecd.org/env/environmentalpolicytoolsandevaluation/taxationinnovationandtheenvironment.htm

Subsidies or taxes? Carrot or stick?

- Getting relative prices right: S or T, but income effect with S will tend to lead to too much pollution (‘pay the polluter’, affects profits and entry and exit in MLR); also rebound effects.

- S rewards abatement, so need to establish the baseline (what to subsidise? Risk of picking the wrong options).

- Risk of subsidising what would have been done anyway.

- Revenue is scarce, so taxes better.

→ So caution when thinking about tax incentives or other subsidies (green R&D)

Taxes or tradable permits?

In simplest model, identical (both can achieve efficiency).

When costs and benefits are uncertain,

- tradable permits focus on the level of emissions or pollution (with uncertain permit prices), and

- taxes focus on price stability with more uncertainty over the level of emissions or pollution.

Taxes or tradable permits?

Auctioning permits or giving them away?

- Public revenue is scarce;

- Pay the polluter or polluter pays?

Markets work well if there are many, ‘atomistic’, parties, a condition not always met.

Administration of permit markets tends to be more difficult than administering taxes.

Environmental fiscal reform

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Environmental fiscal reform – why?

Efficiency- and growth-enhancing fiscal policy

- Market-based instruments raise revenue
  - Implicit revenue (foregone revenue)
  - Explicit revenue
- Socially-productive revenue use
  - Is essential for market-based instruments to make sense
  - Can take very different forms, depending on circumstances
  - Some degree of compromise between political feasibility and productivity but remain vigilant as poor revenue use is among the bigger risks of MBI

Environmental fiscal reform – why?

Efficiency- and growth-enhancing fiscal policy

- Growth-friendly tax reform is possible in many countries. Involves a shift away from labour and corporate income taxes, towards consumption- and property taxes. Environmental tax reform can also be part of a growth-friendly tax shift.
- Specific focus in environmental tax reform: double dividend (environmental benefit, more efficient way of raising same amount of revenue). Depends on starting point (tax interaction effect) and on revenue use (revenue recycling effect – not to be taken for granted.
- Larry Goulder: "Are the costs of the green tax negative? The **simplest analytical models** suggest that the answer is no. Intuitively, that is because **green taxes have a much narrower base than income taxes**. As a result, they tend to imply **larger "distortions" in markets for intermediate inputs, for consumer goods, and for labor and capita**l. Hence, swapping a green tax for part of the income tax augments the (nonenvironmental) distortions of the tax system, and there is an economic cost of this revenue-neutral tax reform**."**
- **The world is not a simple analytical model – DD may or may not occur, but it should not be taken for granted.**

Environmental fiscal reform – why?

Efficiency- and growth-enhancing fiscal policy

Revenue use: compensation via foregone revenue:

For equity and competitiveness reasons, there is frequent use of

- Preferential tax rates for some (all) households and companies,
- Freely allocated permits in emissions trading systems.

These forms of compensation can be seen as implicit revenue use, and tend to:

- Be less transparent than real financial flows;
- Blunt the environmental effectiveness of the taxes or trading systems;
- Reduce the potential for efficiency- and growth-enhancing tax reform.

Environmental fiscal reform – progress

Environmental fiscal reform – principles in practice

- Change behaviour to **reduce environmental damage**
- **Raise public revenue**
- **Recover costs** of infrastructure and operations

→ Environmental taxes often are shaped by two of these factors – pure application of polluter pays principle is rare

- Administration costs (rough proxies are cheap, sophisticated environmental taxes less so)
- Effects on equity and on poverty
- Effects on competitiveness
- Interests and rents

→ The weight of these factors differs across sectors or tax bases

Environmental fiscal reform

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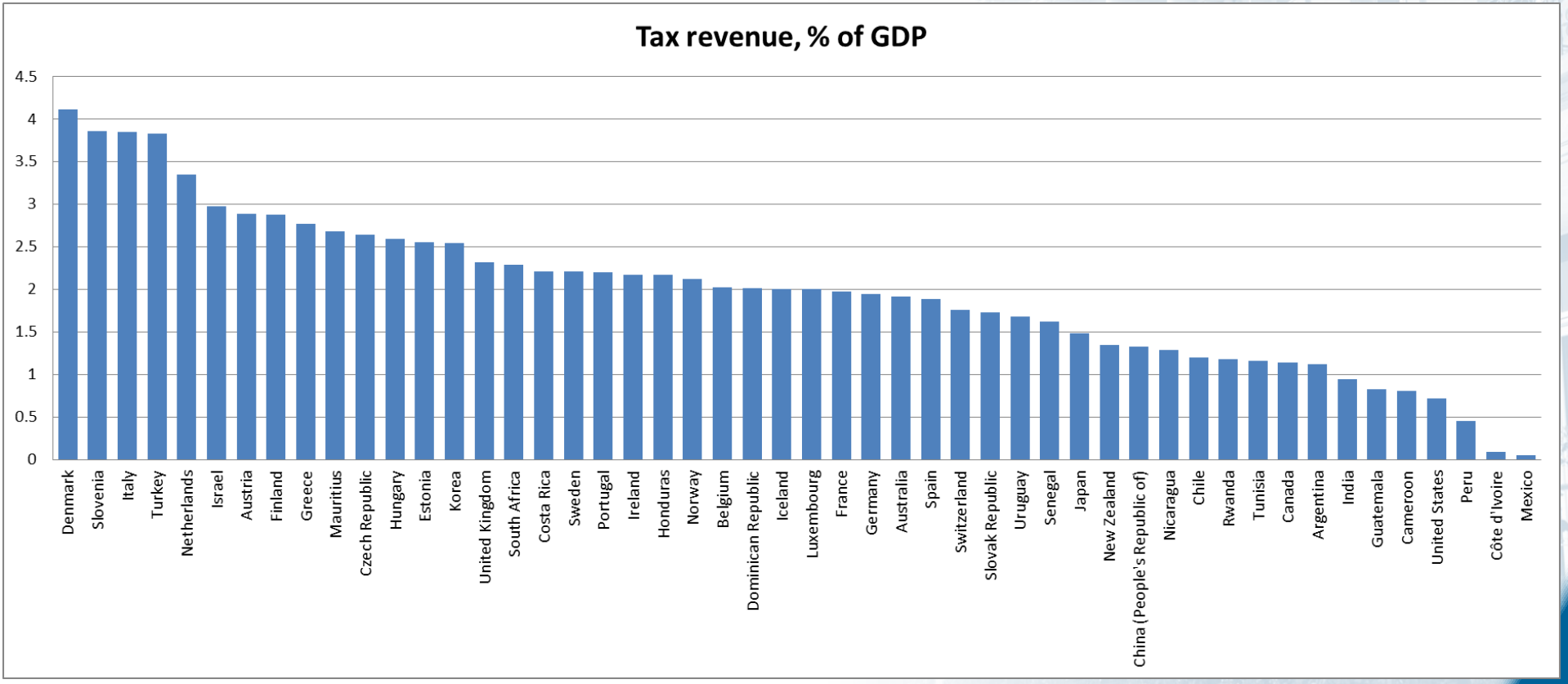
Environmental fiscal reform – progress

The scope of environmental fiscal reform – tax or charging bases

- Energy (motor fuels, heating and process use, electricity; climate, air pollution, etc.)
- Transport (vehicle taxes, aviation taxes, driving(?))
- Waste (landfill, incineration, mechanical and biological treatment, recycling and composting, packaging, single use bags ('plastic bags'))
- Water abstraction
- Water pollution
- Agrochemicals (pesticides, herbicides, fertilizers)

