Emissions Trading in the Climate Policy Instrument Mix

Interaction with other policy instruments and implications for the optimality of climate efforts

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Benjamin Görlach

Ecologic Institute, Berlin

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SEVENTH FRAMEWORK PROGRAMME

Outline

- Policy context: the transformation to a low-carbon economy
- How do Emissions Trading and other (climate) policy instruments overlap?
- Why can instrument overlap and instrument interactions be a problem?
- How to manage the overlap and interactions between climate policy instruments – what could an optimal climate policy instrument mix look like?
- Working to answer these questions: the CECILIA2050 project

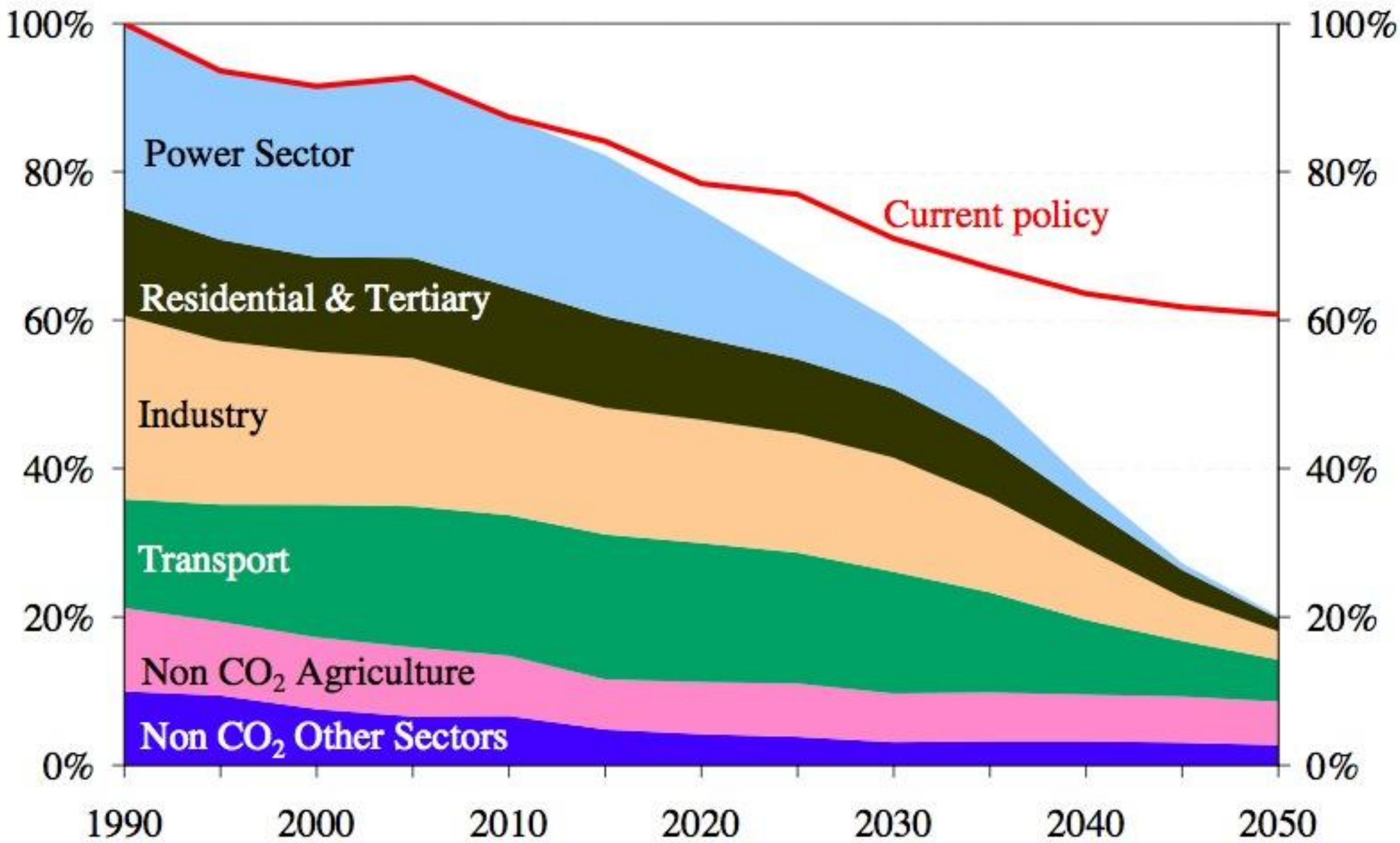
Starting point: the EU is heading for a low-carbon economy

BRUSSELS EUROPEAN COUNCIL
29/30 OCTOBER 2009

PRESIDENCY CONCLUSIONS

The European Council calls upon all Parties to embrace the 2°C objective and to agree to global emission reductions of at least 50%, and aggregate developed country emission reductions of at least 80-95%, as part of such global emission reductions, by 2050 compared to 1990 levels; such objectives should provide both the aspiration and the yardstick to establish mid-term goals, subject to regular scientific review. It supports an EU objective, in the context of necessary reductions according to the IPCC by developed countries as a group, to reduce emissions by 80-95% by 2050 compared to 1990 levels.

