



**BRIEFING PAPER**

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# Carbon Price Floor (CPF) and the price support mechanism

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## Summary

The Carbon Price Floor (CPF) is a UK Government policy implemented to support the EU Emissions Trading System (EU ETS). The CPF was introduced on 1 April 2013 to underpin the price of carbon at a level that drives low carbon investment, which the EU ETS has not achieved.

### What is the CPF?

The CPF taxes fossil fuels used to generate electricity via Carbon Price Support rates set under the Climate Change Levy. The price floor consists of two components which are paid for by energy generators in two different ways: (i) The EU ETS allowance price; and (ii) the Carbon Support Price (CPS), which tops up the EU ETS allowance prices, as projected by the Government, to the carbon floor price target.

The Treasury confirms the target carbon price and CPS rates three years in advance of delivery at each budget, and all revenue from the CPF is retained by the Treasury; in 2017 the Treasury recouped £1billion in CPF tax receipts.

### Price freeze

When the CPF was introduced, it was due to rise every year until 2020 (to a price of £30/tCO<sub>2</sub>). At Budget 2014 the Government announced that the CPS component of the floor price would be capped at a maximum of £18/tCO<sub>2</sub> from 2016 to 2020 to limit the competitive disadvantage faced by business and reduce energy bills for consumers. This price freeze was extended to 2021 in Budget 2016.

### Impact of the CPF

The aim of the CPF is to encourage the transition to a low carbon economy. Since the implementation of the CPF there have been significant falls in coal electricity generation—the most carbon intensive energy source—which have partly been attributed to the CPF.

The additional costs of the CPF are ultimately borne by domestic and business consumers. Fears for the competitiveness of energy intensive industries, led the Government to introduce compensation measures aimed at alleviating the costs of the EU ETS, and the CFP.

### Views on the CPF

There are mixed views on the CPF. Critics says the CPF has done little to reduce emissions, has disadvantaged UK companies and led to increased costs to bill-payers. Many power companies however support the CPF as a mechanism to encourage low-carbon investment, and some environmental groups support the aim of the policy.

### Future of the CPF

There have been repeated calls for longer term clarity on carbon pricing and the CPF. In the 2017 Autumn Budget, the Government stated it was “confident” that the Total Carbon Price is set at the right level, and will continue to target a similar total carbon price until unabated coal is no longer used. The European Commission considered, but ultimately rejected, a similar system to reform the EU ETS.

# 1. The price of carbon

## 1.1 Setting a carbon price

A carbon price is a cost applied to carbon pollution to encourage sources of carbon pollution to reduce the amount of greenhouse gas they emit into the atmosphere. Carbon pricing is designed to capture what are known as the external costs of carbon emissions. These are costs incurred by everyone indirectly through the impact of greenhouse gases on the atmosphere.

### Box 1: What is carbon?

When we talk about carbon, we're focusing specifically on carbon dioxide, or CO<sub>2</sub> emissions. There are both natural and human sources of carbon dioxide emissions. Natural sources include decomposition, ocean release and respiration. Human sources come from activities like cement production, deforestation as well as the burning of fossil fuels like coal, oil and natural gas.

The atmospheric concentration of carbon dioxide has risen throughout the 20<sup>th</sup> century. The longest continuous record of atmospheric CO<sub>2</sub> at the [Mauna Loa Observatory in Hawaii](#) shows that average the average CO<sub>2</sub> content has risen from 280ppm (parts per million) in 1958 to over 400ppm in 2017.

Carbon pricing is a method favoured by many economists for reducing global-warming emissions. For instance, in the [Cost of energy review](#) (commissioned by the Department of Business, Energy and Industrial Strategy (BEIS)), Professor Dieter Helm recommends setting a universal carbon price across the whole economy as the "most efficient way to meet the CCA [Climate Change Act] target and the carbon budget."<sup>1</sup> Economists favour this approach as they argue it promises to meet the overarching environmental goal – of reduced emissions – in the most flexible and least-cost way to society.<sup>2</sup>

There are two main types of carbon pricing: emissions trading systems (ETS) and carbon taxes:

- An **emissions trading system** – also known as a cap-and-trade system – caps the total level of greenhouse gas emissions across a given industry, or the whole economy, and then allocates or auctions emission allowances to companies operating in that sector. By creating supply and demand for emissions allowances, an ETS establishes a market price for greenhouse gas emissions. This incentivises companies to reduce their emissions which can then sell their extra allowances to larger emitters. The cap helps ensure that the required emission reductions will take place to keep the emitters (in aggregate) within their pre-allocated carbon budget.
- A **carbon tax** directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the

<sup>1</sup> [Cost of Energy Review](#), Dieter Helm, gov.uk, 25 October 2017, p. viii

<sup>2</sup> [Pricing Carbon](#), World Bank [accessed: 2 November 2017]

carbon content of fossil fuels. It is different from an ETS in that the emission reduction outcome of a carbon tax is not pre-defined.<sup>3</sup>

## 1.2 Carbon pricing in the UK

In 2002, the UK Government launched the first large scale application of emissions trading to greenhouse gases.<sup>4</sup> This scheme encouraged the development of the EU Emissions Trading Scheme (ETS) and influenced its design in some aspects.<sup>5</sup>

### EU Emissions Trading Scheme (EU ETS)

The [EU ETS](#) was launched in 2005, and has undergone a number of reforms. The EU ETS is a mandatory cap-and-trade scheme for greenhouse gases<sup>6</sup>, which is central to the EU's climate change target of reducing emissions by 40% by 2030 compared to 2005 levels. It operates in 31 countries (the 28 EU countries, Iceland, Liechtenstein and Norway) and covers the 45% of the EU's greenhouse gas emissions that come from energy intensive sectors.

The cap sets an EU-wide cap on the total amount of greenhouse gas emissions from energy intensive sectors including power stations and industrial plants. The cap decreases over time (1.74% each year) in order to reduce overall emissions.<sup>7</sup> Airlines operating between the 31 countries are covered within the EU ETS but via a separate cap.

Companies either receive allowances (EU Allowances or EUAs) free or purchase them during auctions of allowances issued by Governments.<sup>8</sup> Surplus allowances can also be traded on the carbon market. The EU ETS is currently in Phase III (2013-2020), which aims for an overall emissions reduction of 21% compared to 2005 emissions for power stations and industrial plants.

In Phase III, power stations purchase all their allowances whereas other industries still receive some of their EUAs via free allocation. Both sectors can also buy international credits from emission-saving projects

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<sup>3</sup> [Pricing Carbon](#), World Bank [accessed: 2 November 2017]

<sup>4</sup> NAO, [The UK Emissions Trading Scheme: A New Way to Combat Climate Change](#), HC 517, 21 April 2004

<sup>5</sup> NAO, [The UK Emissions Trading Scheme: A New Way to Combat Climate Change](#), HC 517, 21 April 2004

<sup>6</sup> The greenhouse gases covered by EU ETS are carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O) and perfluorocarbons (PFCs). Greenhouse gas emissions are linked to global warming. See for instance the US Environmental Protection Agency, '[Overview of Greenhouse Gases](#)', accessed 20 October 2016.

