C³A Annual Symposium
December 2-6, 2024
World Bank Paris

Distributional impacts of climate policy and effective compensation: Evidence from 88 countries

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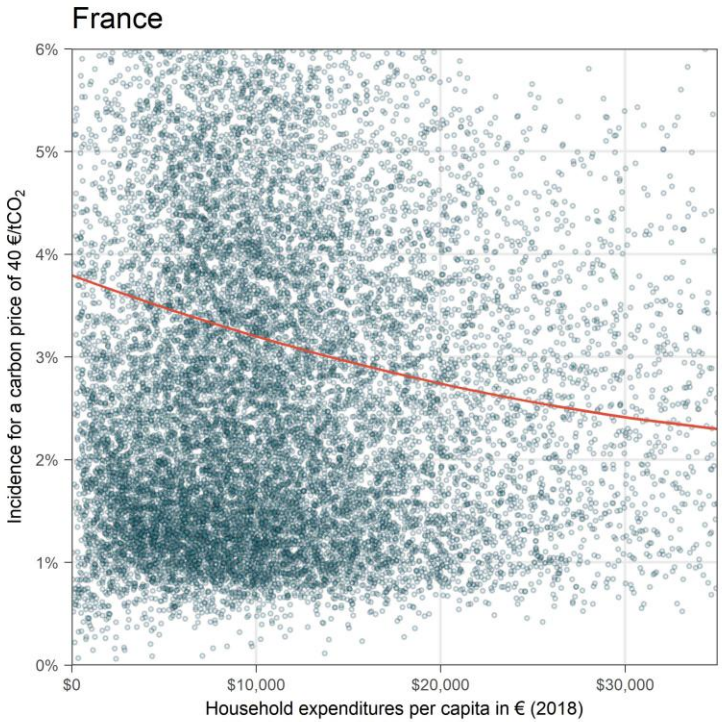
Which households bear the highest costs of climate policy?

- **Unequal distribution** of costs is a key barrier for climate policy.
- **Compensation policies** can help addressing distributional effects.
- Which households bear the highest costs of climate policy? Why?
- Important for design of compensation policies.

- A novel cross-country dataset.
- Understanding country-level drivers of heterogeneity with machine learning.
- Country- and policy specific drivers. Six country clusters.

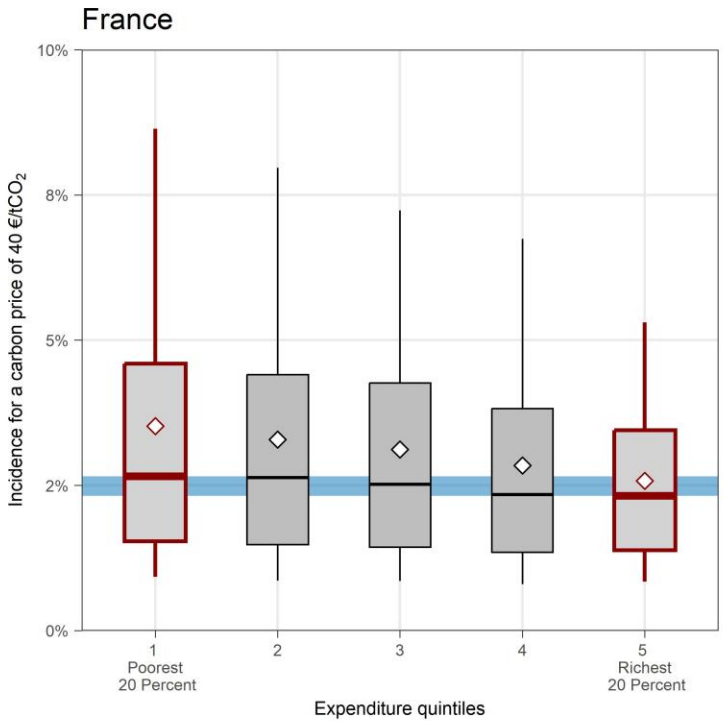
Climate policy affects different households differently

- Poorer households would bear higher additional costs than richer households.