Current policy mix is not equipped for reaching the 2050 targets

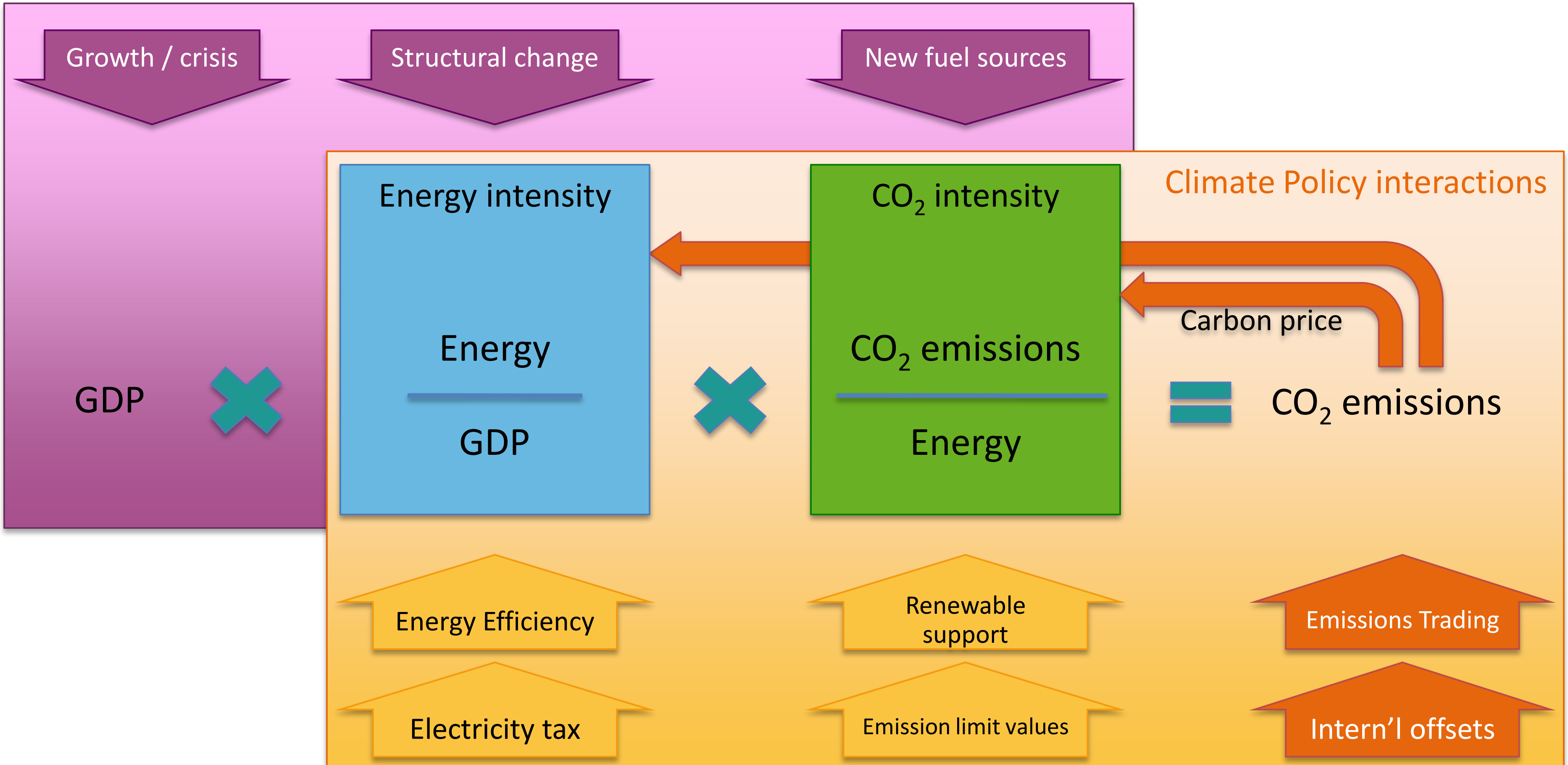


Source: "A Roadmap for moving to a competitive low carbon economy in 2050" COM(2011)112

The policy challenge: how to manage the transformation?

- EU and MS already employ a variety of climate policy instruments – but current instruments are not sufficient to reach the 2030 – 2040 – 2050 milestones
- Existing instruments need to be scaled up considerably, and new instruments added to the policy mix
- This raises a number of issues:
  - How is the current policy mix performing, and how far can it be scaled up? What constraints need to be addressed? Which new instruments do we need?
  - What does an "optimal" instrument mix for European climate policy look like – taking into account the real-life constraints and barriers, and the lessons learnt from past successes and failures?
  - How to deal with uncertainties, where to be rigid and where flexible?
  - How to manage the increasing interactions and overlap of policy instruments?

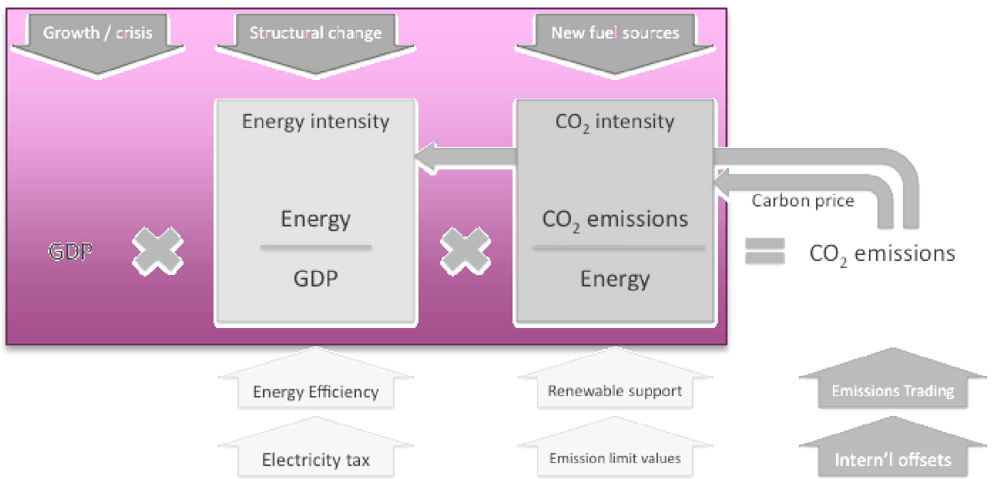
Emissions Trading in the Climate Policy Mix*



*for simplicity, only energy-related emissions shown here.

