

Determinants of climate change disclosure practices of global hotel companies: Application of institutional and stakeholder theories

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ABSTRACT

The purpose of this paper was to develop a theoretical model of climate change disclosure in the hotel industry that builds on stakeholder and institutional theories from the broader sustainability and carbon disclosure literature. A second aim was to develop a climate change disclosure index for the hotel industry and use it to empirically investigate climate change-related disclosure of 183 largest hotel companies in the world. Findings suggest that while several indicators were relatively well disclosed (e.g., within the strategy and policy dimensions), many others were rarely disclosed. The hotel company's listed status, presence of proprietary brands, CDP adoption and GRI adoption were found to be positively related to disclosure likelihood and extent of disclosure, confirming the role of stakeholder and institutional pressures in motivating hotel companies to disclose their climate change-related information, as proposed in the theoretical model. The study contributes to a greater understanding of observed variations in carbon reporting and formulates recommendations for carbon disclosure practices and policy development for the future.

1. Introduction

The last decade has seen unprecedented growth in understanding climate change (CDSB, 2019), leading to increased efforts to reduce greenhouse gas (GHG) emissions to combat global warming. The Paris Agreement adopted by the international community in 2015 calls for global commitment and collaboration in addressing climate change and sets high GHG emissions reduction goals (UNFCCC, 2015). Emissions reduction and climate resilience have been recognized as a Sustainable Development Goal (SDG 13) in the 2030 Agenda for Sustainable Development. Concerning tourism, the UNWTO views the need to address GHG emissions as one of the sector's main challenges (UNWTO, 2019). In 2005, tourism contributed to climate change by emitting approximately 5 % of all human-made CO₂ emissions, with the accommodation sector responsible for 21 % of these tourism CO₂ emissions (UNWTO, 2008). The carbon footprint of global tourism increased by 3.3 % annually during 2009–2013, reaching about 8 % of global greenhouse emissions (Lenzen et al., 2018). Simultaneously, tourism is vulnerable to direct and indirect climate change impacts, such as water shortages, biodiversity loss, damage to assets, the decline in destination attractiveness, floods, tornados, and heatwaves (Scott, 2021; Scott et al., 2019).

Increased awareness of climate change issues has led to greater demand for GHG emissions measurement and carbon disclosure (UNFCCC, 2015). Several global carbon reporting frameworks and guidelines have been developed to facilitate measurement and reporting processes, such as the Global Reporting Initiative (GRI), CERES, and the CDP (formerly Carbon Disclosure Project). At the same time, a growing number of academic studies on carbon disclosure practices, determinants and outcomes have emerged (Hahn et al., 2015). As a result, considerable growth in the number of companies reporting their climate change performance has been observed, with 6937 companies reporting on such issues through the CDP in 2018. There is also evidence of increased environmental and carbon disclosure in tourism, although reporting levels and quality are relatively low (de Grosbois & Fennell, 2011). The tourism sector's response to climate change has been affected by the coronavirus pandemic, which had an unprecedented impact on tourism since early 2020, contributing to a projected 80 % decline in international tourism in 2020 and leading to significant losses in revenues, jobs and business closures (OECD, 2020). The pandemic exposed structural weaknesses of the sector and highlighted a need to build a more robust, more sustainable and resilient tourism. International organisations view recovery efforts as an opportunity to implement green strategies and policies that better balance the environmental, social and economic

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impacts of tourism (OECD, 2020). In particular, the UNWTO recommends implementing recovery plans that contribute to the Sustainable Development Goals (SDGs) and the Paris Agreement (UNWTO, 2020a). To meet these goals, the UNWTO calls for improved measurement and disclosure of CO₂ emissions from tourism operations, enhanced mitigation efforts and improvement of carbon removal (UNWTO, 2020b). However, the actual nature of the post-pandemic tourism recovery is highly debated (Higgins-Desbiolles, 2020; Lew et al., 2020), with some authors arguing that the post-pandemic recovery could trigger the sustainable transformation of tourism (Higgins-Desbiolles, 2020; Lew et al., 2020) and others pointing out that in some cases a commitment to sustainability and climate change response efforts could decline since the industry may prioritise rapid recovery and return to business as usual (Hall et al., 2020).

An example of low reporting levels is the hotel sector, which, according to the Sustainable Hospitality Alliance (2017), will need to reduce GHG emissions per room per year by 66 % by 2030 and by 90 % by 2050. Hotels are among the most vulnerable tourism businesses to climate change due to their high investments in fixed assets and limited flexibility as they cannot easily relocate their operations (Gössling, 2011; Su et al., 2013). The hotel sector's response to climate change is challenging due to its service-oriented nature, including a high degree of human involvement in operations and high visibility to stakeholders. The assessment of carbon emissions in the sector is further complicated by the sector's structure, characterised by the involvement of real estate investment funds, hotel management companies, property owners and brand owners. According to industry experts, although most energy usage and GHG emissions come from franchised hotels, these emissions have historically not been counted within most brands' inventories (Becken & Bobes, 2016). Global hotel companies with locations throughout the world also need to address different institutional contexts. As part of the tourism industry, the hotel sector increasingly faces growing stakeholder pressures, changing legal landscape, and growing climate change risks and significant barriers to decarbonisation (Gössling & Scott, 2018). Despite these factors, academic research addressing carbon disclosure in the hotel industry is scarce. Climate change-related issues are included in several studies on environmental or sustainability reporting in the hotel industry, but few papers exclusively focus on energy use and carbon reporting (de Grosbois & Fennell, 2011; Nelson, 2010) even though it is considered a significant gap in hospitality research (Chan & Hsu, 2016).

To address the complex nature of the global hotel sector, the purpose of this paper is to fill a gap in the literature by developing a theoretical model on climate change-related disclosure in the hotel industry that builds on stakeholder and institutional theories from the broader sustainability and carbon disclosure literature. First, climate change-related disclosure practices of hotel companies are conceptualised as an organisational response to legitimacy considerations shaped by institutional norms, stakeholder pressures and internal context, using the open system perspective. Secondly, the paper develops a climate change disclosure index for the hotel industry and empirically investigates climate change-related disclosure practices of 183 global hotel companies. Finally, the impact of institutional and stakeholder pressures on carbon disclosure is tested to identify disclosure determinants. The findings are interpreted using the proposed theoretical model. The study contributes to a greater understanding of observed variations in carbon reporting and formulates recommendations for carbon disclosure practices and policy development to help guide a sectoral response to climate change.

2. Hotel industry and climate change

Research on climate change and the hotel industry is rooted within the broader field of corporate social responsibility (CSR) research, investigating the role and responsibilities of business towards the environment and society. One of the more commonly used definitions of CSR

states that it 'encompasses the economic, legal, ethical and discretionary expectations that society has of organisations at a given point in time' (Carroll, 1979, p.500). It is often conceptualised as initiatives implemented by companies to reduce negative impacts and improve positive impacts. The extensive CSR research in the hotel industry provides insight into the development of green hotels (Butler, 2008), motivators and barriers for adopting eco-friendly practices (Best & Thapa, 2013), environmental management practices and their impact on performance (Tang et al., 2014), operators' environmental awareness (Bohdanowicz, 2006) and environmental communications and marketing strategies (Leonidou et al., 2013). Insights from CSR research allow for a better understanding of carbon management as a holistic sustainability management component. This body of literature focuses on issues such as energy use and its determinants in different types of individual properties (Bohdanowicz & Martinac, 2007), carbon footprint assessment and life cycle analysis (Filimonau et al., 2011; Hu et al., 2015), energy savings measures and practices (Beccali et al., 2009; Coles et al., 2016), the potential for GHG emissions reduction through greater use of renewable energy (Dalton et al., 2008), impacts of climate change on hotels (He et al., 2019), as well as hotel industry responses to climate change (Su et al., 2013). Findings from tourism CSR research suggest that in response to pressure from customers and the public, companies may engage in 'vener sustainability', characterised by the disconnect between communications and action (Weaver, 2007), where sustainable claims are not supported with implementation of corresponding initiatives and changes to companies' operations. Such corporate behaviour occurs in response to 'vener environmentalism' on the part of travellers who are unwilling to make substantive changes to their behaviour to protect the environment, despite expressing concern for it (Weaver, 2007).

In the past decade, the hotel industry has undertaken several studies to address climate change issues. In 2017, the Global Hotel Decarbonisation Report, published by the Sustainable Hospitality Alliance, investigated actions the sector should take to ensure future growth without increased carbon emissions (Sustainable Hospitality Alliance, 2017). Significant efforts were made to address the need for quality measurement and reporting on carbon emission. The Hotel Carbon Measurement Initiative (HCMI), developed in 2012 by the International Tourism Partnership (now the Sustainable Hospitality Alliance) and the World Travel and Tourism Council (WTTC) in partnership with KPMG and 23 global hotel companies, introduced a tool to calculate and communicate the carbon footprint of hotel stays and meetings consistently and transparently (Sustainable Hospitality Alliance, 2016). HCMI data is used by hotels participating in two primary hotel carbon benchmarking tools: the Cornell Hotel Sustainability Benchmark Index (CHSB), and the Hotel Footprinting Tool, providing participating hotels with a peer-based reference for analysing their carbon performance. The industry also explored the business case for carbon reporting, with Becken and Bobes (2016) arguing that carbon reporting can bring substantial benefits for travel and tourism companies.

