Title: EII Support Levy & EII Network Charging Cost Compensation Scheme **IA No:** DBT-008(IA-F)-23-BG **RPC Reference No:** N/A **Lead department or agency:** DBT **Other departments or agencies:** DESNZ	**Impact Assessment (IA)** **Date:** 22/01/24 **Stage:** Final **Source of intervention:** Domestic **Type of measure:** Secondary legislation **Contact for enquiries:** energyintensiveindustries@businessandtrade.gov.uk

Summary: Intervention and Options

RPC Opinion: N/A

Cost of Preferred (or more likely) Option (in 2020 prices)			
Total Net Present Social Value	**Business Net Present Value**	**Net cost to business per year**	**Business Impact Target Status**
£9.4 billion – Total Supercharger package £5.8 billion – Network Charging Cost Compensation Scheme	£9.4 billion – Total Supercharger package £5.8 billion – Network Charging Cost Compensation Scheme	£0.02m – Total Supercharger package £0.02m – Network Charging Cost Compensation Scheme	Non-qualifying provision

What is the problem under consideration? Why is government action or intervention necessary?

GB industrial electricity costs are higher than those of comparable neighbouring countries, causing a risk of indirect carbon leakage where production shifts to other jurisdictions because our energy intensive industries (EIIs) are not able to remain profitable. Electricity network costs paid by GB based EIIs are higher than in many other EU countries largely due to the discounts offered in some jurisdictions to EIIs that meet certain eligibility criteria regarding electricity consumption and off-peak grid utilisation. Failure to address the electricity price gap would result in production, and therefore output decreasing, and some firms facing increased risk of closure due to reduced liquidity.

What are the policy objectives of the action or intervention and the intended effects?

The proposed intervention is intended to provide the Government (HMG) with the powers to lower the effective price paid for electricity by EIIs. The objective of the secondary legislation will be to provide EIIs with relief from the network costs on their electricity bills through a compensation scheme. Following this intervention, and other components of the British Industry Supercharger, electricity prices for eligible businesses will be comparable with international competitors.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Do nothing: without intervention, HMG will not have the powers to compensate network costs for electricity intensive and trade exposed businesses. The continued electricity price gap could lead to production, investment and employment leaving the UK market for markets with lower net zero ambitions and thus lower electricity prices.

Option 1: The levy and compensation scheme (preferred option) will contribute to closing the industrial electricity price gap without interfering in the market regulator (Ofgem)'s ability to set and change the design of network charge costs.

Other discounted options included private grants and loans which were deemed too complex and inefficient, investment in electricity infrastructure, which was deemed not timely enough, and an exemption scheme which was deemed too complex.

Is this measure likely to impact on international trade and investment?	Yes

Are any of these organisations in scope?	**Micro** Yes	**Small** Yes	**Medium** Yes	**Large** Yes
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded:** +0.4 (annual)		**Non-traded:**
Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** Before 2029				

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister: N Glen Date: 22/01/24

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2020	PV Base Year 2023	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: Supercharger - £3,282m Network charging costs - £2,198	**High:** Supercharger - £24,041m Network charging costs - £14,906	**Best Estimate:** Supercharger - £9,438m Network charging costs - £5,818m

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Present Value)	Total Cost (Present Value)
Low	-		**Supercharger - 45** **NCCCS - 31**	**Supercharger - 453** **NCCCS - 309**
High	-		**Supercharger - 380** **NCCCS - 238**	**Supercharger - 3,802** **NCCCS - 2,384**
Best Estimate	-		**Supercharger - 141** **NCCCS - 88**	**Supercharger - 1,414** **NCCCS - 881**

Description and scale of key monetised costs by 'main affected groups'

As the Supercharger and the Network Charging Cost Compensation Scheme are transfers, there are no fiscal impacts to consider. The main monetised costs are from increased carbon emissions (£400m-3,600m from the overall Supercharger with £300m-2,300m from the Network Charging Cost Compensation Scheme) and related air quality impacts (£20m-200m from the Supercharger with £20m-100m from the Network Charging Cost Compensation Scheme) resulting from increased electricity usage by eligible businesses.

There are also administration and familiarisation costs that will be faced by eligible EIIs and administration costs for the administrator of the Supercharger which will potentially be passed through to customers. These have been included in the calculation of Direct Costs to Businesses and are estimated at c. £0.3m over the 10-year appraisal period, with a £0.02m annual cost.

The Network Charging Cost Compensation scheme is expected to account for all of these costs given the nature of the administration of the scheme. Note that we do not currently have an estimate for the administrator costs of the Network Charging Cost Compensation Scheme, but it is expected to be less than £10m over the 10-year appraisal period.

Other key non-monetised costs by 'main affected groups'

N/A

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Present Value)	Total Benefit (Present Value)
Low	-		**Supercharger - 374** **NCCCS - 251**	**Supercharger - 3,735** **NCCCS - 2,508**
High	-		**Supercharger – 2,784** **NCCCS – 1,729**	**Supercharger - 27,842** **NCCCS - 17,290**
Best Estimate	-		**Supercharger – 1,085** **NCCCS – 670**	**Supercharger - 10,853** **NCCCS - 6,699**

Description and scale of key monetised benefits by 'main affected groups'

The monetised benefits result from increased output and investment resulting from lower electricity prices for eligible firms. Increased employment is worth between £1.8bn-15bn for the Supercharger with £1.2bn-9.3bn for the Network Charging Cost Compensation Scheme. Increased investment is worth between £0.6bn-2.5bn for the Supercharger with £0.4bn-1.6bn for the Network Charging Cost Compensation Scheme. Increased domestic profits are worth £1.2bn-10.1bn for the Supercharger with £0.8bn-6.2bn for the CM Exemption.

We have also estimated the benefits from preventing potential firm closures with the support offered through the Supercharger and Network Charging Cost Compensation Scheme. These benefits are smaller than those estimated for the productivity and investment impacts at up to c. £200m for the Supercharger with up to c. £120m for the Network Charging Cost Compensation Scheme.

Other key non-monetised benefits by 'main affected groups'

N/A

Key assumptions/sensitivities/risks	**Discount rate (%)**	3.5%

There are a range of elasticities taken from literature that have been used to estimate the production and investment impacts resulting from lower electricity prices. These are detailed in Section 6 on monetised costs and benefits.

Assumptions on future electricity prices and in particular fossil fuel prices are key assumptions which face inherent uncertainty. To mitigate these we have included Low and High Fossil Fuel sensitivity tests.

The benefits and costs are based on the current view of eligibility of the Supercharger scheme. If more sectors and businesses are deemed eligible for the scheme, the estimated costs and benefits of the scheme will increase.

The direct impacts on electricity prices for eligible and non-eligible businesses are treated as a transfer and therefore not considered in the calculation of the value for money of the scheme or the direct impact on business. The value for money assessment is based on the indirect impacts resulting from lower electricity prices for eligible businesses (increased production, investment) and assumes that the additional electricity costs for households and non-eligible businesses are not big enough to impact their behaviour.

The direct impact on business is treated as the costs that result from additional adminstration and familiarisation for eligible businesses. The direct benefits and costs in terms of electricity prices are treated as a transfer between businesses and therefore not considered.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			**Score for Business Impact Target (qualifying provisions only) £m:**
Costs: 0.02	**Benefits:** -	**Net:** -0.02	N/A

Contents

Evidence Base

Section 1 - Problem under consideration and rationale for intervention

Introduction

1. Energy Intensive Industries (EIIs) are trade-exposed and high electricity using businesses that cover a number of key foundation industries (e.g. glass and cement) as well as industries that are essential to critical national infrastructure (e.g. steel and chemicals) and form the supply chain for other important strategic sectors (e.g. auto and aero). EII firms represent c. 400,000 direct key manufacturing jobs within GB, predominantly in Wales, the North and the Midlands, with many more in the wider supply chain.

2. GB industrial electricity costs are higher than those of comparable neighbouring countries, causing a risk of indirect carbon leakage where production shifts to other jurisdictions with less ambitious climate policies because our EIIs are not able to remain profitable. EIIs include important strategic sectors whose high energy costs have been cited as a critical factor for decisions on inward investment.

3. HMG's 2022 Energy Security Strategy committed to explore a series of measures designed to support EIIs, committing to address the issue of high prices, which has been more recently compounded by rising domestic prices and uncertainty in the global energy market flowing from Russia's invasion of Ukraine.

4. High and volatile energy prices have been a central part of GB's economic story for the last two years. Preceding Russia's invasion of Ukraine, prices had already been rising for some time due to a combination of factors – including increasing Asian demand, a cold winter in 2020, lower renewable generation (weather driven), and reduced supply from Russia.

5. The Energy Bill Relief Scheme (EBRS) was launched on 1 October 2022 to help all non-domestic energy customers, receiving energy from licensed suppliers with their bills and mitigate against significantly inflated gas and electricity prices in light of global price pressures, triggered by Russia's invasion of Ukraine. The scheme provided a discount on eligible customers' gas and electricity unit prices, thereby reducing their energy bill.

6. In January 2023, the Chancellor announced a more targeted Energy Bill Discount Scheme (EBDS) that will provide capped support for all non-domestic consumers from April 2023 until April 2024 if energy prices reach a sufficiently high level. Energy and trade intensive industries were singled out for a more generous support package as energy costs made up a larger proportion of their total costs and they are less able to pass on costs to consumers due to international competition.

7. Whilst the EBDS and EBRS deal with the short-term wholesale electricity cost increased by the Russian invasion of Ukraine, the long-term inequality in retail price with comparator countries remains for EIIs in particular. This long-term gap is in part due to GB's ambition of decarbonising electricity generation, with a large reliance on gas which is more expensive than coal, putting GB at a disadvantage relative to EIIs in comparable countries. GB's ambitious deployment of renewable electricity generation leads to higher policy costs and higher prices for consumers.

8. HMG has therefore announced the British Industry Supercharger – a suite of measures designed to close the long-term gap in electricity prices between GB and key competitor countries. The measures include:

- Increasing the level of exemption offered by the existing EII Exemption Scheme from 85% to 100% aid intensity; which is anticipated to amount to a £5-£7/MWh reduction in 2025 from current levels;

- Implementing a full exemption from the charges associated with the UK Capacity Market, which is anticipated to amount to around £5/MWh in 2025; and

- A reduction in the charges paid for use on the electricity grid (also referred to as Network Charging costs).

