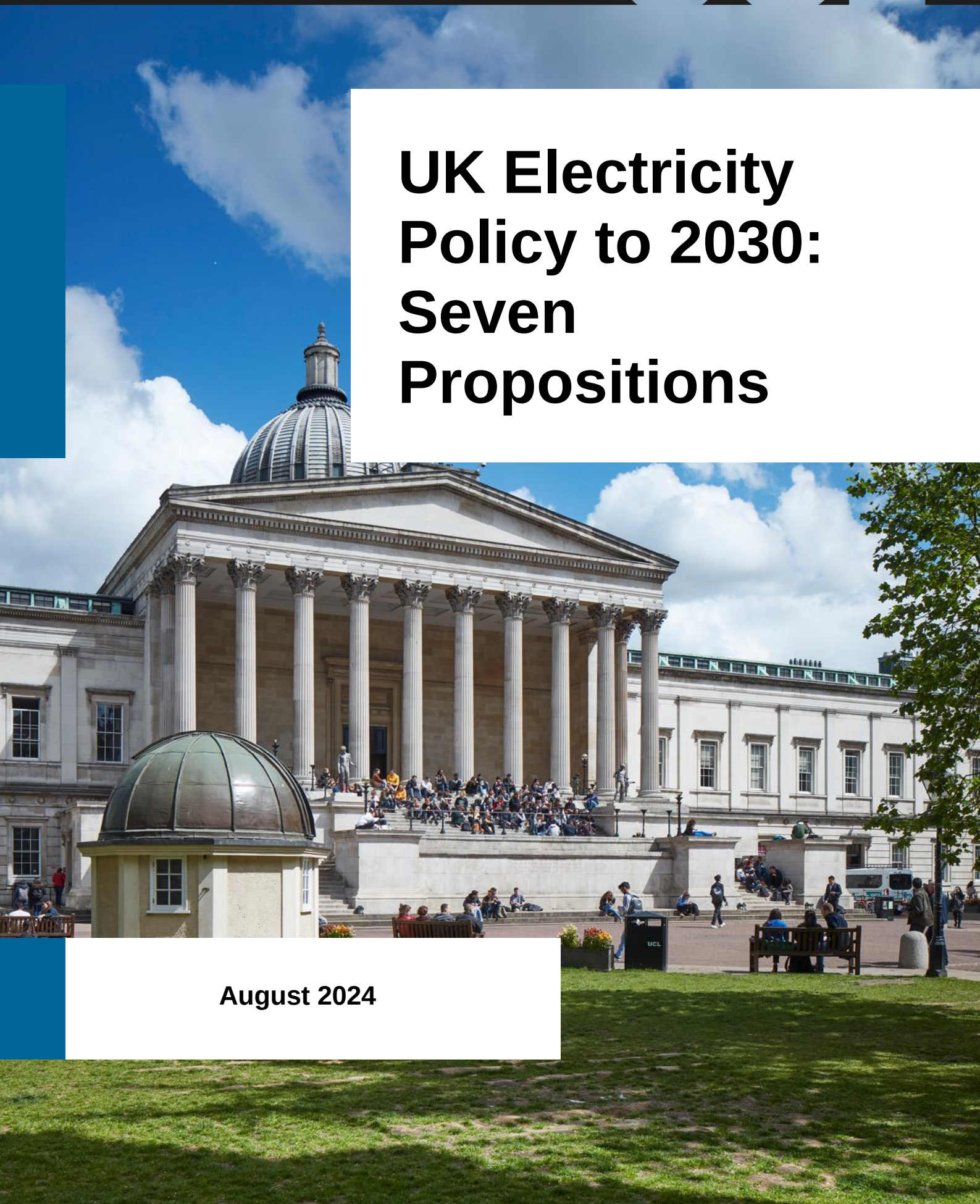
UCL Institute for Sustainable Resources

UK Electricity Policy to 2030: Seven Propositions



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Introduction

The UK government has committed to ambitious transformation of UK energy, including a decarbonised electricity system. Policy to achieve this needs to be grounded in a firm understanding of the complexities of the energy sector, the determinants of investor confidence in a rapidly changing context, and the potentially challenging politics of energy.

