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/tCO\(_2\) (2030), €49–190/tCO\(_2\) (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

<table>
<thead>
<tr>
<th>Full sectoral coverage</th>
<th>Multi-sector ETS</th>
<th>Power-only ETS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Canada</strong></td>
<td>Floor: Top up levy C$10 (2018) + $10/year</td>
<td></td>
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<tr>
<td><strong>Beijing pilot</strong></td>
<td>Corridor: Permit buybacks CNY 20–150</td>
<td></td>
</tr>
<tr>
<td><strong>Partial sectoral coverage</strong></td>
<td><strong>Great Britain</strong> Floor: Top up levy</td>
<td>N/A</td>
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<td><strong>Netherlands</strong> <em>(planned)</em> Floor: Top up levy</td>
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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/tCO$_2$
- **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

Avoiding lock-in into unsustainable technologies…
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...