9. The focus of this impact assessment is the third pillar of the British Industry Supercharger - **the reduction of network costs paid by EIIs.**

Network costs

10. Electricity network costs paid by GB based EIIs are higher than in many other EU countries largely due to the discounts offered in some jurisdictions to EIIs that meet certain eligibility criteria regarding electricity consumption and off-peak grid utilisation. Equivalent discounts that offer an explicit reduction to network costs for EIIs have to date not been offered in GB. The effect of these discounts is to redistribute network costs between different user groups. Therefore, although aggregate network costs are not necessarily higher in GB than in comparator countries, the share of these total costs paid for by EIIs is higher than in comparator countries.

11. Unlike in much of the rest of Europe, GB network charges are typically categorised into:
    - "cost reflective" charges, which are intended to reflect the forward looking marginal cost network users place on the system, and therefore users will take these charges into account when deciding how to use the system, minimising overall system costs; and
    - "cost recovery" or "residual" charges, which ensure network companies can recover their full costs but which do not reflect costs attributable to any individual network user, and therefore typically are levied in a manner that minimises changes to behaviour.

12. The implication of this charging structure is that charges for EIIs are not uniform and will reflect to some degree the relative costs/benefits that they impose/bring to the system compared to other network users. In other words, EIIs will pay lower charges where they consume less in peak hours, or are more favourably located (e.g. closer to sources of generation). EIIs will also face significant residual charges, which typically are uniform and, by design, more difficult to avoid.

13. In GB, electricity network charges are paid by electricity network users and are split into three separate sets of charges.
    - Transmission Network Use of System (TNUoS) charges cover use of the transmission system;
    - Distribution Use of System (DUoS) charges cover use of the distribution system; and
    - Balancing Services Use of System (BSUoS) charges cover the cost of day-to-day operation of the transmission system.
14. Within these individual charges, there are elements that are either cost reflective or cost residual.

Breakdown of network charges

Network cost	Cost Reflective charge	Residual cost charge
TNUoS	Peak consumption ("Triad") based charge which can be avoided via demand response or BTMG (behind the meter generation i.e. as on site generation) at peak	Flat charge for each consumption or connection voltage band, which is difficult to avoid unless consumption can be reduced sufficiently to shift a site to a lower charge band or a site changes its connection capacity.
DUoS	At EDCM[1], three different charges, with "super-red" volumetric based charge possible to avoid through demand response or BTMG at peak	Flat charge for each capacity band, which is difficult to avoid without adjustments to connection capacity or voltage level.
BSUoS	N/A	Exposed to higher volumetric charge (albeit offset by lower wholesale prices) which can be avoided through energy efficiency or baseload BTMG

Existing electricity price support offered to EIIs

15. HMG delivers two EII relief schemes to reduce the cumulative impact of some energy and climate change policies on industrial electricity prices for eligible EIIs in sectors such as steel, chemicals, cement, ceramics, paper and glass. This reduces the risk of carbon differentials and supports the competitiveness of key manufacturing industries to help keep production in the UK rather than risking them moving overseas to countries with less ambitious climate policies. Like all sectors of the economy, industry will need to decarbonise, but it is equally important that they remain competitive and that the UK remains an attractive location in which to invest during the transition to Net Zero.
    - Since 2013, a compensation scheme has provided partial compensation for indirect carbon costs (the UK Emissions Trading Scheme – ETS and the Carbon Price Support Mechanism (CPS), which places additional carbon costs on electricity generation). Under this scheme, direct payments are made from HMG to eligible firms with the budget coming from the former Business and Energy department's (BEIS') RDEL (resource) allocation. Additional funds have been earmarked from the Department's contingency to cover the greater level of relief announced in the British Energy Security.
    - Since 2017, an exemption scheme provides relief for the indirect costs passed on by electricity suppliers for the cost of schemes designed to increase the share of renewable electricity - the Contracts for Difference (CFD), Renewables Obligation (RO) and Feed-In-Tariff (FIT). The cost of funding the exemption is redistributed to all non-eligible consumers including other businesses and households.
16. The 2022 Energy Security Strategy announced that the EII Compensation Scheme will be extended for a further 3 years with an increased aid intensity which represents a doubling of the previous annual budget. It also included a commitment to consider measures to support business including increasing the subsidy intensity of the Exemption Scheme from 85% to up to 100%.

Rationale for intervention

17. The rationale for intervention is the risk of carbon leakage due to high electricity prices. For those energy intensive industries (EIIs) particularly exposed to international trade

[1] For users that connect to the Extra High Voltage distribution network (EHV), charges are determined through the EHV Distribution Charging Methodology (EDCM). This applies to many EIIs.

and heavily reliant on electricity, paying the full amount of electricity policy costs on their electricity consumption to support delivery of the Government's Net Zero Strategy can increase the risk of carbon leakage and the cost of electricity relative to other energy sources. Higher electricity prices may also make it more challenging for industrial users to switch from gas-intensive production to less carbon-intensive production relying on electrification.

18. Carbon leakage is the displacement of domestic production, and its associated emissions, due to different levels of carbon pricing and climate regulations across jurisdictions.

19. The risk of carbon leakage is supported by theoretical analysis and evidence. While the UK has committed to Net Zero by 2050, many other competitors have not. The ambitious target the UK has set to deliver Net Zero brings requirements for change and associated costs (as well as economic opportunities), which the UK will incur sooner given our legally binding requirements included in carbon budgets compared to less ambitious commitments by global competitors.

20. The indirect funding of renewable policy costs under the CfD, RO and FiT scheme represents a portion of a firm's electricity costs and is associated with supporting the transition to Net Zero. These levies are some of the highest in Europe and are not present in some other competing countries and as such, represent an additional climate policy cost when compared to these countries. Where there are instances of these costs being applied, there are often more extreme mitigations in place relative to the UK. While these costs alone are not always considered to be the most important factor for carbon leakage, with cost pass-through rates having a significant impact, they contribute to a wider carbon leakage risk. Other factors which affect carbon leakage include capital intensity, trade intensity/exposure, emissions output, and other industry associated costs.

International electricity price gap for EIIs

21. UK industrial electricity costs have been historically higher than comparable neighbouring countries and our EIIs are unable to remain competitive without intervention. Three main components contribute to electricity prices for EIIs: wholesale prices, policy costs and network costs. Typical electricity costs for very energy intensive users in the UK were £56/MWh, compared to £38/MWh in the Netherlands, £34/MWh in France and £35/MWh in Germany in 2020.[2]

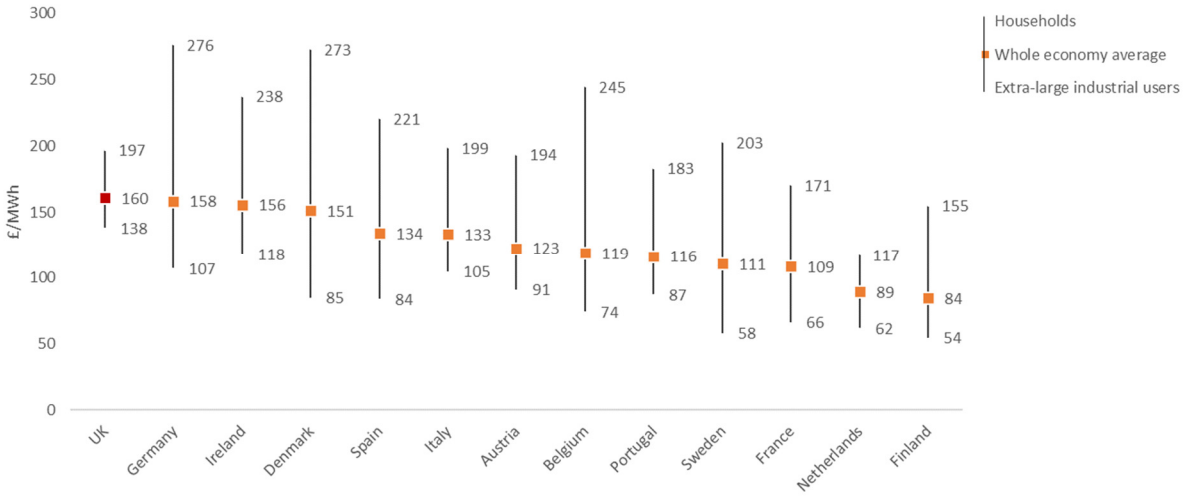
22. Prices are made up of the following components:
    - Wholesale prices – the cost of electricity generation on wholesale markets, including the carbon costs of generating electricity from fossil fuels.
    - Network costs – charges on the energy bills of households and businesses, which are used to fund both investment and maintenance of both the transmission and distribution networks and also balancing – ensuring that electricity can travel from the point of generation to the point of use, and that supply meets demand at any given time. The manner in which these costs are paid is set by Ofgem.
    - Policy costs – additional charges on the energy bills of households and businesses, set by HMG, which are used to fund energy policies that support grid decarbonisation, or to ensure security of supply.

23. While wholesale costs are broadly common to all energy consumers (although this can vary depending on time profile of demand and how different consumer groups pay for their electricity), policy and network costs vary across these groups. This leads to a

[2] ICIS 2022 day-head prices used for wholesale prices across countries. DESNZ analysis used for UK network, policy and carbon cost analysis. Ofgem 2020 report used for policy and network costs estimate for other EU countries.

complex picture of electricity prices, both in the UK and in our key EU competitors. Figure 1 shows electricity prices in the UK and EU 14-countries. The household price is for a medium use household.

Figure 1: EU-14 + UK electricity price spread (household, average*, industry) 2021, £/MWh



Source: Households and Extra-Large Industrial Users are from BEIS QEP 2021 data. Average based on Eurostat 2019 sectoral consumption values

[3]

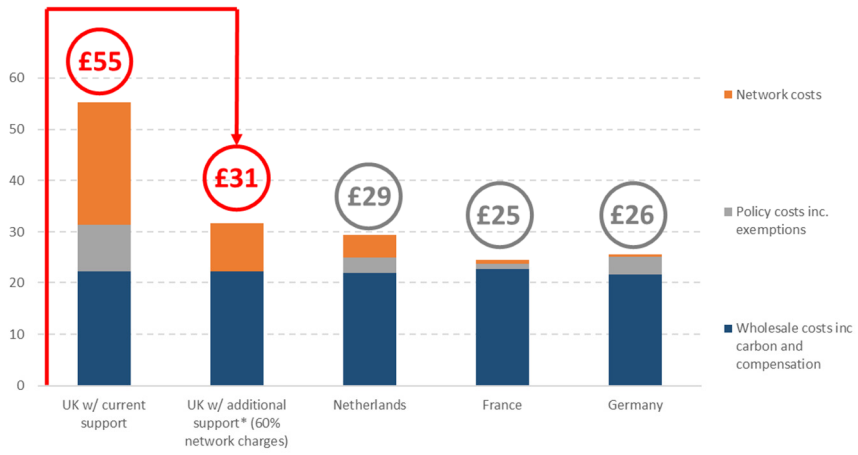
24. UK electricity wholesale prices have historically been higher than for main competitors, thus contributing to high retail prices. Despite this, figure 1 shows in 2021 UK household electricity prices were around average across EU countries, whereas among very large industrial consumers, UK prices were higher than any other EU-14 + UK country for which data is available, around 62% higher than the EU-median in 2021. This is reflective of how network and policy costs are distributed across different consumers; the UK has chosen to distribute policy and network costs relatively evenly across households and industrial users, whereas other countries have chosen to protect large industrial users with a greater share of these costs falling on households.

