



# Coal, Carbon Controls and the UK Economy

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## Project main objective

- **CoalPro commissioned NERA to conduct an independent analysis of the potential economic impacts** on the GB electricity market and the broader UK economy of **phasing out the CPS rate** to harmonise UK and EU carbon costs.

## Specific objectives and methodology

- Assess potential impacts of phasing out the CPS rates on the GB electricity market, HMT revenues from CPS rates and electricity sector emissions.
- Evaluate potential macro-economic and inter-sectoral impacts and HMT's net tax receipts.
- NERA's GB electricity market model was used in conjunction with NERA's  $N_{ew}$ ERA computable general equilibrium macroeconomic model.

## Scenarios analysed and key assumptions

- The two scenarios: the "Baseline" and Carbon Cost "Harmonisation" scenario.
- **Baseline:** a balanced view of the world where UK energy and environmental policy targets are partially met.
- **Harmonisation:** identical to the Baseline, save for CPS rates, which are phased out after 2016.

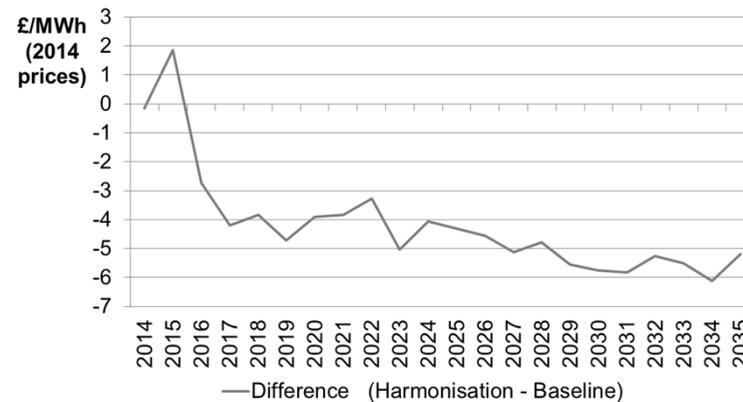
## Phasing out the Carbon Price Support (CPS) rates from 2016 could lead to:

1

### Improved affordability:

Lower wholesale electricity prices translate into reduced end user prices and savings for households and businesses

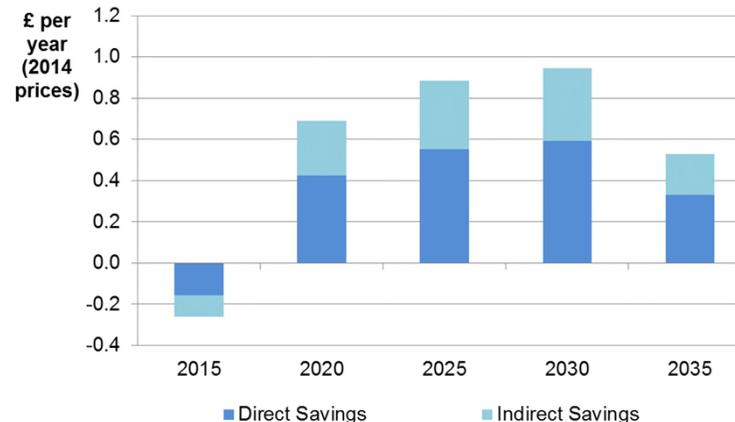
Difference in Wholesale Electricity Prices



Source: NERA analysis

Wholesale electricity prices average ~£5/MWh lower in the Harmonisation scenario through the 2020s.

Difference in direct and indirect savings to UK Households from lower electricity prices (Harmonisation – Baseline)



