



# 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 CO<sub>2</sub> 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



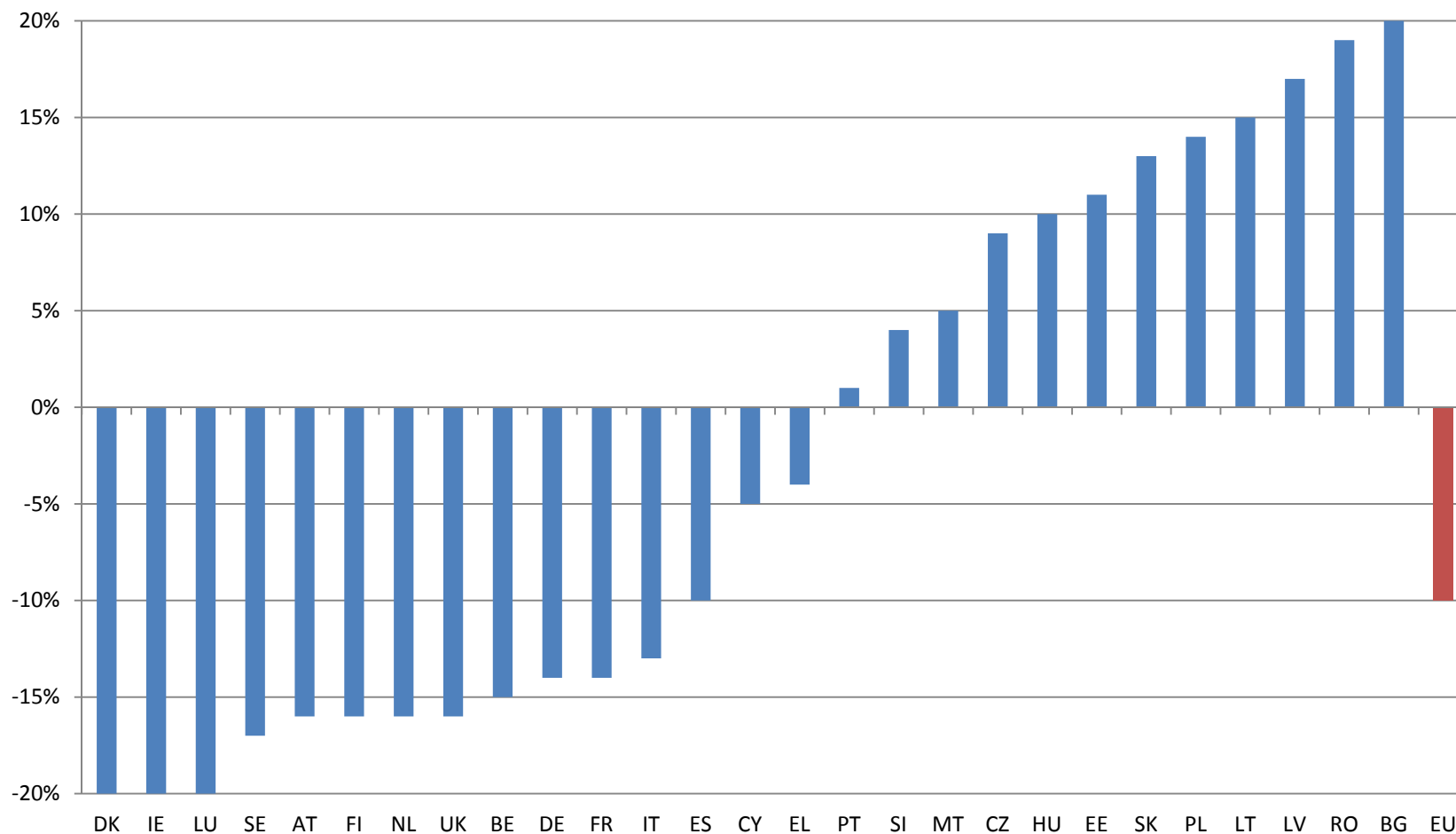
- **GHG Emissions** from EU ETS and non-EU ETS sectors
  - **EU ETS** covers almost 50% of EU emissions
  - **Non-ETS** includes household, most transportation (e.g., CO<sub>2</sub> for cars)
- **Renewable Energy** through binding national targets and Member State policies
- **Energy Efficiency** through “indicative” national targets and action plans
  - Various policies (although unclear evidence for low-cost savings and checkered policy history)

# Effort Sharing for Non-ETS CO<sub>2</sub> Emission Reduction Targets



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## Effort Sharing Targets for 2020 Compared to 2005 Emissions Levels