This short note, drawing upon extensive research expertise at UCL's Institute for Sustainable Resources, offers seven propositions which could contribute to effective delivery of the government's objectives.

Summary

Electricity decarbonisation offers long-term, diverse benefits in a world of typically short-term decision-making and political pressures. The key challenge for the new government is smart policy design to deliver the investment required at low cost-of-capital, whilst minimising political risks. We sketch a potentially challenging energy-economic context and offer seven propositions for policy.

#1 Reforming CfDs for new challenges. CfDs risk becoming a victim of their own success, as more output becomes curtailed at times when renewables output exceeds net electricity demand ("cannibalisation"). **Proposition:** ***Flexibility & storage need to become central priorities; in the context of the REMA programme, adopt CfD reforms which support this, whilst minimising cannibalisation and the economic and political risks of paying for generation that periodically may exceed system needs -*** also considering the political dimensions of how electricity system costs are charged and appear (#5, #6)**.**

#2 Transitioning away from gas power generation. The government's ambition for a net zero power system cannot be achieved purely by increasing wind and solar power generation. It also requires moving from gas to cleaner forms of flexibility**. Proposition:** ***Develop a transition strategy for gas-fired generation, including amending the Capacity Market to encourage asset extension as well as low-carbon flexible generation, and announce timing to move gas generation into a Strategic Reserve (within the lifetime of this Parliament),*** *with additional measures to stimulate cleaner flexibility investment and handle political risk.*

#3 Efficient consumer access to cheap renewables in regions. The current system rarely enables consumers to benefit *directly* from renewables, or from network upgrades. **Proposition:** ***To demonstrate local benefits (access to cheap renewables) and support industrial decarbonisation through electrification (e.g. in Neath-Port Talbot), establish a pilot regional (zonal) Green Power Pool as part of package for local renewables and infrastructure development.***

#4 Offshore wind and North Sea cooperation. The value of offshore wind development at scale will be greatly enhanced by seamless access to electricity markets all around the North Sea, ideally with 'hybrid' interconnections. **Proposition:** To enhance value and investor confidence in offshore wind and transmission infrastructure, ***work with relevant EU member states to establish terms for closer integration of electricity trading and investment regimes after the expiry of TCA provisions on energy cooperation.***

#5 Paying for the transition: energy charge rebalancing and energy poverty. The low carbon transition is a cross- energy transition, with a core role for electrification. **Proposition:** To enhance attractiveness of industrial electrification, EVs, and heat pumps, ***rebalance investment and policy costs between gas and electricity, whilst adopting a package of measures to protect the most vulnerable consumers who would otherwise be adversely affected. Options include direct fiscal supports, subsidies for heat pumps, and 'social tariffs' identified and delivered through cooperation between Treasury (welfare) and supplier data on household consumption.***

#6 Communicating the economics of transition: better metrics. Traditional metrics do not capture or represent the real economics of the transition and can mislead. Instruments such as CfDs, and expenditure on improved grids, storage and energy efficiency, highlight the investment costs of decarbonisation more than the savings (such as lower average wholesale prices, better use of existing generation, and reduced energy consumption). **Proposition:** ***Assess options and consider a metric of "National Energy Cost Share" to give attention to overall national consumer expenditure on energy.*** This would thereby include the savings arising from clean energy investments and enhanced efficiency (and is likely therefore to decline); and ***potentially expand to include the cost of emissions*****,** to reflect value of emission reductions.

#7 Carbon pricing, industrial decarbonisation and trade. Whilst it is not the primary policy driver of emissions reductions, the government should consider multiple areas of reform and extension to the UK Emissions Trading Scheme (ETS). **Proposition:** ***Consider closer alignment with EU ETS, border adjustments, extension to additional sectors, and use of revenues to enhance the domestic transition, with international sharing of border revenues to support international climate commitments for just transitions out of carbon-intensive production.***

#1 Reforming CfDs for new challenges

Our submission to the previous government's second Review of Electricity Market Arrangements (REMA)[1] demonstrates the rapidly growing challenge of 'cannibalisation' of revenues for new investment, at periods when renewables output exceeds demand. We find that if the existing National Grid scenarios for renewables are achieved, then *already by 2030*, more than half of the output from additional new wind energy – as implied by Labour's heightened ambitions – could be at times when there is already a surplus of 'must run' GB generation over demand, with increasing frequency of negative wholesale prices.

