

Mercator Research Institute on  
Global Commons and Climate Change gGmbH

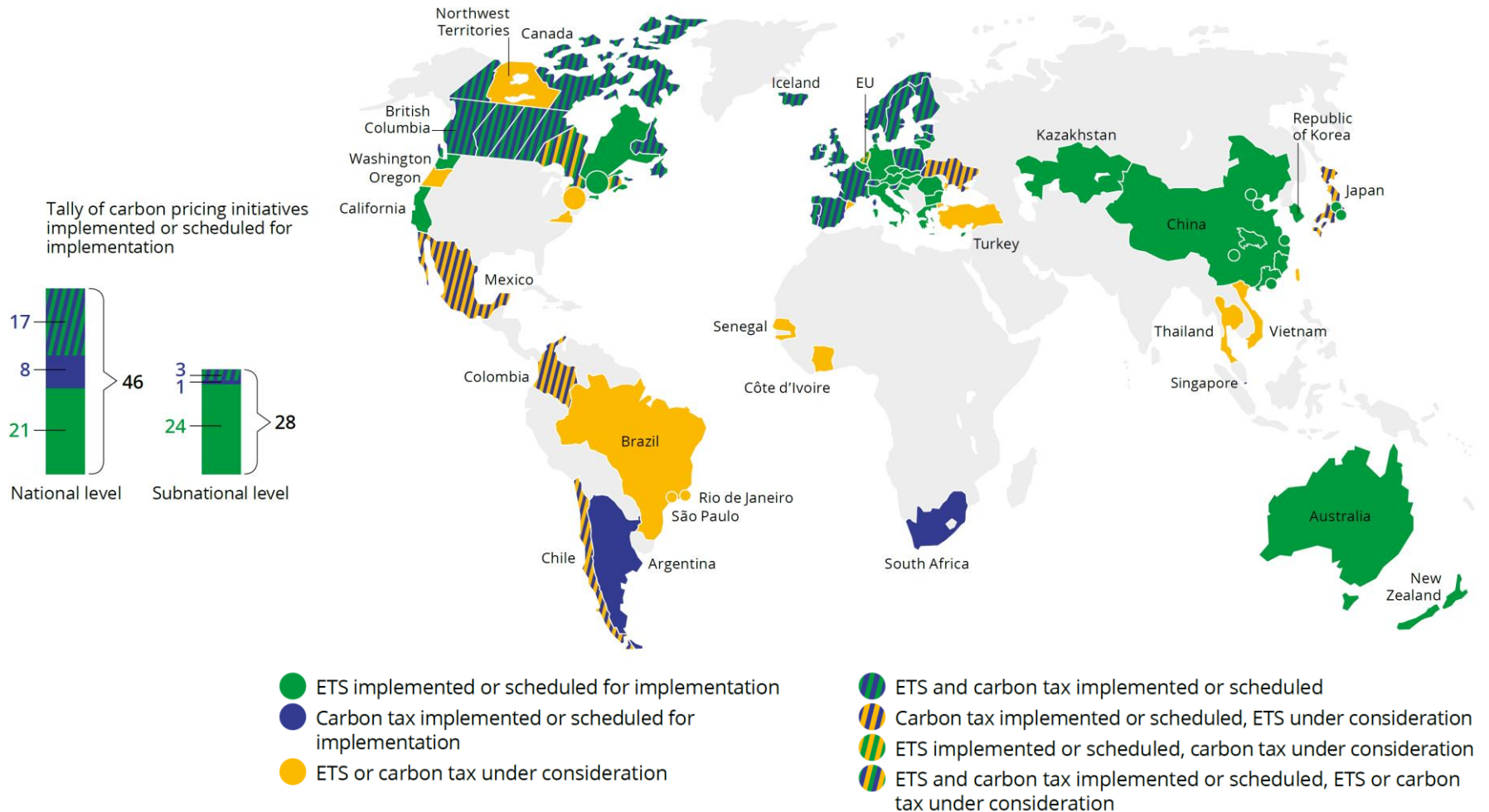
# Distributional implications of carbon pricing

