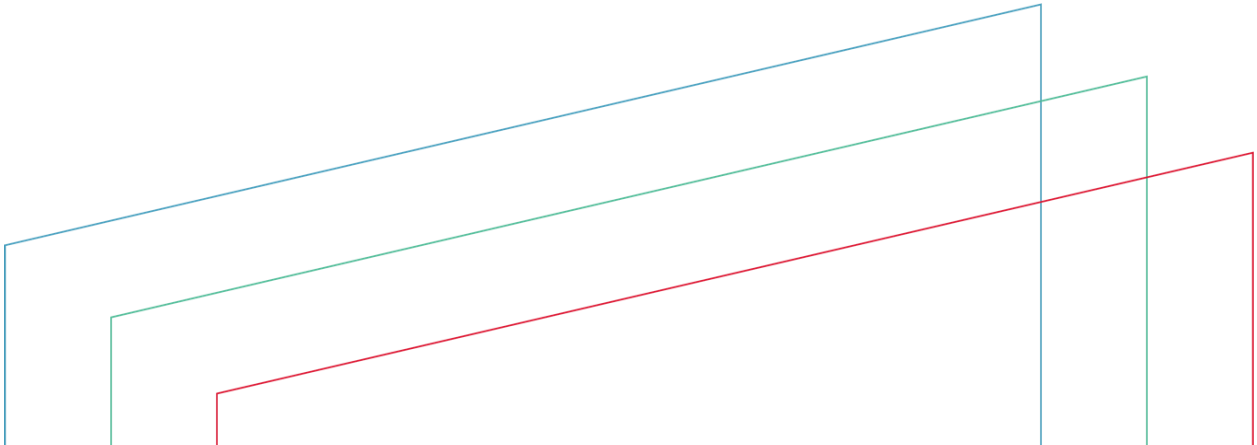
WARM THIS WINTER

Estimating the benefits and costs of the campaign proposals



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Executive summary

Warm this Winter (WtW) is a new campaign demanding the government acts now to help households struggling with energy bills this winter and to ensure we all have access to affordable energy in the future. The campaign has demands across four areas: providing emergency support on energy bills, helping homes in the UK to upgrade using various retrofit measures, increasing the electricity generation capacity from renewable energy sources (specifically onshore, offshore wind, and large-scale solar projects) and finally, reducing the UK's dependence on oil and gas. This research briefing provides estimates of the costs of different measures proposed by the campaign alongside the potential benefits that could accrue to the households, the government, and the wider economy by implementing the campaign's recommendations, relative to business as usual.

We identified several key findings from the modelling:

- In the coming six months, the government could reduce energy bills to pre-crisis levels (October 2021 price cap) for the 6.7m households in fuel poverty at a cost of £2.94bn. This would reduce their bills by an average of £439 for the period from October 2022 to March 2023, compared with the status quo of the Energy Price Guarantee (EPG) and the Energy Bills Support Scheme (EBSS). We estimate the EPG and the EBSS will cost £40.91bn over the coming six months, meaning the additional support for households in fuel poverty would cost just 7.2% more than the status quo.

- The government could roll out emergency home upgrades to 3.31m homes in the next two years by spending £3.6bn. These measures include insulation, draught-proofing, and smart heating control systems. Households who have the measures in place would see an average reduction in their energy bills of between £267 and £546 in 2023 and between £197 and £402 in 2024, depending on the type of home they live in.

- During the two years of its delivery alone, this £3.6bn programme of emergency home upgrades would save a total of £1.08bn on bills for those households getting the upgrades. Further bill savings would occur for these households beyond 2024

- Getting all homes to Energy Performance Certificate (EPC) Band C would create significant reductions in household energy bills, even once prices have fallen back from their current spike to longer-term levels. We find that Band D homes could reduce their energy bills by 12% by achieving Band C, whereas the corresponding reductions would be larger for homes in Band E (23%) and especially Bands F (32%) and G (30%).

- Homes in the lowest two bands also have the highest energy bills based on their usage, with Band F and G households spending £1,881 and £1,829, respectively at October 2021 prices, compared with £1,666 for Band E and £1,451 for Band D. Due to their high initial bills and the larger relative saving from retrofit, people living in Band F and G homes would make a far larger saving in money terms from achieving Band C, with a reduction in their bills of between £500 and £600 per household.

- Generating more of our energy from onshore and offshore wind and solar power could save the UK energy system £2.83bn in the next three years (equivalent to £32.90 for each household in the country) compared with the status quo by reducing our reliance on expensive gas generation.

- Increasing the windfall tax on the oil and gas sector and removing their tax loopholes could raise a substantial amount of revenue and would fully fund the aforementioned bill support and emergency energy efficiency interventions. An additional windfall tax of 25% on oil and gas profits would raise an estimated £6.6bn in revenue if applied to the full calendar year 2022, and £7.35bn of additional revenue in 2023.
- We estimate that the government's current profit taxes and Energy Profits Levy would raise £19.1bn in the 2023 calendar year if loopholes were removed, but a higher windfall tax (moving from a 65% total tax rate to 85%–95%) could raise between £25.0bn and £27.9bn in 2023.
- Applying the additional windfall tax of 25% for 2022-24 would raise an estimated £20.4bn in revenue (Table 1). We estimate that this would fully cover the cost of capping bills at the October 2021 price cap level for 12 months for 6.7m households, extending the EPG by six months, and installing emergency insulation measures in 3.31m homes.

Table 1: Financial summary of expenditure and revenue-raising proposals

£ billions	2022[a]	2023	2024	Total: 2022 - 2024
Expenditure				
Bill support for 6.7m families in fuel poverty (Oct 2022 - Mar 2023)	1.28	1.66		**2.94**
Extending the EPG by six months for all households (Apr - Sept 2023)		8.95		**8.95**
Bill support for 6.7m families in fuel poverty (Apr - Sept 2023)		2.45		**2.45**
Emergency insulation measures for 3.31m homes (2023-2024)		2.16	1.44	**3.60**
Total expenditure	**1.28**	**15.22**	**1.44**	**17.94**
Revenue				
Additional windfall tax of 25% on oil and gas profits	6.61	7.35	*6.42*[b]	**20.38**
Total revenue	**6.61**	**7.35**	**6.42**	**20.38**

[a] Note: the windfall tax revenue estimate for 2022 assumes that the additional windfall tax is backdated to apply to all profits since 1st January 2022, to more effectively match the period of elevated oil and gas prices.

[b] Note: in the absence of a reliable forecast for wholesale oil and gas prices in 2024 to facilitate modelling, we have reapplied HM Treasury's estimated revenue from the 25% Energy Profits Levy for the 2024-25 fiscal year as an estimate of how much a 25% additional windfall tax could collect in calendar year 2024.

Introduction

Warm this Winter (WtW) is a new campaign demanding the government acts now to help households struggling with energy bills this winter and to ensure we all have access to affordable energy in the future.

The campaign has demands across four areas: providing emergency support on energy bills, helping homes in the UK to upgrade using various retrofit measures, increasing the electricity generation capacity from renewable energy sources (specifically onshore, offshore wind and large-scale solar projects) and finally, reducing the UK's dependence on oil and gas.

This briefing compares how the UK economy and the energy market function in a business-as-usual (BAU) scenario versus an alternative scenario proposed under the WtW campaign. We provide estimates of the costs of different measures proposed by the campaign alongside the potential benefits that could accrue to the households, the government, and the wider economy by implementing the campaign's recommendations.