<sup>7</sup> European Commission, Climate Action, '[Emissions cap and allowances](#)', [accessed: 14 November 2017]

<sup>8</sup> Each allowance gives the holder the right to emit one tonne of carbon dioxide or the equivalent of nitrous oxide and perfluorocarbons. (EU Commission, Climate Action, '[Emissions cap and allowances](#)', accessed 20 October 2016)

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around the world.<sup>9</sup> At the end of each year, if a company does not have enough EUAs to cover all its emissions it is required to pay a fine.<sup>10</sup>

In July 2015, the European Commission presented a legislative proposal for [Phase IV \(2021-2030\)](#) of EU ETS with the objective of reducing emissions by 43% by 2030 compared to 2005.

### Brexit

Although the UK's future participation in the EU ETS after Brexit is uncertain, the Government has reiterated its commitment to carbon pricing as an emissions reduction tool; in answer to a [PQ concerning the UK's future relationship with the EU ETS](#), BEIS Minister Lord Prior of Brampton stated:

As the Clean Growth Strategy sets out, the Government is considering the UK's future participation in the EU ETS after our exit from the EU, and we remain firmly committed to carbon pricing as an emissions reduction tool whilst ensuring energy and trade intensive businesses are appropriately protected from any detrimental impacts on competitiveness.

Whatever our future relationship with the EU, we will seek to ensure that our future approach is at least as ambitious as the existing scheme and provide a smooth transition for the relevant sectors. The UK's commitment and leadership role in tackling climate change remains undimmed and working closely with the EU on this global challenge will remain important.<sup>11</sup>

In their [inquiry examining the impact of leaving the EU on energy and climate change policy](#), the Business, Energy and Industrial Strategy (BEIS) Select Committee recommended "that the Government seeks to retain membership of the EU ETS until at least end of Phase III in 2020, and that it seeks to negotiate longer term membership of the EU ETS on the condition of commitment to future reform."<sup>12</sup>

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<sup>9</sup> European Commission, Climate Action, '[Free allocation](#)', [accessed: 14 November 2017]

<sup>10</sup> European Commission, Climate Action, '[The EU Trading System \(EU ETS\)](#)', [accessed: 14 November 2017]

<sup>11</sup> [PQ HL2268](#) [EU Emissions Trading Scheme] 26 October 2017

<sup>12</sup> Business, Energy and Industrial Strategy Committee, [Leaving the EU: negotiation priorities for energy and climate change policy](#), Fourth Report of Session 2016–17, HC 909, 2 May 2017, para 76

## 2. What is the Carbon Price Floor (CPF)?

The Carbon Price Floor (CPF) is a UK Government policy implemented to support the EU ETS. After [consulting on proposals for a CPF in 2010](#)<sup>13</sup>, the Coalition Government introduced the measure in its [2011 Budget](#), confirming it would take effect from 1 April 2013.<sup>14</sup> The CPF works in conjunction with the EU ETS scheme to underpin the price of carbon at a level that will drive low carbon investment, which the EU ETS has not as yet achieved (see box 2). The price of carbon faced by the power sector affects investment decisions in low-carbon technology; a higher carbon price increases the cost of emitting CO<sub>2</sub> whilst rewarding low carbon innovations. The tax revenues from the CPF are not ring-fenced for low carbon technologies. The Coalition Government's Carbon Price Floor consultation response set out the target carbon price to 2030 and the anticipated benefits:

Over the long term (2013-2030) a price floor targeting £30/tCO<sub>2</sub> provides £1.9 billion of net present value benefits. It also achieves the right balance between encouraging investment without undermining the competitiveness of UK industry. The £30/tCO<sub>2</sub> price floor in 2020 rising to £70/tCO<sub>2</sub> in 2030 will drive £30-£40 billion of new investment in low-carbon electricity generation. This is equivalent to 7.5-9.3 gigawatts (GW) of new capacity.<sup>15</sup>

### Box 2: Is the EU price of carbon too low?

Compliance with EU ETS rules is high (less than 1% non-compliance) but the last recession and over-allocation of allowances in Phase II resulted in a collapse of the price of EUAs. As a result the EU has taken several measures to reduce the supply of allowances going forward, including removing surplus allowances from the market. However there is no floor price for EUA auctions. The market price of allowances has fallen dramatically since the scheme was first introduced in 2005.

In the [Committee on Climate Change's \(CCC's\) June 2017 report to Parliament](#), it highlighted that the carbon price in the ETS had remained broadly stable at around €5/tCO<sub>2</sub>, and that the UK's Carbon Price Support – the UK only aspect of the Carbon Price Floor – increased from €9/tCO<sub>2</sub> to £18/tCO<sub>2</sub> in April 2015.<sup>16</sup>

The CPF comprises the price of CO<sub>2</sub> from the EU ETS and the Carbon Price Support (CPS) rate per tonne CO<sub>2</sub> (tCO<sub>2</sub>), which is the UK-only additional element (see box 3 for an explanation of how the CPF is calculated and shared). The Treasury's consultation on the CPF in 2011 provides an illustration of the different components of a price floor (see

<sup>13</sup> HM Treasury, [Carbon price floor: support and certainty for low-carbon investment](#), December 2010

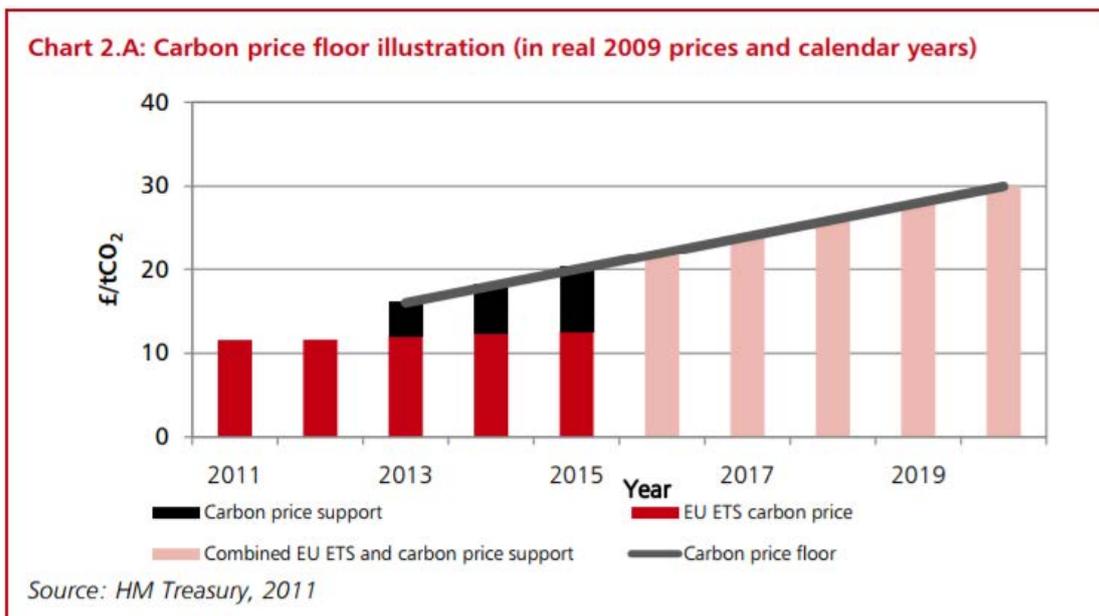
<sup>14</sup> HM Treasury, [Budget 2011](#), HC 836, March 2011, para 1.111

<sup>15</sup> HM Treasury/HMRC, [Carbon price floor consultation: the Government response](#), March 2011, p. 5

<sup>16</sup> [Meeting Carbon Budgets: Closing the policy gap 2017 Report to Parliament](#), CCC, June 2017, p. 24

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chart below) – the prices are illustrative only as the target prices have since been amended – see section 2.2.