The role of policy instruments and recycling schemes

Michael Jakob and Jan Christoph Steckel

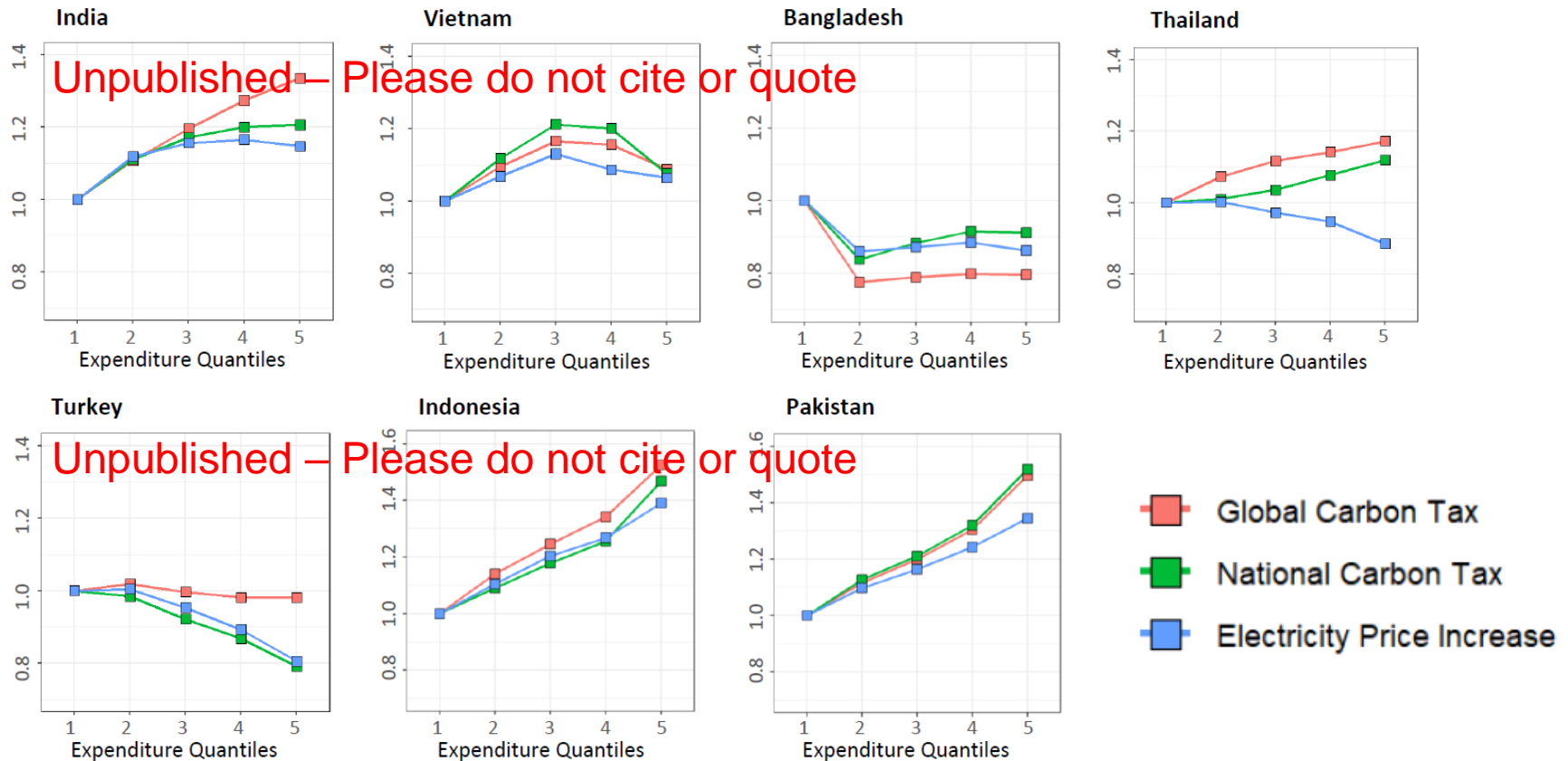
30 October 2019

# Approaches to carbon pricing across countries



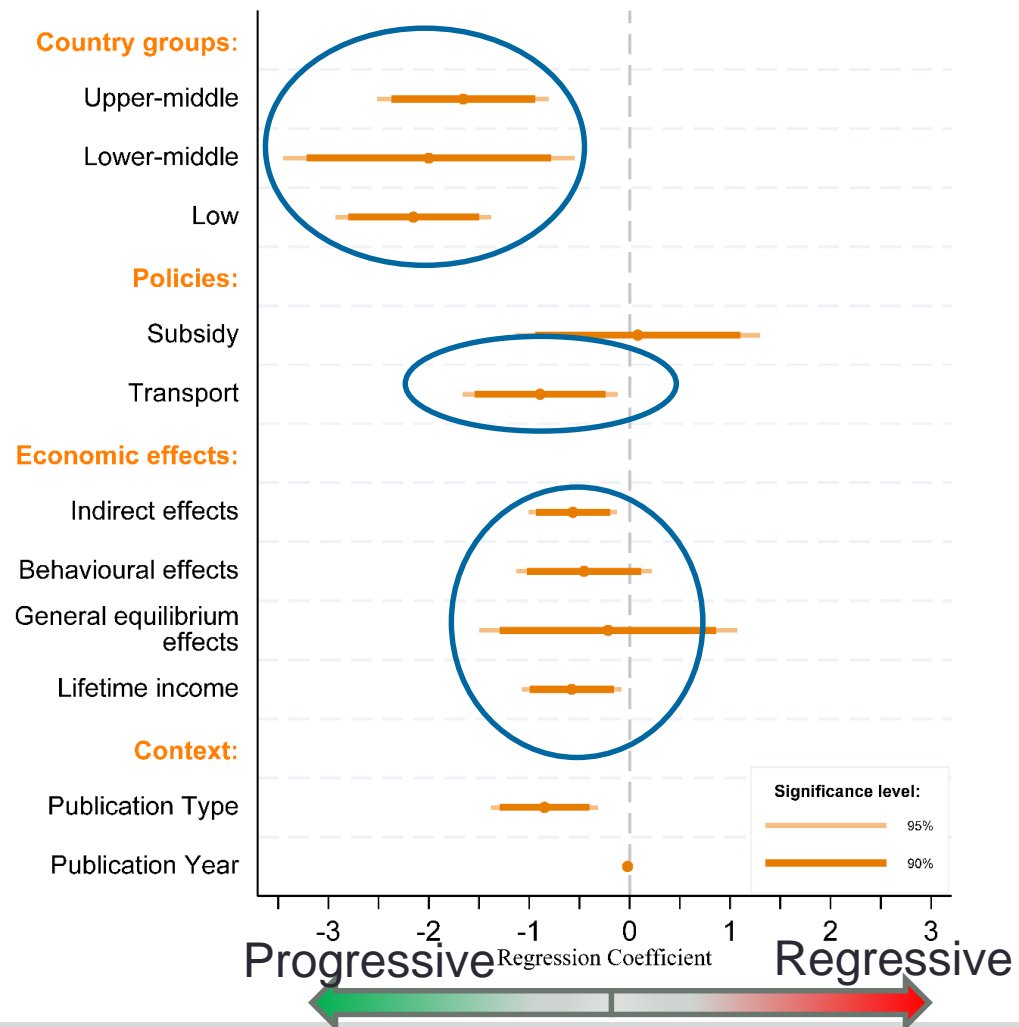
# Distributional effects are country – and instrument specific