1. Emergency support now

The campaign is calling for a new package of financial support to households who, without additional urgent action, will be on the front line of poverty this winter. In the short term, this campaign proposes capping the average annual energy bills of the 6.7m households in fuel poverty[1,c] at the October 2021 price cap level of £1,277 (in addition to any reductions in bills that they are already receiving through other policies). In the longer term, the campaign is calling for the introduction of a social tariff for households with lower incomes, to permanently reduce their energy bills.

Short term: Cost of support with bills and benefit of bill reductions

An October 2022 research paper from Cornwall Insight[2] estimated the cost of the original Energy Price Guarantee (EPG), a policy announced to cap gas and electricity unit costs at a level that would yield an average annual energy bill of £2,500 per household for the two years from October 2022 to September 2024. The paper estimates the gap between the average bill under Cornwall Insight's base-case forecast for the default price cap (the average energy bill that would occur in the absence of the EPG) and the EPG unit costs for each year of the policy, estimating that the policy would have cost £30.74bn in its first year and £58.05bn in its second year to support 29m households.[d]

Building on this analysis, we apply the unit costs and standing charges under the October 2021 price cap to compare energy bills for the average household under the Warm this Winter (WtW) scenario, the EPG, and the default price cap. We have incorporated the latest forecasts for the quarterly default price cap during 2023 from Cornwall Insight (released on 3

[c] This estimate is based on a definition of fuel poverty as households needing to spend more than 10% of their income on maintaining a satisfactory heating regimen.
[d] This model and our model assume that the average household consumes 2,900 kWh of electricity and 12,000 kWh of gas each year.

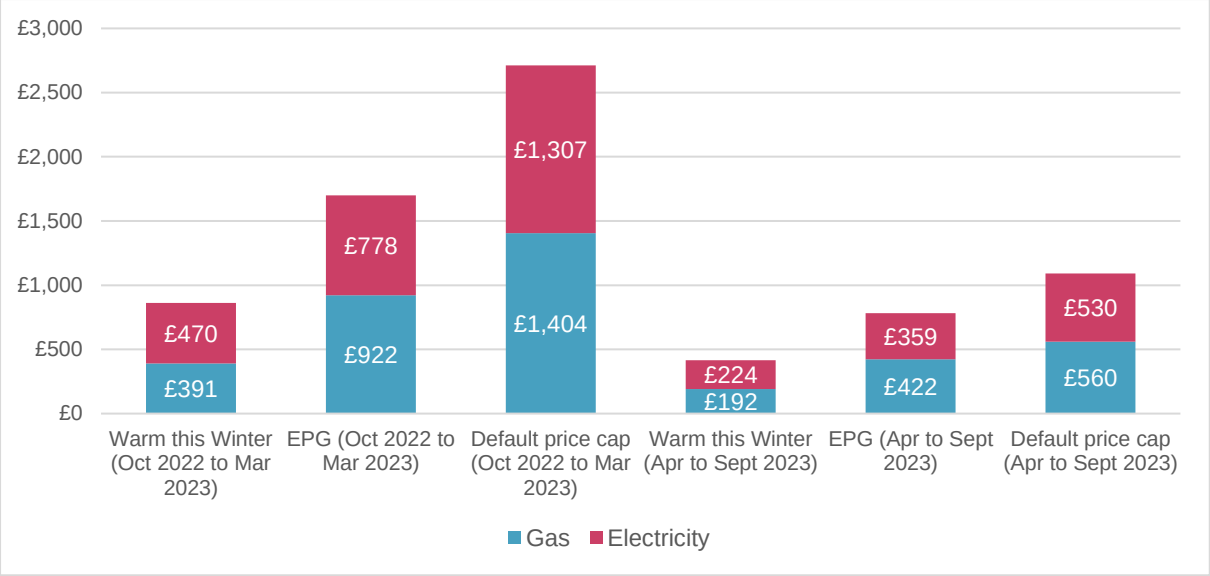
November 2022) into our model.[3] For the final quarter of 2022, we have taken the default price cap from Ofgem as an input to our model.[4]

We have incorporated seasonality in energy use into our quarterly modelling, using Department for Business, Energy and Industrial Strategy (BEIS) data on monthly domestic energy consumption (gas, electricity, and other fuels combined, from October 2019 to September 2021).[5] These data show that households consumed 33% of their energy between October and December, 38% between January and March, 19% between April and June, and 10% between July and September. The average energy bills and total cost estimates reported herein apply the same proportions of annual energy use in each quarter of the relevant years.

The EPG has since been reduced to a six-month price cap, with the government still considering what interventions it will take on energy bills from April 2023 onward. In this section, we estimate the energy bills faced by the average household in each scenario during this initial six-month period and also model the costs that would occur, were the government to decide to extend its EPG by an additional six months from April to September 2023.

During the six months from October 2022 to March 2023, the average household energy bill is estimated to be £862 under the WtW price cap for households in fuel poverty, compared with £1,700 under the EPG price cap and £2,711 under the default price cap (Figure 1). Including the £400 reduction from the Energy Bills Support Scheme (EBSS), the average bill under the BAU scenario falls to £1,300. This means that the bill level under the WtW price cap would save families in fuel poverty an average of £439 on their fuel bills in the six months, compared with business as usual.

Figure 1: Average household energy bills under WtW, the EPG, and the default price cap, for the winter (October 2022 to March 2023) and summer (April to September 2023) six-month periods[e]



[e] Note: for illustration, this chart assumes that the WtW campaign proposal and the EPG are extended by an additional six months to cover the period from April to September 2023.

We estimate that the government's EPG will cost £29.31bn over the six months from October 2022 to March 2023, while the additional support via the EBSS will cost £11.60bn.[f] Both of these estimates assume the schemes are provided to 29m homes nationwide. This means that the BAU policies will cost an estimated £40.91bn over the six months.

The total bill savings across 6.7m households (and therefore also the total cost of the measure) under the WtW scenario would be £2.94bn between October 2022 and March 2023. The cost of this intervention to protect fuel-poor households from price rises is just a 7.2% increase in cost on top of the existing cost of the EPG and the EBSS during the same six-month period. This means that the additional bill support under WtW could be fully funded by an additional windfall tax of 25% on oil and gas sector profits for either 2022 or 2023 (Section 4).

We estimate that extending the EPG by six months (to cover the period April to September 2023) would cost an additional £8.95bn across 29m households and save the average household £309 on their bills during that period.[g] For a further £2.45bn, the government could extend the WtW targeted bill support to 6.7m fuel-poor households (ie reducing the price cap for these families to the October 2021 level) between April and September 2023, saving each of them a further £365 on their bills during those six months relative to the EPG price cap level.

