An Introduction to the CECILIA2050 Project

Joint ENTRACTE-CECILIA2050 Workshop on Climate Policies
Dublin, 12 September 2013

Benjamin Görlach

Ecologic Institute, Berlin

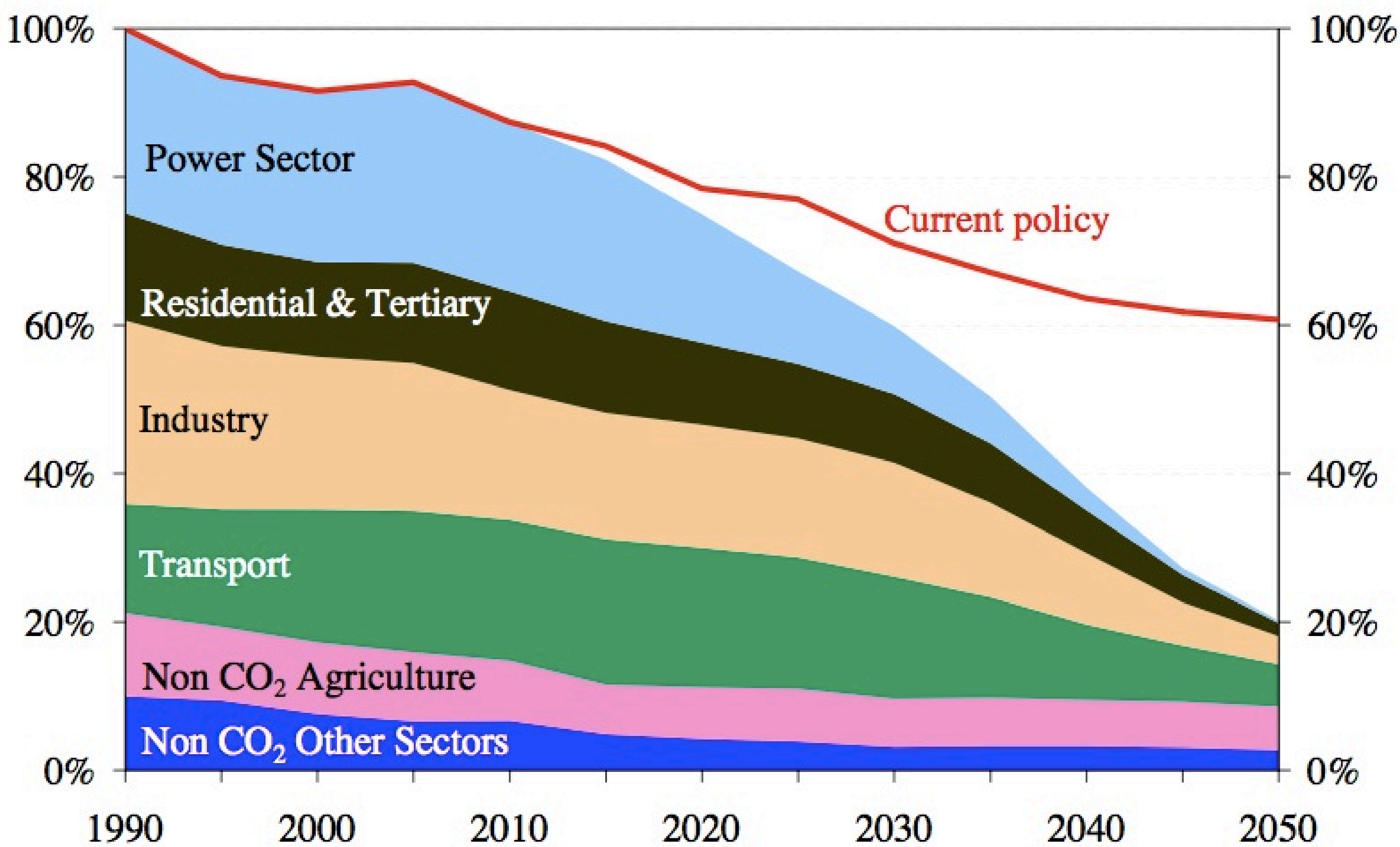
The EU's 2050 target: 80-95% reductions = decarbonisation