Emissions Trading in the Policy Mix: exogenous influences

- Exogenous factors (beyond climate policy): general economic trends, unforeseen technological developments, developments in other policy areas, radical policy changes, accidents …
- Plenty of examples where exogenous factors have had decisive impact on ETS:
  - EU ETS 2008 – 2013: impact of the economic crisis (decrease in industrial output, power consumption)
  - RGGI: Shale gas boom (natural gas price collapsed - massive fuel switch from coal to gas)
  - TMG trading scheme: Fukushima nuclear accident 2011 (electricity shortages, temporary rationing for electricity consumption)
  - US SO_2 Trading Scheme: availability of low-sulphur coal from the Western US (due to liberalisation of the railway market, falling freight rates)



Interactions between climate policy instruments: obvious cases…

- Waterbed effect: the cap fixes the total emissions for the covered sector. Additional policies cannot lead to emission reductions, but will only affect the distribution of emissions between sectors, and the allowance price (unless the cap is adjusted…)
- Carbon intensity of the power sector
  - High carbon price – low carbon intensity of the power sector: estimated reduction contribution of renewables is lower, abatement cost higher
  - Vice versa for a low carbon rice
- Use of revenue: if part (or all) of the allowances are auctioned, the revenue can be used for different purposes – helping to overcome barriers and constraints
  - Achieve additional emission reductions in the non-covered sector, e.g. support investments in sectors that are not sensitive to the carbon price (housing)
  - Address undesirable effects, such as impacts on vulnerable groups
  - Support flanking measures that enhance the functioning of the scheme – e.g. campaigns to raise awareness, inform about abatement options

… and less obvious examples

- Power market: high share of renewables drive down costs on the wholesale power market (guaranteed grid access, near-zero marginal cost).
  - Eventually, power markets may need to be complemented with other instruments (capacity mechanism). Unclear how / if a carbon price can be incorporated in such mechanisms.
  - Feed-in-tariff: low carbon price drives down wholesale electricity prices. If renewables receive a fixed remuneration, the gap between wholesale prices and fixed tariffs widens - volume of the necessary transfer increases.
- Regulatory framework (in particular energy market reform)
- Competition for financial resources (investment)
- Administrative capacity (government agencies and regulated companies): competition for limited capacity, as well as synergies with other regulation
- Competition for political attention (parliaments, decision makers, stakeholders have limited capacity to initiate and to pursue policy developments)

So how do we deal with policy overlap and interactions?

ETS only

- Set cap in line with the emission objective
- Leave it to the market to determine the most efficient way to get there – don't worry about the carbon price
- Renewables and energy efficiency are still relevant, but need to be triggered through the carbon price
- Only one tool – no overlap
- No need to account for interactions

Policy mix

- Make assumptions about all factors that have an effect on the emissions in the covered sectors (other policies, exogenous factors)
- Plan the contribution of different instruments based on abatement cost (current and future), abatement potential etc...
- Set cap in line with these assumptions and the emission objective
- Revisit assumptions periodically and, if necessary, adjust cap or other policies

Should we rely on a mix of policy instruments, and why?

NO, because…

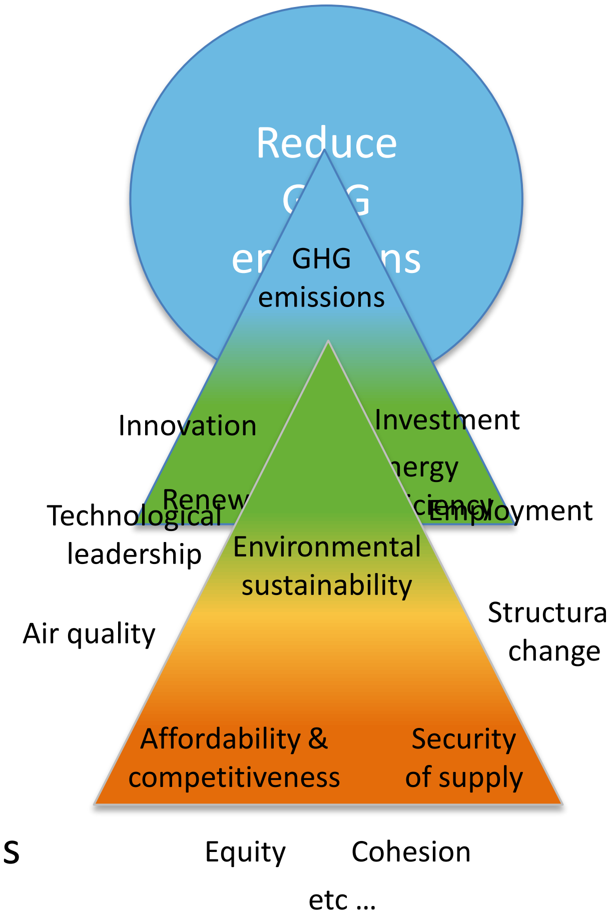
- … ETS only is the most efficient way to reduce carbon emissions – no need to interfere with the market, pick winners
- … with a fixed cap on total emissions, other policies do not reduce emissions, but only drive up costs (abatement cost, administration, bureaucracy)
- … ETS is most compatible with the climate target, as it caps absolute emissions – gets us where we need to be, no rebound-effects etc.