25. The UK does offer relief for some energy intensive businesses such as the ETS/CPS Compensation and RO/ FiT/ CfD Exemption schemes. The ETS/CPS Compensation Scheme was increased in April 2022 and is estimated to compensate around 70% of indirect carbon costs for eligible EIIs, whereas the Exemption Scheme exempts eligible EIIs from 85% of RO, FiT and CfD costs.

26. These schemes reduce electricity prices for eligible users, however, the relief offered in EU competitor countries is ultimately greater, and as a result supported UK EIIs still face higher electricity prices than their key competitors in Germany, France and the Netherlands (Figure 2). The chart below shows the impact of the current exemption and compensation scheme on EIIs, for the businesses eligible for both schemes, and those eligible for just exemptions. It also shows the estimated impact of the Supercharger proposals.

Figure 2: Average EII Electricity prices (including exemptions and compensation) across different countries in 2020 (£/MWh)

[3] DESNZ QEP data here: *https://www.gov.uk/government/statistical-data-sets/international-industrial-energy-prices, https://www.gov.uk/government/statistical-data-sets/international-domestic-energy-prices*



Source: ICIS (wholesale), BEIS analysis (UK policy and network), Ofgem report (2020) (international policy and network)

Note – Figure 2 uses 2020 data as that is the latest available data for the network and policy costs international comparison and is the latest wholesale price data before the extreme volatility in prices seen since the reopening of economies post-COVID and the Russia/ Ukraine war. However, so that £ amounts can be compared to other analysis in this document, the prices have been adjusted to 2022 levels.

27. In 2020, the EIIs receiving support from both the ETS/CPS Compensation and the renewables Exemption schemes paid more for electricity than French, German or Dutch EIIs. In GB they paid £55/MWh compared to £25/MWh for France, £26/MWh for Germany, and £29/MWh for the Netherlands. EIIs who receive support only from the EII Exemption Scheme paid on average c. £40/MWh more for electricity than fully supported German or French firms. It is important to note that different firms will be eligible for different support in other countries, so comparing exempted-only domestic firms with fully supported firms in Germany may not be a fair comparison.

28. Wholesale cost gaps will fluctuate year-to-year depending on fuel and carbon prices, but in 2020 firms that received compensation had a wholesale cost gap at around £2-3/MWh with Germany and France. For EII firms who only benefit from exemptions, the wholesale cost gap was c. £16-17/MWh, representing roughly a third of their total gap with Germany and France. Firms in the Netherlands, France and Germany are assumed to receive compensation for carbon costs.

29. For both groups of EIIs receiving support, network costs make up c. £23/MWh of the gap with Germany and France, while policy costs make up c. £5-8/MWh of the gap. This means that network costs make up around two thirds of the gap for firms that receive compensation and around half for firms that do not. Significant exemptions (up to 90%) on network costs are offered for EIIs in Germany and France, with these costs spread across other consumers including households. Although GB offers 85% exemptions from some policy costs, firms still pay Capacity Market (CM) charges in full and further exemptions are offered in other countries. Again, the cost of current GB exemptions are funded through other consumers.

Impact of the price gap on carbon leakage

30. While it is clear there is a significant diversion between UK electricity prices and those of similar competitor countries, the relationship between the price gap and carbon leakage needs to be established. The literature suggests that firms facing higher electricity costs, in part caused by stringent environmental regulation, will look to reduce investment and potentially move elsewhere.

31. This section will first discuss the relevant literature surrounding the relationship between higher electricity prices caused by environmental regulation leading to carbon leakage and then will assess evidence provided by companies as part of the EII exemption scheme 2022 consultation – seen below.

32. The relevant literature highlights a relationship between where EIIs decide to locate, and areas of low environmental regulation and electricity costs. Khan and Mansur (2013)[4] found that high electricity intensive and polluting firms tend to cluster in areas of low regulation and electricity cost. While this paper was conducted within the USA and studied movement between states as opposed to among nations, the results for typically energy intensive industries (e.g., steel) were found to be significantly more elastic with regards to energy prices and employment.

33. Sato and Dechezleprêtre (2015)[5] examined the influence of an energy price gap between two trading partners on bilateral trade flows for 42 countries and 62 manufacturing sectors between 1996 and 2011. On average, they found that a 10 percent increase in the energy price gap increases bilateral imports by 0.2 percent and that overall, energy price differences explained 0.01 percent of the variation in trade flows. This showed that where a country has higher electricity costs, such as that of the UK, caused in part by more stringent environmental policy, they will see an increase in the imported goods, which could a risk factor for carbon leakage. This narrative is supported by the evidence provided by EII firms in the consultation.

34. Multinational corporations were found to have a marginally higher electricity elasticity of demand for employment (Dechezlepretre, Lovo, Martin, and Sato (2016))[6], suggesting these companies were able to take advantage of their international status to move resources more responsively. This paper found in support of the pollution haven hypothesis, whereby firms will move production to areas of lower environmental regulation, as evidence by an increase in imports of energy intensive goods increasing in response to tighter regulation. This would indicate that when a country has more stringent environmental regulation, consumption habits move to import from areas of lower environmental regulation and as such represent carbon leakage. This has been borne out by the consultation evidence, with many energy intensive sectors citing a significant increase in imports.

35. Bijnens et al (2021)[7] concerned electricity elasticity of demand for investment. This ECB paper found that investment was relatively elastic in response to a change in electricity prices, often more severe response than that for employment. This could imply that when faced with relatively high electricity prices firms may seek to reduce investment, which could be seen as a precursor to carbon leakage, whereby domestic productive capacity may be significantly reduced prior to exit. This investment, when not undertaken by a multinational firm, may go elsewhere.

Evidence of carbon leakage from EII exemption scheme summer 2022 consultation

36. Firms provided a mix of anecdotal and quantitative evidence to suggest a reduction/potential reduction in UK productive capacity as a result of higher electricity prices. SGL fibres stated their parent company (based in Germany) would potentially

4 Kahn and Mansur (2013) "Do local energy prices and regulation affect the geographic concentration of employment," Journal of Public Economics 101, 105-114.

5 Sato and Dechezleprêtre "Asymmetric industrial energy prices and international trade", Energy Economics 51,1, 130-141. (2015)

6 Dechezlepretre, Lovo, Martin and Sato (2016) "Does climate change policy pose a risk to competitiveness: Global firm-level evidence," LSE Grantham Institute.

7 Bijnens, Hutchinson, Konings, Saint-Guilhem (2021) "The interplay between green policy, electricity prices, financial constraints and jobs: firm-level evidence," European Central Bank Working Paper No 2537.

move their production to a similar plant based in the US with lower electricity costs because of the higher electricity prices. This would put c.250 jobs at risk.

37. Some firms cited reduced export demand and increased import demand as an indication of a loss of UK productive capacity such as Flour milling.

38. Cast Metals Federation stated they felt carbon leakage has occurred in their sector with their sector seeing an 80% shift in capacity offshoring since 2008, representing £8bn in lost GVA per annum. The steel industry also argued this. Tata Steel reported producing 60% less than they were in 1990, despite world steel production increasing by 150%.

39. Imports have been seen by firms as a proxy for carbon leakage, with firms stating that domestic demand is being met increasingly by international firms, indicating a loss of competitiveness and domestic productive capacity. The cement sector felt this was the case, with the Mineral Products Association (MPA) citing an increase of imports meeting domestic demand up to 22.6% in 2021, predominantly from countries not seeing these policy costs – providing Turkey, Morocco and China as examples. Cemex, a cement producer, also stated costs are too high to continue significant portions of supply chain be kept entirely domestic, stating that imports have effectively grown at 1% per annum over the past decade, coming to represent nearly a quarter of the market. Indeed, in 2020, CEMEX mothballed a kiln at their South Ferriby plant; as they were now supplementing their production at Rugby with imports. Other industry players also increased their importation as a way of managing costs and supplying the market competitively.

Section 2 - Rationale and evidence to justify the level of analysis used in the IA (proportionality approach)

40. The analysis in this Impact Assessment is considered to be proportionate. The monetised costs and benefits represent our best understanding of the impacts of both the Supercharger package and the individual CM Exemption. A number of sensitivities have been conducted to address the inherent uncertainty in forecasting electricity prices and the productivity and investment impacts resulting from the lower electricity prices for eligible EIIs that have been estimated.

41. The Supercharger and its policies are transfers that redistribute policy and network costs on electricity from eligible EIIs to other electricity users. Therefore, as per the Treasury Green Book there are deemed to be no fiscal costs and so the increased electricity costs for non-eligible businesses and households are not considered in the Value for Money assessment. In terms of the benefits, only the productivity and investment impacts resulting from the reduced electricity prices eligible EIIs face are considered, not the reduced electricity prices themselves.

Section 3 - Description of options considered

42. This impact assessment considers the following options for funding the necessary compensation EIIs for a proportion of their network charging costs:

- **Do-nothing:** We assume a counterfactual baseline scenario where in the absence of HMG interaction, there would be no further electricity price reduction for EIIs. In this counterfactual scenario, UK based EIIs would face a greater risk of carbon leakage as they would be exposed to the full competitive disadvantage of the higher industrial electricity prices. As such production, and therefore GVA, would decrease relative to the scenario of continued compensation and some firms would face increased risk of closure

due to reduced liquidity as result of higher electricity costs and therefore no longer be able to compete internationally. However, EIIs would not incur the cost of purchasing additional emissions allowances and environmental costs would decrease, due to the reduced production.