Tax Incidence Relative to Poorest Quantile

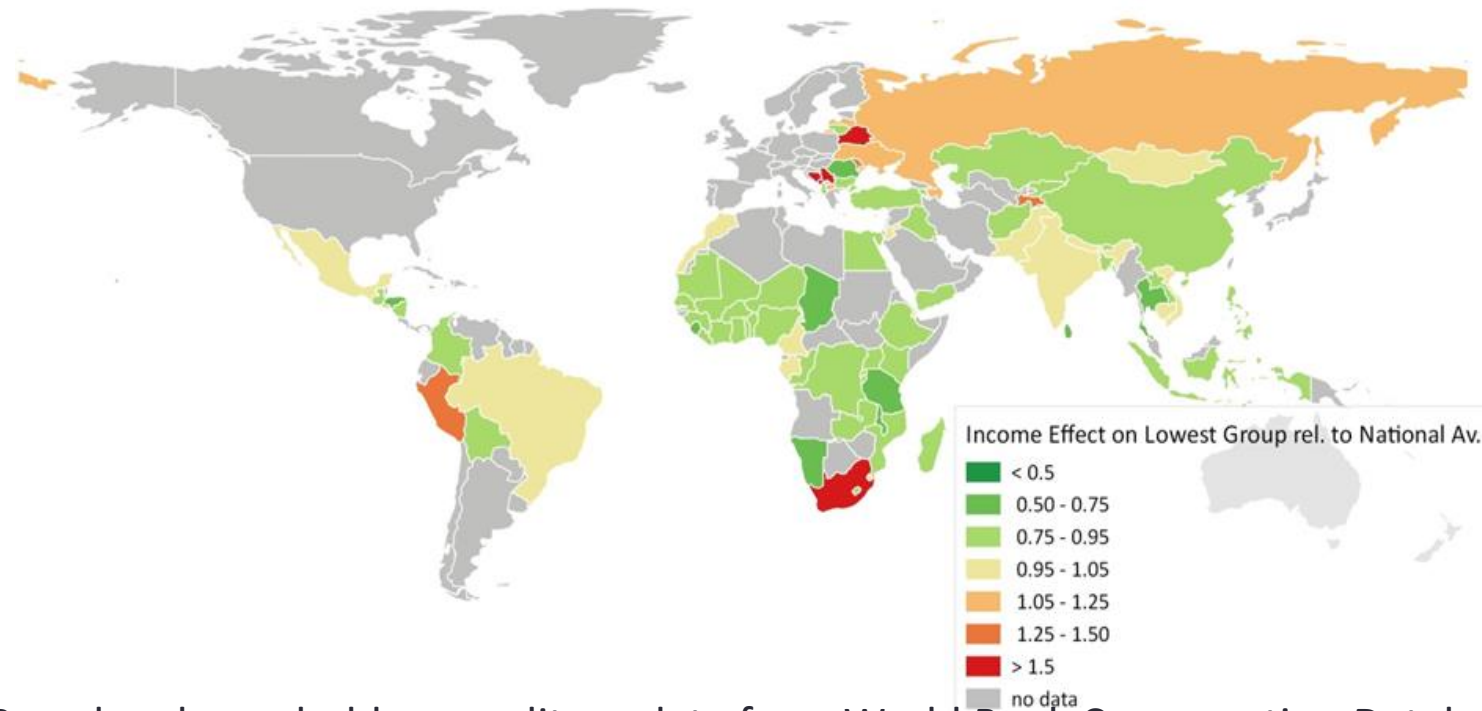


# Impacts on households: A meta-analysis

- Distributional impacts:  
53 studies in 39 countries with  
183 effects
- More progressive study outcomes for:
  - Lower income countries
  - Transport sector policies
  - Including additional economic effects
- Subsidy reforms are per se not different from carbon pricing.



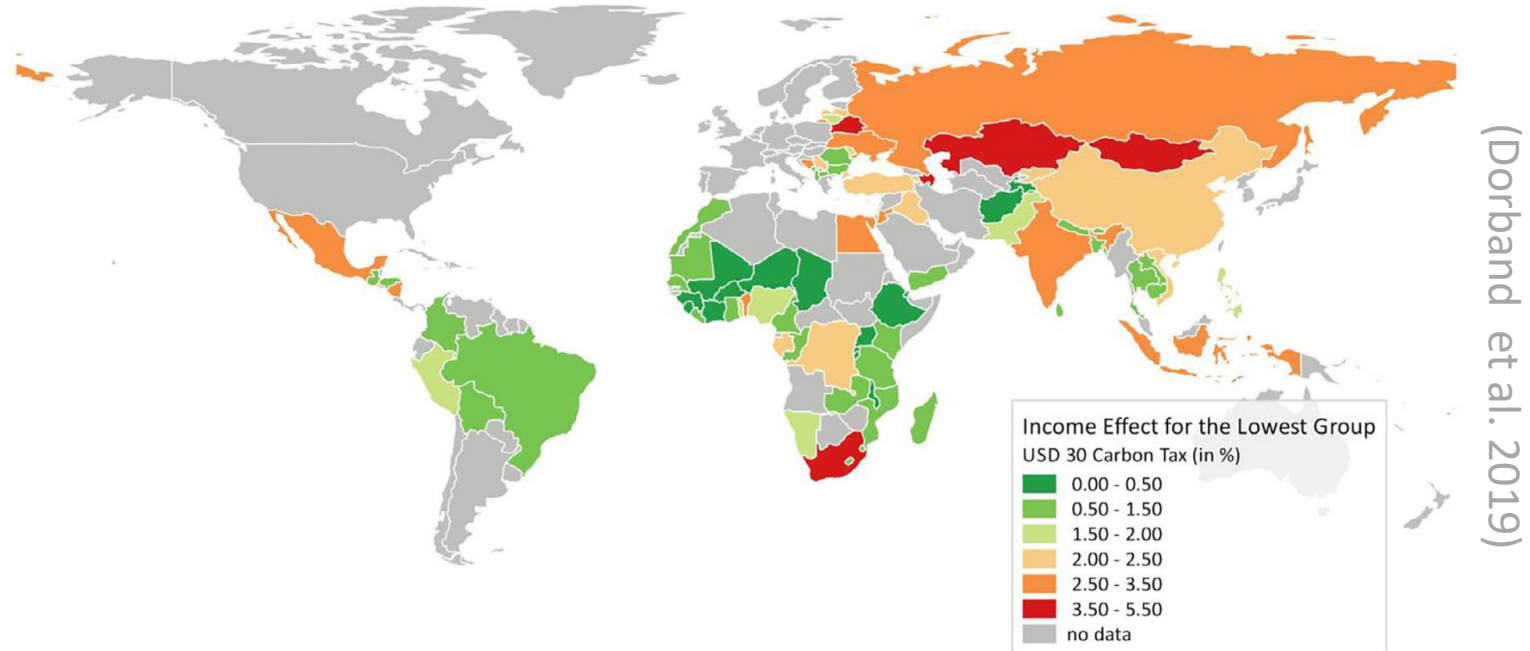
# Distributional effects on households



(Dorband et al. 2019)

- Based on household expenditure data from World Bank Consumption Database
  - 87 countries, 106 household consumption categories
  - Four income groups, lowest < USD 2.97 daily per capita consumption
- Combined with carbon intensity data from an environmentally-extended multiregional input-output (MRIO) model → household specific carbon footprints
- Calculate immediate, short term distributional incidence of a carbon tax

# Absolute effects on households



Even progressive distributional implications can mean a substantial burden to incomes of poor households.