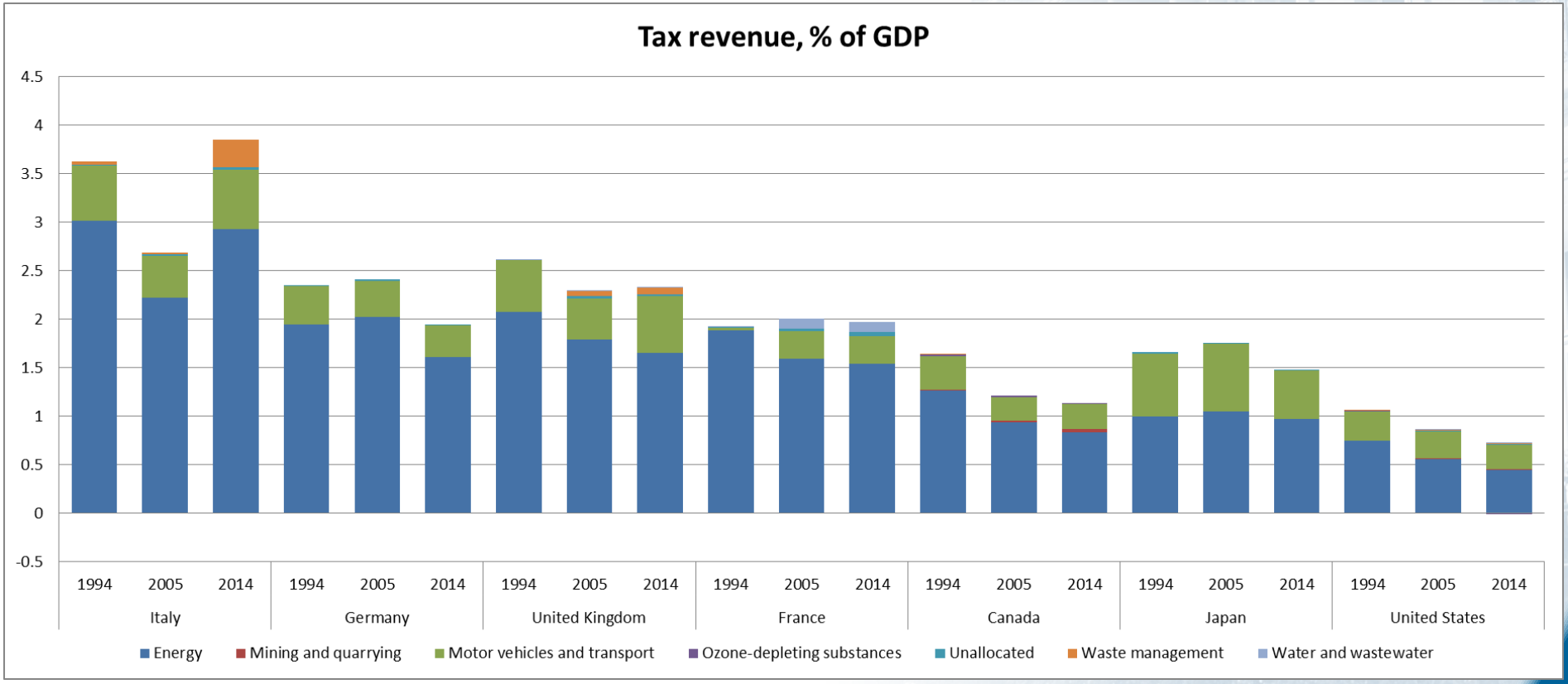
Environmental fiscal reform – progress

Revenues raised – environmentally related tax revenue in 2014

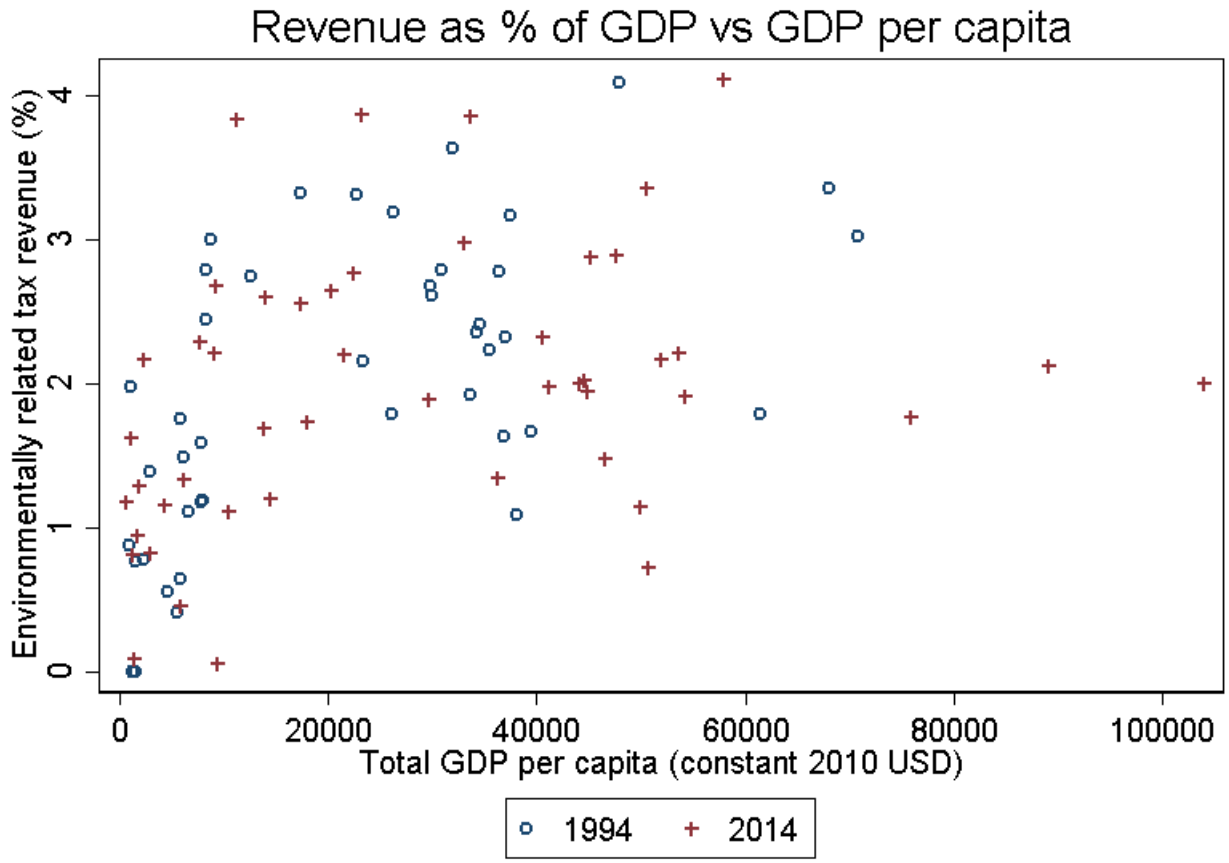


Environmental fiscal reform – progress

Revenues raised – change over time in G7 countries



Revenue as % of GDP - all countries



Environmental fiscal reform – potential

Good practice – what revenue impacts?

- Better than now but not full marginal social cost pricing
- E.g.: energy – uniform carbon and energy component within sectors; higher vehicle taxes; ticket and tonnage taxes in aviation; higher landfill and incineration taxes; focus packaging taxes more on prevention and not just recycling; tax plastic bags; increase pollution taxes; more systematic abstraction charges (per volume) and effluent charges (dependent on BOD); integrate more pollution-based differentiation into water charges; tax pesticides on potential environmental impact more than on active ingredient; tax fertilizers more broadly

Environmental fiscal reform – progress

Revenues raised and revenue potential

Good practice would increase the revenue as a share of GDP by about 50% or Z%-point in the EU-28, an estimate with a basic correction for demand responses.

Environmental tax revenue as a share of GDP, EU 28

2013	2.58%
good practice	3.63%
additional	1.05%

Breakdown of the additional potential, % GDP, EU-28

energy	0.25%	of which 0.23% transport energy
transport (excluding energy)	0.59%	of which 0.52 vehicle taxes
pollution and resources	0.21%	of which 0.09% water abstraction charges
total	1.05%	

Environmental fiscal reform – progress

Revenues raised and revenue potential

- Marginal social cost pricing is a much more ambitious policy and back-of-the-envelope calculations can be misleading (very short run only). To give an indication, the revenue potential of carbon pricing has been estimated to measure up to 6% of GDP (depending on the country).
- Use revenues well!