Moreover, this is *without* taking into account network constraints, which would further curtail usable output from renewables. Already by 2023, 'constraint payments' to generators *not* to generate, so far mainly due to limited transmission capacity between Scotland and England, were close to £1bn. Alleviating network constraints is a top priority but does not resolve questions about how to treat potentially national surplus generation.

The current rules for Contracts for Difference (CfDs) would not pay CfD generators when the (national) wholesale price is negative. They therefore have a high risk of receiving no revenues when they could generate the most, unless there is greatly enhanced progress on varied forms of flexibility on the system. Recognising this risk, companies may either choose not to bid in light of the risk, or charge much higher CfD prices to compensate for the volume risks and associated 'missing revenues'.

Thus, CfDs risk becoming a victim of their own success, as more output becomes curtailed at times when renewables output exceeds net electricity demand. Even at other times, larger renewables output will tend to depress the wholesale electricity price.

The political implication for bills also needs to be recognised. Electricity bills could increasingly include a combination of standing charges, depressed wholesale prices, and apparently high policy costs for renewables and grid upgrades – even if they serve to drive down the average wholesale price (see also proposition #6).

Proposition #1: ***Flexibility & storage need to become central priorities; in the context of the REMA programme, adopt CfD reforms which support this, whilst minimising cannibalisation and the economic and political risks of paying for generation that periodically may exceed system needs*** **-** also considering the political dimensions of how electricity system costs are charged and appear (#5, #6)**.**

#2 Transitioning away from gas power generation

The government's ambition for a net zero power system requires a rapid shift away from gas power generation. This cannot be achieved purely by increasing wind and solar power generation, given the need to maintain system security at times of low renewables output.

[1] https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/ucl_isr_rema_2_response_updated.pdf

A planned transition for the UK's legacy gas-fired generation fleet is therefore required. Recent analysis for DESNZ by Baringa states that only 12GW of the UK's current 27GW of combined cycle gas turbine (CCGT) capacity will still be operating in 2035 under business-as-usual conditions.[2] This would be in addition to 4GW of new gas-fired capacity that already has Capacity Mechanism contracts, and an unspecified proportion of other current gas capacity (totalling 5GW).

Building new gas capacity without CCS risks being in tension with the decarbonisation objective, and will be hard to finance given that it would operate at a low load factor. Overcoming this through the Capacity Market could require high Capacity Market prices which in turn would imply high subsidies for all gas plants on the system, undermining the incentives for non-emitting forms of flexibility. The following options should be considered instead.

As part of a planned transition away from gas, Capacity Mechanism rules could be amended to make it more attractive for gas plant owners to extend their lives; options include lowering the investment threshold for three-year Capacity Mechanism agreements.

Instead of new unabated gas investment, the government should ensure that there are sufficient incentives for the full range of flexibility options – from generation to demand side response. This includes the rapid demonstration and deployment of long-duration storage and power plants running on green hydrogen. All of the 'big three' manufacturers (GE, Siemens and Mitsubishi) already have gas turbines available that can burn up to 100% hydrogen. They are also exploring options to retrofit existing plants so they can do so. Just as the UK provided one of the largest 'lead markets' for natural gas CCGTs, it could be one of the first countries to take advantage of this new wave of innovation in gas turbine technology.

There may also be a case for gas-fired capacity with carbon capture and storage (CCS), but this should only be supported if it has CCS fitted from the outset. So-called 'capture ready' gas plants bring significant risks that investors decide not to fit CCS equipment to them (and lobby against the costs and reduced efficiency this involves).