# Effects of Carbon Pricing in Mexico

	good	CI (kg/MXN)		Price Change (t = 25 USD)	
		CO <sub>2</sub>	CO <sub>2</sub> e	CO <sub>2</sub>	CO <sub>2</sub> e
1	Electricity	0.290	0.297	9.0%	9.2%
2	Motor Fuel	0.217	0.222	6.7%	6.9%
3	Gas	0.140	0.140	4.3%	4.3%
4	Public Transport	0.029	0.031	0.9%	1.0%
5	Food	0.020	0.070	0.6%	2.2%
6	Other	0.013	0.022	0.4%	0.7%

Renner et al. (2018)

- A carbon price would raise prices of electricity, transport fuels, gas, food, public transport etc.
- Estimate a full demand system that takes into account substitution effect (US\$ 25 / tCO<sub>2</sub>):
  - Overall, substantial emission reductions and slightly progressive distribution
  - Inclusion of non-CO<sub>2</sub> GHGs could be problematic (raises food prices)
  - Can be made progressive via revenue recycling (e.g. Prospera)

# Revenue recycling can increase political feasibility

**Table 1 | Recycling mechanisms ranked according to efficiency, equity and acceptability**

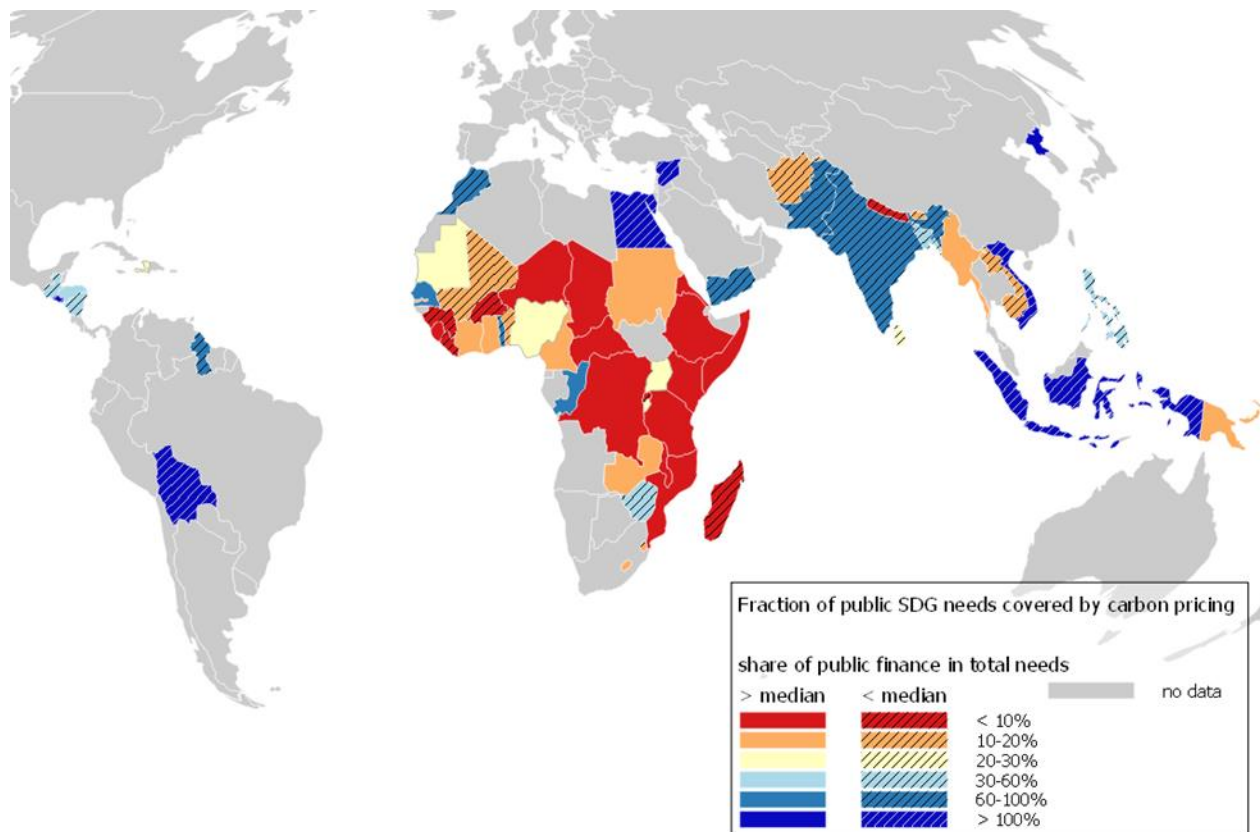
Recycling mechanism	Efficiency	Equity	Acceptability
Labour tax (initial system non-optimal)	+	+	0
Labour tax (initial system optimal)	0	0	0
Capital/corporate tax (initial system non-optimal)	+	-	0
Capital/corporate tax (initial system optimal)	0	-	0
Directed transfers	0	+	+
Uniform transfers (initial system non-optimal)	0	+	+
Uniform transfers (initials system optimal)	+	+	+