YES, because …

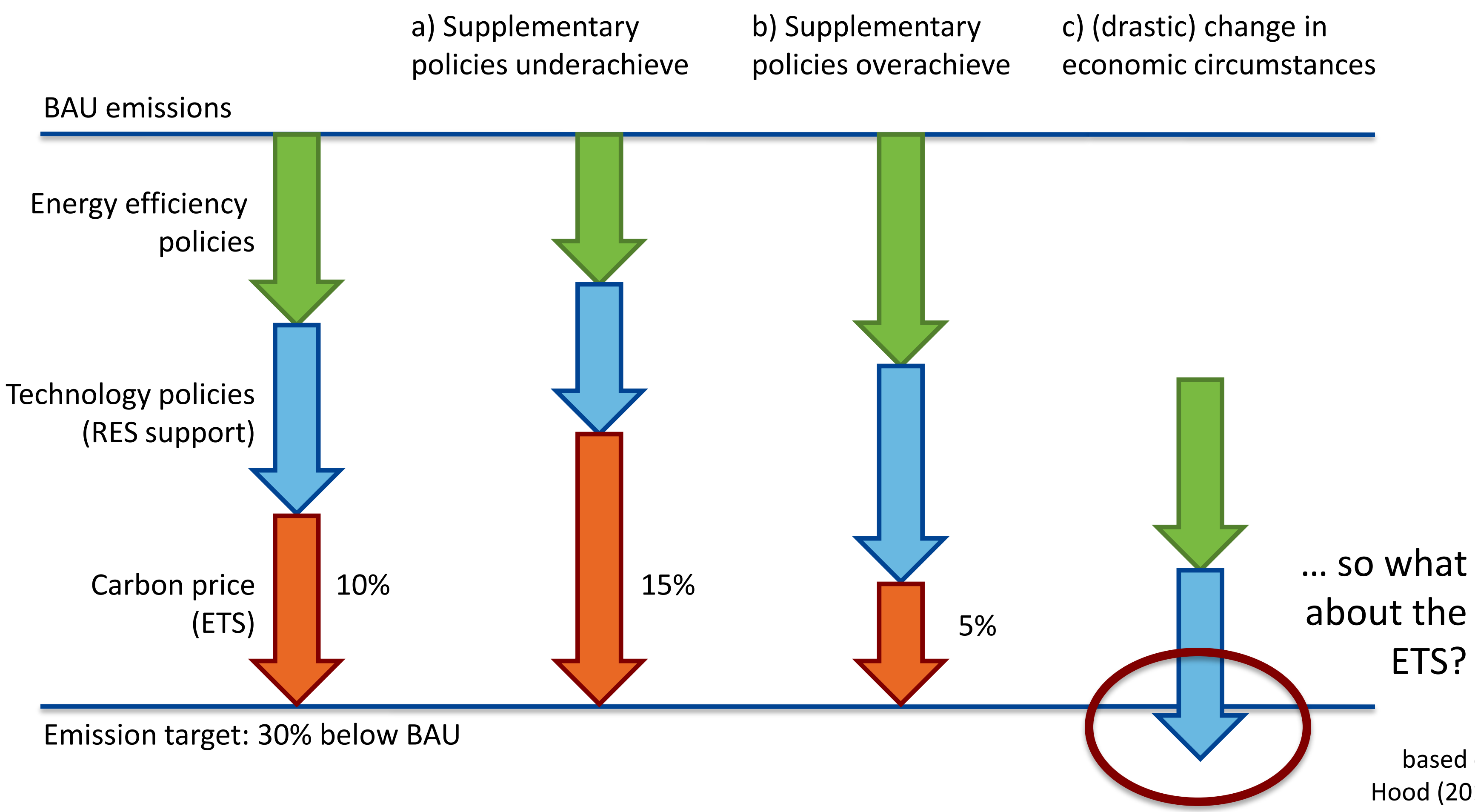
- … there are multiple objectives – even within climate policy
- … we need belt and suspenders (or seatbelt and airbag) to hedge against the risk of policy failure
- … different instruments have different functions in the policy mix
- … there are manifold other market failures, imperfections, barriers, so that the carbon price will not always work - flanking measures are needed to provide the right framework conditions

Arguments for a policy mix: multiple objectives

- ETS = the cheapest way to achieve the climate objective
- Which objective?
  - Emission reduction *should* be the overriding objective of all climate policy efforts
  - EU climate policy: Trias of objectives (GHG emission target, renewables target, energy efficiency target, plus biofuels target in transport) with no explicit hierarchy
  - Energy policy: Triangle of security of supply, affordability/ competitiveness and environmental protection
  - Wider policy context (e.g. Europe 2020 strategy) – competitiveness, jobs, innovation, equity, cohesion, rural development …
- Tinbergen rule: number of policies ≥ number of objectives
- Policy objectives (or their hierarchy) often not specified!