Environmental fiscal reform

Some terminology

Taxes as environmental policy instruments

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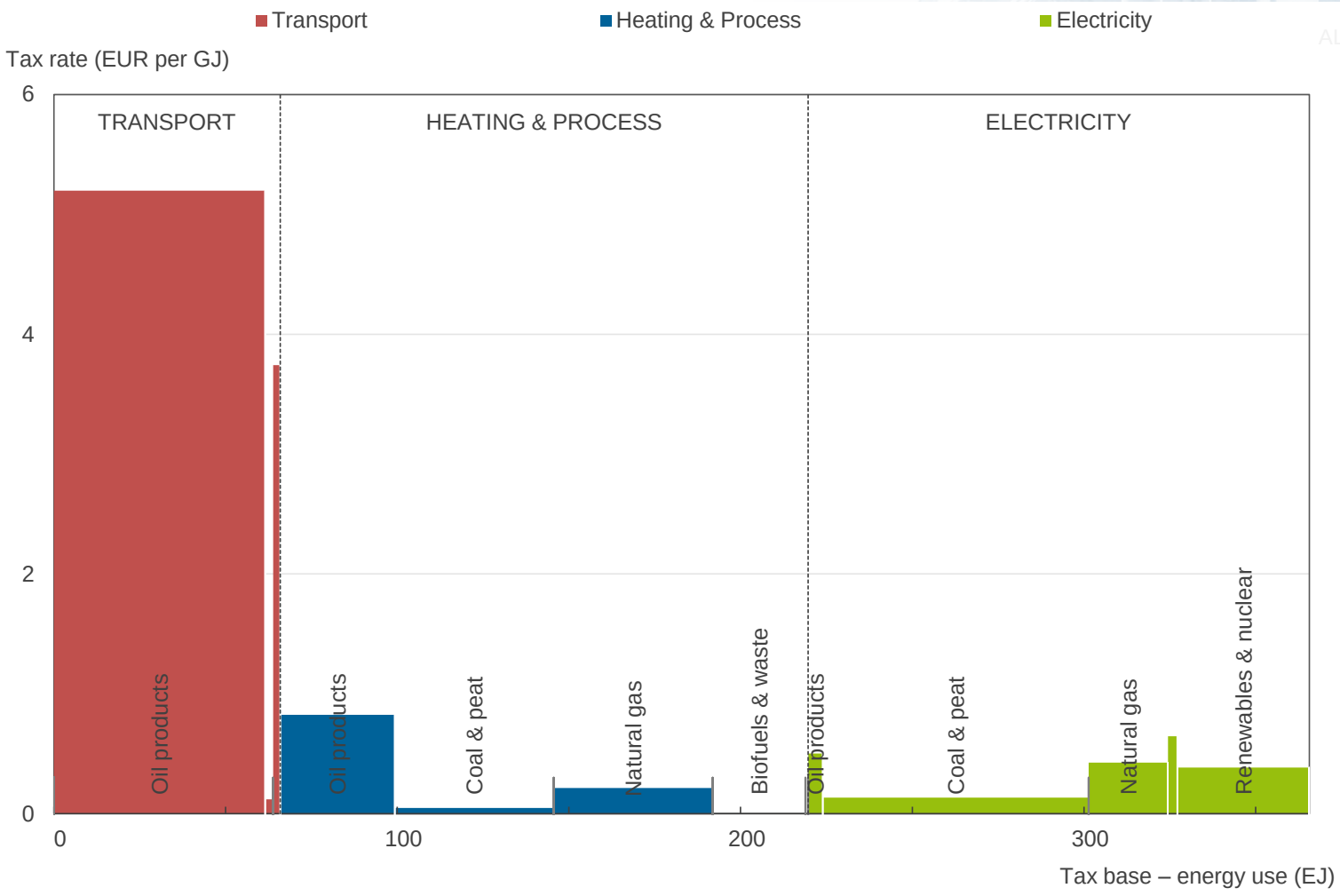
Sectors

Environmental fiscal reform – progress

Principles in practice – energy taxes – 41 OECD and G20 countries

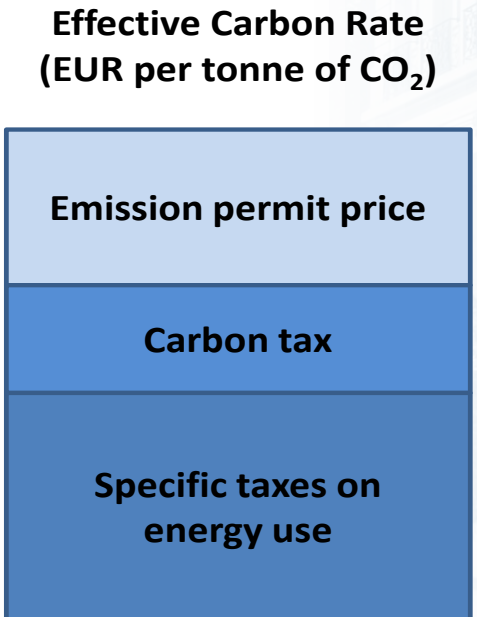


Environmental fiscal reform – progress

Principles in practice – energy taxes

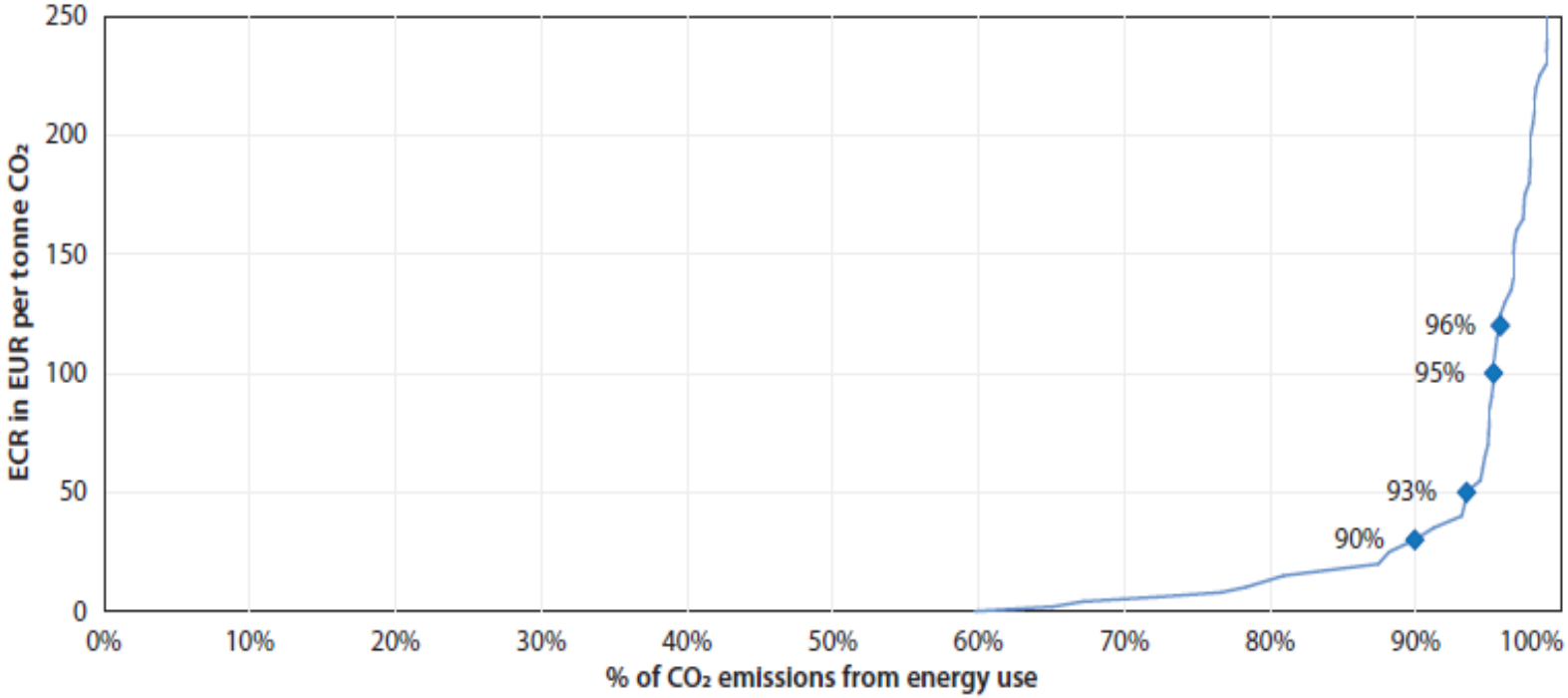
Effective carbon rates (ECRs) are the total price on CO_2 emissions from energy use as a result of market-based policy instruments.

