

Damages to nature: An Economic Point of View

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The main difference between the legal and the economic approach to damages

The legal system intervenes after the damage => **Ex-post** tool to compensate victims of pollution



Economists think of tools to make people (firms, consumers) internalize the cost of pollution **ex-ante** => **incentive effect**

Liability and compensation rules are also supposed to have this **incentive effect**...



... on the condition that the compensation is proportional to the severity of damage and polluters cannot avoid their responsibility...

2 options to make people internalize the cost of pollution ex ante:

Administrative solutions
like
norms/regulations/ban..



Economic solutions
like
taxes and CO2 markets



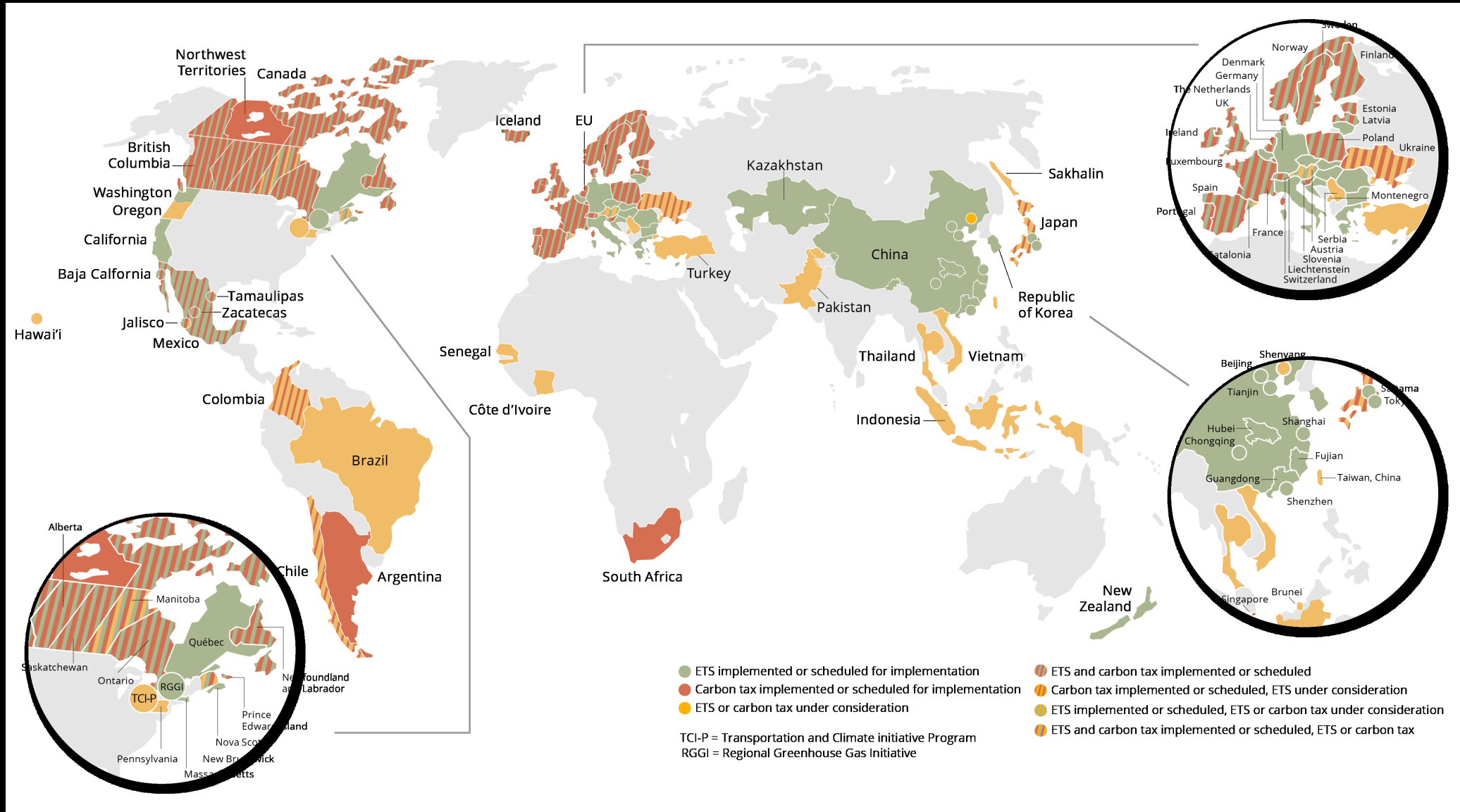
What is the goal of ex ante solutions?