Source: NERA analysis

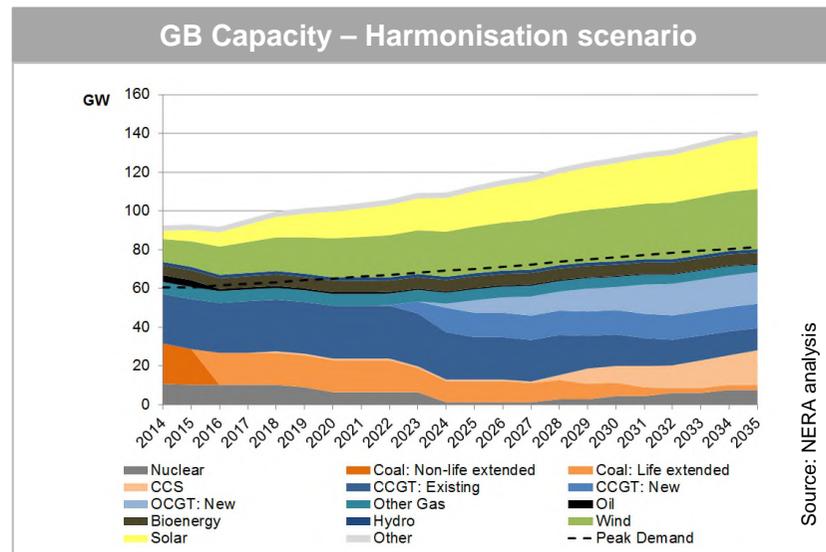
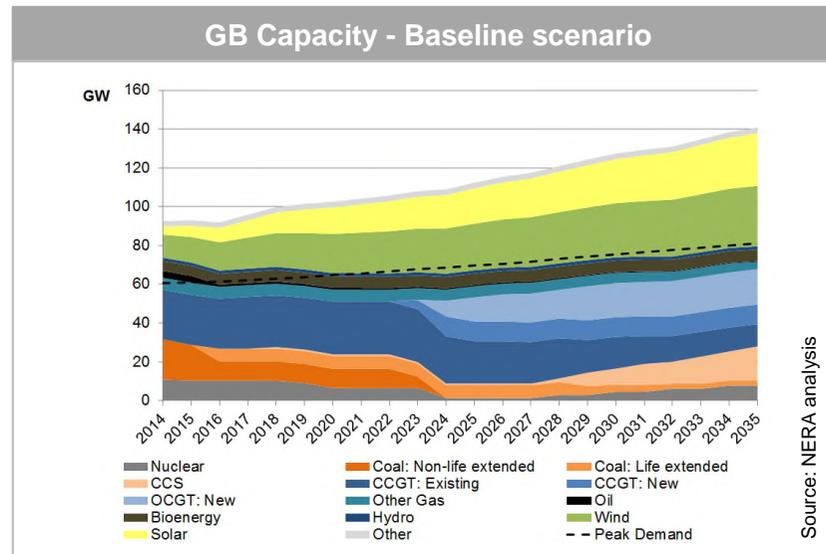
Through direct and indirect effects of lower energy costs, households save £29 per year on average between 2020 and 2035.

## Phasing out the Carbon Price Support (CPS) rates from 2016 could lead to:

2

### Enhanced GB supply security:

The amount of coal capacity that chooses to invest in life extensions more than doubles



**6.6 GW of coal plants elect to invest in life extensions in the Baseline.**

**16.5 GW invest in life extensions if the CPS rates are phased out.**

**UK energy supply security would be enhanced while CCS is deployed at scale.**

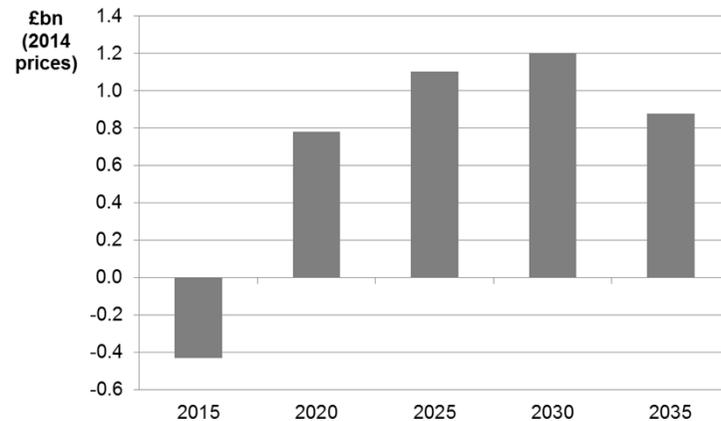
## Phasing out the Carbon Price Support (CPS) rates from 2016 could lead to:

3

### Higher economic growth:

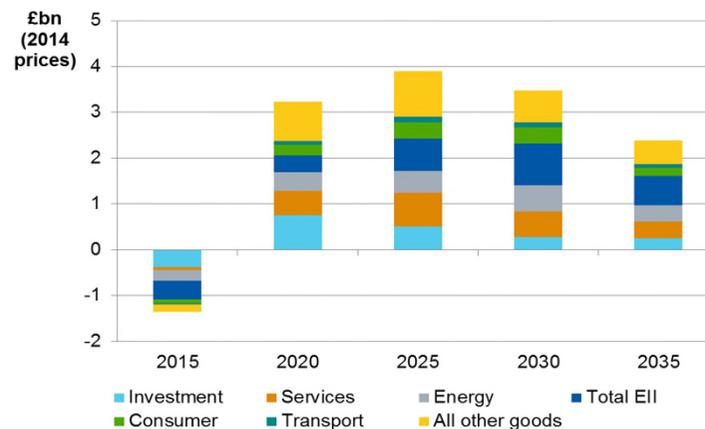
Driven by greater household consumption and economic output, the UK economy grows more quickly

Difference in UK GDP (Harmonisation – Baseline)



Source: NERA analysis

Difference in Output from All UK Economic Sectors (Harmonisation – Baseline)



Source: NERA analysis

Lower electricity prices stimulate domestic consumption and industrial output.

GDP increases, on average, by £1 billion per year through the 2020s.

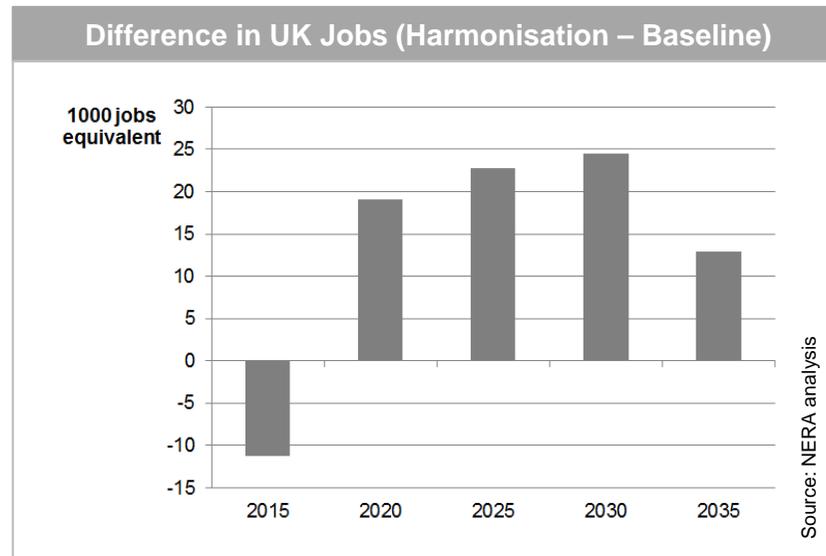
Value of production from UK economic sectors increases, by ~£3 billion per year through the 2020s.

## Phasing out the Carbon Price Support (CPS) rates from 2016 could lead to:

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### Increased employment:

Higher economic activity prompts the creation of additional jobs in the UK



**Labour earnings increase to meet the increase in industrial output.**

**Change in labour earnings implies the equivalent of up to 25,000 new jobs at the average prevailing wage, between 2020 and 2035.**

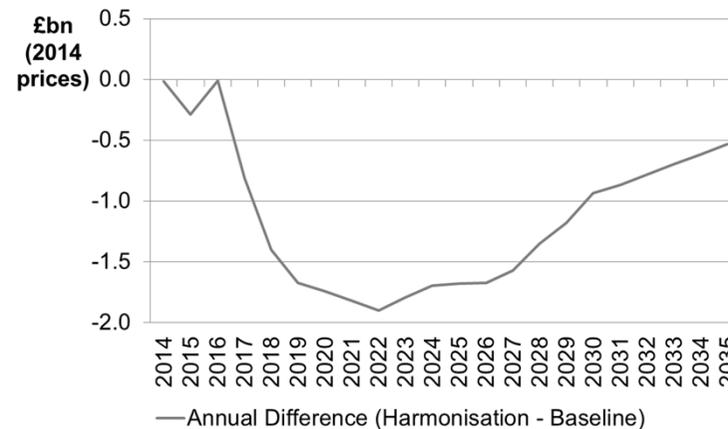
## Phasing out the Carbon Price Support (CPS) rates from 2016 could lead to:

5

### Government revenues:

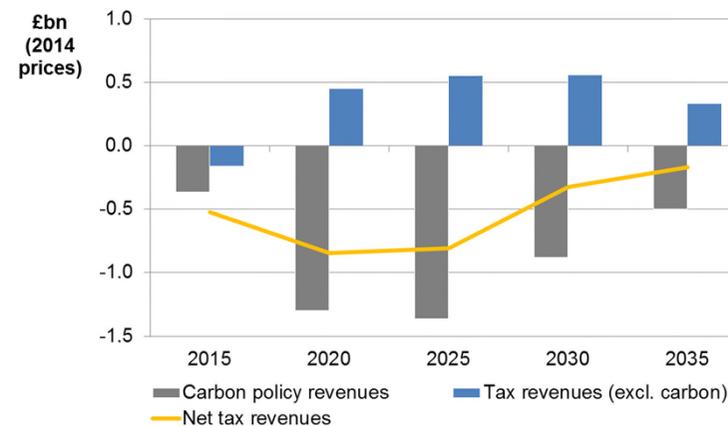
Lost revenues from phasing out CPS rates are partially offset by higher tax revenues from increased economic activity

Change in HMRC Revenues from CPS Rates



Source: NERA analysis

Difference in UK Tax Revenues (Harmonisation - Baseline)



Source: NERA analysis

Tax revenues from increased economic activity increases by £0.5 billion per year in the 2020s.

This partially offsets a decrease in revenues of £1 billion per year from carbon policy (CPS rates + EU ETS) over the same time period.

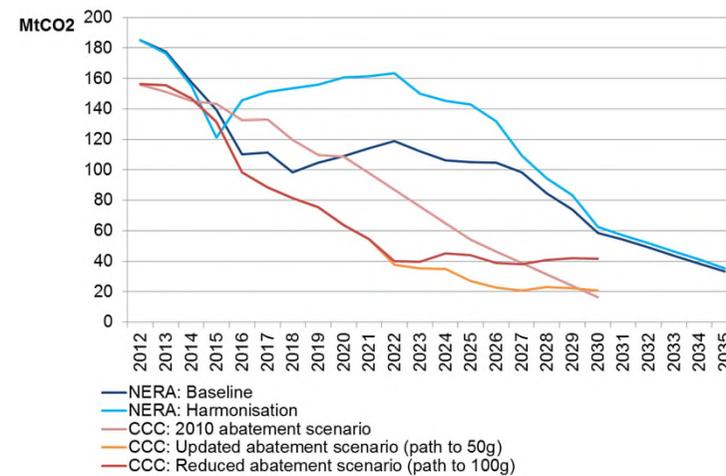
## Phasing out the Carbon Price Support (CPS) rates from 2016 could lead to:

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### Emissions:

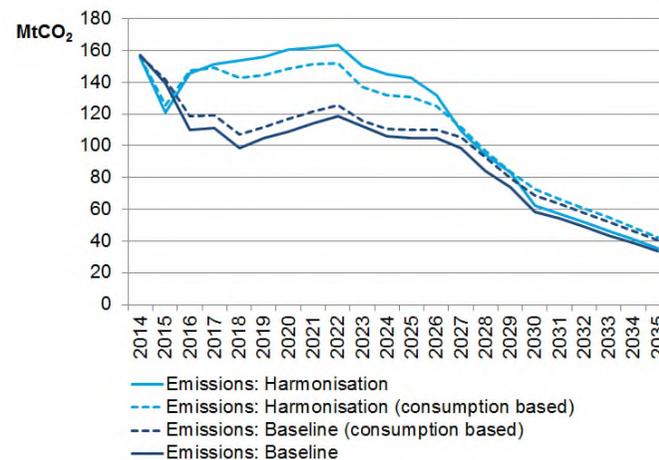
Direct emissions rise, but impact is limited when considered from a consumption-based perspective, and converge to the same long term level

Emissions in the Baseline and Harmonisation scenarios



Source: NERA analysis

Consumption-Based Emissions in the Baseline and Harmonisation scenarios



Source: NERA analysis

Annual emissions are ~22 MtCO<sub>2</sub> higher in the Harmonisation scenario between 2014-2035.