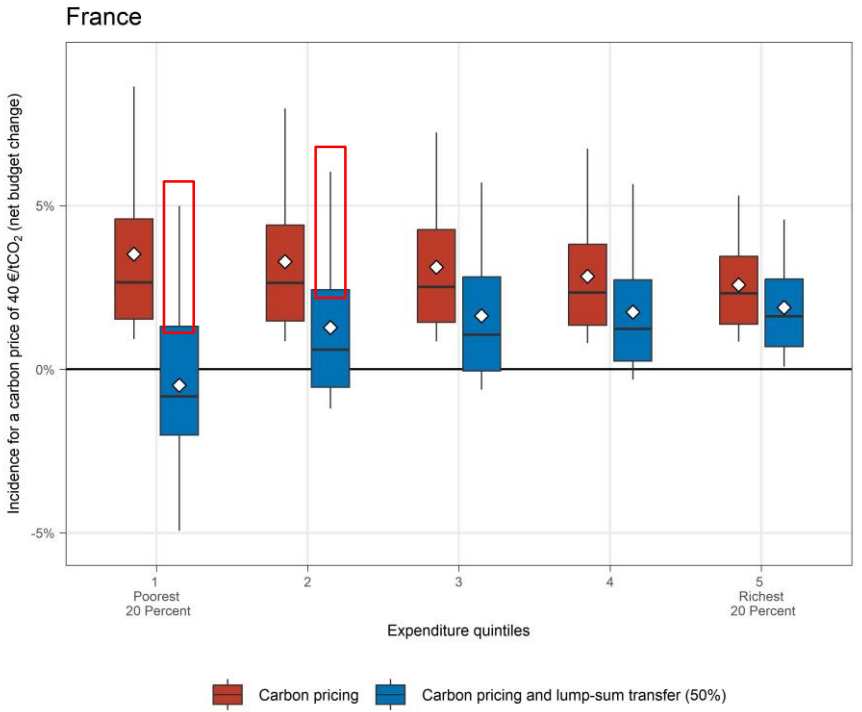
Horizontal differences exceed vertical differences

- Poorer households would bear higher additional costs than richer households.
  - Vertical heterogeneity
- Differences within expenditure quintiles are large.
  - Horizontal heterogeneity



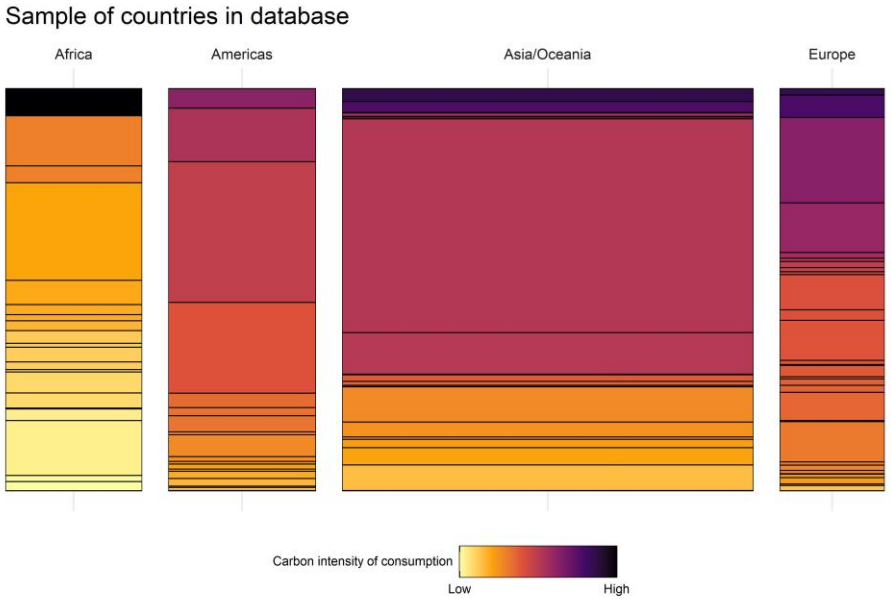
Horizontal differences exceed vertical differences

