Modal verbs in London's climate change reports

Oleksandr Kapranov (iD)

NLA University College, Oslo, Norway

ABSTRACT

Given that London is exposed to the negative consequences of climate change, the Greater London Authority (GLA) has authored a number of climate change reports. However, little is known about linguistic and discursive means that characterise the GLA's climate change reports. Attempting to bridge the present gap, this paper looks into the frequency and pragmatic use of the central modal verbs (for instance, "can," "could," "may," "might," etc.) in a corpus of the GLA's climate change reports that are available to the public at large. By means of using a mix of quantitative and qualitative methodology, the paper shows that the central modal verbs "will," "can," and "should" are the most frequently occurring modals in the corpus, in which they play a range of pragmatic roles that are further analysed in the paper.

1. Aims and scope

Research indicates that an increased occurrence of heavy rainfall, flooding, and heatwaves is clearly associated with the negative consequences of climate change (Boykoff & Rajan, 2007; John & Rein, 2025; Wibig & Jędruszkiewicz, 2025). Particularly, the United Kingdom (the UK) has experienced recurring patterns of flooding and heatwaves over the last twenty years (Carvalho & Spataru, 2023; Kendon et al., 2023). London also bears the brunt of the climate crisis (Kovats et al., 2004), just like the rest of the UK. Conceivably, the British government, inclusive of the local government bodies, the major political parties, and the reigning monarch King Charles III, takes the issue of climate change

seriously (Kapranov, 2024a, 2024b). Accordingly, the British government bodies have adopted extensive programmes and initiatives to curb the climate crisis (Hodson et al., 2013). For instance, the UK's net zero initiative aims to cut CO_2 emissions by 2050 (Somerville, 2021). In this regard, the Greater London Authority (further in the article – the GLA), which is the regional governance body of Greater London (Pimlott & Rao, 2002), is actively involved in the process of drafting, planning, and implementing a set of measures that pertain to mitigating the negative consequences of climate change (Siders, 2017).

Currently, however, not much is known about the GLA's climate change discourses (Bergman, 2014; Cretella, 2025). Moreover, little is known about the frequency and pragmatic roles of modal verbs in the GLA's climate change reports. It should be specified that modality, which is normally expressed by modal verbs, seems to play one of the pivotal pragmatic roles across various discourse genres, such as media, politics (Chen, 2025), as well as the genre of official climate change reports (Kapranov, 2024c). To illustrate the point, let us examine, for instance, the following two sentences:

(1) *London **must** address mobility and climate change through a carefully designed set of measures*. (adapted from Ribeiro et al., 2025)
(2) *London **should** address mobility and climate change through a carefully designed set of measures*. (adapted from Ribeiro et al., 2025)

Whilst we can interpret (1) as an expression of obligation and, most likely, the manifestation of an imperative need due to the presence of the modal verb "must," we can regard (2) as a suggestion and, possibly, a polite indication of a desirable opinion because of the occurrence of "should." We can infer from (1) and (2) that modality plays a critical role in the discourse on climate change. The same argument is expressed by Fløttum (2010, 2014), who maintains that the use of modal verbs in climate change discourse is reflective of a polyphony of pragmatic options associated with the manifestation of climate change-related propositions. Accordingly, the present paper seeks to unveil the way modal verbs are used in the GLA's reports on climate change by means of addressing the following two research questions (RQs):

RQ 1: What are the most frequent modal verbs in a corpus of official reports on climate change by the GLA?
RQ 2: What are the pragmatic roles of the frequently occurring modal verbs in a corpus of official reports on climate change by the GLA?

Apart from the novelty of the paper, its findings may provide a better insight into how central modal verbs are used in discursive representations of the issue of climate change (Bailey et al., 2014). In this regard, it should be reiterated that research on modality in the context of climate change discourses is underrepresented (Sedlaczek, 2017; Poole & Hayes, 2022). Hopefully, the present paper will contribute to our understanding of modality and how it shapes climate change reporting by the local authorities in the UK. Presumably, the paper will generate a novel perspective on the pragmatic role of modality in climate change reports by the GLA.

Further, this paper is organised as follows. First, in section 2, the literature review is provided. The review deals with the prior publications on modality in climate change

discourses. Second, the theoretical tenets, corpus, and methodology of the present paper are given in section 3. Third, in section 4, the paper is concluded with the summary of the findings and their implications for the field of climate change discourse.

2. The literature review: Modality in climate change discourse

Ten years ago, Aiezza (2015) noted that the literature on modality in climate change discourses appeared to be limited. Currently, at the time of the article writing in 2025, the number of studies on modality and modal verbs in climate change discourses remains rather low (Kapranov, 2023). The major bulk of research articles on modality in climate change discourses was published between 2010 and 2025 (see Fløttum, 2010, 2014; Fløttum & Dahl. 2012; Juliansyah et al., 2020; Kapranov, 2024c; Wu and Wang, 2025). In addition to the studies that are centred on modality in climate change discourses, modality is investigated at the junction of climate change-related and sustainability-related discourses (Aiezza, 2015; Hassan, 2022). Further, we will review and summarize these studies.

The pragmatic role of modality in climate change discourses is discussed by Fløttum (2010, 2014), as well as Fløttum and Dahl (2012). In particular, Fløttum (2010, 2014) maintains that the central modal verbs in climate change discourses are involved in hedging (i.e., softening claims to express uncertainty). Fløttum (2010, 2014) argues that hedging is manifested by such modals as "could," "may," "might," "should," and "would." Furthermore, she posits that the pragmatic role of the central modals as hedges seems to be in perfect alignment with their analogous roles in academic writing on the matter of climate change. Additionally, Fløttum (2010) indicates that the occurrence of central modals as hedges is accompanied by the use of such discourse markers as "if," "however," etc., which amplify their roles in expressing tentativeness and uncertainty.