BRUSSELS EUROPEAN COUNCIL
29/30 OCTOBER 2009

PRESIDENCY CONCLUSIONS

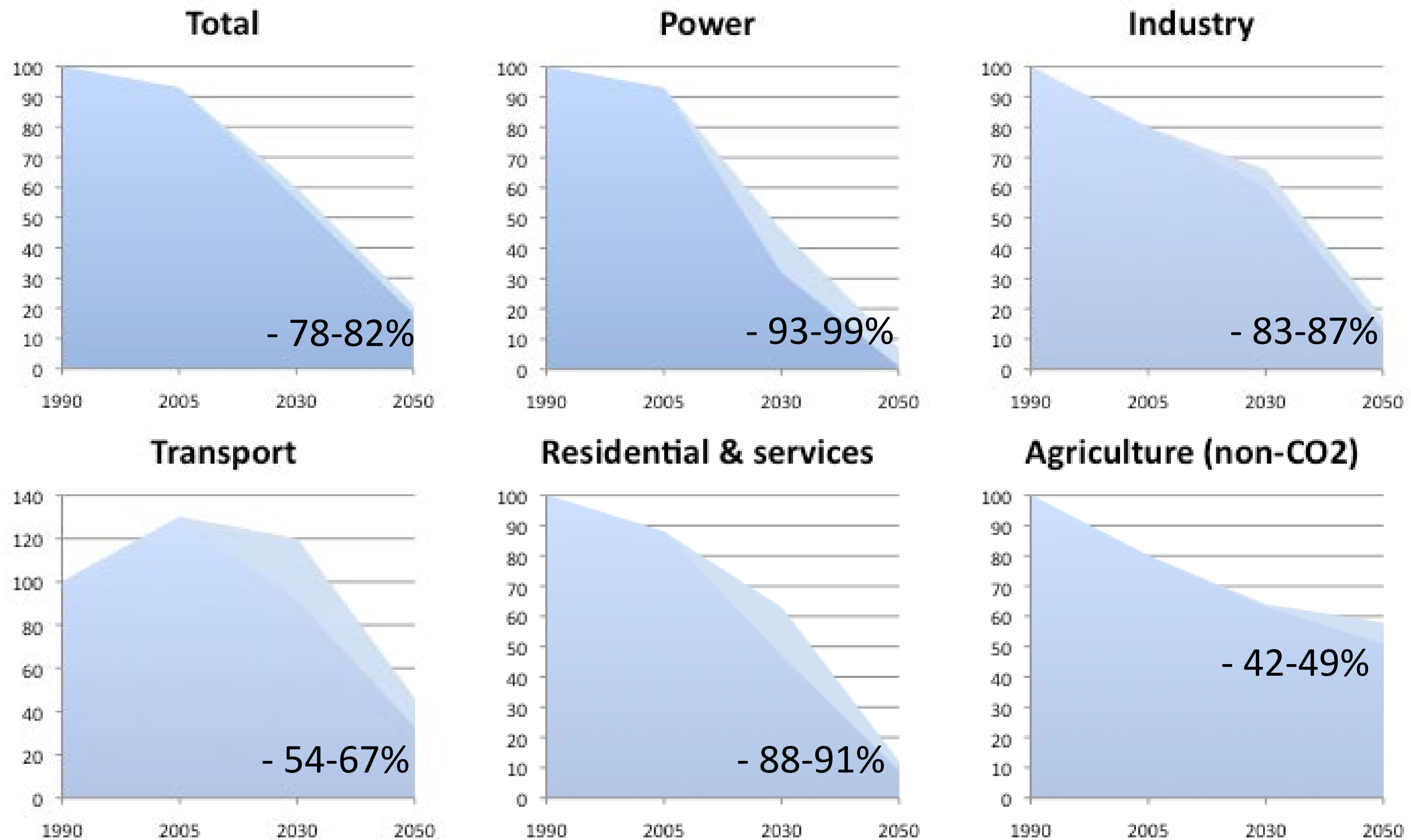
The European Council calls upon all Parties to embrace the 2°C objective and to agree to global emission reductions of at least 50%, and aggregate developed country emission reductions of at least 80-95%, as part of such global emission reductions, by 2050 compared to 1990 levels; such objectives should 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

Radical Transformation Required in all Parts of the Economy



Source: Roadmap Impact Assessment SEC(2011) 288

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?
  - How to manage the increasing interactions and overlap of policy instruments?
  - How to deal with uncertainties, where to be rigid and where flexible?
  - 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?