Medium term: Cost of social tariff and other options

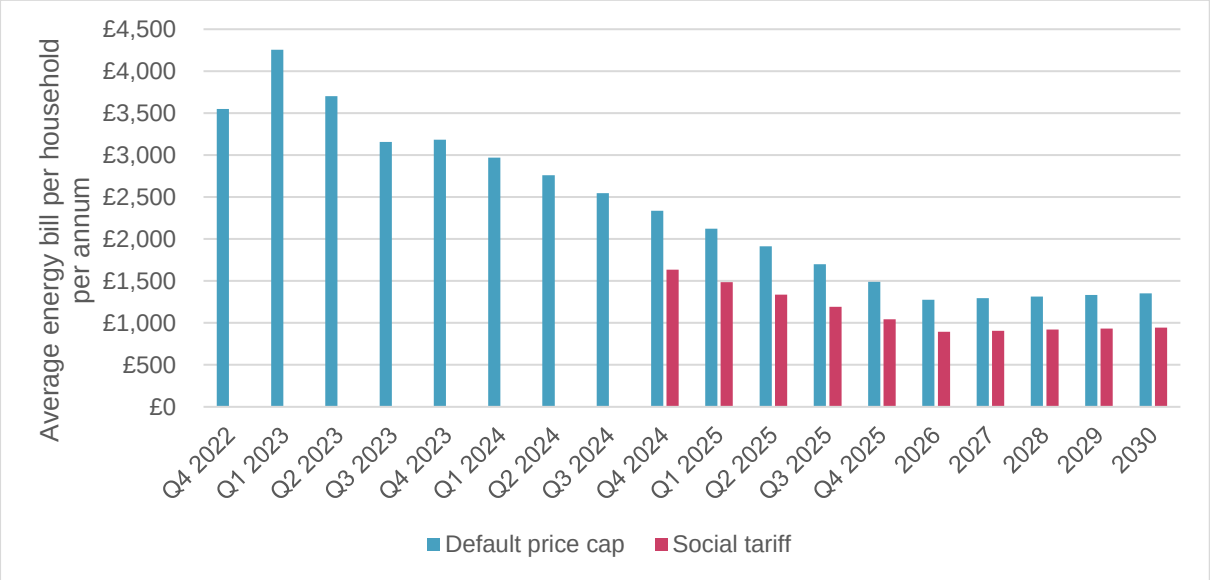
In the medium-term, the campaign proposes introducing a social tariff for low-income households, which would be mandatory for suppliers to offer, set below the price cap, in addition to current protections, offered to a well-defined set of low-income and vulnerable households with auto-enrolment. We have set this social tariff at a rate of 30% below the standard price cap, based on the level currently applied in Flanders.[6]

In our central price forecast, we apply the 3 November 2022 default price cap projections from Cornwall Insight until the end of 2023[7] and assume that prices then return to their pre-crisis average level (equivalent to the October 2021 price cap level) by 2026, based on the forecasts of several energy consultancies and financial institutions.[8,9,10] From 2026, we assume that the price cap rises in line with the National Grid's July 2022 forecast for wholesale gas prices.[11]

This means that our projected social tariff begins at a relatively high level of £1,264 during the calendar year 2025, before falling and settling in a range from £894 to £959 per household from 2026 to 2030. It would save eligible households an estimated £542 on their energy bills in 2025 and an average of £394 per year between 2026 and 2030 (Figure 2).

[f] Note: we assume that the EBSS will cost £400 per household across 29m households.
[g] Note: we do not assume any additional support under the EBSS from April 2023.

Figure 1: Annualised social tariff price cap estimate from Q4 2024



The quarterly cost of providing this social tariff to the same set of the 6.7m households currently most vulnerable to fuel poverty (relative to leaving them to pay the default price cap) would be £1.17bn in Q4 2024, which would fall steadily as energy prices return to pre-crisis levels, reaching £642m per quarter by early 2026. In annual terms, the cost is estimated at £3.63bn in the calendar year 2025, falling to an average of £2.64bn per annum in the remainder of the decade.

An alternative to the social tariff would be the National Energy Support Package proposed by NEF in September 2022.[12] This proposal would involve a reform to the way that energy is priced together with transfer payments to households to help offset the rising cost of living. The proposal includes a new system of 'free basic energy', where every household would be entitled to a free amount of energy consumption, but would pay a higher marginal cost for energy use above the free amount. There would also be some temporary subsidies in the short term to reduce energy costs while wholesale prices are high. The other components of the package would create a new 'energy element' to universal credit and legacy benefits (a payment of £1,000 per person per year or £1,650 per couple) and a universal 'cost of living allowance' that would transfer £750 to all families in the year from April 2023. The package would be progressive in its impact, offering the most support to those on the lowest incomes, with some of the costs recovered through an increase in the energy costs of the top 10% of earners. A similar package could be developed in the medium term as an alternative to a social tariff from 2025 onward, albeit with adjustments to the elements of the NEF proposal that specifically respond to the currently elevated energy prices of 2022.

2. Help to upgrade homes

The campaign calls for an urgent investment of £3.6bn for improving home energy efficiency during this Parliament. The programme will target low- and middle-income households, who are facing fuel poverty, across all tenures. The investment is proposed in the form of grants to ensure that resulting bill savings are fully retained by households. This analysis assumes that these grants are spent on emergency home upgrade measures, including improving loft

insulation to 270mm, installing cavity wall insulation, draught-proofing, putting thermostatic radiator valves (TRVs) on radiators, adding smart heating control systems, and conducting an energy audit in each relevant home.

Short term: Cost of emergency home upgrades

Not all of the six emergency insulation measures are required by every home. For example, some homes already have TRVs installed, may have loft insulation in place that is less than 270mm thick, or may have solid walls and therefore be ineligible for cavity wall insulation. To account for this, we have weighted the measures installed in line with the proportion of homes of each type that require each measure. These proportions are based on data for the national housing stock as used in the modelling for NEF's emergency insulation plan and are shown in Table 2.[13]

Table 2: Proportion of homes of each type needing each energy efficiency measure, with underlying data sources

	Semi-detached house	End-of-terrace house	Flat/ Maisonette	Detached house	Mid-terrace house	Source
Loft insulation (to 270mm)	87%	88%	96%	85%	87%	English Housing Survey 2019 (underlying data)[14]
Cavity wall insulation	21%	17%	28%	22%	17%	English Housing Survey 2019 (underlying data)[15]
Draught proofing	80%	80%	80%	80%	80%	Modelling assumption
TRVs	55%	55%	55%	55%	55%	English Housing Survey 2020 headline report[16]
Smart thermostat	93%	93%	93%	93%	93%	YouGov Smart Homes Report survey 2018[17]
Energy audit	100%	100%	100%	100%	100%	Modelling assumption

The analysis assumes that the £3.6bn is spent to install the aforementioned measures in as many homes as possible, and it is also assumed that 60% of the funds are used in the first year (Jan–Dec 2023) and 40% in year 2 (Jan–Dec 2024), with Q4 2022 used to begin mobilisation and the first quarterly cohort receiving the measures by January 2023. We assume that homes in fuel poverty are prioritised for receiving the insulation measures during 2023 and 2024, so that the proportions of homes of each type receiving measures are in line with the split of housing type among those in fuel poverty across the UK, using 2020 data from the Department for Business, Energy and Industrial Strategy (BEIS)[18] (Table 3).

Table 3: Number of homes of each type receiving each energy efficiency measure under the WtW scenario (2023-24)

	Semi-detached house	End-of-terrace house	Flat/ Maisonette	Detached house	Mid-terrace house
Loft insulation (to 270mm)	807,394	530,957	669,335	361,613	569,874
Cavity wall insulation	197,578	100,734	196,569	93,543	114,164
Draught proofing	743,445	483,323	555,486	342,354	525,278
TRVs	513,906	334,097	383,980	236,652	363,099
Smart thermostat	865,742	562,830	646,863	398,671	611,687
Energy audit	929,306	604,154	694,357	427,942	656,598
Proportion of total recipient households (ie proportion of housing type among fuel-poor households in England)	**28.1%**	**18.2%**	**21.0%**	**12.9%**	**19.8%**

Under these assumptions, it is estimated that a total of 3.31m homes can be fitted over the period for £1,087 per home on average. The cost to install each of the six measures in each type of house is derived from secondary data used in separate modelling by NEF for the Emergency Homes Upgrade campaign.[19] The homes receiving measures in each quarter are divided evenly throughout the year. As the investment is frontloaded to create bill savings as soon as possible, measures would be newly installed in just under half a million (497,000) homes each quarter during 2023, and in 331,000 homes each quarter during 2024.

