

Missing the target: Are local climate targets aligned with national net zero ambitions?

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Abstract

Climate emergency declarations made by local governments often include targets to reach net zero emissions, but it is unclear how these targets contribute to national commitments to reduce emissions or whether these targets are achievable. At the national level, the UK has set the ambitious target to reduce emissions by 78% by 2035, however, the UK is currently not on track to reach its 4th and 5th Carbon budgets, let alone the 6th Carbon budget. Using a bottom-up emission reduction pathway based on local authority (LA) emissions reduction targets we find that the UK would achieve its 6th Carbon Budget and its 2030 Nationally Determined Contribution if local emissions targets are achieved. More importantly, the targets set by local authorities could be missed by 39% in 2030 and 18% in 2037 and the UK as a whole would still be able to meet its climate targets. We discuss these results in the context of the current division of responsibilities between the national and local governments, the potential for, and consequences of, a gap emerging between the emissions of different local authorities, the capacity of local governments to meet net zero targets and the absence of regional government in the UK. We conclude that polycentric modes of climate governance, as are emerging from Climate Commissions developed in Leeds, Belfast, Edinburgh and 16 other local authorities across the UK, may play a key role helping to fill capacity gaps at the local and regional levels.

Introduction

The UNFCCC's 26th Conference of the Parties (COP26) held in Glasgow in November 2021, paved the way for the UK to set its Nationally Determined Contribution (NDC) target in December 2020 of a reduction of emissions by at least 68% by 2030, compared to 1990 levels, (UK Government 2020) in line with Article 4 of the Paris Agreement (UN 2015). The UK government has also set a national target to reach net zero emissions by 2050 and has accepted the UK Climate Change Committee's (CCC) advice outlined in the 6th Carbon budget in 2020 to set a new legally-binding target of reducing emissions by 78% by 2035 compared to 1990 levels.

To meet these targets the UK government released its Net-Zero Strategy (UK Government 2021) in October 2021, which was received as a "genuine step forward" by the CCC. Importantly, however, the CCC also noted significant strategic gaps and uncertainties. Among these, policy and planning decisions, including from local governments, are seen as a risk to blowing the strategy off course (CCC 2021). In the meantime, based on currently funded and implemented policies, the UK is not on track to meet its 4th and 5th Carbon budgets and more is needed to meet domestic mitigation targets (CCC 2019).

A fundamental challenge that remains unaddressed in this context is the relationship between international, national, and local targets, particularly where local action seeks to overcome a lack of national ambition. For example, in the United States the 'We Are Still In' movement of leaders from cities, states, tribal nations, and others aims to circumvent a lack of federal ambition and leadership under the Trump administration (Gurney et al., 2021). While, globally, 60% of cities are on track to meet their mitigation targets, these targets are often less ambitious with higher baseline emissions (Hsu et al., 2020), there tends to be a lack of periodic reporting and monitoring of actions (Jost et al., 2020), and there is a lack of consensus regarding a suitable and consistent approach for measuring and accounting of locally embedded urban carbon emissions (Ramaswami et al., 2021).

Moreover, sub-national governments typically rely heavily on national governments for support in areas outside of their jurisdiction. In the UK, for example, the CCC estimates that local governments only have powers or influence over approximately one-third of GHG emissions (CCC 2020). Considering the gap between ambition and delivery at the national level, the extent to which local targets can actually be delivered in practice has been questioned in the literature (Fuhr et al., 2018; Howarth et al., 2021; Hsu et al., 2020). Moreover, the emergency framing used to put forward local council's commitments is highly contentious due to the potential for unintended consequences (Asayama et al., 2019; Patterson et al., 2021).

Even still, local governments play an important role in shaping and delivering climate targets at the local level through the services they provide, stakeholder networks they contribute to and by providing a voice to citizens through locally-elected councillors. While Local Authorities in the UK are directly responsible for only 2–5% of local carbon emissions (e.g. estate, procurement and service operations), they also have a strong influence over a third of local emissions (CCC 2020) through planning powers for transport and buildings, collection and disposal of waste and their role in local planning. To date, 78.5% of local authorities in the UK have declared a climate emergency with the majority setting a net zero target (Howarth et al 2021).