The CPF has doubled since it was introduced in 2013 from £9/tCO<sub>2</sub> to £18/tCO<sub>2</sub>. In the spring 2015 budget, the CPF was frozen at £18 per tonne of CO<sub>2</sub> until 2020.<sup>17</sup> The 2016 budget extended this price freeze until 2021, and indicated clarification on the future of the CPF would come forward at the Autumn Budget.<sup>18</sup> As expected, the Government made a statement on the price floor in the [Autumn 2017 Budget](#). The Treasury stated that it was “confident” that the Total Carbon Price is set at the right level, and will continue to target a similar total carbon price until unabated coal is no longer used.<sup>19</sup>

### Box 3: How the CPF is charged

The CPF taxes fossil fuels used to generate electricity via CPS rates set under the Climate Change Levy. The carbon floor price consists of two components which are paid for by energy generators in two different ways:

- The EU ETS allowance price. Generators purchase the [EU ETS allowances](#) through regular Government auctions or the carbon markets.
- The Carbon Support Price (CPS). This tops up EU ETS allowance prices, as projected by the Government, to the carbon floor price target. It is charged through a component of Climate Change Levy, in £/kWh, and applied to fuels used for electricity generation. The [CPS rates of CCL](#) are paid by owners of electricity generating stations. It is different to the CCL main rates paid by businesses for their energy supply.

<sup>17</sup> [Meeting Carbon Budgets: Closing the policy gap 2017 Report to Parliament](#), CCC, June 2017, p. 24

<sup>18</sup> HM Treasury, [Budget 2016](#), HC 901, March 2016, para 1.191

<sup>19</sup> HM Treasury, [Autumn Budget 2017](#), HC 587, November 2017, para 3.46

## 2.1 Setting CPS rates

The Treasury sets carbon price support rates three years ahead of the year in which they will apply (with indicative rates published for two further years).

CPS rates are provided for different fuel types on a £/kWh basis. This is calculated by multiplying the difference between the Government's target carbon price from the market price (see box 4). The market carbon price is calculated from the average annual ICE-ECX benchmark end of day settlement price for carbon for delivery in the target year. The difference between the carbon price floor and market carbon prices represents the 'carbon price support rates' by carbon content (i.e. per tonne of CO<sub>2</sub>). This is then multiplied by standard carbon emission factors (as published by DEFRA) which gives an emission factor CPS rate per kWh, which is paid by electricity generators under the Climate Change Levy (see box 3). This means that fossil fuels with higher emissions factors (such as coal) will be charged more under the Climate Change Levy as they emit more CO<sub>2</sub>.

### Box 4: CPS rates formula

$$\text{CPS Rate} = (\text{target carbon price} - \text{market carbon price}) \times (\text{emission factor of the fuel})$$

At successive Budgets in [2011](#), [2012](#) and [2013](#), the Coalition Government confirmed the CPS support rates for 2013-14 to 2015-16, and in [2013](#) set out indicative rates from 2016-17 to 2017-2018:

### CPS rates set before the price freeze at Budget 2014

	Confirmed rates			Indicative rates	
	2013-14	2014-15	2015-16	2016-17	2017-18
Carbon price equivalent (£/tCO <sub>2</sub> )	4.94	9.55	18.08	21.20	24.62

Source: HM Treasury, [Budget 2011](#)<sup>20</sup>, [Budget 2012](#)<sup>21</sup>, [Budget 2013](#)<sup>22</sup>

However, concerns were raised over future growth rates in 2014 (see section below).

## 2.2 Freezing the carbon price

Carbon prices were due to rise every year until 2020, with all revenue raised retained by the Treasury. In 2016/17, the Treasury recouped £1 billion from CPF tax receipts.

Ahead of the 2014 Budget, concerns were raised that the price floor was harming the competitiveness of energy intensive industries. For

<sup>20</sup> HM Treasury, [Budget 2011](#), HC 836, March 2011, para 1.111

<sup>21</sup> HM Treasury, [Budget 2012](#), HC 1853, March 2012, para 2.162

<sup>22</sup> HM Treasury, [Budget 2013](#), HC 1033, March 2013, para 2.160

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instance, in February 2014 the [Confederation of British Industry \(CBI\) wrote to the Chancellor](#) calling for the price floor to be frozen in a way which minimises the divergence between the UK's carbon price floor and the EU ETS price.

The UK currently faces a higher carbon price than its European counterparts as a result of the Carbon Price Floor (CPF) which was introduced last year. This is an important tool to promote investment but with continuing disappointment with the level of the EU ETS price, the CPF puts UK industry, particularly those that are energy-intensive and trade-exposed, at a considerable competitive disadvantage.

[...]

As such, the government should freeze the UK carbon price from 2015/16 in a way which minimises this divergence [emphasis in original].<sup>23</sup>

At the [2014 Budget](#), the Coalition Government confirmed that it would freeze the CPS rate at £18/tCO<sub>2</sub> from 2016-17 to 2019-20 in order "to limit any competitive disadvantage British companies face in the global race."<sup>24</sup> The Treasury estimated that this would reduce revenue to the Government by £870m by 2018 compared to figures published in the 2013 budget.<sup>25</sup>

A [Tax information and impact note \(TIIN\) published by HM Revenue and Customs \(HMRC\)](#) alongside the 2014 budget, explained that the CPS rate was being frozen because:

...EU ETS carbon prices are now substantially lower than was expected when the CPF was introduced. If kept in place, the current CPF trajectory would cause a large and increasing gap between the carbon price faced by UK energy users and those faced abroad. This would result in UK firms facing significantly higher energy prices than those of competitors abroad, and raise energy bills for households.<sup>26</sup>

By freezing the CPS rate at £18, the Coalition Government stated that British businesses could save "up to £4 billion by 2018-19 over £1.5 billion in 2018-19 alone, and £15 off a typical household energy bill in the same year."<sup>27</sup>

The Committee on Climate Change (CCC) [examined](#) the impact of the freeze on reducing emissions concluding that its impact would be marginal, but that the change was not conducive to providing a clear and consistent signal to investors.<sup>28</sup>

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<sup>23</sup> [CBI Letter to the Chancellor of the Exchequer](#), 18 February 2014

<sup>24</sup> HM Treasury, [Budget 2014](#), HC 1104, para 1.106

<sup>25</sup> HM Treasury, [Budget 2014: Policy Costings](#), p16

<sup>26</sup> HMRC, [Carbon price floor: reform and other technical amendments](#), TIIN 6002 7047, 2014