Short term: Bill savings from emergency upgrades

Bill savings are estimated using a separate model that NEF has prepared for the Emergency Homes Upgrade campaign. This incorporates evidence of the reduction in energy consumption that usually results from each of the six measures combined with data on energy bill levels for the period until the end of 2024 and actual energy consumption in different types of housing. Assumptions on energy bills are based on Cornwall Insight's default price cap forecast to the end of 2023 (3 November 2022 release) and a reversion to long-term trend growth from 2024 onwards, as described in Section 1 of this report.

Once the emergency insulation measures have been installed in a given home, the household will begin to make significant savings to their energy bills, with the estimated quarterly and annual reductions in energy bills shown in Figures 3 and 4. Quarterly reductions in energy bills are most significant during winter 2022-23, while detached and semi-detached homes would yield more savings than terraced homes and flats. In Q1 2023, when the default price cap is expected to be at its highest, the total savings (for households and the Treasury via the Energy Price Guarantee (EPG)) would be between £80 and £164 per household receiving insulation measures.

Figure 3: Average reductions in energy bills per household by housing type and quarter, after measures have been installed

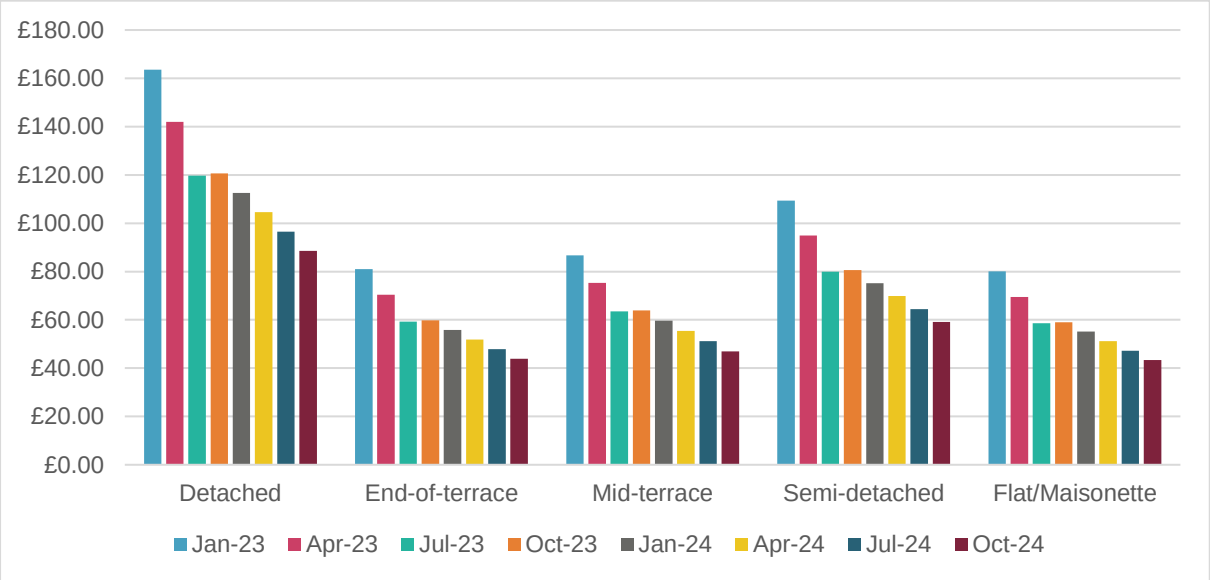


Figure 4: Reductions in energy bills by housing type and calendar year, once measures have been installed

For the average household with the emergency measures installed, the bill savings from reduced energy consumption would be an estimated £336 for the calendar year 2023, equivalent to a 9.4% reduction in their energy bills. The full saving across 2023 and 2024 would not be achieved by all 3.31m homes, however, as the emergency measures would need to be installed steadily throughout the two years, with homes beginning to save on their bills once the installation is complete. Table 4 shows the number of homes of each type that would receive measures by each quarter, and the resulting bill savings during each quarter from the homes that have already received the measures. In total, the bill savings are estimated at £1.08bn across the two years for the 3.31m homes, with these homes expected

to continue adding to that figure with further savings on their bills beyond this short-term time horizon.

Table 4: Cumulative number of homes with emergency measures installed by quarter, and bill savings occurring within each quarter in the homes that already have those measures installed

	Jan-23	Apr-23	Jul-23	Oct-23	Jan-24	Apr-24	Jul-24	Oct-24
Detached	64,191	128,383	192,574	256,765	299,560	342,354	385,148	427,942
End terrace	90,623	181,246	271,869	362,492	422,908	483,323	543,739	604,154
Mid terrace	98,490	196,979	295,469	393,959	459,618	525,278	590,938	656,598
Semi-detached	139,396	278,792	418,188	557,584	650,514	743,445	836,376	929,306
All flats / maisonettes	104,154	208,307	312,461	416,614	486,050	555,486	624,922	694,357
Total	**496,854**	**993,707**	**1,490,561**	**1,987,415**	**2,318,650**	**2,649,886**	**2,981,122**	**3,312,358**
Bill savings achieved in homes fully fitted (by quarter)	£49,969,717	£86,742,928	£109,665,879	£147,353,833	£160,476,851	£170,332,453	£176,920,640	£180,241,411

The bill savings for the first 497,000 homes receiving measures would occur during Q1 2023, when the EPG would still be operational, meaning that some of the savings would accrue to HM Treasury and some to households. Based on the forecast default price cap for Q1 2023 relative to the EPG price cap levels, 44.1% of the total savings in that quarter would accrue to the government (equivalent to £22.0m). If the government were to extend the EPG by a further six months, we estimate that the bill savings from the roll-out of emergency insulation measures would save the Treasury a total of £78.7m between January and September 2023 (equivalent to 32.1% of the total bill savings over these nine months). The bill savings would rise as more homes receive the insulation measures, but the rise would be offset slightly by the reduction in wholesale energy prices expected in late 2023.

Given the relatively low cost per household of these emergency energy efficiency measures and the significant impact on their energy consumption, we estimate that the bill savings from the measures installed in the average home will exceed the cost of installation within 5–7 years (depending on the type of house they are living in).

Medium term: Cost of retrofit to achieve EPC target by 2030

The campaign is calling for several policy interventions to accelerate the rate of energy efficiency improvements to buildings through to the end of the decade. These include delivering EPC Band C for all social housing and privately rented premises by 2028, EPC Band B for non-domestic premises by 2030, and EPC Band C for the homes of those in fuel poverty by 2030. As an illustration of the costs and benefits of these proposals, we estimate a scenario where all remaining homes of EPC Band D and below in England are retrofitted to Band C between 2025 and 2030.

The English Housing Survey shows that in 2020, 13.45m of England's 24.97m homes were at Band D or below. We assume that some of these will be retrofitted to Band C between 2020 and 2025 without any assistance from the campaign proposals and apply the average rate of improvement in this metric (0.46% increase per year) that occurred between financial years 2016-17 and 2020-21 based on data from the Department for Levelling Up, Housing and Communities.[20] This leaves 13.0m homes to be improved to Band C as of 2025.

For simplicity, we assume that the emergency measures installed in 3.31m homes in the short term do not have an impact on those homes achieving Band C. In reality, emergency measures such as cavity and loft insulation would reduce the cost of the subsequent retrofit interventions to some extent.

