



Do Women on Boards Influence Climate Change Disclosures to CDP? – Evidence from Large Indian Companies

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Abstract

Participation of women on corporate boards is increasing across the globe. Corporate with women directors on their board are more likely to address the emerging strategic issues of climate change, enhance GHG emission disclosure strategy and communicate the actions to the stakeholders. According to Board Capital Theory, the presence of women on boards increases board capital breadth in different dimensions. According to Critical Mass Theory, boards with three or more female directors tend to influence the board's decision-making process which results in more favourable environmental disclosure. Findings of earlier studies reiterate that female executives and directors bring different ethical values and traits to decision-making. This paper studies the effect of women on board on climate change reporting to the Carbon Disclosure Project (CDP) by the large Indian companies. The sample for this study includes S&P BSE 100 indexed companies and the period of the study is 6 years ranging from 2010-11 to 2015-16. This study used secondary data. The CDP data and financial data are taken from Bloomberg Professional Database. Based on the items disclosed by companies for CDP questionnaire, a Carbon Disclosure Index is constructed and used in this study. Using a multiple regression model, it is found that there is a significant positive relationship between the percentage of women directors on boards and climate change-related disclosure to CDP. Using independent 't' tests, it is found that companies having at least three women directors disclose more. Thus, this study supports both board capital theory and critical mass theory.

JEL classification: Q5.

Keywords: Carbon Disclosure Project, Women on Board, Board Capital Theory, Critical Mass Theory, BSE 100 companies.

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1. INTRODUCTION

Socio-economic change has led women to occupy many roles including roles on company boards and their share of professional and managerial positions in corporate has increased. In order to bring greater gender diversity in corporate boardrooms, several countries have chosen either to regulate the desired levels of diversity or to introduce voluntary targets for companies. Many countries across Europe, Asia-Pacific and Africa have implemented some form of mandate or target to have a certain percentage of women on the board of companies. The trend started after Norway introduced a mandate requiring at least 40 per cent of the board of listed companies to comprise women in 2006. In Europe, regulatory intervention is believed to have largely spurred by a significant increase in the proportion of women directors on boards, at times contributing to a growth of 100 per cent or more between 2011 and 2015. European Union and the State of California in USA have come up with regulations specifying fixed number of women as board members. India is a \$2.948 trillion economy (World Economic Outlook Database, April 2018). It is currently the 6th largest in the world in terms of Gross Domestic Product. The Companies Act, 2013 and guidelines issued by Securities and Exchange Board of India (SEBI) made it mandatory for all listed companies and every public company, having paid-up share capital of not less than Rupees one hundred crore or turnover of Rupees three hundred crore or more, to have at least one woman on their boards, either as an executive or a non-executive director. This study examines impact of the presence of women directors on climate change-related disclosure made by large Indian companies to the Carbon Disclosure Project (CDP).

2. REVIEW OF LITERATURE

2.1. International Regulatory Developments

2.1.1. United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty adopted in the Earth Summit in Rio de Janeiro in 1992. The objective is to control the Greenhouse gas concentrations in the atmosphere. The framework sets non-binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. The framework outlines how specific international treaties (called "protocols" or "agreements") may be negotiated to specify further action towards the objective of the UNFCCC. There are two important agreements developed under this framework viz., a) Kyoto Protocol and b) Paris Climate Agreement. (UNFCCC, 2015).

2.1.2. Kyoto Protocol

Kyoto Protocol adopted in 1997 is an international agreement with an objective to commit countries by setting internationally binding emission reduction targets. The Kyoto Protocol is an important step towards a global emission reduction regime that would stabilize GHG emissions. It was entered into force in February 2005. A total of 192 parties, including the European Union, have signed and ratified the Kyoto Protocol. The first commitment period of the Kyoto Protocol is from 2008 to 2012. The Doha agreement in 2012 extended the second commitment period from 2013 to 2020. The Kyoto Protocol (that lapses in 2020) is the existing climate change agreement that will be replaced by the Paris Agreement in 2020 (What is the Kyoto Protocol, n.d.).

2.1.3. Sustainable Development Goals (SDGs)

Sustainable Development Goals (SDGs) are 17 global goals set by the United Nations General Assembly in 2015. The SDGs cover social and economic development issues, and it lists Gender Equality and Climate Actions as two major goals to be attained by 2030 (UNDP 2015).

2.1.4. Paris Climate Agreement

The Paris Agreement is a global treaty to limit climate change, which was negotiated in 2015. After signing the agreement, the ratification of the agreement takes place by competent authorities in each of these countries. Signing shows the ‘intention’ of countries to take steps to ratify the agreement in due course. Unlike the signing process, which is open only until April 21, 2017, there is no specific deadline for ratification. As in March 2018, there are 197 signatories to the Paris Agreement and 175 countries ratified it. India signed and ratified both the Kyoto Protocol and the Paris agreement. The Paris Agreement on Climate Change, 2015 necessitates companies to be more focus on actions on climate change mitigation and adaptation (UNFCCC, 2015).

2.1.5. Carbon Disclosure Project (CDP)

Carbon Disclosure Project (CDP) is an organisation based in the United Kingdom which supports companies and cities to disclose the environmental impact of major corporations. It aims to make climate change reporting and risk management a business norm, and drive disclosure, to promote action towards a sustainable economy. Companies all over the world report their climate-related information through CDP (Carbon Disclosure Project, 2017).