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

CECILIA 2050
OPTIMAL EU CLIMATE POLICY

eco logic

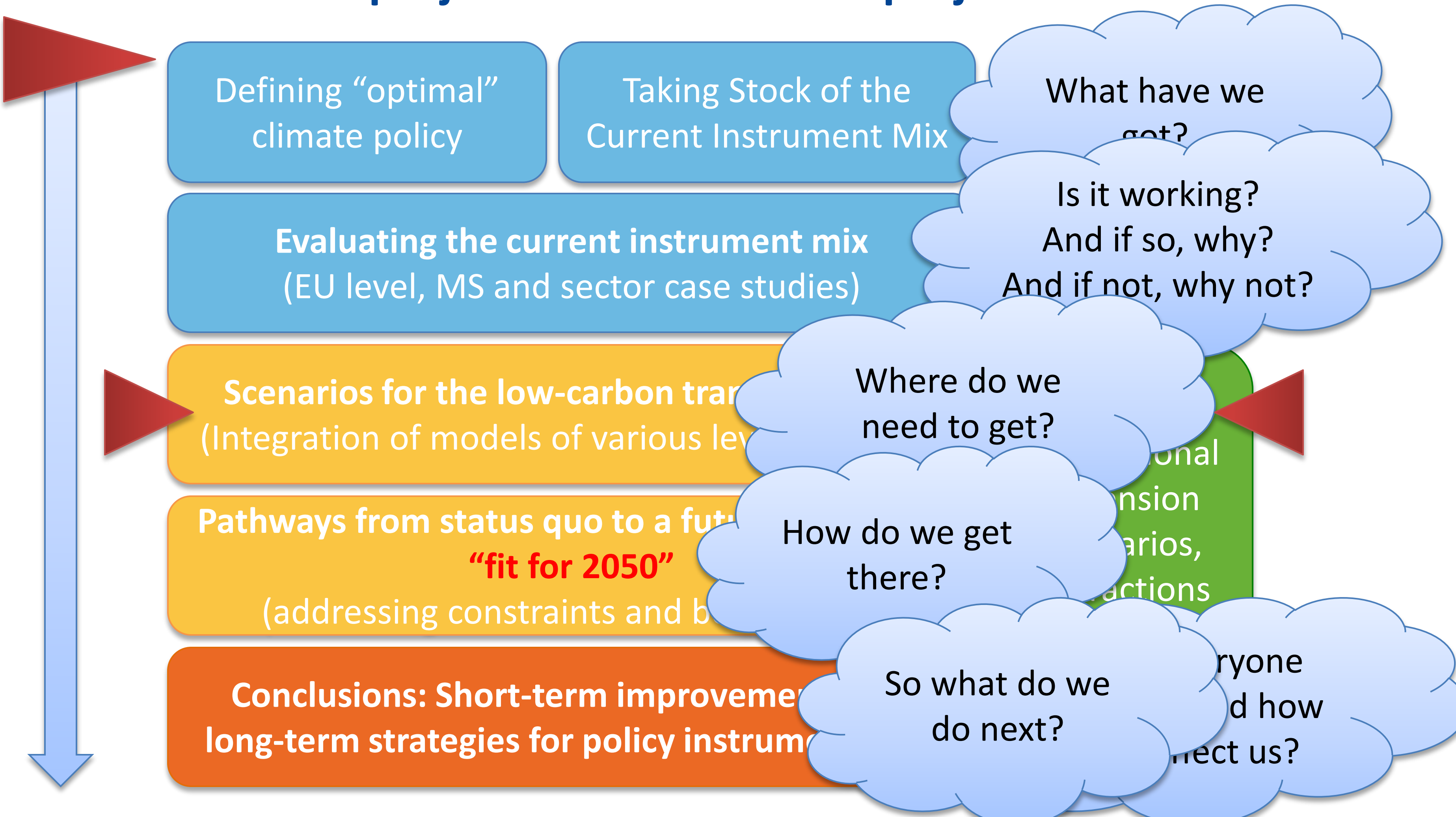
Who we are: 10 partners from 8 countries

- **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

- 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
  - Through conferences and workshops, permanent Advisory Board and college of practitioners, gaming and focus groups

The CECILIA2050 project: overview of the project structure



A few thoughts on the "optimality" of climate policies

- Notion of optimality: central concept in economics
  (maximise y, subject to constraints a, b, c)
- Optimal climate policy – fairly easy to define in an ideal world:
  - Establish carbon price that internalises the external costs of carbon emissions
  - If a carbon price is established, additional policies can only make things more complicated – and more expensive
- Alas, reality is more complex…

What complexities are we facing?