Along these lines, Fløttum (2010: 9) argues that "may," "might," "could" and "would" convey "the epistemic value of toning down the propositional content of the sentence in which it occurs" in climate change discourses. Moreover, Fløttum (2010, 2014) and Fløttum and Dahl (2012) report that "would," "could," and "may" are the most frequently occurring modal verbs in the written mode of climate change discourses. According to Fløttum (2014) and Fløttum and Dahl (2012), these modals manifest uncertainty and contribute to the reading of the climate change document in a polyphonic manner. Specifically, Fløttum (2014: 9) illustrates her point by the clause "it is difficult to achieve emission reduction at a significant scale," which she modifies by adding the modal "may" in order to manifest an alternative authorial voice in the clause "It may be difficult to achieve emission reduction…" In accordance with Fløttum (2014), "may" enables two polyphonic readings of the aforementioned clause. In other words, both Fløttum (2014) and Fløttum and Dahl (2012) assume that modality unveils additional, often internalised meanings of the proposition that facilitate the interpretations of the text from two perspectives, a direct and neutral one, and a hedged one.

Unlike Fløttum (2010, 2014), Juliansyah et al. (2020) contend that modality in climate change discourses is most frequently expressed by "will." It is deemed to render certainty in the proposition and strengthen claims to express certainty (i.e., boosting).

Juliansyah et al. (2020) ascribe the frequently occurring "will" to the oral mode of climate change discourse, which is, arguably, more emotive and self-assured in comparison with the written mode. It should be noted that "will" is reported to be among the most frequently occurring modals in the written climate change discourse on Facebook by the Australian branch of the worldwide environmental organisation Greenpeace (Kapranov, 2024c). Another frequent modal in Greenpeace's discourse on climate change is represented by "can." Its frequent use is attributed to the positive image-building by Greenpeace (Kapranov, 2024d). Identically, "will" and "can" have been identified as the most frequently occurring modals in the corpus of speeches on climate change by King Charles III (Kapranov, 2024d).

Similar to the studies outlined above (Juliansyah et al., 2020; Kapranov, 2024c, 2024d), Wu and Wang (2025) have found that "can" is a frequent modal in the climate change discourse by The New York Times. Particularly, Wu and Wang (2025) demonstrate that "can" is used to convey a more assertive and fact-based way of presenting news on climate change. Their finding is in alignment with the science-based view on climate change. Furthermore, "can" renders the potentiality of actions and/or outcomes that are feasible in the context of climate change mitigation. Additionally, Wu and Wang's (2025) findings reveal that "may," another frequently occurring modal in their corpus, is associated with the media contexts that express uncertainty and vague possibility in relation to the negative impact of climate change. In this regard, Wu and Wang (2025) maintain that "may" serves as a hedge, which is reflective of cautious potential outcomes and speculative claims. It should be mentioned that this observation is in line with the approach to the modal verbs that is found in Fløttum (2010, 2014) and in Fløttum and Dahl (2012).

As already stated, the studies that focus exclusively on modality in climate change discourses are not numerous. However, there is a line of research that explores modality in the context of sustainable development and corporate social responsibility (CSR), which marginally involves references to climate change. Among these studies, one may single out the investigations conducted by Aiezza (2015) and Hassan (2022). Aiezza's (2015) study is set within the context of CSR and corporate discourse on sustainability. Importantly, she also addresses the issue of climate change as an integral facet of the CSR discourse. Aiezza (2015) alludes to the need to include the issue of climate change into corporate discourses on CSR and sustainability. She observes that corporations nowadays are under "particular pressure to meet more and more restrictive requirements and to improve performance, especially on climate protection" (Aiezza, 2015: 70). Moreover, Aiezza (2015) observes that the linguistic category of modality is critically involved in the corporate discourses on CSR and sustainability, inclusive of climate change. Modality in climate change discourses is employed discursively in order to communicate the corporate ethical image, as well as the corporations' degree of commitment to the validity of their stance on CSR and sustainability (Aiezza, 2015). She shows that "will" and "would" occur rather frequently in the CSR- and sustainability-related discourses. Aiezza (2015) contends that "will" is used in making promises that concern corporate performance associated with CSR, sustainability, and climate change. She explains the high frequency of "would" as a rhetorical strategy of showing a cautious

approach to the promises that pertain to the improvement of environmental- and climate change-related corporate performance.

In a similar vein, a recent research publication by Hassan (2022) addresses the use of modality in the discourse on sustainable development, which is also tangential to the issue of climate change. It should be specified that whereas Hassan's (2022) focus on climate change is epiphenomenal, it, nevertheless, follows from the study that "will," "can," as well as "should" are the most frequent modals in sustainability and, to an extent, climate change discourses in the corpus.

In summary of the present literature review, we may posit that the studies on modality and, particularly, modal verbs in climate change discourses are quite limited. It also follows from the literature review that there is no published research that focuses on the frequency and pragmatic roles of modal verbs in climate change reports by the GLA. The study, which is further given in section 3 of the article, addresses this research gap.

3. The present study: Its theoretical tenets, corpus, and methodology

The theoretical tenets of the present study are anchored in the view of modal verbs as a critical linguistic and pragmatic means in climate change discourses, as postulated by Fløttum (2010, 2014). Furthermore, the study is informed by Fløttum's (2010, 2014) ideas concerning the pragmatic roles of the central modals, i.e., "can," "could," "may," "might," "must," "shall," "should," "will," and "would" in climate change discourses. In accordance with Fløttum (2010, 2014), the modals "could," "may," "might," "should," and "would" are associated with a cautious approach to expressing the proposition in climate change discourses. Following Fløttum (2010, 2014), the modals "can," "must," "shall," and "will" are related to strengthening claims and expressing affirmation, urgency, and certainty in the proposition pertaining to the issue of climate change. In other words, whilst "could," "may," "might," "should," and "would" are regarded as hedging devices (Fløttum, 2010, 2014), the modals "can," "must," "shall," and "will" are seen as boosters (Fløttum, 2010, 2014; Fløttum & Dahl, 2012).

