



Driving low carbon investment and innovation

Florens Flues

Economist

Centre for Tax Policy and Administration, OECD

Policy Solutions for a Climate Friendly Materials Sector, UNFCCC
Side Event, Bonn, May 2017

Opinions expressed and arguments employed are those of the
presenter



Backdrop

- » Paris Agreement: two degrees or less – zero net emissions in the second half of the century
 - » Requires **deep cuts** now, especially where **long-lived assets** are concerned (or face much higher costs later)
- What are the incentives to invest in long-lived assets from carbon taxes and from emissions trading systems?

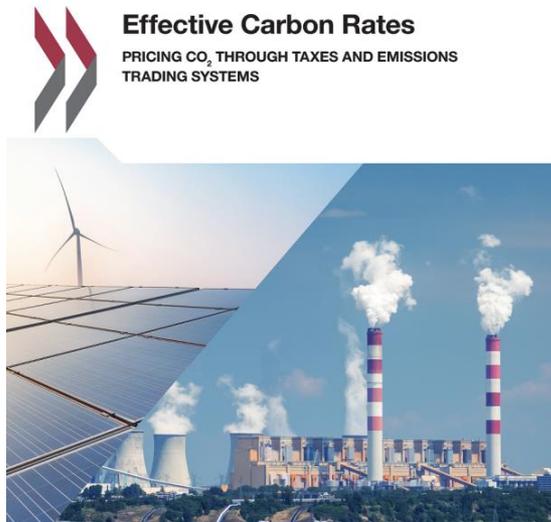
effective marginal carbon rates

effective average carbon rates (*work in progress*)



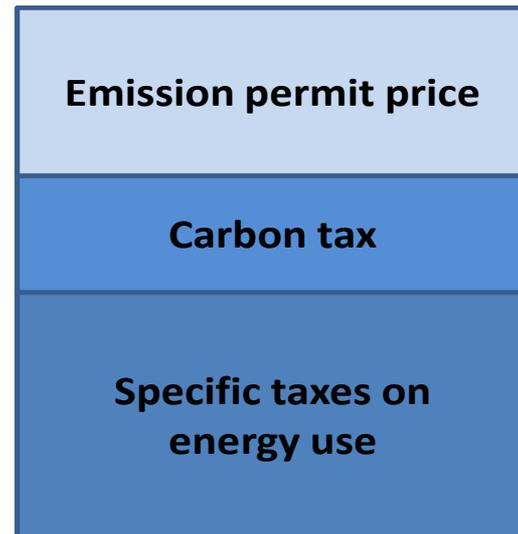
Effective (Marginal) Carbon Rates

- » Effective carbon rates (ECRs) are the total price on CO₂ emissions from energy use as a result of market-based policy instruments.



Effective Carbon Rates
PRICING CO₂ THROUGH TAXES AND EMISSIONS
TRADING SYSTEMS

Effective Carbon Rate (EUR per tonne of CO₂)