Carbon accounting and disclosure practices are considered a critical element of climate change response and an essential component of CSR reporting, defined as the 'process of communicating the social and environmental effects of organisations' economic actions to particular groups within society and to society at large (Gray, Owen, & Adams, 1996, p.3). The literature on CSR reporting suggests that it can lead to multiple benefits, including greater customer satisfaction and loyalty, improved reputation, better efficiency, and better relations with stakeholders (Kim & Park, 2011; Sen & Bhattacharya, 2001). Despite the importance and potential benefits of carbon disclosure, there is little research on these practices in the hotel industry. Early studies found that this sector, in general, has been slow to engage in any form of environmental reporting (Chan, 2005). Several studies on environmental or sustainability reporting in the hotel industry include climate change-related issues as indicators or dimensions (Priego & Palacios, 2008; de Grosbois, 2012; Hsieh, 2012; Medrado & Jackson, 2016). In

their study of environmental reporting by EMAS-certified hotels in Spain, Priego and Palacios (2008) found that while 85.2 % of hotels in the sample reported total electric energy consumption, only 1.7 % provided information about GHG emissions in tons of CO₂ equivalents. In a study of corporate social responsibility reporting in the hotel industry, de Grosbois (2012) investigated disclosure of three climate change-related goals: mitigating the impacts of climate change and reducing GHG emissions, reducing energy consumption, and using renewable energy sources. The study found low levels of reporting on all three issues among the top 150 global hotel companies, with 18 % reporting commitment to address climate change and reducing GHG emissions and 12 % providing performance measurement concerning achieving this goal at the corporate level. Hsieh (2012) found that 32 % of the top 50 global hotel companies reported their carbon footprint reduction efforts. Medrado and Jackson (2016) found the highest percentage of lodging companies reporting energy consumption, energy conservation strategies, carbon footprint disclosures, efforts to reduce carbon footprint, GHG emission, disclosures and carbon offset programs.

Few papers explicitly focus on energy use and carbon reporting in the hotel sector (de Grosbois & Fennell, 2011; Nelson, 2010). Nelson (2010) studied 50 individual accommodation providers Eco-Certified by Ecotourism Australia and found that just under 50 % of the sample provided information about energy on their websites. Among those providers, the majority stated the goal of reducing energy consumption, but only one quarter described specific efforts to reduce the facility's energy. Nelson (2010) concluded that few of the accommodations were proactive in communicating to tourists about their energy strategies at the time of the study. de Grosbois and Fennell (2011) found that the industry's carbon footprint reporting was scarce and often suffered from unclear methodology and incomplete data. Both studies did not attempt to explain the disclosure practice through the lens of organisational and management theories.

3. Theoretical foundation

Several organisational and management theories have been used to explain differences in corporate sustainability reporting practices (Hahn & Kühnen, 2013) and climate change-related or carbon reporting practices more specifically (Daddi et al., 2018). However, in many of these studies, scholars have relied on specific theoretical reference points and fail to provide a holistic explanation of reporting practice, leading to calls for stronger theoretical considerations (Chan & Hsu, 2016; Hahn & Kühnen, 2013). In responding to this gap, we propose conceptualising climate change-related disclosure in the hotel industry using stakeholder, legitimacy and institutional theories and applying an open system view of an organisation. All these theories are well established and provide valuable insight into firms' carbon disclosure practices (Daddi et al., 2018; Comyns, 2016).

3.1. Stakeholder theory and legitimacy theory

Sociopolitical theories (Gray, Kouhy, & Lavers, 1995), including stakeholder theory and the closely related legitimacy theory, explain voluntary disclosure by companies as their effort to respond to social or political pressure from different stakeholders and society (Hahn et al., 2015). According to stakeholder theory, a company requires its stakeholders' support to ensure its long-term success (Roberts, 1992). As a result, companies adjust their activities to balance stakeholders' conflicting interests and demands (Ansoff, 1965). Stakeholder theory views sustainability disclosure as the primary mechanism used by companies to communicate their actions in response to stakeholder concerns around different issues, including sustainability (KPMG, 2005, 2008). Stakeholder theory has been applied to sustainability reporting in the hotel industry, focusing on identifying relevant stakeholders, stakeholder engagement, materiality determination, and response to stakeholder issues. These studies have found that reporting transparency is

low (Guix et al., 2018) and hotel groups often adopt reporting guidelines only symbolically, failing to embed stakeholder and materiality considerations into core business practices (Guix et al., 2019).

Legitimacy theory provides further insight by expanding stakeholder theory by focusing on the relationship between the organisation and society (Suchman, 1995). It defines legitimacy as "a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within the same socially constructed system of norms, values, beliefs and definitions" (Suchman, 1995, p. 574). It proposes that organisations strategically use corporate disclosure to convey a message to society that they are competent and responsible citizens to gain, maintain or restore legitimacy (Freedman & Jaggi, 2005). If an organisation does not comply with societal expectations and breaches the social contract, a legitimacy gap is created. As a result, sanctions may be imposed on the organisation, motivating managers to adopt legitimising strategies, e.g., increased public disclosure of information (Deegan, 2019) to close the gap.

Strategies for gaining legitimacy fall along a continuum from conformity to manipulation, where only symbolic actions are taken (Oliver, 1991). Legitimacy theorists emphasise the strategic focus of organisational legitimacy (Deegan, 2002), which assumes managerial control over the legitimisation process and views sustainability reporting as an essential tool to communicate with society (Morsing & Schultz, 2006). However, several authors have taken a more critical approach to legitimacy theory in recent years by pointing out that other social and institutional contexts, including regulative, normative and cultural influences, tend to be ignored (Deegan, 2019).

3.2. Institutional theory

According to institutional theory, all companies operate within specific institutional environments or organisational fields, defined as "those organisations that, in the aggregate, constitute a recognized area of institutional life" (DiMaggio & Powell, 1983, p. 143). The institutional environment includes regulative, normative and cognitive structures such as political and legal frameworks, guidelines, accepted norms of behaviour, or general belief systems in society (Scott, 1998). The resulting institutionalised rules, policies, patterns and programs are products of agents such as the state, professional groups, industry organisations, public opinion, and courts (Meyer & Rowan, 1977). Through institutional theory, corporate behaviour, such as carbon disclosure, can be explained as an action conducted by organisations to conform to standards, rules, and norms shared in the organisational field to gain institutional legitimacy (Meyer & Rowan, 1977). Institutionalised elements are incorporated into the organisational structure and processes through isomorphism. Isomorphism is a process through which organisations develop similar structures and characteristics because they operate under similar conditions (Scott, 1998). As a result, by incorporating rules within their structures and procedures, organisations within the field become more homogenous over time. Institutional theory proposes that companies that face similar institutional pressures will eventually adopt similar strategies and organisational practices to gain legitimacy (DiMaggio & Powell, 1983; Scott, 1998).

DiMaggio and Powell (1983) identified three mechanisms through which organisations change to conform with their institutional environments: coercive, normative and mimetic. The coercive mechanism occurs when an organisation adopts specific procedures to comply with the rules imposed by external forces. In contrast, the normative mechanism occurs when an organisation adopts procedures because they are considered superior and professionally correct. For example, normative pressures in the carbon disclosure context result from global or hotel industry-specific carbon disclosure standards, such as the GRI or guidelines developed by the World Business Council for Sustainable Development (WBCSD). The third mechanism, mimetic isomorphism, refers to the imitation of model organisations in the same field. Unlike the other two processes, this type is not triggered by coercive authority

or normative pressures but occurs in response to increased uncertainty. Mimicking successful peers in an uncertain environment allows an organisation to become legitimate faster with lower costs (DiMaggio & Powell, 1983). Meyer and Rowan (1977) further suggest that organisations responding to the institutional requirement may “decouple” their normative structure from the operational structure, resulting in disparities between policies and actual practice.

In the context of carbon disclosure, companies can follow different strategies. On one hand, disclosure may reflect actual performance; however, it may also be superficial, without any change in business practices, reflecting decoupling as conceptualised by institutional theory. Several previous studies on environmental disclosure observed that in the worst environmental performers, the choice and presentation of the data were manipulated to improve a company’s image (Cho et al., 2010). In the context of carbon disclosure, Talbot and Boiral (2018) found that some companies tend to use disclosure to present themselves positively by concealing information concerning the methodology and presenting an incomplete carbon balance by omitting selected emission sources. Therefore, although institutional theory proposes that companies in an organisational field will become more homogenous over time, the likelihood of isomorphism can be influenced by several factors, including an organisation’s position in the industry or its internal characteristics.

3.3. Theoretical model

For this study, a theoretical model is proposed based on institutional, stakeholder and legitimacy theories explaining carbon disclosure in the hotel industry. The model has four parts: the hotel company, its external environment, carbon disclosure strategy, and carbon disclosure outcomes (Fig. 1). The model views a hotel company from the open system perspective (Scott, 1998) as an organisation interacting with its environment. The open system perspective stresses the cycle of interdependence of organisations and environments, where organisations attempt to directly influence environments and vice versa (Scott, 1998). In the context of carbon disclosure, hotel companies implement carbon disclosure strategies to influence their stakeholders’ perceptions and gain legitimacy, while the stakeholders and institutional environments exert pressure on hotel companies to influence their carbon management and disclosure. The hotel company’s actions, and the environmental response, jointly shape the carbon disclosure outcomes, affecting the company and environmental expectations.

Hotel companies are part of the tourism supply chain that contributes significantly to GHG emissions. They operate in complex, diverse and interconnected environments, characterised by increasing concerns

about sustainability and climate change concerns. Following the institutional theory, the model recognises institutional disclosure pressures including coercive, normative and mimetic mechanisms as a critical component of the environment. Simultaneously, following the stakeholder theory, the model incorporates and prioritises stakeholder demands and pressures by noting that different hotel companies face different stakeholder pressures, leading to more variability in the carbon reporting practice than institutional theory alone would suggest.