When adjusted for consumption (i.e. net of the impact of exported electricity, to better reflect impact on pan-EU emissions), the average annual difference reduces to 14 MtCO<sub>2</sub>.

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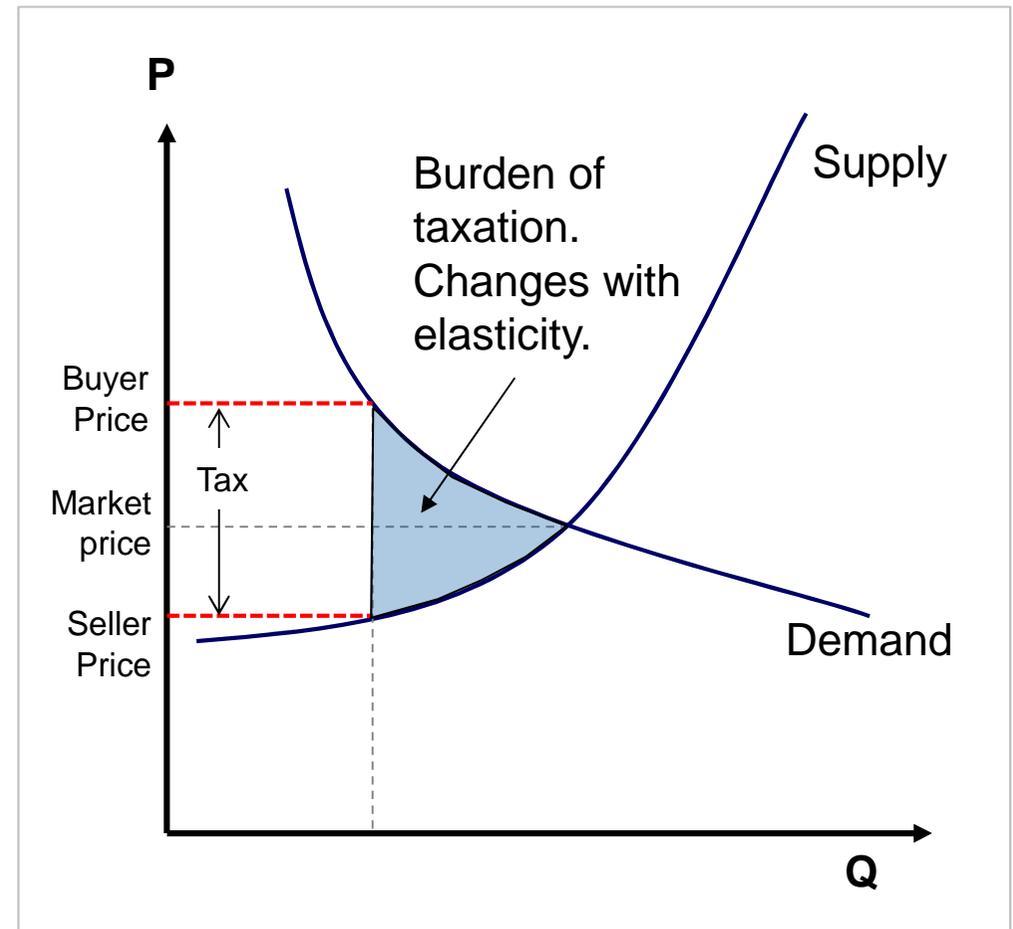
**II. UK CPS vs EU ETS**