Another theoretical pillar of the study involves an approach to the genre of corporate reporting proposed by Bhatia (2008). Before we delve into his view on genre further, it should be mentioned that the GLA could be conceptualised not so much as a purely government body, but as a state-run corporate entity (Copus, 2013). Accordingly, the GLA's discourses could be seen through the prism of the genre of corporate reports and disclosures (Kapranov, 2025). In this regard, Bhatia (2008: 167) posits that the genre of corporate reporting is associated with

> … the appropriation of linguistic resources to obscure corporate performance, in particular, the negative aspects of corporate results, and to highlight instead the positive aspects of performance in order to enhance the company's image in the eyes of the shareholders, other stakeholders, and the business community as a whole. (Bhatia, 2008: 167)

In other words, Bhatia's (2008) ideas concerning the genre of corporate reporting are suggestive of the possibility that the GLA's reports on the issue of climate change may

exhibit pragmatic preferences for the modals that are associated with boosting (e.g., "will") or, alternatively, may show a tendency to use and, perhaps, intentionally over-use, the modals that are related to hedging (e.g., "might"). In our case, it remains to be investigated whether or not the corpus of the GLA's official reports on climate change is marked by the frequently occurring modals that are hedging- or boosting-related.

Against such a theoretical background, the RQs in the study are formulated in the introductory part of the article. In line with the RQs, the practical tasks of the study are as follows: (i) to collect a corpus of the official reports on climate change that are authored by the GLA; (ii) to analyse the corpus quantitively in order to identify the most frequently occurring central modal verbs, such as "can," "could," "may," "might," "must," "shall," "should," "will," and "would;" and (iii) to determine their pragmatic roles in the corpus.

The corpus was collected by means of accessing the official site of the GLA at https://www.london.gov.uk/ and searching for the following keywords: "anthropogenic climate change," "climate change," "climate crisis," "climate change plan," "climate change plans," "climate change report," "climate change reports," "climate change reporting," "climate change strategy," "global warming," "greenhouse gasses," "net zero," and "zero carbon." the search returned 14 official reports (total number of words = 402,824, mean words = 28,773.9, standard deviation = 25,525.8), whose descriptive statistics were summarised in Table 1 below. It should be noted that Table 1 provides details of the reports' authors and dates of publication, if available. Otherwise, the abbreviation N/A (i.e., not available) was given.

Table 1: The descriptive statistics of the corpus

#	Report Titles	N Words	N Pages	Publication Date
1	The London Plan 2011. London's Response to Climate Change	16,401	38	July 2011 Author: N/A
2	London Environment Strategy	102,510	442	May 2018 Author: N/A
3	Technical Assistance to Deliver London's Climate Action Plan	45,439	118	18 May 2018 Authors: A. Tuddenham, L. Horrocks
4	Solar Action Plan for London	9,935	34	June 2018 Author: N/A
5	CAP Technical Assistance for London Work Package 2 – Zero Carbon Building Policies. Key Findings Report	13,245	47	17 August 2018 Authors: S. Robson, C. Lumsden, S. Cook
6	London's Climate Action Plan: WP3 Zero Carbon Energy Systems Report for Greater London Authority & C40 Cities	31,270	86	September 2018 Author: N/A

7	Zero Carbon London: A 1.5°C Compatible Plan	4,271	19	December 2018 Author: N/A
8	Climate Adaptation Plans for Schools. Overview Report	18,583	77	June 2023 Authors: B. Smith et al.
9	GLA Roofs Designed to Cool A Review of Reflective and Solar PV Roofs for London June 2023	42,389	166	June 2023 Authors: A. Figueiredo et al.
10	London Climate Resilience Review: Interim Report	14,274	47	January 2024 Authors: E. H. Boyd, G. Leigh, and J. Sutton
11	The London Climate Resilience Review	58,452	168	July 2024 E. H. Boyd, G. Leigh, and J. Sutton
12	London Climate Risk A Spatial Analysis of Climate Risk Across Greater London: Methodology Report	6,366	29	August 2024 Authors: Bloomberg Associates
13	The London Surface Water Strategy: Increasing resilience through collective action 2025-30	21,973	92	2024 Author: N/A
14	Exercise Helios. An Extreme Heat Exercise for London. Post Exercise Report	17,726	40	March 2025 Authors: L. Elstow, M. Hogan, and E. Nderitu

It should be observed that the corpus collection factored out the GLA's (i) press releases on climate change, (ii) climate change-related news, (iii) blogs, and (iv) general interest information. In other words, only the GLA's official reports on climate change were factored in and analysed.

Thereafter, the corpus was analysed in the computer concordance program AntConc (Anthony, 2022). The analysis was conducted in the following manner. Each report (see Table 1 above) was fed into the program, which searched for the total occurrence of the nine central modal verbs. Subsequently, the results of the analysis in AntConc were processed in the program Statistical Package for Social Sciences (SPSS), version 20.0 (IBM, 2011) in order to compute means and standard deviations of the modals in the corpus.

As far as the qualitative analysis was concerned, it was conducted in accordance with the theoretical tenets provided by Fløttum (2010, 2014). She indicated that the central modal verbs could be analysed on the basis of their association with (i) hedging, i.e. softening claims to express uncertainty (e.g., "might") and (ii) boosting, i.e. strengthening claims to express certainty (e.g., "will") in a text written on the topic of climate change.