- **Common features between norms, taxes, and market for pollution**
 - **For companies**
 - Short term: they reduce their polluting production
 - Long term: they innovate and drive technological change
 - **For consumers**
 - Short term: People adjust their habits of consumption, transportation, heating...
 - Long term: they invest in energetic renovation, ...

Economists prefer economic to administrative tools

- **Norms = same objective for all (producers/consumers)**
 - For some actors, norms are too strict (costly) for others too easy to reach
 - Norms have **hidden costs** for most users and seem more socially accepted when issued
- **Taxes or markets for pollution**
 - Actors (public and private) must include them in their economic calculation of production and consumption (play as an input factor)
 - They compare them with their costs of depollution
 - Ex: if the value of a tonne of CO₂ is set at 30 euros, a depollution decision of less than 30 would be undertaken by consumers and producers.
 - The cost of depollution is minimized compared to administrative tools

Carbon tax or CO2 market price



Taxes or markets?

- If we choose taxes, how to set a price to carbon = 20 € or 100€ or 250€ or 1000€ ?
- **How to set the tax at the “right level”?**
- The first approach is to make a **cost-benefit analysis (CBA)** to compare the costs of depollution with the costs of damages → carbon price equalizes marginal costs
 - Necessity to give a monetary value to all the damages
 - It can be made via many different techniques and works well for well-defined local damage
 - But, the CBA is not satisfying for climate change damages: boundaries are not correctly defined regarding probability, severity, and time duration...
 - **Example:** What is the monetary value NOW of the impact of a tonne of CO₂ in 200 years? Economists have tried to answer this question, but their methodology is necessarily biased

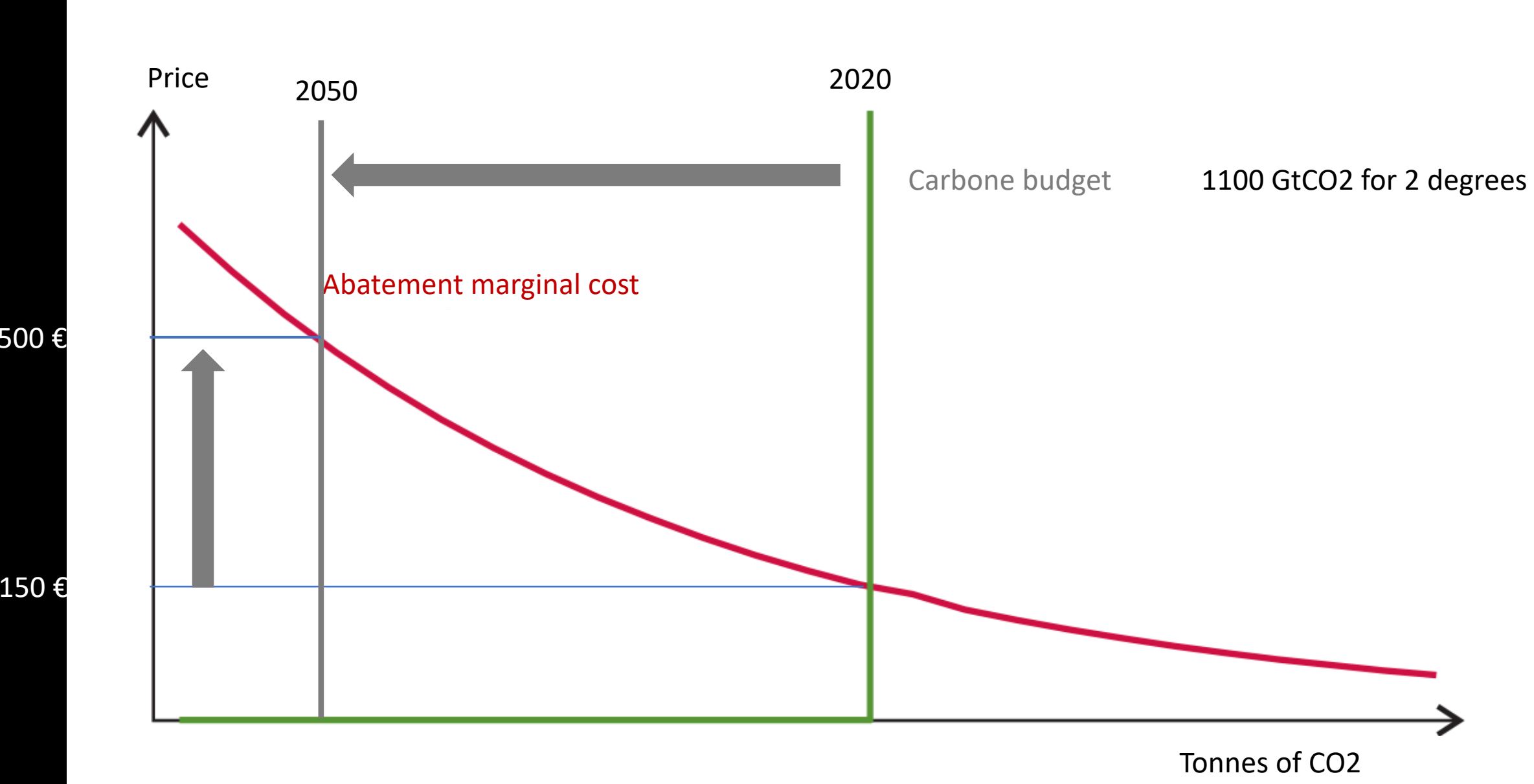
Taxes or markets (2)?

