

When is a carbon price floor desirable?

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Policy background

Ambitious post-Paris decarbonization agenda

EU ETS price < target-consistent carbon price

- €25–63/tCO₂ (2030), €49–190/tCO₂ (2040)
(European Commission 2011, in 2008 prices)
- EU ETS reform leaves risk of “too low” EUA price

Longer-run carbon price = “missing market”

⇒ Growing policy interest in **carbon price floor**

- **National CPF** for power: GB, Netherlands
 - **EU-wide CPF**: France...
- + *proximate objective of coal exit (unabated)*

Contribution of this paper

Desirability & design of a carbon price floor (CPF)

1. International experience with CPFs

2. EU-wide CPF & national CPF

⇒ Political economy: Market failure + policy failure

Scope: Electricity sector in Europe (within EU ETS)

- Minimal concerns about carbon leakage

Premise: Deliver on (unilateral) EU climate targets

GB Carbon Price Support since 2013

“To support and provide certainty for low carbon investment” (HMT, 2010)

Original policy: £30/tCO₂ (2020) up to £70/tCO₂ (2030)

- Drive £30–40bn (=7.5–9.5GW) new investment...

Current policy: Maximum £18/tCO₂ until 2021...
(added to EUA price)

Impacts: Significant to coal-to-gas (and RE) switching

- Coal share: 41% (2013) down to 8% (2017)
- Rise in wholesale electricity price
- Increase in imports via interconnectors

International policy experience with CPFs

	Multi-sector ETS	Power-only ETS
Full sectoral coverage	California (WCI) Floor: Reserve price \$10 (2012) infl'n + 5% p.a. Canada Floor: Top up levy C\$10 (2018) + \$10/year Beijing pilot Corridor: Permit buybacks CNY 20–150	Regional Greenhouse Gas Initiative (RGGI) Corridor: Reserve price \$6–13 (2021) +7% p.a.
Partial sectoral coverage	Great Britain Floor: Top up levy Netherlands (planned) Floor: Top up levy	N/A

Rationale for EU-wide CPF for electricity sector

Economics of **instrument choice** under uncertainty

- **Hybrid design** combining price & quantity does better than tax (which does better than quota)
 - Unless close to climate “tipping point”...
- ⇒ **CPF = practical implementation of hybrid design within existing EU ETS framework**

EU carbon price is then differentiated across sectors

- Power sector faces higher carbon price than ETS
 - ↔ traded sectors get “discount”
- Why?* Carbon leakage + no corrective tariffs

Economic impacts of a EU-wide CPF

- ① Fuel switching from coal to gas & RES
- ② Higher wholesale electricity price
- ③ Stronger low-carbon investment incentives
- ④ Lower carbon emissions from electricity sector
- ⑤ Additional tax revenue (double dividend...)
- ⑥ Abatement cost inefficiency
 - Due to unequal sectoral carbon prices

Policy recommendation: Design of EU CPF

- **Level:** Starting at €20–25/tCO₂
- **Trajectory:** Inflation plus 3–5% increase p.a.
- **Duration:** At least up to 2030
- **Design:** Top up levy for electricity generation