- Multitude of objectives:
  - In climate policy alone (emission reduction, renewable share, energy efficiency),
  - In the wider policy context (energy policy, social objectives, industrial policy and competitiveness, geopolitics, etc.).
  - Plus: objectives are not independent of each other.
- Path dependency and lock-in risk:
  - Choices are contingent on past decisions: e.g. innovation, infrastructure;
  - Institutions matter – regulatory framework, e.g. in the energy market;
  - Systemic constraints and obstacles, e.g. landlord-tenant dilemma;
- Surprises are possible:
  - Unforeseen economic and technological developments, e.g. economic crisis, fracking;
  - Political upheavals, e.g. Germany post-Fukushima
- System boundaries: carbon leakage, small emitters, diffuse sources…

What do we mean by optimality?

- 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

What do we *not* mean by optimality?

- Assessment whether the EU climate targets are in fact justified from a cost-benefit perspective, i.e. whether they are in fact welfare-maximising;
- Assessment whether the EU climate targets strike an efficient balance between mitigation and adaptation (or geoengineering);
- Assessment whether European efforts are optimal in the light of global efforts to fight climate change (or lack thereof)
- Bottom line: EU climate targets (decarbonisation by mid-century) are taken as given – optimality refers to the best way of getting there.

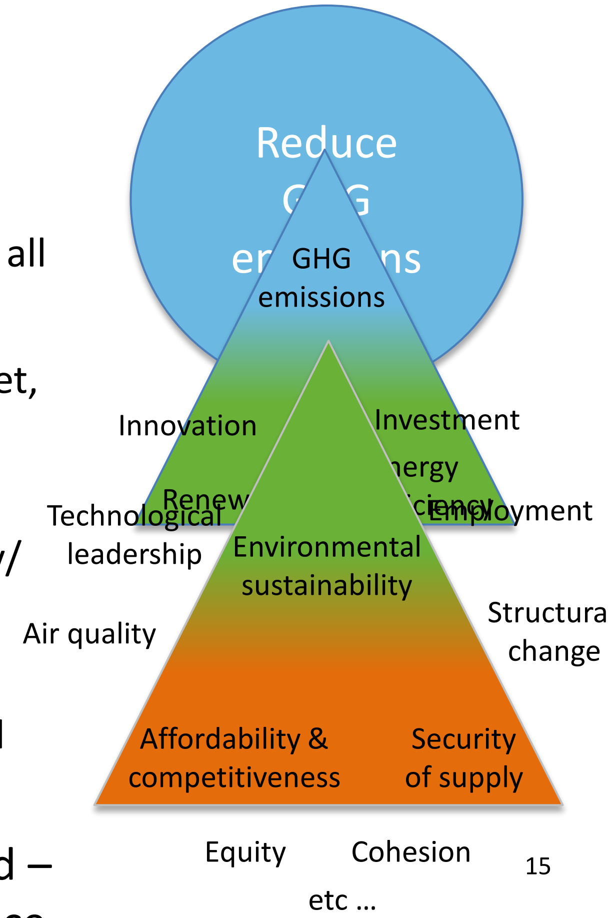
Criteria for optimality of climate policies

Set of criteria for the CECILIA2050 project – based on the existing literature

- 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?
  - 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 …
- Policy objectives (or their hierarchy) often not specified – at EU level, impact assessments provide some coherence



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

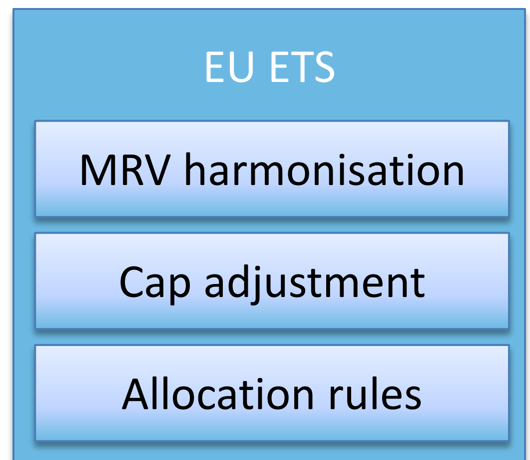
- Cost-effectiveness (efficiency) := is the objective of the policy intervention achieved at least cost to society?
- Static efficiency: all emitters covered by the policy mix, and all face an equivalent incentive to reduce emissions, so that marginal abatement costs are equalised across sectors (emissions 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)

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 (at the level of policy *outputs*), or
  - that the policy might not deliver the expected results once implemented (policy *outcomes*), including unintended side-effects.
- 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 EU legislation (primary and secondary), as well as national legislation.
- 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.