2.1.6. Taskforce on Climate-Related Financial Disclosure

Financial Stability Board (FSB) formed the Task Force on Climate-related Financial Disclosures (TCFD) after G20 Finance Ministers and Central Bank Governors asked the FSB to convene public and private sector participants to review how the financial sector can take account of climate-related issues. In the course of its work, the TCFD reviewed existing disclosure frameworks, consulted with a wide range of stakeholders and tapped into the deep expertise of its members. In June 2017, the TCFD published its final report, Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD Recommendations). The Recommendations has four themes, such as governance, strategy, risk management, and metrics and targets. These overarching areas are supported by 11 specific disclosure recommendations (Recommendations of the Task Force on Climate-related Financial Disclosures, 2017).

2.2. Regulatory Developments in India

2.2.1. The National Voluntary Guidelines for the Social, Environmental and Economic Responsibilities of Business (NVGs)

The NVGs were released by the Ministry of Corporate Affairs in 2009. It is the product of an intensive multi-stakeholder collaboration spanning three years and involving contributions from a wide variety of stakeholders. The NVGs comprises of “9 Core Principles” which address different aspects of business responsibility (such as environmental, social and governance) and “48 Core Elements”, which are included alongside the core principles to help guide businesses in adopting/integrating the NVGs into their operations. It advocates that businesses adopt a holistic triple-bottom-line approach whereby financial

performance can be harmonized with the expectations of society, the environment and the many stakeholders it interfaces in a sustainable manner. (National Voluntary Guidelines, 2011).

2.2.2. Business Responsibility Reporting (BRR)

Business responsibility makes business balance profit-making activities with activities that benefit society; it involves developing businesses with a positive relationship with the society in which they operate. Followed by growing attention towards ESG reporting by business, SEBI mandated BRR for top 100 BSE, and NSE listed companies to disclose their Business Responsibility Practices through a report adhering to the NVG framework from financial year 2012-2013. As per SEBI Regulation, 2015, the top five hundred listed entities based on market capitalization (as on March 31 of every financial year) are required to report BRR from FY 2016-17 (Securities and Exchange Board of India, 2012).

2.2.3. Companies Act 2013

In India, The Companies Act, 2013 made it mandatory for all listed companies to have at least one woman on their boards, either as an executive or a non-executive director. The Company, whether public or private, is mandated to appoint at least one-woman director if it is i) a listed company whose securities are listed on any stock exchange, or ii) a company having paid-up capital of Rupees one hundred crore or more, or a turnover of Rupees three hundred crores or more (Ministry of Corporate Affairs, 2013).

2.2.4. SEBI Mandates the appointment of women directors

As per the provisions of Companies Act, 2013, SEBI had mandated all listed companies to have, at least, one-woman director on their Boards by October 1, 2014. Followed by the recommendations of Kotak Committee on Corporate Governance, SEBI decided that there should be at least one woman independent director in the top 500 listed entities by market capitalisation by 2019 and at least one woman director in the top 1,000 listed companies by 2020 (Securities and Exchange Board of India, 2017).

2.3. Studies on Measuring Carbon Emission Disclosure to CDP

Kolk, Levy and Pinkse (2008) studied the development of GHG emission reporting mechanisms and corporate responses to climate change. The study found that CDP uses institutional investors to urge to provide information about their climate change activities from companies. Freedman and Jaggi (2011) studied whether disclosures on global warming by companies from the European Union are more extensive than disclosures by Japanese and Canadian firms. Disclosures made on annual reports, social, environmental and sustainability reports, websites, and Climate change disclosure to CDP by 282 of the largest firms from these countries were utilized for content analysis to measure their disclosures. The study found that EU firms make significantly less global warming disclosures than firms from Japan or Canada. Thus, the study identified that regulatory disclosure requirements could be a good tool to improve disclosures.

Gallego-Álvarez, Rodríguez-Domínguez and García-Sánchez (2011) studied voluntary GHG emissions disclosures to the CDP by the US S&P 500 companies. The study, using content analysis and disclosure index, found that even though many firms answered the questionnaire, but they did not disclose their emission amounts or how they account for them. Stanny (2012) studied voluntary GHG emission disclosures by US S&P 500 companies to CDP. Disclosure on answering the CDP questionnaire, disclosure on emissions and

disclosure on accounting methodology adopted and their trends were examined from 2006 to 2008. The study found that the frequencies of all three disclosures increased over the study period. The finding of the study is consistent with the legitimacy theory that firms will disclose the minimum to avoid scrutiny. Previous disclosures are the most significant variable in explaining subsequent disclosures, which suggests that there is a repetitive pattern in disclosure.

Liesen, Hoepner, Patten and Figge (2015) measured the GHG emissions disclosure practices of EU companies using corporate reports, websites and CDP reports from 2005 to 2009. The study classified the reported data in terms of both scope and type of the emissions information provided, as well as the reporting boundary applied to identify the completeness of corporate disclosures on GHG emissions. The study found that only 15 per cent of companies produced complete reports. Gonzalez-Gonzalez and Zamora Ramírez (2016) on their study on determinants of voluntary carbon disclosure by Spanish companies, measured transparency and quality of carbon reporting using the score obtained in the CDP questionnaire. The study found that influence of pressures from society, markets, shareholders and international interactions determine the voluntary carbon disclosures.