We assume the remaining 13m homes are retrofitted to bring them up to Band C at a constant rate across the six years from 2025 to 2030 (inclusive). Similarly, we assume that all homes in bands below C are equally likely to be retrofitted each year so that each year's new retrofits represent the same proportions of homes in Bands D, E, F, and G as the full group of 13m homes.

Applying the average cost to achieve Band C from the English Housing Survey 2020 (£7,737 per home), this implies a cost of £16.76bn per annum between 2025 and 2030 to retrofit 2.17m homes each year. This cost could be met by a combination of different forms of finance, such as publicly funded grants and loans, public guarantees on private loans, and green mortgages, tailored to the ability to pay of the households receiving retrofit investment, meaning that the actual cost to the government would likely be significantly less than the full £16.76bn per year. Evidence from similar programmes in Germany indicates that for every €1 in public investment, €6 in private spending was leveraged; the UK could similarly expect to leverage private investment to cover a large part of the total cost of renovating homes to Band C.[21]

Specifying the financing mechanisms in further detail is beyond the scope of this analysis. However, analysis by NEF in 2020[22] modelled a similarly large-scale and rapid national retrofit programme (a whole-house retrofit of 8.69m homes across four years), estimating that a total investment of £100.15bn could be met through £34.65bn in public financing, which would unlock private finance for the remaining £71.95bn. The £34.65bn consisted of £22.19bn in grants for retrofit in low-income households, a subsidy of £6.01bn to reduce the interest rates of retrofit loans to able-to-pay households, and other related costs of £6.45bn including a VAT incentive and public investment in related training, supply chain innovation, and a National Retrofit Taskforce to deliver the programme. The private finance component in the same analysis included £46.25bn in state-backed loans to able-to-pay households and the remaining £25.7bn coming from green mortgages and associated interest payments.

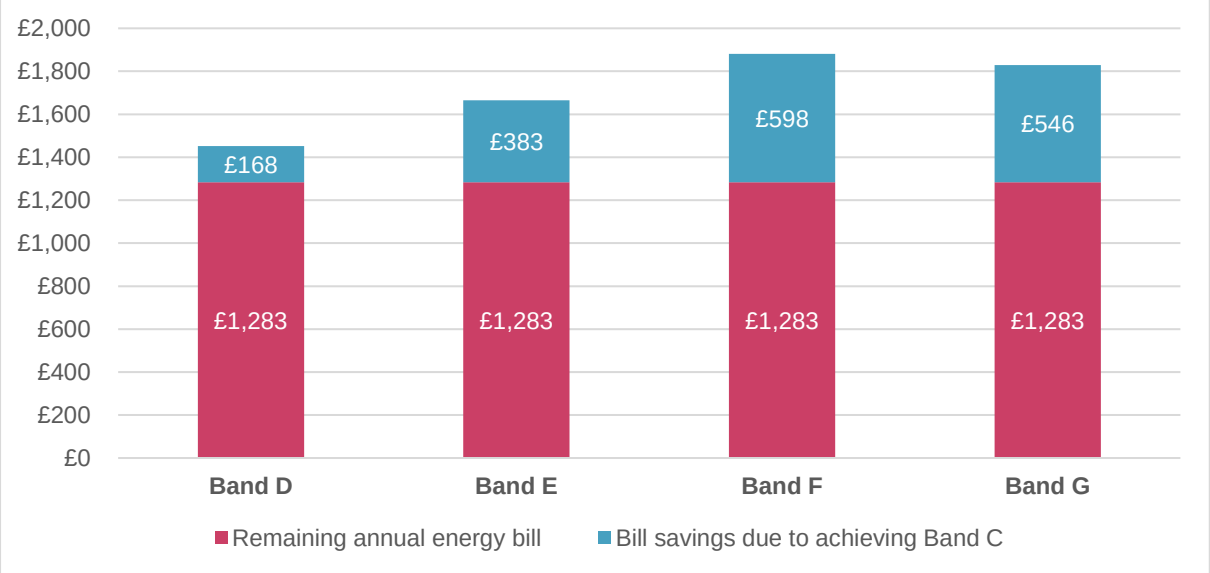
Medium-term benefits of retrofit: Bill savings

Improving England's housing stock to Band C would create substantial savings in energy bills for the relevant households, whose bills are currently well above the national average in many cases. We have generated a precise estimate of these savings using a separate NEF model developed for the Emergency Homes Upgrade campaign, which is based on 2019 English Housing Survey data on mean electricity and gas consumption by homes within each EPC Band.[23] The additional energy used by homes in Bands D, E, F, and G, relative to

a home in Band C, is monetised using our long-term forecast for the default price cap,[h] giving an estimate of the potential reduction in each household's annual bill as a consequence of moving from their initial lower band to Band C.

We find that Band D homes could reduce their energy bills by 12% by achieving Band C, whereas the corresponding reductions would be larger for homes in Band E (23%) and especially Bands F (32%) and G (30%). Homes in the lowest two bands also have the highest energy bills based on their usage, with Band F and G households spending £1,881 and £1,829, respectively, at October 2021 prices, compared with £1,666 for Band E and £1,451 for Band D. The average annual bill in all of these lower bands is well above the price cap average of £1,277. Due to their high initial bills and the larger relative savings from retrofit, people living in Band F and G homes would make a far larger saving in money terms from achieving Band C, than those in Band D homes (Figure 5).

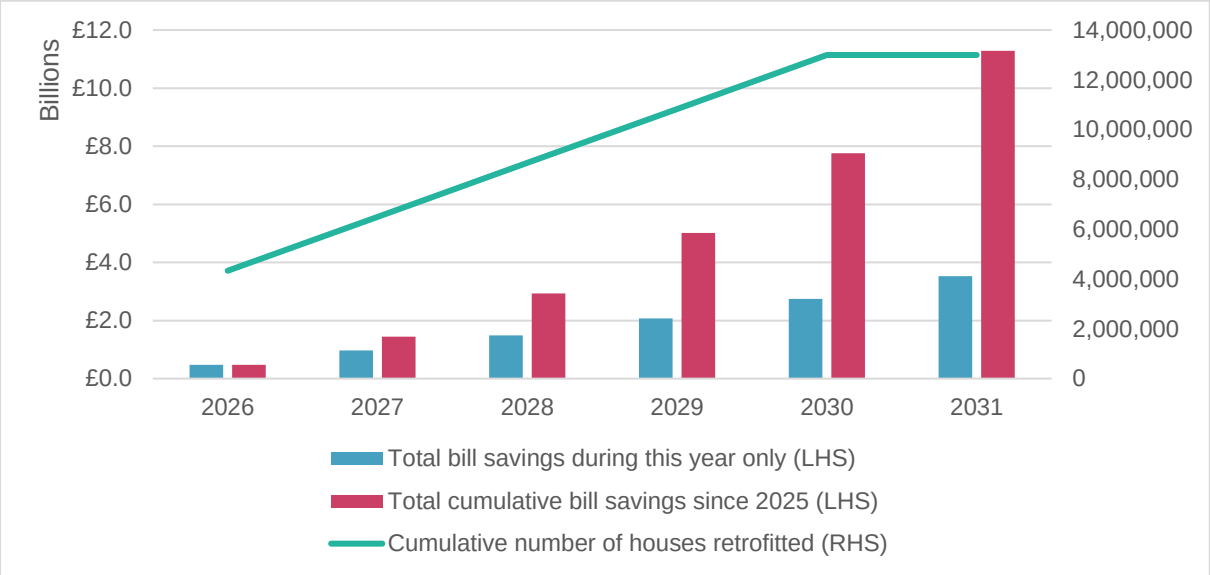
Figure 5: Estimated bill savings and remaining energy bill for homes retrofitted to EPC Band C, by initial EPC Band, at October 2021 price cap level (ie our forecast for price levels in 2026)



Across the 13m homes achieving EPC Band C, the cumulative bill savings begin to mount towards the end of the decade (Figure 6). By 2031, the first full year in which all of the homes are at Band C, the annual bill savings relative to the 2025 baseline for these households are an estimated £3.53bn, a saving that would be repeated in subsequent years provided energy prices remain steady.

