



The interactions of complementary policies with a GHG cap and trade program: the case of Europe

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Agenda



- EU Energy and Climate Policies
- Policy Interactions
- Cost Implications of Policy Interactions
- Rationales for Complementary Policies

- EU climate policy is a complicated mix of cap-and-trade (EU ETS) and “complementary policies” at EU and country levels motivated by “20-20-20” goals
- Complementary policies can have major impacts on the EU ETS (and vice versa)
- Complementary policies likely increase the cost of meeting CO₂ goals (although many complications)
- Complementary policies seem motivated by various reasons not related to “cost minimization”

EU 20/20/20 Targets to be Achieved by 2020



- **GHG Target:** 20% reduction relative to 1990 – 30% with international agreement
- **Renewables Target:** 20% of total energy consumption – implying about 40% of electricity production
- **Energy Efficiency *Indicative Target:*** 20% reduction in energy consumption relative to “business as usual”

Mix of Policies to Achieve GHG, Renewable and Energy Targets



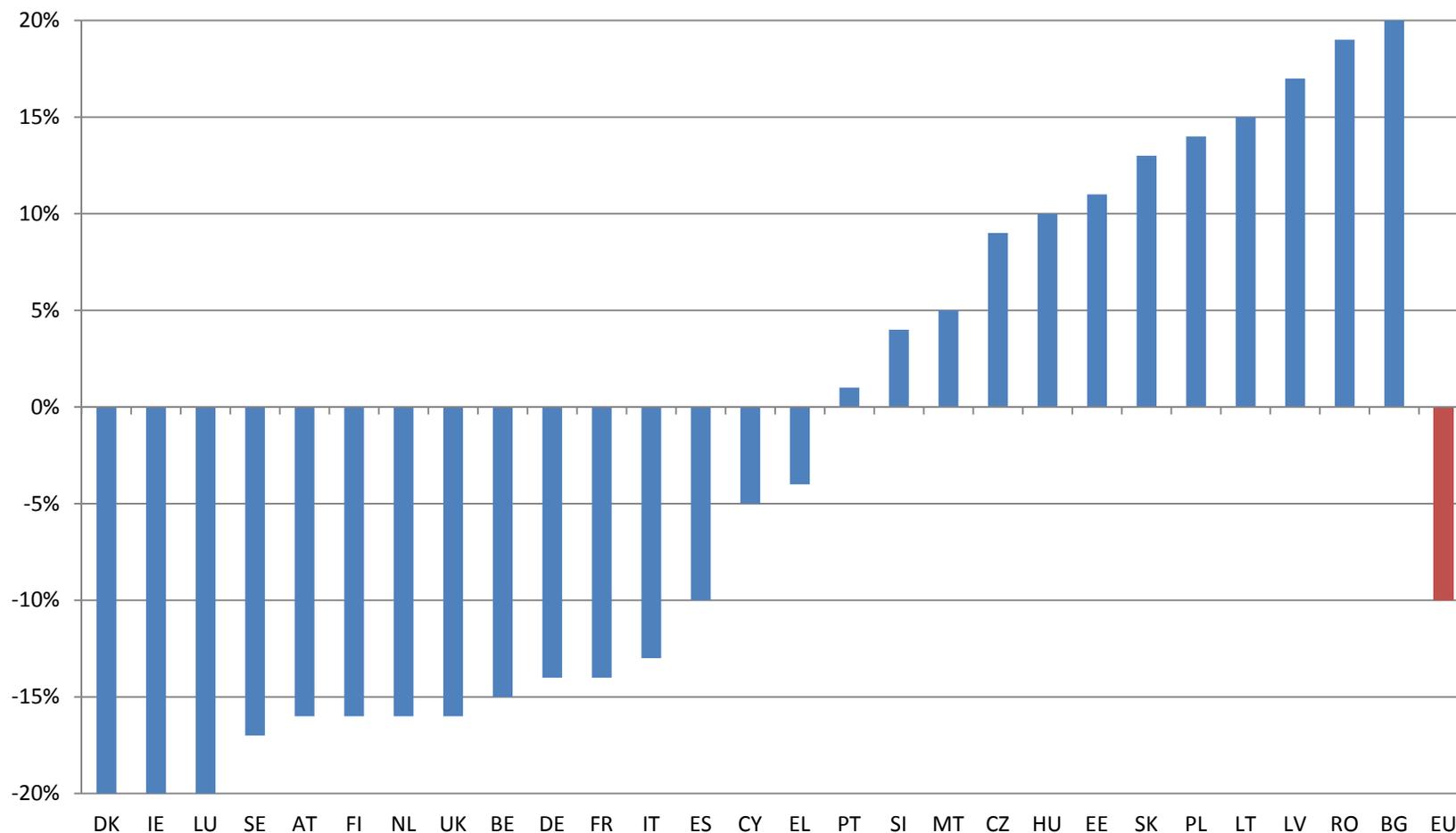
- **GHG Emissions** from EU ETS and non-EU ETS sectors
 - **EU ETS** covers almost 50% of EU emissions
 - **Non-ETS** includes household, most transportation (e.g., CO₂ for cars)
- **Renewable Energy** through binding national targets and Member State policies
- **Energy Efficiency** through “indicative” national targets and action plans
 - Various policies (although unclear evidence for low-cost savings and checkered policy history)

Effort Sharing for Non-ETS CO₂ Emission Reduction Targets



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Effort Sharing Targets for 2020 Compared to 2005 Emissions Levels

