Environmental ambition: scope, stringency, and policy mix

Life – Dicet

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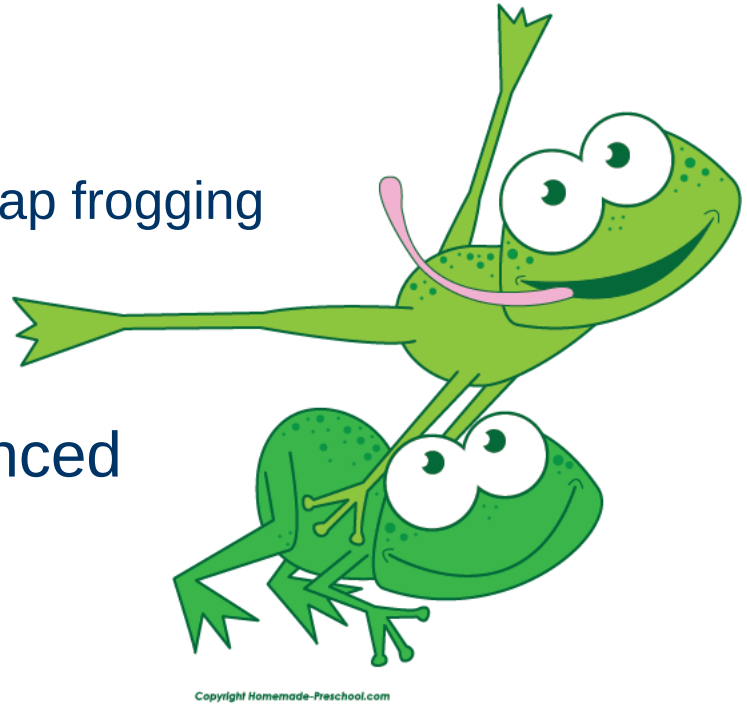
Carbon Sorrow

- Economists always know better
  - just weigh goals and instruments in a grand CBA and we all know what to d
- Do we?
  - Real world copes with yellow jackets, climate skeptics and what else?
- Simple solution!
  - You know what, just put a price on ca and return the revenue!
- Is it that simple?

Carbon transition

- Key aim: transition to a carbon neutral economy
  - Carbon is at the core of fossil fuel era
  - Neutrality equires a very deep change of economic system: leap frogging
  - Examples: electricity generation, industries



- Transition: system wide change based on a pre-anounced goal with timepath
  - Example: EU 2050 goal for carbon neutrality

- System change requires more than just a simple carbon tax
  - From dirty to clean production and consumption
  - Lock-in fossil fuel era (see e.g. Acemoglu et al., 2012)

Carbon transition in the mix

- Carbon pricing for *primary failure* of the system
  - e.g. ETS sectors using ETS
  - Non-ETS through energy taxes and other policies (standards)

- Supplementary policy for *failure in knowledge market*
  - Innovation spillovers (both R&D and diffusion)
  - Lock-in fossil (bias knowledge stock and ‘sunk cost’)

- Suplementary policy for *other problems*
  - State support (healthy functioning of markets)
  - Limited coordination energy policy (e.g. in the EU)
  - Networks and infrastructure