[h] As outlined in Section 1 of the report, this assumes that the default price cap returns its October 2021 level by 2026 and subsequently grows in line with the National Grid's July 2022 forecast for wholesale gas prices.

Figure 6: Progress in retrofitting remaining homes in England to Band C and total bill savings by year



Medium-term benefits of retrofit: Job creation and GDP

While we have not directly quantified the job creation and GDP growth that would result from the campaign's short-term and medium-term proposals on energy efficiency, a body of existing research can indicate the potential impact.

A 2020 study looked at the potential impact of a large-scale programme of whole-house retrofits of a similar size to the medium-term WtW scenario, with £100.15bn spent to retrofit 8.69m homes.[24] This was estimated to create 294,527 new jobs on average during the four years of its implementation (with fewer jobs in the first year and more in the fourth year, in line with the ramping up of delivery) and raise the GDP level by 1.58% in the fourth and final year. Similarly, a 2021 assessment of the Climate Change Committee (CCC) Balanced Net Zero Pathway,[25] which would upgrade all buildings to EPC Band C within 10–15 years and ensure high levels of energy efficiency in new builds from 2025, found that it would create 44,700 full-time equivalent (FTE) jobs by 2025 and 84,700 by 2030, with a 0.22% uplift to GDP levels expected by 2030.

3. Cheap energy

The campaign is calling for initiatives to more than triple the amount of renewable energy in the UK by 2030, including wind and solar generated in harmony with nature so that we can permanently lower bills.

In practice, this would refer to the requirements put forth by the Leading the Way scenario that would enable the UK to achieve its Net Zero targets by 2050.[26] This translates into an increase in the deployment of variable renewable energy (VRE), with 45GW of offshore wind, 35GW of onshore wind, and 45GW of solar PV deployed by 2030.[27]

The campaign also proposes allowing sufficient capacity each year in Contracts for Difference (CfD) auctions to ensure the UK has enough onshore wind and solar coming online to end reliance on expensive, volatile, and insecure gas power. The campaign proposes bringing in a route to market for community energy projects, such as a community CfD pot and a viable smart export guarantee (SEG) tariff.

Another campaign ask revolves around removing the planning blocks on new onshore wind projects in England and replacing them with a proportionate system that prioritises local involvement, local benefit, and protecting nature, and does not allow lone dissenting voices to veto projects that have wide community support. The current government announced removing the onerous planning restrictions in place since 2015 for onshore wind energy projects.[28]

Lastly, the campaign wants to ensure that Ofgem has a zero-carbon mandate, and that the national grid supports power feed-in by renewable energy projects across the UK.

Pipeline of investment in renewables and investment gaps to fill

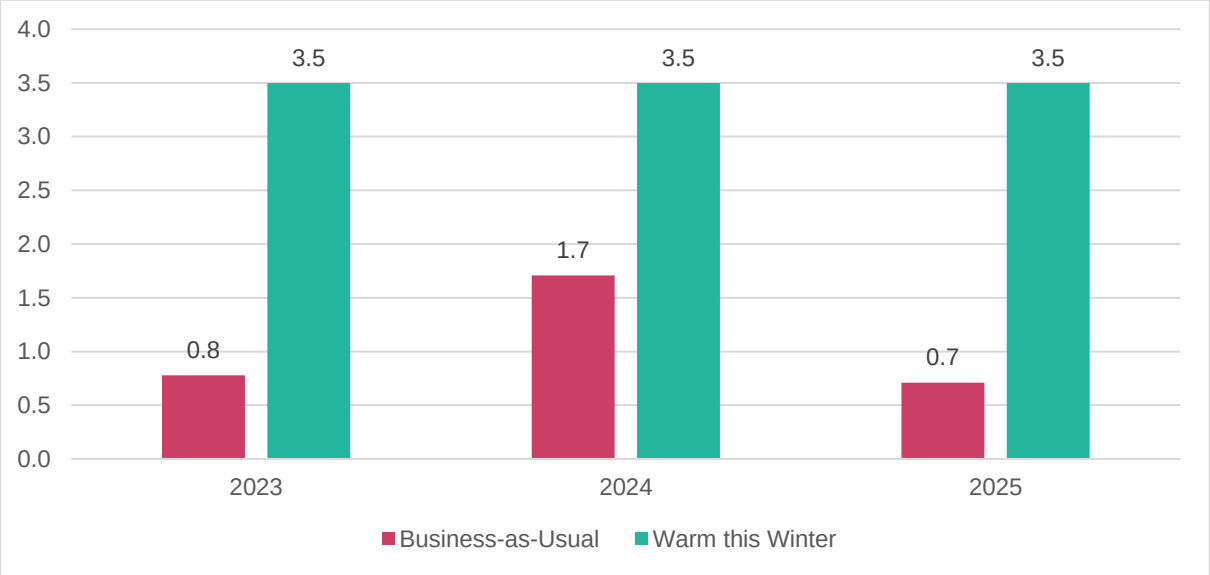
We looked at the current installed capacity for the three renewable energy sources from the Renewable Annual Electricity Capacity and Generation data maintained and published annually by the Department for Business, Energy and Industrial Strategy (BEIS). We then estimated the electricity generation capacity in the pipeline leading up to 2030. For large solar projects, we used the data maintained by the Solar Power[29] portal while the data on onshore wind and offshore wind farms was sourced from RenewableUK.[30]

In 2021, there was an installed capacity of 14.5 GW for onshore wind, 11.2 GW for offshore wind, and 13.9 GW for solar energy. Excluding the projects in the pipeline that were in the pre-planning stage, an additional capacity of 40 GW of offshore wind projects is expected to be added by 2030 thus exceeding the targets set under the Leading the Way scenario. In the short term, about 13.4 GW capacity is expected to be operational over the period from 2023 to 2025.

Similar calculations for onshore wind showed an additional 12.6 GW capacity being installed by 2030 leaving a gap of 7.8GW to its 35 GW target capacity. Focusing on the period of 202325, only an additional 3.2 GW of onshore capacity is expected to be operational in the next three years under the business-as-usual (BAU) scenario.

However, under the Warm this Winter (WtW) scenario, we recommend frontloading increased capacity in the next three years to meet the 35 GW capacity target by 2030. The campaign calls for 3.5 GW of onshore wind capacity to be commissioned annually over the next three years. Thus with additional investment, 10.5 GW of capacity would be operational in the next three years, from 2023 to 2025 (Figure 7).