Equity and efficiency are determinants of acceptability, but the evaluation of acceptability focuses on the other factors that determine it. We use the definition of optimal as given in the section on public economics. Plus (+) and minus (-) signs indicate positive and negative evaluations, respectively, whereas 0 indicates a neutral evaluation.

(Klenert et al. 2018)



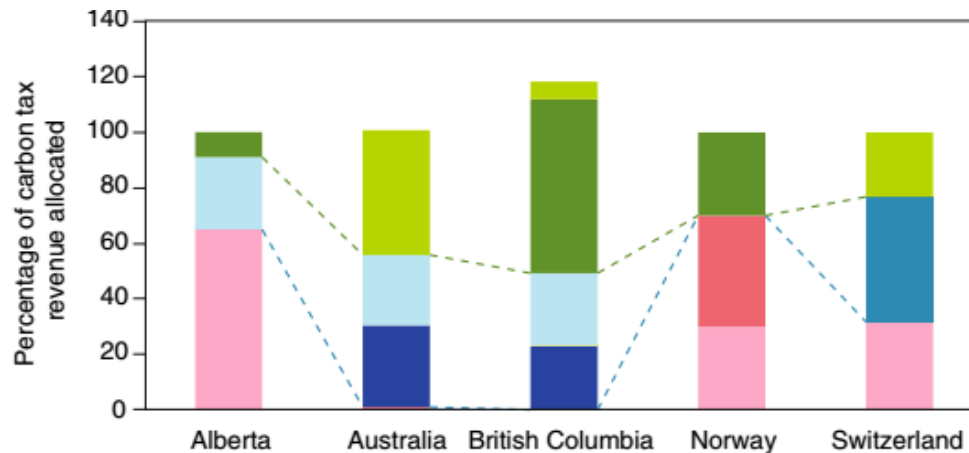
# How to use carbon pricing revenues?



(Franks et al. 2018)

Revenues for carbon prices that would be consistent with the 2°C target can cover a substantial part of public investment needs for the SDGs.

# Revenue recycling can increase political feasibility



## Recycling to firms

- Transfers to firms that are particularly affected
- Tax cuts for firms

## Recycling to households

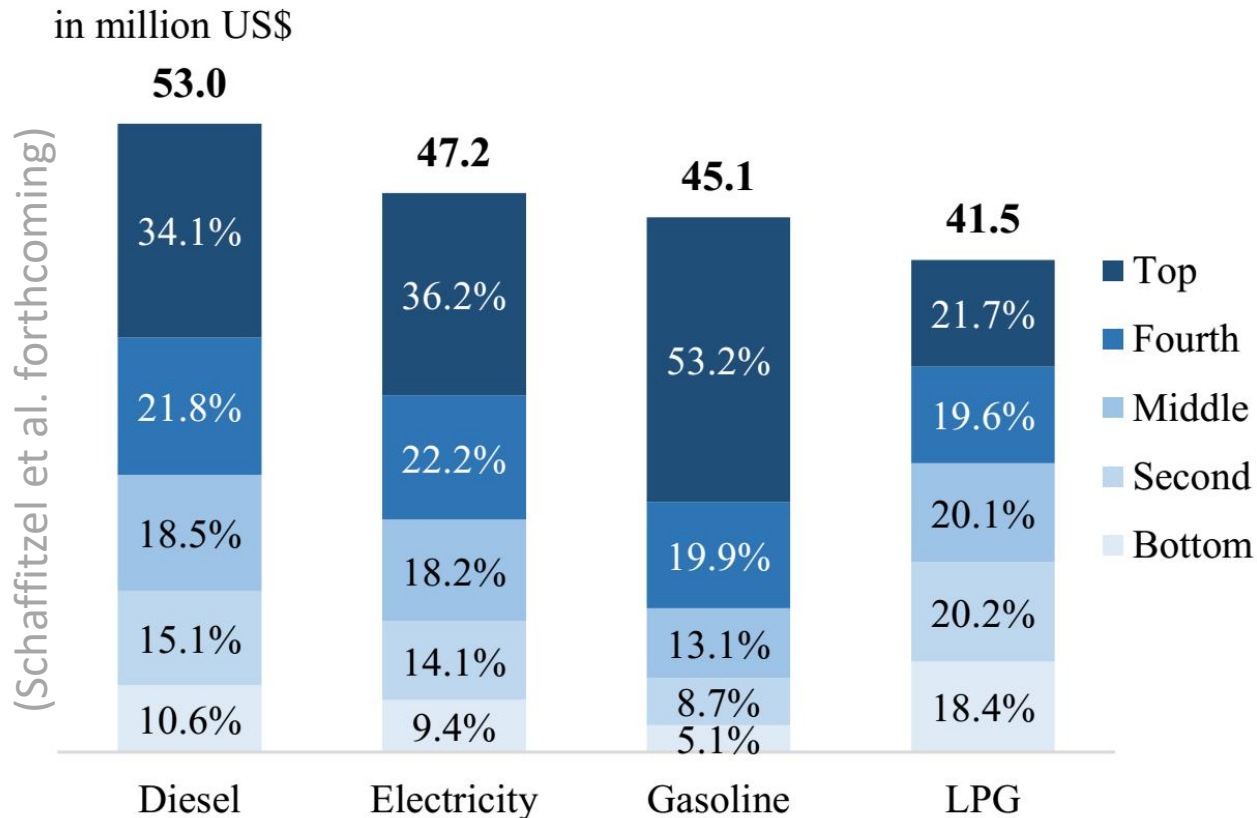
- Uniform lump-sum transfers to households
- Directed transfers to particularly affected households
- Other tax cuts for households
- Progressive tax cuts for households