The credibility of sub-national commitments to reduce carbon emissions, however, is in question. The term 'net zero' provides a useful frame through which "global action against climate change can be (and is increasingly) structured and understood" (Fankhauser et al., 2022, p. 15), but the many different target dates, and choices around the scope of emissions to be included suggests disagreement about what 'net zero' means for local climate action in the UK. The wave of activity on climate action at the local level has led to diverse and innovative mechanisms for local climate governance. However, there is a lack of alignment and coordination regarding the setting of the national net zero target, the 6th Carbon budget, the NDC, especially as these translate to the local level. Mechanisms to deliver these national targets sit at the national level with the UK having statutory targets enshrined in law through the 2008 Climate Change Act with criticism from the UK Climate Change Committee of the government's lack of progress (CCC 2020). Processes and strategies through which these targets will be met are unclear, with local decision-makers adopting different approaches to enact action locally in contrast to state-drive action (Asayama et al., 2019; Rickards et al., 2014) and debate continues on whether the growth of non-state forms of governance acts to empower non-state actors or weaken state responsibilities (Gillard et al., 2017).

Declaring Targets Versus Delivering Action

Regional institutions can play a critical role helping national and local government resolve and coordinate responsibilities for climate action but connecting local and national approaches also faces a challenge along another dimension. While the national approach to climate action features rising targets and an expanded scope for action over time, local approaches, especially those which target net zero emissions by 2030, feature single, near-term targets. In other

words, the national approach makes incrementalism its foundation while local approaches frequently seek an immediate step-change, or transformation, in the way climate action is approached.

Increasingly the necessity of a transformative approach is implicit in increasingly tight carbon budgets. Recent figures suggest the world has less than 5 years to substantially reduce emissions before 1.5 degrees of warming is locked in (Damon Matthews et al., 2021), and while emissions reductions from buildings and energy have been substantial in the UK, reductions from transport and industry have been modest (CCC 2021). The necessity of systemic transformation for cities to realise net zero is raised by a number of recent publications (Seto et al., 2021) and a complementary literature explore the nature and extent of transformative capacity (Castán Broto et al., 2019; Hölscher & Frantzeskaki, 2020; Wolfram, 2016).

Across these literature, political leadership, access to finance, technical skills and knowledge, social licence, and buy-in from stakeholders are recognised as elements of transformative capacity. Whether more ambitious climate targets are associated with more advanced transformative capacities is therefore important for understanding how targets lead to the delivery of action.

Assessing local climate targets and plans for action in the UK, Harvey-Scholes (2019) find that more ambitious plans for action were set where more ambitious climate targets had been established, suggesting institutional level skills and knowledge may overlap with more ambitious climate targets. Howarth et al. (2021), exploring climate emergency declarations in London, find that commitment from internal and external political actors was key to the setting of declarations, suggesting that political leadership for climate action could also be found in these places. A competitive dynamic that has been cited as leading to climate target setting by local governments speaks to a wider movement taking place, and a developing social licence for local governments to take action on climate (Lützkendorf & Balouktsi, 2019).

Contrasting with these positive assessments, (Creasy et al., 2021) find that the development of climate targets and a climate action plan in the city of Edinburgh were largely internal exercises undertaken with limited stakeholder input or support, and included the strategic neglect of key aspects of the challenge of climate action in the city. While Howarth et al. (2021) identify political leadership leading to climate emergency declarations (and in many cases climate targets) in London, they also identify a 'web' of heterogeneous motives shaping different meanings of these declarations. In cases, actions from local councils were seen to reveal intent to develop action plans and capacities for action, in other cases emergency declarations emphasised the limited responsibility and capacities of local councils. Merton Council, for example, emphasised that it directly controls less than 2.5% emissions within its borders in its declaration of a climate emergency. Similarly, Hale et al. (2021) find that less than 10% of net zero climate targets covered by their global analysis met a minimum standard of robustness, in terms of the target's coverage of activities, the publishing of a plan and progress reports, transparent governance and appropriate use of offsets.