Blanco, Caro and Corbett (2017) studied carbon disclosure by 38 firms in seven countries that disclose to CDP. The study found that more diverse benefits accrue to firms from the measurement and disclosure process. Benefits can be both operational and strategic, and internal as well as external. The study drew several implications for managers such as precaution by the managers on biases related to investments in profitable emission reduction opportunities. Giannarakis, Zafeiriou and Sariannidis (2017) in their study on whether climate change disclosure reflects a firm's environmental performance, measured the level of disclosure made by a sample of listed firms in FTSE 350 using Climate Performance Leadership Index (CPLI) by CDP. CPLI is calculated by considering initiatives that contribute to climate change mitigation, adaptation and transparency.

Kouloukoui, Gomes, Marinho, Torres, Kiperstokand and de Jong (2018) investigated the climate risks disclosure by the 100 largest companies in the world. Using content analysis of CDP and GRI reports, the study found that companies are at serious threat of facing regulatory risks due to low level of disclosure. Information disclosed on climate change is not mutually exclusive to the information disclosed on climate risks. De Faria, Andrade and da Silva Gomes (2018) found that pollution prevention, loss prevention, environmental asset management, GHG emissions and the strategy are the determinants mostly disclosed by companies that are members of the Carbon Disclosure Project.

2.4. Studies on Board Diversity and Corporate Social Responsibility

Studies observed that the role of women in board positions is getting increased attention (Daily C.M, Certoand Dalton, 2000), Singh, Terjesen and Vinnicombe (2008), Terjesen, Sealy and Singh (2009). Hillman, Shropshire and Cannella (2007) observed that experiences, perspectives, and values of women directors differ from men. Hillman, Cannella and Harris (2002) and Helfat, Harris and Wolfson (2006) observed that women directors tend to possess human capital that is inclusive of professional experiences in the fields of public and human relations, which results in better stakeholder management. Studies by Hillman et al., (2007) and Adams and Ferreira (2009) found that women on boards bring different perspectives and experiences to the board and are more open to discussion of difficult issues. Bear, Rahman and Post (2010), Wang and Coffey (1992) and Williams (2003) observed that firms with a

greater proportion of women directors are more active in the areas of corporate philanthropy and social responsibility.

Gul and Leung (2004) Studied the linkages between board structure in terms CEO duality and voluntary corporate disclosure by Hong Kong listed companies and found that CEO duality is associated with lower voluntary disclosure supporting the view that position of Chairman and CEO should be separated.

Konrad, Kramer and Erkut (2008) studied the board diversity of fortune 1000 companies and observed that boards have 9–12 members on average and when there are at least three women members on board, they begin to constitute a numerically important minority. Social science research has provided us with very few magic formulas for influencing people's behaviour. In the area of group dynamics, the number three seems to be pivotal. Similarly, in corporate boards, the presence of three women or more on a board results in their having more influence on board discussions through the critical mass effect. Lim, Matolcsy and Chow (2007) studied the association between board composition and voluntary disclosure by Australian companies. It is found that there is a positive relationship between both board composition and voluntary disclosure; independent boards provided more voluntary disclosure, and the structure of the board has no bearing on non-financial and financial voluntary disclosure.

Nielsen and Huse (2010) studied the contributions of women on boards of directors of Norwegian firms and found that the ratio of women directors is positively associated with board strategic control. The positive effects of women directors on board effectiveness are mediated through increased board development activities and through a decreased level of conflict. The study found that women's ability to make a contribution to the board may be attributable to their different leadership styles. Bear et. al (2010) studied the impact of biodiversity and gender composition on CSR and firm reputation and found that women board members provide a broad range of contributions to boards. Boulouta (2013) studied the link between Board Gender Diversity and Corporate Social Performance of companies from S&P500 and found that board gender diversity significantly affects corporate social performance. The study observed that promoting diversity in the boardroom is likely to impact positively on the voluntary provision of holistic information and thus improve stakeholder engagement.

Larkin, Bernardi and Bosco (2013) studied the association between the number of women directors on a company's board of directors and the company's appearance on Ethisphere Magazine's "World's Most Ethical Companies" list. The study found that having a higher percentage of women on the board of directors of a Fortune's 500 company is associated with companies being included on the list of ethical companies. Fernandez-Feijoo, Romero and Ruiz-Blanco (2014) studied whether the inclusion of at least three women on the board of directors affects the levels and credibility of CSR disclosure. The study found that in countries with a higher proportion of boards of directors with at least three women, the levels of CSR reporting was higher. Countries with higher gender equality have more companies with boards of directors with at least three women.

Al-Shaer and Zaman (2016) studied the effect of board gender diversity on sustainability reporting quality and found that gender-diverse boards are associated with high-quality sustainability reports, and independent female directors have greater effect on sustainability reporting quality than other female directors. Sanan (2016) studied the impact of gender-wise

heterogeneous boards on financial and social performance of Indian firms. The study used Blau's diversity index to capture gender diversity of the Board. The study could not establish significant association between gender diversity of boards and financial and social performance. Alazzani, Hassanein and Aljanadi (2017) studied the impact of gender diversity on social and environmental performance in Malaysian context and found that there is a significant positive association between social performance and the presence of female directors on the board of directors. The study found no association between environmental performance and the presence of female directors and thus concluding that the female directors of Malaysian firms pay more attention to social issues than to environmental ones.