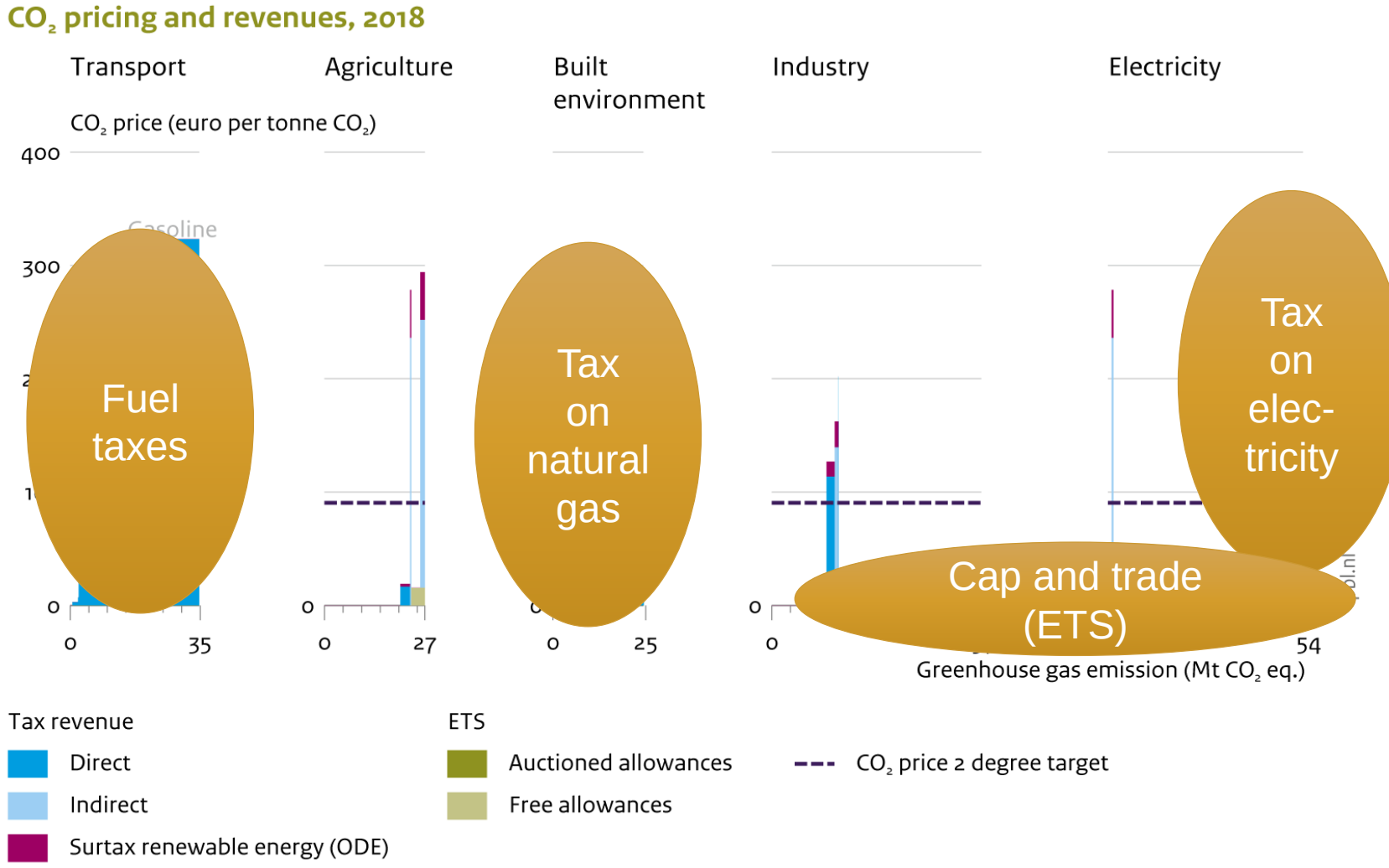
Careful Carbon Pricing

- Key elements in instrument choice design of transitions:
  - Factoring in all aspects of choice behavior (motives, prices, constraints, uncertainty)

- Criteria for evaluation should take stock of the role of design and context (‘the devil is in the detail’):
  - Aim: does the instrument target the operational goal?
  - Scope: how much of the regulatory base is addressed?
  - Price: what price for the un(der)priced scarce resource is aimed for?
  - Timing: when is the instrument implemented?
  - Interaction: role of other (overlapping) instruments and policies

Example: carbon pricing in the Netherlands

- Use effective carbon taxes and prices (OECD) for proper picture
  - Implicit prices through existing excises: mainly non-ETS; coordinated by EU minimum taxes
  - Explicit prices through cap-and-trade (ETS)
- Complicated?