- **Support investment in electricity infrastructure**: Support for development of private wire networks or a sector level Purchase Power Agreement do not guarantee a certain level cost reduction. Support for development of private wires also comes with significant policy delivery challenges. Private wires are predominantly used in conjuncture with onsite generation as a means of meeting an EIIs energy demands. This form of behind the meter generation is not suitable to all eligible EIIs and brings with it a series of alternative operating costs. A sector level Purchase Power Agreement is unlikely to meet the workstream design principles and could be expected to take 5+ years to become operational, due to complexity of the structure, negotiations with a large number of counterparties and difficulty accessing enough liquidity on the banking market.
- **European styled exemption:** We explored the feasibility of offering an exemption on network charging costs equivalent to those offered in Germany, France and the Netherlands. These exemptions are broadly offered on grounds that EIIs with a constant and stable load profile (pattern of electricity usage by day and by year) is beneficial to the efficient operation of the electricity network. We commissioned external consultants, Frontier Economics, to review the GB electricity grid and ascertain whether a comparable exemption could be offered. The report concluded that the discounts applied in other European countries do not directly translate into the GB context. The structure of GB charges is different, and as a result some of the justifications for discounts applied in Europe are already reflected in the Cost Reflective elements of network charging costs. Consequently, this option was discounted.
- **Exemption Scheme:** We also explored the option of developing an exemption scheme based on the rationale of combatting carbon leakage. However, the design of the scheme proved undeliverable given it would have required the amendment of network charging codes which are set by Ofgem. The process for amending network charging codes is complex, lengthy and it would have proved challenging to offer this for a bespoke cohort of EIIs, meaning HM Government would not have been able to offer targeted support to those sectors most in need of support. Furthermore, it would have interfered with Ofgem's responsibility to independently set the network charging regime. Consequently, this option was discounted.
- **Bespoke support:** An alternative approach would be to negotiate bespoke support for individual companies (through policy levers such as direct guarantees, loans and grants). This is not a suitable approach as it is slower, disproportionately burdensome in terms of government administration, and more likely to be seen as discriminatory due to the absence of a common approach, and due to the absence of political support for exchequer funding on this scale would not provide the support necessary to address the wider risk of carbon leakage as a result of high electricity prices.
- **Levy and compensation** (**preferred**)- the introduction of a levy on all licenced electricity suppliers and a compensation scheme paid out to EIIs deemed most at risk of carbon leakage. This option achieves the policy objective of reducing the effective electricity price paid by EIIs without interfering with Ofgem's ability to set and alter the design of network charges.

Section 4 - Policy objective

43. The policy objective of the full British Industry Supercharger (BIS) package is to support the most electricity intensive industries with the high cost of electricity. These businesses are disproportionately impacted by high electricity prices due to the volume of

consumption and their inability to pass on costs to their consumers, as they operate within highly internationally traded sectors. International competitors face lower electricity costs than their GB equivalents, e.g., because they operate in jurisdictions with less stringent environmental regulations, most notably in countries outside of the EU, leading to lower associated policy costs, or because they benefit from more generous subsidies for these costs than are offered in GB.

44. These two factors put GB EIIs at an international competitive disadvantage and without intervention could lead to carbon leakage, hinder decarbonisation ambitions, and lead to disinvestment and subsequent job losses in key strategic sectors.

45. The intended outcome of providing support is to:

- Exempt particular EIIs from certain policy costs associated with the Contracts for Difference, Renewable Obligations and Feed-In Tariff schemes, the Capacity Market and some costs associated with use of the electricity grid;
- Mitigate the risk of carbon leakage;
- Mitigate the risk of disinvestment and protect jobs in key industries; and
- Encourage decarbonisation and electrification longer term by lowering electricity costs.

46. We have identified that a reduction of c. £24MW/h is expected to meet the needs of industry and supports the intended outcomes set out above, without seeking to undercut our nearest neighbours, given the interconnected nature of the energy systems across the UK and Europe. This should be achieved from April 2024 onwards and the total saving should be reflected by 2025.

Indicators of success for the Network Charges Compensation scheme

47. We have identified that compensating eligible EIIs from 60% of network charges passed to them by electricity suppliers would reduce electricity costs by c.£14-19MW/h from 2025 when we propose the measure should be implemented from.

48. A successful indicator for the policy will be EIIs seeing this saving passed on to them. For the overall Supercharger we would expect to see a saving for EIIs of £24-31/MWh.

49. For the overall Supercharger the indicators of success will be that GVA, the level of investment and employment for eligible firms will increase. Data on these will be collected from eligible firms and monitored.

Section 5 - Summary and preferred option with description of implementation plan

50. In order to provide support to EIIs on their network charging costs and mitigate the additional cost burden placed on GB EIIs through historic policy decisions, we will establish:

- An EII Support Levy raised on all licensed electricity suppliers, which will raise revenue that will be used to fund support;
- An EII Network Charging Cost Compensation Scheme which will compensate eligible EIIs for a portion of the network charging costs.

51. The proposal would not interfere with the ability of the regulator (Ofgem) to set the design of network charges. Nor would it seek to interfere in the payment of network charging costs by EIIs (through paying their energy bills from energy suppliers) to the network operators. EIIs would remain obligated to pay any and all network charging costs element in their energy bills.

52. The proposed levy would constitute a new policy cost on all licensed electricity suppliers across GB. The proceeds from the levy would be used to compensate eligible EIIs for a proportion of the network charging costs element in their energy bills.

53. The schemes are due to be implemented by April 2025.

54. The details of the policy proposal were tested with stakeholders before implementation through secondary legislation.

EII support levy

55. The proposed levy would constitute a new policy cost on all licensed electricity suppliers across GB. As with other policy costs, the presumption is that this cost will be passed onto their customers.

56. EIIs that are eligible for the compensation scheme will be exempted from the support levy.

57. It is not proposed the Levy will be charged on gas suppliers on the basis the corresponding support scheme is designed to refund specific electricity costs. Consequently, there is no rationale for a levy on gas consumption.

58. The Levy will not extend to non-licensed electricity suppliers given the structure of the market and non-licensed nature of its participants would create challenges on applying the proposed levy.

59. Nor would the Levy apply to licensed electricity supplied to Northern Ireland. This includes both licensed electricity suppliers that exclusively supply Northern Ireland and also the proportion of electricity supplied to Northern Ireland by suppliers that supply both Great Britain and Northern Ireland. Northern Ireland is excluded from the levy given the scope of the NCC Scheme does not extend to cover Northern Irish network charges, hence there is no rationale for applying the funding measure to the territory.

60. The Government noted the concerns raised by suppliers over their ability to pass through the costs onto fixed contracts and the time needed to incorporate any new policy costs into billing systems. In order to provide suppliers with sufficient time to adapt their internal billing systems to the new levy, the Government will commence the EII Levy from April 2025.

61. The collection of the levy will be carried out monthly which ensures that demand on suppliers are spread more evenly over twelve months, reducing the risk of default and the requirement to draw upon default protection. Furthermore, given the intent to calculate supplier obligations on a volumetric basis based on ELEXON data, a monthly levy ensures obligations are more reflective of their ongoing electricity supply market share.

62. The collection of the levy and the subsequent compensation to EIIs will be provided by an administrator which will be named in the secondary legislation.

63. On appointment of an administrator, the Government will continue to work with suppliers on the technical operation of the Levy. This will feed into the publication of a detailed technical memorandum on the levy in 2024 to provide suppliers with the necessary technical detail on the operation of the scheme.

EII Network Charging Cost Compensation Scheme

64. Eligibility for the NCC Scheme is contingent upon an EII holding a valid EII Exemption Scheme certificate. This is issued by the Government to eligible EIIs to demonstrate they qualify for the EII Exemption Scheme, and the other British Industry Supercharger measures once these schemes commence.

65. The NCC Scheme will offer EIIs 60% compensation on eligible network charging costs. As the NCC Scheme is funded via the EII Support Levy, compensation will be paid out to EIIs in arrears once the funds have been raised via the Levy. This means that network costs incurred by an EII in April 2024 will be compensated in 2025 after the necessary funding is raised via the Levy.

66. Certain elements of scheme design require input from the scheme administrator. Once appointed, government will work with them to determine whether quarterly compensation payments work, or whether a more regular cycle that tracks the monthly levy collection would be more feasible.

67. The scheme would not extend to NI given energy is a devolved matter to NI and that NI operates under a separate grid to GB.

Section 6 - Monetised and non-monetised costs and benefits of each option

68. This section covers the Value for Money analysis of the preferred option. The Network Charging Cost Compensation scheme is one of three parts of the British Industry Supercharger package and is not intended to be implemented in isolation. Therefore, we will show both the overall Value for Money of the Supercharger as well as that of the individual Network Charging Cost Compensation Scheme.

69. The Supercharger value for money analysis assesses the combined costs and benefits of the three parts of the Supercharger package. The assumptions, methodology and types of costs and benefits also apply to the Network Charging Cost Compensation Scheme, with the only difference being the scale of costs and benefits.

Value for Money analysis

70. The total annual value of the UK Supercharger Package to eligible businesses is expected to be between £320 mil - £410 mil. The expected total annual electricity consumption compensated in 2025 is 13.4TWhs and is based on actual consumption of the eligible cohort from 2022/23.

71. We estimate that in the central scenario the NPV and BCR of the UK Supercharger Package to be £9.4 billion and 7.7 respectively.

72. The individual annual value of the Network Charging Cost Compensation scheme is expected to be c. £65m. We estimate that in the central scenario, the NPV and BCR of the Network Charging Cost Compensation scheme in isolation to be £5.8 billion and 7.6 respectively.

Table 1. NPV and BCR estimates

	Central	Low	High

Network Charging Cost Compensation Scheme NPV	£5.8bn	£2.2bn	£14.9bn
Network Charging Cost Compensation Scheme BCR	7.6	8.1	7.3
Supercharger NPV	£9.4bn	£3.3bn	£24.0bn
Supercharger BCR	7.7	8.2	7.3

Choice of counterfactual

73. We assume the benefits and costs are realised against a baseline scenario (in which the current level of support continues), where in the absence of the increased compensation/exemption the costs and benefits outlined below would be 0. In this counterfactual scenario, UK based EIIs would face a greater risk of carbon leakage as they would continue to be exposed to the competitive disadvantage of the higher UK industrial electricity price caused by higher UK policy and network charges costs. As such production, and therefore GVA, would decrease relative to the scenario of the introduction of the UK Supercharger Package and some firms would face increased risk of closure due to persistently higher UK electricity costs and therefore will struggle to be able to compete internationally.

74. In the central scenario, in the years that the UK Supercharger Package is in effect, eligible businesses will increase production relative to a baseline scenario without the UK Supercharger Package – generating GVA benefits and increasing the profitability of UK EIIs. However, this additional production will incur air quality and emission costs.