Estimated for six economic sectors in 41 OECD and G20 countries, representing 80% of global carbon emissions from energy use



Environmental fiscal reform – progress

Principles in practice – energy taxes and emissions trading



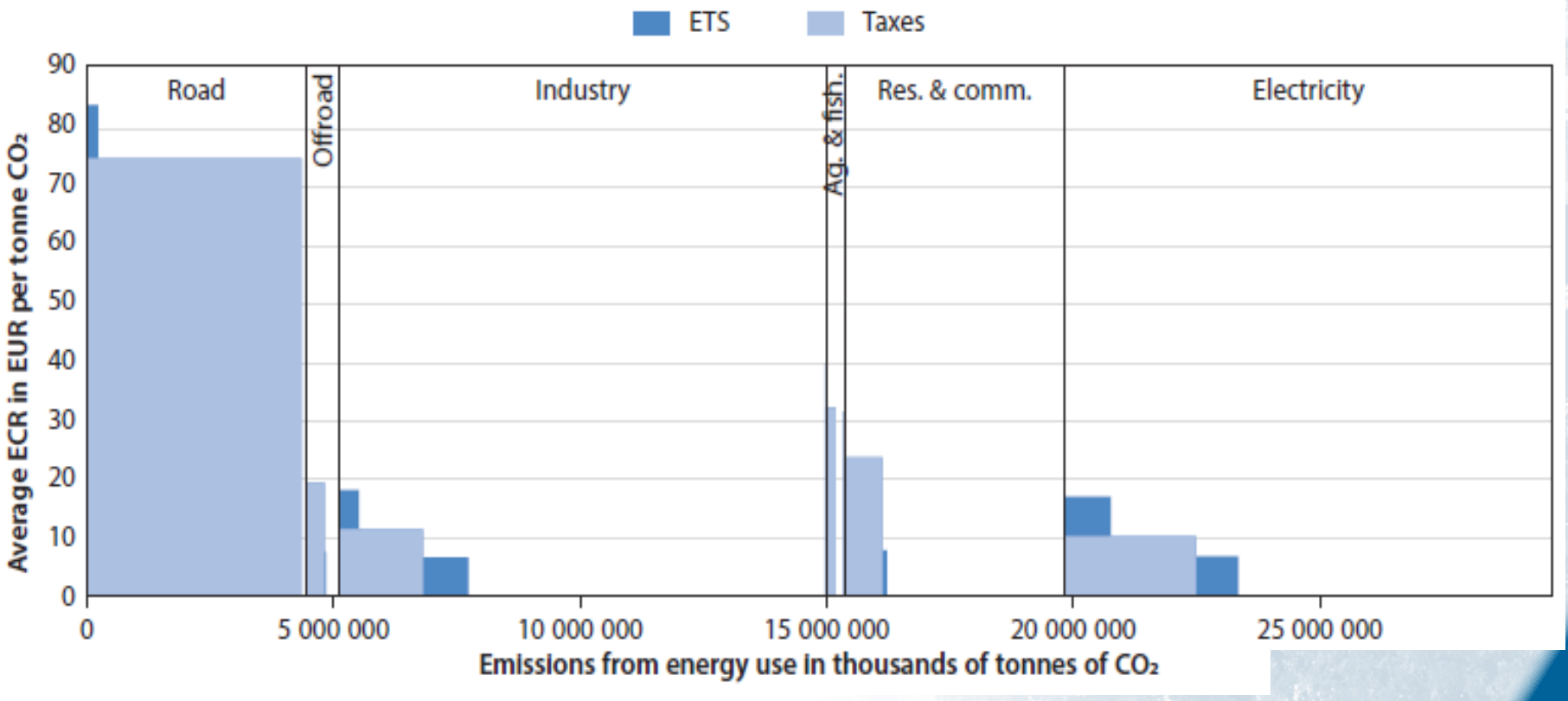
Conservative estimate of social cost of carbon: EUR 30 per tonne; 60% of ECRS in 41 OECD and G20 countries are zero; 10% at ERU 0 or more

OECD, 2016, Effective Carbon Rates: Pricing CO_2 through taxes and emissions trading systems

Environmental fiscal reform – progress

Principles in practice – energy taxes and emissions trading

Average ECRs across 41 countries by sector, showing ETS and Tax component

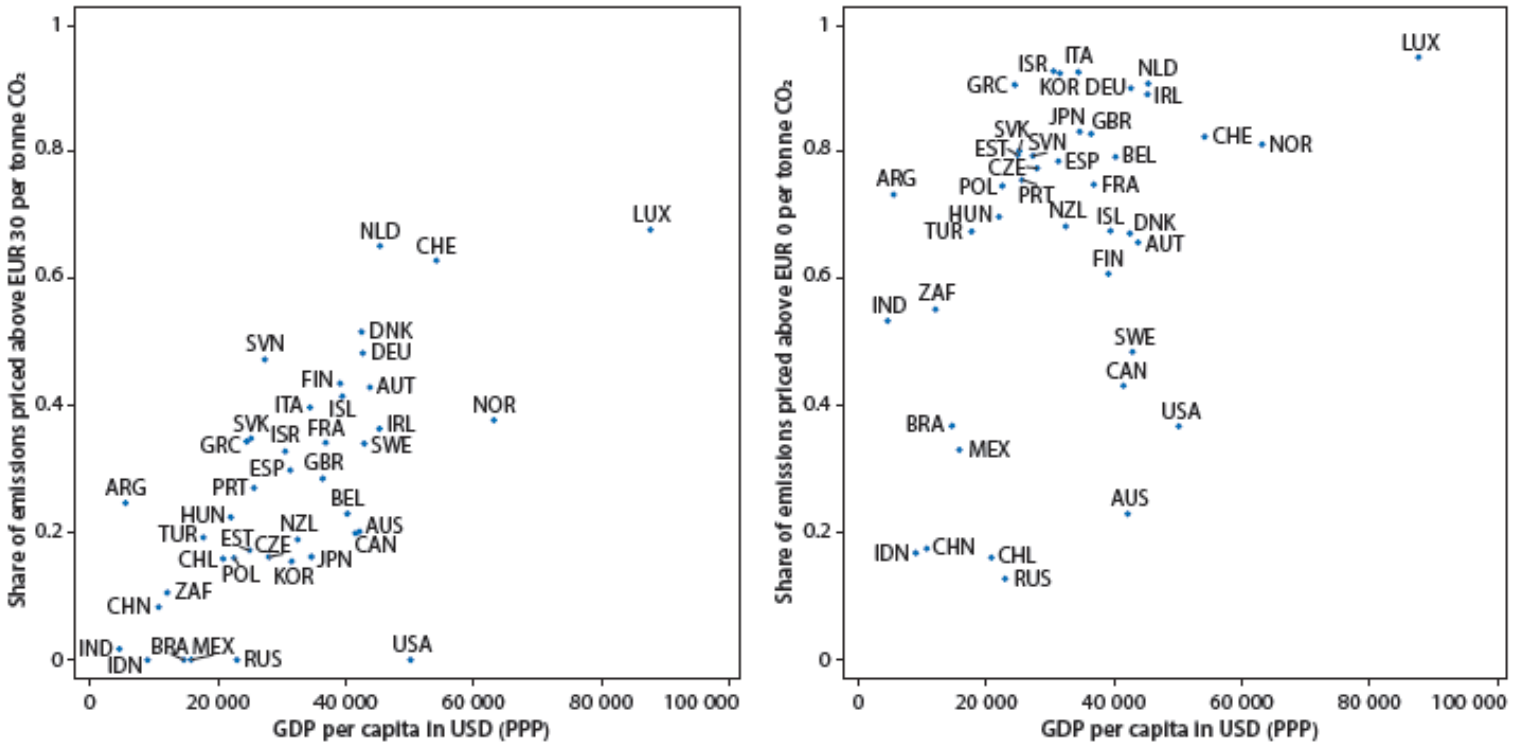


OECD, 2016, Effective Carbon Rates: Pricing CO_2 through taxes and emissions trading systems