One approach to combine system security with the decarbonization objectives would be for unabated gas generation to be moved into a strategic reserve – available when called upon for security needs. Existing unabated gas would then no longer amount to subsidised competition to storage and other sources of flexibility in the market, thus sending an important signal. However, this requires the system to be ready with sufficient flexibility, to compensate for the absence of gas during normal market operation.

Proposition #2: ***Develop a transition strategy for gas-fired generation, including amending the Capacity Market to encourage asset extension as well as low-carbon flexible generation, and announce timing to move gas generation into a Strategic Reserve (within the lifetime of this Parliament),*** *with additional measures to stimulate cleaner flexibility investment and handle political risk.*

[2] https://assets.publishing.service.gov.uk/media/65e3a3a32f2b3bbc587cd767/8-assessing-deployment-potential-flexible-capacity-gb-interim-report.pdf

#3 Efficient consumer access to cheap renewables in regions

The 2022 energy crisis highlighted the fact that the wholesale electricity price in the UK is almost entirely set by natural gas generators – even whilst half the country's generation was from non-fossil sources. Energy bills in total rose by about £30bn: we estimated that revenues to both gas generators overall, and (pre-CfD) non-fossil generators, each rose by close to £15bn, paid by consumers.[3] For CfDs, the recycling to suppliers of any earnings above the CfD strike price only partially alleviates the problem, and only at a level of national average *ex-post* payments.

As noted, (proposition #1), rising levels of renewables would also start to lower the realised wholesale electricity price. This will reduce periods for which wholesale prices exceed CfD strike prices, and hence reduce the potential for such 'excess earnings' (above the strike price) to be visibly recycled back to suppliers.

On the demand side, uncertainty and volatility of electricity prices also deters investment in the electrification options required to decarbonise the UK energy system, including and particularly for industrial conversions such as at Port Talbot.

Our previous work laid out potential design of a national Green Power Pool, which would provide consumers efficient direct access to a 'pool' of renewables output at prices reflecting their actual costs, rather than the volatile wholesale price, or relying on complex mechanisms to recycle 'surplus' revenues to consumers through suppliers.[4]

The previous government's second REMA Consultation Document acknowledges that a Green Power Pool would be feasible, but says it "failed Deliverability and Investor Confidence criteria".[5] As summarised in an appendix to our response,[6] we do not concur with this assessment; and as noted in proposition #1, the current design of CfDs could face a rapidly growing investor confidence challenge due to cannibalisation risks.

Moreover, the principles behind a Green Power Pool are equally applicable at a regional level. Recognising the complexity and timescales of national market reforms, a regional Green Power Pool could pilot the idea – and also help to address other challenges.

Specifically, the new government's aim to double onshore wind and treble solar faces major barriers. Planning obstacles and needed network upgrades risk impeding the needed investment without local support.

The Conservative government toyed with the idea of offering energy discounts to those directly facing such developments. This would also be a complex approach to a genuine problem, most obviously in terms of injecting a principle of developers (or

[3] https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/necc_working_paper_2_final_pdf_with_cover40.pdf
[4] https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/navigating_the_energy-climate_crises_working_paper_4_-_green_power_pool_v2.pdf
[5] https://assets.publishing.service.gov.uk/media/65ef6694133c220011cd37cd/review-electricity-market-arrangements-second-consultation-document.pdf
[6] https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/ucl_isr_rema_2_response_updated.pdf

the state?) ‘compensating’ citizens for needed national infrastructure, selecting which groups of residents should be compensated (on what basis, and by how much?), for what kinds of infrastructure projects.

A regional Green Power Pool would instead offer residents in a given region (defined by geography or transmission constraints) efficient access to the economic benefits of renewables. Both existing renewables, and new onshore renewables with reduced obstacles, do indeed offer cheap and predictably-priced power.

Efficient direct access to such power through a regional Green Power Pool could be attractive to multiple constituencies in a region: to industries considering electrification; to commercial and public sectors wanting to purchase legitimately zero carbon power; and to private households, offering cheaper power and an attractive alternative to gas, associated with generation in their region.