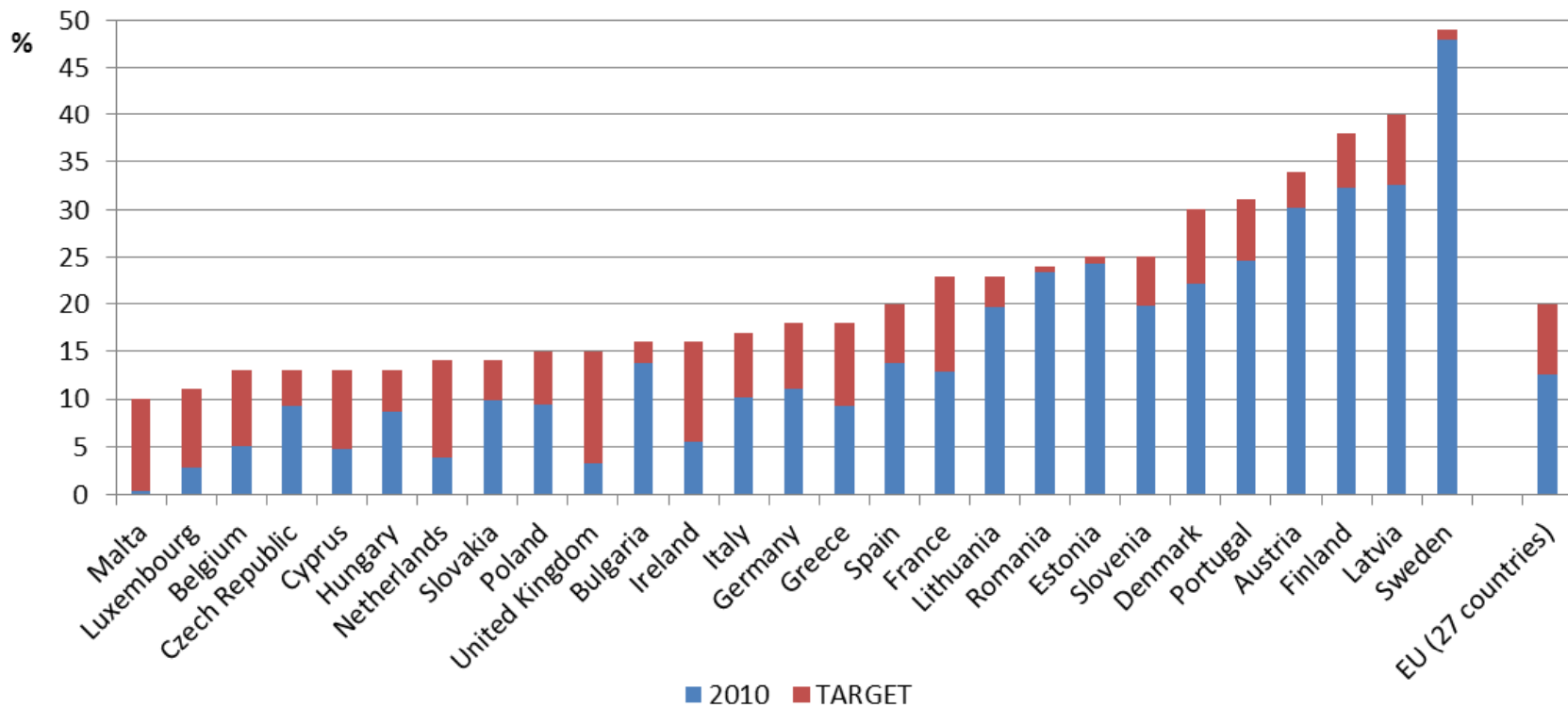


Source: Decision No. 406/2009/EC

# Current EU-27 Renewable Energy Shares and Targets



## EU-27 Renewable Share of Total Energy Consumption

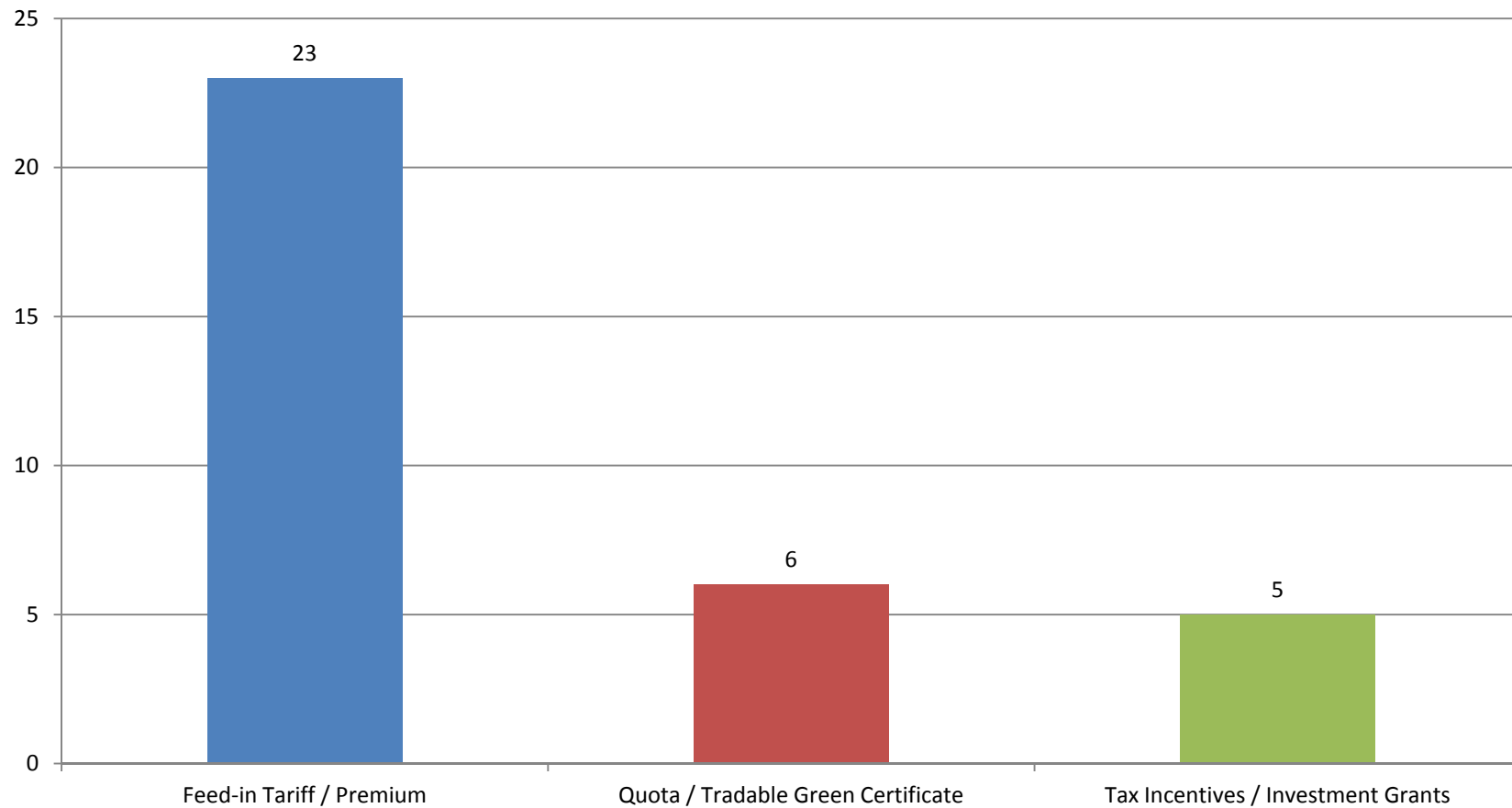


Source: Eurostat

# 2012 EU-27 Renewable Energy Support Instruments