Katmon, Zuriyati, Norlia, Norwani and Farooque (2017) studied the relationship between wide-ranging board diversity and the quality of corporate social responsibility (CSR) disclosure variables in Malaysia and found significant positive association between gender diversity and CSR disclosure, knowledge and experience of the board as well as the placement of females on the board in improving a firm's quality of CSR. Yasser, Al Mamun and Ahmed (2017) studied the relationship between Corporate Social Responsibility and Gender Diversity in firms across three Asia Pacific emerging economies viz Malaysia, Pakistan, and Thailand using stakeholder and institutional theory. It found a significant positive relationship between board gender diversity and enhanced adoption of CSR.

Sial, Zheng, Cherian, Gulzar, Thu, Khan and Khuong (2018) studied whether corporate social responsibility reporting mediates the relationship between gender diversity in boards and firm performance of Chinese listed companies. The study found that the existence of female directors onboard improves firm performance. The study used Blau index (BI) to measure board gender diversity and CSR reporting index to measure corporate social responsibility reporting. Manita, Bruna, Dang and Houanti (2018) studied board gender diversity and environmental, social and governance (ESG) disclosure. The ESG disclosure score provided by Bloomberg is used as a proxy for the extent of corporate social responsibility (CSR) and found significant relationship between board gender diversity and ESG disclosure. Pucheta-Martínez and Gallego-Álvarez (2017) studied how independent and institutional women directors on boards affect CSR reporting and found that the CSR disclosure improves when presence of independent and institutional women directors on boards increases.

2.5. Studies on Women Directors and Climate Change Disclosure

Hillman and Dalziel (2003) introduced the concept of board capital in the strategic management literature as the sum of the human and social capital of the board of directors. It is a proxy for the board's ability to provide resources to the firm. Board capital has two dimensions – Breadth and Depth. The first dimension of board capital, 'breadth,' captures various facets of the heterogeneity of the board such as education, functional background, occupation, age, tenure, and the heterogeneity of industry ties through interlocks, or work experiences in other industries. Board capital depth refers to the embeddedness of the board in the focal firm's industry. Industry embeddedness is a result of directors' current or former industry work experience, their horizontal or vertical ties to firms in the industry. Post, Rahman and Rubow (2011) find that the boards with three or more female directors have more favourable environmental disclosure strength scores, based on a sample of 78 electronic and chemical companies on the Fortune 1,000 list of 2006 and 2007.

Post, Rahman and Mcquillen (2015) studied board composition and corporate environmental performance and found that the representation of independent directors and women directors on a firm's board is positively associated with firm forming sustainability-themed alliances.

Such alliances, in turn, positively contribute to corporate environmental performance. Hollindale, Kent, Routledge and Chapple (2017) examined whether women on boards are associated with disclosure and quality of corporate greenhouse gas (GHG) emissions related reporting using institutional and board capital theory. The study found that companies with multiple female directors make higher quality GHG emissions related disclosures. Companies with multiple women on the board have superior quantity and quality of GHG emission related disclosure. Hossain, Farooque, Momin and Almotairy (2017) studied the relationship between gender diversity and the Carbon Disclosure Project score. Specifically, the study described extant research on theoretical perspectives, and the impact of women on corporate boards on carbon emission issues in the global perspective. Using Carbon disclosure scores of the CDP from 2011 to 2013, the study found a positive relationship between gender diversity and carbon disclosure information.

Ciocirlan and Pettersson (2012) studied whether companies with more workforce diversity are committed to the fight against climate change than less diverse companies. Socio-demographic dimensions such as age, gender, race are considered for the study. The study found that companies that employ more women tend to exhibit a higher concern for climate change. Management of GHG emissions is a relatively new strategic and ethical issue for companies. Liao, Luo and Tang (2014) found that the presence of women on boards increased the likelihood that the board understands the ethical and social demand of providing meaningful and transparent disclosures regarding GHG emissions. This leads to GHG emissions disclosures that are of higher quality. Ben-Amar, Chang and McIlkenny (2017) studied the effect of women on board on stakeholder's demand for greater climate change-related disclosure using CDP reports. The study found that voluntary carbon disclosure increases with percentage of women on board of directors.