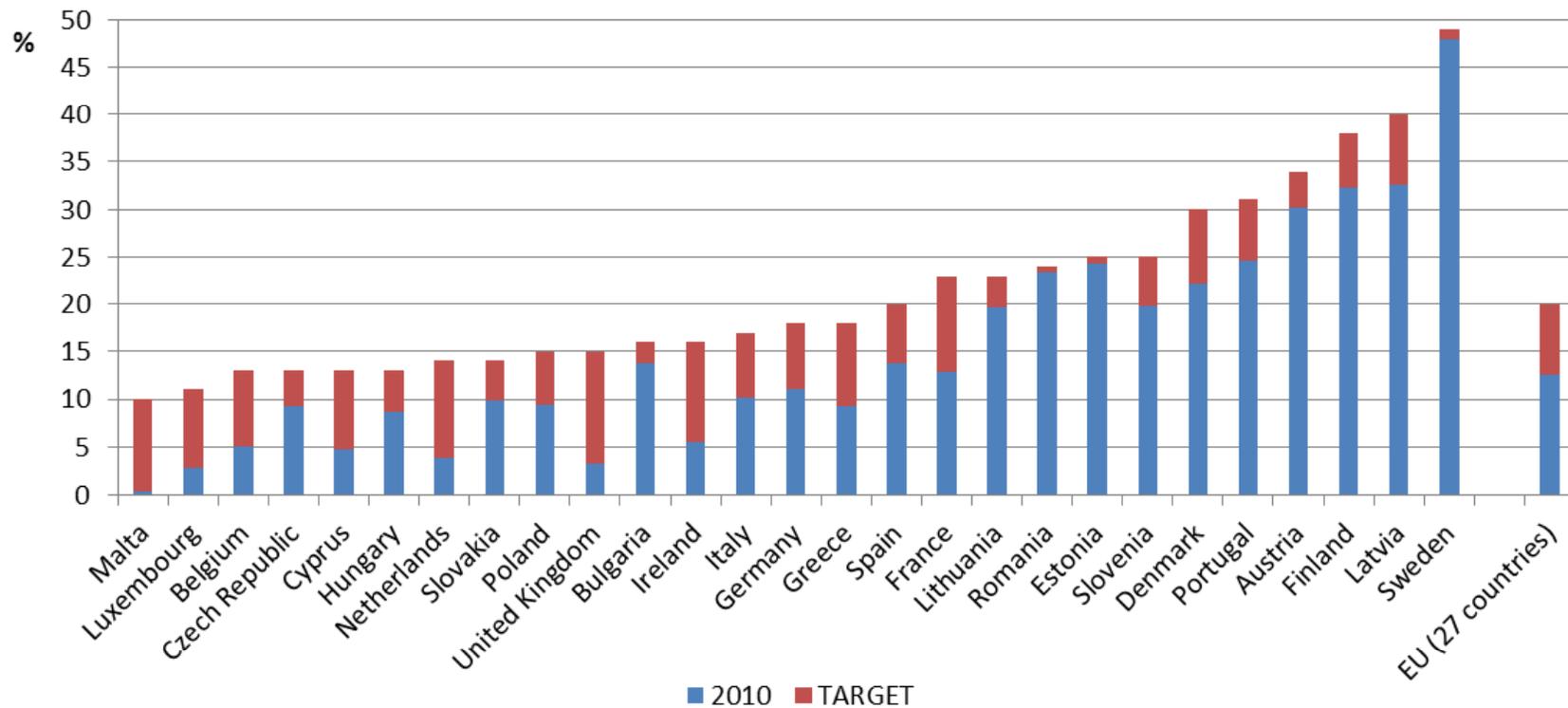


Source: Decision No. 406/2009/EC

Current EU-27 Renewable Energy Shares and Targets



EU-27 Renewable Share of Total Energy Consumption

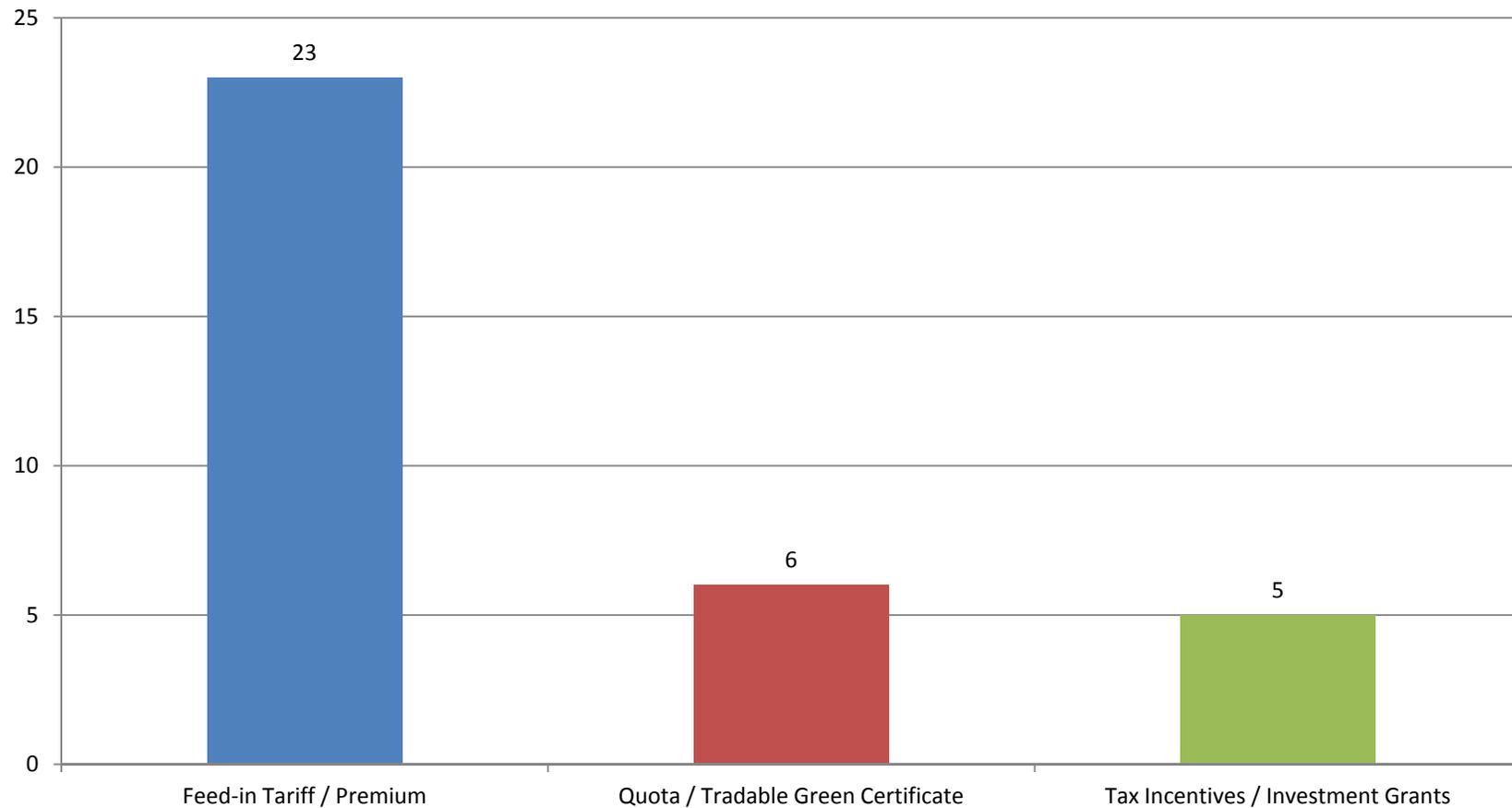


Source: Eurostat

2012 EU-27 Renewable Energy Support Instruments