Arguments for a policy mix: belts and suspenders



based on Hood (2011)

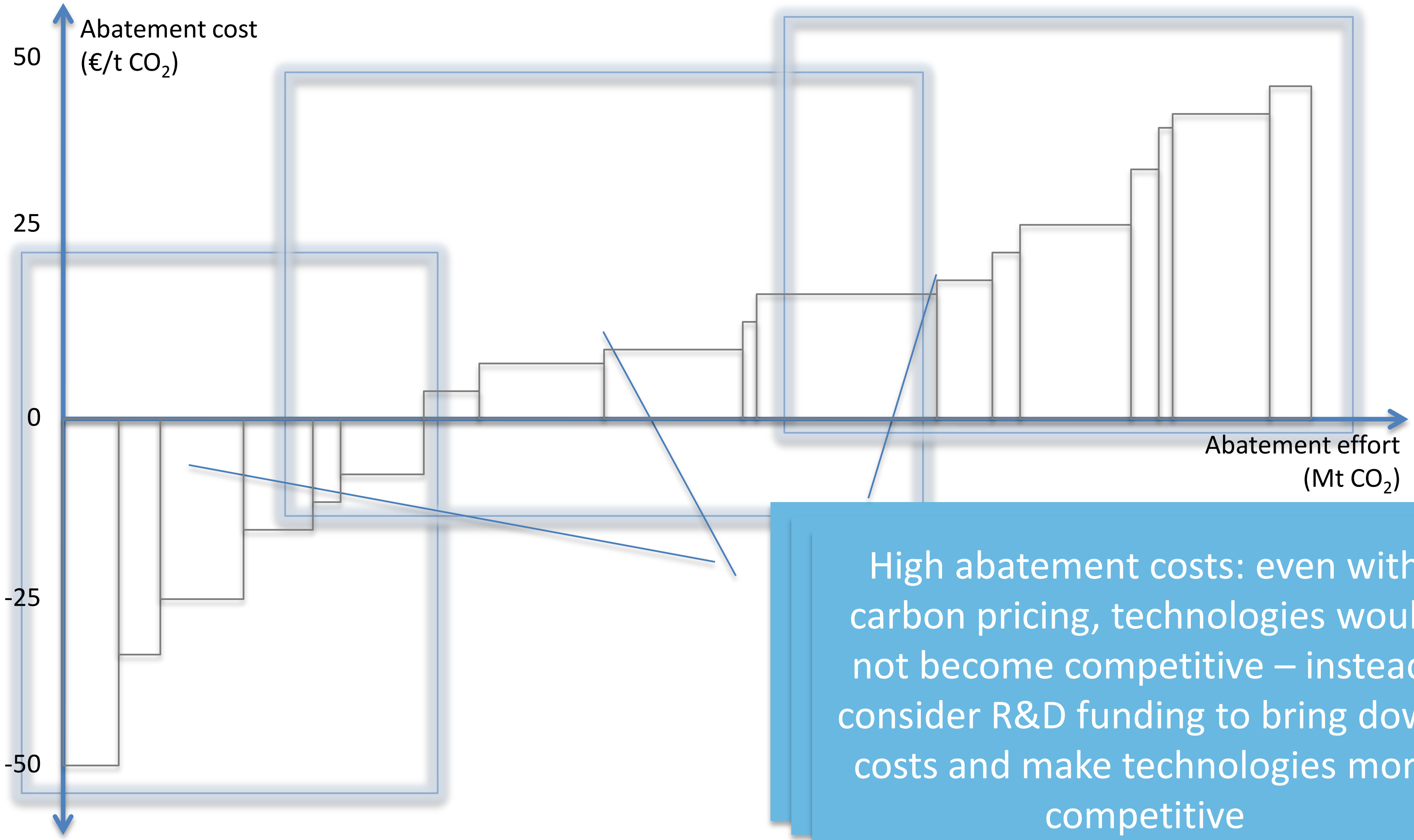
Arguments for a policy mix: functional differentiation

- Different policies for different tasks: de-carbonising an economy is a complex job, multidimensional problem requires multidimensional solutions
- Three pillars for the transition
  - Behavioural change
  - Substitution, optimisation
  - Technology development
- Economic and regulatory instruments mostly apply to substitution, optimisation

	Innovation, RTD policies	Carbon pricing	Soft measures
Behaviour	o	+	++
Optimisation	o	++	+
Technology	++	+	o

Source: Michael Grubb (forthcoming), CO_2NNECT

Arguments for a policy mix: limits to carbon pricing



High abatement costs: even with carbon pricing, technologies would not become competitive – instead, consider R&D funding to bring down costs and make technologies more competitive

