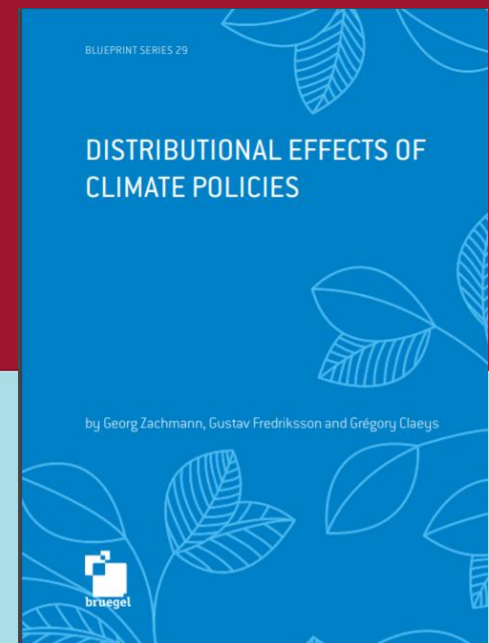


Distributional Effects of Climate Policies

Georg Zachmann, Grégory Claeys, Gustav Fredriksson



Three key messages

1. Distributional effects become more important

- More ambitious climate targets
- More climate policy areas

2. We know too little about distributional effects

- Complex effects – limited policy interest and research in the past

3. Distributional effects are not unavoidable

- Effects depend on:
 - Prioritisation of sectors
 - Choice of instruments
 - Concrete policy design
- Compensation measures and climate policies that mainly benefit lower income households can further reduce the distributional effects of climate policies

Introduction

- 2°C target requires **stabilising the greenhouse-gas concentration**
 - This requires a **massive shift in our economy** (e.g., essentially stop using oil, gas and coal)
 - This requires a bundle of **forceful climate policies** (carbon taxes, emission standards, subsidies, trade policies, ...)
 - Such policies can have **substantial distributional effects**
 - **Increasing inequality** is socially and economically undesirable
 - Adverse distributional effects will reduce the **political acceptability** of strong decarbonisation efforts
- Need to address the distributional effects of climate policies

First an example ...

A significant carbon tax on road fuel

- Does barely affect the poor that own no car
- Constitutes only a small share in the total expenditure of rich households
- Might mainly affect middle-class car owners
- Implies a strong rural/urban divide
- Affects poor households that need a car and might not be able to buy an efficient one / while rich households might go electric
- Will negatively affect petroleum refinery and other “brown” jobs
- Will negatively affect the owners of oil reserves and other “brown” capital

... it is complex and depends on multiple characteristics of a household (income, location, assets owned, ...)

Some general thoughts (1/2)

Poorer households :

- Face tight **budget constraints** → they prefer different consumption baskets than rich households (more food, less services)
- Have higher **discount rates**/feature **borrowing constraints** that prevent them from procuring more efficient durables
- Have different **skill endowments** and hence wages
- Earn less income from capital and land

Some general thoughts (2/2)