Number of EU-27 Member States Implementing Various Renewable Energy Support Instruments



Source: Ecofys *et al.* Renewable Energy Policy Country Profiles (2011)

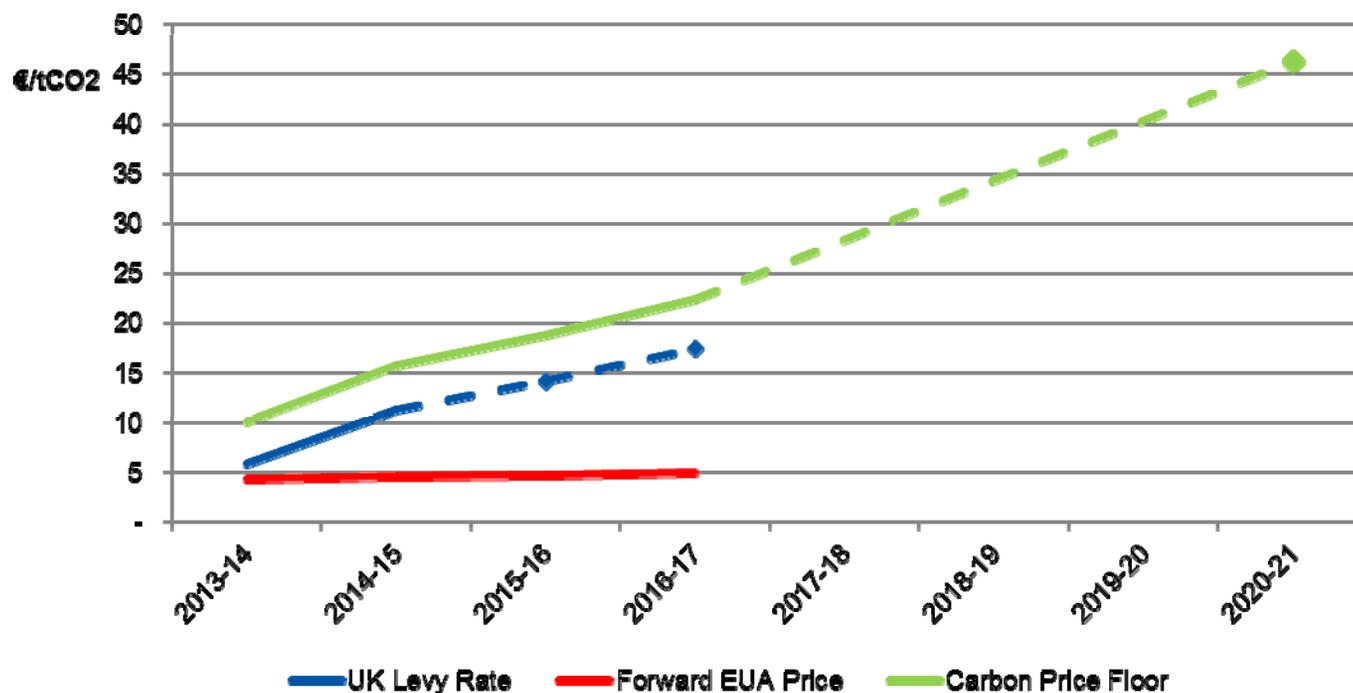
Domestic Carbon Taxes Add to Complexity of EU Climate Policy