- 2d approach: as CBA did not work for climate, economists have worked out another method: **A cost-effectiveness analysis**
 - It comes from operational research and in particular from constrained optimization techniques
 - The principle is to find the most effective program for a given cost or the less costly program for a given benefit

Cost-effectiveness analysis applied to climate change

- **Climatologists** define the world maximum pollution level = world carbon budget to limit to 1.5 or 2 degrees more (1100Gt)...
 - Estimation of an emission trajectory in the reference scenario
 - Modelling of emission trajectories enabling a target to be reached
 - Calculation of discounted costs to reach the target
 - The carbon price obtained is the one that allows the economy to reach the target
- **Gollier 2021** : for 2degrees = 150€ today and 500 € in 2050.

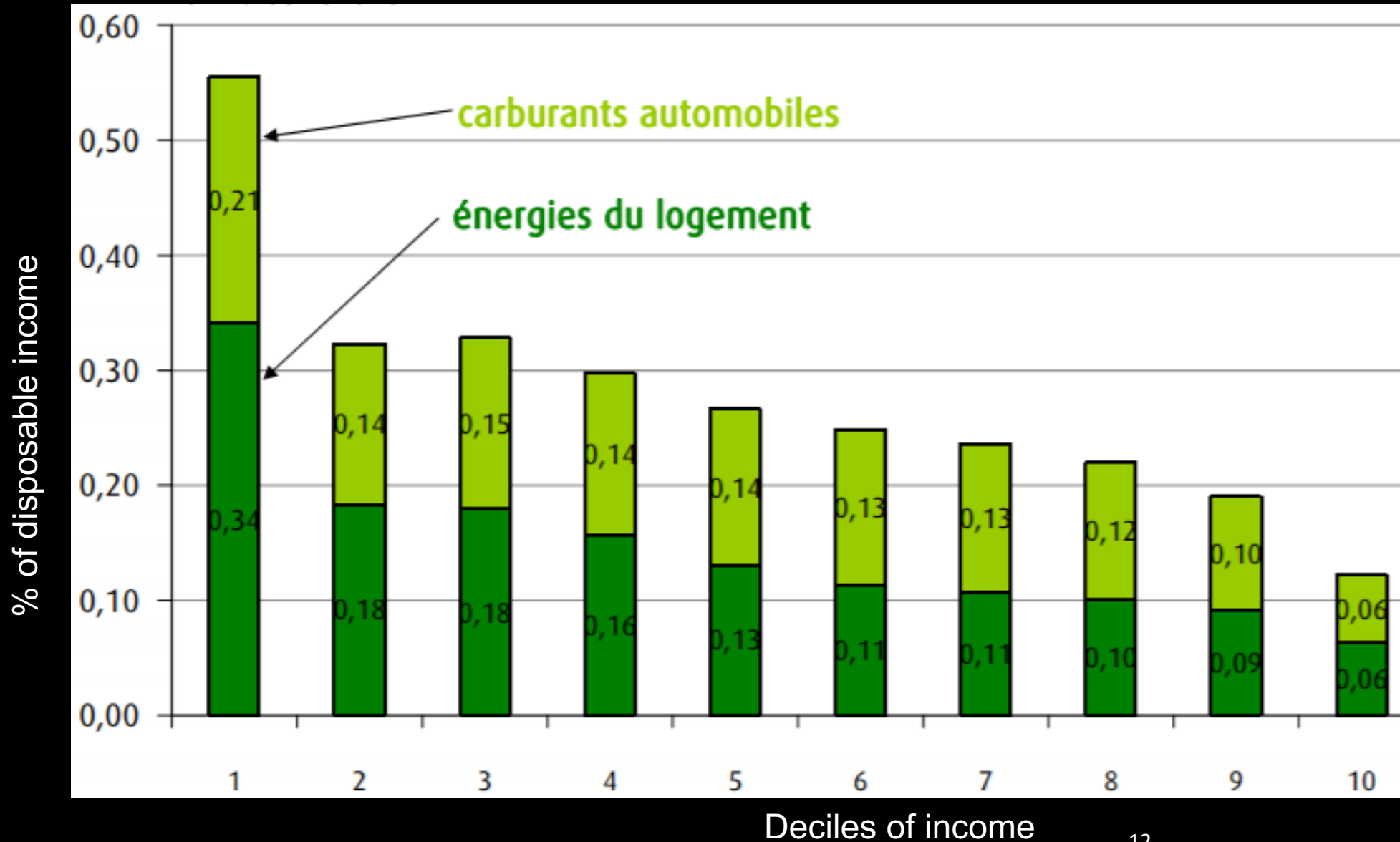
Cost-effectiveness analysis (Gollier 2021)