The model proposes that environmental pressures on carbon disclosure strategy depend on these pressures and how the company perceives them and the company itself. As proposed by institutional and stakeholder theories, companies seek legitimacy; however, the actual actions undertaken to gain it will differ depending on its specific situation. Internal factors such as strategy, business model, culture, available resources and competencies, market position, the actual level of climate change-related activities and performance, and cost and benefit analysis affect a hotel company’s carbon disclosure strategy in response to environmental pressures. For example, if a company has poor carbon performance, the disclosure pressures and desire for legitimacy will likely result in symbolic actions and decoupling communications from reality ((Meyer and Rowan, 1977); Talbot & Boiral, 2018; Herold et al., 2019).

Depending on the interaction between the external pressures and the internal organisational factors, a hotel company shapes its carbon disclosure strategy, deciding whether to provide any disclosure and, if yes, what information to disclose and how. Based on the reporting frameworks of GRI and CDP and previous literature, it is proposed that the main dimensions of carbon disclosure include strategy and policy, risks and opportunities, GHG emissions targets, company-wide carbon footprint, GHG emission change over time, energy-related information, disclosure on emission reduction initiatives and disclosure quality.

Fig. 1 further illustrates that following the open system view of organisations, carbon disclosure strategy combined with the environmental response leads to carbon disclosure outcomes, either desired or undesired. For example, desired outcomes from the hotel company’s perspective may include increased legitimacy, reduced risk and uncertainty, positive stakeholders’ perceptions of the brand, increased brand value, financial gains, competitive advantage, or improved carbon management. On the other hand, carbon disclosure also contributes to stakeholders’ goals regarding improved access to information, fulfilment of their demands, and potential environmental benefits. However, if stakeholders perceive the disclosure as insufficient to meet their needs and expectations, the legitimacy gap is formed, and the company’s efforts may lead to undesired outcomes such as an accusation of greenwashing, regulatory action or liability issues.

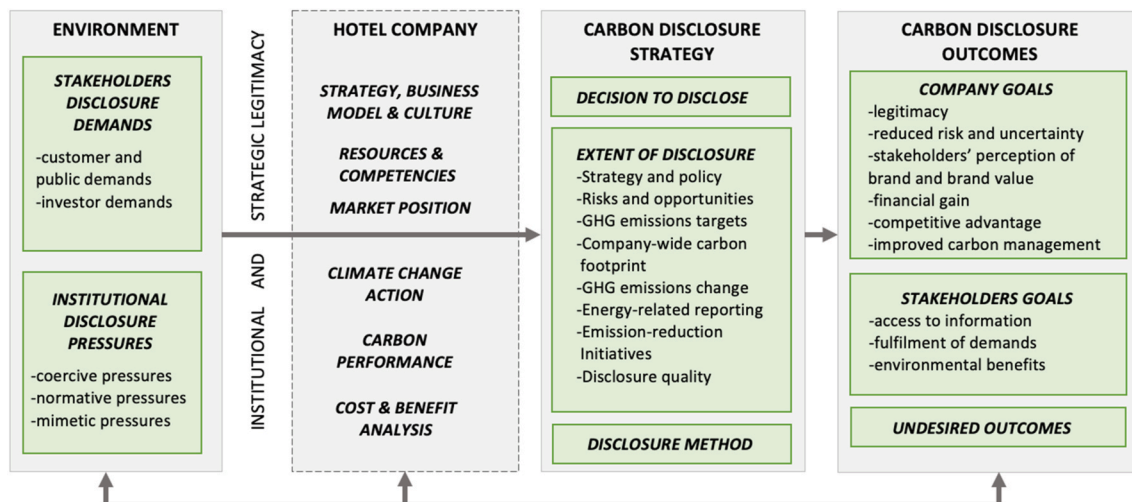


Fig. 1. A theoretical model of carbon disclosure.

4. Conceptual framework and development of research hypotheses

The current study focuses on the relationship between the environment and the carbon disclosure strategy, leaving the remaining relationships postulated in the model for further research. Specifically, to test the impact of stakeholder pressures on the hotel company’s carbon disclosure strategy, the study focuses on two groups of stakeholders: (1) customers and the public and (2) investors and shareholders. Pressure from customers and the public is captured by company size and the presence of proprietary hotel brands, while pressure from investors is captured by listed status and CDP participation. In order to test the role of institutional pressures, the study investigates normative pressures captured by GRI adoption. The constructs included in the present study and the proposed hypotheses are illustrated in the conceptual framework (Fig. 2), while the justification of variables and relationships is provided in the following section.

4.1. Company size

In order to capture the intensity of customer and public demands on carbon disclosure, company size was used as a proxy for organisational visibility, as established in previous studies (Choi, Lee, & Psaros, 2013). Larger companies undertake more activities, have larger-scale operations, make a more significant impact on society, and are more visible, attracting more scrutiny than smaller companies (Prado-Lorenzo et al., 2009). They also have a greater number of stakeholders they interact with who might be concerned with the company’s actions and face higher expectations regarding climate change efforts (Cormier et al., 2005). As a result, large firms are exposed to more significant stakeholder pressures and therefore are expected and motivated to provide quality voluntary disclosures to respond to stakeholders’ informational needs to gain legitimacy (Cho & Patten, 2007). It is also proposed that large companies have more available resources to meet the costs related to the preparation of comprehensive GHG emissions disclosures than smaller companies (Choi et al., 2013; Freedman & Jaggi, 2005; Prado-Lorenzo et al., 2009). Therefore, following the stakeholder theory, we propose the hypothesis:

H1: There is a positive relationship between company size and the likelihood of climate change disclosure.

4.2. Ownership of proprietary hotel brands

The second variable used to capture the intensity of customer and

public pressure on carbon disclosure is the ownership of proprietary hotel brands by the hotel company, used as a proxy for customer proximity. Since the 1990s, the hotel industry has experienced increased separation of ownership, operations and brand trademarks, where each of these aspects is controlled by different organisations (Roper, 2018). This process, referred to as vertical disintegration, created specialised firms, such as third-party management companies that do not have their brands but manage properties for real estate investment trusts or private equity owners under other brands through franchising agreements. We propose that customers’ pressure on hotel companies will be greater towards the companies that own proprietary hotel brands that customers recognise and associate with the services they purchase, as opposed to companies with lower customer proximity, such as pure hotel management companies, that customers may not even know are involved in delivering the services they purchase. Previous research in the context of other industries found that the closer the company is to the private end consumer, the more it engages in sustainability management and reporting (González-Benito & González-Benito, 2006; Haddock-Fraser & Tourelle, 2010) and produces CSR reports with higher transparency (Fernandez-Feijoo et al., 2014). The B2C (business to customer) companies, characterised by closer proximity to end consumers than B2B (business to business) companies, receive greater pressure from stakeholders (Haddock-Fraser & Tourelle, 2010) and are more frequently scrutinised on their corporate social responsibility efforts than business-to-business companies (Johnson et al., 2018) and therefore are more likely to report on sustainability.

Additionally, previous research indicates that companies are motivated to disclose their CSR efforts to customers in order to promote customers’ positive attitudinal and behavioural change towards the company’s brand and achieve a wide range of related business benefits, such as improved customer loyalty, brand preference, positive word-of-mouth, and ultimately higher profitability (Du et al., 2010; Liu et al., 2014; Akbari et al., 2020; Chung et al., 2020). Since ensuring customers’ favourable attitudes towards the brand is especially important for service industries, where strategic positioning and differentiation rely on more factors than just price and quality, hotel brand owners will be experiencing heightened pressure to meet customer disclosure demands or risk losing some of these customers. Given the vital role of customer proximity, stakeholder theory supports the proposition that companies with proprietary hotel brands would feel more substantial pressure from their customers and be more likely to respond with CSR communications than their counterparts. Therefore, the following hypotheses are proposed:

H2a: Hotel companies that own or lease proprietary brands are more

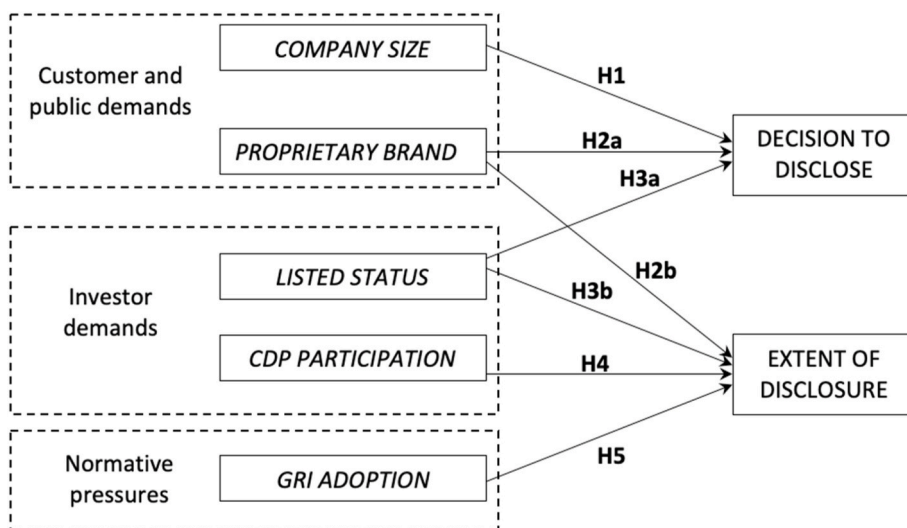


Fig. 2. Conceptual framework of carbon disclosure in the hotel industry.

likely to provide carbon disclosure than companies without proprietary brands.

H2b: Hotel companies that own or lease proprietary brands will have higher climate change disclosure scores than companies without proprietary brands.