## Government budget

- General funds
- Green spending (infrastructure, buildings, R&D, renewables)

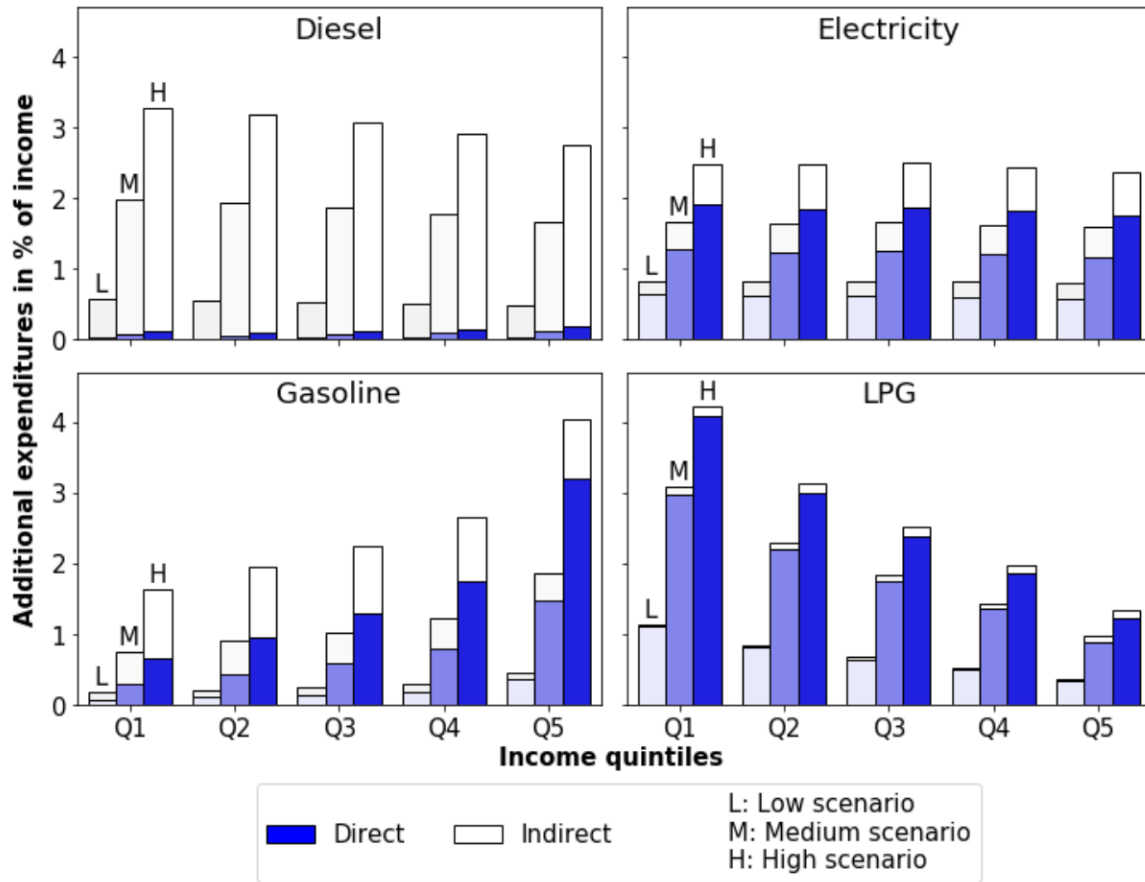
(Klenert et al. 2018)

# Ecuador: who benefits most from subsidies?



The richest quintile gets the largest share of fossil fuel subsidies, esp. for gasoline.