More generally, Howarth et al (2021) identify a disconnect between the immediate and urgent responsibility for action needed and hence expressed through climate emergency declarations, and a common understanding of what these declarations mean for the governance of action. In the most extreme cases, declarations seemingly made as a political gesture, rather than a call to action, might be interpreted as attempts to prevent or slow transformation, a concern raised by wider literature (Heikkinen et al., 2019; Nagorny-Koring, 2019; Wolfram, 2019). The absence of an updated climate plan in almost half of local authorities that declared climate emergencies (Howarth et al 2021), and the dramatic reductions in local council budgets over the last decade (Philips, 2019), each add to the evidence that local government leadership on urban transformations will be constrained.

Methodological Approach

Despite a burgeoning literature on the role local governments in the fight against climate change, for the most part either a local (pertaining to the places where action is taken) or global (the scale of the climate challenge) lens dominates existing literature. To date, little attention has been paid to the implications ambitious and coordinated local action might have for the *national* scale.

In order to address this, here we analyse how cumulative impacts of the locally-set net zero targets across all UK local authorities towards the UK's three targets: (i) the 6th Carbon budget to reduce emissions by 78% by 2035, (ii) reaching net zero, nationally, by 2050, and (iii) the NDC of reducing emissions by at least 68% by 2030. Given that a number of local actors in the UK have yet to set climate targets we consider the key question: to what extent do local authorities with climate targets need to realise their targets in order for the UK as a whole to meet its targets? To do this we project BEIS (UK Department for Business, Energy and Industrial Strategy) estimates of local authority's emissions using local authority-based population estimates and BEIS estimates of sector emissions projections at the national level. Full details of the methodology can be found in Methods.

3.1. Baselines

3.1.1 National Baseline

Estimates of UK emissions from 1990 to 2020 are drawn from the Committee on Climate Change (CCC) and from 2021–2050 BEIS 2019 Updated Energy & Emissions Projections under the reference scenario are used in order to capture planned and funded government policies. To this baseline three adjustments are made, in line with recommendations from the CCC that the government has committed to including in future carbon budgets (UK Government 2021). First, an adjustment is made to capture the Global Warming Potentials (ER5) used in the IPCCs Fifth Assessment (IPCC 2014). Second, emissions from International Aviation and Shipping (IAS), which are excluded from current UK Climate Change budgets. Third, an adjustment is made to capture the most recent estimates of wetland emissions in the UK. The estimates for an ER5 adjustment, IAS and wetland emissions are drawn the from UK Times Model estimates presented in the BEIS Impact Assessment for the 6th Carbon Budget (BEIS 2021).

3.1.2. Local Authority Baselines

To develop a baseline trajectory we project historic local authority CO₂ emissions from BEIS by utilising city-level population forecasts and national-level emissions scenarios. These data sources are available through the government’s open data site (<https://data.gov.uk>):

- Local authority (LA) level emissions data disaggregated into *domestic, industrial and commercial*, and *transport* sectors and various sub-sectors is available from The Department for Business Energy and Industrial Strategy (BEIS);
- UK- and city-level population projections from the Office for National Statistics (ONS);
- UK-level projections of emissions and the carbon intensity of electricity are also available from BEIS (both CO₂ and all GHGs; disaggregated by sector). These are available for various scenarios with differing energy prices, decarbonisation paths, and policies.

3.2. Scenario construction

To make our projections, we match the national-level emitting sectors to the city-level sectors, aggregating into clusters where necessary (as shown in Table 1). We then convert the local CO₂ emissions to all GHGs by using the ratios of CO₂e to CO₂ for each national-level sector/cluster. Third, we calculate growth rates in *per-capita* emissions for these national-level sectors/clusters. Using these growth rates, we then take the latest city-level, per-capita emissions for each sector/cluster and project these forward to 2050. We therefore assume that the per-capita growth rates in emissions at the city- and national-levels are the same for each sector/cluster. Finally, we aggregate these projections into total emissions using the city’s population projections.