In addition, the qualitative analysis considered an approach to modality formulated by Palmer (1990). According to Palmer (1990), modality expressed by the central modal

verbs could be classified into (i) epistemic (i.e., conveying assumption, tentativeness, and uncertainty), (ii) deontic (i.e., expressing command, obligation, and permission), and (iii) dynamic (i.e., rendering ability and physical possibility). Palmer's (1990) classification of modality facilitated the coding of the central modals in the corpus into those that were related to (i) hedging, (ii) boosting, and (iii) neutral fact-stating. The qualitative analysis was conducted manually in each of the reports summarised in Table 1. The coding procedure could be illustrated by the following examples (1) – (4) taken from the corpus:

(3) *Retrofitting a building now reduces energy bills sooner, which is especially important for the fuel poor. The building also starts to save carbon straight away. Waiting longer **would** mean that more buildings **would** need to be retrofitted to achieve the same cumulative carbon reduction.* (GLA, 2018a: 7)

In (3), "would" could be argued to represent a tentative suggestion and/or a degree of uncertainty. Accordingly, it could be indicative of epistemic modality in the sense postulated by Palmer (1990), which, in turn, could be linked to hedging. Consequently, the instances of "would" in (3) were coded as hedges in the present analysis.

(4) *Government **must** decide which low carbon heat pathway the UK will take by the mid-2020s at the latest. In the meantime, there are important short-term actions London and the national government should focus on.* (GLA, 2018a: 12)

In (4), "must" could be regarded as a modal that could be involved in expressing deontic modality in accordance with Palmer (1990), given that it could manifest obligation. Additionally, "must" in (4) could be treated as a booster, since it amplified the proposition by rendering it an assertive tonality. In line with that reasoning, "must" in (4) was coded as a modal that expressed certainty (i.e., booster).

(5) *… it's not just the Mayor that needs to act. We **can** all play a part.* (GLA, 2018a: 32)

In (5), the coding of "can" took into consideration Palmer's (1990) approach to the treatment of "can" in the majority of instances as a manifestation of dynamic modality. In the context of (5), it was assumed to enhance the proposition given in the preceding clause. Consequently, "can" in (5) was coded as a booster. The coding seemed to be supported by the slightly emphatic tonality rendered by the foregrounding of "**We** can **all**" (see (5) above).

(6) *Peak demand **can** also be reduced by demand side response initiatives* (GLA, 2018a: 19)

In (6), the coding of "can" was based upon Palmer's (1990) argument concerning "can" as a manifestation of dynamic possibility. However, the idea of dynamic possibility rendered by "can" in (6) was deemed to be neutral, i.e. neither tentativeness nor confidence was clearly expressed. Accordingly, "can" in (6) was coded as playing a neutral fact-stating pragmatic role.

Having explained the theoretical foundations of the study and having described the corpus and its analyses, let us proceed to the results that are further presented in subsection 3.1 of the article.

3.1. *Results*

The results of the quantitative analysis reveal that there are 6 088 (mean 761.0, standard deviation 557.5) central modal verbs in the corpus. They are represented by "can," "could," "may," "might," "must," "should," "will," and "would." These and other findings, such as the total number (N) of each individual verb in absolute values, means (M), standard deviations (SD), and the normalised frequency values (per 10 000 words) of the modals are presented in Table 2 below.

Table 2: The results of the quantitative analysis of the corpus

#	Modal Verbs	Total N	M	SD	Normalised Values
1	*can*	1 151	82.2	96.8	28.6
2	*could*	587	41.9	38.9	14.6
3	*may*	677	48.4	73.7	16.8
4	*might*	58	7.3	9.2	1.4
5	*must*	272	20.9	28.3	6.8
6	*shall*	0	0	0	0
7	*should*	840	64.6	79.2	20.9
8	*will*	1 985	141.8	230.1	49.3
9	*would*	518	37.0	31.6	12.9

It should be observed that the findings summarised in Table 2 show that the modal verb "shall" has not been identified in the corpus. This finding is in line with the literature (Garzone, 2013a, 2013b; Dvořáková, 2023; Kapranov, 2024c), which demonstrates that the use of "shall" is either infrequent or absent from the British legal discourses. In this regard, we should observe that the absence of "shall" in the GLA's climate change reports testifies to the current trend of phasing out "shall" from the legal and official reports published in the UK (Williams, 2013).

We, however, will not delve in detail into this finding, given the foci of the RQs in the study. To reiterate, RQ 1 focuses on the frequency of the modal verbs in the corpus, whereas RQ 2 centres on the pragmatic roles of the frequently occurring modals. Further, in section 3.2 of the article, we will discuss RQ 1 and, thereafter, in section 3.3, we will consider RQ 2.

3.2. *The discussion of RQ 1: Frequency patterns of the dominant modals*

As mentioned, RQ 1 in the study aims at providing answers related to the frequency of the modal verbs in the corpus. Judging from the results of the data analysis, there are three frequently occurring modals in the corpus, namely (i) "will," (ii) "can," and (iii) "should." Let us discuss them in more detail.

The most frequent central modal in the corpus is "will" (see Table 2). Its occurrence is further illustrated by excerpts (5) and (6) below.

(7) *The Mayor's London Environment Strategy (May 2018) was one of the first plans of any world city to be compatible with the highest ambition of the Paris Agreement. It*

commits London to being a zero carbon city by 2050. It sets out the actions the Mayor ***will*** *take, within his powers, to get there as soon as possible.* (GLA, 2018a: 5)

(8) *Understanding these different pathways has enabled us to set an ambitious emissions pathway in line with the IPCC recommendations. It* ***will*** *see London reduce its emissions by 60 per cent on 1990 levels by 2030 and by nearly 80 per cent by 2040.* (GLA, 2018a: 9)

Setting aside the discussion of the pragmatic roles of "will" for now (see subsection 3.3 further in the article), we can argue that the frequent occurrence of "will" is explicable by the planning phase of the GLA's climate change reports. Specifically, the GLA's climate change strategy consists of its commitment to reduce greenhouse gas emissions (i.e., net zero) by 2050, as shown in (5). Additionally, the GLA's climate change strategy involves several intermediate targets to be met by 2030 and 2040, as illustrated by (6). Apparently, the GLA's future-oriented reports that roll out operational activities up to 2050 necessitate a rather frequent use of the modal "will" to denote futurity.