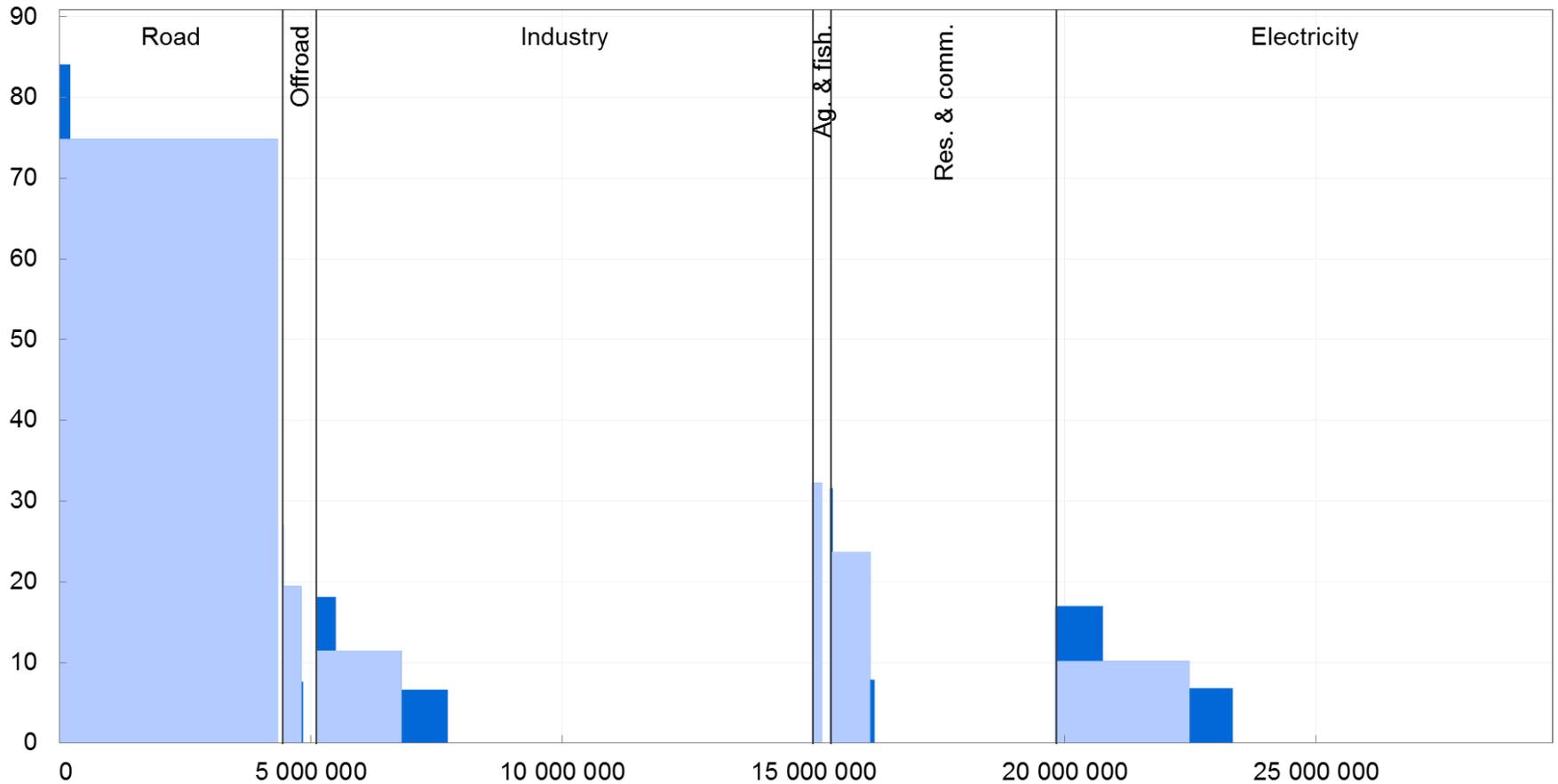
Effective (Marginal) Carbon Rates

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

Average ECR in EUR per tonne CO₂

■ ETS

■ Taxes



Emissions from energy use in thousands of tonnes of CO₂

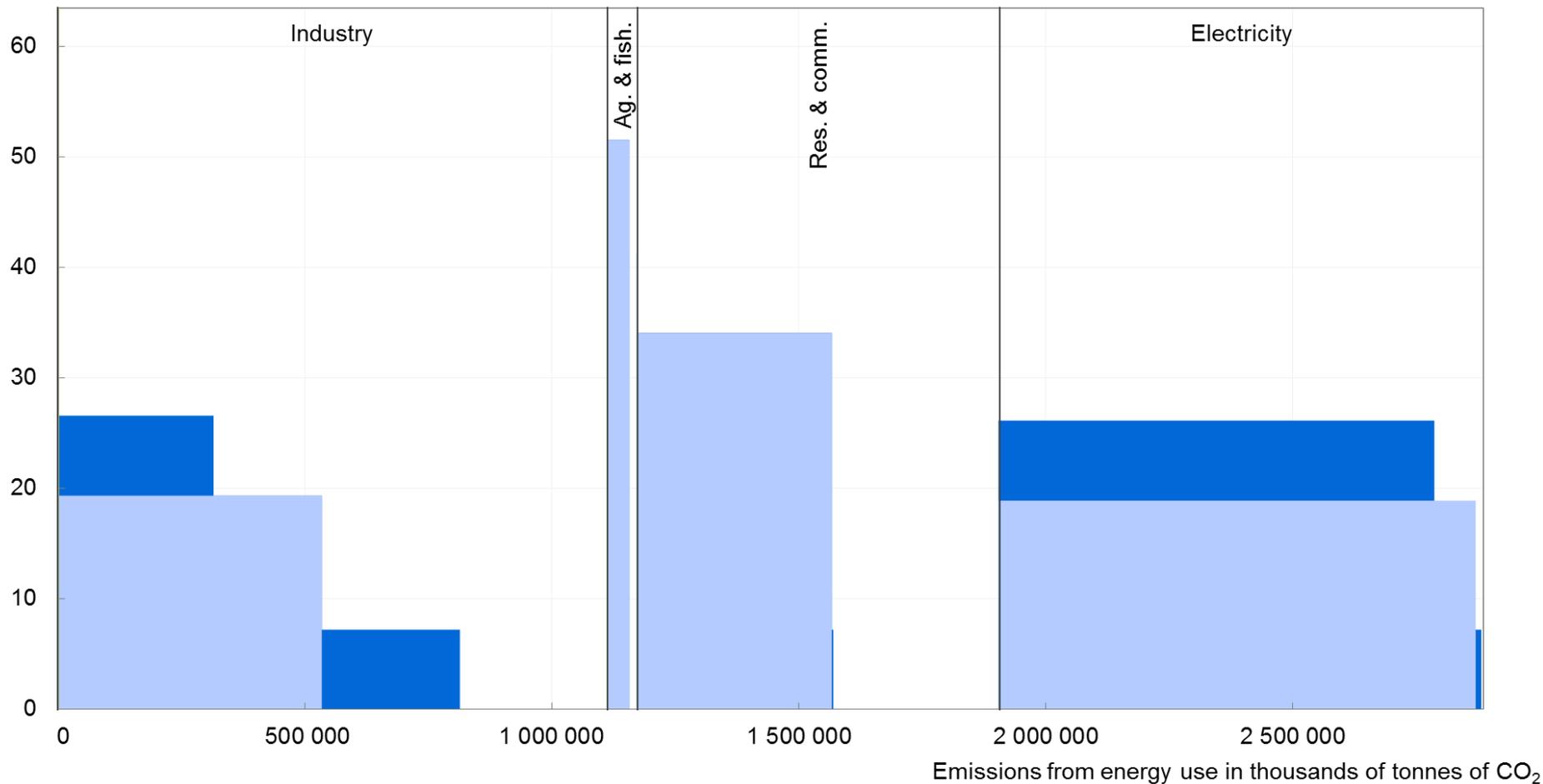


Effective (Marginal) Carbon Rates, EU 21, non-transport

Average ECR in EUR per tonne CO₂

■ ETS

■ Taxes



Average ECRs, EU 21, showing ETS and Tax component

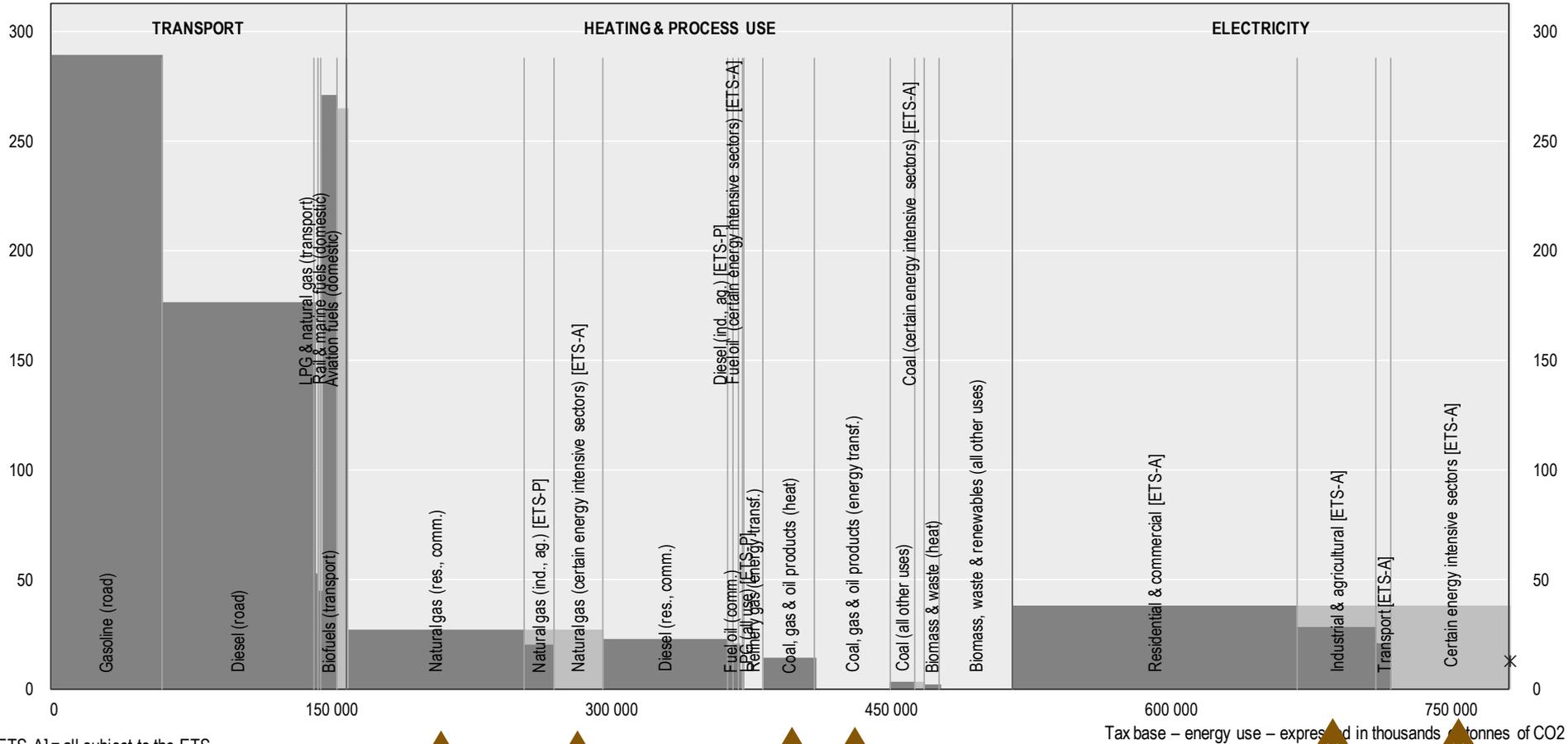


Tax component of Effective Carbon Rates, Germany

Tax
 Fuel tax credit or tax expenditure
 x Average 2010-11 ETS price
DEU

Tax rate expressed in EUR per tonne of CO2

Tax rate expressed in EUR per tonne of CO2



[ETS-A] = all subject to the ETS
 [ETS-P] = partially subject to the ETS



Tax base – energy use – expressed in thousands of tonnes of CO2



Average effective carbon rates

