

DESIGNING A CARBON PRICING FOR THE ENERGY COMMUNITY

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Carbon pricing is an instrument that captures the external costs of greenhouse gas (GHG) emissions

Carbon pricing schemes can be

Explicit (carbon tax) – interference with excise taxes

Implicit (price of tradable allowances)

It puts an explicit price on GHG emissions, i.e. a price expressed as money per ton of carbon dioxide equivalent (€/tCO₂).

Carbon pricing may imply

Transfer payments to the state

Tax

Auctions

Emitters restructure operation and investment as a response to the price signal

No transfer payments

Internal carbon pricing

Free allowances

Emission standards

The economic impacts depend on marginal abatement costs – i.e. the price-elasticity of the emitter – *consumers are better-off when abatement is low-cost*

Emission reduction implies additional costs, at least in the short-term

Due to the fuel mix

Due to investment choices

Stranded assets

Short-term responsiveness is generally lower than long-term, as investment takes time to implement

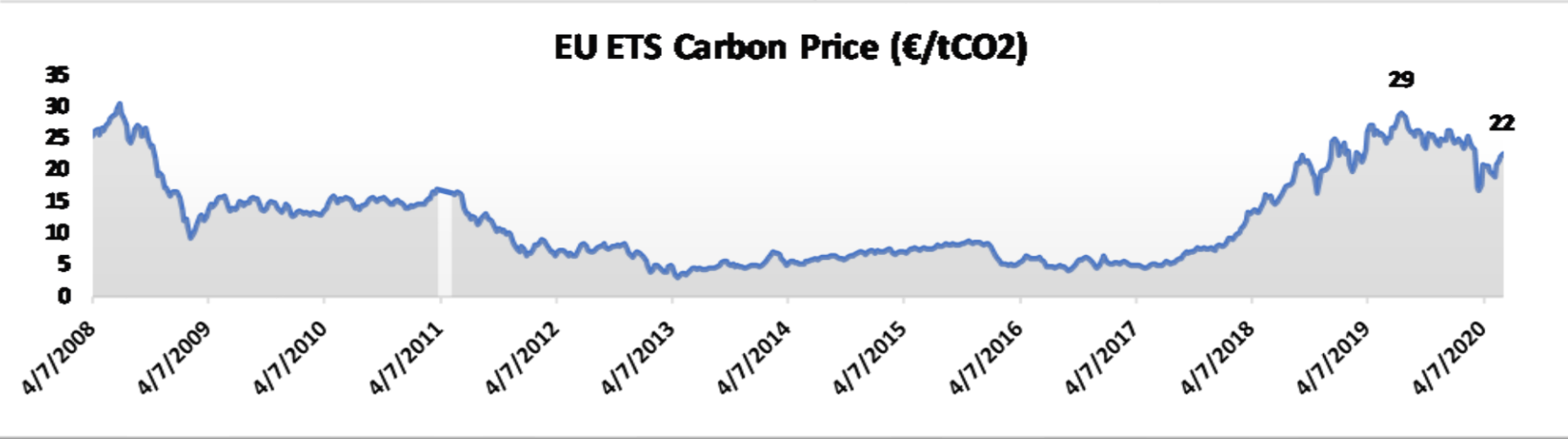
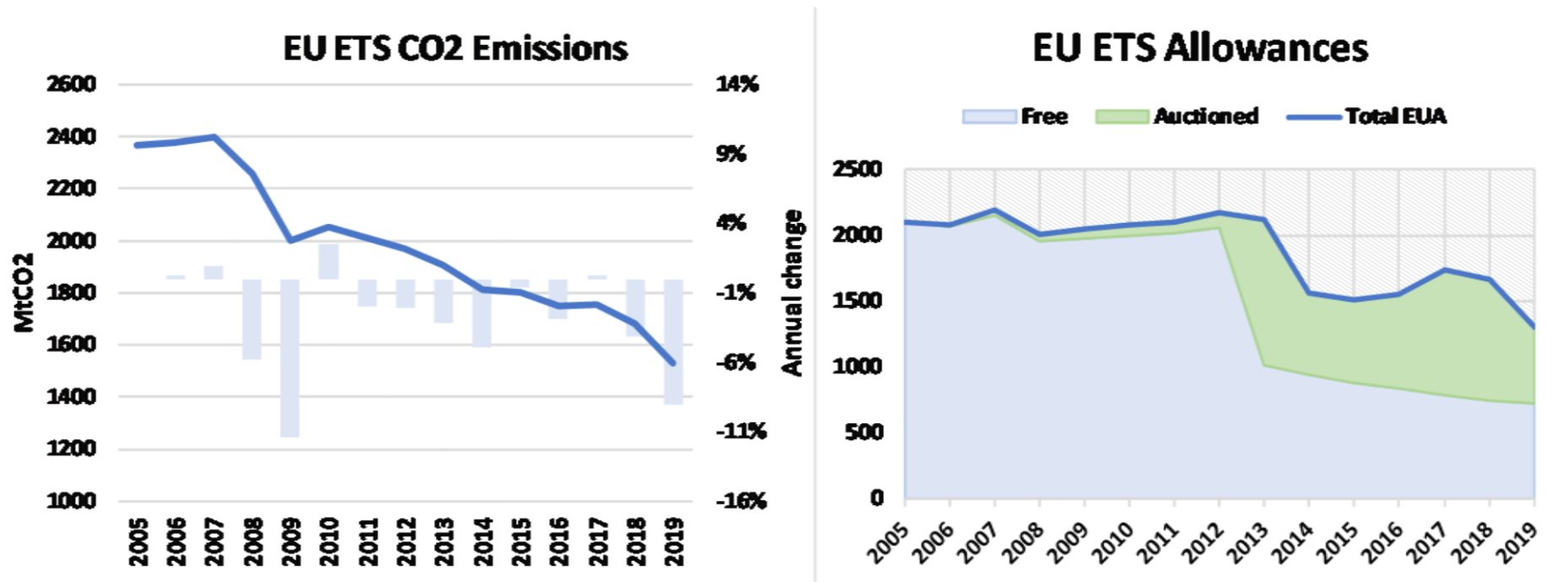
Impacts on economics of consumers depend on price effects and on accompanying measures

Consumer price impacts – average cost or marginal cost pricing?