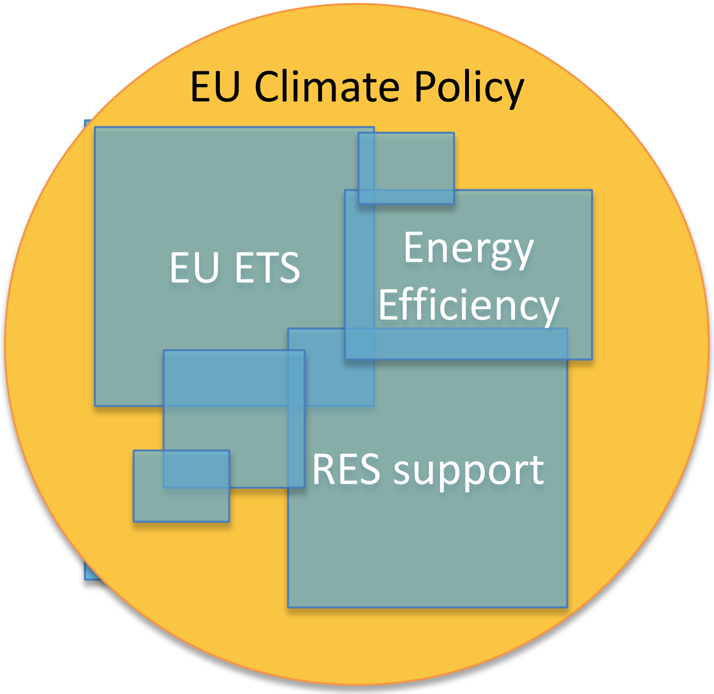
Optimality – at what level?

- Optimisation of individual policy instruments:
  - is the instrument well-designed and performing as planned, or could it be enhanced through design changes?
  - E.g. allocation methods, harmonisation, set-aside in the EU ETS; adaptation of feed-in-tariff rates; tax exemption rules and loopholes: micro planning of policies



Optimality – at what level?

- Optimisation of the climate policy instrument mix:
  - are the different climate policy instruments well-integrated, coherent and consistent, do they cover all major sectors and emitters? Are the different instruments mutually supportive, or do they conflict?
  - E.g. interaction between RES support, energy efficiency and the ETS cap; distribution of reduction efforts across broad economic sectors: macro planning of the climate policy mix
  - Alignment between EU-level and national climate policy instruments

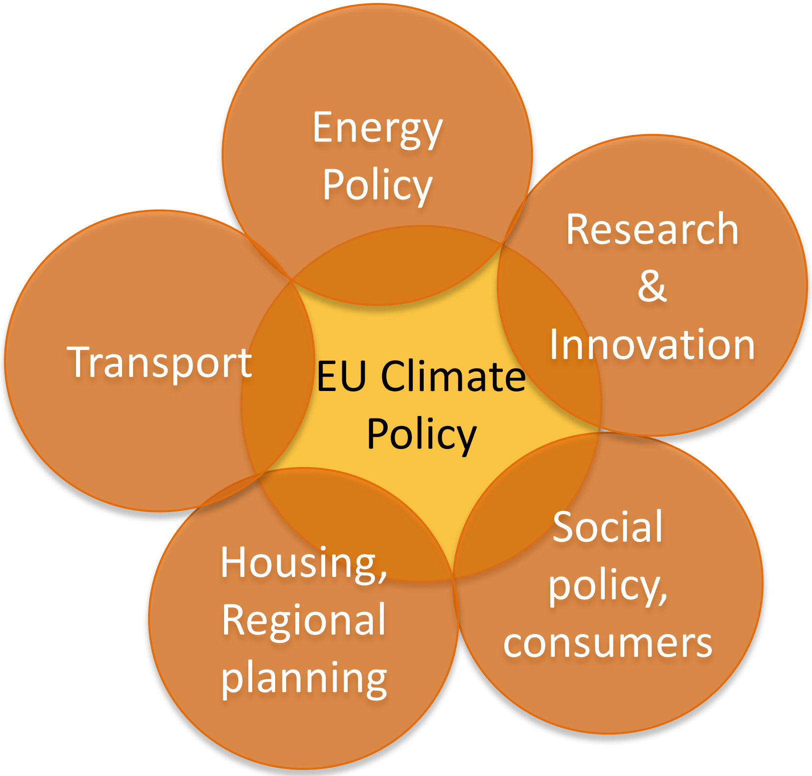


CECILIA 2050 OPTIMAL EU CLIMATE POLICY

ecologic

Optimality – at what level?