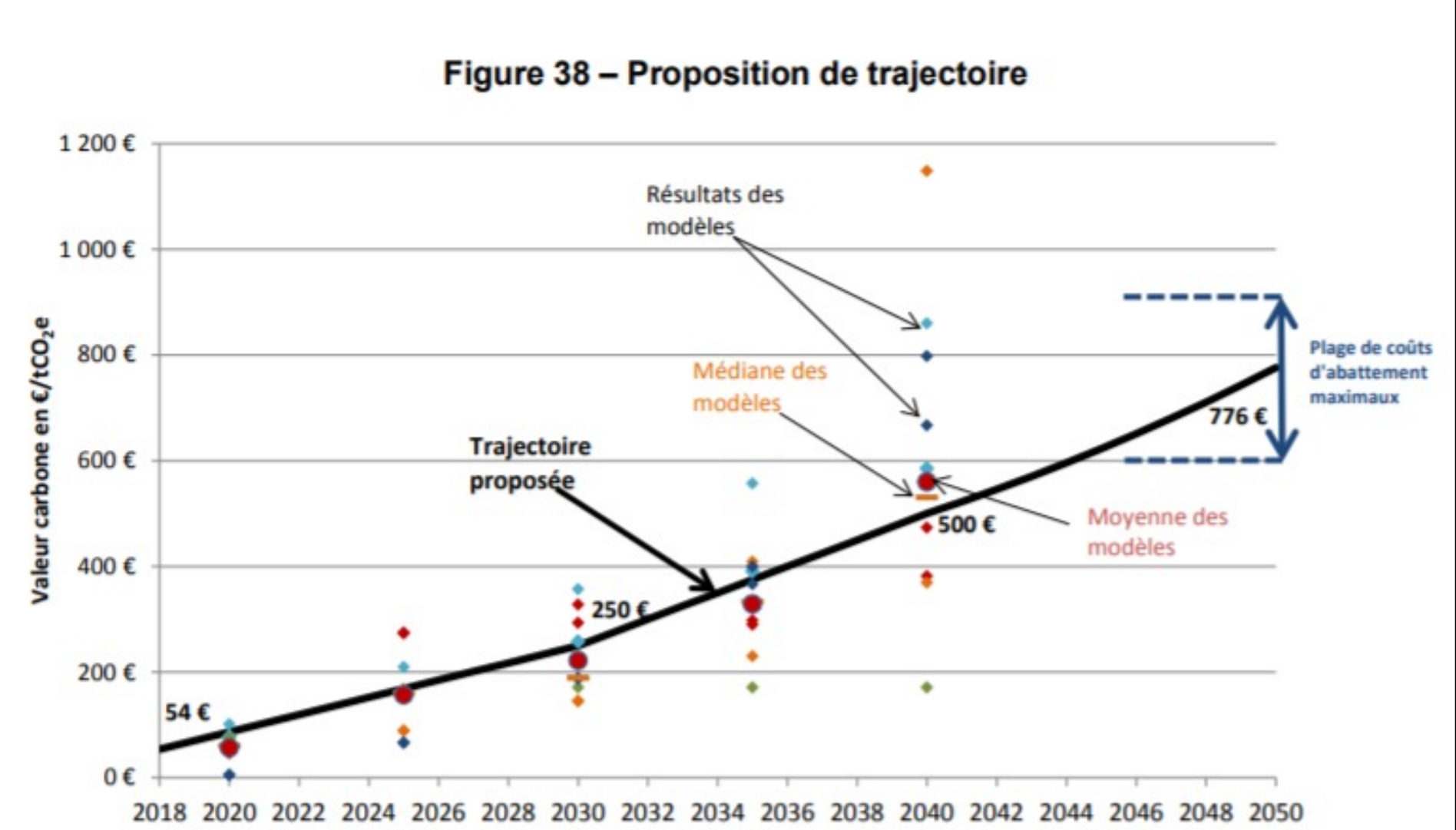
What most economists agree on:

- We need a **globalized price for carbon** (the social cost of the ton of carbon emitted is the same whoever and wherever the emitter is).
- **On all producers and consumers**
- But there is a problem of acceptability because giving a value to carbon is **very anti-redistributive**.... => same cost for poor and rich but with big revenue differences : **Clearly Unfair**
- On a local, national or international scale, **carbon pricing cannot be implemented without a well-thought-out redistribution system**
- Local / national / International Green Fund

Impact of a 22 €/T carbon tax on the household revenues

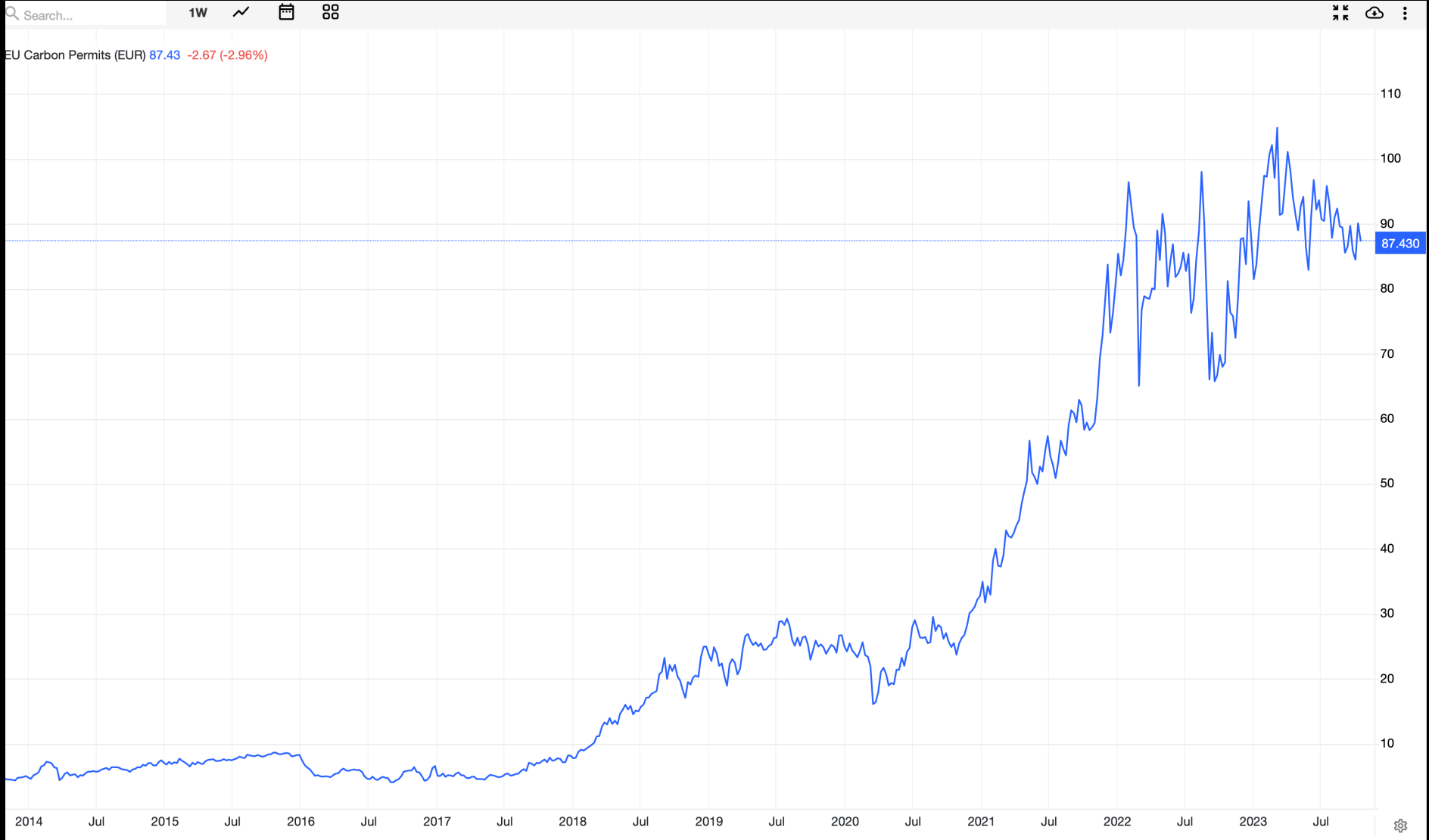


Example : 2019 carbone neutrality in 2050 for France