Modelling Assumptions

75. The scenarios are modelled across central, high and low scenarios and assume annual compensation payment through the whole 10-year appraisal length beginning in 2025, with the benefits and costs of additional production and the increased profitability of UK EII incurred over the 10-year period. Sensitivity analysis has been carried out across key assumptions to reflect the inherent uncertainty in forecast modelling and the ranges of values brought out by evidence sources.

76. We have looked at a range of fossil fuel price scenarios for each of the high, central and low scenarios and have used the appropriate fuel price estimate to give the lowest and highest NPVs for the low and central scenarios respectively.

Table 2. Modelling Assumptions

Assumption	**Central**	**Low**	**High**
Production Elasticity	-0.41	-0.21	-0.86
Fossil fuel price scenario	Central	Very High	Low
Investment level	£957 mil	£957 mil	£957 mil
Investment Multiplier	0.33	0.257	0.503
% of eligible firms at risk of closure	6.4%	6.4%	6.4%

% of at risk firms saved	50%	0%	100%
Network Charging Cost Compensation Scheme NPV	£5,818 mil	£2,198 mil	£14,906 million
Network Charging Cost Compensation Scheme BCR	7.6	8.1	7.25
Supercharger NPV	£9,438 mil	£3,282 mil	£24,041 mil
Supercharger BCR	7.7	8.2	7.3

77. An optimism bias of 10% is applied to all benefits in line with Green Book guidance regarding capital expenditures. The above scenarios are all appraised over a 10-year appraisal period, in 2025 prices. Overall additionality is subject to the sensitivity scenarios for each benefit strand, including the elasticities and deadweight applied.

Benefits summary

78. The main benefits derived from the reduction in electricity prices for eligible firms are increased production, avoidance of firm closure and increased investment. Our central estimate for total benefits over the 10-year period for the whole Supercharger package is £7.7 billion.

Table 3. Monetised Benefits Summary – whole Supercharger package (2025 Present Values, 10-year appraisal period)

PV 2025	**Central**	**Low**	**High**
Benefits			
Profit (domestic)	£3,815 mil	£1,243 mil	£10,121 mil
Employment	£5,655mil	£1,843 mil	£15,001 mil
Avoid firm closure	£96 mil	£0	£196 mil
Investment	£1,286 mil	£649 mil	£2,525 mil
Total benefits	£10,853 mil	£3,735 mil	£27,842 mil

79. Our central estimate for total benefits for the Network Charging Cost Compensation scheme over the 10-year appraisal period in isolation is £6.7bn.

Table 4. Monetised Benefits Summary – Network Charging Cost Compensation scheme only (2025 Present Values, 10-year appraisal period)

PV 2025	**Central**	**Low**	**High**
Benefits			
Profit (domestic)	£2,349 mil	£835 mil	£6,284 mil
Employment	£3,482 mil	£1,237 mil	£9,314 mil
Avoid firm closure	£61 mil	£0	£124 mil
Investment	£807 mil	£436 mil	£1,568 mil

Total benefits	£6,699 mil	£2,508 mil	£17,290 mil

Production Increase

80. The Supercharger Package reduces the electricity price that recipient firms face, via exemptions from policy costs and compensation on a portion of the network charges. The fall in electricity price translates into a rise in firm electricity consumption (a movement along the demand curve), compared to what otherwise would have been in a counterfactual scenario, through a price elasticity of demand. The central case elasticity is –0.41 with range –0.21 to –0.86. This is based on an internal literature review of estimates of the price elasticity of demand for industrial electricity, which includes papers looking at relevant sector-level estimates.

81. The choice of low, central and high estimates is based on sector-level estimates from two key papers. The sectors that receive the most value from the UK Supercharger Package are chemicals, paper and pulp and metals (iron and steel as well as other metals). The following table shows sector-specific estimates from the two key papers mentioned above:

Table 5. Production Elasticities used

Authors	Chemicals	Metals	Paper and Pulp[8]	Unweighted Average	Weighted Average[9]
Agnolucci et al. (2017)	-0.32	-0.52 (Non-ferrous only)	-0.34	-0.39	-0.41
Steinbuks and Neuhoff (2014)	-0.21[10]	-0.86[11]	-0.54	-0.69	-0.56

82. The rise in electricity consumption is scaled up to a rise in gross value added (GVA) according to a GVA-MWh ratio. This ratio is developed using electricity consumption data obtained from recipients of the existing exemption scheme. The additional GVA is decomposed into profit and wage components using a profit-to-wage ratio. This ratio is based on FAME data for firms in the EII Exemption scheme, using this assumption gives 52% of GVA attributed to profit and 48% for wages.

Production Increase – profit

83. For profits, multinational profits are again assumed to be transferred out of GB while domestic profits are fully retained within GB. The split is made according to the location of the global ultimate owner (GUO) of the firm. Using FAME[12] data for the location of the GUO of firms for the currently eligible businesses in the EII CFD/ RO/ FITs Exemption scheme, 72% of firms are classified as domestic and the remaining firms as multinational.

[8] Includes publishing in both papers

[9] Weights are based on the fractions of ETS/CPS compensation that goes to each of these sectors, excluding the 1% of compensation that goes to 'other' sectors. The weights used to calculate the weighted average are: chemicals 33%, paper and pulp 25%, metals 42%.

[10] Refers to chemicals, rubber, plastics and fuel products.

[11] Refers to basic metals and fabricated metal products.

[12] FAME, Bureau Van Dijk database - available at fame.bvdinfo.com

84. For domestic firms we assume that the profit remains in GB and is not subject to being transferred abroad, while for multinational firms we assume the profit is transferred abroad. This is in line with guidance from the Green Book, which states that 'the relevant costs and benefits (to appraisal) are those to UK society overall'.

Production Increase - employment benefits

85. The increase in GVA derived from the increase in production leads to increased demand in working hours in eligible businesses[13]. These increased hours in eligible businesses aren't expected to have an impact on other ineligible businesses' employment behaviour, this is due to the relatively small impact of the approximately 13,000 new jobs[14], over the 10-year appraisal period across eligible businesses, would have on local employment when impacts are spread across GB. Therefore, we have treated all the increased employment spending as societal benefit for the new hours worked in these businesses.

86. In the central scenario, this benefit is worth around £5.7 billion over the 10 years in additional wages due to the reduction in electricity price through the exemption provided.

87. In the central scenario for the NCC scheme in isolation, this benefit is worth around £3.5 billion over the 10-year appraisal period.

Investment Benefits

88. This benefit measures the impact on investment from reducing the electricity price for eligible firms. An elasticity has been calculated using regression analysis from a European Central Bank working paper[15] analysing how changes in electricity prices affect investment.

89. The paper finds that there is a negative elasticity of between -0.2 and -0.5, This implies that a 10% fall in electricity prices increases next year's investment by 2% to 5%. The model calculates the average electricity price impact of applying the Supercharger Package in each year. This is then combined with the elasticity from the ECB paper. We adjust the elasticities for our sensitivity analysis to account for the range provided in the paper and the wage and fixed asset factors they considered when running their analysis.

90. The output of the change in electricity price and elasticity is then multiplied by the existing domestic investment across the firms on the scheme. This has been sourced using ABS average for 2016-2018 data for investment in fixed and current assets.

91. In the central scenario for the whole Supercharger package, this benefit is worth £3.6 billion over the 10 years in additional investment due to the reduction in electricity price through the exemption provided.

[13] We assume that 52% of the increase in GVA will be spent on wages, this ratio is based on FAME data for firms in the EII exemption scheme.

[14] Based on the estimated increase in spending on employment by eligible businesses divided by their average staff costs per employee figure.

[15] Bijnens et. al (2021), The interplay between green policy, electricity prices, financial constraints and jobs. Working Paper Series No 2537. Available online at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2537~002be51914.en.pdf

92. In the central scenario for the Network Charging Cost Compensation scheme in isolation, this benefit is worth c. £800m over the 10-year appraisal period.

Benefits from Preventing Firm Closure

93. Based on ONS business demography 2021 data we can see that there was around a 6% death rate of businesses in eligible sectors, we assume that a portion of these businesses would avoid closure with the additional support of the Supercharger Package and that workers in businesses facing closure are displaced and wages follow a lower path than if the business avoided closure. This lower wage path is based on 'The Losses of Displaced Workers' BEIS paper[16]. Therefore, a benefit of the scheme is that it keeps some firms open and prevents large wage losses for displaced workers. The table below gives the implied percentage difference in wages under a firm closure scenario relative to the scenario where the firm remains open.

Table 6. Annual wage loss due to firm closure

Years after firm closure	1	2	3	4	5	6
% Difference in wages under firm closure scenario relative to open firm scenario	-52.2%	-27.9%	-23.7%	-9.2%	-7.2%	-7.2%

94. We assume that on a yearly basis there are around 6% of eligible businesses at risk of closure based on ONS business demography 2021 data. In our high scenario we assume that all of the businesses that are at risk of closure would avoid closure. In our central scenario and low scenario, we assume half and none of the at-risk businesses avoid closure due to the impact of the Supercharger Package.

95. Using FAME data we look at the level of employment spending in eligible businesses and apply the displaced worker wage discount rate to the portion of businesses that avoided closure. This gives us the estimated loss of total wages that would be avoided as a benefit.

96. We are aware of UK sites that have closed whilst being supported by existing schemes. While it is difficult to prove that high electricity prices caused these sites to close, these closures do provide some evidence of the risk faced by these companies from carbon leakage due to higher electricity prices.

Carbon Leakage

97. Avoidance of carbon leakage is a potentially large portion of benefits which are too difficult to quantify in a meaningful way, as it is impossible to separate the impact of higher electricity prices from other factors that have also caused a decline over time in the domestic demand for products domestically produced from eligible sectors.

98. As the purchasing of equipment used by the sectors supported by the Supercharger Package are a substantial portion of their costs, and due to the long-lived nature of this equipment (over 10 years in many cases) we expect that the riskiest time for carbon leakage to occur would be when old equipment would need replacing. We assume that without the reduced electricity prices more firms would choose to relocate but we don't

[16] Page 97, BEIS Research Paper Number 6, 'The Losses of Displaced Workers', March 2017, prepared by Frontier Economics.

have the required data to forecast when these major investments to replace equipment would happen and therefore we cannot quantify the impact of this specifically.

Costs summary

99. The main costs derived from the reduction in electricity prices for eligible firms are air quality impacts and increased emission due to increased production. Due to the proportionally small cost impact to households and ineligible businesses, we assume there is no behavioural change from this policy and thus no associated cost impact from behavioural changes.