3. RESEARCH GAP

Corporate climate change disclosure studies in the Indian context is in its nascent stage. Corporate disclosure on other aspects such as corporate information through websites, insurance disclosure, voluntary disclosure and CSR disclosure were studied in Indian context. Charumathi and Surulivel (2009) studied the effectiveness of information disclosure of Indian public sector banks on their websites, Charumathi and Nithya (2012) studied public disclosure by Indian life insurers. Kota & Charumathi (2018) studied financial derivative disclosure by Indian companies in the light of stewardship theory. Charumathi and Ramesh (2013) studied voluntary disclosures by large Indian companies using content analysis of annual reports, and Charumathi and Ramesh (2015) studied determinants of voluntary disclosure by Indian companies. Charumathi and Padmaja (2018) studied the impact of regulations and technology on corporate social responsibility disclosures by public sector enterprises in India. Studies pertaining to the corporate disclosure on climate change are more done in the context of developed countries which includes studies which measure the climate change disclosure using a disclosure index. A notable study on climate change disclosure done in India is Kumar and Firoz (2018) which studied the impact of climate change disclosure on the financial performance of Indian companies. There are studies which analysed the influence of women on board of directors on climate change-related disclosure using samples from developed countries - both individual (Hollindale et al., 2017) and multi-countries (Hossain et al., 2017; Ciocirlan and Pettersson, 2012). From developing countries, very few studies are available. Sanan (2016) studied board gender diversity and financial and social performance in the Indian context. Alazzani et al. (2017) analysed the impact of gender diversity on social and environmental performance in the Malaysian context. No study has

developed Carbon Disclosure Index (CDI) using Climate change disclosure to CDP and analysed the influence of board characteristics on the same in the context of developing countries. This study attempts to fill this gap.

4. STATEMENT OF THE PROBLEM

Climate change has become an important aspect of the sustainability of business, and the climate change risk to business is alarmingly increasing. It is indeed an ethical issue which needs to be dealt with to avoid dangerous consequences of climate change which causes physical risks and transition risks (policy & legal risk, technology risk, market risk and reputation risk) to the business (Recommendations of the Task Force on Climate-related Financial Disclosures, 2017). There are individual level and organizational level explanations for the lesser representation of women on boards. Individual-level explanations argue that women are under-represented in senior management and on corporate boards because there is a shortage of women with the requisite human capital. Organizational-level explanations can be that male-biased expectations and requirements for success make it more difficult for women to enter management and the top grades of many professional functions. According to KPMG report, 2017, Norway is the country with 100% companies with at least one women director, followed by US (87%), Germany (82%) Sweden and the UK (76%). With 27 % of companies having at least one woman in the boards, India stands among countries with least percentage. Further studies have proved that women on board will increase the likelihood of carbon emission disclosures. In the light of the above information, it is essential to study whether the board diversity, especially the number of women on board, would influence the level of corporate climate change disclosure, as the management of GHG emission is a relatively new strategic and ethical issue for companies.

5. OBJECTIVES OF THE STUDY

Following are the objectives of the study:

- 1) To construct a Carbon Disclosure Index (CDI) using CDP climate change disclosure to measure climate change disclosure by Indian companies using CDI.
- 2) To study the influence of the presence of women directors on the corporate board on level of climate change disclosure to CDP.

6. VARIABLES OF THE STUDY

Table 1 shows the variables used for this study.

Table 1: Variables used in this study	
Dependent Variable	Carbon Disclosure Index Score
	a) Reporting Period
	b) Risks and Opportunities
	c) GHG Emissions
	d) Energy Use
	e) Trading
	f) Targets and Initiatives
	g) Governance and Strategy

Independent Variables		Definition & Purpose	Expected Sign
Governance Variable	Board Size	Total number of directors on board on the last date of the financial year.	+
	Board Meetings	The number of board meetings held in a financial year	+
	Independent Directors	Number of independent directors/ Total directors on the board as on the last date of the financial year.	+
	Women Directors	Number of women directors/ Total directors on the board as on the last date of the financial year.	+
	CEO Duality	CEO duality indicates the role of CEO and chairman is held by the same person. It is a dichotomous variable. Coded as 1 If CEO and Chairman are different and 0 otherwise.	-
Control Variables	Energy Consumption	Natural Logarithm of total energy consumption in a financial year.	+
	Market Capitalisation	Natural Logarithm of market capitalisation at the end of each financial year.	+
	Return on Asset	Profit after tax/ Total asset.	+

Dependent Variable

The dependent variable considered for the study is the Carbon disclosure to CDP by sample companies. This study has constructed a Carbon Disclosure Index to measure the level of climate change disclosure. The index consists of sub-categories such as A) Reporting Period, B) Risks and Opportunities, C) GHG Emissions, D) Energy Use, E) Trading, F) Targets and Initiatives, and G) Governance and Strategy. The total score of CDI is taken as depended variable.

Independent Variables

Independent variables chosen for the study include governance variables such as board size, board meetings per year, Percentage of independent directors, Percentage of women directors on board and CEO Duality.

Control Variables

Control variables chosen include energy consumption by the company, market capitalisation as a proxy for firm size and Return on Asset as a proxy for profitability.

7. HYPOTHESES

This study tests the following null hypotheses:

H₀₁: There is no significant company-wise difference in the level of climate change disclosure to CDP during the study period.

H₀₂: There is no significant year-wise difference in the level of climate change disclosure to CDP during the study period.

H₀₃: There is no significant sector-wise difference in the level of climate change disclosure to CDP during the study period.

H₀₄: There is no significant difference in the level of climate change disclosure to CDP between BSE Sensex companies and Non-BSE Sensex companies.

H₀₅: There is no significant difference in the level of climate change disclosure to CDP between before and after the introduction of mandatory BRR.

H₀₆: There is no significant difference in the level of climate change disclosure to CDP between before and after the introduction of Paris Agreement.