Table 1
National-level sectors from the BEIS emissions scenarios matched to the city-level, local authority emissions sectors (aggregating is indicated by the shading).

	National-level		City-level	
	Disaggregation	Time frame	Disaggregation	Time frame
Emitting sector	Agriculture	1990-	Industrial & Commercial (<i>other fuels</i>)	2005-
	Industrial processes	2040		2019
	Waste management			
	Business			
	Public			
	Energy supply		Industrial & Commercial (electricity)	
			Domestic (electricity)	
	Residential		Domestic (other fuels)	
	Transport		Transport	
	LULUCF		LULUCF	

Data on local government net zero targets was collected between July 2020 and February 2021 through the Place-based Climate Action Network. Data collected included the date of net zero targets and what emissions they included in the targets (all local authority emissions, for example, or only those emissions produced by the council). Emissions targets are assumed to be met in a straight-line manner. If a target for net zero is 10 years away, for example, baseline emissions are reduced 10% on the baseline after one year, 20% after two years, and so forth.

Figure 1: Local authority emissions targets by date and type

3.3. Assumptions

Several additional assumptions were made to overcome data limitation and uncertainties created by overlapping GHG commitments:

- Where a local authority and a higher level of sub-national government (for example a County Council) both had net zero targets it was assumed that the local authority followed the pathway associated with its own target.
- Where a local authority does not have a target but a higher level of sub-national government does, it is assumed that the local authority reduces emissions according to the pathway of the sub-national government’s target.
- Where a local authority target only includes own-source emissions it is assumed these account for 2.5% of the local authorities total emissions.
- We assume scope 1 and 2 emissions are covered by local authority targets but not scope 3 emissions.

The datasets used in this analysis are publicly available government datasets, and are therefore of high quality. Results are, however, sensitive to choices of key economic parameters. In Fig. 2, the sensitivity to the economic growth scenario used and the scenario used for the electricity grid are shown. Results illustrate that even with BEIS’s high economic growth scenario for national emissions and baseline policies for the electricity grid (which leads to a small increase in the emissions intensity of the grid through 2050), a scenario where all local authority targets are met leads to the UK meeting its 6th carbon budget.

Local authority actions are calculated against a baseline scenario that builds on the BEIS reference scenario for Greenhouse Gas (GHG) emissions with the addition of GHG emissions from international aviation and shipping (as recommended by the CCC). A key assumption in the modelling of the targets is that

they are assumed to be met in a straight-line manner: the gap between an individual local authority's baseline emissions and scenario emissions increases by the same amount each year through to 100% at the target year.

Figure 2: Sensitivity to economic growth and the electricity grid

Findings: Local Commitments To Net Zero In The UK

Across the UK we find that 168 local authorities have committed to targets for own-source (operational) emissions and 291 have committed to targets for all-borough emissions. This means that of the 398 principle (unitary, upper and second-tier) councils in the UK, 42% have targets for own-source emissions and 73% have targets for borough emissions. A majority of the targets set for borough-wide net-zero emissions are for the years 2030 and 2050 with approximately one-quarter identifying an alternative year (Fig. 1).

Given that the majority of councils have committed to net-zero borough emissions, and a significant number have established 2030 as their target date (Fig. 1), it is unsurprising that commitments to reduce emissions are greater than the emissions reductions needed to meet the UK's 2030 NDC and 6th carbon budget (Fig. 2). What is more interesting and important is the question of to what extent emissions reductions at the local level will need to be met for the UK's targets to be met.

Relative to the baseline scenario, GHG reduction commitments from local governments are found to target emissions of 234Mt GHGs in 2030, the date of the UK's current National Determined Contribution to the Paris Agreement, and 256Mt GHG in 2037, the midpoint of the 6th carbon budget (Fig. 3). This is equivalent to an 80% reduction on 1990 emission levels in 2030 and an 85% reduction in 2037, in excess of the targets of 68% and 78% respectively. This means that local authorities with climate targets could miss those targets by 39% in 2030 and still allow the UK to meet its NDC commitment. Conversely, in 2037 local authorities would need to meet 82% of their targets in the absence of action from wider local authorities in order for the 6th carbon budget to be met.