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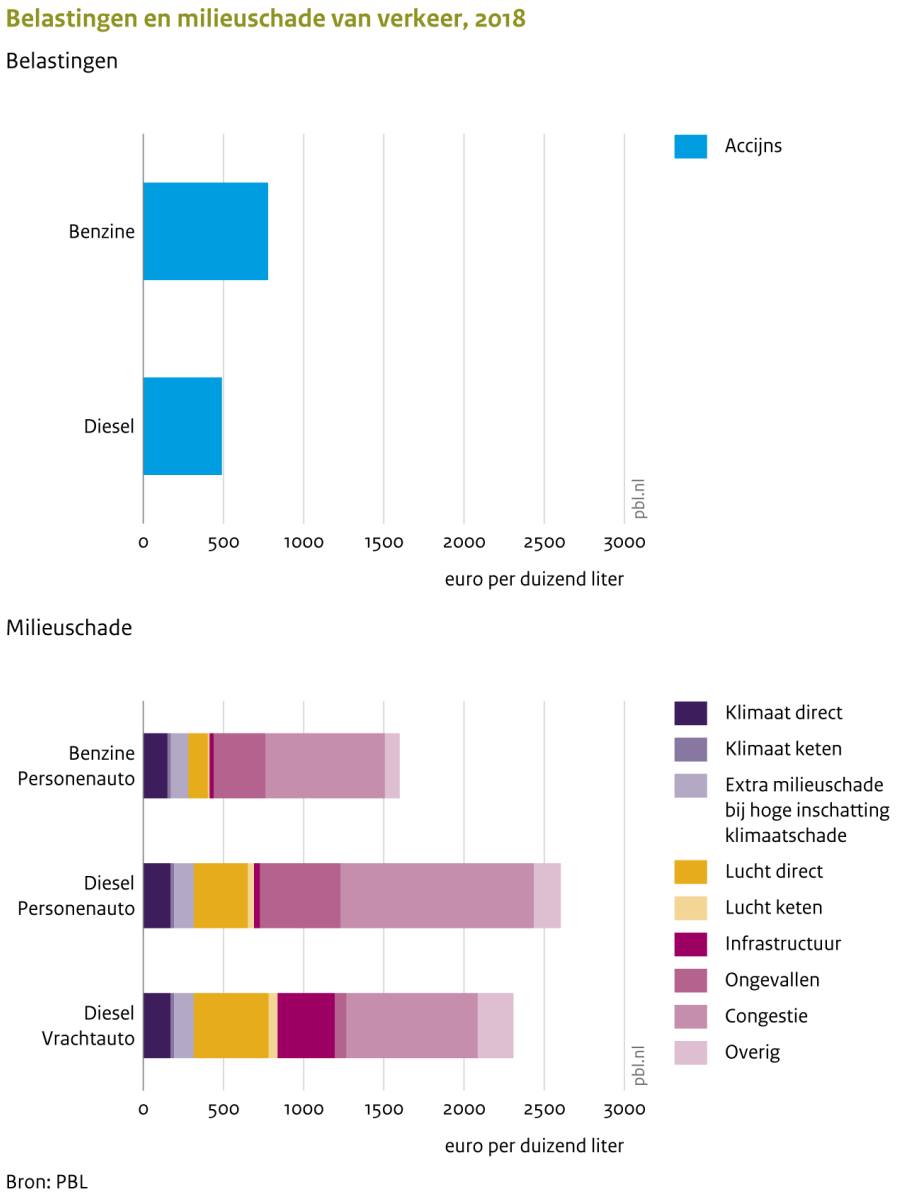
Example: carbon pricing in the Netherlands

- Economist: just use a simple uniform tax rule as the solution!
- Yes?
- The real world consists of multiple externalities but not always multiple instruments
- No simple solutions! Economist should be careful not to contribute to the fuzz!