Environmental fiscal reform – progress

Principles in practice – energy taxes and emissions trading

Figure 4.18. **Proportion of CO_2 emissions priced above EUR 30 (left) and EUR 0 (right) per tonne of CO_2 relative to GDP per capita**



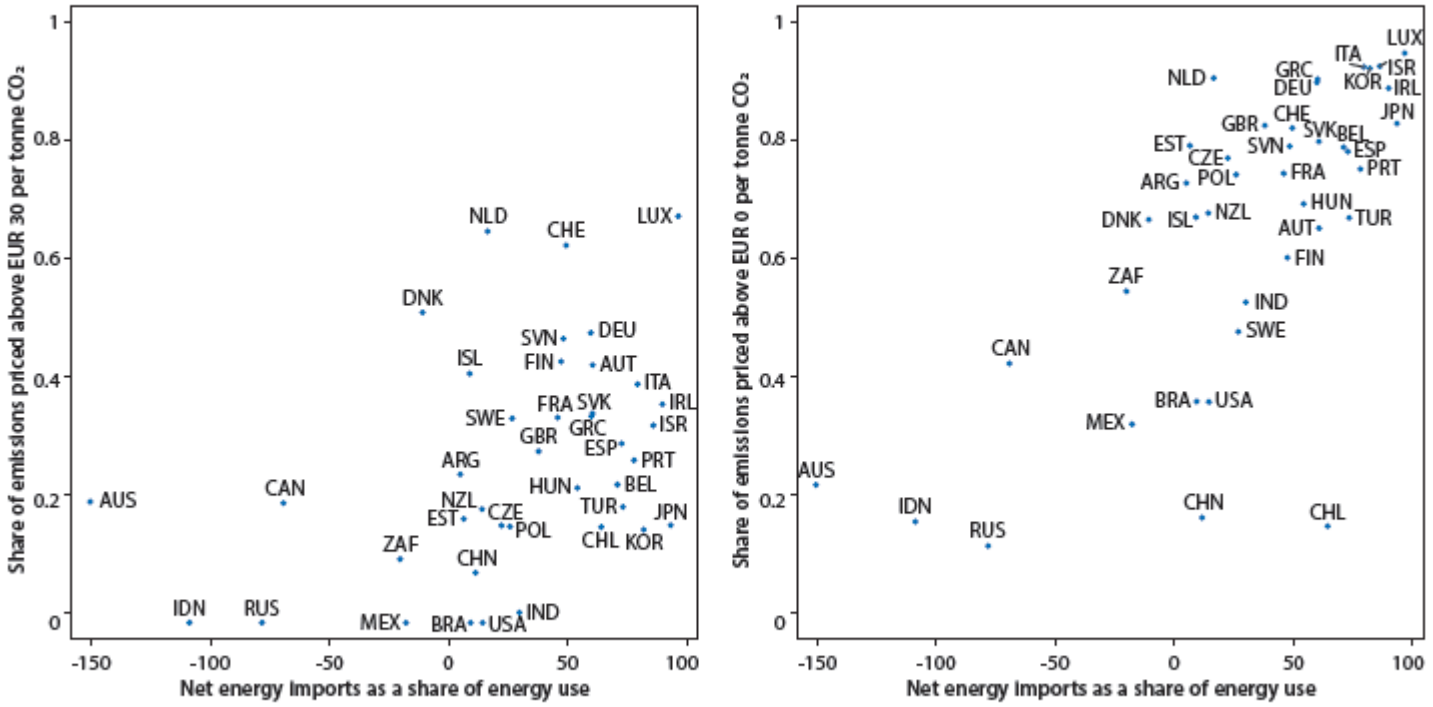
Source: GDP data is from the World Bank (2016), *World Development Indicators* (database), http://data.worldbank.org/data-catalog/world-development-indicators.

OECD, 2016, Effective Carbon Rates: Pricing CO_2 through taxes and emissions trading systems

Environmental fiscal reform – progress

Principles in practice – energy taxes and emissions trading

Figure 4.19. **Proportion of CO_2 emissions priced above EUR 30 (left) and EUR 0 (right) per tonne of CO_2 relative to net energy imports**



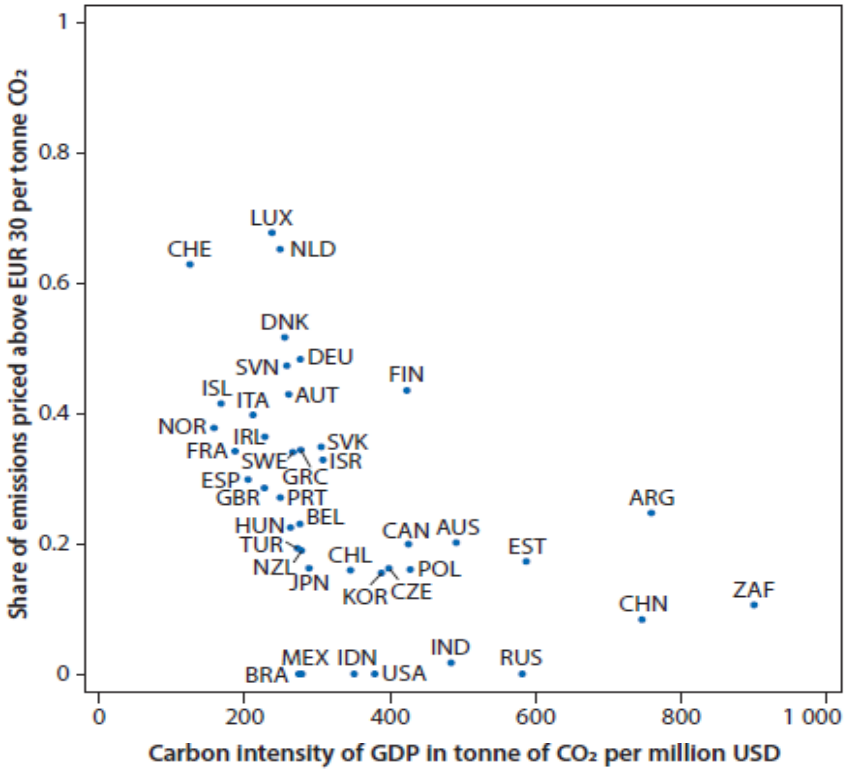
Source: Net energy imports are from the World Bank (2016), *World Development Indicators* (database), http://data.worldbank.org/data-catalog/world-development-indicators.