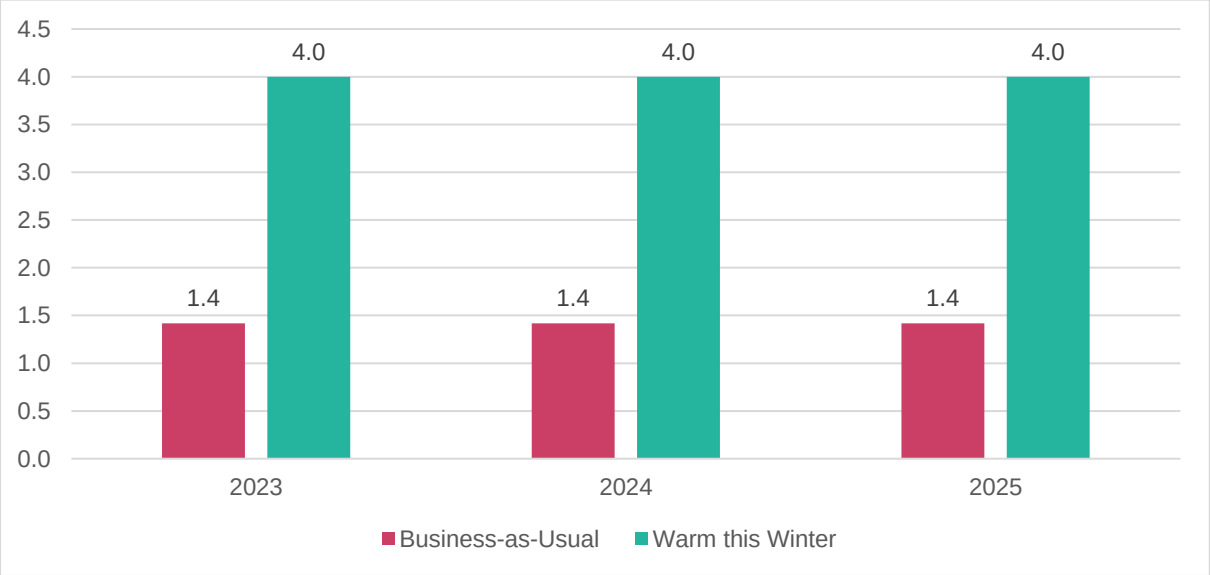
Figure 7: Onshore wind capacity (GW) pipeline under the BAU and the WtW scenario



For solar projects, however, only 12.7 GW of additional capacity is expected to be installed by 2030. This would mean a significant gap of 18.3 GW to meet the target of installed capacity of 45 GW. In 2022, only about 1GW of additional capacity is expected to become operational. Focusing on the period of 2023–2025, only an additional 4.3 GW of large-scale solar projects are expected to be operational in the next three years under the BAU scenario.

However, under the WtW scenario, similar to the onshore wind capacity building, we urge immediate capacity creation for solar-powered projects to meet the 45 GW capacity target by 2030. The campaign calls for 4 GW of solar-powered projects to be commissioned annually over the next three years (Figure 8). Thus with the additional investment, we expect 12 GW of capacity to be operational from 2023 to 2025.

Figure 8: Large-scale solar capacity (GW) pipeline under the BAU and the WtW scenario



Benefits: Increased supply of electricity from renewable sources in the short term

In 2021, the total demand for electricity in the UK was 334.2 TWh[31] and according to the Sixth Carbon Budget, this is expected to increase to 470 TWh by 2035.[32] We thus predict a demand of 372.9 TWh of electricity in 2025.

Assuming that the projects in the pipeline become operational as per plan, we then calculate annual electricity generation from each renewable energy source under the BAU scenario. This generation is calculated using the installed capacity and the load factors[i] for each type of renewable energy source. In 2025, a total of 163.5 TWh of electricity can be generated from these three sources. This could help meet 44% of the total electricity demand in 2025 (Table 5).

However, under the WtW scenario, electricity generation from these three sources would increase to 187.7 TWh, 15% higher than the BAU scenario. This would help meet 50% of the total electricity demand in 2025.

Table 5: Supply from onshore and offshore wind and solar for UK's electricity demand from 2023–2025 under the BAU and the WtW scenario

Year	Total electricity demand in UK (TWh)	Supply from renewables TWh (BAU scenario)	% of electricity supplied from renewables (BAU scenario)	Supply from renewables TWh (WtW scenario)	% of electricity supplied from renewables (WtW scenario)
2023	353.4	123.5	35%	132.3	37%
2024	363.1	144.6	40%	160.0	44%
2025	372.9	163.5	44%	187.7	50%
Total	1,089.4	431.6	40%	480.1	44%

Benefits: Cost saving of renewable generation relative to gas in the short term (2023–2025)

According to the Contracts for Difference Allocation Rounds 3[33] and 4,[34] the Levelised Cost of Electricity (LCOE) from these three renewable sources in 2025 is estimated to be £51.3/MWh for offshore wind, £52.3/MWh for onshore wind, and £49.2/MWh for large-scale solar projects. The LCOE is the discounted lifetime cost of building and operating a generation asset, expressed as a cost per unit of electricity generated (£/MWh).[35] Using these as a proxy for the cost of electricity supply from these sources over the next three years and using the forecast cost of natural gas[36] in 2025, we calculate the amount of savings that could accrue to the UK's energy system by getting electricity from renewable sources.

Under the BAU scenario, from 2023 to 2025, approximately 431.6 TWh of electricity can be supplied from these three renewable sources. By using renewables instead of purchasing the equivalent amount of natural gas, there would be a saving of £25.69bn to the energy system in the UK over the next three years.

[i] The load factor used is an average of load factors from 2017 to 2021 from the BEIS datasheet

However, under the WtW scenario, 480.1 TWh of electricity will be supplied from renewable sources. This would further reduce the demand for natural gas and result in increased savings of £28.52bn to the UK's energy system. Thus if the campaign ask for tripling renewable energy capacity, with increased capacity building over the next three years is on track, it would save the UK energy system an additional £2.83bn.

If the government's ban on new onshore wind production is lifted and if the WtW campaign ask of annual additional 3.5GW capacity over the next 3 years is met, it would result in £1.98 billion in savings to the UK energy system.

Domestic consumption is about 32% of the total electricity consumption in the UK. Hence, under the WtW scenario, there would be an additional saving of £924.9m to all UK households, which would translate into a further reduction of £32.90 in the electricity bill of each household (Table 6).

Table 6: Additional savings for the UK energy system and UK households under the 'Warm this Winter' scenario

Year	Additional savings to the UK energy system under the WtW scenario (£ million)	Additional savings to the domestic sector under the WtW scenario (£ million)	Additional savings per household under the WtW scenario (£)
2023	503.2	164.5	5.90
2024	879.3	287.5	10.20
2025	1,445.9	472.8	16.80
Total	2,828.5	924.9	32.90

Benefits: Job creation operating renewable generation

Several studies have estimated potential job creation from investment in renewable energy in the UK economy. A study by Vivid Economics calculated that deploying 35 GW of onshore wind capacity has the potential to create 14,000 direct jobs in the UK.[37] Additionally, based on the data from Offshore Wind Skills Intelligence Report (2022),[38] delivering about 47GW of offshore wind capacity by 2030 can generate 61,000 direct jobs in the UK.

4. Free us from oil and gas

The campaign proposes several measures to reduce the net subsidy to the oil and gas sector from the UK government and wind down its production. These include calling for no new oil and gas drilling in the UK (via a rejection of new licences and developments), an end to public subsidies for new drilling, and support for affected workers in the sector to re-train and re-skill for a just transition away from fossil fuels. The campaign is also proposing an increased windfall tax on the sector's profits in the short term.

Potential revenue from a windfall tax

Using August 2022 Oil and Gas Authority (OGA) forecasts for the production in the oil and gas sector, 2022 spot price data for natural gas and Brent crude oil, and futures data for the same fuels as a price forecast, NEF estimates that the sector's profits were £26.44bn in 2022, and will be £29.40bn in 2023. These figures are both on a calendar year basis.

This implies that the government's existing tax proposals (40% headline tax rate on profits, plus the 25% additional Energy Profits Levy) will collect £19.1bn in 2023. This would leave the sector with profits of £10.3bn, which is far above their usual annual profit level. The average annual profits of oil and gas producers in the UK were £5.96bn between 2010-11 and 2020-21.

