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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	**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

Policy recommendation: CPF design

- **Level**: Starting at €25–30/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**
  - 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/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)

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/tCO_2 (2020) up to £70/tCO_2 (2030)

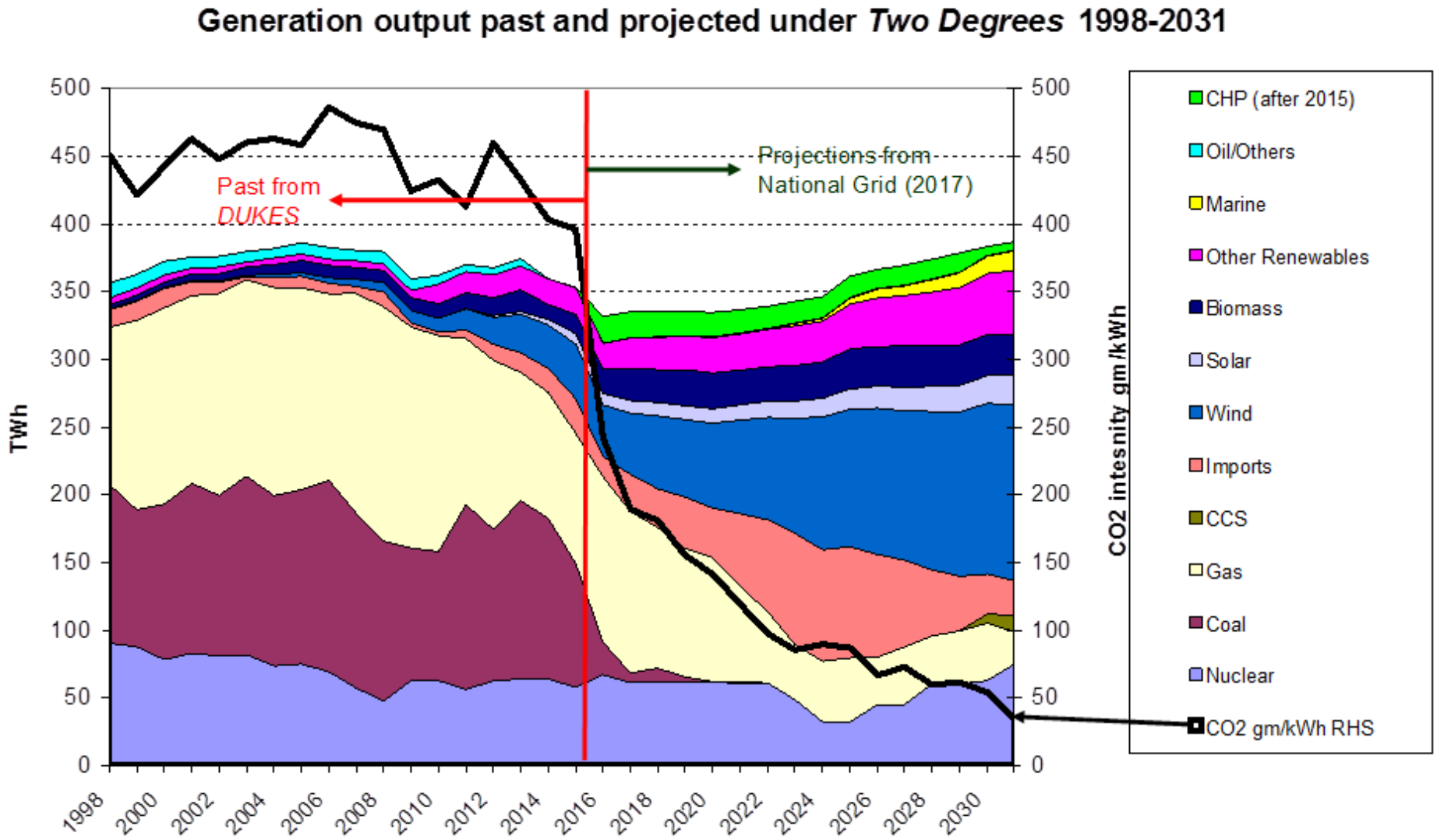
- Drive £30–40bn (=7.5–9.5GW) new investment…

Current policy: Maximum £18/tCO_2 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