Figure 3: UK GHG emissions under the baseline scenario and local action scenario compared with emissions reduction targets

The scope for truly independent action from ambitious local governments is, of course, limited. Actions from individual councils – affecting infrastructure, regulations, or mechanisms of governance – ease the transition for other councils and stakeholders. Differences in the ambition of local actors to address climate change that are indicated by differences in, or the absence of, climate targets, suggest a growing gap between the level of climate action in different parts of the UK.

These results suggest that at least for the coming decade both climate targets (the 2030 NDC) and the pathway to deeper decarbonisation could met with limited action from the set of local governments yet to establish targets. However, to maintain a commitment to meet the UK's 2050 net-zero target would then require the rapid implementation and delivery of local climate policies from 2038. Putting off action to 2038 thus implies a commitment to climate action from 2038 forward that is second in ambition only to the set of net-zero targets for 2030 (Table 2). The extent to which leadership from ambitious local governments supports more action and earlier action from places currently less focused on climate action is therefore a critical question for the future of UK climate policy.

Table 2
Implied decarbonisation rates by net-zero target year

Net-Zero Target	Implied annual decarbonisation rate
2050 target	-10%
2040 target	-15%
2030 target	-28%
No action until 2038	-22%

[1]It is assumed that 5% of emissions remaining are covered by emissions removals specified in the CCC Balanced Pathways Scenario

Discussion

Much has long been made of the need for 'Common but Differentiated Responsibilities' (CBDR) when it comes to tackling climate change. When approached as a challenge requiring participation from different geographies, we must inevitably acknowledge the historical contributions of CO₂ emissions made by these same geographies. At the international scale, where nation states are deeply embedded as the principal stakeholders in global environmental governance regimes, dividing up these responsibilities in a 'fair' manner is now well rehearsed, if still highly contentious. But what about the state scale itself? How should states, such as the UK, approach the question of relative responsibility for action from their constituent geographies?

Despite (or perhaps precisely because of) the centralised form of governance found in the United Kingdom, considerable ambition can be seen on the part of many local governments when it comes to decarbonisation, as reflected in the range of net zero targets set by local authorities. This ambition, above the level seen from the national government from a majority of local authorities, is supported by analysis from academic institutions such as the Tyndall Centre (Tyndall Centre 2022) and the Place-based Climate Network (Gouldson, Sudmant, Boyd, et al., 2020; Gouldson, Sudmant, Duncan, et al., 2020; Williamson et al., 2020) each of which have produced and analysed carbon budgets for local authorities that are significantly more ambitious than a downscaled version of the budgets written into UK law.

Realising the ambition of these targets, however, will require increased levels of action and ambition from the state, the enabling of local governments, and increased or initiated targets from the local governments who have thus far resisted.

In alignment with research on challenges between linking up bottom-up and top-down climate policies (Green et al., 2014), work remains to be done to convince the remaining local authorities to both set, and ultimately meet, net zero targets, prior to the 2050 backstop set at the national scale. If local targets are missing, national governments may struggle to gain social licence for interventions and may find their actions in conflict with local government policies and programs, raising the question of whether national targets are even possible in the absence of local targets. Local government intransigence could also lead to conflicts between neighbouring local authorities who need to coordinate to develop low carbon transport networks, regional strategies for decarbonising industry, and in other areas.

Where national government ambitions are absent or insufficient, as has been argued for the government's strategies on food and decarbonisation of heating (CCC 2021), local targets can establish the social and political case for action. Faced with reductions in their budgets equivalent to 24% per person over the last decade (Philips 2019) and limited scope to take action across two-thirds of emissions sources within their geography (CCC 2021), local governments will be unlikely to have the capacity to meet their targets without significant enabling action from the state.