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

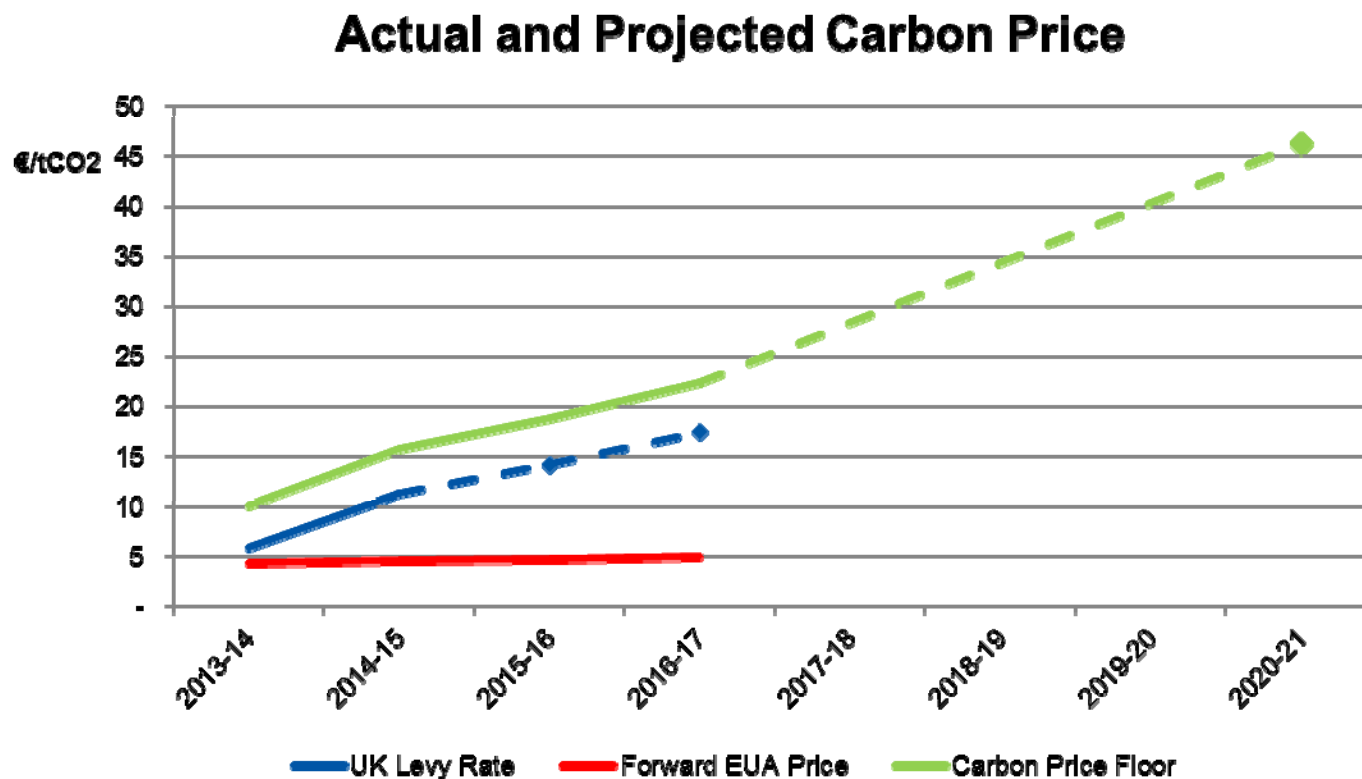


Source: Ecofys *et al.* Renewable Energy Policy Country Profiles (2011)



# Domestic Carbon Taxes Add to Complexity of EU Climate Policy

- UK Carbon Price Floor (Power Generation)

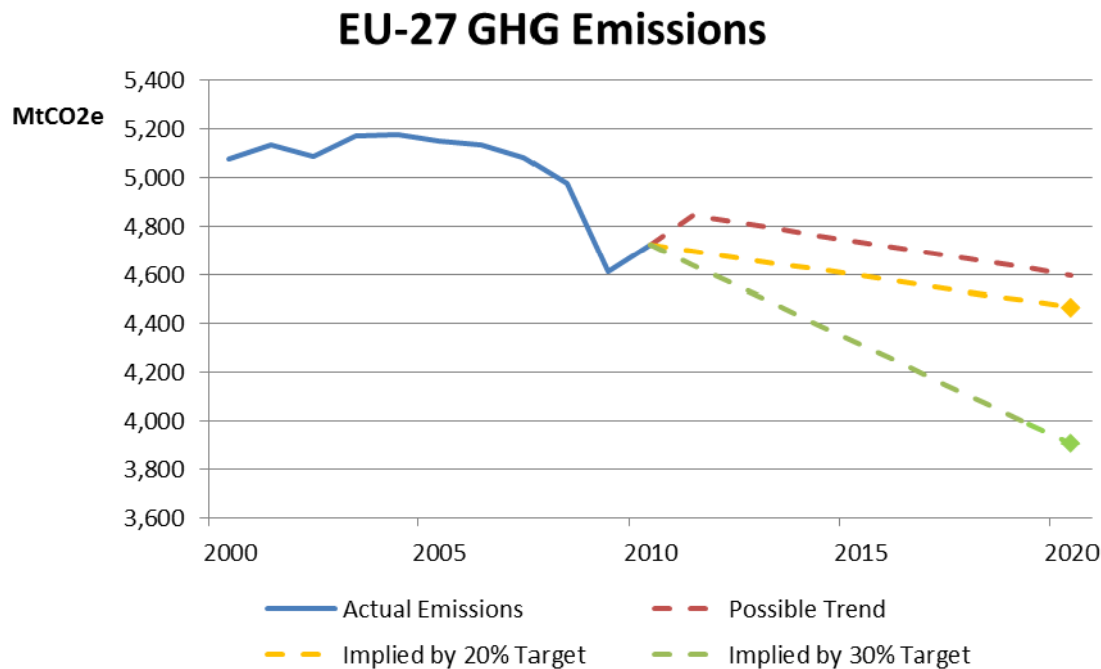