H₀₇: There is no significant relationship between the level of climate change disclosure to CDP and a) Board Size, b) Board Meetings c) Percentage of independent directors, d) Percentage of Women on Board, e) CEO Duality, f) Energy Consumption, g) Market Capitalisation, h) Return on Asset.

H₀₈: There is no significant difference in the level of climate change disclosure to CDP between companies having no women director and at least one women director on their board.

H₀₉: There is no significant difference in the level of climate change disclosure to CDP between companies having three women directors and less than three women directors.

8. RESEARCH METHODOLOGY

8.1. Method

This is an empirical study.

8.2. Data – Nature, Source and Method of collection

The study used secondary data. Secondary data such as CDP disclosure data, financial and governance data are collected from Bloomberg Professional database. The CDP reporting status of sample companies is known from CDP database.

8.3. Sample

Publicly listed and constituents of S&P BSE100 companies as on 31 March 2017 are chosen as the sample for this study. S&P BSE100 is a well-diversified 100 stock index accounting for 10 different sectors. The CDP non-reporting companies were excluded. This resulted in 235 firm-year observations, based on the availability of CDP data. The number of companies reporting and not reporting to CDP is shown in Table 2.

Year	CDP Reporting Companies (Sample for this study)	CDP Non- Reporting Companies	Total
2011	35	65	100
2012	36	64	100
2013	37	63	100
2014	42	58	100
2015	42	58	100
2016	43	57	100
Total	235	365	600

Source: www.cdp.net

8.4. Methodology for Constructing Carbon Disclosure Index (CDI)

This study constructs an index, viz., Carbon Disclosure Index (CDI). The index is constructed from the CDP data available in the Bloomberg database. The CDP is an organisation based in the United Kingdom which supports companies and cities to disclose their environmental impact. It promotes carbon disclosure by publishing the reports based on a questionnaire sent to companies around the globe. Bloomberg Professional database features CDP climate change disclosure data by companies from various countries.

Subcategories		No. of variables	Score
A	Reporting Period	4	4
B	Risks and Opportunities	6	6
C	GHG Emissions	23	23
D	Energy Use	10	10
E	Trading	4	4
F	Targets and Initiatives	2	2
G	Governance and Strategy	7	7
Carbon Disclosure Index		56	56
CDI Score			100%
<i>Note: Developed by authors based on Climate change disclosure to CDP</i>			

Out of all items of climate change disclosure to CDP available in Bloomberg database, the index constructed for this study, viz., CDI, has taken only the commonly reported items consisting 56 reporting items under 7 broad categories such as a) Reporting Period, b) Risks and Opportunities, c) GHG Emissions, d) Energy Use, e) Trading, f) Targets and Initiatives and g) Governance & Strategy. The CDI in condensed version is shown in Table 3 and CDI in a detailed version is given in Annexure 1.

The first subcategory ‘**Reporting Period**’ consists of disclosure in a reporting year such as start date and end date of the CDP reporting year, CDP survey year and CDP reported fiscal year. The second subcategory ‘**Risk and Opportunities**’ consists of disclosure on regulatory risk exposure, physical risk exposure, other risk exposure, regulatory opportunities present, physical opportunities present and other opportunities present. The third subcategory ‘**GHG Emissions**’ consists of Scope 1 Emissions, Scope 2 Emissions, location-based and market-based Scope 2 emissions, Scope 3 emission from sources such as use of sold produces and products, Scope 3 investments, emissions from travel. Emissions of bio sequestered carbon and verified emission data are included under the category of GHG Emissions. It includes CH₄ Emissions, N₂O Emissions, HFC Emissions, PFC Emissions, Emissions NF₃, SF₆ Emissions. The fourth subcategory ‘**Energy use**’ include total fuel consumption, use of biodiesels, biogas and crude oil, low carbon energy, total electricity consumption, total purchased electricity consumption, total electricity production, total renewable electricity produced, total production & consumption of renewable electricity, etc. The fifth subcategory ‘**Trading**’ includes information disclosure related to purchased allowances, trading allowances, other compliance programs and carbon offsets. The sixth subcategory ‘**Targets and Initiatives**’ includes company’s targets such as emission reduction targets and renewable energy targets. The seventh subcategory ‘**Governance and Strategy**’ include disclosure related to climate change mitigation governance and strategy by the company such as incentives for management, policy on climate change, climate change strategy, internal price

of carbon, third party avoided emissions, emission reduction activities and value chain engagement.

CDP filing from the financial year 2010-2011 to 2015-2016 is taken for the analysis based on data availability. While measuring the disclosure, each item of the index is given the same weighting. A score of 1 is given for the disclosed items, and a score 0 is given for non-disclosed items. The total score is calculated and then converted into percentage by using the formula

$$\text{CDI Score} = \text{No of items disclosed in all categories} / \text{Total No. of items in CDI} * 100$$

8.5. Period of the study

The study period is ranging from the financial year 2010-2011 to 2015-2016. Availability of CDP reporting data was the criteria for choosing the period. The period witnessed increased attention to climate change-related disclosure by the introduction of mandatory BRR in India during 2012-2013 and the introduction of the Paris Climate Agreement during 2015-2016 at the global level. The period also witnessed the introduction of the Companies Act 2013, which mandates the appointment of at least one women director by every listed company and every public company having paid-up share capital of not less than Rupees one hundred crores or turnover of Rupees three hundred crores or more.