- Poorer households would bear higher additional costs than richer households.
  - Vertical heterogeneity
- Differences within expenditure quintiles are large.
  - Horizontal heterogeneity
- Implications for design of compensation
- Lump-sum transfers lead to a more **progressive distribution** of costs
- Yet, some households would be left highly affected.



Contribution and method

- What helps to explain heterogeneity in additional costs of climate policy?
- We construct a novel dataset.



Contribution and method

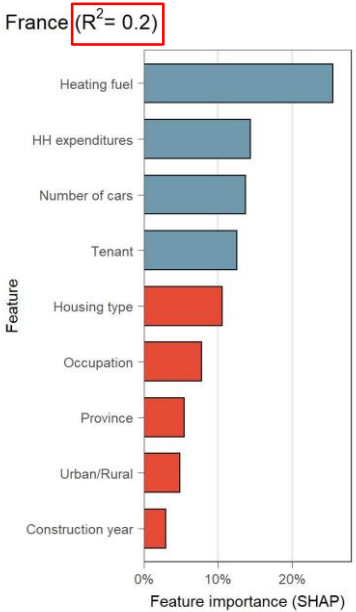
- What helps to explain heterogeneity in additional costs of climate policy?

- We construct a novel dataset
- More than 1.5 million households from 88 countries
- What do households consume?
  → Household-level expenditure data
- What are CO_2-emissions embedded in consumption?
  → Multi-regional input-output data

- We use supervised machine learning to detect the relationship between **household characteristics** and the **carbon intensity** of consumption.

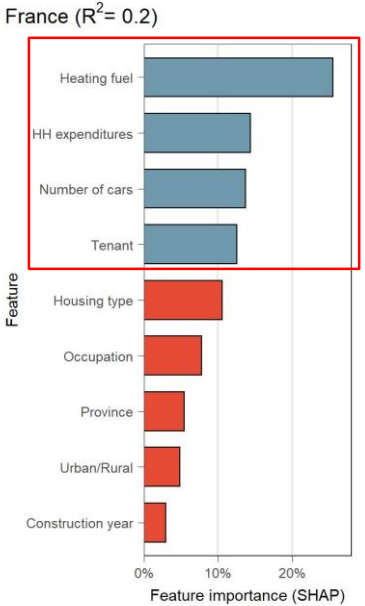
What explains differences in costs of climate policy in France?

- The model can predict **20%** of variation in households' carbon intensity.



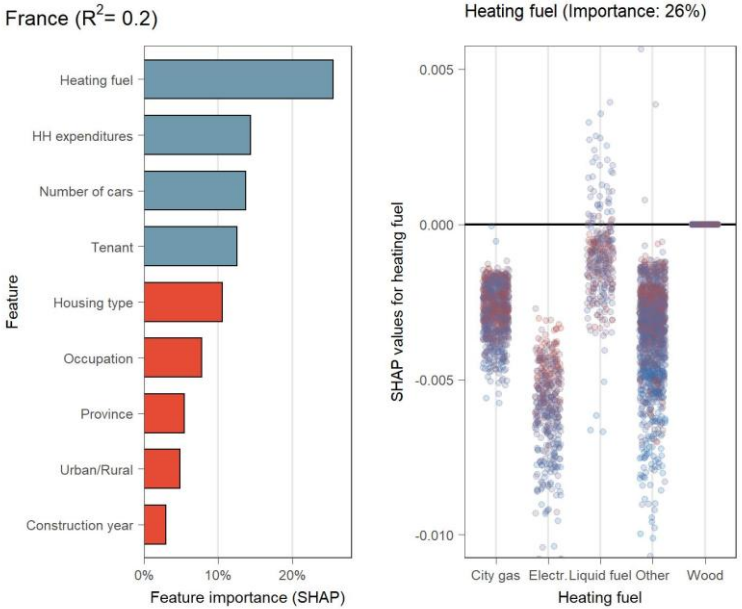
What explains differences in costs of climate policy in France?