Source: UK Budget 2011 and Budget 2012 (Levy rates) and Point Carbon (EUA prices)

Notes: EUA forward prices on 11 April 2013

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

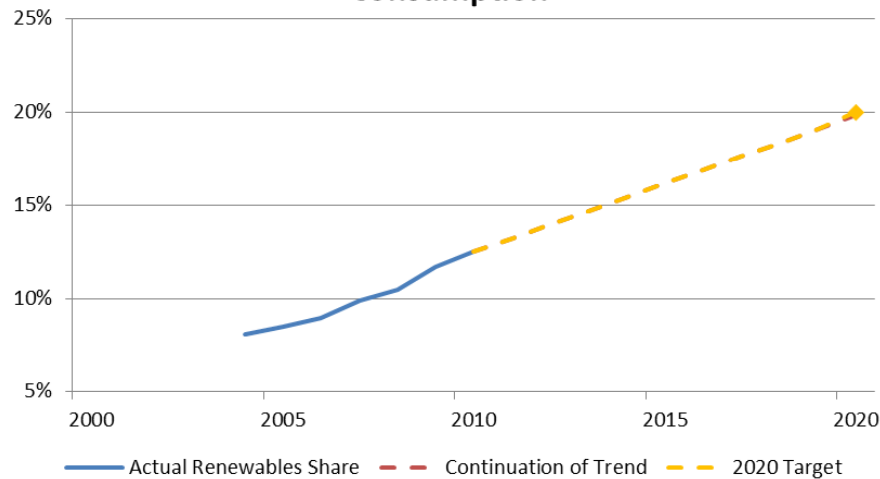
# GHG Emissions May Achieve 20% Reduction Target by 2020