We model three different options for an increased windfall tax on the oil and gas sector: a baseline scenario of an additional 25% tax (a total tax rate of 90%) and two other scenarios with additional tax rates of 20% or 30% (a total tax rate of 85% or 95%, respectively). We model the amount of revenue that these taxes could raise if applied retrospectively to the calendar year 2022 (from January to December)[j] and looking forward to 2023.

Because projecting important data inputs such as commodity prices and exchange rates for 2024 is more challenging, we have reapplied HM Treasury's estimated revenue from the 25% Energy Profits Levy for the 2024-25 fiscal year to generate estimates of how much an additional windfall tax could collect in calendar year 2024.[39]

There is also a loophole allowing oil and gas companies to get a tax rebate on the money they spend on investment (91p back on every £1 of tax due). The revenue projections in Table 7 assume that this loophole is closed so that the windfall tax can more effectively collect supernormal profits in the sector, and so that the public is not subsidising new investment in fossil fuels.

We estimate that a further windfall tax on the sector of 25% (ie a total tax rate of 90%) would yield additional revenue of £6.6bn in 2022 and £7.3bn in 2023. This leaves profits after tax of £2.6bn and £2.9bn in the sector in 2022 and 2023, respectively.

We estimate that an additional windfall tax on the sector of a further 20% (ie a total tax rate of 85%) would yield additional revenue of £5.3bn in 2022 and £5.9bn in 2023. This leaves profits after tax of £4bn and £4.4bn in the sector in 2022 and 2023, respectively.

We estimate that a further windfall tax on the sector of 30% (ie a total tax rate of 95%) would yield additional revenue of £7.9bn in 2022 and £8.8bn in 2023. This leaves profits after tax of £1.3bn and £1.5bn in the sector in 2022 and 2023, respectively.

For comparison, HM Treasury's projections for revenue collected from the Energy Profits Levy were published in *The Growth Plan* in September 2022. Using fiscal years rather than calendar years, they forecast that it would collect £7.73bn in FY2022-23, £10.41bn in FY 2023-24, £6.42bn in FY2024-25 and £3.5bn in FY2025-26.[k] As our additional windfall tax would increase the total tax rate by a further 25 percentage points (equivalent to doubling

[j] Note: this would differ from the current application of the EPL to profits occurring since May 2022 only.

[k] These appear to be the latest available official forecasts as of early November 2022. TheyWorkForYou. (2022). *Energy: Taxation.* Retrieved from https://www.theyworkforyou.com/wrans/?id=2022-10-28.73910.h

the EPL), this suggests that our modelled estimates of revenue potential are consistent in scale with the Treasury's estimates, albeit the Treasury expects somewhat higher revenues in 2023.

Our baseline model for the WtW scenario, which applies a 25% additional windfall tax on the sector's profits for calendar years 2022 to 2024, would see an estimated £20.38bn in total additional revenue collected. This would be sufficient to fully fund the interventions on bill support, extension of the EPG and the rollout of emergency home energy efficiency measures, as shown in Table 1.

Table 7: Potential windfall tax revenue generation: comparison of calculations by NEF and HM Treasury [l]

	NEF model (Nov 2022)			***HMT model (Sept 2022)***		
£ billions	**2022**	**2023**	**2024**	**2022-23**	**2023-24**	**2024-25**
Sector model						
Total sales	57.14	57.21				
Total profit	26.44	29.39				
Business as usual scenario						
Tax take (initial 40%)	10.58	11.75				
Tax take (EPL 25%)	6.61	7.35		7.73	10.41	6.42
Tax take (40% plus 25% EPL)	17.19	19.10				
Remaining profit (i.e. 35%)	9.26	10.29				
Warm this Winter scenario						
Tax take (additional windfall tax of 20%)	5.29	5.88	*5.14*	*6.18*	*8.33*	*5.14*
Tax take (additional windfall tax of 25%)	6.61	7.35	*6.42*	*7.73*	*10.41*	*6.42*
Tax take (additional windfall tax of 30%)	7.93	8.82	*7.70*	*9.28*	*12.49*	*7.70*
Tax take (total collected at 85% tax rate)	22.48	24.98				
Tax take (total collected at 90% tax rate)	23.80	26.45				
Tax take (total collected at 95% tax rate)	25.12	27.92				
Remaining profit (total 85% tax rate)	3.97	4.41				
Remaining profit (total 90% tax rate)	2.64	2.94				
Remaining profit (total 95% tax rate)	1.32	1.47				

Potential impact of stopping new oil and gas licensing

An impact analysis conducted by Economic Insight on behalf of BEIS in 2021, which was released via a Freedom of Information request, contains some estimates of the aggregate economic impact of a scenario where all new licensing is halted immediately in the sector.[40] From a status quo level of 49,000 direct jobs in the sector in 2022, the analysis finds that halting licensing would reduce direct employment by 9,400 by 2050. The estimates for indirect and induced employment relating to the oil and gas sector are far larger, with a baseline of 330,000 indirect and 260,000 induced jobs in 2022. The reduction associated with stopping all licensing is 19,000 indirect and 19,000 induced jobs by 2050.

[l] Note: figures shown in *italics* are estimated from the HM Treasury forecasts by dividing their projections for revenue from the EPL by 25% and multiplying by the relevant percentage.

From the same analysis, the direct gross value added (GVA) impact of halting licensing is estimated at a reduction of £1.2bn per annum by 2050 (relative to a baseline direct GVA of £16bn per annum in 2022), whereas the indirect and induced GVA would fall by £1.3bn and £1.1bn, respectively.

The scale of these impacts, relative to the positive employment and GDP impacts cited for the retrofit and renewable energy campaign proposals, suggests a good potential to offset the reduction in GDP and employment in the oil and gas sector, provided that the correct resources are also directed to retraining and reskilling.

5. Interaction between the different components of the campaign proposals

The four parts of the campaign proposals all relate to energy and clearly, there will be interactions between them if they are all delivered simultaneously. For example, one part of the proposals could have the effect of offsetting or increasing the benefits of another part or reducing its costs due to duplication of efforts. While we have not been able to quantitatively model these interactions, we list them for consideration and transparency.

- The cost of the bill support component would be reduced somewhat by the rollout of the emergency home improvements during 2023 and 2024, as these measures would reduce energy consumption in some of the homes receiving the lower WtW price cap.
- The longer-term retrofit rollout to bring every home in England up to EPC Band C would also reduce energy consumption and bills, which could in turn reduce the public funds required to fund the social tariff.
- The emergency insulation measures installed in 2023 and 2024 would somewhat reduce the cost of subsequently retrofitting the same homes to achieve Band C. Quantifying this would slightly reduce the total cost to the state and to households of the short- and medium-term proposals to improve home energy efficiency. Equally, the rollout of emergency insulation measures in the first two years could be useful in building supply chain and labour market capacity for the eventual wider-scale retrofit programme.
- As discussed, there is potential for the jobs created in retrofit and renewable energy to offset the jobs lost in oil and gas, and likewise for GDP growth. Retraining proposals would help to ensure this occurs.
- The revenue available from a windfall tax on the oil and gas sector would fall in the medium term as output winds down in the sector. Likewise, this source of revenue would be reduced as fossil fuel prices fall back towards longer-term trend levels from their current price spike in the latter part of the 2020s.
- On the other hand, the current spike in prices and profits in the sector could allow the use of the elevated windfall tax revenue to fund other parts of the campaign proposals.

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