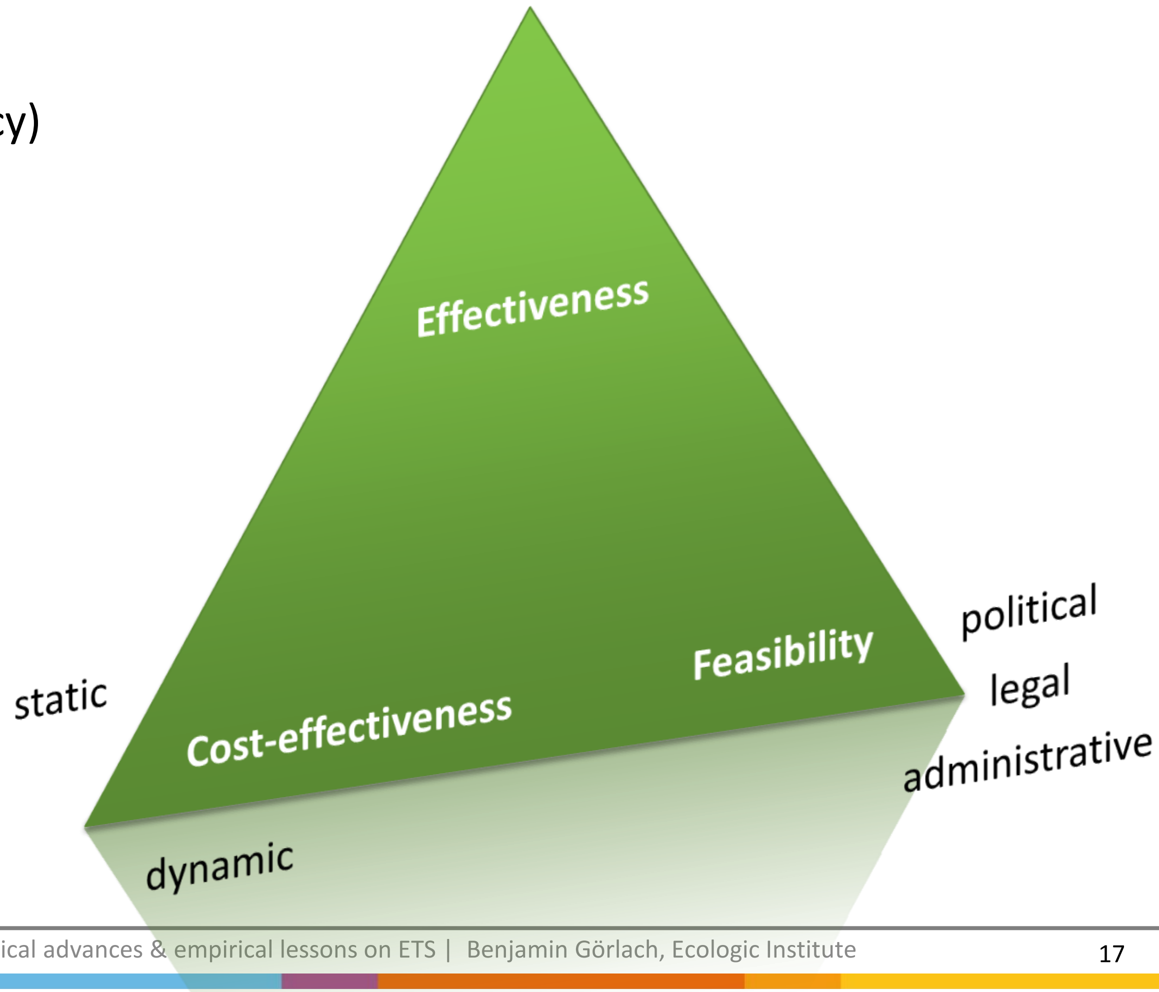
So what should an “optimal” climate policy mix look like?

- If we agree that we need a mix of climate policy instruments – what should an optimal climate policy instrument look like?
  - Policies that get us to the EU Climate Targets, with minimal adverse impacts on society and economy – now and over time
  - Policies that stand a chance of being adopted and implemented, and function as expected once they are implemented
  - Policies that can deal with the manifold uncertainties and surprises that expect us on the way to a low-carbon economy: Flexible where possible, rigid where necessary
  - Policies that function as a policy mix – exploiting synergies and avoiding conflicts between policy instruments
- Other valid considerations – but not addressed here:
  - Are EU climate targets justified from a cost-benefit perspective, i.e. welfare-maximising;
  - Do EU climate targets strike an efficient balance between mitigation and adaptation;
  - Are European efforts optimal in the light of global (non-)efforts to fight climate change

Criteria for optimality of climate policies

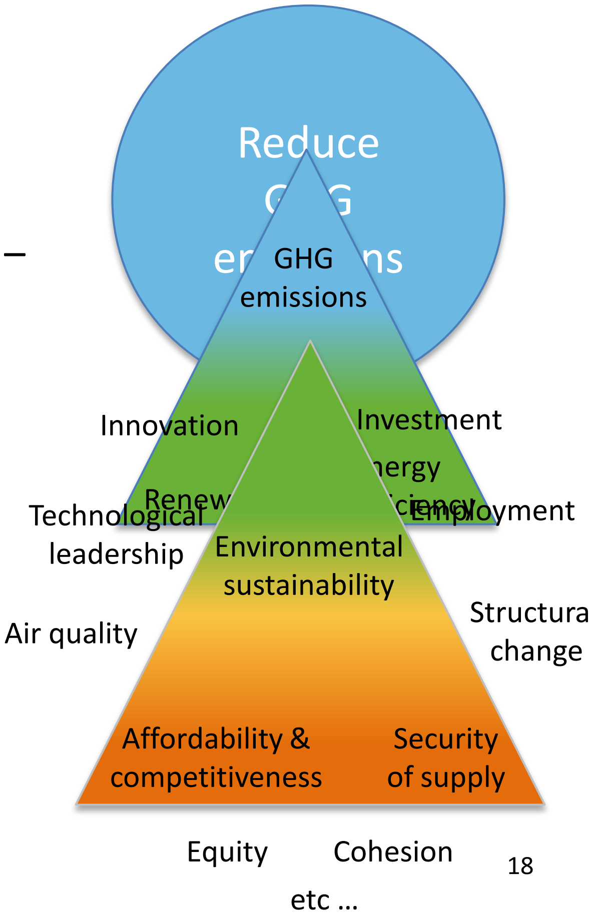
Set of criteria for “optimal” policies defined for the CECILIA2050 project