8.6. Statistical tools

Descriptive analysis is done for understanding the data. The study used ANOVA to find out year-wise, company-wise and sector-wise differences in climate change disclosure. Multiple linear regression is used to study the relationship between the presence of women on board and the level of climate change-related disclosure.

Independent 't' test is used to find the disclosure differences based on grouping variables such

- a) Listing status in S&P BSE Sensex 30, i.e., i) indexed and ii) non-indexed companies
- b) Business Responsibility Reporting period, i.e., i) before and ii) after BRR
- c) Paris Agreement Period, i.e., i) before and ii) after the Paris Agreement
- d) Presence of women director, i.e., i) with and ii) without women directors on board
- e) Presence of more women directors, i.e., i) three and ii) less than 3 directors on board

8.7. Software used

Microsoft Excel and IBM SPSS 25.0 are used for data analysis.

8.8. Research Model

The research model used for the study is as follows:

$$\text{CDI Score} = B_0 + B_1 \text{Board Size} + B_2 \text{Board Meetings} + B_3 \text{Independent Directors} + B_4 \text{Women on Board} + B_5 \text{CEO Duality} + B_6 \text{Energy Consumption} + B_7 \text{Market Capitalisation} + B_8 \text{Return on Assets} + \epsilon_i$$

9. RESULTS AND DISCUSSIONS

9.1. Level of Climate Change Disclosure

	N	Minimum	Maximum	Mean	SD
2011	35	0.000	42.857	28.877	13.196
2012	36	0.000	44.642	30.009	12.147
2013	37	0.000	44.642	30.308	13.064
2014	42	0.000	46.428	31.887	12.299
2015	42	0.000	53.571	36.011	9.0188
2016	43	0.000	78.571	49.086	27.032

Note: Figures are in percentage; Results computed using SPSS 25.

Table 4 gives descriptive statistics of the level of climate change disclosure to CDP by sample companies from 2011 to 2016. It is evident from the table that there are companies with zero disclosure score during the study period. The maximum score for a company was in 2016 with score 78.571%. It is also evident that there is an increasing trend in the level of climate change disclosure to CDP from 2011 to 2016.

Cronbach's Alpha	No. of Items
0.896	235

Note: Results computed using SPSS 25.

The reliability of the index was calculated. Table 5 depicts the reliability statistics. The value of Cronbach's alpha is 0.896. As the value is more than 0.8, the index is reliable.

9.2. Company-wise, Year-wise and Sector-wise differences in the Level of Climate Change Disclosure to CDP

H₀₁: There is no significant company-wise difference in the level of climate change disclosure to CDP during the study period.

H₀₂: There is no significant year-wise difference in the level of climate change disclosure to CDP during the study period.

H₀₃: There is no significant sector-wise difference in the level of climate change disclosure to CDP during the study period.

Table 6: Company-Wise, Year-wise and Sector-wise ANOVA					
Company-Wise ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Companies	35224.693	51	690.680	3.693	.000
Within Companies	34228.954	183	187.043		
Total	69453.647	234			
Year-Wise ANOVA					
Between Years	11994.133	5	2398.827	9.560	.000
Within Years	57459.514	229	250.915		
Total	69453.647	234			
Sector-wise ANOVA					
Between Sectors	6445.065	8	805.633	2.890	.004
Within Sectors	63008.582	226	278.799		
Total	69453.647	234			
<i>Note: Results computed using SPSS 25.</i>					

Table 6 gives the results on company-wise, year-wise and sector-wise differences in the level of climate change disclosure based on ANOVA. As the p-value is less than 0.05, the null hypotheses, H_{01} , H_{02} and H_{03} are rejected at the 1% level of significance. Thus, there is significant company-wise, year-wise and sector-wise differences in the level of climate change disclosure to CDP among the sample companies during the study period. Post Hoc for years was categorised into 2 homogeneous subsets. The CDI scores from years from 2011 to 2015 are homogeneous, but the CDI scores for 2016 categorised into a different mean group which has higher mean score compared to the first group due to introduction of Paris agreement. Post Hoc test for sectors was categorised into 3 homogeneous subsets. The Energy sector has the least mean CDI score, and the Utilities sector has the maximum mean CDI score. The difference in the level of disclosure can be attributed to the non-disclosure of climate change-related information by the Energy sector as their operations lead to more carbon emission than other sectors.

9.3. Difference in the level of Climate Change disclosure to CDP by Sensex and Non-Sensex Companies

H_{04} : There is no significant difference in the level of climate change disclosure to CDP between BSE Sensex companies and Non-BSE Sensex companies.

Table 7: Results of Independent Samples Test – Differences in CDI Scores among Sensex and non-Sensex companies							
Variable	Sensex Companies (N=90)		Non-Sensex Companies (N=145)		Levene's test for Equality of Variances (Sig.)	Equal Variances Assumed (Sig.)	Equal Variances not Assumed (Sig.)
	Mean	Std. Dev	Mean	Std. Dev			
CDI	34.345	17.847	35.061	16.889	0.244 (0.622)	0.757	.761
<i>Note: Results computed using SPSS 25.</i>							

Table 7 shows the results of independent t-test for BSE Sensex companies and non-Sensex companies. It is evident that the mean CDI score for Sensex companies is at 34.345, and that of non-Sensex companies is at 35.061. The F value stands at 0.244, with a significance value of 0.622. Since the p-value is at 0.622 for Levene's test, equal variances assumed column is considered. Base on the p-value, the null hypothesis, H_{04} , is accepted. Thus, there is no significant difference in the level of climate change disclosure to CDP between BSE Sensex companies and Non-BSE Sensex companies.