<sup>27</sup> HM Treasury, [Budget 2014](#), HC 1104, March 2014, para 1.106

<sup>28</sup> CCC, [The Budget freeze in Carbon Price Support](#), 31 March 2016

## 2.3 CPF beyond 2021

The CPF was maintained at £18/tCO<sub>2</sub> at the 2016 Budget alongside a commitment to set out the long-term direction for CPS rates and the Carbon Price Floor at the 2016 Autumn Statement.<sup>29</sup> In the [spring 2017 Budget](#) the Government stated that from 2021-22 it would “target a total carbon price and set the specific tax rate at a later date, giving businesses greater clarity on the total price they will pay.”<sup>30</sup> The Government also stated that further details on carbon prices for the 2020s would be set out in the 2017 Autumn Budget.<sup>31</sup>

As expected, the Government made a statement on the price floor in the [Autumn 2017 Budget](#). The Treasury stated that it was “confident” that the Total Carbon Price is set at the right level, and will continue to target a similar total carbon price until unabated coal is no longer used.<sup>32</sup> However, some [energy analysts](#) have warned that coal could make a revival without an increased carbon price (see [section 5](#)).<sup>33</sup>

## 2.4 Revenue from the CPF

Revenue from both EUAs and the Carbon Price Support are retained by the Treasury. The Treasury recouped £1 billion from CPF tax receipts in 2016/17. This revenue is expected to fall year-on-year. In 2014, the Treasury estimated that the CPF price freeze would reduce revenue to the Government by £870m by 2018 compared to figures published in the 2013 budget.

Climate Change Levy (CCL) receipts			
£ billion			
		of which:	
	CCL Receipts	CCL Receipts (excluding Carbon Price Floor)	CCL Receipts - Carbon Price Floor
2014/15 (outturn)	1.5	0.5	1.0
2015/16 (outturn)	1.8	0.6	1.2
2016/17 (outturn)	1.9	0.9	1.0
2017/18 (forecast)	1.8	1.0	0.9
2018/19 (forecast)	1.9	1.1	0.8
2019/20 (forecast)	2.2	1.4	0.8
2020/21 (forecast)	2.3	1.6	0.7
2021/22 (forecast)	2.3	1.6	0.6
2022/23 (forecast)	2.3	1.7	0.5

sources:  
 HMRC. Climate Change Levy tax & duty bulletin, June 2017  
 Office for Budget Responsibility. Economic and fiscal outlook - November 2017, supplementary fiscal tables, table 2.13

<sup>29</sup> HM Treasury, [Budget 2016](#), HC 901, March 2016, para 1.191

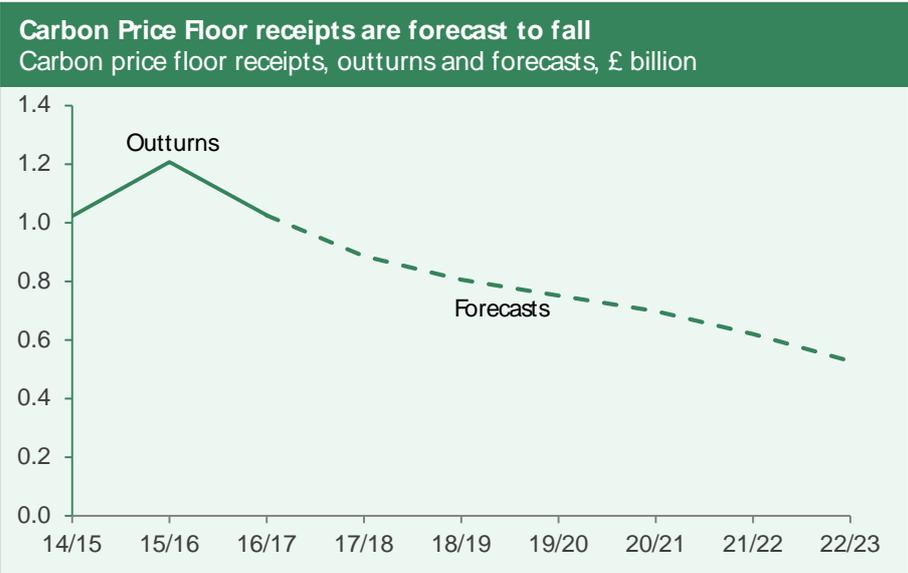
<sup>30</sup> HM Treasury, [Budget 2017](#), HC 1025, March 2017, para 3.27

<sup>31</sup> HM Treasury, [Budget 2017](#), HC 1025, March 2017, para 3.27

<sup>32</sup> HM Treasury, [Autumn Budget 2017](#), HC 587, November 2017, para 3.46

<sup>33</sup> [Next Steps for Carbon Pricing](#), Policy Exchange, November 2016

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### 3. Views on the CPF

There are mixed views on the CPF: several environmental groups maintain that it has had little effect on emissions; industry says it has disadvantaged UK companies in the global market; and consumer groups have criticised the risk of increased costs to bill payers.<sup>34</sup> In contrast, many power companies support the CPF on the grounds that it encourages investment in low-carbon power generation, but have called for long-term clarity.<sup>35</sup> Other environmental groups have praised the overarching aim of the CPF but criticised the implementation of the policy.<sup>36</sup>

When the CPF was introduced the CBI welcomed the news whilst cautioning that it needed to be co-ordinated with other measures.<sup>37</sup> The Renewables Energy Association also welcomed the announcement, but would have liked the commitment to go beyond 2020 to provide greater certainty to investors.<sup>38</sup>

#### Emissions reductions

A strong carbon price signal should allow businesses to make more effective investment decisions in relation to low-carbon energy and should, therefore, stimulate low-carbon investment. The evidence suggests that the CPF has played a role in encouraging a shift from coal to gas generation since its introduction in 2013 (see [section 4.2 coal generation decline](#)). As gas emits less CO<sub>2</sub>/MWh than coal, this means that alongside other measures the CPF has played a role in helping the UK to reduce its GHG emissions.<sup>39</sup> However, [environmental groups](#) have criticised the policy on the grounds that tax receipts from the CPS go straight to the Treasury and not to support the deployment of renewable energy deployment.<sup>40</sup>

#### Carbon leakage and industrial competitiveness

There have been concerns raised that the CPF – and other energy and climate policies – could make operating in the UK and the EU uneconomic, and that businesses will relocate to operate in countries without similar levels of Greenhouse Gas emission regulation. This is known as “carbon leakage”. The EU maintains a list of sectors and sub-sectors (e.g. cement manufacturing) deemed to be at risk of carbon

<sup>34</sup> [Carbon floor price boost for ‘green’ power](#), *Financial Times*, 23 March 2011

<sup>35</sup> [Energy UK writes to the Chancellor ahead of Autumn Statement](#), Energy UK, 2 November 2016

<sup>36</sup> See for instance, comments of Liz Hutchins, Senior campaigner at Friends of the Earth in: [Autumn statement 2016: Key climate and energy announcements](#), *Carbon Brief*, 23 November 2016

<sup>37</sup> CBI, *The Budget and the Low Carbon Economy*, 24 March 2011

<sup>38</sup> REA *Press Release, Budget to re-energise funding and planning for renewables*, 23 March 2011

<sup>39</sup> [2015 UK Greenhouse Gas Emissions](#), DBEIS, March 2017

<sup>40</sup> [The UK Carbon Floor Price](#), Sandbag, 2016

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leakage under the EU ETS; companies operating in these sectors are eligible for special treatment to support their competitiveness (see box 5).