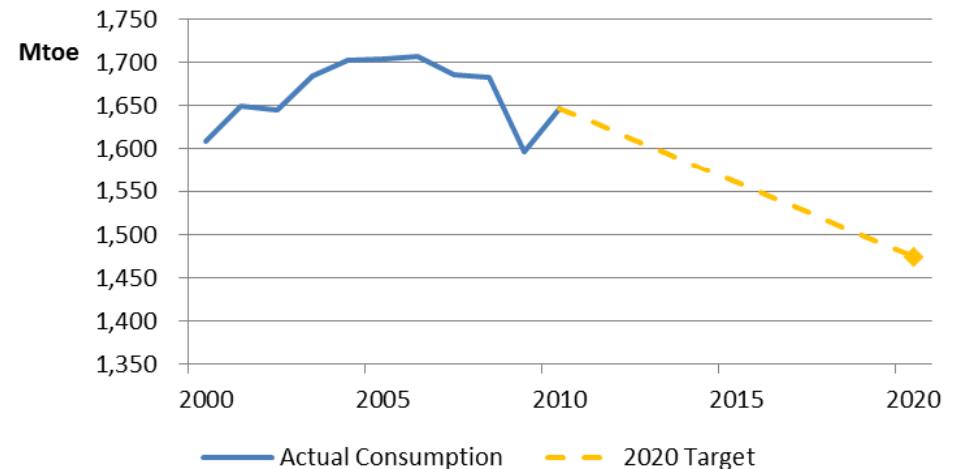
- Economic crisis has cut emissions dramatically
- Considering tighter target (30%) dependent upon international commitment in Durban platform