Work in progress – for discussion at the event only

- » Why do we care? Choice between mutually exclusive investment projects in a context where there is economic rent (Devereux and Griffith, 1998).
- » In ETS, **allocation rules** affect average rates and **can affect project ranking** *unless allocation is technology neutral*. In other words, compensation via free allocation can distort investments in long-lived assets.
- » → Look at rules (in particular benchmarks) to assess technology-neutrality



Benchmarks differ for close substitutes

Work in progress – for discussion at the event only

» California CTP

	Allowances / metric tone	Δ free allocation of permits
fried potato chips	0.919	~ 60% higher
baked potato chips	0.570	

» EU ETS

	Allowances / metric tone	Δ free allocation of permits
blast furnace steel	1.328	~ 360% higher
electric arch steel	0.283	
white clinker (for cement)	0.987	∞ - higher
grey clinker (for cement)	0.766	∞ - higher
clinker substitutes (for cement)	0	



Average and marginal effective carbon rates in California and the EU in 2013 (ex post)

Work in progress – for discussion at the event only

ETS	Sector	Emissions	Freely allocated permits	Share of freely allocated permits	Marginal permit price	Average permit price
California Cap & Trade	Electricity	80'946'223	*	*	\$12.83	\$12.83*
	Industry	56'042'078	53'894'995	0.96	\$12.83	\$0.49
EU ETS	Electricity	746'767'565	197'450'780	0.26	€4.38	€3.22
	Industry	792'553'182	803'672'140	1.01	€4.38	-€0.06

Work in progress - OECD estimates based on Effective Carbon Rates

* Californian electricity suppliers receive permits free of charge, which they have to auction to the benefit of their customers



Driving low carbon investment and innovation

Florens.Flues@oecd.org