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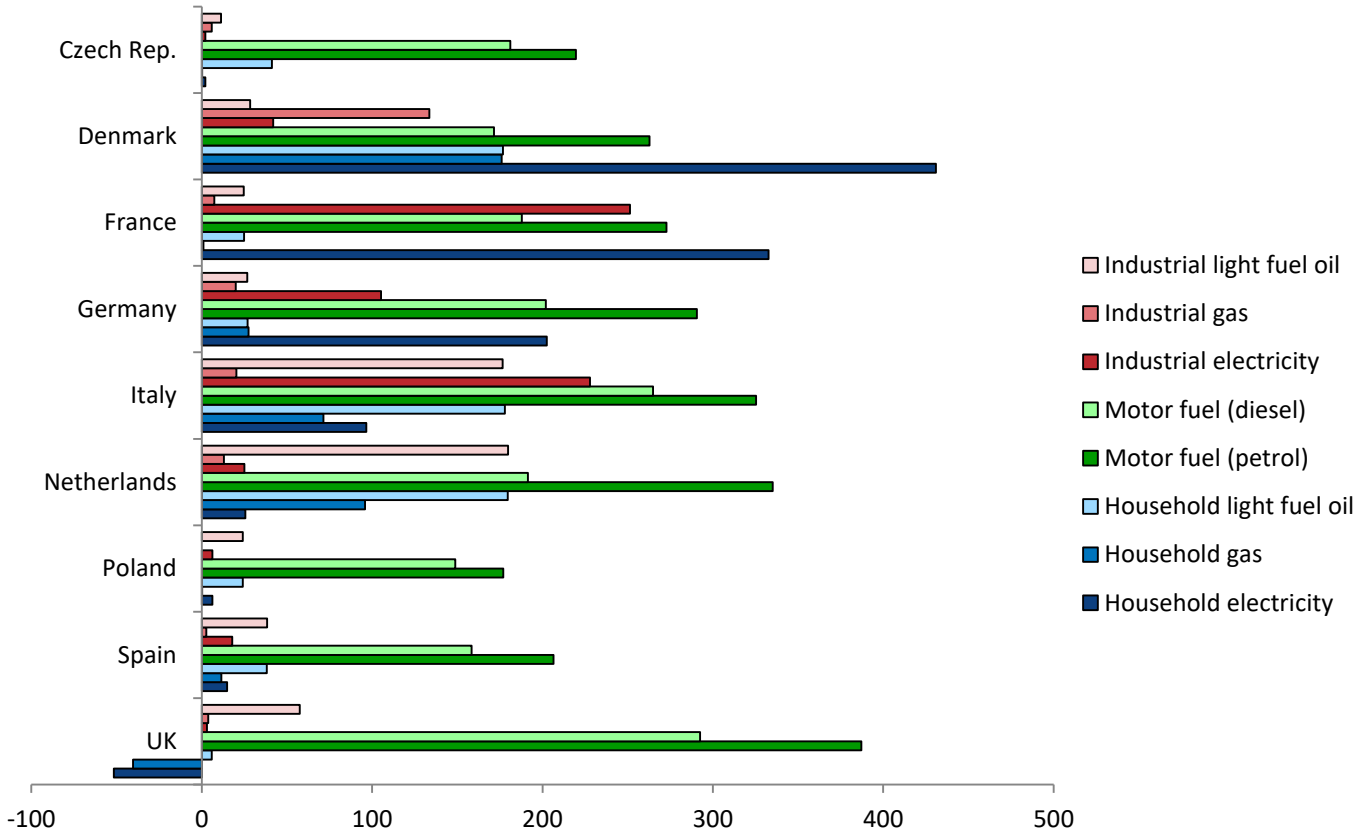
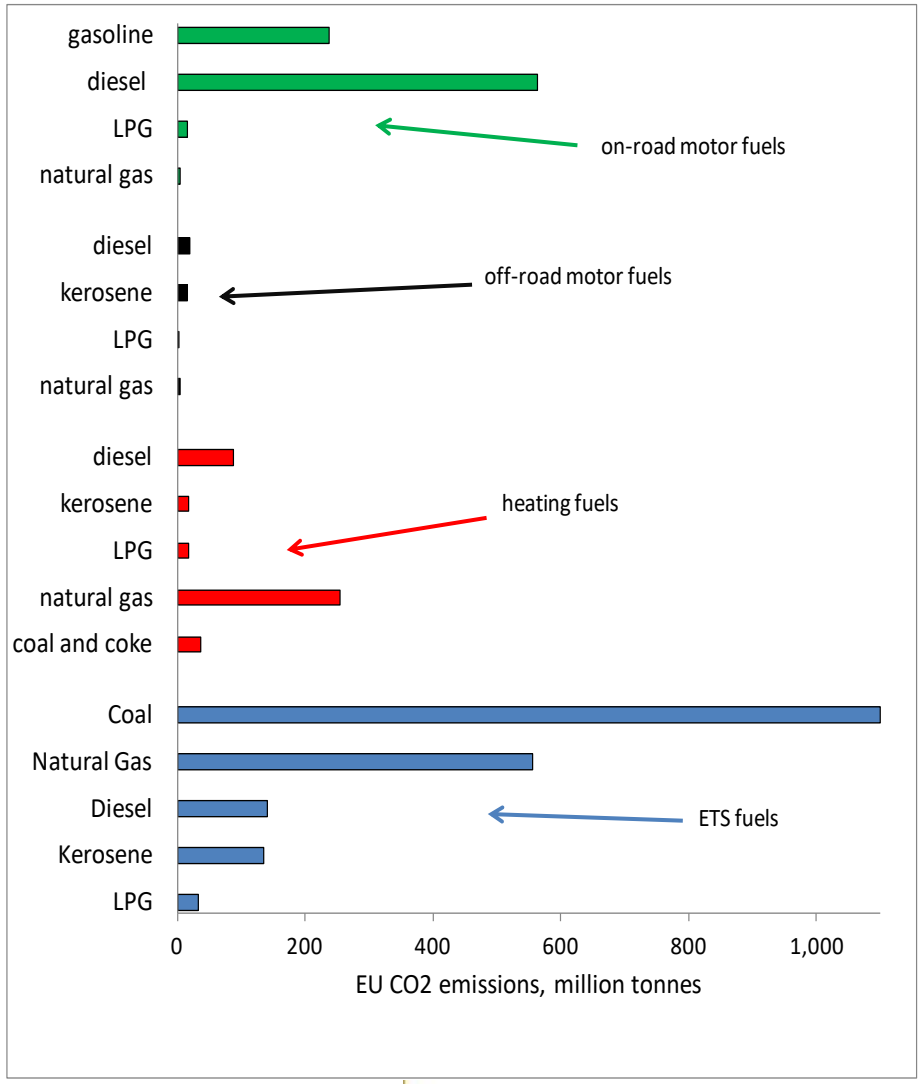
Example: energy taxation in the EU