### Box 5: Carbon leakage under the EU ETS

Under the EU ETS, industrial installations deemed to be exposed to a significant risk of carbon leakage receive special treatment to support their competitiveness. To safeguard the competitiveness of industries covered by the EU ETS, the production from sectors and sub-sectors deemed to be exposed to a significant risk of carbon leakage receive a higher share of free allowances in phase 3 of the EU ETS (2013- 2020), compared to the other industrial installations.

The sectors and sub-sectors deemed to be exposed to a risk of carbon leakage are defined in an [official list](#). According to the [ETS Directive](#) (Article 10a), a sector or sub-sector is deemed to be exposed to a significant risk of carbon leakage if:

- direct and indirect costs induced by the implementation of the directive would increase production cost, calculated as a proportion of the gross value added, by at least 5%; and
- the sector's trade intensity with non-EU countries (imports and exports) is above 10%.

A sector or sub-sector is also deemed to be exposed if:

- the sum of direct and indirect additional costs is at least 30%; or
- the non-EU trade intensity is above 30%.<sup>41</sup>

In September 2015, the Engineers Employers Federation (EEF) published a report which examined industrial decarbonisation policies.<sup>42</sup> This report recommended (amongst other things) removing the CPF and CPS on the basis that it affects international competitiveness.<sup>43</sup>

The (now disbanded) Energy and Climate Change Select Committee published a report on 26 January 2012 on the [EU Emissions Trading System](#) in which it was highly critical of the proposals for a floor price for carbon.<sup>44</sup>

### Investor certainty

The design of the CPF – in which the Treasury sets the price floor three years ahead of delivery and via a vote on the *Finance Bill* – has been criticised for not providing investors with the long term certainty needed to invest in low carbon energy.<sup>45</sup> For example, in March 2016, the Energy and Climate Change Committee called on the Government to put an end to the policy uncertainty surrounding the CPF beyond 2020:

As we have already noted, energy projects can take many years, or even decades, to go from conception to fully operational. Investors therefore want to have clarity about the policy framework over a project-long timescale. Witnesses described a policy “cliff-edge” in 2020: beyond this point, there is no

<sup>41</sup> [Carbon leakage](#), European Commission, [accessed 15 November 2017]

<sup>42</sup> [The Low-Carbon Economy – Moving from Stick to Carrot](#), EEF, September 2015

<sup>43</sup> [The Low-Carbon Economy – Moving from Stick to Carrot](#), EEF, September 2015

<sup>44</sup> Energy and Climate Change Committee, [The EU Emissions Trading System](#), Tenth Report of Session 2010–12, **HC 1476**, 26 January 2012

<sup>45</sup> [The UK Carbon Floor Price](#), Sandbag, 2016

information about the Levy Control Framework budget or the Carbon Price Floor.<sup>46</sup>

Furthermore, in the build-up to the 2016 Autumn Statement Energy companies SSE and Drax expressed their support for the policy and urged the Chancellor, to maintain the CPF until at least 2025.<sup>47</sup> Energy UK, which represents energy companies, also published a statement calling for the CPF to be retained ahead of the 2016 Autumn Statement.<sup>48</sup>

## Costs to bill payers

There were criticisms that a Carbon Price Floor would result in higher energy prices and therefore provide a windfall for existing nuclear generators and a hidden subsidy for any new generation by increasing the price of fossil fuel generation.<sup>49</sup> However nuclear generators, such as EDF, welcomed the proposals as a way of providing investment in future generation by restoring the carbon price to what was originally intended.<sup>50</sup>

In 2012, a year ahead of the CPF taking effect, Pete Moorey, Head of Campaigns at *Which?* (the consumer rights group) called for the Treasury to re-think its plans, explaining that:

...we don't think it [the CPF] will achieve its aim of encouraging significant new investment in low-carbon electricity, and we worry it will hit cash-strapped households at a time of rising energy prices.<sup>51</sup>

*Which?* emphasised they weren't opposed to carbon pricing, but thought the CPF was flawed, and that the Government should instead pursue a strengthened EU ETS.<sup>52</sup>

The Centre for Policy Studies (a free-market thinktank) has also questioned the cost implications of the CPF. The thinktank published an [economic brief](#) in 2016 which included an estimate of the direct and indirect costs of renewables to households in 2020/21, and called on the Government "To urgently review how its interventionist policies are damaging the UK's energy policy, particularly on the Carbon Price Floor

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<sup>46</sup> Energy and Climate Change Committee, [Investor confidence in the UK energy sector](#), 3 March 2016, para 24

<sup>47</sup> ['UK climate pledge faces stiff test amid carbon tax drive'](#), *Financial Times*, 25 September 2016

<sup>48</sup> [Energy UK writes to the Chancellor ahead of Autumn Statement](#), *Energy UK*, 2 November 2016

<sup>49</sup> [Budget 2011: Experts divided over carbon floor price impact](#), *Business Green*, 23 March 2011

<sup>50</sup> EDF [Energy, Carbon Price Floor will encourage investment in nuclear, renewables and carbon capture and storage](#), 23 March 2011

<sup>51</sup> [Scrap carbon tax – why pay more for a policy that won't work?](#), *Which?*, 13 March 2012

<sup>52</sup> [Scrap carbon tax – why pay more for a policy that won't work?](#), *Which?*, 13 March 2012

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and the promotion of renewables.”<sup>53</sup> The figures cited in the report were disputed.<sup>54</sup>

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<sup>53</sup> Centre for Policy Studies, Economic Bulletin, [Are We Heading For Blackout Britain?](#) 29 September 2016

<sup>54</sup> [Factcheck: The carbon floor price and household energy bills](#), *Carbon Brief*, 29 September 2016

## 4. Impacts of CPF

The (now disbanded) [Department for Energy and Climate Change \(DECC\) published research](#) in November 2014 which examined the impacts of energy and climate change policies (including the CPF) on energy prices and bills.<sup>55</sup> This report took into account the impact of the carbon price floor freeze until 2020-21 and provide the most up to date information available on impacts on energy bills. This research found a positive impact of policies on household energy bills but a negative impact for business energy bills making compensation mechanisms necessary.

A summary of the estimated impact of the CPF on annual bills for different sized electricity consumers in 2014, 2020 and 2030 is provided below (note there was no estimate for large businesses in 2030):

<b>Estimated impacts of CPF on electricity bills (£/yr)</b>			
	<b>2014</b>	<b>2020</b>	<b>2030<sup>1</sup></b>
Average household	14	30	80
Small business	1,100	2,300	5,600
Medium sized business	47,000	97,000	230,000
Large business (including EEI compensation)	149,000	356,000	-
Large business (no EEI compensation)	427,000	890,000	-

Source: DECC, 2014

<sup>1</sup> Due to uncertainties around EU ETS prices post-2020, the impact of the EU EUTS and and CPF has been combined

The Committee on Climate Change also examined the issue at the time, publishing [Energy prices and bills - impacts of meeting carbon budgets](#) in December 2014.