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# UK CPS vs EU ETS

## Narrow-base taxes (e.g. UK CPS) are more distortionary than broad base taxes (e.g. EU ETS or VAT)

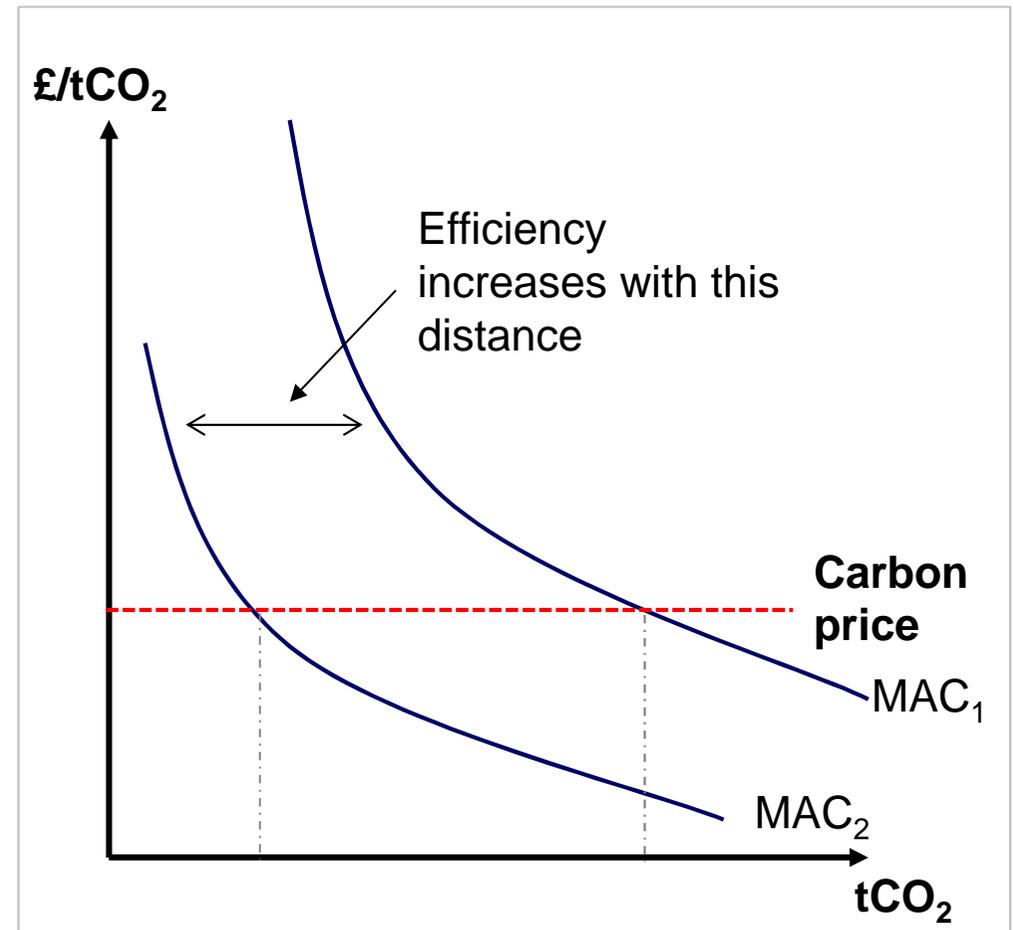
- Narrow-based taxes generate a greater “deadweight loss” or “excess burden” of taxation than broad-based taxes (as demand tends to be more price elastic in smaller markets).
- Evaluated **solely for their revenue raising potential** (i.e. putting to one side the fact that they seek to internalise the emissions externality), carbon taxes are inferior to more broad-based taxes.
- A carbon tax is a narrow-base consumption tax, and will have larger deadweight losses per pound of revenue than e.g. VAT.



