



# When is a carbon price floor desirable?

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*Based on joint work with David Newbery & David Reiner*

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# Plan for this talk

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- 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

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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/>

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*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/tCO<sub>2</sub> (2030), €49–190/tCO<sub>2</sub> (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/tCO<sub>2</sub> (2020) up to £70/tCO<sub>2</sub> (2030)

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

**Current policy:** Maximum £18/tCO<sub>2</sub> 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><b>California (WCI)</b> Floor: Reserve price \$10 (2012) infl'n + 5% p.a.</p> <p><b>Canada</b> Floor: Top up levy C\$10 (2018) + \$10/year</p> <p><b>Beijing pilot</b> Corridor: Permit buybacks CNY 20–150</p>	<p><b>Regional Greenhouse Gas Initiative (RGGI)</b> Corridor: Reserve price \$6–13 (2021) +7% p.a.</p>
Partial sectoral coverage	<p><b>Great Britain</b> Floor: Top up levy</p> <p><b>Netherlands (planned)</b> 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

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- 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<sub>2</sub>
- **Trajectory:** Inflation plus 3–5% increase p.a.
- **Duration:** At least up to 2030
- **Design:** Top up levy for electricity generation

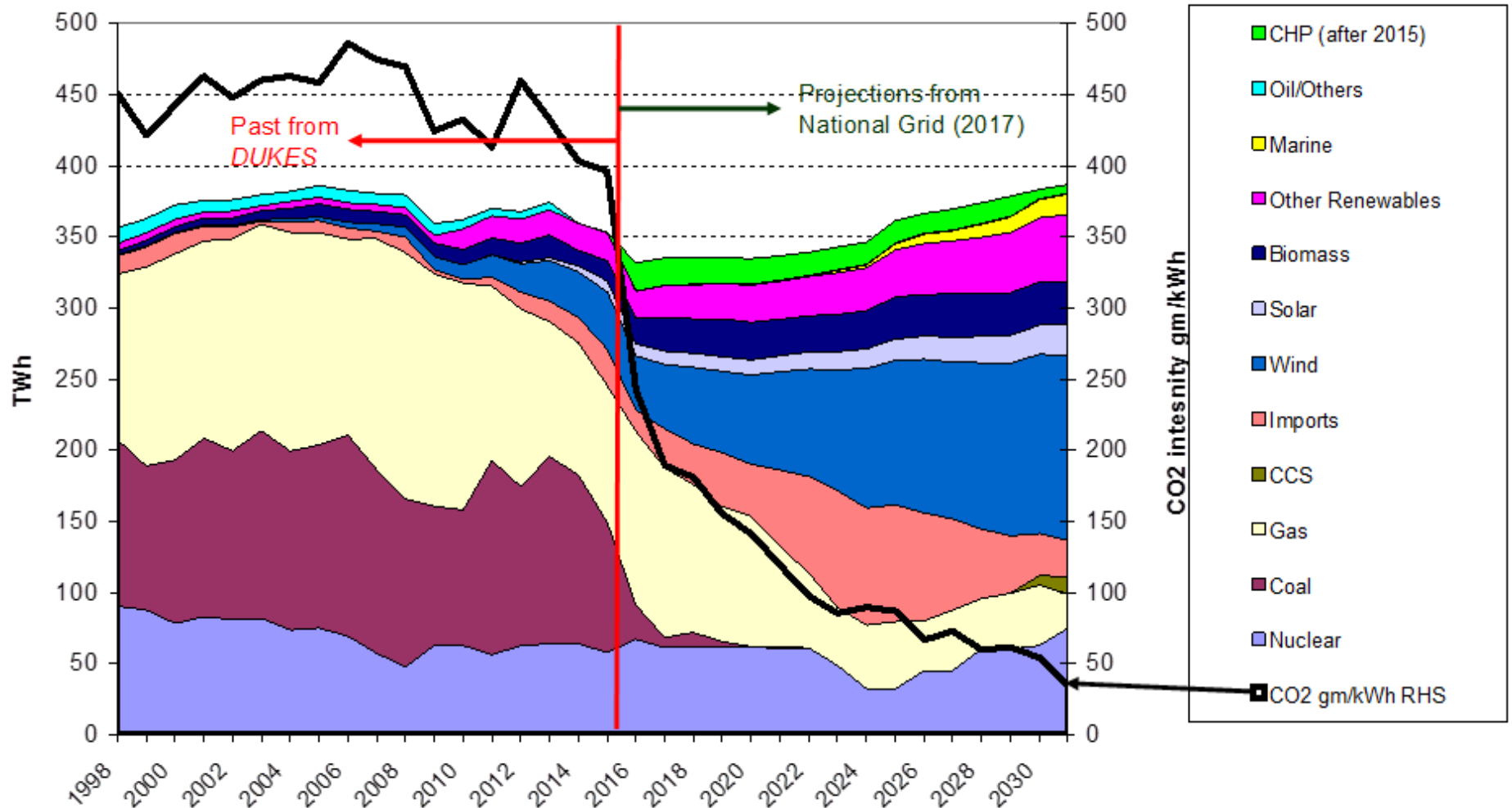
- ✓ Design based on inducing coal-to-gas switching
- ✓ More practical than SCC or target-consistent prices

⇒ **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

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**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...