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- UK Carbon Price Floor (Power Generation)

Actual and Projected Carbon Price

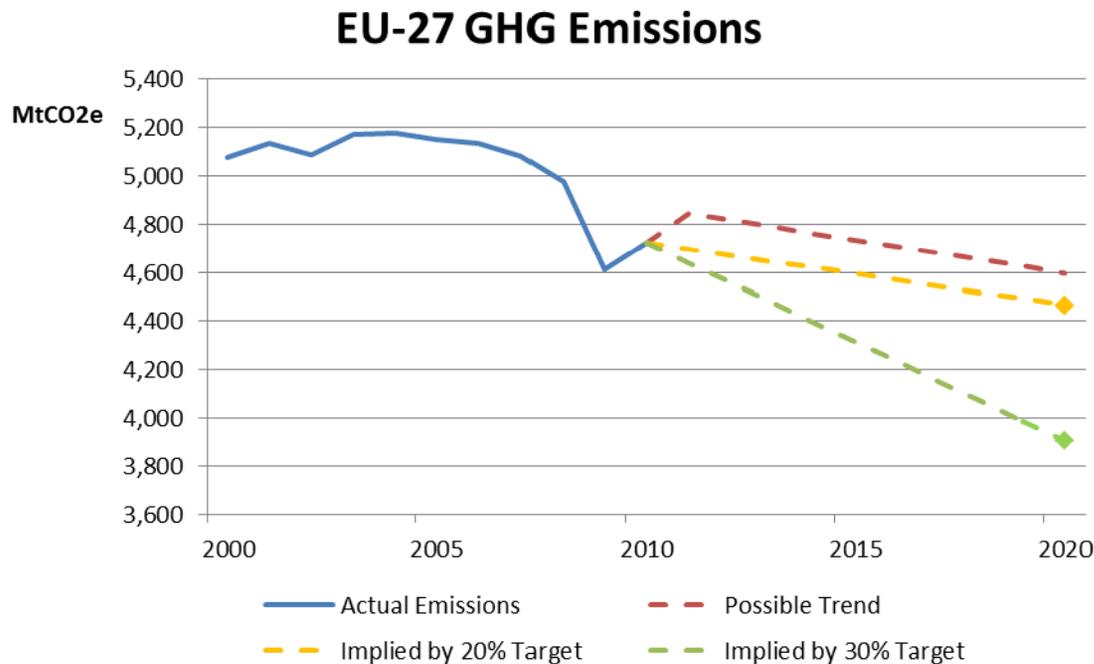


Source: UK Budget 2011 and Budget 2012 (Levy rates) and Point Carbon (EUA prices)

Notes: EUA forward prices on 11 April 2013

2020 Target Price calculated using EUR/GBP rate on 11 April 2013 and OBR inflation projections

GHG Emissions May Achieve 20% Reduction Target by 2020

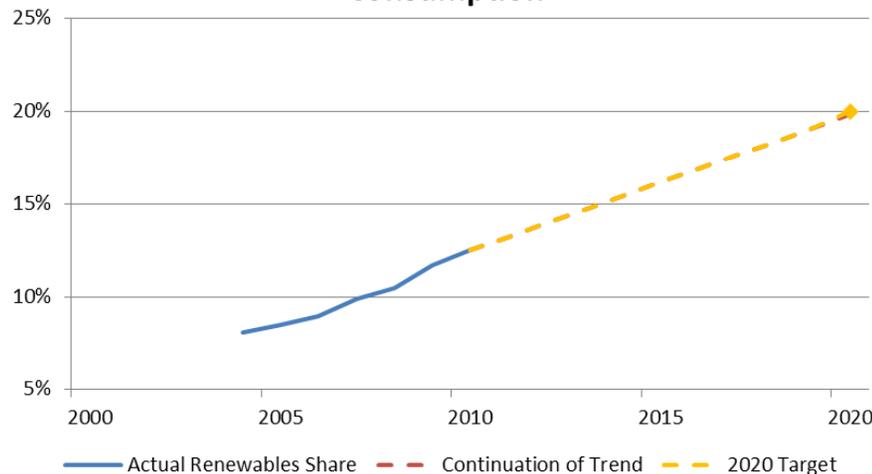


Source: Eurostat

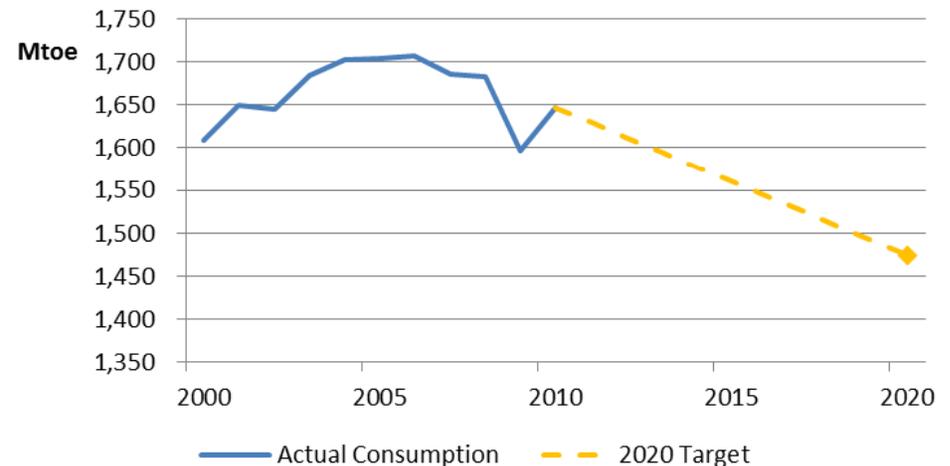
- Economic crisis has cut emissions dramatically
- Considering tighter target (30%) dependent upon international commitment in Durban platform

