



The political economy of a carbon price floor for power generation

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Based on joint work with David Newbery & David Reiner

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Conclusions: The role for a carbon price floor

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

Rationale: A CPF for the EU 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 other ETS
 - ⇔ traded sectors get “discount”
 - Why?** Carbon leakage + no corrective trade tariffs
 - Electricity needs to decarbonize more quickly

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

Policy recommendation: CPF design

- **Level:** Starting at €25–30/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**
 - Coal-to-gas switching level may differ across countries
- ✓ More practical than **social cost of carbon (SCC)** or **“target-consistent” carbon prices**

Policy interactions: CPF & MSR

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

New 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

EPRG Research project + Op-eds

Research project

David Newbery, David Reiner & Robert Ritz:

When is a carbon price floor desirable?

EPRG Working Paper 1816, June 2018

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

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/>

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

Opinion pieces

Arthur van Benthem & Robert Ritz: *Handelsblatt Global* (25 July 2018),
de Volkskrant (7 August 2018), and *The Hill* (5 September 2018)

Backup slides

Contribution of this research 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

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)

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

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...

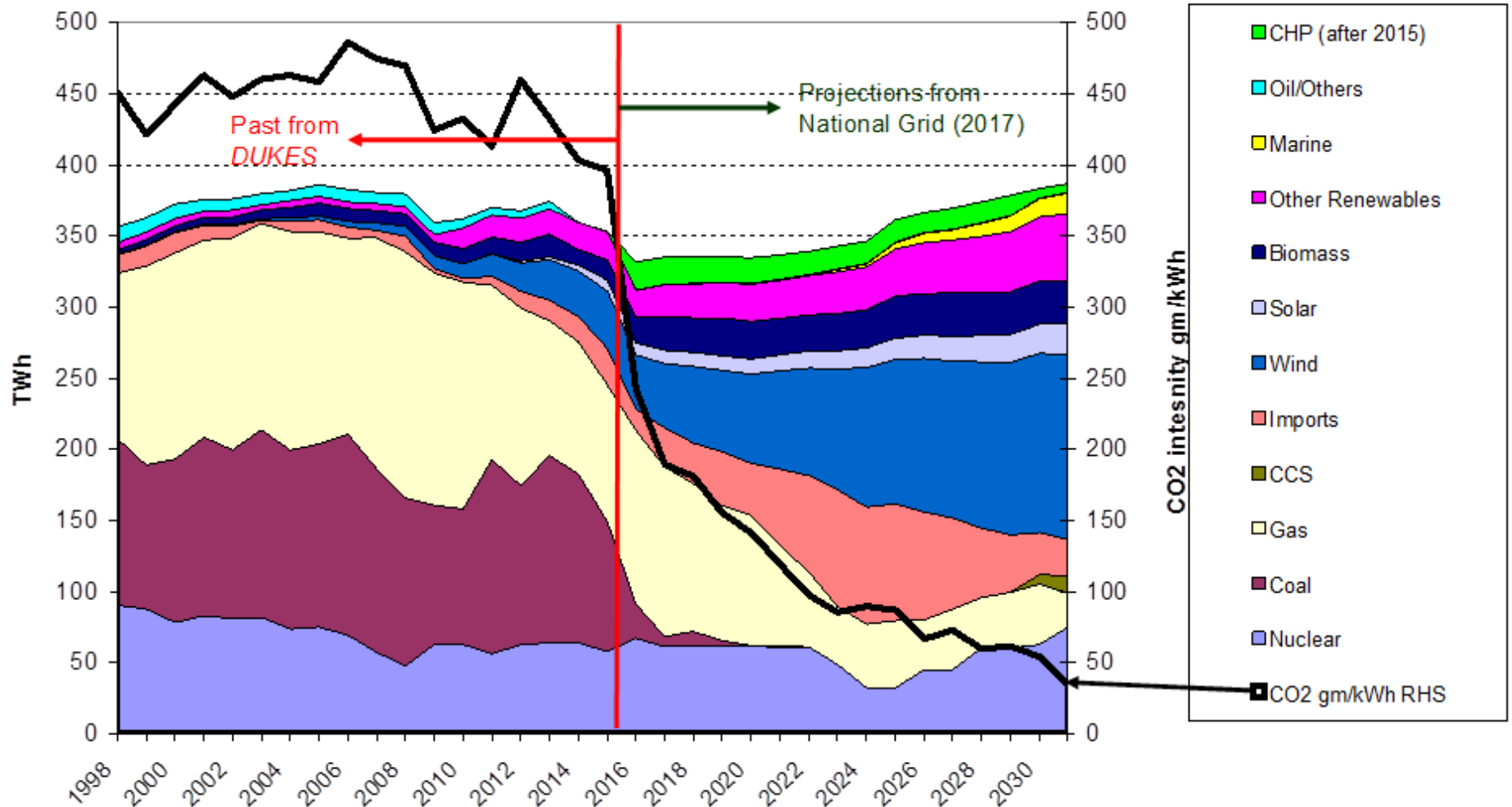
(added to EUA price)

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

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”

Thought experiment: Global coal-to-gas switch

Q: How much existing coal-fired power generation can be replaced with existing unused gas generation?

Top 5	“Gas potential”
China	6%
US	47%
India	12%
Russia	37%
South Korea	35%

- **European countries:** mostly >100% potential
 - Except: Germany, Czech
- **Zero potential:** Japan, Mexico, Poland, Kazakhstan

A: Global switching potential ~20% with existing assets

⇒ Annual global carbon emissions fall by ~1 GtCO₂

- **Social value:** ~\$50 billion per year

Source: Grant Wilson & Staffell (2018), 2015 data

Potential for coal-to-gas switching in power