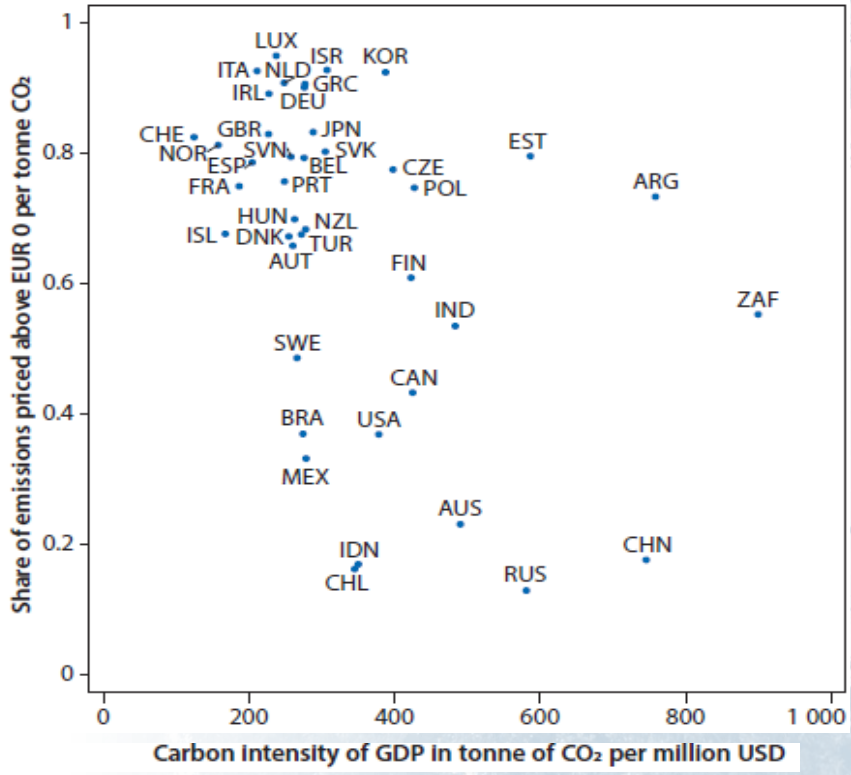
OECD, 2016, Effective Carbon Rates: Pricing CO_2 through taxes and emissions trading systems

Environmental fiscal reform – progress

Principles in practice – energy taxes and emissions trading

Proportion of CO_2 emissions priced above EUR 30 (left) and EUR 0 (right) per tonne of CO_2 relative to the carbon intensity of GDP



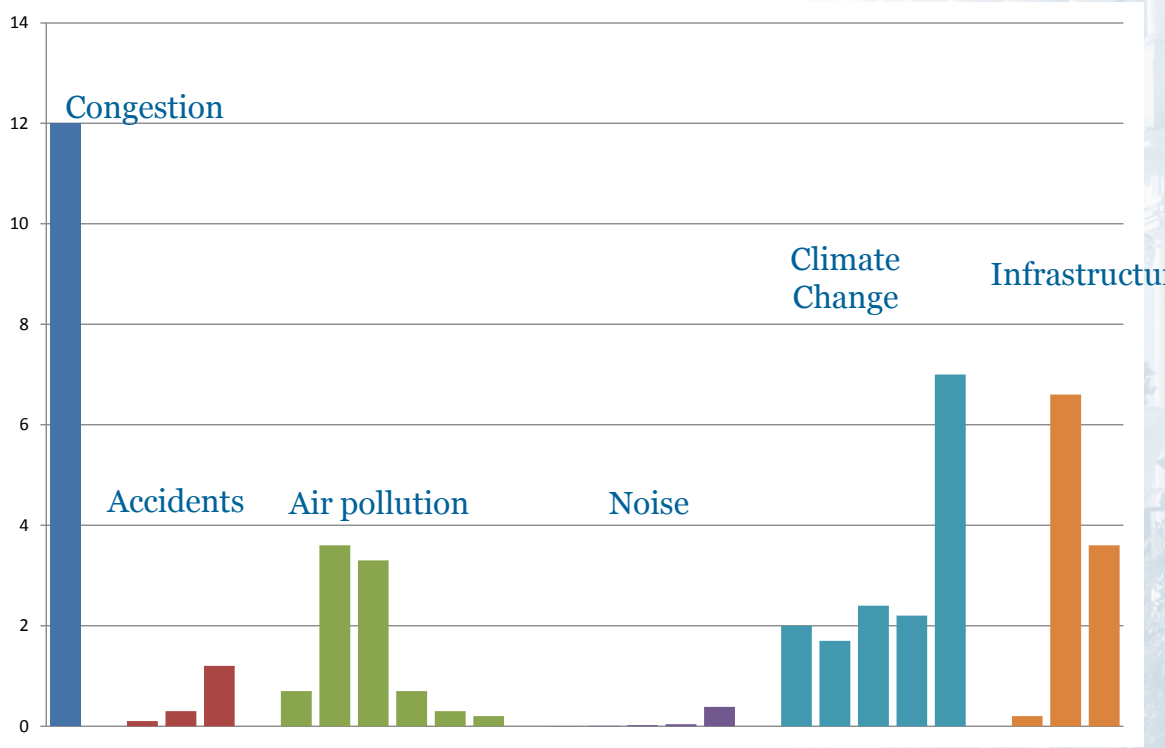


OECD, 2016, Effective Carbon Rates: Pricing CO_2 through taxes and emissions trading systems

Environmental fiscal reform – progress

Principles in practice – transport

Main external costs of road use – average congestion cost (Euro-cent/vehicle-km, 2010)



Environmental fiscal reform – progress

Principles in practice – transport (non-energy)

Changes in transport tax practice - Minimum excise duty on transport fuels

European Union

- Distance-based charges for trucks (mix of AC and MC pricing) gradually covering more areas
- Introduction of distance-based charges usually a strong tax increase, not strong downward pressure on excise
- Risk of tax competition (tax exporting)

USA

- Lower fuel taxes, earmarked, temporary measures to support Highway Trust Fund, variety of state-level responses to funding shortfall
- Diesel tax competition mitigated through IFTA
- Environmental concerns addressed with regulation more than with taxation

Environmental fiscal reform – progress

Principles in practice – transport (non-energy)

Truck charges per 'representative trip', European Countries, 2010 EUR

	Electronic charge	2008 charge / 1998 charge	% of total charge that is distance-based
Switzerland	2001	3.62	78
Austria	2004	1.29	58
Germany	2005	1.49	59
Czech Rep.	2007	2.05	28
France	-	0.97	46
UK	-	0.95	0
Belgium	-	0.85	0

Environmental fiscal reform – progress

Principles in practice – transport (non-energy)

External costs and revenue-raising:

- Beware of averages
- More closely related to driving than to fuel use

→ Large potential benefits from gradual transitioning to driving-based charges

→ Consistent with decarbonisation (fossil fuel tax base erodes, don't discourage cleaner energy by high taxes; tax driving instead)

→ Consistent with revenue-raising objectives (relatively inelastic tax base)

Revenue-interest drives policy change; seize the opportunity for better management of negative side effects.

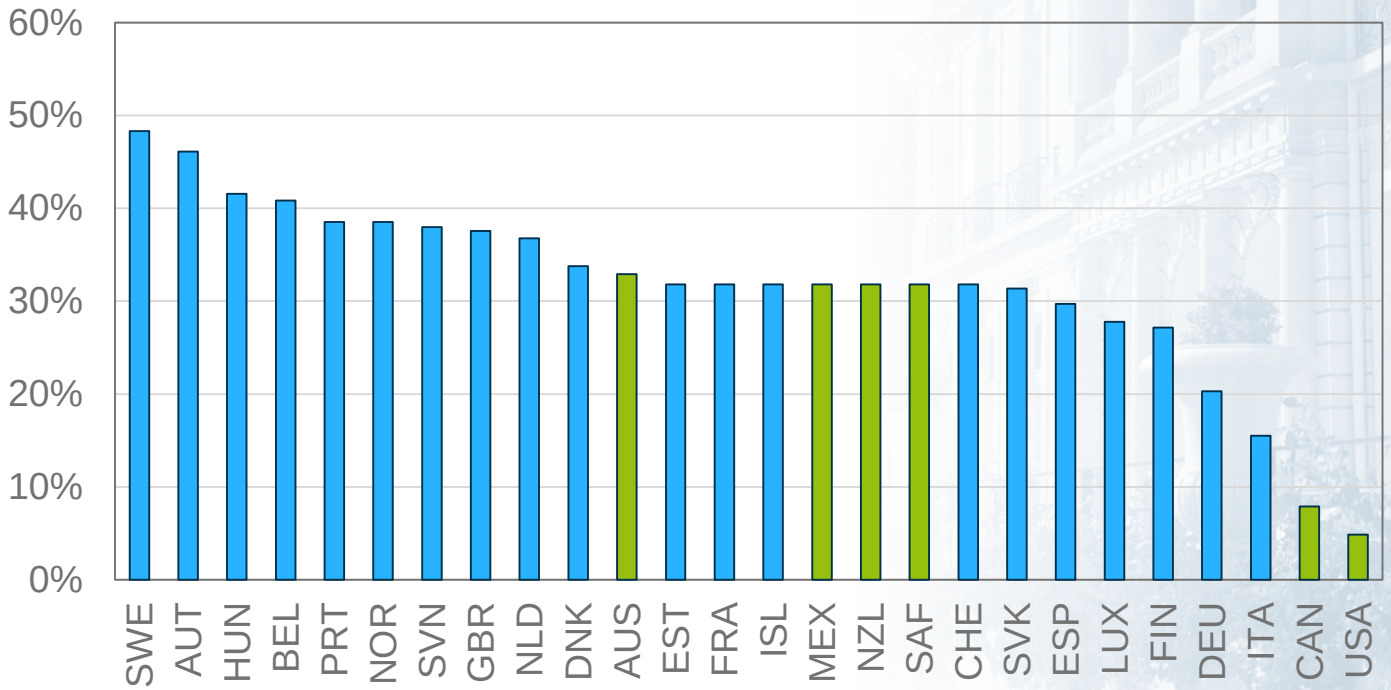
Speed of transition from fuel to distance-base charges: administrative and institutional capacity matters; relative weight of policy objectives does too.