Progress Towards Renewable and Energy 2020 Targets

EU-27 Renewable Energy Share of Total Energy Consumption



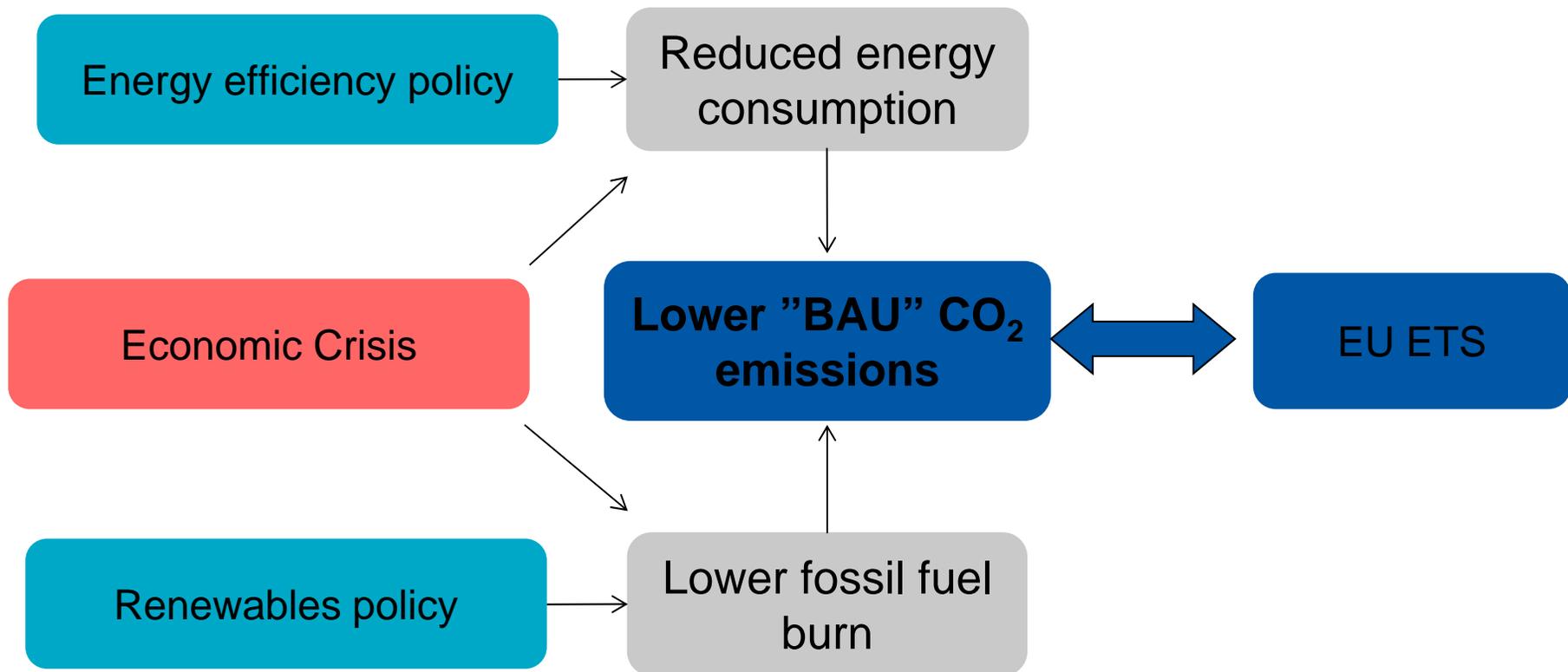
EU-27 Primary Energy Consumption



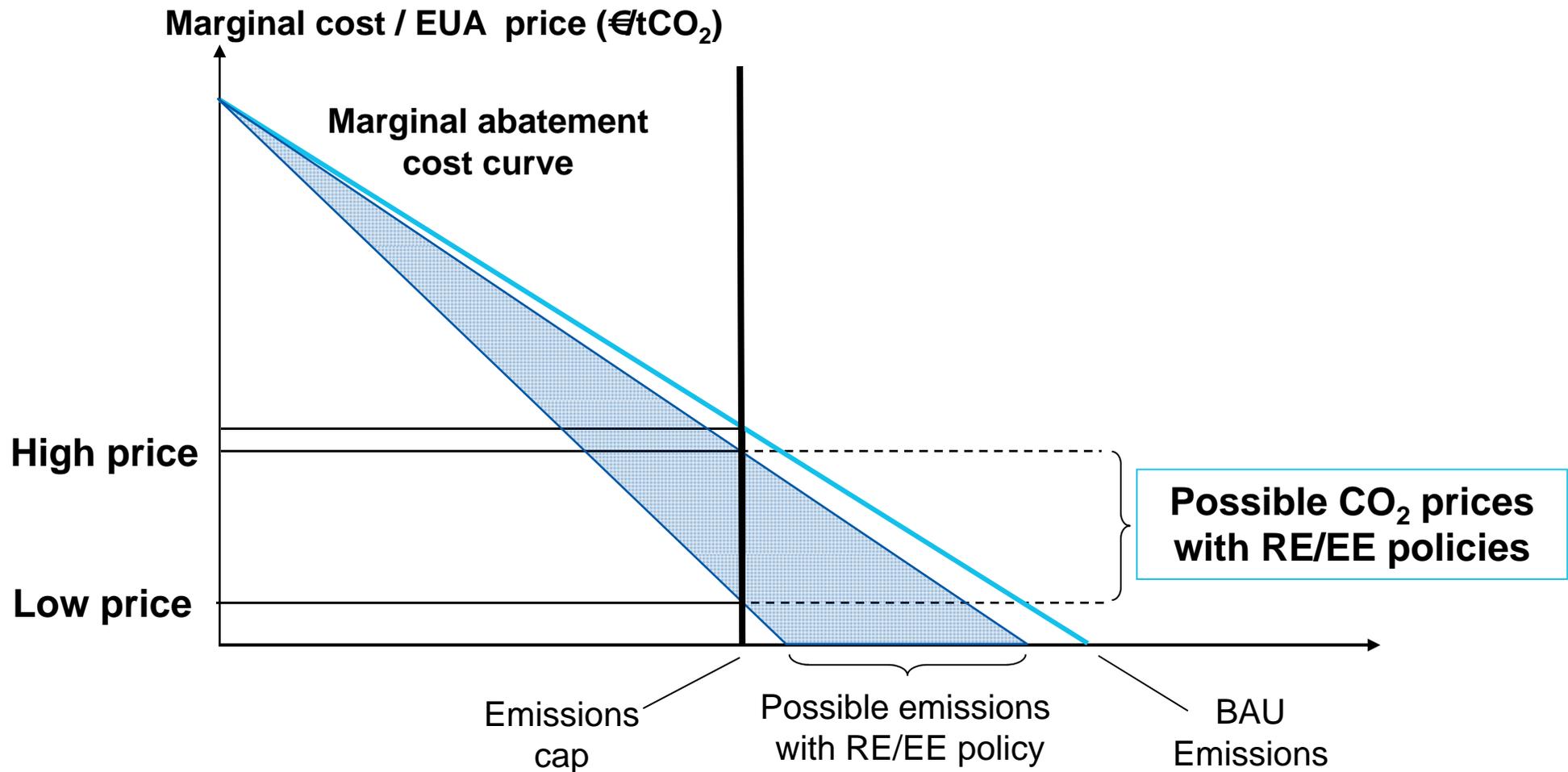
Source: Eurostat

- Minimum 2011/12 Renewable Energy targets met early by almost all countries