- Optimisation of climate policy in the wider policy context:
  - are the climate policy instruments consistent with, and supported by, policies in other areas
  - Integration with sectoral policies that define the context for climate policies (e.g. energy policy and regulation of energy markets, research and innovation, transport, social and consumer policies, etc. …)

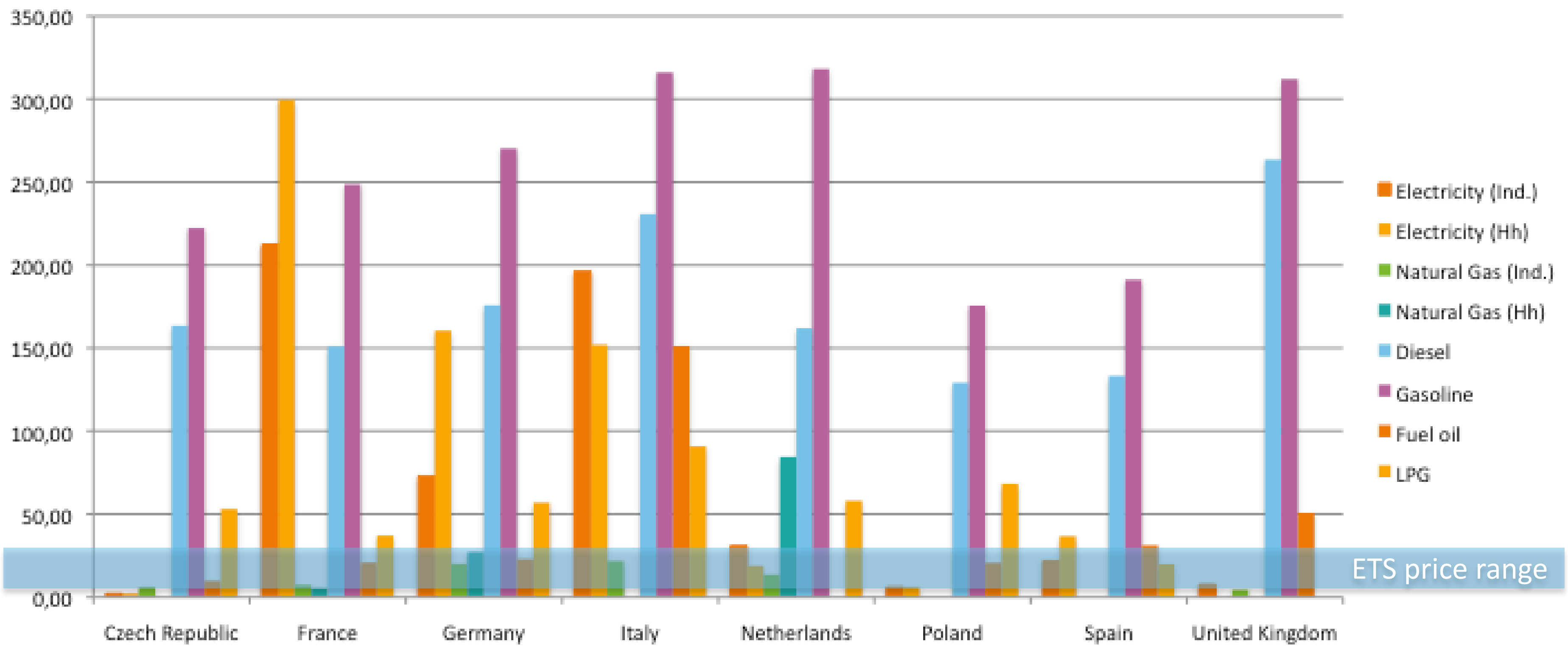


So how close is the current EU climate policy mix to optimality?