4.3. Listing on the stock market/public ownership

In order to capture the intensity of investors' and shareholders pressure on carbon disclosure, listing on the stock market was considered. Shareholder theory proposes that shareholders pursue financial gains expressed as dividends and an increase in share price while wanting the company to operate at a reasonable level of risk. In light of shareholder theory, the company's only responsibility is to increase profits (Friedman, 1962) and ecological goals are secondary and relevant only if they contribute to the profit-maximisation goal. However, several authors argue that the changes in corporate ownership in recent years point to an emergence of a new type of institutional investor who has social motivations and interests more compatible with stakeholder theory (Ryan & Schneider, 2002; Ryan & Schneider, 2003). These modern institutional investors pursue social and financial goals (Ryan & Schneider, 2002) and increasingly demand high-quality information about corporations' exposure to climate change risks (Smith et al., 2008; Stanny & Ely, 2008).

From the stakeholder theory perspective, investors place high demands on companies to provide carbon disclosure to evaluate their risks regarding investment decisions (Khan et al., 2013). An absence of reliable and appropriate carbon information will create information asymmetry leading to greater uncertainty and investor interest loss. Since public listing leads to exposure to potential investors, it can significantly influence organisational efforts to reduce carbon emissions and engage in related carbon disclosures in response to pressures from these investors (Ryan & Schneider, 2003). As a result, companies seeking investor support and access to resources are under heightened pressure to provide carbon disclosure compared to privately held companies. Institutional theory also supports the positive relationship between public listing and carbon emissions reduction efforts and disclosures (Ryan & Schneider, 2003). From the institutional theory perspective, firms listed on a stock market are usually subjected to a set of standards and requirements established by securities authorities, often specifying the amount and type of information they are requested to provide to shareholders (Monteiro & Aibar-Guzmán, 2010). These regulations act as a source of coercive and normative pressures on firms motivating them to provide carbon disclosure.

Additionally, listed companies are more visible than their unlisted counterparts (Branco & Rodrigues, 2006) and face more stakeholder pressures to provide disclosure. Previous research found that listed status positively impacts the level of a company's environmental and social disclosure (Khan et al., 2013) and carbon disclosure specifically (Kiliç & Kuzey, 2019). Therefore, the following hypotheses are proposed:

H3a: Hotel companies listed on a stock market are more likely to provide climate change disclosure than non-listed companies.

H3b: Hotel companies listed on a stock market will have higher climate change disclosure scores than non-listed companies.

4.4. CDP participation

Stakeholder theory suggests that institutional investors represent a powerful and legitimate stakeholder group increasingly interested in corporate accountability related to climate change (Smith et al., 2008). The collective efforts of these stakeholders concerning climate change disclosure have been led by the CDP, which has become a 'secondary stakeholder' with significant ability to influence corporate climate change disclosure (Cotter & Najah, 2011). The CDP is a non-profit organisation that requests climate change-related information from

companies and makes it available to investors. CDP participation is a voluntary choice on the part of a company, and therefore it demonstrates its carbon risk awareness (Jung et al., 2018) and the willingness to respond to investor pressure to seek legitimacy (Cotter & Najah, 2011). According to stakeholder theory, high responsiveness to pressures of institutional stakeholders would result in a higher level of climate change-related disclosure. A previous study found a positive relationship between responsiveness to institutional investors, captured by CDP participation and a firm's carbon disclosure in a sample of large global companies (Cotter & Najah, 2011). Similarly, it is proposed in this study that hotel companies that participate in CDP demonstrate higher responsiveness to institutional investors and will provide higher levels of climate change-related disclosure than hotel companies that do not engage with CDP but still choose to report on climate change. Therefore, the following hypothesis is advanced:

H4: Companies participating in CDP have higher climate change disclosure scores than companies that choose not to engage in CDP activities.

4.5. GRI adoption

In order to capture the normative pressures affecting global hotel companies, GRI standards adoption was considered. The GRI guidelines were introduced in 2000 and revised several times to provide a standardised framework to ensure comparability and consistency of social and environmental reporting globally. Over the past two decades, the GRI framework's popularity has grown significantly, and it can be argued that it is the most widely adopted reporting framework worldwide (Bhattacharyya & Yang, 2019) and reporting according to it is *de facto* the standard and the norm in many industries (de Villiers & Alexander, 2014). In this way, GRI guidelines represent a normative system putting pressure on companies and motivating them to adopt the standardised reporting practices to maintain institutional legitimacy (Bebbington et al., 2009; Comyns, 2016). Standardisation of reporting will, in turn, lead to an increase in the quantity and quality of disclosed information (Kolk, 2003).

Furthermore, since reporting according to GRI is voluntary, hotel companies that choose to engage in it demonstrate higher responsiveness to normative pressures than their counterparts. In the context of carbon disclosure, these normative pressures will motivate companies to meet the requirements on GHG indicators' disclosure prescribed by the standard. Therefore, it can be expected that the magnitude of carbon disclosure would increase after the adoption of GRI guidelines as a reflection of normative pressures on disclosing companies. Previous research confirmed the positive relationship between GRI adoption and carbon disclosure in the context of oil and gas companies (Comyns, 2016). It is therefore proposed that hotel companies that follow the GRI Guidelines will be motivated to disclose more detailed climate change-related information than hotel companies that do not disclose according to GRI guidelines.

H5: Companies that produce their sustainability reports according to the GRI guidelines will have higher climate change disclosure than companies not using GRI guidelines.

5. Methodology

5.1. Sample selection

To test the hypotheses and meet our research objectives, we sampled 200 large global hotel companies listed in the 2020 Hotels Magazine ranking (Weinstein, 2020). For each company, its corporate website was identified, if available. Companies that did not have an English-language website (10 in total) were excluded from the sample. Additionally, companies were excluded from the sample if they were subsidiaries of other companies already represented in the sample (6 in total) or underwent a merger with another company represented in a sample (1

case), leaving a total sample of 183 hotel companies.

5.2. Data collection

Corporate websites for all companies were reviewed for climate change-related information and, if available, in the latest sustainability or environmental reports, annual and integrated reports, and other documents posted on corporate websites (e.g., CDP questionnaire responses if available on the corporate website). Since the unit of analysis was a hotel company, the study focused on corporate websites and did not consider the websites of individual hotel properties or hotel brands. Corporate websites are created to communicate corporate identities that companies claim for themselves (Esrock & Leichty, 2000) and have been used as sources of information on corporate disclosures in previous studies. In cases where a company created a separate website for its corporate CSR reports, such a website was included in the analysis. Data collection took place over one month (January 2021) to account for the fact that websites are dynamic and frequently updated. For every company, a parent company (if existed) was identified, and its website and reports were searched for any additional information applicable to the analysed company.

5.3. Measurement of variables

5.3.1. Carbon disclosure

Previous studies have used three main approaches to capture carbon disclosure (Hahn et al., 2015): binary variables measuring whether a company participates in a specific voluntary carbon disclosure scheme or not (Stanny, 2013); carbon disclosure scores provided by the CDP, which measure how completely a company answered the CDP questionnaire (Luo and Tang, 2014; Alsaifi, 2021); and carbon disclosure indices, with items based on disclosure frameworks and standards, such as CDP questionnaire (Choi et al., 2013), ISO 14061 standard (Rankin et al., 2011) or multiple frameworks and guidelines available (Haque & Deegan, 2010). The values of disclosure indices have been based in content analysis of company websites (e.g., Freedman & Jaggi, 2005) or environmental and sustainability reports (e.g. Comyns, 2016).

In order to quantify climate change-related disclosure, we followed the index approach by developing a list of climate change-related disclosure items based on the requirements of several reporting frameworks (the CDP questionnaire and GRI) and the review of previous studies using carbon disclosure indices (e.g., Haque & Deegan, 2010; Choi et al., 2013). In some cases, the indicators from previous studies were broken down to provide more detail (for example, the current study distinguishes between emissions reduction target, emissions intensity reduction target and targets for specific breakdowns such as by business unit, fuel type or business model). Additionally, hotel sector-specific indicators were developed and incorporated to reflect the unique nature of the hotel industry. The industry recommends sector-based approaches to carbon reporting because they facilitate meaningful metrics for comparisons (Becken & Bobes, 2016). We determined coding rules for each item and conducted a pilot study by checking ten hotel companies' websites to validate the applicability of the measurement tool. This process identified a limited number of other hotel-related climate change disclosure items, which were then incorporated into the list. The resulting disclosure index included 85 items, grouped into eight dimensions relevant to climate change disclosure: strategy and policy, climate change risks and opportunities, corporate GHG emissions targets, company-wide carbon footprint, GHG emissions change over time, energy-related reporting, implementation of climate change-related initiatives, and quality of disclosure. The categories and individual items are listed in Table 3. A detailed explanation of all the items is provided in the Appendix.

To assess GHG disclosure, we used content-analysis, commonly applied in carbon disclosure studies (e.g., Haque & Deegan, 2010; Kiliç & Kuzey, 2019). The scores were obtained by coding companies'

websites and any documentation available on these websites (e.g. annual reports, stand-alone environmental/sustainability reports). A binary variable was used (0 or 1, depending on whether the company disclosed the item on its corporate website or in a report or not) for each indicator to avoid issues with subjectivity (Prado-Lorenzo et al., 2009). Following Haque and Deegan (2010), we focused on the presence or absence of disclosure about a particular climate change-related aspect, not the actual performance. A total disclosure score was obtained for each hotel company by adding its values for all items (unweighted) in which no greater importance is given to any specific item of disclosure and then dividing it by the maximum possible disclosure score, resulting in the possible range of 0–1. A score for each dimension was calculated as the number of indicators within the dimension that a company reports on, divided by the number of the indicators in the dimension.

