



When is a carbon price floor desirable?

Robert A. Ritz

Assistant Director, EPRG

Cambridge Judge Business School

r.ritz@jbs.cam.ac.uk

Based on joint work with David Newbery & David Reiner

French Association for Energy Economics

Paris Dauphine, 4 July 2018

Plan for this talk

- ① **Policy background**
- ② **International experience**
- ③ **Carbon price floor: Rationale and design**
- ④ **Interaction with EU ETS**
- ⑤ **Conclusions & policy recommendation**

EPRG Working Paper & Policy Brief

Newbery, David, David Reiner & Robert Ritz (2018).

When is a carbon price floor desirable?

EPRG Working Paper 1816, June 2018

<https://www.eprg.group.cam.ac.uk/eprg-working-paper-1816/>

Newbery, David, David Reiner & Robert Ritz (2018).

A carbon price floor for power generation to reaffirm EU climate leadership

EPRG Policy Brief, June 2018

<https://insight.jbs.cam.ac.uk/2018/carbon-price-floor/>

Financial support from Iberdrola is gratefully acknowledged.

All views expressed and any errors are those of the authors.

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

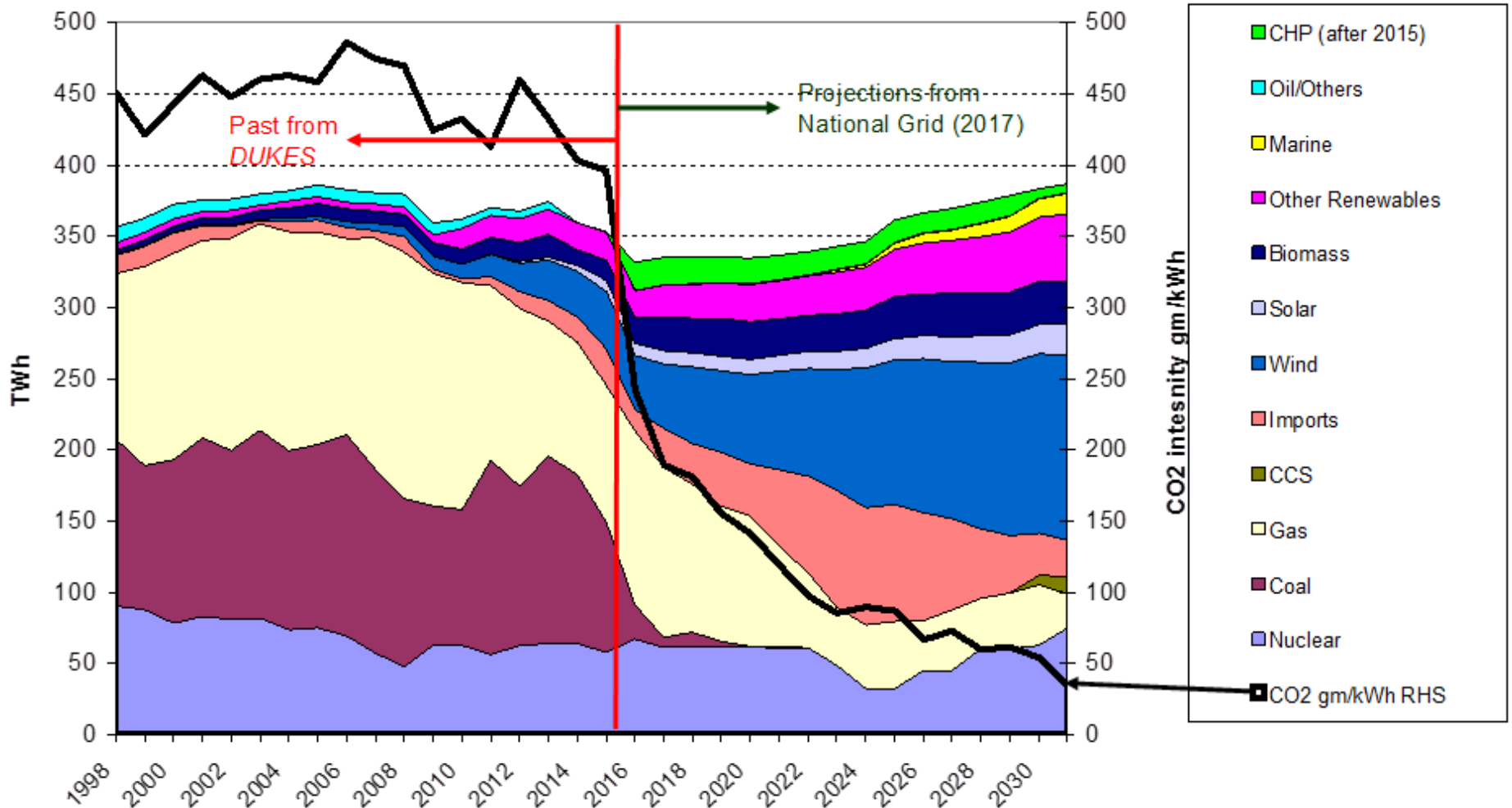
- ① **Fuel switching** from coal to gas & RES
- ② Higher wholesale **electricity price**
- ③ Stronger low-carbon **investment incentives**
- ④ Lower **carbon emissions** from electricity sector
- ⑤ Additional **tax revenue** (double dividend...)
- ⑥ **Abatement cost** inefficiency
 - Due to unequal sectoral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



⇒ 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...