Finally, even where each of local and national governments specify the same target there is the possibility each government could - wilfully or mistakenly - assume the other is taking responsibility for some element of the challenge. The opportunity provided by overlapping commitments is therefore most likely to be realised when those commitments are translated into a coordinated set of policies and programs, a discrete set of responsibilities and actions for each level of government and buy-in from the wider set of non-state actors also making GHG reduction commitments.

Two conclusions can be drawn from this. First, the ambition of a national or subnational climate target may be less important than the substance of how it is set to be achieved. 2030 net-zero targets established without funding, the support and buy-in of major public and private actors, a firm commitment and plan to reduce own-source emissions, and dialogue with national and regional governments, may act as a signalling mechanism, but little more. And as emissions reductions inevitably move from the readily available to the hard and contentious, these targets could help to define the divisions between national and local governments, but offer little in the way of an obvious bridge between them.

New forms of regional governance may offer an opportunity in this context. The recently established Yorkshire and Humber Climate Commission (YHCC) establishes enabling engagement and helping to build capacities for delivery of action as foundational aims. In this way the YHCC can offer support for local authorities looking to turn their targets into strategies, a venue for local authorities to develop coordinated approaches to action, and a means for bringing accountability to local authorities that set targets but fail to follow them with actions.

Second, while net-zero targets from both local and national government are essential for net-zero to be achieved, different emissions reductions approaches may be needed between them. National government's sectoral approach reflects its power to regulate and incentivise key industries. Local government, on the other hand, may be relatively better positioned to lead place-specific interventions and to support, and in some cases lead, the processes of engagement needed for emissions reductions associated with consumption patterns and behaviours, for example meat-eating. This suggests that the most socially and politically challenged aspects of decarbonisation may best be led by local actors, raising questions around whether these challenges can be realised without substantial devolution of powers from national government.

Conclusion

Following agenda-setting scholarship, local climate action in the UK may have progressed from the public agenda, to the systemic agenda of issues addressed by government, but not to the agenda of issues explicitly and proactively considered in public decision making (Pralle, 2009). Ambitious climate targets, by this interpretation, may face a serious challenge being realised where transformative capacities have not already been developed. While public and systemic government agenda setting can feature rapid change when conditions are appropriate (so called 'punctuated equilibriums'), the translation of the government agenda into the policies and programs of government is more often gradual (Torres et al., n.d., 2020). Neo-institutionalists, building on Douglas North's work (North, 1991) have emphasised that this kind of institutional change is typically slow, continuous and path defined. The Paris Agreement, based around coalition building, repeated bargaining, and an understanding that ambition will be raised over time, aligns with this understanding of institutional change, while the independence, commitment and finality of the approaches set by the most ambitious local authorities do not.

The challenges that local authorities face in leading urban transformations therefore emphasise the value, and possibly the necessity, of polycentric approaches to climate action. Climate Commissions, partnerships for supporting local climate action that have been developed recently in Leeds, Edinburgh, Belfast and 16 other UK local authorities, may have a significant role in this context. Bringing together public, private, community and third sector actors, Climate Commissions offer avenues for collaborative climate action, and respond to the needs for place-based action (Creasy et al., 2021) and experimental governance (Håkansson, 2019; Kivimaa et al., 2017). Climate Commissions may also be able to realise unrecognised capacities and demand for action. Realising the opportunity of polycentric approaches to climate action, including Climate Commissions, however, will require that these institutions develop transformative capacities faster than would otherwise be developed by local and national governments, an area in pressing need of further research.

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Declarations

The authors declare no conflicts of interest

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Authors' contributions.

CH and AS are joint first authors of this publication.

