

Supporting Information

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Understanding the Use of Carbon Credits by
Companies: A Review of the Defining Elements of
Corporate Climate Claims

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Supporting Information

Supporting Information 1 – Review Methods

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The analysis presented in this paper is underpinned by a review exercise aiming to synthesize insights into what it means for corporate climate claims to be (in)commensurate with global climate mitigation efforts, the risks that emerge when claims are incommensurate with their impact, as well as the associated governance and research gaps. To ensure that we capture relevant recent scholarship on this rapidly evolving topic, our review strategy comprised both a systematic component and elements of an expert review.

The search strategy guiding the systematic component of our review was designed in an iterative manner. To ensure the quality of results retrieved, the lead author explored different combinations of search terms, which were subsequently discussed among the author team. Using the final set of search strings presented in Table S1, Web of Science was searched to retrieve a total of 91 academic articles published between 01-01-2018 and 27-03-2022. A complete overview of all 91 articles is presented in Supporting Information 2.

Table S1: Overview of the number of articles retrieved during the systematic component of our review, for each combination of search terms, including duplicates.

Search terms	“Net Zero”	“Carbon Neutral”	“Claim*”	“Corporate Social Responsibility”
+ “Carbon credit*”	4	6	8	2
+ “Carbon market*”	8	7	11	3
+ “Carbon offset*”	19	26	12	7

Each of these 91 articles were screened by two authors in parallel to check whether they met our inclusion criteria. The authors met on a weekly basis to discuss the screening process and

doubts as they emerged. We included in our review English-language, peer-reviewed articles that explicitly discussed the use of carbon credits in climate claims made by companies and other organizations (Table S2). This included both articles that offered a holistic appraisal or critique of corporate carbon claims and offsetting using voluntary carbon credits, as well as articles that zoomed in on the specific contexts wherein corporate carbon claims are made, such as net-zero housing, voluntary offsetting of flight emissions by passengers, and carbon neutral universities. We excluded from our review articles that offered a solely supply-oriented perspective on the generation of carbon credits in the voluntary carbon market, such as articles discussing (the credibility of) carbon offset generation methodologies, as well as articles discussing the marketing of claims made by carbon credit projects.

Table S2: Overview of the inclusion- and exclusion criteria applied to the systematic component of our review.

Dimension	Inclusion criteria	Exclusion criteria	Decision-base
Duplicates	-	Always remove	Duplicates obtained from two or more search strings were identified through Zotero and removed with the “merge” command.
Peer review	Peer reviewed journal articles	All other types of documents, including journal articles that have not been peer reviewed, reports, conference proceedings, newspaper articles, books, book chapters, blogs, and dissertations.	The first pages of documents were screened to confirm whether they concern a journal article, followed by a Google search to confirm peer review status as necessary.
Language	English	All other languages, including French, Spanish, and German.	Documents were screened to confirm that the article is in English.
Topic	The use of carbon credits underpins	All other topics, notably: i) corporate climate	Titles, abstracts, and introductions were read

	climate claims made by companies and other organizations	claims that do not involve the use of carbon credits and ii) discussions on the voluntary carbon market and carbon credits that do not reflect on their use in corporate climate claims.	to confirm that articles are on a relevant topic. When unsure whether article meets criteria, this was discussed with coauthors.
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When unsure whether article meets criteria, this was discussed with coauthors.

After an initial screening of the 91 retrieved articles, 18 articles were preliminarily found to meet our inclusion criteria and were read in their entirety by at least two authors. During this parallel reading process, one article was found to not meet our inclusion criteria and was therefore removed from the review. The remaining 17 articles were each read and coded by two authors, using the coding strategy in Table S3.

The codes extracted from the 17 systematic review articles were used as the basis for drafting the results section and served as a primary input to our discussion and proposed classification. These results from the systematic review were complemented with insights from academic and grey literature that the authors were familiar with or which were referenced in the review articles, which we deemed to be relevant to our discussion of the use of carbon credits in corporate climate claims. In this way, elements of both a systematic review and an expert review of academic and grey literature enabled us to identify three defining elements of corporate climate claims that involve the use of carbon credits, such as to propose a preliminary categorization of these claims and offer insights for their governance.

Table S3: Overview of codes used during the full reading of included articles.

Research question	Codes	
	Written out	Shorthand
How are climate claims made by companies and other organizations	<ul style="list-style-type: none"> • Definition of claims 	DEF
	<ul style="list-style-type: none"> • Academic understanding of claims 	AC

understood?		
What is the role of carbon credits in corporate climate claims?	<ul style="list-style-type: none"> • Temporal scope of claims • Future commitment • Stated achievement 	TEMP TEMP_COM TEMP_ACH
	<ul style="list-style-type: none"> • Framing of claims • Net-zero • Carbon neutral 	FRAM FRAM_NZ FRAM_CN
	<ul style="list-style-type: none"> • Use of carbon credits in claims • Offsetting • Non-offsetting 	USE USE_OFF USE_NO
When is the use of carbon credits to achieve corporate climate goals aligned and commensurate with the claimed climate impacts?	<ul style="list-style-type: none"> • Quality criteria all corporate claims 	QUA_ALL
	<ul style="list-style-type: none"> • Quality criteria corporate climate claims 	QUA_CLI
	<ul style="list-style-type: none"> • Quality criteria relating to the temporal scope of claims • Future commitment • Stated achievement 	QUA_TEMP QUA_TEMP_COM QUA_TEMP_ACH
	<ul style="list-style-type: none"> • Quality criteria related to the framing of claims • Net-zero • Carbon neutral 	QUA_FRAM QUA_FRAM_NZ QUA_FRAM_CN
What are the risks involved in using carbon credits that are not aligned and commensurate with the claimed climate impacts?	<ul style="list-style-type: none"> • Greenwashing risk 	GW
	<ul style="list-style-type: none"> • Reputational risks 	RISK_REP
	<ul style="list-style-type: none"> • Litigation risks 	RISK_LIT
	<ul style="list-style-type: none"> • Regulatory risks 	RISK_REG

<p>What governance gaps remain around the use of carbon credits for making corporate climate claims?</p>	<ul style="list-style-type: none"> • Governance of claims 	<p>GOV</p>
<p>What research gaps remain around the use of carbon credits for making corporate climate claims?</p>	<ul style="list-style-type: none"> • Future research 	<p>FUTURE_RESEARCH</p>

Supporting Information 2 – Articles retrieved during the systematic review

Danick Trouwloon, Charlotte Streck*, Thiago Chagas, Glenpherd Martinus

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