This could also be linked to ideas of ‘social tariff’, at least indirectly because regions with large onshore renewable resources (and cheap land) tend to include some of the more deprived regions of the UK.[7]

***Proposition #3:* To demonstrate local benefits (access to cheap renewables) and support industrial decarbonisation through electrification (e.g. in Neath-Port Talbot), establish a pilot regional (zonal) Green Power Pool as part of package for local renewables and infrastructure development.**

#4 Offshore wind and North Sea cooperation

The government’s energy ambitions cannot be achieved without continued rapid expansion of offshore wind, particularly (but not exclusively) in the North Sea. This will require tens of billions of pounds of investment over the course of this Parliament. GB Energy could play an important role in leveraging the far larger amounts of private capital required – but the cost and terms of that private investment will of course depend on expected returns and estimated risks.

That in turn will depend on a clear and secure investment regime, along with efficient and flexible access to European electricity markets. The latter requires extensive, interlinked networks with clear governance, including development of ‘hybrid’ – or multi-purpose - interconnectors to both connect offshore wind and facilitate real-time electricity trade. The government should acknowledge the technical, governance and political complexities involved, and treat this as a strategic priority.

Current post-Brexit arrangements are defined by the Trade and Cooperation Agreement. The provisions on energy cooperation, which are due to expire in June 2026,[8] give inadequate access to EU markets to enable efficient, real-time electricity

[7] For example, Cornwall has large untapped potential for renewables, constrained by poor electricity networks; and the output from renewables in the county of Neath-Port Talbot (NPT) in South Wales already equates to 75% of the county’s electricity demand (also constrained by saturated grid supply points). In both regions, employment rates are lower than respective regional averages (South-West, and Wales respectively, as well below national average) and both have “economic inactivity” around 23%, as well as Household Gross Disposable Incomes below the national average.

[8] For recent report on the EU-UK TCA by House of Commons Library, see https://researchbriefings.files.parliament.uk/documents/CBP-10040/CBP-10040.pdf
“the provisions contained in Title VIII on Energy **will cease to apply on 30 June 2026 unless the UK and EU decide in the Partnership Council that they should be extended**.”

trade, or to establish effective coordinated investments in offshore generation and multi-purpose transmission. The terms of the TCA are a major deterrent to the scale of private investment required and would, if extended, needlessly inhibit larger-scale offshore wind development and increase its infrastructure costs and investment 'premiums'.

At present, EU institutions are minded to simply roll over the TCA agreement as the continued default and have more pressing priorities than to propose improvements. However, some member states – most obviously, but not only, Ireland – have a strong interest in improving electricity trading and investment arrangements.

Proposition #4: To enhance value and investor confidence in offshore wind and transmission infrastructure, ***work with relevant EU member states to establish terms for closer integration of electricity trading and investment regimes after the expiry of TCA provisions on energy cooperation.***

#5 Paying for the transition: energy charge rebalancing and energy poverty

Currently, the costs of policies that drive our transition to a low carbon energy system are mostly recovered through the electricity portion of household bills; 80% of all policy costs are added to electricity bills, with only 20% on gas.[9] Gas is also exempt from paying CO_2 emission costs (through the UK Emissions Trading Scheme (ETS)), unlike electricity. Under current cost allocation, as we continue to encourage renewable energy generation via policies such as the CfD, combined with grid expansion, household bills could become increasingly dominated by electricity policy costs.

Whilst facilitated by electrification, decarbonisation involves transformation of our *entire energy system*. Placing the transition costs predominantly on consumers' electricity bills could disincentivise the adoption of two of the technologies crucial to reaching net zero - heat pumps and electric vehicles. Whole system transition costs should not be so concentrated on electricity bills.

Over 55% of total policy costs have delivered benefits such as new clean energy industries, through payments towards the Renewable Obligation and Feed in tariff schemes, now closed and largely considered 'public goods'. A further 35% of policy costs are associated with alleviating fuel poverty for the most vulnerable households.[10] There are strong arguments for moving such policy costs onto general taxation – to recover costs progressively, ensuring the poorest pay the smallest share. However, recognising the government's self-imposed constraints on public expenditure – and particularly, general taxation – other approaches can be considered.