- Variation in some household characteristics is more important than in others.



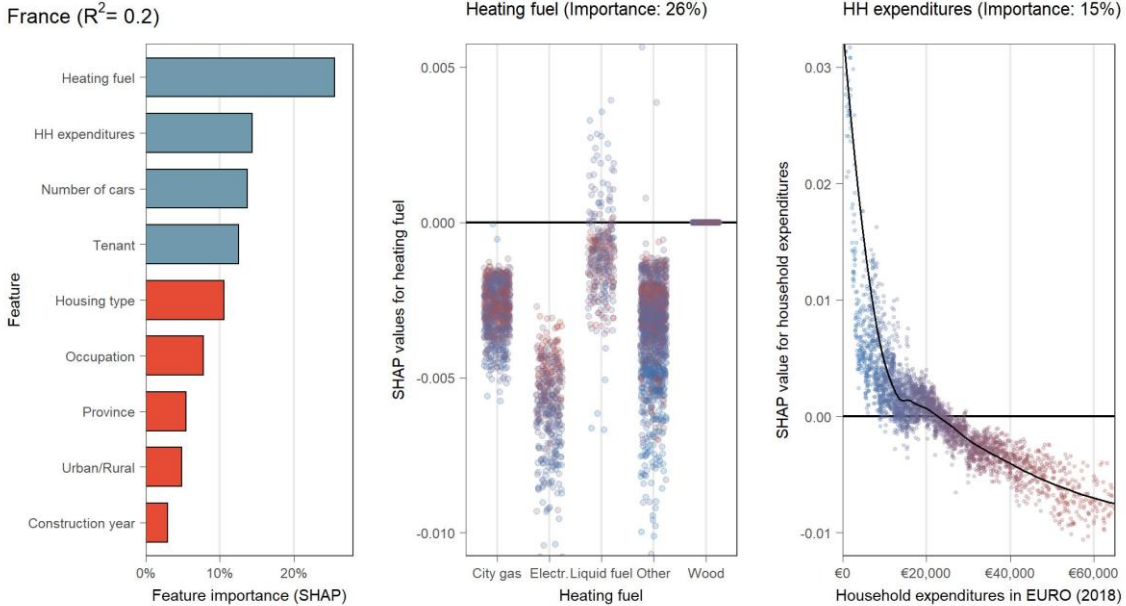
What explains differences in costs of climate policy in France?

- Households heating with **liquid fuels** or **wood** bear higher costs.