Another explanation of the high frequency of "will" in the corpus can be accounted for by the contention that climate scientists are certain of the need to cut the emissions by 2050 (Collins & Nerlich, 2016; Warren et al., 2024). Conceivably, their certainty is manifested by the high frequency of "will" in the corpus. Additionally, the highly frequent occurrence of "will" can be explained by one of its meanings that refers to what is reasonable to expect and can be paraphrased as a reasonable inference (Palmer, 1990). This contention finds support in a number of prior studies (Aiezza, 2015; Juliansyah et al., 2020) that report that modality in sustainability- and climate change-related discourses is most frequently expressed by "will." The literature suggests that "will" renders scientific certainty in conjunction with offsetting the negative consequences of climate change (Kapranov, 2023, 2024c; Wu & Wang, 2025).

Following "will," "can" is the second frequently occurring modal verb in the corpus. Excerpts (9) and (10) show how "can" is employed in the GLA's climate change reports.

(9) *This study aims to provide further insights into the possible 2050 outcomes, by identifying policies, programmes and decisions that* ***can*** *drive the transition. It is also critical to understand key actions and decisions to be taken in the near term to ensure London* ***can*** *meet its climate goals, including potential requirements for the safeguarding of land or assets.* (GLA, 2018b: 13)

(10) *Finally, in cities with extensive heat networks, such as Gothenburg, city planning or heat zoning has commonly played an effective role in creating efficient district heating systems with high connection rates. Within heat network zones, connection policy* ***can*** *ensure that the majority of consumers connect to the heat network in the long run, including existing domestic buildings.* (GLA, 2018b: 19)

Presumably, the high frequency of "can," as shown by excerpts (9) and (10) above, could be interpreted by the need to convey physical possibility and the ability of the subject that are associated with the implementation of climate change-related actions and measures. Arguably, a relatively high frequency of "can" in the corpus is accounted for by one of the meanings of "can" that denotes what one can do or what possibly will be implemented (Palmer, 1990). Given that the GLA's reports involve a range of "to-do" activities to offset the climate crisis, the high occurrence of "can" is logical and even

expected. The high occurrence of "can" provides direct support to the studies conducted by Kapranov (2024c, 2024d) and Wu and Wang (2025), who demonstrate that "can" is rather actively used in the written mode of climate change discourses. It should be noted that we will return to the discussion of the frequency of "can" in section 3.3 of the article, in which we will dwell upon its pragmatic roles.

The third most frequent modal in the corpus is "should" (see Table 2). Its occurrence is emblematised by excerpts (11) and (12) below.

(11) *Boroughs and waste authorities* ***should*** *identify sites which are potentially suitable for a variety of technologies, depending on the particular site's opportunities and constraints, and assess how many facilities and what type of waste processing facilities/technologies will be required locally to meet their apportionments.* (GLA, 2011: 167)

(12) *Waste processing facilities, including materials recycling facilities and depots, inert waste recycling plants, composting facilities, waste treatment and energy recovery facilities, and reprocessing of recyclables,* ***should*** *be well designed. They need not be bad neighbours and could be a source of new products and new jobs. They* ***should*** *be developed and designed in consultation with local communities, taking account of health and safety within the facility, the site and adjoining neighbourhoods. Energy recovery* ***should*** *be carried out through advanced conversion techniques, i.e. gasification, pyrolysis or anaerobic digestion, or any combination of these.* (GLA, 2011: 168)

It could be posited that the high frequency of "should" in the corpus is accounted for by the fact that the reports' authors express cautiousness, as seen in (9) and (10). Accordingly, we may claim that the reports' cautious and carefully worded passages facilitate the need to employ "should," which, as a result, occurs rather profusely in the corpus. It follows from (11) and (12), for instance, that "should" is used in its meanings of mild obligation and indication of an expected and/or desirable state (Palmer, 1990). In (11) and, particularly, in (12), we observe situations in which the GLA prescribes a course of climate change-related actions in a mild and careful manner.

Indeed, the GLA could have employed "must" in (12) instead of "should" to show its resoluteness that mandates a very concrete course of action. However, as we notice in (11) and (12), the use of "should" dampens the main message of conducting a set of climate actions. Presumably, "should" conveys a reading of both (11) and (12) that suggests that there is a degree of flexibility in the execution of climate change-related plans. Perhaps the aforementioned contention could explain the high frequency of "should" in the corpus.

Finally, it should be emphasised that a relatively high frequency of "should" is a novel finding in climate change-related discourses. In particular, Fløttum (2010, 2014), as well as Fløttum and Dahl (2012), do not report the high occurrence of "should" in their studies. Furthermore, neither Kapranov (2024c, 2024d) nor Wu and Wang (2025) demonstrate that "should" is frequently found in climate change discourses.

3.3. *The discussion of RQ 2: The pragmatic functions of hedging, boosting, and fact-stating*

Prior to discussing the pragmatic roles of the most frequent modal verbs (i.e., "will," "can," and "should"), let us note that there is a high percentage (44.0% or N = 2680) of the modals that are associated with hedging in the present corpus. Judging from the data analysis, hedging in the corpus is represented by "could," "may," "might," "should," and "would." A substantial presence of hedges in the corpus lends direct support to Fløttum (2010, 2014), who maintains that the discourse on climate change is typically related to the types of modality that render cautiousness, tentativeness, and a perceptible lack of assertion. Furthermore, these findings bolster the prior studies by Fløttum and Dahl (2012), Aiezza (2015), and Wu and Wang (2025), who report that hedging in climate change discourses is typically manifested by "may," "might," "should," and "would." To reiterate, the present findings are in line with the literature, which emphasises that modal verbs are employed in the discourse on climate change, predominantly, as the pragmatic means of hedging.