There has been a large number of changes to climate and energy policies since 2014 which is likely to impact on the estimates of policy costs and future energy bills. These include the ending of the Green Deal finance for householders, reductions in renewable support mechanisms and the removal of the exemption from the climate change levy for renewables.

<sup>55</sup> DECC, [Estimated impacts of energy and climate change policies on energy prices and bills](#), November 2014

## 4.1 CPF impact on electricity bills

### Households bills

According to the DECC research, household energy bills are first and foremost driven by wholesale energy costs. They were estimated to be responsible for 56-71% of increase in energy prices between 2010 and 2013.<sup>56</sup> Bill levels are also driven by network costs (gas and electricity transmission and distribution costs) and supplier costs and margins. In comparison, DECC estimated that energy and climate change policies had been responsible for 5% of the increase.<sup>57</sup>

The research specifically identified the impact of the CPF on an average household in 2014 at £14/year rising to £30/year in 2020 and £80/year by 2030, assuming a frozen CPF target to 2020-21 then rising to £70/tCO<sub>2</sub> in 2030.

### Business bills

Unlike domestic energy, business energy bills and consumption have steadily increased since 2005 – an increase which has only partly been offset by energy efficiency policies:

Consumption trends in the non-domestic sector are heavily driven by fuel-switching, and the economic environment. The effect of the recession is notable in both gas and electricity consumption [...]. However energy efficiency policies have also played a role in reducing consumption.<sup>58</sup>

According to the DECC report in 2014, energy costs accounted for around 3% of operating costs on average for businesses overall. However, policy costs – such as the CPF, Renewables Obligation and other low carbon policies – accounted for less than 1% of these overall costs.<sup>59</sup> However the impact on Energy Intensive Industries is much greater.

The costs of energy to Energy Intensive Industries (EII) were expected to rise but DECC's 2014 estimates of impacts were very broad – between 1% and 50% depending on weather high or low fossil fuel prices scenarios were used, with the impact dependant on the effectiveness and uptake of compensation measures.<sup>60</sup>

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<sup>56</sup> DECC, [Estimated impacts of energy and climate change policies on energy bills](#), November 2014, para. 16

<sup>57</sup> DECC, [Estimated impacts of energy and climate change policies on energy bills](#), November 2014, para. 20-27

<sup>58</sup> DECC, [Estimated impacts of energy and climate change policies on energy bills](#), November 2014, para. 33

<sup>59</sup> DECC, [Estimated impacts of energy and climate change policies on energy bills](#), November 2014, p. 41

<sup>60</sup> [Estimated impacts of energy and climate change policies on energy bills](#), Table 7, p.50

## Energy Intensive Industries support

Energy intensive industries (EIs) – steel, chemicals, brick making and engineering industries – are those businesses that have high energy costs as a share of their total gross value added and are therefore particularly sensitive to increases in energy costs. In recent years there have been increasing concerns raised about the financial impact of EU and UK energy and climate change policies on energy intensive industries.

In answer to these cost concerns, the Government has introduced several compensation measures aimed at alleviating the costs of the EU ETS, the CFP, feed in tariffs and the renewables obligation. These compensation measures are available for qualifying '*electro-intensive*' businesses. Not all EIs are able to access these compensation measures.

### 2011 support package

In the [2011 Autumn Statement](#) the Chancellor announced a £250 million compensation package for EIs.<sup>61</sup> This included amounts to compensate energy intensive industries for the impact of the EU Emissions Trading Scheme (EU ETS) (£110 million) and the UK's Carbon Price Floor (£100 million) for the period April 2013 to March 2015.<sup>62</sup> For this package, the Coalition Government notified the European Commission of its plans to compensate certain energy intensive industries for the indirect costs of the Carbon Price Floor. The European Commission approved this State Aid application on 21 May 2014.<sup>63</sup>

### 2014 support package

In Budget 2014 the Coalition Government announced it would:

- extend the compensation for qualifying EIs for the cost of the CPF and EU ETS to 2019-20; and
- introduce a new compensation scheme, to help qualifying EIs with higher electricity costs resulting from the renewables obligation (RO) and small-scale feed in tariffs (FIT) for renewable generation, from 2016-17.<sup>64</sup>

At the same time it announced the combined cost of these compensation measures was expected to be around £500 million a year from 2016-17.<sup>65</sup> Along with previous announcements, the Treasury said that this package means qualifying energy intensive industries would be compensated for all government policy designed to support low carbon and renewable investment up until 2019-20.<sup>66</sup>

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<sup>61</sup> [HC Deb 29 Nov 2011 c807](#)

<sup>62</sup> HM Treasury, [Autumn Statement 2011](#), Cm 8231, November 2011, para 1.105

<sup>63</sup> [HC Deb, 1 July 2014, c538W](#)

<sup>64</sup> HM Treasury, [Budget 2014](#), HC 1104, March 2014, para 1.107

<sup>65</sup> HM Treasury, [Budget 2014](#), HC 1104, March 2014, para 1.108

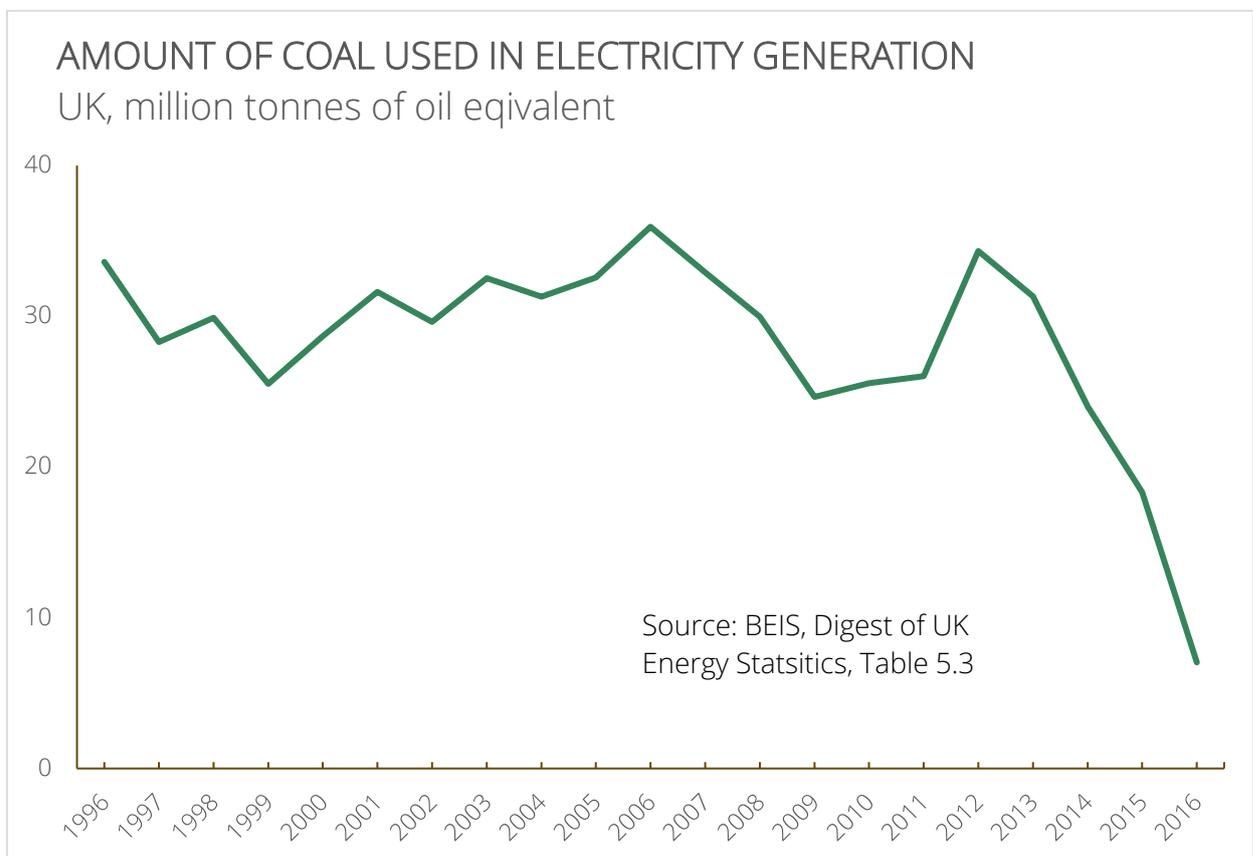
<sup>66</sup> HM Treasury, [Budget 2014](#), HC 1104, March 2014 para 1.107