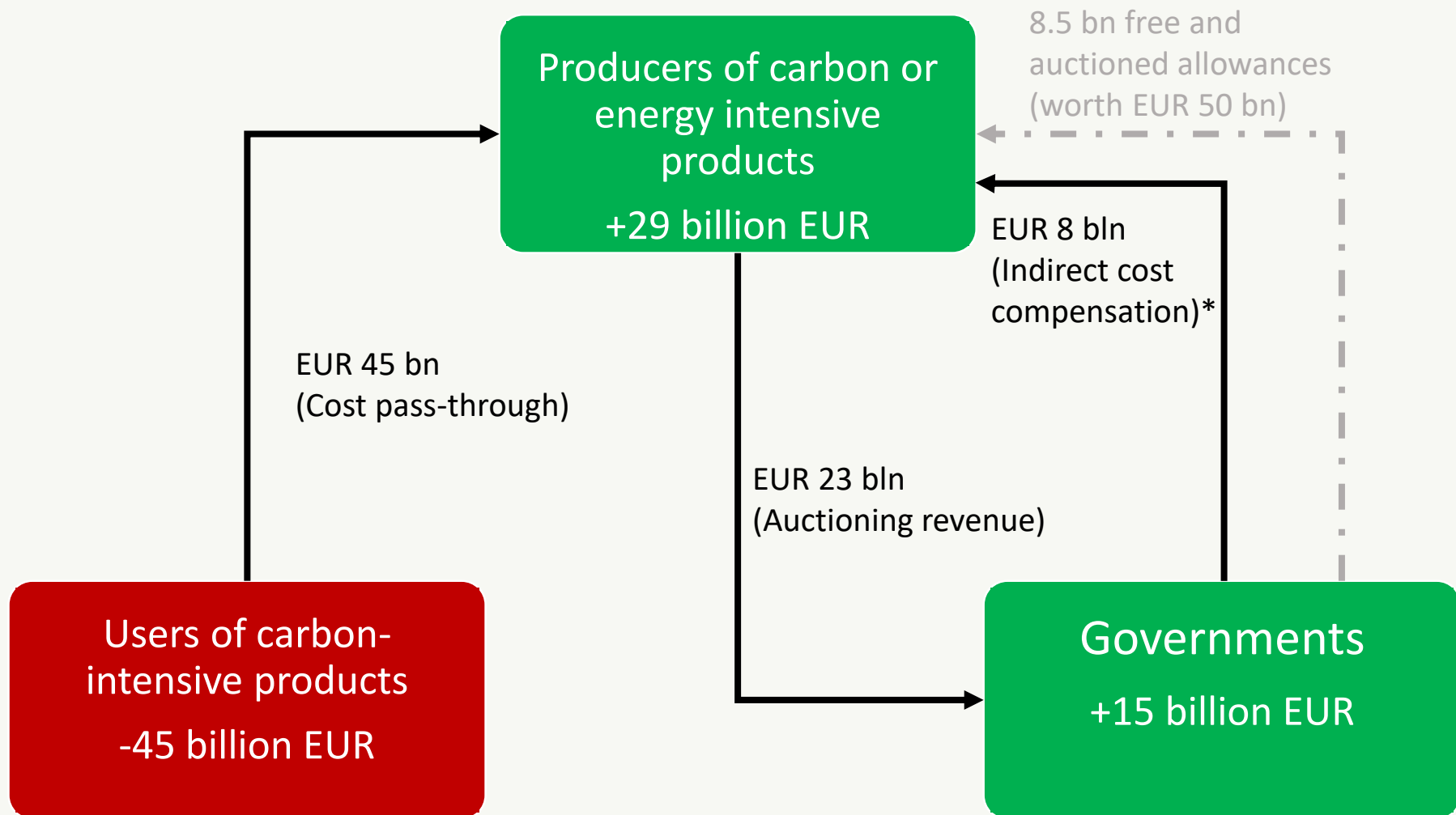
Individual climate policy measures can have very different distributional effects depending on:

- (1) The policy **tool** (e.g. tax vs. standard),
- (2) The addressed **sector** (e.g. aviation vs. electricity)
- (3) The **design** of the policy (e.g., free allocation of emission permits)
- (4) The **initial conditions** in the country (importer, specialisation, tax system)

What we know

- **Standards** often more regressive than carbon prices
- **Subsidies** for investment into low carbon technologies (housing isolation, rooftop solar, electric vehicles,) are often quite regressive
- The relative burden of carbon taxes that falls on poor households depends on the **sector**
[aviation < road fuel < heating < electricity]
- **Policy design** matters a lot – and design elements such as exemptions can make real world policies even more regressive (ETS free allowances, exemptions from feed-in tariffs)
- **Value of land** will in general increase

Example 1: The monetary flows in the EU ETS (2013-2017)



Source: Bruegel based on data from the EUTL of the EEA.

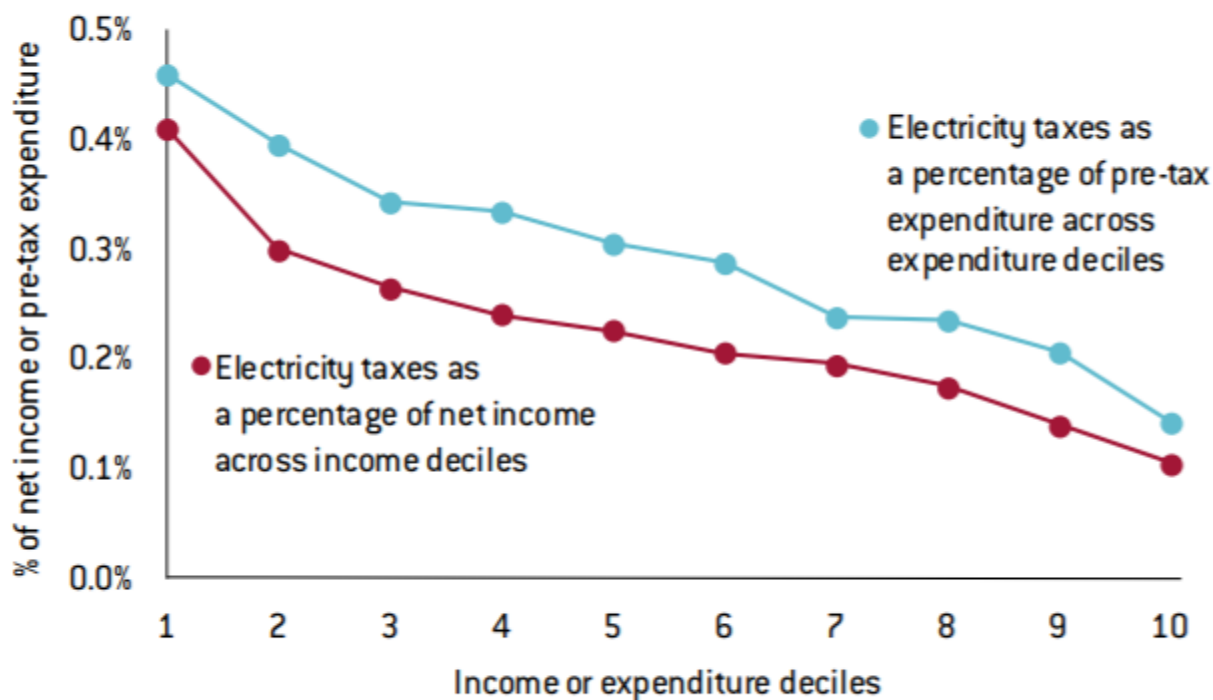
*Note: The indirect cost compensation is directed towards electricity-intensive firms. The figure includes installations in both the EU and the EEA.