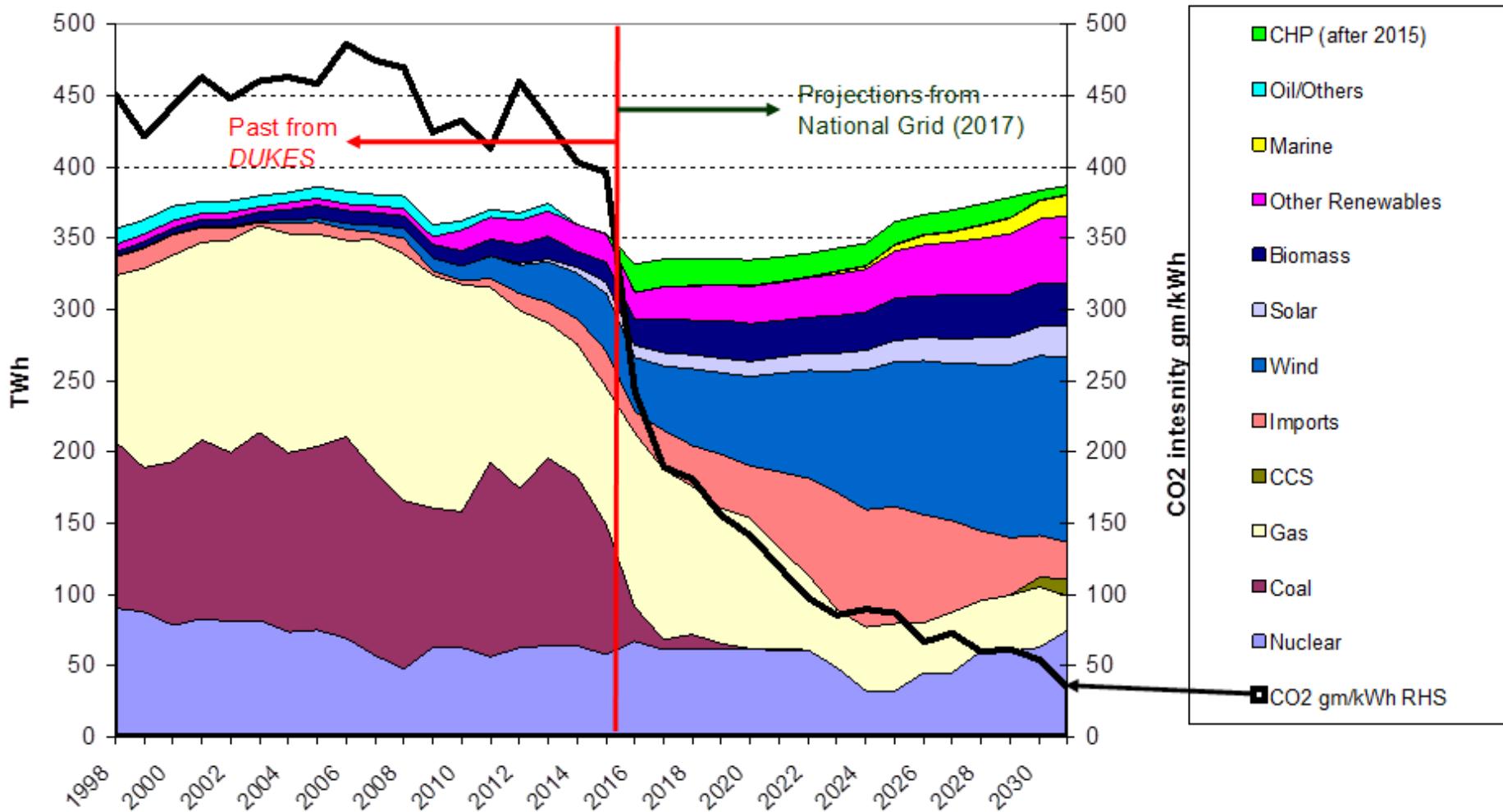
- ✓ Design based on inducing coal-to-gas switching
- ✓ More practical than SCC or target-consistent prices

⇒ **EU carbon price floor = “low regret” policy**

- Directly addresses risk of “too low” EUA price
- Remains useful even if other reforms gain pace

GB longer-term climate commitment

Generation output past and projected under Two Degrees 1998-2031



Rationale for & design of national CPF

National CPF supports serious long-term climate target

Trade-off: Greater feasibility than EU-wide agreement
versus additional intra-EU trade distortions

Design: Same recommendation as for EU-wide CPF

- Coal-to-gas switching level may differ across countries

Credibility: Commitment to price trajectory is key

- GB: Additional emissions performance standard (EPS) to help signal “no new coal”

Interaction between CPF & EU ETS

National CPF reduces domestic carbon emissions

ETS benchmark result

Fixed & binding ETS cap: zero EU-wide emissions cut
due to “**waterbed effect**”

⇒ Climate benefit requires national EUA cancellation

EU ETS Market Stability Reserve

MSR to fill up (2019–) & cancel surplus EUAs (2023–)

- Medium-term: Waterbed reduced by ~50–80%
- Post-2030: Waterbed re-emerges...

⇒ New MSR design enhances value of national CPF

Conclusions on role for a carbon price floor

- ① Good case for CPF as **practical hybrid ETS design**, supported by international experience
- ② **EU-wide power CPF = “low regret” policy**
 - Address risk of too low EUA price & missing market
 - Useful even if other EU ETS reforms gain pace
- ③ **National power CPF = “ambitious” policy**
 - Support national climate commitment & avoid lock-in
 - Value enhanced by new Market Stability Reserve
- ④ **Dynamic towards regional CPF?**
 - Potential CPF coalition building on GB & Dutch policy...