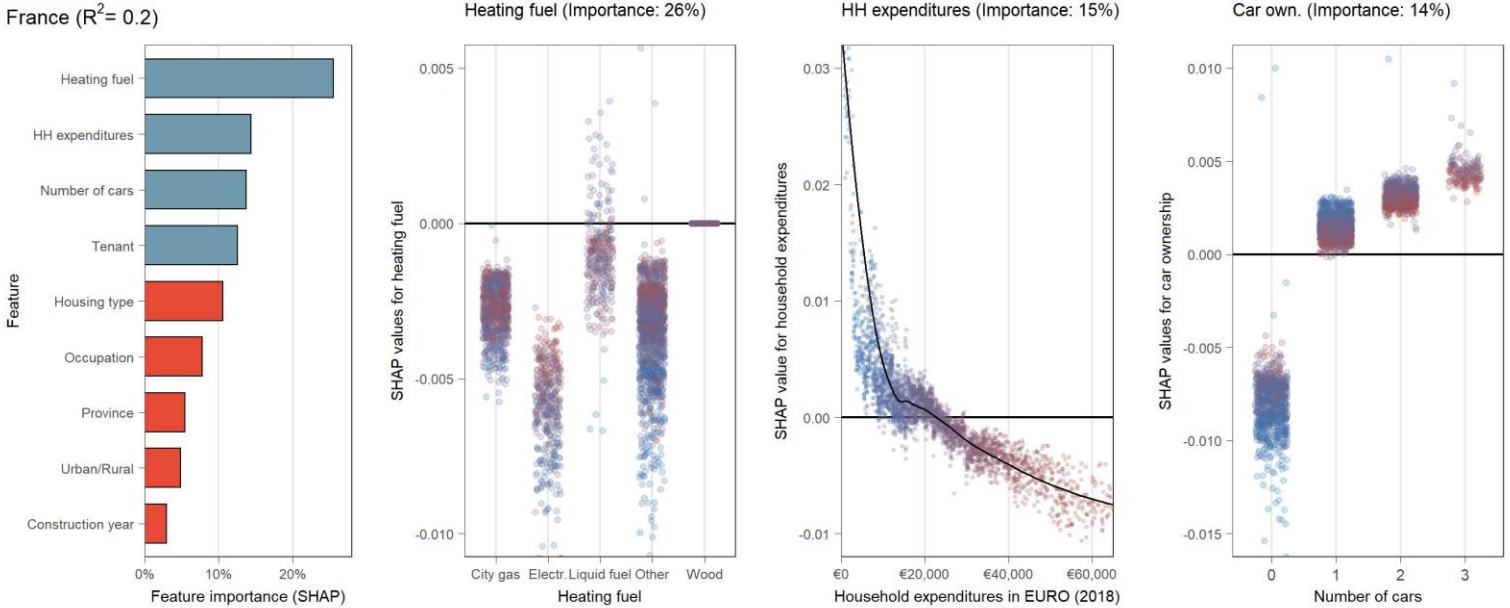
What explains differences in costs of climate policy in France?

- Controlling for other factors, **poorer households** bear higher costs.



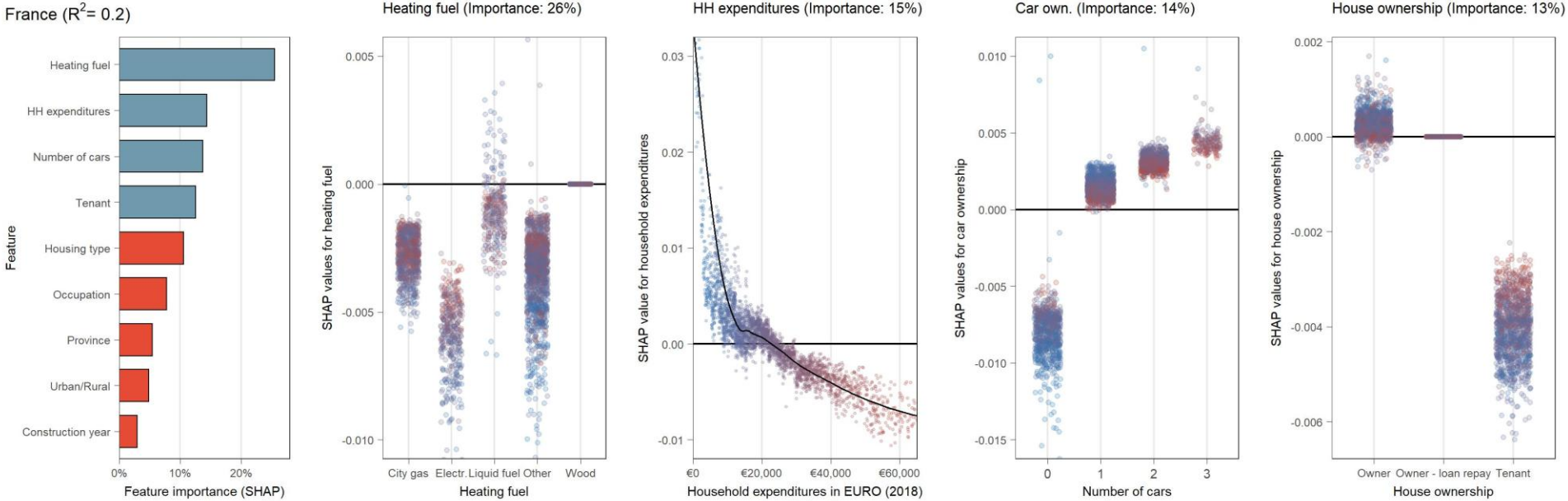
What explains differences in costs of climate policy in France?