Note: In addition carbon prices constitute a higher share in poorer households expenditures

Example 2: Power sector illustrates the complexity

- Electricity sector is crucial for decarbonisation
- Increasing electricity prices have a stronger impact on poorer households
- Support for RES makes capital owners richer

Figure 7: Average electricity taxes (21 OECD countries) as a percentage of net income or pre-tax expenditure



Source: Flues and Thomas (2015).

Market design and fiscal system is decisive

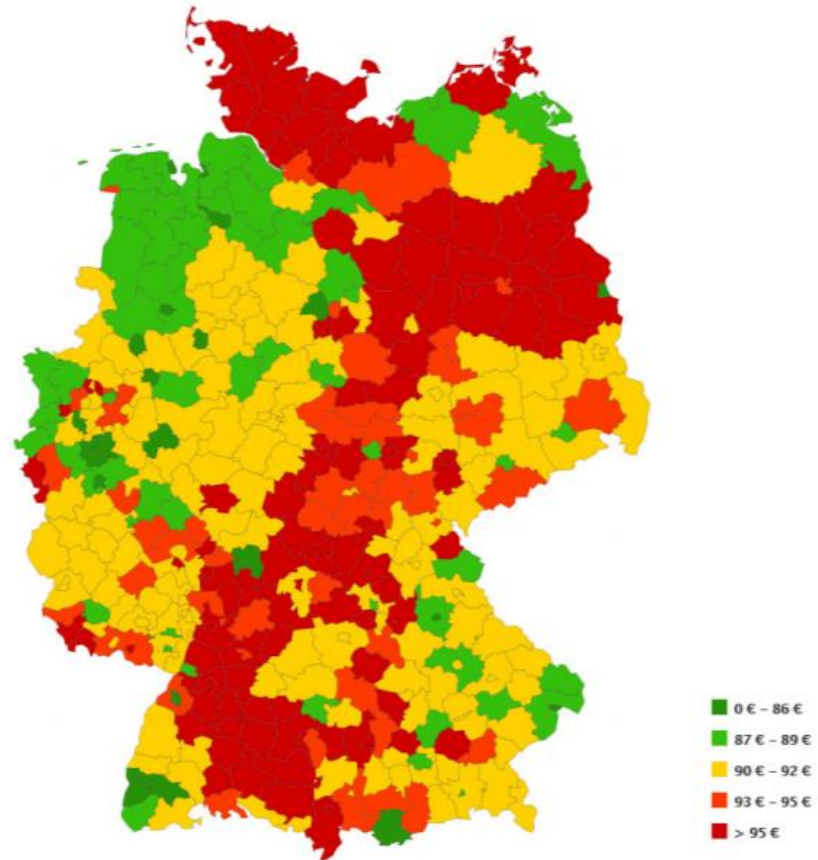
Table 6: Ratio of household to industry retail electricity price (2016 Semester 2; price incl. taxes and levies)

	(1) Medium household/ industry	(2) Small household/ large household
Austria	2.00	2.47
Belgium	2.37	2.23
Bulgaria	1.19	1.04
Cyprus	1.25	1.20
Croatia	1.52	1.69
Czech Republic	1.94	2.58
Denmark	3.30	1.75
Estonia	1.38	1.16
Finland	2.23	2.81
France	1.89	1.89
Germany	2.00	1.68
Greece	1.55	1.04
Hungary	1.41	1.13

Regional distributional effects

- Regions with high RES shares do not benefit from lower prices,
- But feature higher distribution tariffs

Figure 16: Monthly electricity costs (€) for German households (using the price of the cheapest supplier)