Recycling of state revenues

EU ETS as a powerful enabler

- 2013 Milestone: abolishing free allowances in the power sector
- 2018 Milestone: Market Stability Reserve reduces expected surplus of allowances
- Auctioning has established carbon pricing in internal accounting and costing of heavy emitters
- The reduction of allowances surplus accelerated coal phase-out in all countries



Stages of transition towards ETS

Stage 1: Internal carbon pricing – certificates

- Internal carbon pricing
- Allocation of allowances/administrated price
- No trade of allowances

Stage 2: Internal carbon pricing – traded nationally

- Bilateral transactions & allowances market
- Market-based carbon prices/price floor
- Trade of allowances

Stage 3: Cross-border trade among CPs and EU-MS

- Basic pre-conditions
- Free allowances
- Cross-border trade of allowances - bilateral

Stage 4: Adherence to EU-ETS under a transitional regime

- Full trade with EU ETS
- Free allowances allocated – accompanying measures

Stage 5: Full integration in the EU-ETS

- No free allowances – recycling of state revenues
- Ready for full integration into EU ETS

National and then regional approach: policy options as stages

- The duration of the stages may vary per country depending on:
 - the degree of responsiveness to carbon pricing,
 - the threat of social and industrial adverse effects,
 - the potential of attracting decarbonizing investment, and
 - the expected positive externalities (new industrial growth)
- Whether or not to follow all stages may also vary by CP
- The details, e.g. level of carbon price or degree of ambition of allowances cap to be defined by country
- Stage 1 requires a system monitoring and verification and a certain degree of harmonization across the CPs
- Stage 3 is a milestone requiring completion of harmonization of designs and institutional arrangements
- Stage 4 requires all pre-conditions to be fully met:
 - Market liquidity and financial regulation
 - Level-playing field in the energy sector (e.g. abolishment of direct and indirect subsidies, state-aid rules, free trade, etc.)
 - Revenue recycling rules

The main scenario options for the CPs

Baseline – Asymmetric development among CPs and EU-MS

Power and gas market coupling and integration

Without market coupling and integration

Regional Trajectory to the EU ETS

National Trajectories to the EU ETS

Energy Market Integration as a facilitation condition

- **Baseline:** Asymmetric carbon pricing in the power sector among the CPs and the EU-MS
 - Poor resilience versus protection of national interest
 - Trade barriers to emerge as a response of asymmetric practices
- **Facilitation:** Energy Market Coupling and Integration among the CPs and EU-MS
 - Sharing of low-cost and low-carbon resources
 - High resilience – flexibility thus avoidance of adverse effects on electricity prices and affordability
 - Sharing of balancing and reserve resources, as a condition for development of renewables
 - Gas market integration as a condition for gas power plant investment
 - Anticipation of enlarged market helps investment in RES, grids and storage

Degree of Resilience and Preparedness

| | Flexibility | Decarb. Investment | Threats | Potential for Market Integration |
|--------------------|-----------------|--------------------|-------------|----------------------------------|
| ALBANIA | High | High | Few | High |
| NORTH MACEDONIA | Relatively High | Relatively High | Moderate | High |
| KOSOVO (*) | Poor | Poor | Significant | Poor |
| MONTENEGRO | High | High | Moderate | High |
| BOSNIA-HERZEGOVINA | Moderate | Moderate | Significant | Moderate |
| SERBIA | Moderate | Moderate | Significant | Moderate |
| UKRAINE | High | High | Moderate | Several conditions |
| MOLDOVA | High | Moderate | Few | Poor |
| GEORGIA | Moderate | Moderate | Few | No |

Using the model PRIMES-IEM to quantify the scenarios

- Assumption of carbon pricing stages towards ETS – scenarios
- Assumptions about the energy market context and integration
- Run the model for each scenario, calculate restructuring of power and heat sectors, including investment, trade, costs and consumer prices

Economic and social impact assessment

- Assess the impacts of prices on
 - Private consumers – family budgets, affordability, poverty
 - Industry – competitiveness, indirect impacts on prices of industrial outputs and propagation into the economy
- Indirect effects on activity and employment due to lost domestic fuel production (e.g. lignite) and new investment (e.g. RES)
 - Recycling of state revenues from carbon pricing
 - Assessment of few revenue recycling options

Policy indicators and qualitative assessment

- Indicators based on model results as a roadmap
- Policy implementation stages – pre-conditions
- Threats and opportunities – social and economic

The PRIMES-IEM model

Fully-fledged dynamic simulation and optimization of the electricity system and markets

- Optimal capacity expansion
- Individual power plant economics and technical constraints
- Unit commitment – co-optimizing demand, plant operation, ancillary services and cross-border flows
- Simulation of bidding behaviors in wholesale markets
- Determination of wholesale market prices
- Flow-based allocation of interconnectors, DC-linear power-flow, NTC constraints
- Determination of retail prices of electricity by stylized consumption sectors

Outputs

- Investment in new power plants, RES and storage
- Dispatching in power generation – hourly
- Cross-border flows
- Bidding behaviors
- Wholesale market prices
- Losses and profit by power plant
- Retail prices (options on passing through carbon costs to consumer prices)