- Households that own and use **cars** bear higher costs.



What explains differences in costs of climate policy in France?

- **Tenants** bear lower costs.

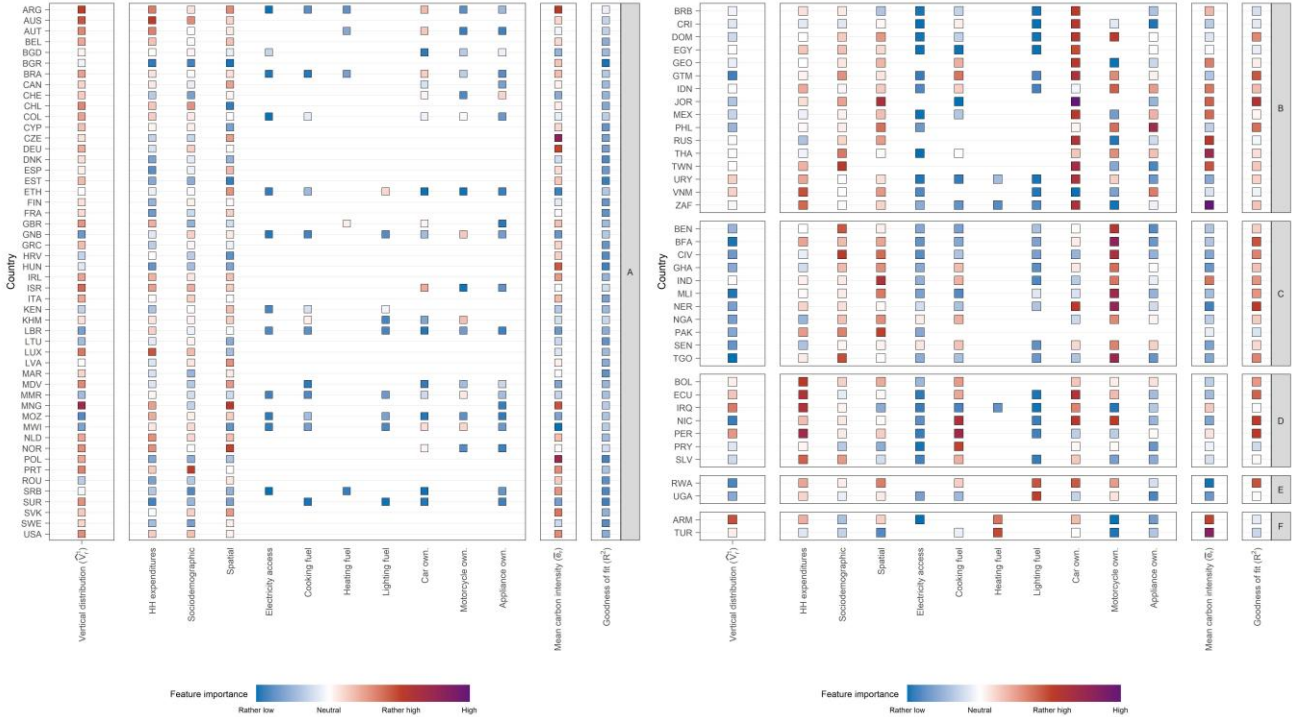


What can we learn about effective compensation?