One alternative approach is redistribution of policy costs more evenly, particularly 'rebalancing' from electricity to gas bills. For the 85% of UK households using gas boilers, this rebalancing would encourage the electrification of heating via the

[9] https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/ucl_isr_rema_2_response_updated.pdf

[10] Analysis of the Ofgem Default Tariff Cap Model, conducted in our report: 'The Case for a Social Tariff: Reducing Bills and Emissions, and Delivering for the Fuel Poor'

installation of heat pumps. Relatively lower electricity bills could also encourage the adoption of electric vehicles.

However, such rebalancing could have difficult distributional consequences.[11] Benefits would accrue only for households with realistic scope for heat pumps and in the financial position to replace their gas boiler with a heat pump, and for those who own property rather than those who rent. Only those in the position to buy an electric vehicle (and ideally with space for convenient home charging) would benefit from the fuel cost savings. New build, potentially with district heating, may offer better opportunities on both counts, but households in old buildings unable to electrify would simply face more charges on their gas bills. Though declining gas prices might reduce the tension and create some political space for the reform, rebalancing still risks impacting the fuel poor for whom the cost of heating hits the hardest – and which too often results in self-disconnection. National Energy Action reported in November 2023 that 2 million households had 'self-disconnected' and gone without any energy in their home.[12]

Therefore, should Government choose to rebalance policy costs across gas and electricity, a combination of measures would be required to reduce the distributional impact. Direct fiscal support would be essential for vulnerable households where an increase in gas bills would render adequate heating unaffordable. Increased subsidies would also be required to make the installation of heat pumps and other energy demand reducing technologies accessible to all households.

Note also that a rebalancing of policy costs between commercial gas and electricity prices may be easier to implement and could support improvements to utility-scale heat pumps, potentially also supporting district heating (especially in new build estates), accelerating development of the technologies and systems.

Alongside a rebalancing of policy costs, the new Government should review options for a much greater level of support for households to improve the efficiency of their homes, and to switch to low carbon heating. This includes reviewing lessons from successful programmes in other countries.[13] It could also consider a package resembling the Liberal Democrats proposed emergency Home Energy Upgrade programme, providing free insulation and heat pumps for low-income households, potentially coupled with a social tariff to provide targeted energy discounts for vulnerable households.[14]

Proposition #5: To enhance attractiveness of industrial electrification, EVs, and heat pumps, ***rebalance investment and policy costs between gas and electricity, whilst adopting a package of measures to protect the most vulnerable consumers who would otherwise be adversely affected. Options include direct fiscal supports, subsidies for heat pumps, and 'social tariffs' identified and delivered through cooperation between Treasury (welfare) and supplier data on household consumption.[15]***

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[11] https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Balancing%20act%20(4).pdf

[12] https://www.nea.org.uk/news/30096/#:~:text=New%20polling%2C%20commissioned%20by%20the,central%20heating%20to%20stay%20warm.

[13] https://www.theccc.org.uk/publication/climate-policy-that-cuts-costs-international-policy-comparison-energy-saving-trust-green-alliance/

[14] https://www.libdems.org.uk/fileadmin/groups/2_Federal_Party/Documents/PolicyPapers/Manifesto_2024/For_a_Fair_Deal_-_Liberal_Democrat_Manifesto_2024.pdf

[15] 'The Case for a Social Tariff: Reducing Bills and Emissions, and Delivering for the Fuel Poor'

#6 Communicating the economics of transition: better metrics

Fossil fuel prices are notoriously uncertain, particularly for years ahead. The cheapness of Round-4 CfDs, followed by the energy crisis, created conditions in which renewables were cheaper than fossil fuels. In the lifetime of this Parliament, this could reverse:

- ***Gas prices are intrinsically unstable and could decline this decade.*** Fossil fuel prices typically follow a pattern of large-scale business cycles - investment booms followed by price busts. The paradoxical result of the energy crisis is to make it more likely that future gas prices will be low due to over-investment. Successful EU policies to curtail gas consumption could have a similar effect (see box).
- ***CfDs-as-usual may become increasingly expensive.*** Their costs will depend upon interest rates, supply chain pressures, and also rapidly increasing investor concerns about the impact of growing periods of surplus renewables generation on wholesale price (see #1).