100. Our central estimate for total costs for the whole Supercharger package over the 10-year period is c. £1.4 billion.

Table 7. Monetised Costs summary – whole Supercharger package (2025 Present Values, 10-year appraisal period)

PV 2025	Central	Low	High
Costs			
Additional Air quality impacts	-£72 mil	-£24 mil	-£186 mil
Additional emissions	-£1,342 mil	-£429 mil	-£3,616 mil
Total costs	-£1,414 mil	-£453 mil	-£3,802 mil

101. Our central estimate for total costs for the Capacity Market Exemption in isolation over the 10-year period is c. £230 million.

Table 8. Monetised Costs summary – Network Charging Cost Compensation scheme only (2025 Present Values, 10-year appraisal period)

PV 2025	Central	Low	High
Costs			
Additional Air quality impacts	-£44 mil	-£16 mil	-£115 mil
Additional emissions	-£837 mil	-£293 mil	-£2,269 mil
Total costs	-£881 mil	-309 mil	-£2,384 mil

Transfer of energy costs

102. The British Industry Supercharger package is a transfer of policy and network electricity costs from eligible consumers to ineligible consumers. This means that in line with Green Book guidance, there is no cost associated with the funding of the reduction in electricity costs given to the eligible cohort.

103. The estimated total value of reduced electricity prices by eligible firms borne by all non-eligible users in 2025 is estimated to be between £320 mil - £410 mil and around £5.1 billion over the ten financial years.

104. These costs, when spread out across ineligible electricity consumption, are estimated to cost the average household £4-£5 per annum and £1-1.5/MWh for ineligible businesses in 2025. Given that electricity prices have been and are expected to be over £100 /MWh, this translates to less than a 1% increase to ineligible businesses' electricity costs. We do not expect these costs to be substantive enough to impact household or ineligible businesses' behaviour, and therefore do not attribute any indirect cost from a change in behaviour due to this transfer.

105. A sensitivity to show what the Value for Money of the Supercharger would be if the bill impacts were not funded through a transfer has been carried out. This sensitivity suggests that the BCR of the scheme would be between 0.8 and 3.4, with a central BCR of 1.9 and an NPV of between -£0.7 to £19.7 billion with a central estimate of £5.1 billion.

Table 9. Summary of energy bills impacts of Supercharger policies

2025	Total cost (£m)	Annual Household bill increase (£)	Price increase for non-eligible consumers (£/MWh)	Discount to eligible EIIs (£/MWh)
100% Exemption	64 - 88	0.8 - 1.1	0.2 - 0.3	5 - 7
100% Capacity Market reduction	65	0.8	0.2	5
60% reduction in network charges	191 - 259	2.4 - 3.2	0.7 - 1	14 - 19
Total	320 - 412	4 - 5	1.1 - 1.5	24 - 31

Air Quality Impacts

106. Increasing production is associated with air damage costs compared to what otherwise would have been the case. The model uses £/MWh costs from Defra's Air Quality Impact calculator[17] to convert the electricity consumption in MWh into air quality damage costs in £.

107. In the central scenario the additional electricity consumed over the 10 years is around 40 TWh and the cost of air damage from additional production averages at around £2/MWh per annum over the ten financial years. Therefore, the total cost of air damage is £82 million.

108. Similarly increasing electricity consumption leads correspondingly to higher emissions of greenhouse gases. The model uses a £/MWh emissions factor to convert the change in electricity consumption due to reduced electricity prices into a greenhouse gas cost which averages at £38/MWh over the 10 year period. This approach is based on Green Book supplementary guidance for the valuation of greenhouse gas emissions for appraisal[18].

109. In the central scenario the additional electricity consumed over the 10 years is around 40 TWh and the corresponding cost of emissions from electricity consumption over the 10 year period averages at around £38/MWh. Therefore, the total GHG costs from additional electricity consumption estimated from the whole Supercharger package

[17] Defra's air quality guidance is available at: https://www.gov.uk/government/publications/assess-the-impact-of-air-quality

[18] https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

is £1.3bn. The individual impact of the Network Charging Cost Compensation scheme is estimated at £837million.

Administration/ Familiarisation Impacts

110. There are also administration and familiarisation costs faced by eligible businesses and the administrator of the policies within the Supercharger package.

111. The EII Exemption Scheme Extension and the Capacity Market Exemption are likely to have no or minimal administrative burdens on businesses. This is due to the existing EII Exemption scheme already having the administrative processes in place that are needed for these schemes.

112. Therefore, most of the administration and familiarisation costs are likely to be from the Network Charges Compensation scheme.

113. There will be a small familiarisation cost and continuous administrative burden on the EIIs eligible for network charges compensation. Under the proposed policy design, eligible EIIs will be required to submit data from their electricity bills to the scheme administrator on a quarterly basis to receive compensation from network charging costs. For some firms, this will mean compiling data from bills from multiple sites.

114. In our consultation on the Network Charging Compensation scheme[19] we provided an estimate for the administration costs across all eligible EIIs of £26,000 per year. This assumes that a worker in an administrative occupation would spend 1 hour per-quarter to collate and share their electricity bills with the scheme administrator.

Table 10 – Estimated administrative burden costs on EIIs receiving Network Charging Compensation

Hourly pay of administrative occupations in manufacturing sector	£13.41
Time taken to collate and submit electricity bills to administrator	1.5 hours
Annual frequency of submissions	4
Annual administrative cost to an eligible EII	£80.46
Annual cost to 320 eligible EIIs	**£26,000**

115. We also provided a one-time familiarisation cost of £12,000 to EIIs. Familiarisation costs entail the time taken for a senior official in the eligible EII to read and comprehend the legislation.

Table 11 – Estimated familiarisation cost for EIIs receiving Network Charging Compensation

Hourly pay of management occupations in manufacturing sector	£24.85
Time taken for manager to review and comprehend the legislation	1.5 hours

[19] Network Charges Compensation scheme consultation available at: https://assets.publishing.service.gov.uk/media/64a590654dd8b3000c7fa521/consultation-on-the-proposed-network-charging-compensation-scheme-for-energy-intensive-industries-_eIIs.pdf

Familiarisation cost to an eligible EII	£37.28
Familiarisation cost to 320 eligible EIIs	**£12,000**

116. The administrator of the Network Charges Compensation scheme will also face administration costs that may be passed on to consumers. We are currently in discussions with the potential scheme administrator on what these costs may be. Given the scale of the benefits from the Supercharger, the administration costs would have to be in the tens of millions of pounds per year to have even a minor impact on the Value for Money of the scheme.

117. Low and high sensitivities of 50% and 150% of the central estimates have been provided to reflect uncertainty in the central estimates.

118. For the combined Supercharger package these costs are estimated at £0.1m - £0.4m (2025 PV) over the 10-year appraisal period, with a central estimate of £0.3m.

Table 12 – Administration and Familiarisation costs – combined Supercharger package. 10-year, 2025 Present Values

Description	**Low Estimate (£m)**	**Central Estimate (£m)**	**High Estimate (£m)**
Costs			
Familiarisation costs to eligible EIIs for Network Charges Compensation scheme	0.01	0.01	0.02
High-level Administration costs of Network Charges Compensation scheme for scheme administrator	Unknown at this stage but expected to be <£10m		
Annual admin burden for EIIs to provide electricity info to electricity suppliers	0.1	0.3	0.4
Total Administration and Familiarisation costs	**0.1**	**0.3**	**0.4**

Equivalent Annual Net Direct Cost to Business (EANDCB)

119. The direct costs to business from the Supercharger are the increased electricity bills for non-eligible businesses and the administrative and familiarisation costs for eligible businesses. The direct benefits to business are the lower electricity prices for eligible businesses.

120. As with the Value for Money assessment above, the direct electricity bills impacts are a transfer from non-eligible businesses and households to EIIs. As such, they are not considered in the EANDCB calculation as the increased costs for those not eligible for the Supercharger would be cancelled out by the benefit of lower electricity prices for EIIs.

121. Therefore, only the administration and familiarisation costs to businesses noted in Table 12 are considered in the EANDCB. The benefits to the wider economy from the increased production for EIIs resulting from lower electricity prices are not direct benefits to EIIs and so are not considered in the EANDCB calculation.

122. With a central estimate of administration and familiarisation costs to businesses of £0.3m over the 10-year appraisal period this leaves the EANDCB for the overall Supercharger package and the Network Charges Compensation scheme at £0.02m, subject to estimated administrator costs.

Section 7 - Risks and assumptions

123. **Risks to Value for Money estimates**: Assumptions used to estimate monetised benefits and costs have been outlined in Section 6. The estimated benefits are based on a range of production elasticities taken from the literature on the relationship between reduced electricity prices and production.

124. High and low sensitivities have been presented alongside the central estimates of benefits and costs to mitigate the uncertainty present in these estimates.

125. **Risks to the costs faced by non-eligible consumers**: The eventual bill impact faced by non-eligible consumers will be dependent on the number of companies, and therefore the volume of electricity consumption, that is eligible for the compensation scheme delivered through the secondary legislation. This volume is sensitive to numerous factors including future electricity price volatility, changes to the UK industrial make-up and HMG Net Zero policies.

126. For a company to be eligible for the network charge cost compensation, they will need to be sufficiently electricity intensive and operate in an eligible sector. The list of eligible sectors can be found in the scheme guidance.

127. **Changes in network costs**: The size of the levy collected may vary with changes in the value of the network costs. If network costs increased through the late 2020s, the compensation for EIIs may also increase and so too will the levy on non-eligible consumers.

128. The electricity network in Great Britain will require significant levels of investment to support the expected increase in peak electricity demand due to net zero. Analysis completed for the Electricity Networks Strategic Framework[20] suggests the onshore electricity network could require an additional £100-240bn of investment by 2050 due to net zero.[21]

129. This investment is paid for by private electricity network operators, who are regulated regional monopolies. This is recovered from consumers through the network costs component of their electricity bills over a 45-year cost recovery period, as dictated by Ofgem's price control process. Our analysis suggests net zero could increase the electricity network costs portion of consumer bills by £40-110bn[22] between 2021-2050, additional to BAU costs of £230-240bn.

Section 8 - Impact on small and micro businesses

[20] BEIS, 2022, Electricity Networks Strategic Framework, https://www.gov.uk/government/publications/electricity-networks-strategic-framework

[21] Note that this analysis was completed prior to the publication of the British Energy Security Strategy, so the scenarios used in this analysis do not incorporate the latest generation assumptions. We would not expect this to impact the results substantially.

[22] This is lower than the £100-240bn investment estimate because this captures the investment that will be repaid between 2021-2050 only. For example, investment made in 2035 would be repaid between 2035-2080, yet the network costs estimate captures repayments between 2021-2050 only.