On 17 December 2015, the Government announced that its application to allow compensation for the energy costs of EIs under State Aid rules had been granted by the EC.<sup>67</sup>

## 4.2 Coal generation decline

Coal is the most carbon intensive fossil fuel producing around twice the carbon dioxide per unit of electricity generated as gas. It is therefore particularly affected by any CPF price increases.<sup>68</sup>

Since the implementation of the CPF there have been significant falls in coal electricity generation output together with the closure of several coal stations in 2016.<sup>69</sup> The doubling of the CPF in April 2015 from £9 to £18 is one of the factors which has accelerated the reduction in 2016 (seen in the chart below).



<sup>67</sup> BIS, [Press release: UK government secures EU compensation for Energy Intensive Industries](#), 17 December 2015

<sup>68</sup> [Coal Generation In Great Britain The pathway to a low-carbon future: consultation document](#), DBEIS, November 2016

<sup>69</sup> ['Energy trends section 2: solid fuels and derived gases'](#), DBEIS, September 2016

## 5. Future of the CPF and CPS

There has been no price for the CPF set beyond 2021. The Chancellor stated in Budget 2016 that the Autumn Statement would set out the “long-term direction” for the Carbon Price Support rate. However, no changes were made, instead the Government stated that it would continue to consider the appropriate mechanism for determining the carbon price in the 2020s.<sup>70</sup> A statement on the future of the CPF was again anticipated in the spring 2017 budget<sup>71</sup>, but the Government stated that further details on carbon prices for the 2020s would be set out at Autumn Budget 2017.<sup>72</sup> Ahead of the 2017 Autumn Budget, four British energy companies (Drax, SSE, VPI Immingham and InterGen) wrote to the Chancellor asking for more clarity on what will happen to the price floor after 2021.<sup>73</sup> In the [Autumn 2017 Budget](#), the Treasury stated that it was “confident” that the Total Carbon Price is set at the right level, and will continue to target a similar total carbon price until unabated coal is no longer used.<sup>74</sup>

### Closure of unabated coal consultation

The then Secretary of State for Energy and Climate Change Amber Rudd [announced](#) in November 2015 that the UK would phase out unabated coal (that has no carbon capture and storage) by 2025 and restrict it from 2023 provided that electricity supplies are maintained. The Government published a consultation on proposals for how to put that into effect in November 2016,<sup>75</sup> and published its [consultation response](#) on 5 January 2018.<sup>76</sup> The Government’s consultation response explains how the level of coal generation in the energy mix has declined:

The level of coal generation on the electricity system has continued to decline since the consultation was launched in November 2016. This comes as a result of a number of factors, but is largely driven by the UK’s carbon price support and the increase in low carbon generation on the system. The level of coal generation in 2016 fell to 9%, down from 22% in 2015, and in the second quarter of 2017 it fell to a record low of 2%. Over the same period low-carbon generation supplied more than 53% of electricity.<sup>77</sup>

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<sup>70</sup> HM Treasury, [Autumn Statement 2016](#), 23 November 2016

<sup>71</sup> [Spring Budget 2017: key climate and energy announcements](#), *Carbon Brief*, 8 March 2017

<sup>72</sup> HM Treasury, [Budget 2017](#), March 2017, para 3.27

<sup>73</sup> [Four UK power firms call for carbon price floor extension](#), *Reuters*, 23 October 2017

<sup>74</sup> HM Treasury, [Autumn Budget 2017](#), HC 587, November 2017, para 3.46

<sup>75</sup> BEIS, [Coal Generation In Great Britain The pathway to a low-carbon future: consultation document](#), November 2016

<sup>76</sup> BEIS, [Implementing the end of unabated coal by 2025: Government response to unabated coal closure consultation](#), January 2018

<sup>77</sup> BEIS, [Implementing the end of unabated coal by 2025: Government response to unabated coal closure consultation](#), January 2018

The response to the consultation stated (amongst other things) that the Government does not plan to set an explicit constraint on coal generation ahead of 2025. This is because Government analysis found that existing policies (including the Treasury's commitment to keep the Carbon Price Support mechanism at around the same level as they are currently, until unabated coal is phased out) would result in the majority of remaining coal power stations closing (or investing to abate emissions) in the early 2020s, with around 1.5 GW of unabated coal capacity likely to remain until 2025. However, in October 2017, Aurora energy research (an energy research consultancy) published a [report examining future carbon price scenarios](#). In their report, they warn that without an increased carbon price, the Government's ambition to phase out unabated coal power could be at risk.<sup>78</sup> Similarly, a year earlier, Policy Exchange published a report which looked at carbon pricing. Policy Exchange recommended that the Government keep the CPF until coal is fully forced off the grid.<sup>79</sup>

The consultation response also stated that the Government would not require Carbon Capture and Storage (CCS) technology to be deployed on existing coal power stations, and instead would set a new emissions intensity limit of 450gCO<sub>2</sub>/kWh of electricity generated from 1 October 2025, to align with the beginning of the 2025/26 Capacity Market delivery year. The government is considering the appropriate legislative vehicle for introducing the emissions intensity limit from 1 October 2025 and other measures required to implement it.<sup>80</sup>

### 5.1 Autumn budget 2017

Having delayed a decision on the future trajectory of carbon pricing at the 2016 budget, the CBI called on the Chancellor to end the uncertainty around carbon prices in the spring 2017 Budget (the last Budget to take place in the spring as Budgets will now be delivered annually in the autumn).<sup>81</sup> However, this decision was delayed until the autumn Budget 2017; the Treasury indicated that it remains committed to carbon pricing, noting the important role that the CPF has had in reducing carbon emissions in recent years:

1.191 At Budget 2014 the government capped Carbon Price Support (CPS) rates at £18 t/CO<sub>2</sub> from 2016-17 to 2019-20 to limit competitive disadvantage to British businesses. Due to the continued low price of the EU Emissions Trading System (EU ETS), the government is maintaining the cap on CPS rates at £18 t/CO<sub>2</sub>, uprating this with inflation in 2020-21, in order to continue protecting businesses. The government will set out the long-term

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<sup>78</sup> [The carbon price thaw: Post-freeze future of the GB carbon price](#), Aurora Energy Research, October 2017

<sup>79</sup> [Next Steps for Carbon Pricing](#), Policy Exchange, November 2016

<sup>80</sup> BEIS, [Implementing the end of unabated coal by 2025: Government response to unabated coal closure consultation](#), January 2018

<sup>81</sup> [Stepping up to the Challenge: Creating a globally competitive low-carbon economy in 2030](#), CBI, February 2017

direction for CPS rates and the Carbon Price Floor at Autumn Statement, taking into account the full range of factors affecting the energy market.<sup>82</sup>

In October 2017, four British energy companies (Drax, SSE, VPI Immingham and InterGen) wrote to the Chancellor asking for more clarity on what will happen to the price floor after 2021.<sup>83</sup>

## 5.2 Helm review

In Professor Dieter Helm's [Cost of energy review](#), he called for a "common carbon price across the economy" that reflects the statutory emissions reduction targets of the Climate Change Act:

The least-cost way of achieving the carbon budgets and the carbon targets requires a common carbon price across the economy. Put another way, any other approach raises the costs of meeting the carbon objective. Indeed, there is always a carbon price – the question is whether it is explicit and efficient, or implicit in the myriad technological and other interventions, and inefficient. If the aim is to minimise the cost of energy, then the carbon price has to be explicit.

[...]

At present, the UK has multiple carbon prices, some explicit and some implicit, as noted in section 10. These include the CPF, the EU ETS price, the CCL implied carbon price, and fuel duty. There are two inefficiencies here: they are inconsistent, causing substitution effects; and none is set relative to the carbon budgets or the 2050 target. In addition, none has an efficient adjustment mechanism.

Over time, the government should first harmonise carbon prices and then move to a carbon price that reflects the CCA target.<sup>84</sup>

## 5.3 Carbon Price Floor and Brexit

Leaving the EU would not automatically remove the CPF, as this is a UK measure; neither would it necessarily mean the UK would have to leave the EU ETS, but it would depend on the approach to exit the UK chooses to take. Membership of the EU is not a prerequisite of participation. Following the Paris Climate Agreement in December 2015, there is an added impetus for the expansion of emissions trading.<sup>85</sup> The UK has been directly involved in this process, with the announcement in January 2016 that UK government officials are working with China to

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<sup>82</sup> HM Treasury, [Budget 2017](#), HC 1025, March 2017, para. 1.191

<sup>83</sup> [Four UK power firms call for carbon price floor extension](#), *Reuters*, 23 October 2017

<sup>84</sup> [Cost of Energy Review](#), Dieter Helm, *gov.uk*, 25 October 2017, pp. 190-191

<sup>85</sup> [State and Trends of Carbon Pricing](#), *World Bank*, October 2016

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ensure that the Chinese carbon cap-and-trade system is compatible with the EU ETS.<sup>86</sup>

Leaving the EU could allow a freer hand for the Government in supporting sectors, such as the Energy Intensive Industries, to deal with the impact of higher carbon prices. This is because it would not need to obtain approval from the EU Commission, which has been to the case to date with existing support schemes as they fall under the definition of state aid. However, any support would still have to be considered in the context of the future trading arrangements in place with the EU and others. Following the referendum the price for carbon allowances fell; Business Green reported this was due to uncertainty over UK policy towards the ETS in the future.<sup>87</sup> In the 2015-17 Parliament, the [BEIS Select Committee recommended](#) "that the Government seek to retain membership of the EU ETS until at least end of Phase III in 2020, and that it seeks to negotiate longer term membership of the EU ETS on the condition of commitment to future reform (Paragraph 76)."<sup>88</sup>

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<sup>86</sup> [Sir David King: EU and Chinese carbon markets will 'join forces'](#), *Business Green*, 29 January 2016

<sup>87</sup> 'EU carbon price tumbles in wake of Brexit uncertainty', *Business Green*, 24 June 2016

<sup>88</sup> Business, Energy and Industrial Strategy Committee, [Leaving the EU: negotiation priorities for energy and climate change policy](#), Fourth Report of Session 2016–17, HC 909, 2 May 2017

## 6. A European price floor?

The CPF is a UK policy but it has been considered at EU level and been pursued by France as an option.<sup>89</sup> In 2012, the European Commission launched a review of the EU ETS system in order to identify solutions to the problem of EUA over supply – EUAs are the permits that cap emissions and enable trade in in a carbon market. A European Carbon Price Floor was one of the mechanisms considered:

As from the third trading period a large amount of allowances will be auctioned, a Carbon Price Floor has been discussed as a feature applied primarily in the primary market, i.e. for auctions. A Carbon Price Floor would create more certainty about the minimum price, giving a better signal for investors.<sup>90</sup>

After running a public consultation on the merits of the various options considered, the CPF option was not favoured by the majority of respondents:

The vast majority of stakeholders highlight that the process for determining the true economic cost of abating greenhouse gas emissions is best determined through market principles and not via discretionary price management. Still, a few stakeholders, including project developers for international credits, would be supportive of a creation of a mechanism, which creates a reserve to buy allowances under a defined policy. A preferred choice that clearly emerges from the online consultation to address part of the surplus due to the economic crisis is to establish, not a price-based, but rather a volume-based supply-management mechanism.<sup>91</sup>

The Commission opted for a different option (back-loading of auctions and market stability reserve).<sup>92</sup> Despite this, the French government announced in May 2016 that it would be introducing its own floor price of 30 Euros per tonne in 2017 in an effort to drive similar reforms in the rest of the EU.<sup>93</sup> However, press reports from October 2016 suggested that the measure, intended to be introduced in 2017, had been dropped.<sup>94</sup>

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<sup>89</sup> [‘Exclusive “We can’t wait any longer”: France floats EU ETS price support proposal’](#), *Carbon Pulse*, 13 March 2016

<sup>90</sup> European Commission, Report from the Commission to the European Parliament and the Council, [‘The state of the European carbon market in 2012’](#), 14 November 2012, p.10

<sup>91</sup> European Commission, [Consultation on structural options to strengthen the EU Emissions Trading System](#), Main outcomes of consultation, [‘Options for structural measures to strengthen the EU Emissions Trading System: Main outcomes of the public consultation’](#), para 9

<sup>92</sup> European Commission, Climate Action, [‘Structural reform of the EU ETS’](#),

<sup>93</sup> [‘France to set Carbon Price Floor at €30 per tonne’](#), *Business Green*, 8 May 2016

<sup>94</sup> [‘France to drop carbon tax plan: Les Echos’](#), Reuters,, 20 October 2016

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