# Progress Towards Renewable and Energy 2020 Targets

## EU-27 Renewable Energy Share of Total Energy Consumption



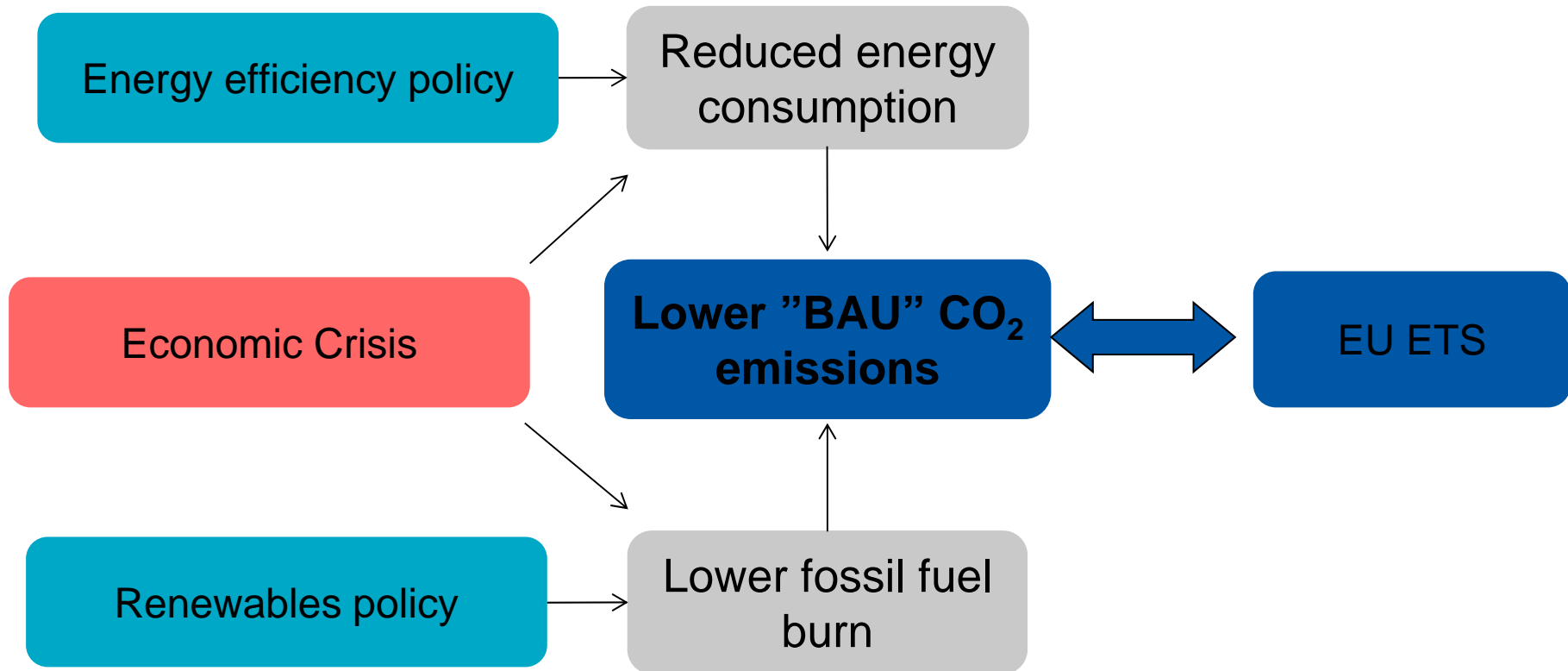
## EU-27 Primary Energy Consumption



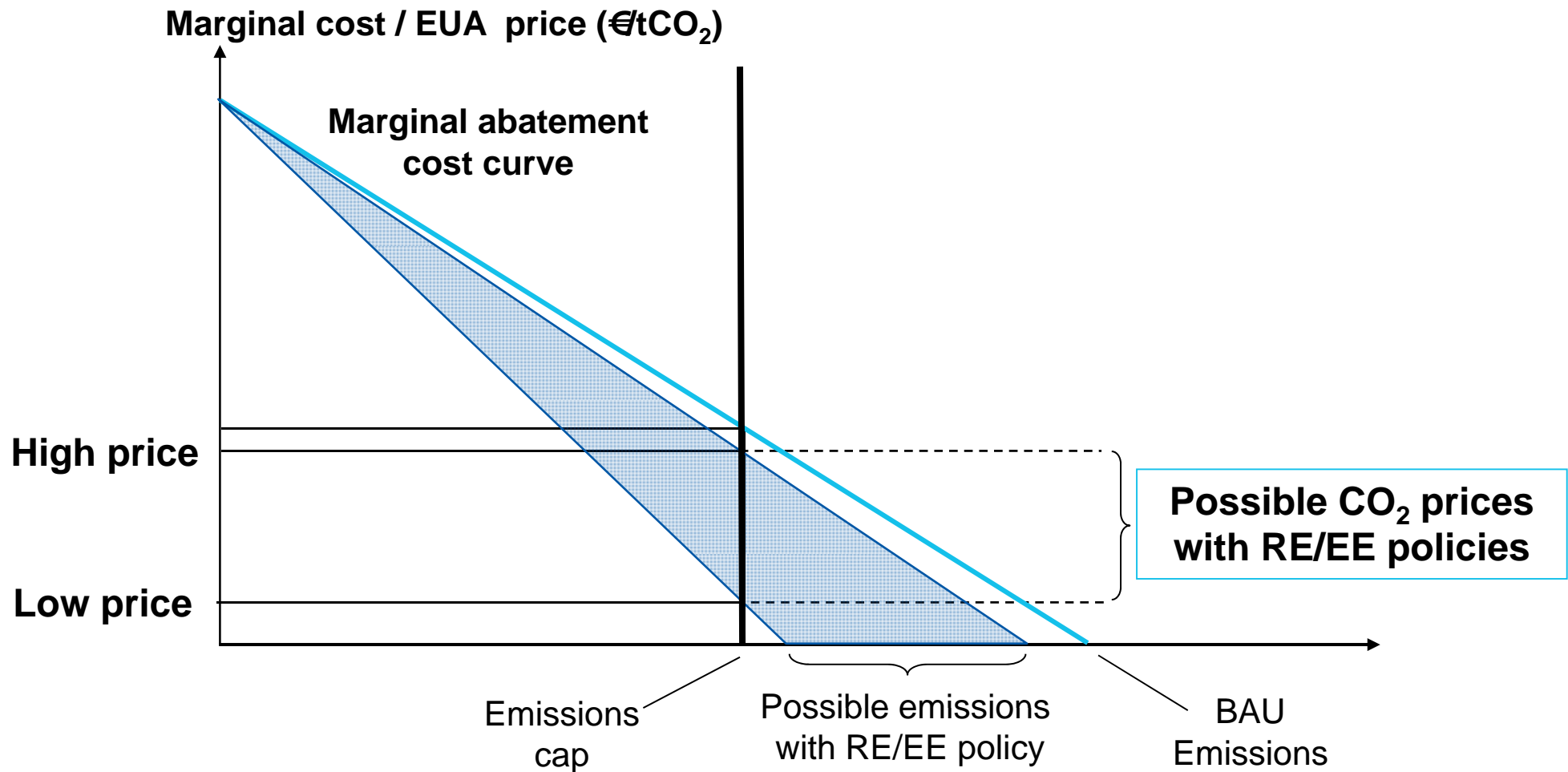