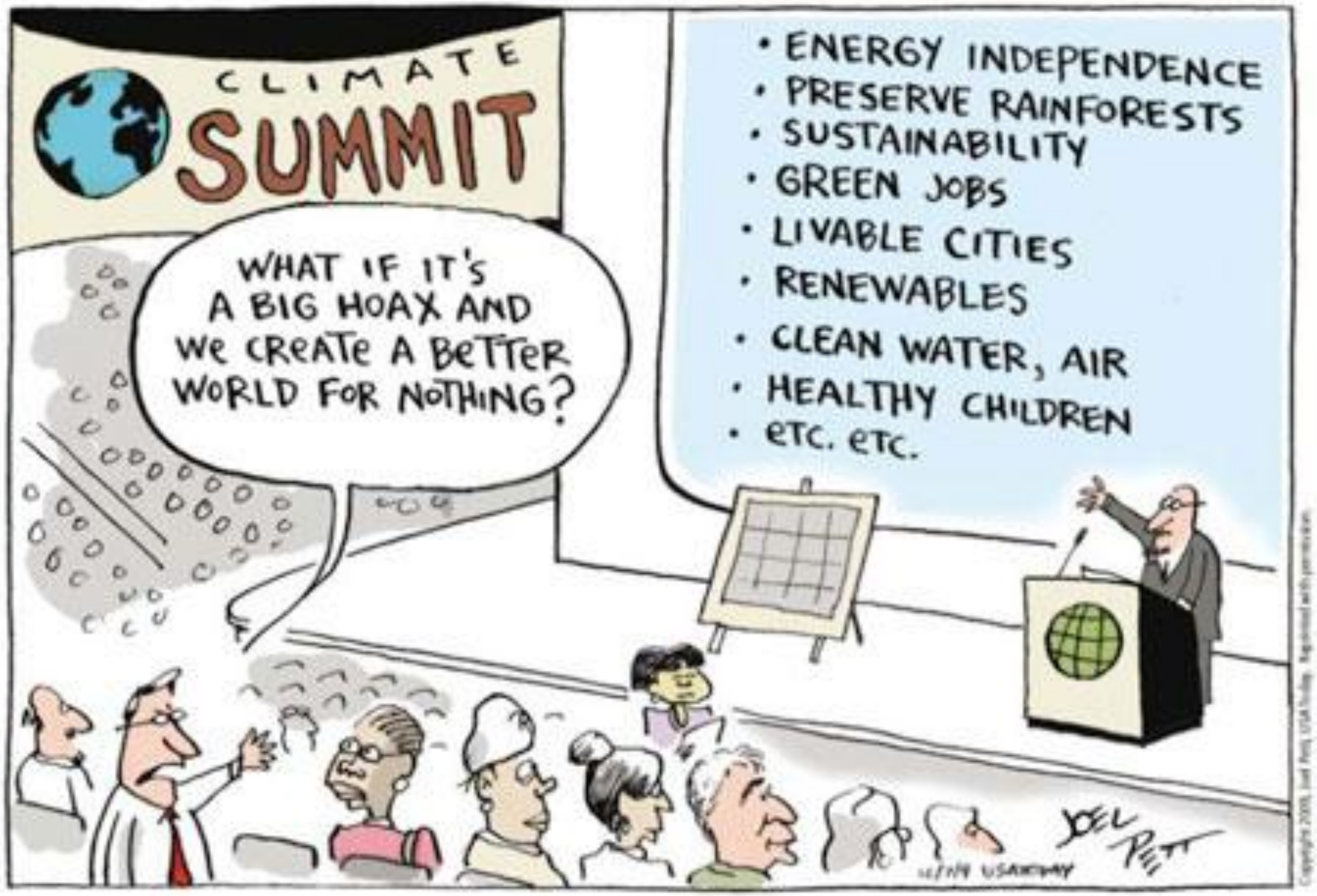
- Effectiveness
- Cost-effectiveness (efficiency)
  - Static efficiency
  - Dynamic efficiency
- Feasibility
  - Political feasibility
  - Legal feasibility
  - Administrative feasibility



Criteria for optimality of climate policies – 1: effectiveness

- Effectiveness := is the policy achieving its objective(s)?
- Which objective?
  - Multitude of objectives (climate policies – energy policies – wider policy context)
  - No clear hierarchy, often not clearly specified or implicit
  - Focus on GHG emissions may be intuitively obvious – but other objectives may have much more political clout
  - Hierarchy of objectives is a very normative / political decision