As already stated in section 3.2, "should" is one of the most frequently occurring modals (see Table 2) whose pragmatic role is associated with hedging. Its pragmatic role, apparently, is conditioned by the GLA's strategy to present its climate change reports in a balanced manner, which shows (i) confidence and certainty of planned actions expressed by "will" on the one hand and (ii) the deliberate lack of assertiveness and outward pugnacity conveyed by "should" on the other hand. Indeed, the pragmatic use of "should" in the corpus is strategically embedded into the fabrics of the GLA's climate change reports to ward off the stakeholders' negative perceptions of the GLA's climate change-related actions and plans. This line of reasoning is illustrated by experts (11) and (12) in the preceding section of the article. To reiterate, both (11) and (12) deal with the measures aimed at waste management as a means of reducing the climate crisis. The measures, however, are formulated in such a way that they do not sound as a hard-and-fast obligation. Let us consider a hypothetical clause, which conveys a strong obligation by means of the deontic "must" in (a) and compare it with its milder version in (b), which uses the modal verb "should:"

(a) **Measures of energy recycling must** be carried out through advanced conversion techniques.
(b) **Measures of energy recycling should** be carried out through advanced conversion techniques.

Obviously, the use of "should" in (b) is suggestive of a mild obligation, whereas "must" in (a) is indicative of a strong compulsion to act in a certain way only. As indicated by (11) and (12), the GLA chooses a milder and more tentative tonality (i.e., "should") in communicating its climate measures. As already stated in section 3.2, the GLA's strategy consists of staving off a confrontational and rigid use of language, which is manifested by "must." Instead of creating tensions with its stakeholders, the GLA employs "should" as a hedge, which comes across in a less assertive manner. Presumably, by means of balancing tentativeness, which is manifested by "should" and certainty, which is rendered by "will," the GLA seeks to create a positive image in the eyes of its stakeholders. This contention is evocative of the study conducted by Aiezza (2015), who

suggests that modality is pivotal in communicating the corporate ethical image, as well as in creating a positive image of the corporate actor.

Having elucidated the pragmatic role of "should," we will direct our discussion to "will" as the most frequent modal verb in the GLA's reports on climate change. From the standpoint of pragmatics, "will" in the corpus seems to be involved in (i) boosting, as well as (ii) neutral fact-stating or expressing pure futurity without any additional connotations. We will examine these pragmatic roles in more detail. As far as the pragmatic role of boosting is concerned, "will" is employed in the corpus in order to manifest commitment and certainty, as exemplified by excerpt (7).

Indeed, as excerpt (7) shows, the GLA "commits London to being a zero carbon city by 2050. It sets out the actions the Mayor will take, within his powers, to get there as soon as possible" (GLA, 2018a: 5). The GLA's commitment and certainty in its climate change-related policies resonate with the choice of "will," which in (7) acquires a touch of reassurance and sends a positive signal to the stakeholders. Presumably, "will" in (7) suggests that the GLA and, particularly, the Mayor of London are focused on doing everything in their power to reach the target of net zero. Consequently, we may argue that "will" in (7) is pragmatically employed as a booster.

In addition to its role as a booster, "will" is also used in the corpus as a pragmatic means of neutral fact-stating. The pragmatic role of fact-stating is emblematised by excerpt (13) below.

(13) *All our pathways to zero carbon in 2050 rely on a high level of energy efficiency building retrofits by 2030. Only 35 per cent of homes currently achieve adequate energy efficiency performance (EPC C or above) and many **will** still be in use by 2050.* (GLA, 2018a: 11)

In (13), arguably, "will" is used as a modal verb of futurity without any additional connotations. In fact, we may contend that "will" in (13) renders a fact rather than an assertion or an expression of certainty.

Similar to the pragmatic role of "will" as a booster, "can" in the corpus partakes in strengthening claims to express certainty. In other words, the pragmatic role of "can" in the corpus could be ascribed to boosting. The pragmatic role of "can" as a booster is exemplified by excerpts (5) and (9). Namely, in excerpt (5), we encounter the boosting role of "can," which is evident from its contextual surroundings, e.g. "We **can** all play a part" (GLA, 2018a: 32).

However, in contrast to the pragmatic role of "can" as a booster, we may distinguish its role as a pragmatic means of neutral fact-stating, as encapsulated by excerpt (14) below.

(14) *There are many actions that Londoners **can** take. Here are some of the most important: Get an Energy Performance Certificate (EPC) assessment to see how best to improve your home. As landlords you should adhere to Minimum Energy Efficiency Standards, bring poorly performing buildings up to a higher rating and develop a plan to improve all your stock. Explore whether your home is suitable for solar and/or electricity storage installations. Look at installing a low carbon heat technology so you **can** benefit from the Renewable Heat Incentive.* (GLA, 2018a: 35)

In (14), we encounter the pragmatic role of "can" that rests on Palmer's (1990) dynamic possibility and does not seem to exhibit assertiveness and/or amplification. Accordingly, we may argue that the pragmatic role of "can" in (12) is related to neutral fact-stating.

4. Conclusions

The present paper focuses on the frequency and pragmatic roles of the central modal verbs in the corpus of reports on climate change by the GLA. The quantitative analysis has revealed that the most frequent modals in the corpus are (i) "will," (ii) "can," and (iii) "should." Summarising the findings, we should explain why these particular modals matter for climate communication.

First, the relevance of the findings is evident from their alignment with a range of prior studies, which demonstrate that "will," "can," and "should" constitute a recurrent leitmotif in climate change discourses. Furthermore, they could be argued to represent a staple in the manifestations of modality in climate change discourses, at least as far as the Anglophone discourses on climate change are concerned.

Second, the qualitative findings of the paper reveal that nearly half of all the modals in the GLA's reports on climate change convey the pragmatic role of hedging. One of the hedges, the modal "should" is among the most frequently occurring modal verbs in the corpus of the GLA's reports on climate change. These findings are interpreted in the paper as the pragmatic strategy of the GLA to employ modality in its climate change discourse in such a way that it is indicative of a non-assertive and, perhaps, non-aggressive and tentative discursive tonality of its reports on climate change.