5.3.2. Independent variables

Hotel company size was captured as the natural logarithm of the number of properties managed, leased or owned in 2019. The remaining variables were all measured as binary. For the ownership of proprietary hotel brands variable, the company was coded 1, if it owned or leased proprietary brands. The decision was made based on the analysis of the websites and annual reports, if available. Companies engaged in hotel management services under other brands were coded 0. Each company's website was analysed for relevant information and verified against listings on different stock exchanges and industry news (Bloomberg News). When a hotel company was a subsidiary of a listed company, it was also coded as publicly owned (value = 1). The rationale was that if the parent company is publicly owned, the disclosure pressures hypothesised through stakeholder and institutional theories will apply to both the parent company and its subsidiaries. CDP participation was measured as a binary variable, where if a company or its parent company submitted a response to the CDP questionnaire, it was given a score of 1, otherwise 0. All companies' and their parent companies' CDP status were determined by searching for responses on the CDP website. Finally, GRI adoption was measured as a binary variable of (1) if a company published a sustainability report following GRI guidelines and (0) if it did not.

6. Results

6.1. Sample characteristics

The sample's hotel companies ranged in size from 4 to 45,600 hotel properties managed, leased or owned in 2019, with 90.2 % of them having less than 1000 hotels. Their portfolios had between 6714 rooms and 1,348,532 rooms. Geographically, the largest group of hotel companies had headquarters in the United States (36.6 %), followed by China (10.9 %) and Spain (9.3 %). All the remaining countries had less than ten observations in the sample (see Table 1).

Seventy (38.3 %) companies were listed on a stock market or were a

Table 1
Climate change disclosure: geographical breakdown.

Country	N	Sample proportion	CC reporters in the country (count)	CC reporters in the country (percentage)
USA	67	36.61 %	31	46.27 %
China	20	10.93 %	11	55.00 %
Spain	17	9.29 %	12	70.59 %
Japan	8	4.37 %	4	50.00 %
Singapore	8	4.37 %	5	62.50 %
England	5	2.73 %	4	80.00 %
France	5	2.73 %	3	60.00 %
Germany	5	2.73 %	2	40.00 %
India	4	2.19 %	3	75.00 %
Thailand	4	2.19 %	3	75.00 %
Other	40	21.86 %	26	65.00 %
TOTAL	183	100.0 %	104	56.83 %

subsidiary of a publicly listed company. Most companies (77.6 %) owned or leased proprietary hotel brands, while the remaining companies engaged in real estate investment, hotel management services under franchised brands or other services without ownership of proprietary brands. The hotel companies used a diversity of approaches to communicate their CSR efforts. While 72.7 % of the companies provided some CSR information on their website, 60.1 % had a dedicated CSR website section, 35.5 % published sustainability or integrated reports, 19.7 % published sustainability reports following GRI guidelines, and 13.7 % responded to the CDP climate change questionnaire (see Table 2).

6.2. The extent of climate change disclosure

The number of hotel companies reporting on each of the indicators is presented in Table 3. Additionally, Table 2 shows the percentage of the total sample reported on each indicator and the percentage of climate change reporters providing information on each indicator. The most-reported indicators, provided by 60 (32.8 %) or more companies, are: mentioning energy savings (100), commitment to reducing energy use (86), mentioning emission reduction (78), commitment to reducing GHG emissions (67), mentioning climate change (65), renewable energy use (64), and installing energy-efficient lighting (60). All these indicators are soft, qualitative indicators, with five of them requiring companies to either mention a concept in their communications or state a commitment to address an issue without verifying that any actual progress has been made. The remaining two indicators address the implementation of two popular energy-saving initiatives (renewable energy use and energy-efficient lighting). The least popular indicators, addressed by six or fewer companies, included GHG emissions target breakdowns, targets related to renewable energy use, Scope 1 and Scope 3 GHG emissions intensity, GHG emissions intensity breakdowns, product classified as low-carbon, carbon-neutral or carbon positive, providing GHG emissions for individual properties, and independent assurance of emissions or energy intensity. Most of these indicators are quantitative indicators, requiring companies to support their commitment with measurable targets and provide performance measures.

Over one-half of the hotel companies (n = 104; 56.8 %) reported some climate change-related information. These companies, referred to here as ‘climate change reporters’ (CC reporters), provided very diverse levels of detail regarding their climate change efforts and performance. The values of the climate change disclosure index for CC reporters ranged from 0.012 (1 indicator addressed) to 0.835 (71 indicators addressed), with the mean equal to 0.275 and a median of 0.200 (Table 4). The average scores for different dimensions of the climate change disclosure index ranged from 0.123 for the ‘corporate GHG emissions targets’ dimension to 0.639 for the ‘strategy and policy’ dimension. The two most disclosed dimensions were strategy and policy and emission-reduction initiatives, while the least reported dimensions were GHG emissions targets, corporate-wide carbon footprint and disclosure quality.

Table 2 Descriptive statistics.

Variable	Value	Frequency	Percent
Listed on a stock market	0.00	113	61.7 %
	1.00	70	38.3 %
Proprietary hotel brands	0.00	41	22.4 %
	1.00	142	77.6 %
Dedicated CSR website section	0.00	73	39.9 %
	1.00	110	60.1 %
Sustainability report	0.00	118	64.5 %
	1.00	65	35.5 %
GRI adoption	0.00	147	80.3 %
	1.00	36	19.7 %
CDP disclosure	0.00	158	86.3 %
	1.00	25	13.7 %

Table 3 Climate change disclosure by the hotel companies in the sample.

Disclosure item	Absolute freq.	Relative (%) out of total sample (N = 183)	Relative (%) out of CC reporters (N = 104)
STRATEGY AND POLICY			
Mentioning ‘climate change’	65	35.5	62.5
Mentioning ‘emission reduction’	78	42.6	75.0
Mentioning ‘energy savings’	100	54.6	96.2
Commitment to reduce GHG emissions	67	36.6	64.4
Commitment to reduce energy use	86	47.0	82.7
Sustainability policy	44	24.0	42.3
Environmental supply chain policy	25	13.7	24.0
CLIMATE CHANGE RISKS AND OPPORTUNITIES			
Recognition of climate change risks	41	22.4	39.4
Explanation of climate change risks	31	16.9	29.8
Discussion of climate change opportunities	11	6.0	10.6
Response to risks and opportunities	22	12.0	21.2
Assessment of financial implications of selected risks or opportunities	7	3.8	6.7
CORPORATE GHG EMISSIONS TARGETS			
Target of carbon neutrality	8	4.4	7.7
Commitment to or adoption of science based GHG emissions targets	15	8.2	14.4
Absolute GHG emissions reduction target	20	10.9	19.2
GHG emissions intensity reduction target	15	8.2	14.4
GHG emissions target breakdown	6	3.3	5.8
COMPANY WIDE CARBON FOOTPRINT			
Disclosure of total GHG emissions in absolute terms	42	23.0	40.4
Breakdown of total GHG emissions	12	6.6	11.5
Disclosure of Scope 1 GHG emissions	38	20.8	36.5
Breakdown of Scope 1 GHG emissions	16	8.7	15.4
Disclosure of Scope 2 GHG emissions	37	20.2	35.6
Breakdown of Scope 2 GHG emissions	12	6.6	11.5
Disclosure of Scope 3 GHG emissions	19	10.4	18.3
Breakdown of Scope 3 GHG emissions	12	6.6	11.5
Disclosure of GHG emissions intensity	37	20.2	35.6
Breakdown of GHG emissions intensity	6	3.3	5.8
Scope 1 GHG emissions intensity	5	2.7	4.8
Scope 2 GHG emissions intensity	7	3.8	6.7
Scope 3 GHG emissions intensity	2	1.1	1.9
GHG EMISSIONS CHANGE OVER TIME			
Comparison of absolute GHG emissions with previous year	44	24.0	42.3
Explanation of changes in absolute GHG emissions over time	26	14.2	25.0
Breakdown of absolute GHG emissions change	15	8.2	14.4
GHG emissions intensity change from last or base year	35	19.1	33.7
Breakdown of GHG emissions intensity change over time	9	4.9	8.7
GHG emissions saved due to a specific initiative	15	8.2	14.4
ENERGY-RELATED REPORTING			

(continued on next page)

Table 3 (continued)

Disclosure item	Absolute freq.	Relative (%) out of total sample (N = 183)	Relative (%) out of CC reporters (N = 104)
Energy-related targets	24	13.1	23.1
Total energy consumption	49	26.8	47.1
Breakdown of energy consumption	37	20.2	35.6
Energy consumption change over time	42	23.0	40.4
Breakdown of energy consumption change	22	12.0	21.2
Energy intensity	39	21.3	37.5
Breakdown of energy intensity	11	6.0	10.6
Energy intensity change over time	35	19.1	33.7
Breakdown of energy intensity over time	11	6.0	10.6
Targets related to renewable energy use	6	3.3	5.8
Renewable energy consumption	15	8.2	14.4
EMISSION-REDUCTION INITIATIVES IMPLEMENTATION			
Carbon offsetting or purchase of renewable energy credits	15	8.2	14.4
Investment in low carbon or energy R&D	23	12.6	22.1
Sustainable building construction and renovation process	51	27.9	49.0
Improving efficiency of everyday operations	77	42.1	74.0
Installing energy-efficient lighting	60	32.8	57.7
Heating and cooling systems improvements	54	29.5	51.9
High-efficiency equipment	38	20.8	36.5
Efforts to reduce transportation-related emissions	39	21.3	37.5
Renewable energy use	64	35.0	61.5
Customer engagement in emissions reduction	51	27.9	49.0
Employee engagement in emissions reduction	39	21.3	37.5
Supplier engagement in climate change efforts	33	18.0	31.7
Engagement with business partners on climate change	17	9.3	16.3
Participation in external collaborations on climate change	18	9.8	17.3
Targets related to specific initiatives	15	8.2	14.4
Performance-related to specific initiatives	40	21.9	38.5
Product classified as low-carbon, carbon-neutral or carbon positive	6	3.3	5.8
Properties certified to a recognized sustainability standard or label	43	23.5	41.3
QUALITY OF DISCLOSURE			
Boundaries for GHG emissions calculations are specified	42	23.0	40.4
The reporting period which the data covers is specified	55	30.1	52.9
GHG emissions data provided for the hotel business unit separately	49	26.8	47.1
GHG emissions or energy use is given for individual properties	4	2.2	3.8
Scope of total emissions is specified	34	18.6	32.7
Scope 2 emissions are specified as either location- or market-based	15	8.2	14.4
Both location- and market-based Scope 2 GHG emissions are reported	12	6.6	11.5
Inclusions of emissions sources for each scope are explained	29	15.8	27.9
Exclusions from GHG emissions calculations are explained	15	8.2	14.4
	26	14.2	25.0