Source: Parry and Vollebergh (2017)

Careful design of carbon pricing necessary

- Additional uniform *taxes* in Europe may cause inefficiency
  - Cap and trade already exists in ETS sectors
    - Additional tax crowds out cap-and-trade
  - Existing implicit taxes (usually in non-ETS sectors) may already be too high

- Uniform *prices* (ETS price + tax) helpful only if they take stock of existing role of ETS and the role of other externalities
  - Hybrid schemes: ETS vs taxes in non-ETS
  - ETS is on emissions while taxes are on inputs (mainly gas and electricity)

Careful design of carbon pricing: Pigovian gap analysis

	EU-ETS	EU Energy taxes
Aim	CO_2-emission reduction	CO_2reduction, air quality, congestion, etc

- Reference point: Pigovian carbon price on emisions equal to SCC

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Overlap	Not any more (CDM)	Yes (both tax bases and rates)

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Lessons for design of pricing primary system failure

- Price *base* (aim and scope) of different types of pricing instruments key element
  - ETS usually part of wider pricing scheme (role of energy or implicit carbon taxes)

  Lesson 1: Pigovian gap analysis should check carbon price *base* properly

- Levels of indirect carbon prices (e.g. ‘energy’ tax rate) should also factor in other externalities properly

  Lesson 2: Pigovian gap analysis of price should also account for other externalitiies relevant for the tax base

- PM Interaction with instruments to address secondary failure (subsidies)

Linking issues

	EU-ETS	Key design element
Aim	Reduction CO_2-emission	Absolute cap reducing CO_2 emissions to 0 in 2057
Scope	50% CO_2-emissions (Large emitters + aviation)	Installations above 20MW everywhere in EU
Price	Market (below SCC) Market stability reserve	Interemporal flexibiity Banking policy rules to steer carbon price
Timing	Gradual decline towards 2057 (political decision)	Overall linear reduction factor of 2.2% each year
Overlap	No	CDM option in the past

- Reference point: EU ETS design

Linking issues: key concerns

- Key concerns:
  1. Efficiency gains
  2. Design differences between ETS systems
  3. Role of overlapping (other) instruments with ETS

Ad 1. Efficiency gains: to what extent does a broader global market coverage offer global welfare gains?

- Linking could provide a more comprehensive level playing field and cost reductions, but at what costs?

  Example 1: credibility of CDM

  Example 2: lower price also reduces (innovation) incentives

Linking issues: key concerns

Ad 2. Design differences ETS systems: what are implications of differences in aim, scope, price, timing and overlapping (linked) instruments?

- Diffferences may backfire:

  Example 1: absolute vs relative targets

  Example 2: flexibility provisions (intertemporal, price floors vs MSR)

Ad 3. Overlapping (other) instruments:

- To what extent do overlapping instruments (taxes, subsidies) create positive or negative spillovers?

  Example: Leakage concerns of local subsidies for innovative CO_2-abatement technologies

Careful carbon pricing

- Pros and cons of linking ETS systems requires a careful analysis of consequences of design differences
- Role of ETS should be linked to the wider Pigovian gap analysis of carbon pricing in general
  - Should also include (differences in) local carbon and energy taxes and other externalities
- Role of ETS should also be considered in the broader perspective of instrument choice for transitions
  - Should also include secondary market failure and its interaction

Some literature on carbon pricing

- Fell, Hintermann and Vollebergh (2015) *Carbon Content of Electricity Futures in Phase II of the EU ETS*, The Energy Journal, 2015, 36, 4
- Sen, Vollebergh & Harding (2016), *Energy taxation in OECD countries: Effective tax rates across countries, users, and fuels*, in J. Strand (ed), *Economics and Political Economy of Energy Subsidies*, MIT Press
- Brink, Vollebergh & van der Werf (2016), *Carbon pricing in the EU: Evaluation of different EU ETS reform options*, Energy Policy, 97, 603-617.
- Parry and Vollebergh (2017), *Reforming the EU Energy Tax Directive: Assessing the Options*, in: K. Pittel, I. Parry & H. Vollebergh (eds), Energy Tax and Regulatory Policy in Europe, MIT Press
- Sen and Vollebergh (2018), *The Effectiveness of Taxing Carbon Content of Energy Consumption*, Journal of Environmental Economics and Management, 92, 74-99