130. The policy package will be paid for by contributions from all non-eligible electricity consumers (domestic and non-domestic) therefore small and micro businesses will be impacted.

131. Small and micro businesses are likely to face different baseline energy prices to individual consumers. The overall bill impact will be driven by energy consumption of individual businesses. Unlike in the case of households, there is likely to be greater variance in energy consumption across businesses.

132. In total, the Supercharger is expected to put an additional c. £1-1.5/MWh on the electricity bills of non-eligible firms. Depending on the energy usage of these firms, the absolute cost will vary, however the relative increase on their electricity bills is expected to be below 1%.

133. In terms of energy usage, Ofgem define a microbusiness as one that uses less than 100,000kWh or 100MWh of electricity per year[23]. Based on this assumption, the annual cost of the Supercharger package to a non-eligible microbusiness's electricity bill would be at most £150.

134. Individually, the Network Charges Compensation scheme adds £0.7-1.0/MWh on the electricity costs of non-eligible businesses. Therefore, the individual impact on a non-eligible microbusiness is estimated to be £70-100 annually.

135. Eligible small and microbusinesses will benefit from the c. £24-31/MWh average reduction in electricity prices. It is estimated that based on the eligibility of the existing EII Exemption scheme, c. 8% of all support through the Supercharger package will go to small and micro businesses.

Section 9 - Wider impacts

Technology switching impacts

136. Analysis suggests that the electricity price reduction from the Supercharger is sufficient to make it financially viable for Supercharger-eligible firms to switch from using industrial gas furnaces to electric furnaces, when also considering the costs of replacing these furnaces. This will help to encourage electrification among EIIs where feasible and decrease carbon emissions.

137. One of the objectives of the Supercharger is to encourage decarbonisation for energy intensive firms through fuel switching away from fossil fuels to electricity by lowering electricity prices.

138. However, the cost of replacing fossil fuel reliant technologies with electric replacements (for example, replacing industrial gas fired furnaces for heat used in industrial processes with electric furnaces) is also a consideration when it comes to firms deciding if it is financially viable to fuel switch.

[23] https://www.ofgem.gov.uk/information-consumers/energy-advice-businesses/guidance-microbusinesses

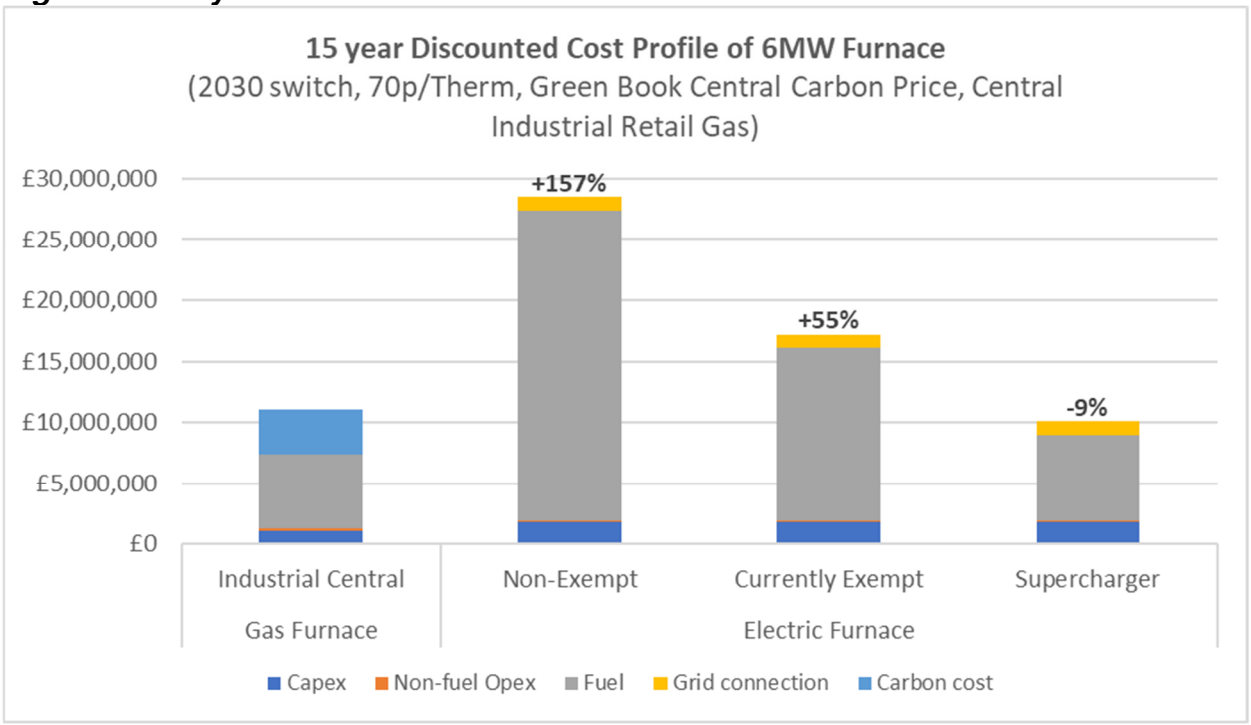
139. We have conducted analysis to show the Net Present Cost (NPC) of purchasing and operating an industrial natural gas fired furnace compared with an industrial electric powered furnace. To show the impact of the Supercharger we have considered the following electricity price scenarios:

- The full industrial retail electricity price with no policy cost exemptions drawn from Green Book Industrial retail price series.
- The current EII Exemption scheme with an 85% exemption from RO/CfD/FIT costs and the current EII ETS/ CPS indirect cost Compensation scheme compensating for c. 86% of the indirect costs of the UK ETS and CPS
- The proposed Supercharger scheme with the increase in RO/CfD/FIT exemption to 100%, Capacity Market exemption and Network Charges compensation and the current EII ETS/ CPS indirect cost Compensation scheme as above

140. Across the low, high and central scenarios, we have assumed firms have a furnace with a 2030 replacement date with the option of installing and using a 6MW gas furnace or a 6MW electric furnace over a 15-year appraisal period (2030-44). We have also assumed that firms will be fully exposed to the Central Green Book Carbon costs and will incur a £350/kW capacity grid connection cost for the electric furnace option. Electricity and gas price forecasts for exempt EIIs have been created from the DESNZ Average Prices & Bills Model (APBM), while Green Book Industrial retail prices have been used for non-Exempt EII firms.

141. When comparing the discounted cost of purchasing and operating an industrial gas fired furnace with the discounted cost of an industrial electricity powered furnace, the analysis indicates that Supercharger-eligible firms are projected to have 9% lower costs if they use the electric powered furnace over the appraisal period.

Figure 3 – 15-year Discounted Cost Profile of 6MW Furnace in the central scenario



142. Firms that are eligible for the existing EII Exemption and Compensation Schemes would face a 55% higher discounted cost from switching to an electric furnace compared

to replacing a natural gas furnace. A non-exempt firm using electricity would see their costs more than double (+157%).

143. This indicates that the electricity price reductions from the Supercharger could make it financially beneficial for firms eligible for the full range of EII support (Supercharger and indirect ETS/ CPS costs compensation scheme) to switch from gas furnaces to electric furnaces, thus encouraging decarbonisation.

144. Note that the ability for firms to fuel switch to electricity is also dependent on other factors such as the ability for firms to connect to the electricity grid and assuming that there are no exogenous shocks that will impact the forecasted gas and electricity prices within the model.

Table 13 – Summary of projected net present cost impacts over a 15-year appraisal period

Technology	Electricity price scenario	Central	Low	High
Discounted Cost				
Gas fired furnace	Costs are not dependent on the electricity price scenario	£11,100,000	£9,200,000	£13,300,000
Electricity powered furnace	Non-Exempt	£28,500,000	£28,200,000	£29,500,000
	Currently Exempt (EII Exemption and indirect ETS/ CPS Compensation)	£17,200,000	£16,200,000	£18,700,000
	Supercharger (incl. indirect ETS/ CPS Compensation)	£10,100,000	£9,200,000	£11,400,000
Net Present Cost differential (discounted electricity premium)				
Electric powered furnace (£) **minus** Gas fired furnace (£)	Non-Exempt	£17,400,000 **(+157%)**	£19,000,000 **(+207%)**	£16,200,000 **(+122%)**
	Currently Exempt (EII Exemption and indirect ETS/ CPS Compensation)	£6,100,000 **(+55%)**	£7,000,000 **(+77%)**	£5,500,000 **(+41%)**
	Supercharger (incl. indirect ETS/ CPS Compensation)	-£1,000,000 **(-9%)**	-£4,000 **(0%)**	-£1,900,000 **(-14%)**

Note: Net present cost (NPC) differs from actual cost difference. In Figure 3 NPC refers to the difference between the present value of costs (discounted cost) from installing and using an electric powered furnace instead of a gas fired furnace. To work out the present value of costs we have used a discount rate of 10% to mirror what might be used in the private sector.

Public Sector Equality Duty Assessment

145. The Supercharger is expected to have impacts on electricity bills for all electricity consumers, lowering electricity bills for eligible businesses and slightly increasing bills for households by £4-5 per year and non-eligible businesses by c. £1-1.5/MWh. As a result, there may be some impacts on Protected Characteristic Groups (PCGs).

146. In terms of household impacts, the additional electricity bill costs faced by households are small at £4-5 per year. At this level of cost, the impacts on PCGs are minimal, with any potential impacts being greater for those PCGs with lower incomes.

147. As the schemes provide exemption and compensation to corporate entities, it is unlikely that the policy will directly affect individuals with “protected characteristics” (age,

gender, race etc). Our equality analysis shows that people sharing some of the protected characteristics under the Equality Duty are less represented in energy intensive sectors.

148. If the Supercharger scheme has the effect of enabling the beneficiaries to employ more people who do not share the protected characteristics and fewer people who do share the protected characteristics, it could be argued that the policy is likely to perpetuate but not worsen some of the inequalities that the Equality Duty aims to reduce.

Section 10 - A summary of the potential trade implications of measure

149. We expect a decrease in imports for eligible EII sectors such as steel, glass and chemicals following the implementation of the EII levy and compensation scheme as part of the British Industry Supercharger. The objective of the secondary legislation is to reduce the risk of carbon leakage in EIIs by closing the electricity price-gap between GB and comparable countries. Electricity makes up a significant proportion of costs for EIIs so reducing electricity prices will make them more internationally competitive. EIIs will be able to better compete with imports from countries which already provide lower industrial electricity prices thus reducing imports.