Table 3 (continued)

Disclosure item	Absolute freq.	Relative (%) out of total sample (N = 183)	Relative (%) out of CC reporters (N = 104)
Targets have clearly stated base year, target year and target value			
Methodology for GHG emissions calculations is provided	28	15.3	26.9
Methodology for GHG emissions calculations follows global or national standards	27	14.8	26.0
External assurance statement in English is available	17	9.3	16.3
Independent assurance of Scope 1 emissions	14	7.7	13.5
Independent assurance of Scope 2 emissions	14	7.7	13.5
Independent assurance of Scope 3 emissions	8	4.4	7.7
Independent assurance of emissions intensity	5	2.7	4.8
Independent assurance of energy consumption	9	4.9	8.7
Independent assurance of energy intensity	5	2.7	4.8
Intensity measures address occupancy rates	22	12.0	21.2

Table 4

Dimensions of climate change disclosure for CC reporters.

Dimension	N	Min	Max	Mean	SD
Climate change disclosure index score	104	0.012	0.840	0.275	0.213
Strategy and policy	104	0.000	1.000	0.639	0.290
Risks and opportunities	104	0.000	1.000	0.215	0.310
Corporate GHG targets	104	0.000	0.800	0.123	0.209
Company-wide carbon footprint	104	0.000	0.692	0.181	0.229
Emissions change over time	104	0.000	1.000	0.231	0.286
Energy reporting	104	0.000	0.909	0.254	0.284
Climate change initiatives implementation	104	0.000	0.833	0.365	0.216
Quality of disclosure	104	0.000	0.900	0.207	0.251

6.3. Climate change disclosure determinants

A three-predictor logistic model was fitted to the data to test the research hypotheses regarding the relationship between the likelihood that a hotel company will disclose climate change-related information and three independent variables: listed status, ownership of proprietary hotel brands and company size. Logistic regression analysis was carried out using the SPSS® version 27. Descriptive statistics for binary variables are presented in Table 5, and estimation results for the logistic regression model are presented in Table 6.

The entire model was statistically significant (Likelihood Ratio test significant with a p-value<.000), indicating that the model distinguished between companies that reported climate change-related information and those that did not. Hosmer and Lemeshow test results indicated a good model fit. The model's pseudo-R square values were 0.284 for Cox and Snell R square and 0.381 for Nagelkerke R square

Table 5

Description of data for logistic regression.

Disclose climate change information?	Total sample (N)	Listed (n ₁)	Non-listed (n ₂)	Proprietary brands (m ₁)	No proprietary brands (m ₂)
Yes	104	62	42	94	10
No	79	8	71	48	31
Total	183	70	113	142	41

Table 6
Logistic regression analysis results.

Predictor	β	S.E. β	Wald's χ^2	df	p	e^β (odds ratio)	
Listed status (1 = listed, 0=nonlisted)	2.394	0.449	28.449	1	0.000	10.956	
Proprietary brands (1 = yes, 0 = no)	1.202	0.440	7.461	1	0.006	3.325	
Size	-0.177	0.127	1.926		0.165	0.838	
Constant	-0.561	0.680	0.681	1	0.409	0.570	
Test			χ^2	df	p		
Likelihood ratio test			61.053	3	.000		
Hosmer & Lemeshow			7.048	8	.531		

Note. Cox and Snell R = 0.276. Nagelkerke R = 0.370. All statistics reported herein use three decimal places in order to maintain statistical precision.

representing a good fit. The coefficients for listed status and ownership of proprietary hotel brands were positive and statistically significant, confirming Hypotheses 2a and 3a. According to the model, the log of odds of a hotel company deciding to engage in climate change disclosure was positively related to its listed status ($p < .05$) and positively related to its ownership of proprietary brands ($p < .05$) (Table 5). In other words, listed companies were more likely to disclose climate change information than non-listed companies. The odds of a listed company disclosing climate change information were 10.9 ($=e^{2.394}$; Table 5) greater than the odds for a non-listed company.

Similarly, companies that owned proprietary hotel brands were more likely to engage in climate change disclosure than companies without proprietary hotel brands. The odds of a brand-owning company disclosing climate change information were 3.22 ($=e^{1.202}$; Table 5) greater than the odds for a company without proprietary brands. The 95 % confidence intervals for both odds contained only values greater than 1, indicating that the odds of reporting on climate change were greater for listed companies and companies with proprietary hotel brands. The coefficient for company size was not statistically significant, indicating that a hotel company's likelihood to engage in climate change disclosure was not related to company size, rejecting Hypothesis 1. The model correctly classified 74.9 % of cases.

Table 7
Results of t-tests of climate change disclosure dimensions scores for CC reporters.

Variable	CC reporters mean N = 104	GRI reporters mean N = 36	Non-GRI reporters mean N = 68	CDP reporters mean N = 25	Non-CDP reporters mean N = 79	Publicly listed mean N = 62	Not-publicly listed mean N = 42	Brand owners mean N = 94	No-brand owners mean N = 10
Strategy and policy disclosure	0.639	0.853	0.525***	0.874	0.564***	0.733	0.500***	0.657	0.471
Risk and opportunities disclosure	0.215	0.428	0.103***	0.536	0.114***	0.339	0.033***	0.217	0.200
GHG emissions targets disclosure	0.123	0.278	0.041***	0.368	0.046***	0.187	0.029***	0.130	0.60
Carbon footprint disclosure	0.181	0.385	0.074***	0.412	0.108***	0.259	0.066***	0.182	0.177
GHG emissions change disclosure	0.231	0.486	0.096***	0.520	0.139***	0.347	0.060***	0.241	0.133
Energy-related disclosure	0.254	0.520	0.114***	0.462	0.189***	0.352	0.110***	0.257	0.227
Initiatives implementation disclosure	0.365	0.541	0.271***	0.520	0.316***	0.404	0.307**	0.372	0.294
Quality of disclosure	0.207	0.438	0.085***	0.536	0.103***	0.306	0.061***	0.209	0.190
Climate change disclosure index score	0.275	0.490	0.162***	0.521	0.198***	0.358	0.153***	0.280	0.227

Notes: This table presents disclosure scores for eight dimensions of the climate change disclosure index. Each dimension's disclosure score is equal to the total achieved score divided by the total available score. The last four columns present the average disclosure scores on each dimension for each group of firms. The significance levels presented in columns 3, 5, 7 and 9 are from a two-sample of Welch's variant of the t-test to test the difference between groups. ***, ** represent significance levels at 1 and 5 per cent, respectively.

6.4. Climate change disclosure comparisons

To test hypotheses H2b, H3b, H4 and H5, a series of independent-samples t-tests (the Welch's variant) were conducted. The t-tests were used instead of non-parametric tests, such as the Mann Whitney Wilcoxon test because the t-test is robust to deviations from a normal distribution (Krzywinski & Altman, 2014), while the rank-based methods are sensitive to departures from the assumption of the distribution shift model (Fagerland & Sandvik, 2009). Welch's variant of t-test was used since it is recommended for unequal sample sizes and unequal variances between the groups (Fagerland & Sandvik, 2009; Krzywinski & Altman, 2014). The dependent variables tested were: total climate change disclosure index score and individual scores for each index dimension. The grouping variables included: ownership of proprietary brands, listed status, CDP participation and GRI reporting adoption. Table 7 presents the results of the conducted tests. The differences between the means were significant for all dimensions of the climate change disclosure index for three independent variables: listed status, CDP participation and GRI reporting adoption. These results indicate that publicly-listed companies disclose more information than non-listed companies, supporting Hypothesis 3b. Similarly, GRI users' average disclosure scores are higher than non-GRI users, confirming Hypothesis 5. Finally, the average disclosure score for CDP participants is 0.521, while it is only 0.198 for non-CDP participants, with the Welch t-test confirming Hypothesis 4. The tests did not find any significant differences in disclosure scores between owners of proprietary hotel brands and companies without proprietary brands, leading to the rejection of Hypothesis 2b.

7. Discussion

The global hotel industry reporting on climate change-related issues is highly diverse, with a small group of top performers and remaining companies ranging widely on the extent of disclosure or not reporting at all. Although several indicators within the strategy and policy dimensions are relatively well disclosed, many others are disclosed by less than 10 % of companies in the sample. A minimal number of companies (20) had climate change disclosure index scores greater than 0.5000, indicating that they disclosed over half of the index indicators. The widespread reporting of basic strategic items accompanied by a low rate

of reporting on many specific performance indicators, such as emissions, targets and quality indicators, can be indicative of corporate 'veneer sustainability' as conceptualised in tourism CSR research (Weaver, 2007), where hotel companies respond only superficially to pressures from tourists who themselves also show limited commitment to climate change mitigation. These findings are consistent with previous literature, indicating that companies are more likely to make broad statements but avoid making tangible commitments when they feel pressure to legitimise their actions (Bonilla-Priego et al., 2014; Clarkson et al., 2008), supporting the legitimacy theory.