Pricing is not the full answer, certainly not where long run choices are involved.

Environmental fiscal reform – progress

Principles in practice – transport

Company Cars as % of Car Registrations (2009-2011)

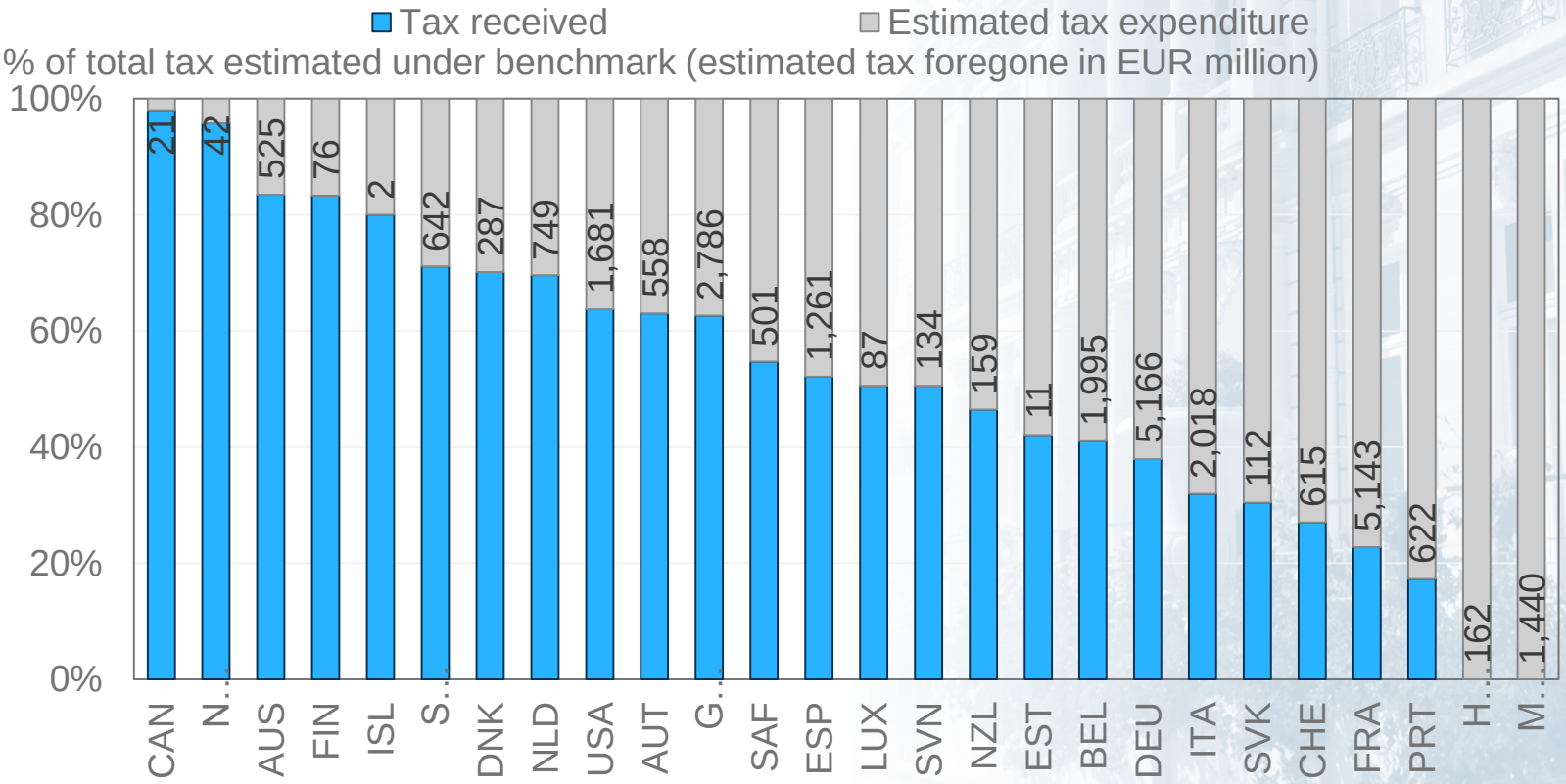


Source: *Personal Tax Treatment of Company Cars & Commuting Expenses (*Harding,

Environmental fiscal reform – progress

Principles in practice – transport

Total Tax Expenditure (2012)



Source: *Personal Tax Treatment of Company Cars & Commuting Expenses (*Harding, 2013)

Environmental fiscal reform – summing up

Choose the right instrument and design it well – e.g. carbon pricing

Requirements:

- Broad coverage
- Strong and stable price (rising minimum rate)
- Use revenues productively

Practice:

- Limited coverage
- Low and sometimes volatile rates
- Heterogeneous rates, free allocation: expensive and ineffective compensation
- Sometimes high administration costs and information-intensive

Environmental fiscal reform – summing up

Summing up

- Considerable potential ('cornerstone') but underused
- Equity and competitiveness considerations not to be overstated and flanking policies should retain environmental effectiveness
- Revenue potential is considerable, and poor revenue choices a real threat (this includes 'implicit revenue use')

The State and Potential of Environmental Fiscal Reform – a View from the OECD

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OECD
BETTER POLICIES FOR BETTER LIVES

Waste

Goal	Instrument
Change waste disposal practices	Landfill taxes
	Incineration taxes
Stimulate greater use of recycling	Taxes on waste disposal
	Recycling subsidy
Change household behaviour	Household waste charges
	Deposit-refund schemes
Link production/marketing decisions to end-of-life disposal costs	Advance disposal fees
	Extended producer responsibility
Discourage the use of virgin material	Virgin material taxes