Source : Alain Quinet, [La valeur de l'action pour le climat](#), 2019.

Actual carbon market prices in EU



Discussions

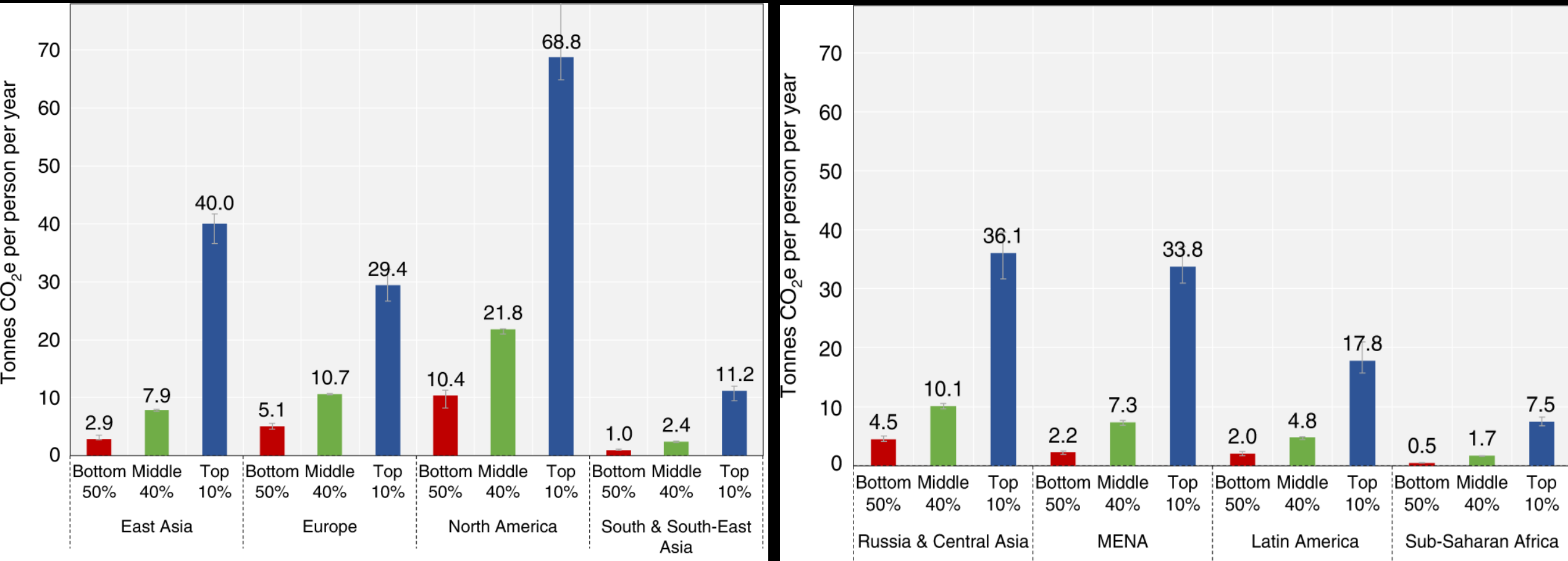
- **Carbon pricing** makes the costs of the transition visible → This climate policy is difficult to support
 - Should costs be hidden by using **ineffective policies** with less transparent costs?
 - Any subsidy to X is a tax to Y
 - What happens if X and Y are not from the same country?
 - **Avoid exemptions** (taxis, road transport, aviation, farmers, etc, poor countries...).
 - The French “Yellow Vests” were right to point out that some do not pay a fair contribution
 - The feeling of injustice is sounded and must be resolved