Third, the qualitative analysis has unpacked the boosting pragmatic roles that are played by the modal verbs "will" and "can," respectively. Boosting, however, is not the only pragmatic role that "will" and "can" perform. Specifically, they have been found to convey a neutral fact-stating role in the GLA's reports on climate change.

We hope that the aforementioned findings may provide a range of pedagogical implications. For instance, the findings may be used in an ESP course that is climate change-related. Furthermore, the findings of the study may be adopted in an ESP writing class that focuses on report writing. Additionally, the present findings could be of use to discourse specialists, as well as speechwriters, who specialise in climate change communication.

Whilst the study has produced novel findings, we emphasise that it has a number of limitations. First of all, the corpus of the study is limited to the GLA's climate change reports. It would be desirable in future studies to compile a corpus of texts that pertain to other genres of climate change discourses by the GLA, for instance, blogs and news releases. Secondly, the study is confined to the written mode of climate change communication. It would be advisable to conduct a series of interviews with the GLA's climate team in order to collect and analyse a corpus of oral statements on the GLA's climate strategy.

Finally, we should note that the findings of the present study may be used to suggest topics for future research on climate change discourses. Conceivably, we may suggest conducting a study on modality in corporate climate change reports by the major fossil fuel corporations in the Anglophone world. Additionally, we may suggest a contrastive study on modality in climate change reports by the GLA and analogous reports by a major American city. Also, a contrastive study on modality in climate change reports by the GLA and similar reports produced by the authorities of a non-Anglophone city would be of potential interest to discourse researchers and climate change scientists.

Primary sources

https://www.london.gov.uk/

References

Aiezza, Maria Cristina (2015). "We may face the risks"…"risks that could adversely affect our face." A corpus-assisted discourse analysis of modality markers in CSR reports. *Studies in Communication Sciences 15*(1): 68–76. https://doi.org/10.1016/j.scoms.2015.03.005

Anthony, Laurence (2022). *AntConc Version 4.0.11.* Tokyo: Waseda University.

Bailey, Adriana, Lorine Giangola, Maxwell T. Boykoff (2014). How grammatical choice shapes media representations of climate (un)certainty. *Environmental Communication 8*(2): 197–215. https://doi.org/10.1080/17524032.2014.906481

Bergman, Noam (2014). Climate camp and public discourse of climate change in the UK. *Carbon Management 5*(4): 339–348. https://doi.org/10.1080/17583004.2014.995407

Bhatia, Vijay K. (2008). Towards critical genre analysis. Bhatia, Vijay, John Flowerdew, Rodney H. Jones, eds. *Advances in Discourse Studies*. London: Routledge, 166–177. https://doi.org/10.4324/9780203892299

Boykoff, Maxwell T., Ravi S. Rajan (2007). Signals and noise: Mass-media coverage of climate change in the USA and the UK. *EMBO Reports 8*(3): 207–211. https://doi.org/10.1038/sj.embor.7400924

Carvalho, Priscilla, Catalina Spataru (2023). Gaps in the governance of floods, droughts, and heat-waves in the United Kingdom. *Frontiers in Earth Science 11*: 1–15. https://doi.org/10.3389/feart.2023.1124166

Chen, Chun (2025). Analyzing personal pronouns and modality in TED talks on food system sustainability. *Crossroads. A Journal of English Studies 49*(2): 26–46. https://doi.org/10.15290/CR.2025.49.2.02

Collins, Luke Curtis, Brigitte Nerlich (2016). How certain is 'certain'? Exploring how the English-language media reported the use of calibrated language in the Intergovernmental Panel on Climate Change's Fifth Assessment Report. *Public Understanding of Science 25*(6): 656–673. https://doi.org/10.1177/0963662515579626

Copus, Colin (2013). London government: Problems, perspectives and power. *Hrvatska i komparativna javna uprava: časopis za teoriju i praksu javne uprave 13*(3): 803–820.

Cretella, Agnese (2025). From policy to practice: Tracing the evolution of urban food policies across London and Rotterdam. *Urban Planning 10*: 1–21. https://doi.org/10.17645/up.9575

Dvořáková, Eva (2023). To use or not to use shall: Current debate on shall in legal texts. *Studie z aplikované lingvistiky 14*(1): 7–29.

Fløttum, Kjersti (2010). A linguistic and discursive view on climate change discourse. *ASp. la revue du GERAS 58*: 19–37. https://doi.org/10.4000/asp.1793

Fløttum, Kjersti. (2014). Linguistic mediation of climate change discourse. *ASp. la revue du GERAS 65*: 7–20. https://doi.org/10.4000/asp.4182

Fløttum, Kjersti, Trine Dahl (2012). Different contexts, different "stories"? A linguistic comparison of two development reports on climate change. *Language & Communication 32*(1): 14–23. https://doi.org/10.1016/j.langcom.2011.11.002

Garzone, Giuliana (2013a). Modality and performativity in legislative texts: The case of shall. In Poppi, Franca Winnie Cheng, eds. *The Three Waves of Globalization: Winds of Change in Professional, Institutional and Academic Genres*. Newcastle upon Tyne: Cambridge Scholars Publishing, 94–122.