**To raise an equivalent amount of revenue (and ignoring other policy objectives or costs such as emissions targets or health impacts) the economy is always better off if revenue is raised with a broader based tax.**

## Broad-based environmental taxes (e.g. EU ETS) are more efficient

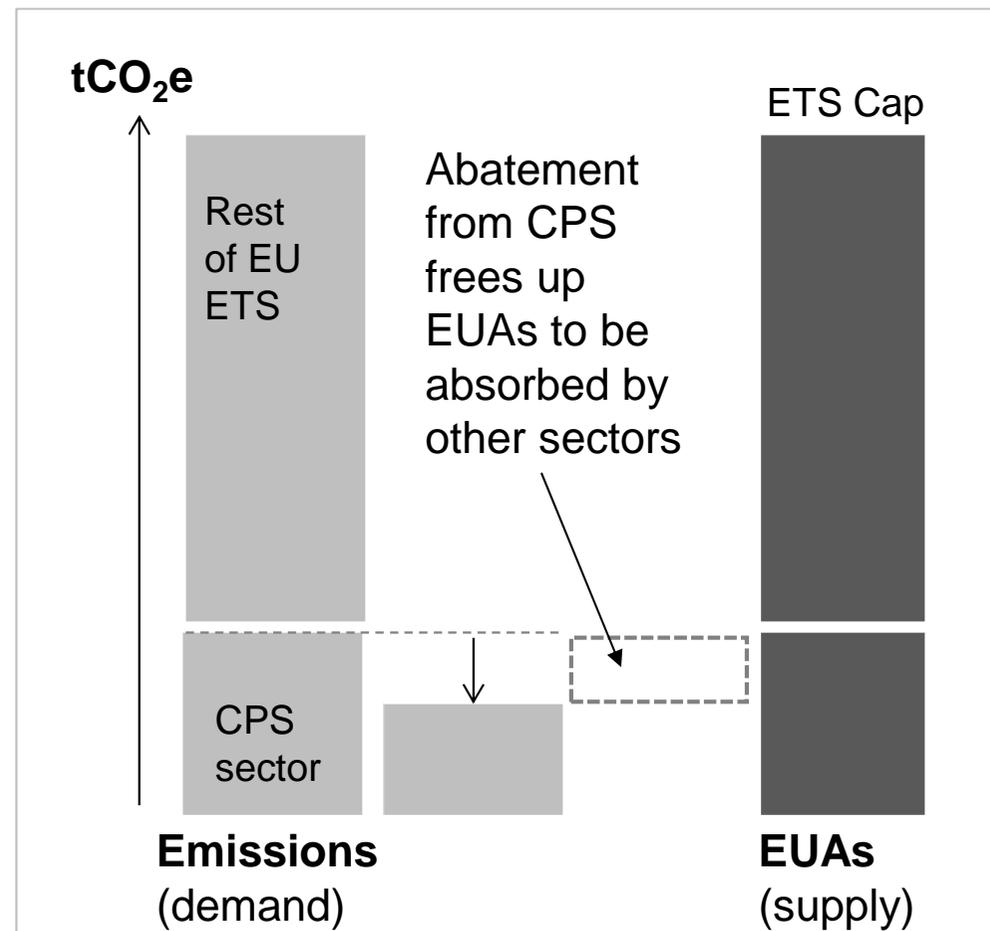
- Price-based emissions abatement policies are **economically efficient as they equalise abatement costs** at the margin.
- Efficiency means **more abatement takes place where it is cheap** and less where it is not.
- This effect increases with the spread between abatement costs.
- Narrowing the scope of emitters (e.g. from the long list of EU ETS sectors to CPS on fuel consumption from the UK electricity sector; or by narrowing the geographical scope) erodes this effect.



**From an EU-wide perspective, the CPS is an inefficient method of reducing greenhouse gas emissions, as it reduces the scope for ensuring abatement takes place at the lowest cost sources.**

## CPS prompts EUA “leakage”

- CPS rates have the perverse effect of reducing the EUA price for other sectors.
- Emissions reductions prompted by the CPS mechanism will lead to freeing up of supply of EUAs to other sources.
- Other sectors could increase their emissions due to the extra supply / lower price of EUAs.
- CPS rates will have no effect on EU wide emissions from sectors under the EU ETS, because total emissions are constrained by the EU ETS cap.