Box: Prospects for gas prices this decade

The energy crisis led to exceptionally high prices, and correspondingly an unprecedented pace of investment in gas production alongside accelerated demand reductions. Even without renewal of Russian imports through Ukraine (or other routes), by 2026, Europe may be oversupplied by gas, as the Liquified Natural Gas (LNG) port terminal investments come on-stream, compared to projected demand *even without* strengthened climate policy.

The overall price will be affected by global trends. If Chinese action on climate change continues its trajectory, this will also weaken the growth of global demand, whilst LNG exports from the US, Qatar, and others, have been predicated on hopes for growing global demand.

Gas prices are intrinsically uncertain. Geopolitical factors curtailing supply, or economic boom and shift from coal to gas in developing countries driving up demand, could drive up prices again, but barring another geopolitical shock or unexpected pace of growth in Asian LNG demand, gas prices for the second half the decade could equally decline further. Policy grounded on expectations of expensive gas – or justified with such predictions – is thus risky.

One trap for the new government's ambitions for clean energy could be wishful thinking on relative prices over the next few years. Climate policy more generally needs to be robust against the paradox that successful decarbonisation could reduce the demand for, and therefore market price of, fossil fuels. Thus, low carbon technologies could appear more expensive in relative terms whilst actually reducing the overall cost of our energy system, by reducing the UK and international demand for (and hence price of) fossil fuels.

Within electricity especially, lower gas prices and/or growing periods of high renewables output imply volatile but on average low wholesale electricity prices – meaning that more of the CfD investment costs will appear as charges on bills. **Much of the investment cost of renewables and transmission upgrade may therefore appear on household bills as policy costs.**

Similarly, expenditure on distribution grids and storage can save overall system costs by making better use of existing and new clean generation, whilst electrification and energy efficiency programmes reduce energy consumption. Again, **many such costs could (misleadingly) appear on household bills as transition support costs**, even when they reduce total costs**.**

A sole focus on electricity prices and the structure of household bills could be politically problematic if more and more of the transition investments appear as policy-related charges. It emphasises the investment costs of decarbonisation rather than the savings.

The country needs better metrics to inform debate on the economics of the transition. Whilst 'whole system costs' are hard to define, a relatively straightforward metric is the *total consumer expenditure on energy* (including industrial and commercial) as a fraction of national wealth. This *energy cost share* measures the overall cost paid for energy consumption across the economy, relative to GDP. The UK's energy cost share peaked dramatically in the recent energy crisis, in part because of the way that gas also largely set the electricity price. Research on energy cost shares finds considerable long-run constancy of energy cost shares, as energy technologies and systems adapt and respond over time to economic and policy incentives.[16]

The **national energy cost share** should be considered as an important metric in the context of energy transition. In capturing the overall final cost of the energy system, it can encompass sectoral changes (e.g. electrification of energy-use sectors) and avoids misleading distinctions between 'market' and policy-driven costs – which is vital when policy can substantially drive down the cost of traditional energy supplies. It could also be extended to include the damage cost of emissions, using established government estimates of the 'social cost of carbon', to the extent that these are not covered by carbon pricing.

Proposition #6: ***Assess options and consider a metric of "National Energy Cost Share" to give attention to overall national consumer expenditure on energy.*** This would thereby include the savings arising from clean energy investments and enhanced efficiency (and is likely therefore to decline); and ***potentially expand to include the cost of emissions*****,** to reflect value of emission reductions.