Environmental fiscal reform – progress

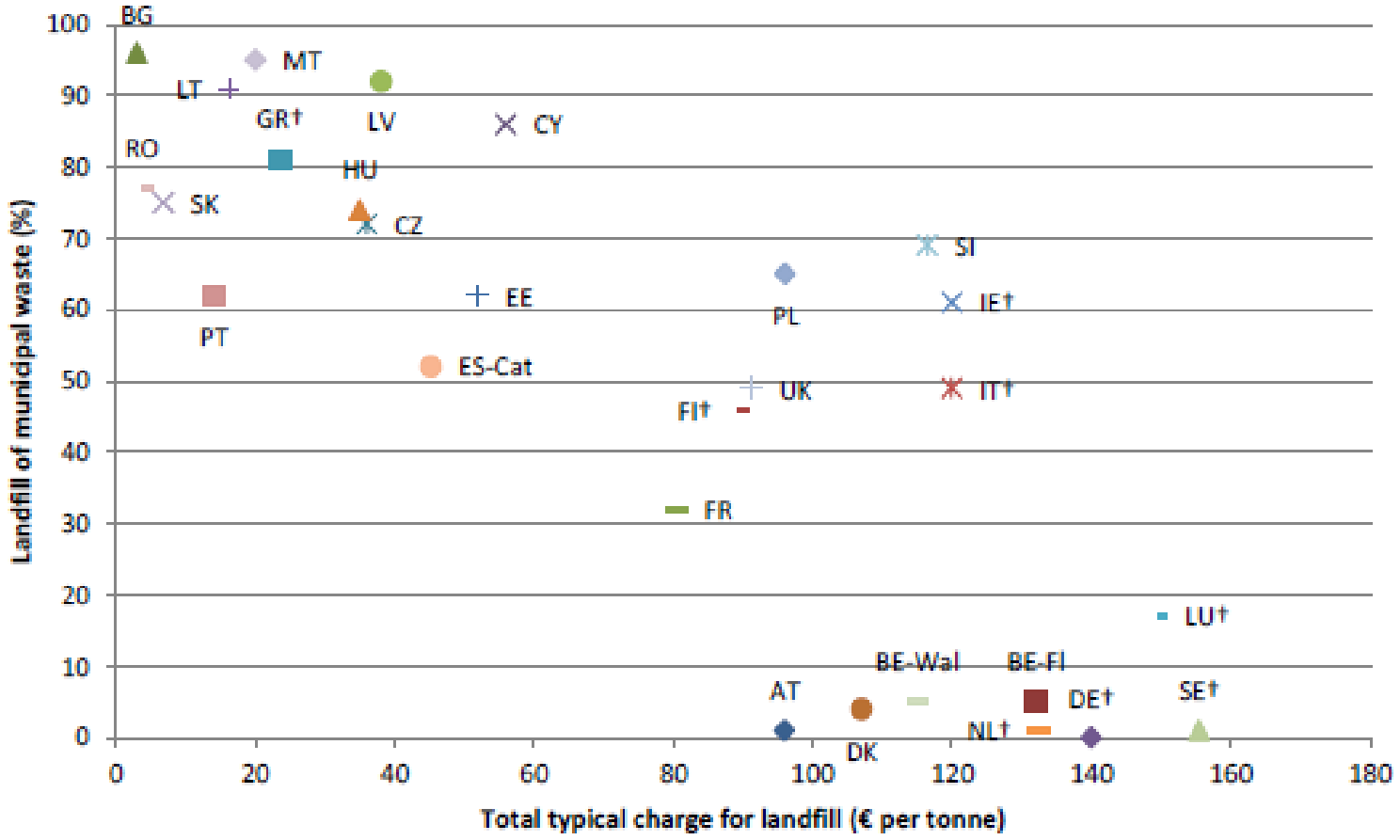
Principles in practice – waste

- Increased use of charging to cover system costs and not always with a strong incentive structure
- Cross-sectional analysis of EU countries:
  - Landfilling charges reduce landfill, partly by pushing waste treatment up the waste hierarchy (landfilling, incineration, recycling and composting)
  - Some evidence that higher incineration charges increase recycling and landfilling, but not that they reduce the share of MSW incinerated
  - PAYT systems can work but require fairly high charges and strong supporting policies – absent those, small effects and risk of illegal dumping.
  - Extended producer responsibility schemes require strong public and private institutions. The correlation between fees and packaging recovery and recycling is weak. The main concern appears to be to ensure cost-effective operation of the systems.

Environmental fiscal reform – progress

Principles in practice – waste

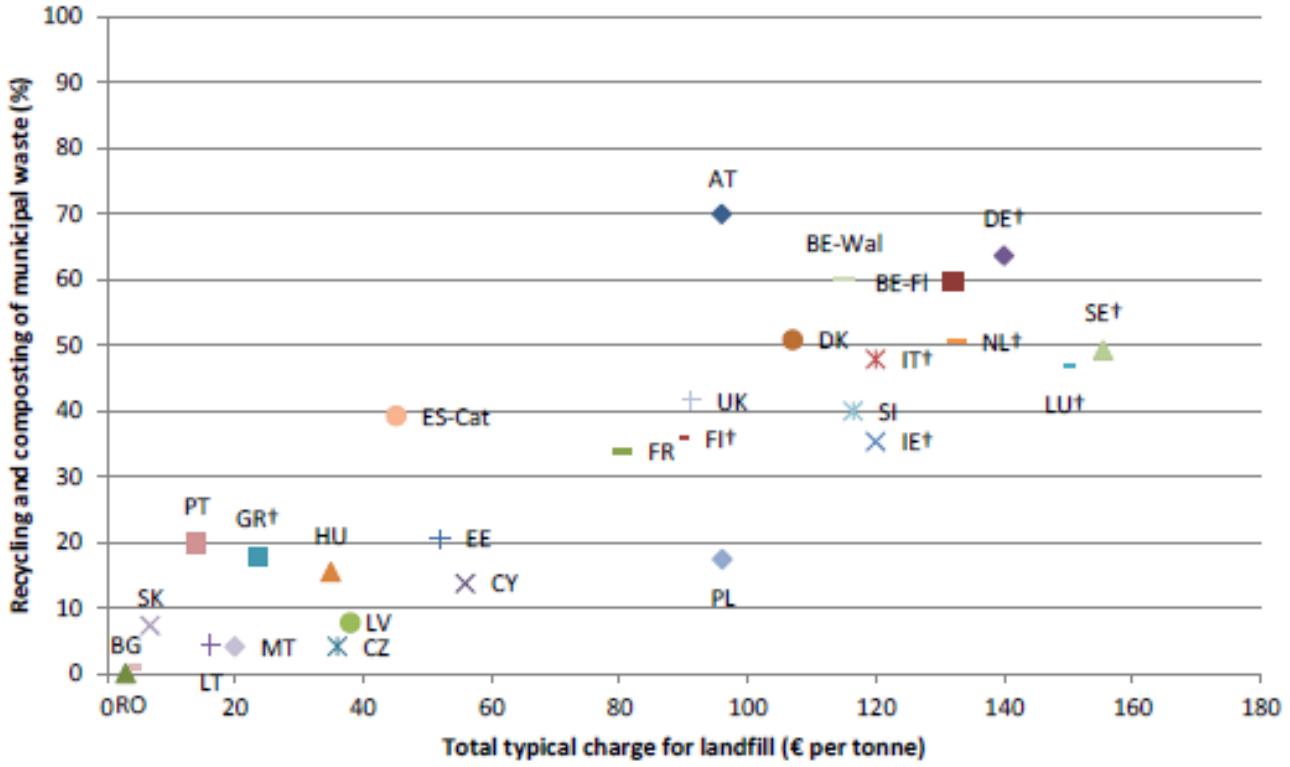
Figure 20 Total typical landfill charge and percentage of MSW landfilled, 2009



Environmental fiscal reform – progress

Principles in practice – waste

Figure 21 Total typical landfill charge and percentage of MSW recycled and composted, 2009



Environmental fiscal reform – progress

Principles in practice – agro-chemicals

- A few countries have implemented taxes on agro-chemicals, but most are not well targeted to impacts on humans and the environment

Taxes on agro-chemicals: Design practice

	Introduced	Rates	Point of imposition	Revenues (2015 or 2016)	Revenue use and earmarking
Sweden	1984	Flat, at SEK 34/kg	Producer/importer	EUR 7-8 million	General budget
Norway	1988	25 NOK/ha*(human health & env risk indicator)	Producer/importer	EUR 6 million	General budget
Denmark	1996 ad valorem, specific since 2013	DKK 50/kg*pesticide content/litre + DKK107*toxicity	Producer/importer	EUR 88.4 million	Different ministries, compensation measures for farmers
France	2000, revised in 2009	3 categories of toxicity, EUR 0.9/kg, EUR 2/kg, EUR 5.1/kg	Retailer	EUR 60 million (2012)	Earmarked to water and sewage treatment
Mexico	2014	6-9% of sales price, 5 categories	Producer/importer	Approx USD 30 million	General budget