- In France, it is difficult to predict additional costs.
- Progressive transfers can help alleviate such costs.
- In addition:
  - Transfers conditional on demand for heating fuels?
  - Transfers conditional on demand for transport fuels?
  - Transfers targeted to home owners?

Driver of heterogeneity differ across clusters

- We identify six clusters of countries.
- Some forms of compensation may be more effective in some clusters.

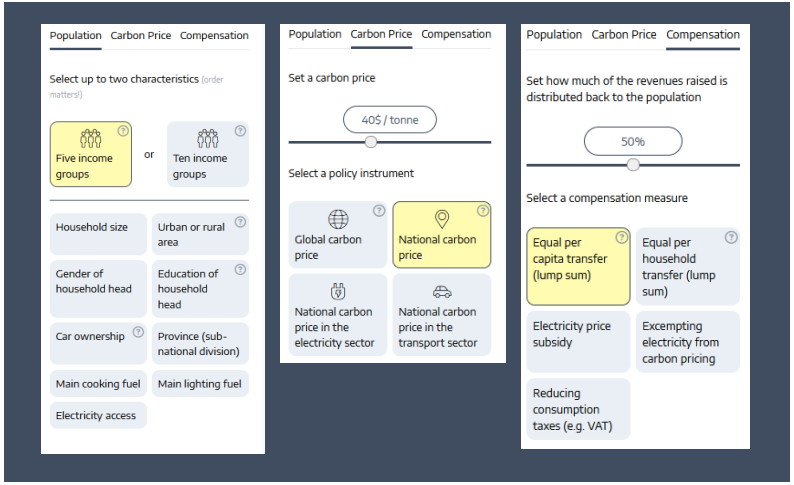


Conclusion

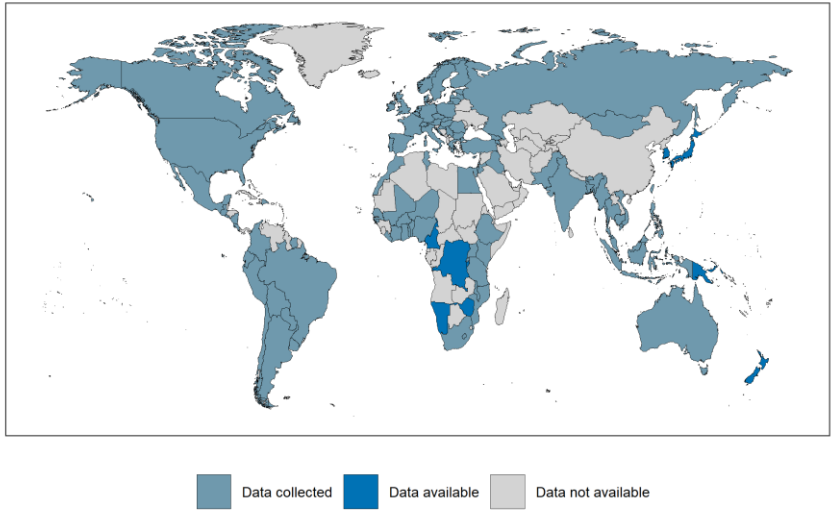
- Distributional effects of climate policy are **country-** and **policy-specific.**
- **Horizontal** differences exceed **vertical** differences.
- Heterogeneity in households' **income** can not explain heterogeneity in households' carbon intensity.
- Instead, include information on energy use, location, assets and socio-demographics.
- Distributional effects do not need to be a barrier for climate policy.
- But: Design of **effective compensation policy** matters.

Carbon pricing incidence calculator: cpic-global.net

- Analyze the country-level distributional impacts of climate policies
- Customize analyses to your needs
- Investigate different compensation measures
- Broad coverage



Coverage of carbon pricing incidence calculator



Thank you.

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Visit https://lmissbach.github.io for more information and working paper.

Preprint available: https://tinyurl.com/Missbach2024

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