150. The increased international competitiveness of EIIs from lower electricity prices could also increase exports.

151. As eligible EII electricity prices fall, prices will increase slightly for non-eligible non-domestic consumers. This could lead to an increase in imports and a decrease in exports for non-eligible sectors. However, the effects on non-eligible sectors are expected to be minimal for two reasons. First, if the cost of the levy is distributed evenly across the whole economy, then the size of the price increase on each consumer will be small. Second, non-eligible industries are less electricity intensive trade exposed, so they are competing less with imports in the domestic market.

Section 11 - Monitoring and Evaluation

152. As part of the existing EII Exemption scheme, monitoring of the following variables already occurs through data provided by eligible businesses on an annual basis:

- Number of eligible businesses
- Electricity usage
- Electricity costs
- Earnings Before Investment, Taxes and Deprecation (EBITDA)
- Staff costs

153. The monitoring and data gathering of these variables will continue under the Supercharger. The monitoring of these variables will continue to provide the means to check continued eligibility for businesses as well as a view as to whether the Supercharger is supporting employment and production activity for eligible businesses.

154. In particular, monitoring of electricity usage, staff costs and EBITDA will allow us to monitor the impact of the Supercharger on the employment and production activity of eligible businesses.

155. In addition, the policy and network charges which the Supercharger impacts will also be monitored as well as the prices paid by eligible businesses to ensure that the exemptions offered by the Supercharger are being passed through to eligible businesses by their suppliers.

156. A review of eligibility for the Supercharger alongside a data refresh will be carried out in 2026. The monitoring and evaluation of the data collected from eligible firms will also be reviewed at this point.

Annex A – Supercharger Bills Impacts Modelling

How the £4-£5 annual household bill increase for households was calculated.

This note describes the calculation and the relevant inputs for the estimated £4-£5 increase in household bills following the introduction of the proposed EII policy support package. The estimate assumes that EII prices receive a 100% exemption from RO, FITs & CFDs (increased from 85%), a 100% exemption from capacity market charges, and a 60% reduction in Network charges from 2025. The ranges of estimates are created using different fossil fuel scenarios.

The calculation

A) Volume of electricity consumption eligible for the Supercharger (MWH)
B) Price discount for eligible EIIs (£/MWH)
C) Total cost to be redistributed (£)

$$A * B = C$$

D) Total volume of UK electricity consumption (MWH)
E) Volume of non-eligible consumption (MWH)
F) Price increase for non-eligible consumers (£/MWH)

$$D - A = E$$
$$\frac{C}{E} = F$$

G) Average Dual Fuel[24] Household Consumption (MWH)
H) Average increase to dual fuel household bills (£)

$$F * G = \boldsymbol{H}$$

H) Average increase to dual fuel household bills is the £4-£5 cost estimate that has been included in the Subsidy Control Assessment.

The inputs

A) Volume of eligible consumption (MWH)

The volume of eligible consumption is based on the annual electricity consumption of the c.300 firms which are currently part of the EII Exemption Scheme. It is therefore assumed that the full package of EII support measures will be offered to the same group of exempt firms.

B) Price discount for eligible EIIs. (£/MWH)

Four price scenarios are used for this analysis. All four are Net Zero Higher Electrification scenarios: they are consistent with Net Zero target by 2050, including the expected increase in demand as a result of EV and heat pump take up. They account for changes to prices as a result of Covid-19 and account for recent volatility in the gas market (up to Q2 2022), however the large amount of uncertainty around short-term gas prices makes these price projections more uncertain than those usually produced.

[24] Without a heat-pump or an electric vehicle

The difference between the four scenarios is assumptions around fossil fuel prices. NZH LFF assumes fossil fuel prices at around 45p/therm in 2030, NZH CFF is a 70p/therm in 2030, NZH HFF assumes ~95p/therm in 2030, and NZH VHFF assumes current very high prices remain high in future at 150p/therm.

Price estimates are inherently uncertain and influenced by several key factors including wholesale gas prices, carbon prices, the evolution of the generation mix, future policy decisions regarding who pays for the cost of decarbonisation and the way that consumers use energy. This uncertainty increases the further forward analysis looks, and prices are especially uncertain beyond the early 2030s.

The ex-BEIS Annual Prices and Bills Model breaks down the price paid by large exempt EIIs into the wholesale cost, transmission cost, balancing cost, ETS cost, RO support cost, CFD support cost, capacity market support cost, and the feed in tariff cost. We applied the proposed policy options to the different cost components to work out the discount each MWH of EII consumption received.

1) Increasing the Exemption Scheme from 85% to 100%- Take the remaining RO, FITs, CFD costs off from the exempt EII price.
2) 100% exemption from capacity market charges- Take the entire capacity market charge component of the EII price.
3) 60% exemption from network charges- Take 60% of BSUoS, TNUoS and DUoS costs off the EII price. This price was estimated via an evidence gathering exercise in the summer of 2023 which collected electricity bill data for April 2021, 2022 and 2023 from eligible EIIs.

The sum of 1), 2) & 3) is the estimated £/MWH price discount for EIIs following the delivery of the EII policy support package.

The size of the discount for EIIs changes over time because the relevant policy costs are sensitive to the chosen fossil fuel price assumption.

The EII exemption scheme covers three renewables policies – Renewables Obligation (RO), Feed-in-tariffs (FITs), and Contracts for Difference (CfDs) – which are designed to incentivise the deployment of renewable generation. The EII exemption exempts companies from a proportion of these costs. The RO and FITs are legacy policies and the price of these does will not change with fossil fuel scenarios. RO and FiT as legacy policies will start to decrease from the late 2020s to zero by the 2040s. For CfDs, when fossil fuel prices are low, the difference between the electricity wholesale price and the CfD strike price will be higher. Therefore, generators will receive higher payments, and the value of the exemption will therefore be higher when prices are low. The opposite is true for higher prices.

Capacity Market is a policy designed to ensure there is enough electricity generation capacity to ensure security of supply. Broadly speaking when prices are higher, there needs to be less incentive for suppliers to generate and less need for Capacity market payments. Therefore, capacity market exemption is lower when prices are high.

For network charges, higher fossil fuel prices incentivise renewable generation. More renewable generation on the grid might mean that there needs to be more investment in the networks to ensure the supply can reach its demand – e.g. more offshore wind means more networks are required.

D) Total volume of UK electricity consumption (MWH)

Total electricity consumption comes from total electricity demand in the Dynamic Dispatch Model (DDM) and has been revised down slightly to estimate actual sales (accounting for distributional losses and theft). This consumption is consistent with the net zero higher electrification scenario, including the expected increase in demand as a result of EV and heat pump take up.

G) Average household consumption (MWH)

We assume that the average (mean) dual fuel household consumes around 3MWH of electricity in 2025. The average household consumption figures do not include the introduction of EVs and heat pumps. This ensures estimates are comparable with today's bills.

Risks - how the size of the household bill impact could change

The estimate of the household bill impact of the EII policy support package is sensitive to the following factors:

- **Electricity prices and policy costs:** Price estimates are inherently uncertain and influenced by several key factors including wholesale gas prices, carbon prices, the evolution of the generation mix, future policy decisions regarding who pays for the cost of decarbonisation and the way that consumers use energy.

- **Volume risk:** The volume of EII electricity demand eligible for support is subject to change. An increase in the eligible volume will lead to an increase in the costs to households. DBT analysts have already accounted for proposed increases to steel and battery electricity demand, but there could be other increases that have not been accounted for. The DBT EII team is planning a review of sector level eligibility which may change the total volume of eligible electricity.

- **Household volume increase:** The household bill increase is based on an average estimate of a dual fuel household’s electricity demand for 2025 without a heat-pump or EV. While the £/MWH price increase may not change, a household with larger electricity demand would face a larger increase in absolute terms.

Annex B – Network Charges Costs Analysis

Data gathering exercise for network charges.

What are network charges?

- The energy network are the gas pipes and electricity cables that carry energy across the country into homes and businesses.
- Network companies charge energy suppliers an Ofgem-regulated price for their use of the energy network. This money goes towards maintaining, running and upgrading the networks.

The main categories of network charges are Transmission Network Use of System charge (TNUoS), Balancing Services Use of System charge (BSUoS) and Distribution Use of Systems (DUoS):

- The TNUoS charge is paid to and set by the system operator and recovered on behalf of the transmission owners for the cost of building and maintaining the shared transmission network.
- The BSUoS charge is paid to the electricity system operator for the cost of balancing the system minute by minute. It pays for the skills, tools and services the system operator needs to balance supply and demand in real time.
- The DUoS charge covers the costs of the electricity distribution network. The DUoS charge is based on the amount of electricity consumed by a business. The DUoS charge covers the cost of maintaining the local electricity distribution network infrastructure including the cables, substations, poles, and transformers.

In the summer of 2023, we undertook an exercise to gather up to date data on network charges. The purpose of this project was to help remedy our evidence gap on how much exactly EIIs were paying in network charges, as there had been several recent impactful reforms to how TNUoS and DUoS were charged since our last view on network costs.

In particular, following the introduction of Ofgem's Targeted Charge Reform (TCR), our previous method for estimating EII network charging costs was outdated and likely leading to an underestimate of the Supercharger costs.

In June 2023 we contacted the ~320 eligible for the EII exemption scheme requesting their April 2023 (and 2022, 2021) electricity bill information on network charges. We received just over 150 responses covering around 300 sites, accounting for ~70% of eligible exemption scheme electricity.

We found that network charges vary significantly across users, with the majority of sites facing costs between £24 - £52 per MWh. However, due to DUoS and TNUoS network charges now being charged largely as a standing charge determined by which band a site falls into (based on an average 24 months of consumption and voltage), the £/MWh for smaller electricity consumers was quite volatile.

To get an estimate of the £/MWh cost of supporting network charges, the collected data was weighted by electricity usage using exemption scheme eligible electricity usage data. We found that network charges for our cohort cost on average £24 -£31/MWh, which at a 60% compensation rate averages £14 - £19/MWh.

The calculation

A) Total network charges – TNUoS + DUoS + BSUoS
B) Electricity usage on bill
C) Proportion of eligible electricity the business was responsible for in 2022/23
D) Weighted average of network charges in terms of £/MWh, for the eligible exemption scheme businesses.

$$Sum(\left(\frac{A}{B}\right) * C) = D$$

Risks and limitations

Due to the recency of the TCR changes we could only collect information regarding businesses April 2023 bills. There were also some adjustments from suppliers during the first month of implementation of these changes, which was reflected in some bills. Ideally, we would have been able to collect several months of data which included the TCR changes but preferred to receive timely information and limit administrative burden for businesses.

These estimated costs are very specific to this cohort of businesses and should not be used to extrapolate to the wider economy.