[16] 'Bashmakov, I., Grubb, M. Drummond, P., Lowe, R., Myshak, A. & Hinder, B., 2024 "Minus 1" and energy costs constants: empirical evidence, theory and policy implications, Structural Change & Economic Dynamics. 71: 95–115. https://doi.org/10.1016/j.strueco.2024.06.010

#7 Carbon pricing, industrial decarbonisation and trade

Textbook economics typically recommends a carbon price, applied uniformly across all emission sources, as an incentive to penalise damaging emissions and reward lower carbon investment. In practice it has rarely worked like this. Carbon prices are notoriously difficult to implement, and progress with emissions reduction has often been driven by more specific policies such as regulatory standards or Contracts for Difference.

Although the UK's existing Emissions Trading Scheme (ETS) was effective in driving out coal in favour of gas generation, it has limited impact on further decarbonisation in either electricity or industry, and currently exacerbates the wider imbalance of charges between electricity and gas.

Following decline in the UK ETS price, revenues – which currently go into general Treasury income - have declined, and electricity exports may face charges under the EU carbon border adjustment mechanism (CBAM), reflecting the carbon price differential.

Effective use of carbon pricing in the UK requires a new generation of reforms, with careful attention to at least five issues as follows.

First, closer linkage with the EU ETS would restore prices, reduce or eliminate trade distortions with the EU, and avoid carbon-related charges (and associated administration) on energy trade with the EU. Inefficient electricity trade, in combination with the non-alignment of emission trading systems (and carbon border adjustment mechanisms), may well have environmental implications, driving demand for gas-fired generation to address growing flexibility requirements in both jurisdictions.[17]

Second, introducing a UK CBAM would protect UK energy-intensive manufacturing against carbon leakage. It would facilitate (and indeed, require) a move from free to auctioned emission allowances, increasing revenues and give clearer incentives to decarbonise energy-intensive industry. Drawing upon and aligning as appropriate with EU CBAM could reduce complexity and transaction costs, but potential impacts on poorer developing countries need to be acknowledged (see final option below).

Third, given adequate measures to protect the most vulnerable households (see #5), the government should aim to introduce a carbon price across the rest of UK energy sector, including gas and potentially all transport fuels, whilst recognising the essential role of more specific, complementary policies to drive emissions reductions.

Fourth, the government should undertake a fundamental review of the use of revenues from carbon pricing. Currently the revenues go into general taxation, whilst the energy transition faces a funding gap; revenues from an expanded carbon pricing system could for example be used to increase funding for GB Energy. Moreover, research shows unambiguously that support for carbon pricing is greater if

[17] For a recent review of implications of disjointed UK-EU systems, see https://afry.com/sites/default/files/2024-03/afry_eu_cbam_impact_study_summary_report_mar_2024_v300.pdf

the revenues are used to help tackle climate change, and potentially give targeted help to the most vulnerable consumers affected.[18]

Finally, the government should acknowledge the consumption footprint of products as an important metric of the UK's climate impact. Standards on the corresponding 'embodied' emissions (for example in construction) could offer important contributions towards decarbonisation. A consumption-based approach to carbon pricing is also the logical justification for a CBAM. However, a CBAM may have a correspondingly significant impact on poorer developing countries given the UK's relatively large carbon-consumption footprint of imports. As part of the UK's contribution to international climate finance, CBAM revenues raised at the border should be offered to support international climate commitments for just transitions out of carbon-intensive production.[19]

Whilst it is not the primary policy driver of emissions reductions, the government should consider multiple areas of reform and extension to the UK Emissions Trading Scheme (ETS).

***Proposition #7:* Consider closer alignment with EU ETS, border adjustments, extension to additional sectors, and use of revenues to enhance the domestic transition, with international sharing of border revenues to support international climate commitments for just transitions out of carbon-intensive production.**

[18] A recent major review finds that "revenue recycling has a crucial impact on public acceptability. While environmental earmarking ranks highest, and reducing corporate taxes is the least preferred option, numerous other revenue recycling options lie between these two options … [also] Trust, communication and salience of revenue recycling can enhance public acceptability of carbon pricing".

[19] You can read our response to the governments consultation on CBAM, expanding on some of these points, here: https://www.ucl.ac.uk/bartlett/sustainable/sites/bartlett_sustainable/files/consultation_on_the_introduction_of_a_uk_cbam_-_ucl_isr_submission.pdf