- EC progress report indicates that existing policies will be insufficient to deliver most individual renewables targets
- EC analysis suggests that EE target will not be met without additional policies (not legally binding)

Renewables and Energy Efficiency Affect the EU ETS



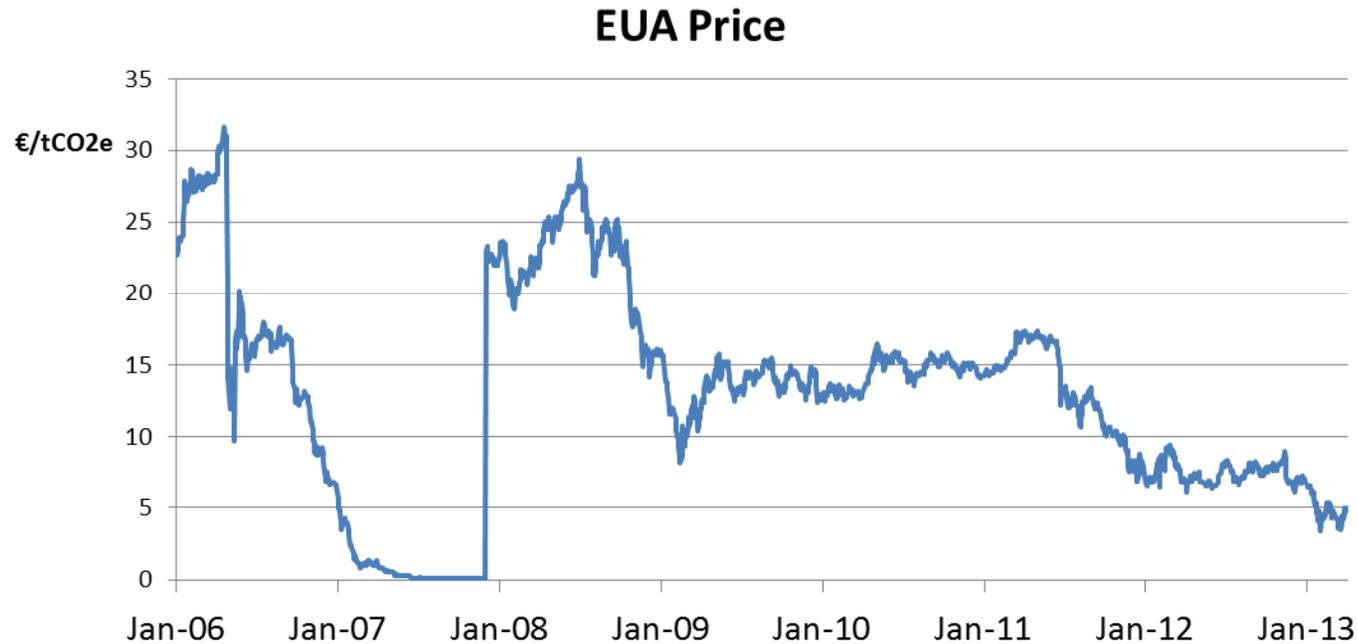
Interactions and Uncertain Attainment of Targets Lead to Uncertain CO₂ Price