The findings also indicate limited sample homogeneity concerning climate change disclosure, suggesting that isomorphic processes in response to institutional and stakeholders' pressures are not uniform across the whole sample. Instead, the sample consists of companies with highly diverse reporting profiles, including reporting leaders and companies potentially engaged in veneer sustainability. We contend, therefore, that the industry is in a relatively early stage of climate change disclosure and has not yet reached mimetic behaviour (Ramus & Montiel, 2005), similar to sustainability reporting in the cruise industry (Bonilla-Priego et al., 2014). Moreover, the isomorphism may be slowed down by the fact that hotel companies in the sample were located in many countries, with different national regulations and norms influencing their behaviour and exerting a different degree of normative and coercive pressures.

This study further suggests that stakeholder influence plays a vital role in motivating global hotel companies to disclose carbon-related information. These findings are consistent with stakeholder theory and previous studies that demonstrated that carbon disclosure is a mechanism used by companies to reduce pressures from stakeholders and provide legitimacy for their operations (Cotter & Najah, 2011; Faisal et al., 2018). The positive relationship between listed status and both the likelihood of carbon disclosure and the extent of disclosure confirms the role that investor pressure plays in motivating hotel companies to disclose their carbon information, confirming similar findings for corporations in general (Cotter & Najah, 2011; Rankin et al., 2011). The role of institutional investors is further confirmed by the significantly higher level of disclosure provided by companies that participate in CDP versus the companies that do not. This finding also suggests that CDP plays a positive role in motivating companies to provide more disclosure and better disclosure quality.

The finding that proprietary hotel brand ownership increases the likelihood of disclosure confirms the assertions that the pressure from customers and the public is higher for companies with greater customer proximity and higher visibility and influences them to disclose information to gain society's approval (González-Benito & González-Benito, 2006). However, this study failed to provide empirical evidence that brand owners disclose more information than non-brand owners. This finding should be interpreted with caution since the sample size for hotel companies that provide carbon disclosure but have no proprietary brands was very small (10 observations), making it more likely that no differences would be detected. Furthermore, the majority (76 %) of hotel companies with no proprietary brands did not disclose any climate change-related information at all, indicating that this group of companies does not perceive sufficient stakeholder or institutional pressures to report and has little commitment to changing practices. This finding points to a need to look at the hotel industry, not as a homogenous group faced with the same environmental influences, but recognise its heterogeneity, related to its complex ownership, franchising, and management structures. The study also found that GRI users disclose more climate change-related information, indicating an essential role of normative pressures and providing further evidence of the positive role of GRI standards in promoting higher levels of disclosure. Finally, the current study failed to find any significant relationship between hotel company size and the likelihood of disclosure, contrary to the relationship postulated in the conceptual framework and previous literature (Cormier et al., 2005). Careful interpretation of these results is required

since this research focused only on large hotel groups, and therefore, the impact of size could be harder to detect.

This study was exploratory, taking a broad perspective and focusing on the extent of carbon reporting and its determinants. It did not assess the impact and achieved performance from carbon management initiatives. It also did not investigate the issue of the credibility of reported information. Given that only 16 % of companies disclosing carbon-related information provided an external assurance statement in English, there is a clear need to evaluate the truthfulness of claims made. Stated initiatives may differ from actual practices (Font et al., 2012) and reported information might be misleading.

8. Conclusion

The results of this research present several implications for theory and practice. Our study contributes to the literature on CSR reporting in the hotel industry by developing the first theoretical model of climate change disclosure that explains reporting practices in the context of both stakeholder and institutional theories, simultaneously applying the open system perspective on the organisation. From the theoretical perspective, this study contributes to previous studies' theoretical approaches to explain carbon disclosure by confirming the postulates of these theories and going further by integrating them into a holistic framework adapted to the hotel industry. At the same time, the study responds to the need for further consideration of institutional theory in disclosure studies (Deegan, 2019). This study is also the first to incorporate the heterogeneity of the hotel industry and compare stakeholder pressures and their effect on hotel companies operating under different business models. This research also developed a hotel industry-specific climate change disclosure index and used it to assess the extent of climate change reporting in the hotel industry. Finally, by testing a series of hypothesis, the study identified several determinants of carbon disclosure in the hotel industry and explained them using the proposed model. In these ways, the study provides the first comprehensive analysis of the nature of climate change disclosure in the hotel industry, with findings useful for companies preparing disclosures, stakeholders, and policymakers.

Hotel companies wanting to adopt climate change-related policies and engage in climate change disclosure can use the proposed index to guide their choice of initiatives and disclosures. In addition, from investor and other stakeholder perspectives, the index can help evaluate companies' accountability regarding climate change response. Finally, the study offers policymakers insight into hotel companies disclosure practices in climate change and can serve as a frame of reference for developing possible disclosure requirements for the hotel industry.

The present study has several limitations. First, our measure of climate change disclosure is based on an index's construction, implying subjective judgment. We tried to reduce subjectivity by using multiple frameworks and previous studies to develop the list of indicators; however, subjectivity is still present. A further limitation is associated with content analysis to assess the climate change disclosure index. In order to ensure data's reliability, a detailed coding scheme was developed, describing the background to each indicator. An additional limitation is related to the varying ages of data used in the study. Data collection was conducted over a short period to improve the comparability of data; however, it has to be noted that the website data may differ in age as different companies update their websites at different intervals. Additionally, since we examined the largest hotel companies' disclosures globally, the observations and conclusions may not apply to the industry as a whole. Finally, the current study only considers climate change reporting at one point in time. Thus, further research is needed to gain more insight into the carbon reporting of small and medium companies in the hotel industry and the changing nature of carbon reporting over time.

Impact statement

Our study contributes to the literature on CSR reporting in the hotel industry by developing the first theoretical model of climate change disclosure that explains reporting practices in the context of stakeholder and institutional theories. This research also developed a hotel industry-specific climate change disclosure index and used it to assess the extent of climate change reporting in the hotel industry. Finally, by testing a series of hypotheses, the study identified several determinants of carbon disclosure in the hotel industry and explained them using the proposed model, with findings useful for companies preparing disclosures, stakeholders, and policymakers.

Credit author statement

deGrosbois and Fennell: Conceptualization, Methodology;

DeGrosbois and Fennell: Writing- Original draft preparation; **deGrosbois and Fennell:** Visualization, Investigation. **deGrosbois:** Data analysis; **deGrosbois and Fennell:** Writing- Reviewing and Editing.

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None.

Declaration of competing interest

None.

Appendix

Disclosure item	Description and Sources
STRATEGY AND POLICY	(Prado-Lorenzo et al., 2009; Yang & Farley, 2016; Herold, 2018; authors)
<i>Mentioning 'climate change'</i>	Climate change or global warming is mentioned as a general issue or in relation to a company's operations.
<i>Mentioning 'emission reduction'</i>	Emissions reduction is mentioned as a general issue or in relation to a company's operations.
<i>Mentioning 'energy savings'</i>	Energy savings are mentioned as a general issue or in relation to a company's operations.
<i>Commitment to reduce GHG emissions</i>	A statement indicating intent to reduce GHG emission (or address climate change/reduce carbon footprint) is provided.
<i>Commitment to reduce energy use</i>	A statement indicating intent to reduce energy use (or conserve energy) is provided.
<i>Sustainability policy</i>	The company provides the full text of its sustainability policy (CSR charter or environmental policy) on the website or mentions that such a policy exists.
<i>Environmental supply chain policy</i>	The company provides the full text of its environmental supply chain policy or responsible sourcing policy on the website or mentions that such a policy exists.
CLIMATE CHANGE RISKS AND OPPORTUNITIES	(Prado-Lorenzo et al., 2009; Choi et al., 2013; Tauringana & Chithambo, 2015; Yang & Farley, 2016; Datt et al., 2019; authors)
<i>Recognition of climate change risks</i>	The company mentions risks (or impacts) related to climate change in general or in relation to the company's operations.
<i>Explanation of climate change risks</i>	The company provides a description of the risks it faces due to climate change (e.g., regulatory, physical or general).
<i>Discussion of climate change opportunities</i>	The company provides a description of the opportunities it has because of climate change.
<i>Response to risks and opportunities</i>	The company describes actions it has taken or intends to take to reduce/mitigate/manage the climate change risks and impacts and/or to respond to climate change opportunities.
<i>Assessment of financial implications of selected risks or opportunities</i>	The company provides an estimate of the financial impact of one or more climate change risks or opportunities.
CORPORATE GHG EMISSIONS TARGETS	(Prado-Lorenzo et al., 2009; Yang & Farley, 2016; authors)
<i>Target of carbon neutrality</i>	The company states the objective of achieving carbon neutrality.
<i>Commitment to or adoption of science based GHG emissions targets</i>	The company states the intent to adopt or actual adoption of science-based targets (targets to reduce emissions in line with the Paris Agreement goals developed with the Science Based Targets initiative)
<i>Absolute GHG emissions reduction target</i>	The company provides a reduction target for total GHG emissions (specified or not specified scope)
<i>GHG emissions intensity reduction target</i>	The company provides a target for reduction of emissions intensity (e.g., emissions per revenue, per room, per square meter)
<i>GHG emissions target breakdown</i>	The company provides separate targets for different categories of GHG emissions (e.g., different scopes, different business units, different business models).
COMPANY WIDE CARBON FOOTPRINT	(Prado-Lorenzo et al., 2009; Choi et al., 2013; Tauringana & Chithambo, 2015; Yang & Farley, 2016; Datt et al., 2019; authors)
<i>Disclosure of total GHG emissions in absolute terms</i>	The company provides information about total GHG emissions by weight (e.g., in metric tonnes of CO ₂ -e)
<i>Breakdown of total GHG emissions</i>	The company provides at least one breakdown of total GHG emissions, e.g., by fuel type, business unit, product or business activity.
<i>Disclosure of Scope 1 GHG emissions</i>	The company reports its Scope 1 emissions, i.e., emissions emitted from sources that are owned or controlled by it.
<i>Breakdown of Scope 1 GHG emissions</i>	The company provides at least one breakdown of Scope 1 emissions, e.g., by fuel type, business unit, product or business activity.
<i>Disclosure of Scope 2 GHG emissions</i>	The company reports its Scope 2 emissions, i.e., indirect emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed.
<i>Breakdown of Scope 2 GHG emissions</i>	The company provides at least one breakdown of Scope 2 emissions, e.g., by fuel type, business unit, product or business activity.
<i>Disclosure of Scope 3 GHG emissions</i>	The company reports its Scope 3 emissions, i.e., indirect emissions that occur from sources owned or controlled by other entities in its value chain (e.g. materials suppliers, third-party logistics providers, suppliers, franchisees)
<i>Breakdown of Scope 3 GHG emissions</i>	The company provides at least one breakdown of Scope 3 emissions, e.g., by fuel type, business unit, product or business activity.
<i>Disclosure of GHG emissions intensity</i>	The company reports its total GHG emissions intensity (e.g., emissions per revenue, per stay, per occupied room etc.)
<i>Breakdown of GHG emissions intensity</i>	The company provides at least one breakdown of GHG emissions intensity (any scope), e.g., by scope, fuel type, business unit, product or business activity.
<i>Scope 1 GHG emissions intensity</i>	The company reports its Scope 1 GHG emissions intensity (e.g., emissions per revenue, per stay, per occupied room etc.)
<i>Scope 2 GHG emissions intensity</i>	The company reports its Scope 2 GHG emissions intensity (e.g., emissions per revenue, per stay, per occupied room etc.)
<i>Scope 3 GHG emissions intensity</i>	The company reports its Scope 3 GHG emissions intensity (e.g., emissions per revenue, per stay, per occupied room etc.)
GHG EMISSIONS CHANGE OVER TIME	(Tauringana & Chithambo, 2015; Choi et al., 2013; authors)
<i>Comparison of absolute GHG emissions with previous year</i>	