Source: Eurostat

- 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



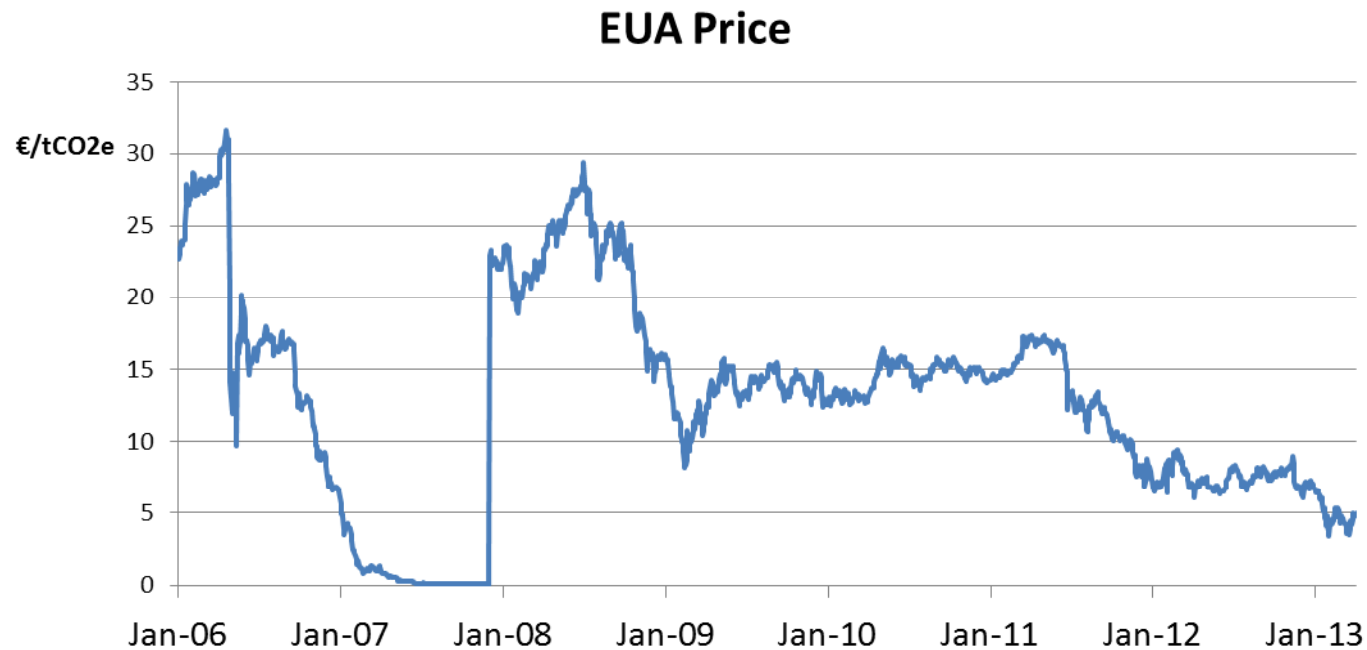
# Interactions and Uncertain Attainment of Targets Lead to Uncertain CO<sub>2</sub> Price