**Leakage of the UK emission reductions attributable to the CPS mechanism to other sectors is likely to be up to 100%.**

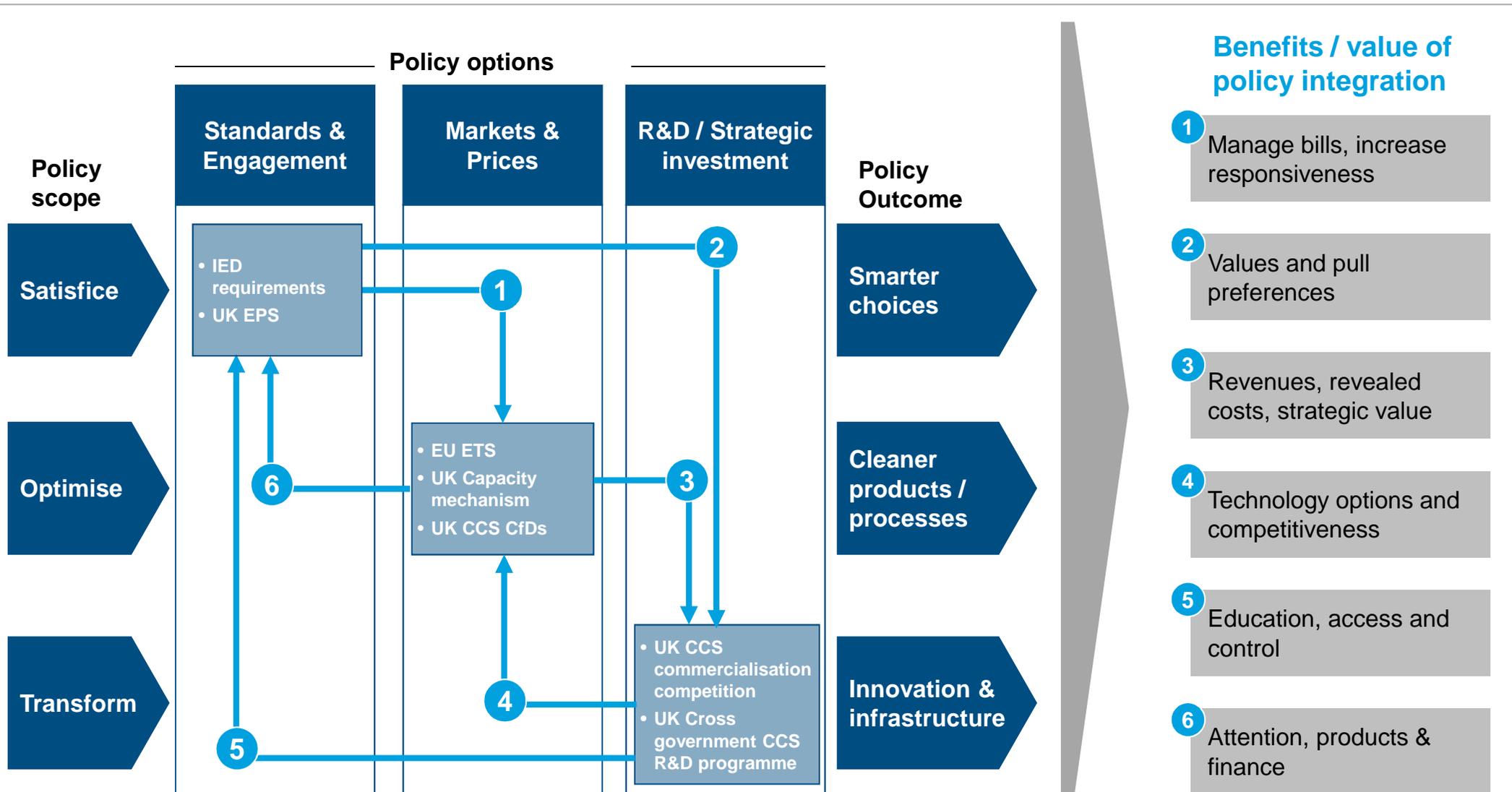
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# A key lever to secure coal's future is to demonstrate and implement the benefits of greater policy & regulatory coordination and integration



Source: NERA adaptation from Grubb, Hourcade, Neuhoﬀ. *Planetary Economics*. 2014.



Examples of policies targeting UK coal sector



## Thank you

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