Main messages

1. The social cost of carbon is incredibly important because it enables policymakers or private decision-makers to make sound decisions
2. The social cost of taxes and CO2 markets are less than norms
3. The actual social cost of carbon is underestimated compared to most estimations
 - Quinet 2: 75€ today, 775€ in 2050.
 - Stern and Stiglitz : \$100 per ton by 2030;
 - Carleton = \$125 per ton of carbon by 2030
 - Frances Moore, put it at \$220 per ton in 2030.
4. CO2 markets/taxes are a source of revenues for policymakers, they must use it to help low-income people (in all countries) face the unfair burden effects of this policy

Additional material

Emitters per region and per deciles



Obama VS Trump : how to manipulate the Social Cost of Carbon

Table 1: Prior and Current Federal Estimates of the Social Cost of Carbon Dioxide per Metric Ton at a 3 Percent Discount Rate in 2018 U.S. Dollars, 2020-2050

Year of emissions	Prior estimates (based on global climate damages)^a	Current estimates (based on domestic climate damages)^b
2020	\$50	\$7
2030	\$60	\$8
2040	\$72	\$9
2050	\$82	\$11

Sources: GAO analysis of data from Interagency Working Group on Social Cost of Greenhouse Gases and Environmental Protection Agency (EPA). | GAO-20-254

Notes: The prior and current federal estimates of the social cost of carbon dioxide were originally reported in 2007 and 2016 U.S. dollars, respectively. We adjusted values for inflation and expressed in 2018 U.S. dollars using the United States Gross Domestic Product Price Index from the U.S. Department of Commerce, Bureau of Economic Analysis.

Parameters of the calculation

- “Discount rate debate”:
 - **Question:** who will pay the cost of carbon in the next 200 years = intergenerational equity .
 - **Tool :** a lower rate means valuing the harms to future generations more highly today, while a higher rate means allowing them to bear more of the burden.
 - **Level:** Most scientists assume a **rate of 2 or 3 %**, while **Trump administration policies used a rate as high as 7 %**.
- “Growth rate debate”:
 - **Question :** In the next 25 years what would be the growth rate?
 - **Setting the parameters:** The bigger, the more we need a high price of carbon
- **Level of uncertainty :**
 - **Question :** how to consider the data we did not know? What are the risks we may face in the future?
 - In terms of investments, do we have to make a difference according to the level of risks?
- **Nice online tool : Social Cost of Carbon Explorer**
- <https://www.rff.org/publications/data-tools/scc-explorer/>

EU's plan for a Carbon Border Adjustment Mechanism (CBAM).

- **Problems: Competition from low cost polluters and 'carbon leakage'**
- The European Parliament and the Council of the European Union signed the CBAM Regulation on 10 May 2023.
- the CBAM will be phased in gradually and will initially apply only to a selected number of goods at high risk of carbon leakage:
 - iron/steel, cement, fertilisers, aluminium, hydrogen and electricity generation.
- From October 23 a reporting system has started.
- Importers will start paying the CBAM financial adjustment in 2026.
- Its coverage will probably increase after 2026 to include chemicals and polymers...