RE/EE lower BAU emissions and EUA price

Uncertain attainment of RE/EE targets leads to uncertain EUA prices

Steady Fall in EU ETS Carbon Price Since 2011



Source: Point Carbon

- Recent decline in EUA price began in early 2011
- Non-zero price maintained by expectation of structural reform and long-term banking
- Low carbon price provides little incentive for long-term infrastructure investment
- Various reforms proposed to maintain/increase interest in carbon market

Mix of EU Policies Implies Cost of Reducing CO₂ Greater than “Needed”

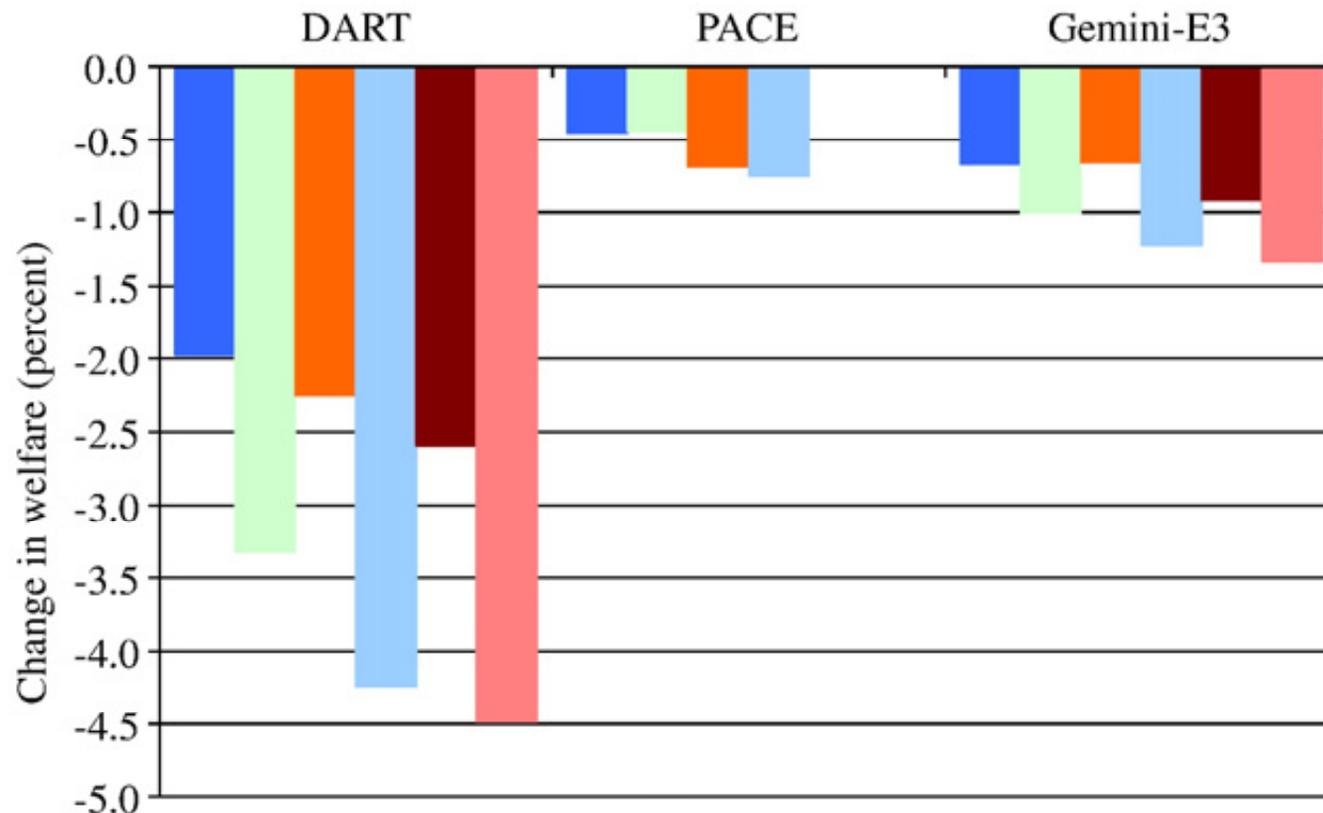


- **Market-based policies** important elements but not comprehensive
 - **EU ETS**, only 50% of emissions covered, 27 targets for other
 - **Green certificates**, but only some MS and not EU-wide
 - **White Certificates**, few applications
 - Other policies indicate little consensus on “market-based” approach (CHP, CO₂ standards for cars, heat sector renewables, biofuels for transport, microgeneration, support for nuclear, etc)
- **Implication: comprehensive cap-and-trade program “in theory” could lower cost of meeting CO₂ target**

**Multiple policies are in place
Interactions add complexity and potential costs**

Three Model Results Suggest Other Policies Increase Cost of CO₂ Target

- Blue--One EU carbon price; Green--Renewable requirement; Orange—Two EU carbon prices, no Renewable; Lt blue—Two EU carbon prices and Renewable; Burgundy—No Renewable, 27 MS prices for non-ETS; Pink—Renewable, 27 MS prices for non-ETS