Figures

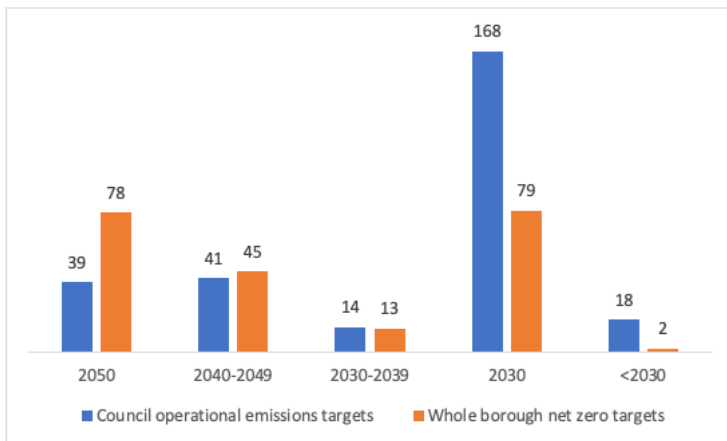


Figure 1

Local authority emissions targets by date and type

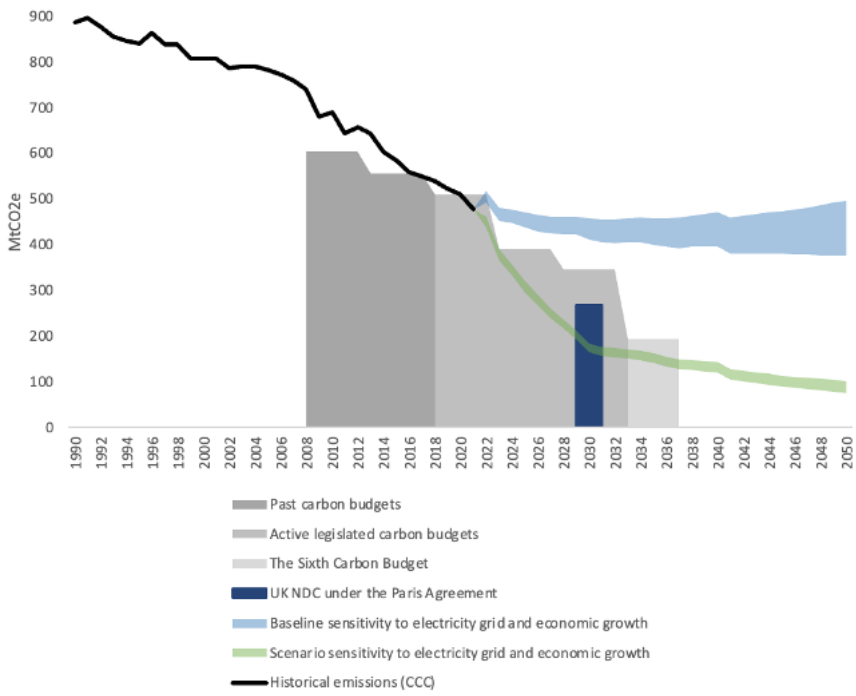


Figure 2

Sensitivity to economic growth and the electricity grid

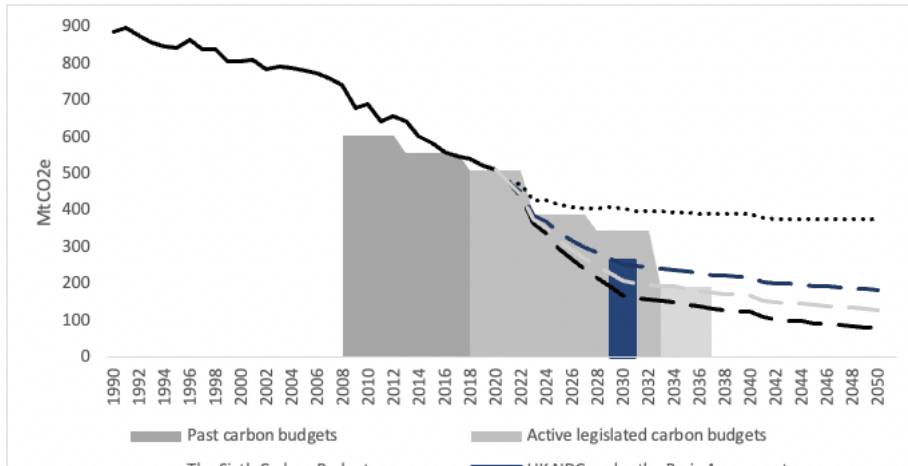


Figure 3

UK GHG emissions under the baseline scenario and local action scenario compared with emissions reduction targets