Source: Heidjann (2018). © Atlas für Strompreise, StromAuskunft.de

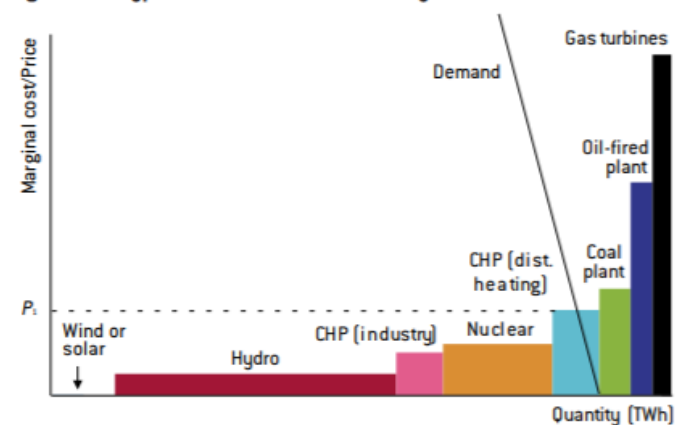
Note: The figure shows the electricity costs per month for 1,437 locations in Germany. The costs are calculated assuming an annual consumption of 3,500 kWh and the price in the beginning of May 2018.

The merit-order effect reduces wholesale prices

At the same time large consumers are exempted from:

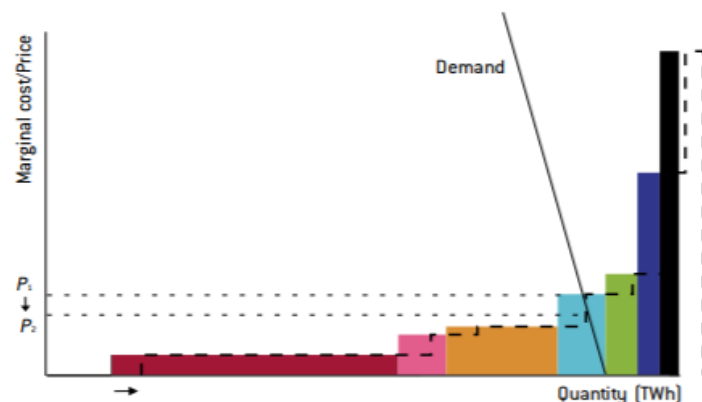
- exempted from network tariffs
- exempted from RES-surcharges
- And get state-aid compensating for indirect ETS cost

Figure 18: A hypothetical wholesale electricity market



Source: Bruegel.

Figure 19: The merit-order effect



Source: Bruegel.

What might the future bring?

- Increasing connection charges
 - Will they be differentiated?
- Increasing price volatility
 - Will only owners of smart meters and appliances and benefit
- Decentralisation
 - How do we prevent that system cost will be carried disproportionately by poorer households?

Distributional effects should not be ignored in electricity market design!

Recommendation 1: Invest more in corresponding research

- Invest more in **gathering data and researching** the distributional effects of individual climate policies.
- Go beyond the partial analysis of individual drivers towards assessing the **aggregate distributional effects** of individual policies.
- This can ultimately allow policy-makers to make better informed choices on designing a suite of climate policies that is at the same **time effective** in mitigating emissions, **welfare maximising** and **socially just**.

Recommendation 2: Make policies less regressive

Designing the specific policy measures in a way that reduces the distributional effects, by:

- Focusing decarbonisation efforts on **less regressive sectors first** (e.g. tax aviation instead of electricity)
- Focusing on **less regressive policy tools** (e.g., taxes compared to standards),
- Implement **design elements** that make policies less regressive (e.g., auctioning emission permits instead of grandfathering them to polluters).
- **Revising existing regressive policies** (e.g. renewable support schemes, the EU ETS)

Policy-makers should factor such known distributional aspects more prominently into their policy choices.

Recommendation 3: Actively develop climate policies that benefit lower-income households

- There are climate policies – such as support for energy efficiency investments in social housing – that can bring **benefits to lower-income households**.
- Policy-makers should become more creative in developing such measures, not least to increase **public acceptance** of climate policies.

Recommendation 4:

Compensation is feasible – but needs to be done

- To achieve the ambitious decarbonisation targets, developed countries will have to resort to regressive carbon taxes on basic needs (e.g., heating fuel) to some degree.
- But recycling the revenues from such schemes – e.g., through **lump-sum** transfers – allows to largely mitigate the distributional concerns, and should be forcefully implemented.

Recommendation 5: An international approach can make domestic climate policies fairer

- **Competitiveness** concerns of domestic industry are currently a main excuse for instruments that benefit high-income households at the cost of the low-income households
- Policy-makers should continue to fight for a **globally synchronised decarbonisation effort**. This will allow for less regressive national policies.

Thank you for you attention!

twitter: @GeorgZachmann