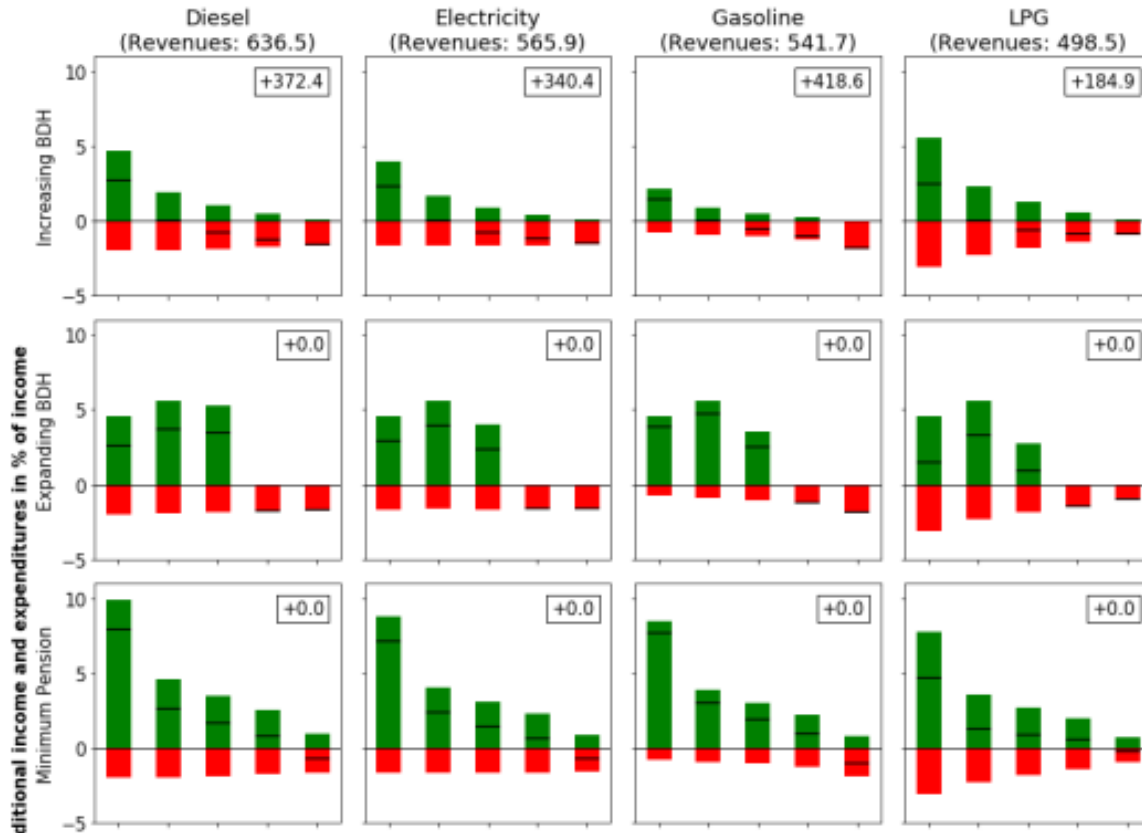
# Ecuador: distributional impact of subsidy reform



- Subsidy reform would be roughly neutral for diesel and electricity.
- Progressive for gasoline.
- Regressive for LPG.

(Schaffitzel et al. forthcoming)

# Ecuador: Potentials for revenue recycling



(Schaffitzel et al. forthcoming)

In Ecuador, recycling the revenues from fossil fuel subsidy reform could increase poor households' income by almost 10%.

Design matters! Horizontal equity, gradual phase-in, clear communication.

# Free Allocation of Emission Permits – EU ETS

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- Emission permits can be given without charge to power generators and industries in order to protect them from competitiveness loss from carbon pricing.
- In the first phases, the lion's share of emission permits was freely allocated, resulting in large windfall profits.
- Gradual shift towards auctioning, resulting in public revenues.
- Power generators since 2013 in principle do not receive any free allowances, but have to buy them.
- At the beginning of the current trading period, manufacturing industry received 80% of its allowances for free; to decrease to 30% in 2020.



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# Thank you.

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