- Effectiveness – EU is well underway to achieving its climate targets
  - EU-27 GHG emissions 17% below 1990 levels in 2011 – 3% left for 2020 target
  - Share of renewables in gross final energy consumption: 13% in 2011, 2020 target is within reach if the current momentum can be maintained
  - Primary energy consumption in 2011 at the same level as 1990 – and 7% below 2005. More efforts needed to achieve the 2020 target
- But: how much of these developments has been achieved by climate policies? Does it actually matter whether changes are policy-induced?

So how close is the current EU climate policy mix to optimality?

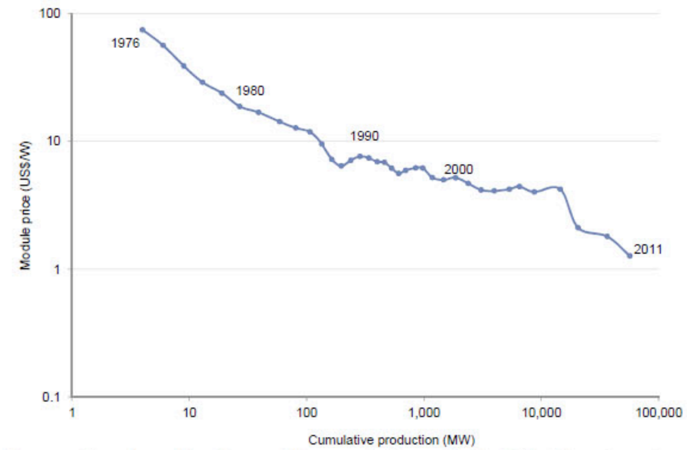
- Static efficiency: hardly given for the EU climate policy mix as a whole (Example: implicit carbon prices for energy products, on the basis of tax rates applied in eight EU countries)



So how close is the current EU climate policy mix to optimality?

- Dynamic efficiency: are climate policies succeeding in driving down the cost of abatement technologies, and directing investments in the right direction?
  - Some success stories from renewable energy support
  - ETS generally not found to have much impact on innovation and investment in new technologies – carbon pricing, on the whole, does not seem to have much long-run impact
  - Climate policy as a whole currently undermining new investment in the power sector?
  - How much foresight can we have about the dynamic efficiency of policy instruments?

Bright spots
PV module price (log scale) vs. production volume



Source: Bloomberg New Energy Finance, Goldman Sachs Global Investment Research.

So how close is the current EU climate policy mix to optimality?

- Feasibility – could be seen as a given: since we have so far been looking at existing policy instruments, they are by definition feasible
  - Past feasibility constraints (legal and political) are reflected in the instrument mix that we have today – the choice of instruments, as well as their design
  - Many of the observed inefficiencies of the current instrument mix were introduced in order to make the policy instruments more palatable (e.g. offset credits in the EU ETS, tax exemptions)
- Do feasibility constraints relax over time as more information becomes available?
  - For legal feasibility – yes, as most legal disputes are fought out when a new instrument is established, creating greater certainty in the process
  - For administrative feasibility – arguably yes, but there are examples both of harmonisation and simplification (e.g. EU ETS) and of growing complexity of policies, requiring more effort to administer
  - For political feasibility – could be expected that resistance wears off as familiarity with the instrument increases and doomsday scenarios do not materialise – yet not necessarily given

Towards optimal climate policy – issues for the tasks ahead

- What role for pricing tools in the optimal policy mix: even if we had a "proper" carbon price, how far would it take us in the transformation?
  - Underlying issue: static vs. dynamic efficiency – pricing tools score well in terms of static efficiency, but do they provide a sufficient dynamic incentive to minimise cost over time?
- Should the EU aim for a well-integrated, clearly structured orchestra of instruments – or should we allow for some overlap and redundancy to insure against policy failure?
  - Underlying issue: static efficiency vs. feasibility – in terms of static efficiency, overlapping policies make the overall mix less efficient. Feasibility constraints remind us that policy failure or underperformance are risks to be reckoned with.
- How much inefficiency (imbalance) are we prepared to tolerate in the name of feasibility?
  - Underlying issue: cost-effectiveness vs. feasibility – consideration of political feasibility may imply that climate leaders do more, and at higher cost, than laggards
- How to deal with the fact that feasibility is both a constraint and a (legitimate) object of public policies?

Thank you for your attention.

Benjamin Görlach, Ecologic Institute

www.cecilia2050.eu