**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 CO<sub>2</sub> Greater than “Needed”

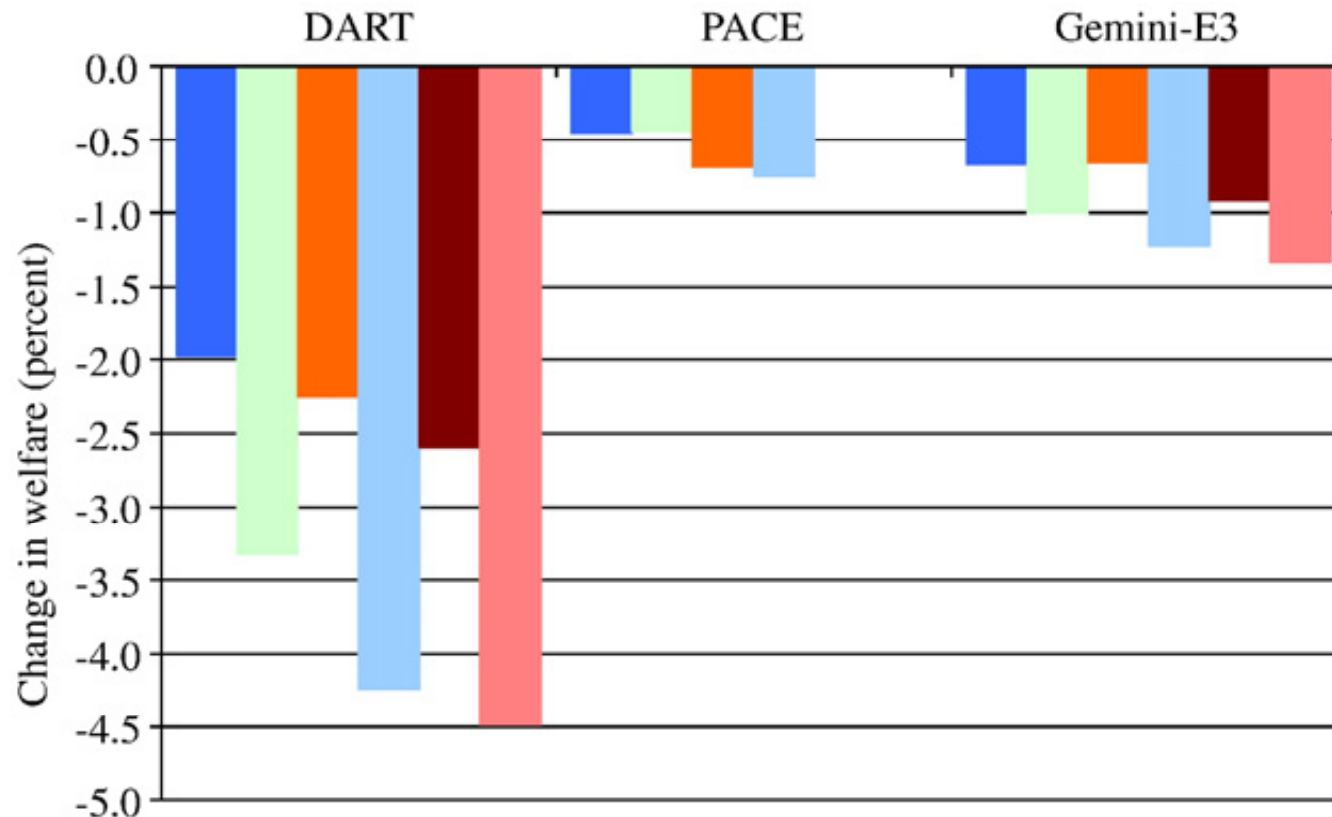


- **Market-based policies** important elements but not comprehensive
  - **EU ETS**, only 50% of emissions covered, 27 targets for other
  - **Green certificates**, but only some MS and not EU-wide
  - **White Certificates**, few applications
  - Other policies indicate little consensus on “market-based” approach (CHP, CO<sub>2</sub> 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 CO<sub>2</sub> target**

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

# Three Model Results Suggest Other Policies Increase Cost of CO<sub>2</sub> 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)

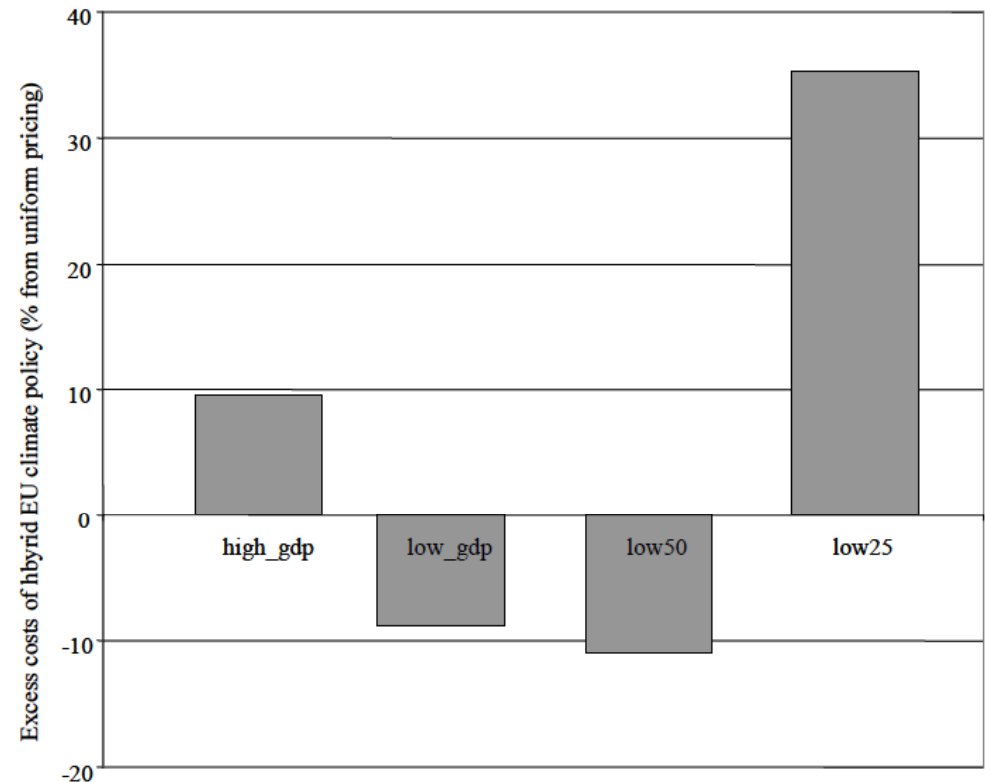
Results differ by model but generally show that both (a) Renewable Requirement and (b) lack of a single carbon price increase cost of meeting CO<sub>2</sub> target



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

- Model CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> price uncertainty
  - Level of CO<sub>2</sub> price influences attainment of RE/EE goals
  
- **But low current CO<sub>2</sub> price seems largely due to economic conditions and uncertain future international context**
  - Low CO<sub>2</sub> 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