Garzone, Giuliana (2013b). Variation in the use of modality in legislative texts: Focus on shall. *Journal of Pragmatics 57*: 68–81. https://doi.org/10.1016/j.pragma.2013.07.008

Greater London Authority. (2011). *Chapter 5: London's response to climate change*. In *The London Plan: Spatial development strategy for Greater London (2011 Edition)*. https://www.london.gov.uk/programmes-strategies/planning/london-plan/past-versions-and-alterations-london-plan/london-plan-2011

Great London Authority (2018a). *Zero Carbon London: A 1.5ºC Compatible Plan*. Available at https://www.london.gov.uk/sites/default/files/1.5_action_plan_amended.pdf

Great London Authority (2018b). *London's Climate Action Plan: WP3 Zero Carbon Energy Systems Report for Greater London Authority & C40 Cities*. Available at https://www.london.gov.uk/ programmes-strategies/environment-and-climate-change/climate-change/zero-carbon-london/pathways-net-zero-carbon-2030

Hassan, Inas H. (2022). Investigating modality in policy texts: Corpus-assisted critical discourse analysis of modals in the 2030 Agenda for Sustainable Development. *Textual Turnings: An International Peer-Reviewed Journal in English Studies 4*(1): 28-49. https://doi.org/10.21608/ttaip.2022.277139

Hodson, Michael, Simon Marvin, Harriet Bulkeley (2013). The intermediary organisation of low carbon cities: a comparative analysis of transitions in Greater London and Greater Manchester. *Urban studies 50*(7): 1403–1422. https://doi.org/10.1177/0042098013480967

John, Jamie, and Guillermo Rein (2025). Heatwaves and firewaves: The drivers of urban wildfires in London in the summer of 2022. *Fire Technology 61*: 3451–3460. https://doi.org/10.1007/s10694-025-01737-7

Juliansyah, Edfan, Lia M. Indrayani, Ypsi S. Soemantri (2020). Modal Verbs in the UN Secretary-general's Remarks on Climate Change. *Jurnal Ilmiah Langue and Parole 3*(2): 1–8. https://doi.org/10.36057/jilp.v3i2.398

Kapranov, Oleksandr. (2023). Modal verbs in English-medium research articles on the issue of climate change and health. *Acta Marisiensis Philologia 5*: 38–48. https://doi.org/10.2478/amph-2023-0084

Kapranov, Oleksandr (2024a). Between a burden and green technology: Rishi Sunak's framing of climate change discourse on Facebook and X (Twitter). *Information & Media 99*: 85–105. https://doi.org/10.15388/Im.2024.99.5

Kapranov, Oleksandr (2024b). The framing of King Charles III's climate change-related activities by the leading American and British mass media. *Philologia 22*(1): 53-73. https://doi.org/10.18485/philologia.2024.22.22.3

Kapranov, Oleksandr (2024c). Modality in climate change-related discourse by King Charles III. *ES Review. Spanish Journal of English Studies 45*: 31–59. https://doi.org/10.24197/ersjes.45.2024.31-59

Kapranov, Oleksandr (2024d). Modality in climate change and environmental discourse by Greenpeace Australia Pacific. *Studies in Linguistics, Culture, and FLT 12*(2): 9–32.

https://doi.org/10.46687/CRYR1521

Kapranov, Oleksandr. (2025). Chair's letter: Analysing discourse markers in BP's annual reports. *Lyuboslovie 25*: 193–209. https://doi.org/10.46687/SUOB1186

Kendon, Elisabeth J., Erich M. Fischer, and Chris J. Short (2023). Variability conceals emerging trend in 100yr projections of UK local hourly rainfall extremes. *Nature Communications 14*(1): 1–14. https://doi.org/10.1038/s41467-023-36499-9

Kovats, Sari R., Shaskoor Hajat, Paul Wilkinson (2004). Contrasting patterns of mortality and hospital admissions during hot weather and heat waves in Greater London, UK. *Occupational and Environmental Medicine 61*(11): 893–898. https://doi.org/10.1136/oem.2003.012047

Palmer, Frank Robert (1990). *Modality and the English Modals*. London: Longman.

Pimlott, Ben, Nirmala Rao (2002). *Governing London*. Oxford: Oxford University Press.

Poole, Robert, Nicholas Hayes (2022). Stance in climate science: A diachronic analysis of epistemic stance features in IPCC physical science reports. *Journal of Corpora and Discourse Studies 5*: 37–60. https://doi.org/10.18573/jcads.100

Ribeiro, Vinicius De Tomasi, Ana Cristina F. Bertolini, Giulio Verdini, Rafael De Lucena Perini (2025). Strategies and sustainability in motion: An analysis of mobility and climate change policies in Greater London. *SSRN Papers*: 1–47. https://dx.doi.org/10.2139/ssrn.5192293

Sedlaczek, Andrea Sabina (2017). The field-specific representation of climate change in factual television: A multimodal critical discourse analysis. *Critical Discourse Studies 14*(5): 480–496. https://doi.org/10.1080/17405904.2017.1352003

Siders, Anne (2017). A role for strategies in urban climate change adaptation planning: Lessons from London. *Regional Environmental Change 17*(6): 1801–1810. https://doi.org/10.1007/s10113-017-1153-1

Somerville, Peter (2021). The continuing failure of UK climate change mitigation policy. *Critical Social Policy 41*(4): 628–650. https://doi.org/10.1177/0261018320961762

Warren, Lilly, Ayotunde Dawodu, Ayomikun Solomon Adewumi, Cheng Quan (2024). Can the UK deliver zero carbon ready homes by 2050? *Sustainability 16*(13): 1–24. https://doi.org/10.3390/su16135820

Wibig, Joanna, Joanna Jędruszkiewicz (2025). Has climate change affected the occurrence of compound heat wave and heavy rainfall events in Poland? *Sustainability 17*(10): 1–20. https://doi.org/10.3390/su17104447

Williams, Christopher (2013). Is legal English "going European"? The case of the simple present. *Canadian Journal of Linguistics/ La revue canadienne de linguistique 58*(1): 105-126.

Wu, Weizhong, Jingjing Wang (2025). A study on the modality of climate news discourse: The case of The New York Times. *Social Sciences and Humanities Open*: 1–29. https://dx.doi.org/10.2139/ssrn.5180222

Author's address

Oleksandr Kapranov

NLA University College

Campus Oslo

Linstows gate 3,

0166 Oslo, Norway

e-mail: oleksandr.kapranov@nla.no