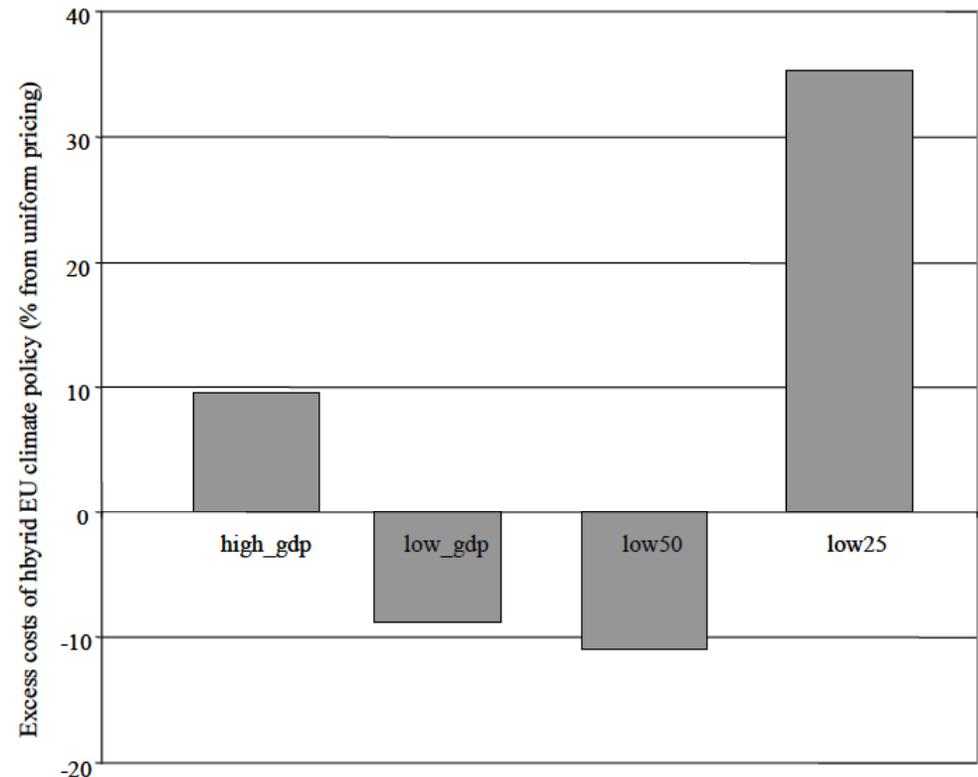
Source: Böhringer et al., *The EU 20/20/2020 targets* (2009)

Results differ by model but generally show that both (a) Renewable Requirement and (b) lack of a single carbon price increase cost of meeting CO₂ target

But Other Effects (Tax Distortions, Terms-of-Trade) Add Complications

- Model CO₂ policy costs with alternative baseline projections:
 - **high_gdp** → high macroeconomic growth (ref case growth + 0.5%)
 - **low_gdp** → low macroeconomic growth (ref case growth – 0.5%)
 - **low50/low25** → country growth rates in 2005 to 2010 are 50%/25% of reference levels (to reflect economic crisis and uncertain growth prospects)
- Implies that differential emission pricing *could* lower costs compared to a single EU price by reducing existing distortions and improving terms of trade (“**Theory of the Second Best**”)

Excess Costs of Hybrid EU Climate Policy in 2020 (% of Uniform Pricing Case)



Source: Lösschel et al., *EU Climate Policy up to 2020* (2010)

Policy interactions can lead to some unexpected modeling results on the cost of climate policies

Potential Reasons (Not Cost) for EU Complementary Policies



- Half of CO₂ emissions outside EU ETS
- International competitiveness concerns
- Interest in other objectives than climate change, e.g. energy security (renewables, energy efficiency)
- Distrust of market to provide “enough” investment
- “No regrets” policies (especially energy efficiency)
- Diversity among Member States in “capacity”

Looking Beyond 2020



- European Commission have recently launched a consultation on 2030 policy framework
 - **Stimulate long-term investment** (renewable capacity, grid infrastructure)
 - Roadmap in place to achieve 80% emission reductions by 2050 (compared to 1990 levels)
- Significant **uncertainties remain**:
 - Perceived requirement for structural reform in the EU ETS
 - Divergence in Member State objectives, e.g. attitudes to nuclear
 - Lack of EU-wide coherence on increasing Energy Efficiency
 - Reluctance to further increase burden without **international commitment**

Many Uncertainties Regarding Future European Climate and Energy Policy

Concluding Remarks



- **Interactions of EU ETS, non-ETS, renewables and energy efficiency policies create uncertainties in both directions**
 - Uncertain attainment of RE/EE targets leads to CO₂ price uncertainty
 - Level of CO₂ price influences attainment of RE/EE goals

- **But low current CO₂ price seems largely due to economic conditions and uncertain future international context**
 - Low CO₂ price means that “market” will not lead to shift toward more renewables and greater energy efficiency

- **Welfare costs of climate policy depend on these interactions as well as other factors** (economic growth, existing tax distortions, terms-of-trade)

- **“Optimum” climate policy difficult to identify due to**
 - (a) effects of these interactions
 - (b) complex set of policy objectives
 - (c) international considerations



Thank You

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EU-27

- Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom

Additional EU ETS Members (Non-EU)

- Croatia
- Iceland
- Liechtenstein
- Norway