⇒ 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%

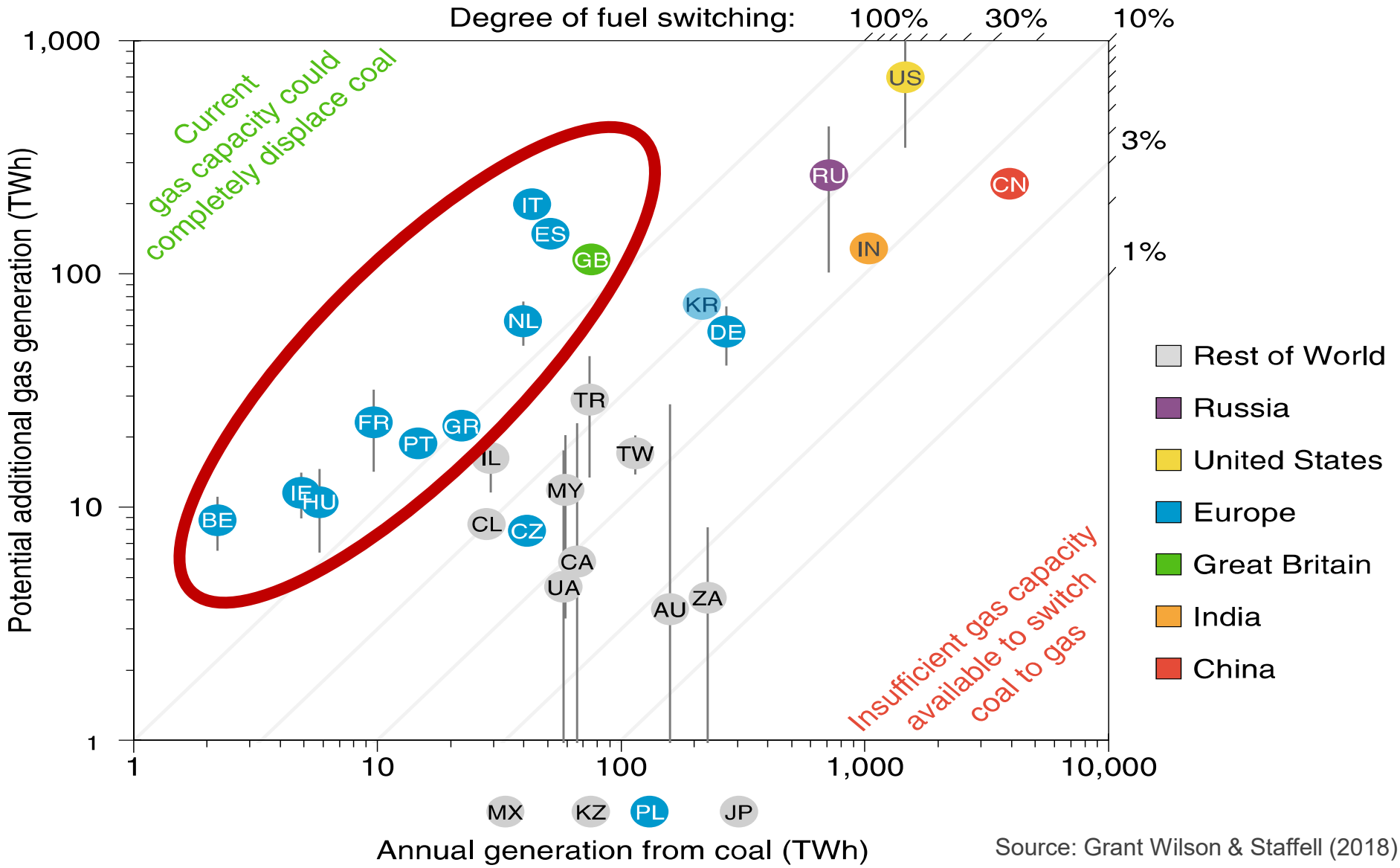
- **European countries**: mostly >100% potential
  - Except: Germany, Czech
- **Zero potential**: Japan, Mexico, Poland, Kazachstan

A: Global switching potential ~20% with *existing* assets

⇒ Annual global carbon emissions fall by ~1 $GtCO_2$
- **Social value**: ~$50 billion per year

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

Potential for coal-to-gas switching in power



Source: Grant Wilson & Staffell (2018)