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Disclosure item	Description and Sources
<i>Explanation of changes in absolute GHG emissions over time</i>	The company reports total GHG emissions for two consecutive years and/or reports percentage/absolute change in GHG emissions compared to the previous year.
<i>Breakdown of absolute GHG emissions change</i>	The company provides the reasons for the increase or decrease in GHG emission over time.
<i>GHG emissions intensity change from last or base year</i>	The company provides a breakdown of GHG emissions for at least two years or the change in emissions between these two years (by scope, business unit, geographical area etc.).
<i>Breakdown of GHG emissions intensity change over time</i>	The company reports GHG emissions intensity for at least two different years and/or reports percentage/absolute change in emission intensity from base or previous year.
<i>GHG emissions saved due to a specific initiative</i>	The company provides a breakdown of GHG emissions intensity for at least two years or the change in emissions between these two years (by scope, business unit, geographical area etc.).
ENERGY-RELATED REPORTING	The company reports total GHG emissions saved due to a specific initiative (e.g., tree planting initiative, installation of energy-efficient lighting).
<i>Energy-related targets</i>	(Prado-Lorenzo et al., 2009; Datt et al., 2019; authors)
<i>Total energy consumption</i>	The company provides one or more targets related to energy (e.g., to reduce energy use, to improve energy efficiency)
<i>Breakdown of energy consumption</i>	The company reports total energy consumption from non-renewable resources, e.g., fuel, electricity, heat, gas.
<i>Energy consumption change over time</i>	The company provides at least one breakdown of energy consumption, e.g., by fuel type, business unit, product or business activity.
<i>Breakdown of energy consumption change</i>	The company reports energy consumption for at least two years or the percentage/absolute change in energy consumption between two years.
<i>Energy intensity</i>	The company provides a breakdown of energy consumption for at least two years or the percentage/absolute change in energy consumption between two years (by scope, business unit, geographical area etc.).
<i>Breakdown of energy intensity</i>	The company provides energy intensity measures (for example energy consumption per hotel stay, per square meter, per room, per room night)
<i>Energy intensity change over time</i>	The company provides at least one breakdown of energy intensity, for example by fuel type, business units, products or business activity).
<i>Breakdown of energy intensity over time</i>	The company reports energy intensity for at least two years or the percentage/absolute change in energy intensity between two years.
<i>Targets related to renewable energy use</i>	The company provides a breakdown of energy intensity for at least two years or the percentage/absolute change in energy consumption between two years (by scope, business unit, geographical area etc.).
<i>Renewable energy consumption</i>	The company reports target or targets related to the use of renewable energy.
EMISSION-REDUCTION INITIATIVES IMPLEMENTATION	The company provides total energy used from renewable sources as an absolute value or percentage of total energy use. (Haque & Deegan, 2010; Yang & Farley, 2016; Kiliç & Kuzey, 2019; authors)
<i>Carbon offsetting or purchase of renewable energy credits</i>	The company reports efforts aimed at carbon offsetting or purchase of renewable energy.
<i>Investment in low carbon or energy R&D</i>	The company reports investing in low carbon or energy research and development.
<i>Sustainable building construction and renovation process</i>	The company reports efforts to engage in sustainable construction and renovation of properties (e.g., pursuing green building certification).
<i>Improving efficiency of everyday operations</i>	The company discloses information regarding its efforts to improve the efficiency of operations.
<i>Installing energy-efficient lighting</i>	The company reports efforts to install energy-efficient lighting.
<i>Heating and cooling systems improvements</i>	The company reports efforts to improve heating and cooling systems (e.g., air sealing).
<i>High-efficiency equipment</i>	The company reports the purchase and installation of high-efficiency equipment and appliances.
<i>Efforts to reduce transportation-related emissions</i>	The company reports the implementation of initiatives reducing transportation-related emissions (e.g., buying locally, sustainable mobility).
<i>Renewable energy use</i>	The company reports using renewable energy.
<i>Customer engagement in emissions reduction</i>	The company reports engaging in initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Employee engagement in emissions reduction</i>	The company reports engaging in initiatives to involve and engage employees in emission reduction (e.g., training).
<i>Supplier engagement in climate change efforts</i>	The company engages with its suppliers on climate change-related efforts.
<i>Engagement with business partners on climate change</i>	The company engages with business partners (e.g., development partners, owners of managed properties) on climate change-related efforts.
<i>Participation in external collaborations on climate change</i>	The company participates in external collaborations (e.g., industry working groups, trade associations) on climate change-related efforts.
<i>Targets related to specific initiatives</i>	The company provides one or more targets related to individual mitigation initiatives.
<i>Performance-related to specific initiatives</i>	The company provides performance measures related to the extent of implementation or outcomes from one or more initiatives (e.g., number of trees planted)
<i>Product classified as low-carbon, carbon-neutral or carbon positive</i>	The company reports the implementation of initiatives reducing transportation-related emissions (e.g., buying locally, sustainable mobility).
<i>Properties certified to a recognized sustainability standard or label^a</i>	The company reports using renewable energy.
QUALITY OF DISCLOSURE	The company reports engaging in initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Boundaries for GHG emissions calculations are specified</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>The reporting period which the data covers is specified</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>GHG emissions data provided for the hotel business unit separately^a</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>GHG emissions or energy use is given for individual properties^a</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Scope of total emissions is specified</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Scope 2 emissions are specified as either location- or market-based</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Both location- and market-based Scope 2 GHG emissions are reported</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Inclusions of emissions sources for each scope are explained</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Exclusions from GHG emissions calculations are explained</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Targets have clearly stated base year, target year and target value</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)
<i>Methodology for GHG emissions calculations is provided</i>	The company reports the implementation of initiatives aimed at involving and engaging customers in emission reduction (e.g., towel reuse)

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Disclosure item	Description and Sources
	The methodologies which have been used to measure GHG emissions are explained (e.g., conversion factors used are provided)
Methodology for GHG emissions calculations follows global or national standards	The company reports using global or national GHG accounting frameworks or standards to calculate GHG emissions.
External assurance statement in English is available	The company provides an assurance statement prepared by an external organization which includes the assurance of GHG or CO ₂ data.
Independent assurance of Scope 1 emissions	The provided assurance statement includes assurance of Scope 1 emissions.
Independent assurance of Scope 2 emissions	The provided assurance statement includes assurance of Scope 2 emissions.
Independent assurance of Scope 3 emissions	The provided assurance statement includes assurance of Scope 3 emissions.
Independent assurance of emissions intensity	The provided assurance statement includes assurance of one or more measures of emission intensity.
Independent assurance of energy consumption	The provided assurance statement includes assurance of energy consumption.
Independent assurance of energy intensity	The provided assurance statement includes assurance of one or more measures of energy intensity.
Intensity measures address occupancy rates ^a	The intensity measures used to report emissions or energy intensity take into account the impact of occupancy rate (measures calculate emissions or energy use per stay, per guest night, per occupied area etc.)

Notes: The Climate Change Disclosure Index has been developed based on the CDP questionnaire, GRI Reporting Standard and prior academic research by Prado-Lorenzo et al. (2009), Haque and Deegan (2010), Choi et al. (2013), Tauringana and Chithambo (2015), Yang and Farley (2016), Comyns (2016), Herold (2018), Datt et al. (2019), Kiliç and Kuzey (2019).

^a Indicates hotel industry-specific indicators based on previous literature on the hotel industry and content analysis of data for the current study.

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