Source: Joel Pett, NY Times / http://www.tumblr.com/tagged/joel-pett

Criteria for optimality of climate policies – 2: cost-effectiveness

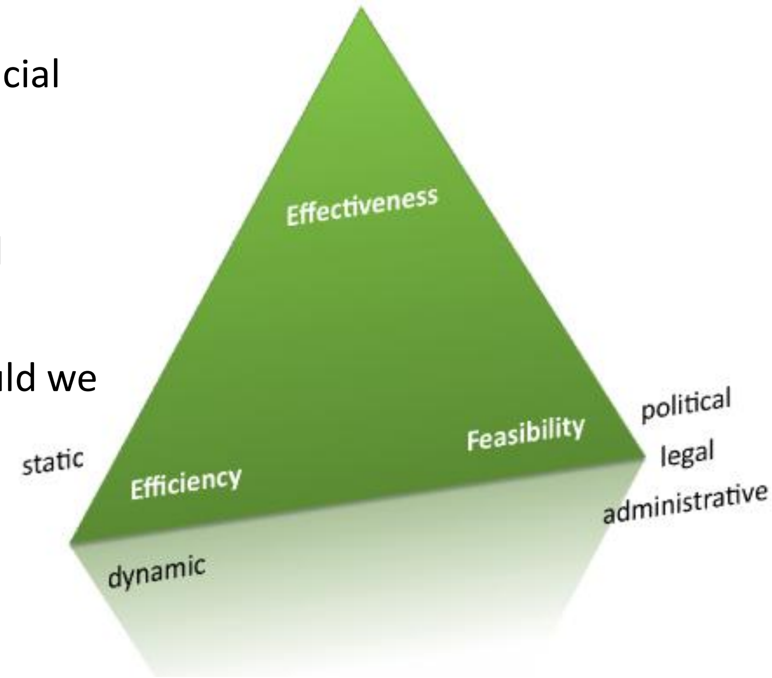
- Cost-effectiveness (efficiency) := is the objective of the policy intervention achieved at least cost to society?
- Static efficiency: all emitters covered by the policy mix, and all face an equivalent incentive to reduce emissions, so that marginal abatement costs are equalised across sectors (emissions are reduced where it is cheapest to do so) - *given the currently available abatement options*
- Dynamic efficiency: minimising the cost of achieving climate targets *over a given time period*, by giving emitters a continuous and ongoing incentive to search for cheaper abatement options
  - Policy instruments induce innovation and diffusion of low-carbon technologies, avoid technological lock-in
  - Trade-off between flexibility (adapting policies in the light of new information, e.g. falling prices of low-carbon technologies) and predictability (creating a credible long-term commitment and providing clear signals to investors)
  - Dynamic efficiency implies that technologies can be supported that are

Criteria for optimality of climate policies – 3: feasibility

- Feasibility: addresses the risk that the risks that a planned policy
  - might not be implemented as designed, or
  - once implemented, might not deliver the expected results
- Political feasibility:
  - acceptance or resistance of policies by the public at large (in their function as voters or as consumers) and by organised interest groups;
  - Support for policies (or lack thereof) by policy makers.
- Legal feasibility: compatibility and coherence of climate policy instruments with existing legislation (primary and secondary), national legislation, legal institutions
- Administrative feasibility: administrative burden of policy implementation in proportion to the administrative capacity; including both the transaction cost for regulated entities (bureaucratic burden), and the effort of government agencies to implement an instrument and ensure compliance.

Is it possible / sensible to aggregate the optimality criteria?

- Ideal for optimisation: different criteria aggregated into an objective function ("maximise y(x) subject to the constraints a, b and c")
- Aggregation of criteria requires weighting / trading off – i.e. a normative decision
- Alternative: establish a hierarchy / ranking among the criteria? Remains a highly normative exercise:
  - Environmental(ist) perspective: effectiveness is crucial – after all, this is about controlling climate change;
  - Economic perspective: cost-effectiveness is key – after all, this is about maximising the public good with limited resources;
  - Pragmatic perspective: feasibility is key – why should we consider policies that do not stand a chance to be adopted and implemented, or don't deliver what they promise?



(Interim) conclusions for an “optimal” policy mix

- Carbon pricing is an essential element of the climate policy mix – indispensible for achieving an efficient distribution of allocation efforts.
- But: a proper pricing tool is needed – the EU ETS does not achieve this in its current shape. On the whole, there is a considerable discrepancy between Europe’s climate ambitions and the policy instruments in place (leading to anxiety among investors).
- Carbon tax might have been a superior option to ETS in theory – but political and legal constraints mean that this option is not a feasible alternative (for the time being).
- Dynamic efficiency of carbon pricing is questionable – does the ETS incentivise innovation and guide investment? Should be the case in theory … but in practice?
- Technology support measures, planning tools for infrastructure, support for energy efficiency are necessary as complementary policies. They are justifiable in terms of dynamic efficiency, and to address other market failures – but need to deliver on this promise. Stronger market-orientation needed as renewables have left the niche.
- Climate policy and energy policy are becoming ever more inseparable.

Tackling the 2050 policy mix – the CECILIA2050 project

Choosing
Efficient
Combinations of Policy
Instruments for
Low-carbon development and
Innovation to
Achieve Europe's
2050 climate targets

SEVENTH FRAMEWORK PROGRAMME

Funded by the European Union

… for more information, see
www.cecilia2050.eu

Who we are: 10 partners from 8 countries

- **NL:** Institute of Environmental Sciences (CML) at Leiden University
- **NL:** Institute for Environmental Studies (IVM) at the Free University of Amsterdam
- **CZ:** Charles University Prague (CUNI)
- **PL:** University of Warsaw
- **UK**: University College London (UCL)
- **F:** Centre International de Recherche sur l'Environment et le Developpement (CIRED)
- **ES:** Basque Centre for Climate Change (BC3)
- **IT:** University of Ferrara (UNIFE)
- **DE:** Institute of Economic Structures Research (GWS) in Osnabrück/Germany
- **DE:** Ecologic Institute in Berlin as project leader

The CECILIA2050 project: key features

- A 3-year research project with 10 partners from all across Europe
- Interdisciplinary and geographically diverse approach
  - Working across disciplines – combining economics, law, political science
  - Joining researchers from eight European countries with different socioeconomic & policy backgrounds
- Broad notion of "optimality" – explicit treatment of political, legal and administrative feasibility
- Consider the entire policy mix - focus on interactions of policy instruments
- Combination of different quantitative approaches with qualitative methods
  - Macroeconomic models (GINFORS), energy models (TIAM-UCL), global CGE models (GTAP-E), micro-simulation models (private households, building sector), legal analysis, focus groups, household / consumer surveys, serious gaming, Delphi polls…
- Involvement of stakeholders and practitioners' knowledge

Thank you for your attention.

Benjamin Görlach, Ecologic Institute

www.cecilia2050.eu