9.4. Level of Climate Change Disclosure to CDP after BRR

H₀₅: There is no significant difference in the level of climate change disclosure to CDP between before and after the introduction of mandatory BRR.

Table 8: Results of Independent Samples Test - Differences in CDI Scores before and after BRR							
Variable	Before BRR (N=71)		After BRR (N=164)		Levene's test for Equality of Variances (Sig.)	Equal Variances Assumed (Sig.)	Equal Variances not Assumed (Sig.)
	Mean	Std. Dev	Mean	Std. Dev			
CDI	29.4517	12.5975	37.0971	18.443	4.325 (0.039)	0.002	0.000

Note: Results computed using SPSS 25.

Business Responsibility Reporting was mandated by SEBI in FY 2012-13. Disclosure on Environmental, Social and Governance aspects of business became mandatory to large-cap companies. Independent samples 't' test is used to measure the improvement in climate change disclosure to CDP by Indian companies after the introduction of BRR. Table 8 shows the results of independent t-test for the two different time periods 2011-2012 (before BRR) and 2013-2016 (after BRR). It is evident that the mean CDI for 2011- 2012 is at 29.4517 and that of 2013-2016 is at 37.0971. The F value stands at 4.325, with a significance value of .039. Since the p-value is at .039 for Levene's test, equal variances not assumed column is considered. As the p-value in that column is less than 0.01, the null hypothesis, H_{05} , is rejected at 1% level of significance. Thus, there is a significant difference in the level of climate change disclosure to CDP between before (2011-2012) and after (2013-2016) the introduction of mandatory BRR. It can be construed that the introduction of mandatory BRR has compelled the companies to make more climate change disclosure to CDP.

9.5. Level of Climate Change Disclosure to CDP after the Paris Agreement

H₀₆: There is no significant difference in the level of climate change disclosure to CDP between before and after the introduction of the Paris Agreement.

Table 9 shows the results of independent t-test for the two different time periods – before (2010-11 to 2014-15) and after the introduction of the Paris Agreement (2015-16). It is evident that the mean CDI for 2011- 2015 is at 31.584 and that of 2016 is at 49.0863. As the F value stands at 65.766 with a significance value of 0.000 for Levene's test, equal variances not assumed column is considered. As the p-value in that column is less than 0.01, the null hypothesis, H_{06} , is rejected at 1% level of significance. Thus, there is no significant difference

in the level of climate change disclosure to CDP between before and after the introduction of the Paris Agreement. It can be construed that introduction of the Paris Climate Accord has made the companies do more climate change disclosure to CDP.

Variable	Before Paris Agreement (N=192)		After Paris Agreement (N=43)		Levene's test for Equality of Variances (Sig.)	Equal Variances Assumed (Sig.)	Equal Variances not Assumed (Sig.)
	Mean	Std. Dev	Mean	Std. Dev			
CDI	31.5848	12.1080	49.0863	27.0322	65.766 (0.000)	0.000	0.000

Note: Results computed using SPSS 25.

9.6. Influence of governance variables on Climate Change Disclosure to CDP

H₀₇: There is no significant relationship between climate change-related disclosure and a) H_{07a}: Board Size, b) H_{07b}: Board Meetings c) H_{07c}: Percentage of independent directors, d) H_{07d}: Percentage of Women on Board, e) H_{07e}: CEO Duality, f) H_{07f}: Energy Consumption, g) H_{07g}: Market Capitalisation, h) H_{07h}: Return on Asset.

Table 10 shows the regression results of the research model on the factors influencing climate change disclosure to CDP. From the p-value, it is clear that the model is fit.

As the p-value is less than 0.10, the null hypothesis, H_{07c}, is rejected at 10% level of significance. As the p-value is less than 0.05, the null hypothesis, H_{07d}, is rejected at 5% level of significance. As the p-value is less than 0.0, the null hypothesis, H_{07g}, is rejected at 1% level of significance. Thus, there is a significant positive relationship between climate change disclosure to CDP and that of the percentage of independent directors, percentage of women directors and market capitalisation. As the p-value is less than 0.05, the null hypothesis, H_{07e}, is rejected at 5% level of significance. Thus, there is a significant negative relationship between CEO Duality on climate change disclosure to CDP.

As the p-value is less than 0.01, the null hypothesis, H_{07h}, is rejected at 1% level of significance. Thus, there is a significant negative relationship between Return on Asset on climate change disclosure to CDP. Based on p-value, the null hypotheses, H_{07a} and H_{07b}, are not rejected. Hence, there is no significant relationship between climate change disclosure to CDP and that of board size and number of board meetings per year.

Table 10: Regression results on the factors influencing Climate change disclosure to CDP

Model Summary					
R	R Square	Adjusted R Square		Std. Error of the Estimate	
.437a	.191	.142		14.267869327253107	
ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	6309.370	8	788.671	3.874	.000b
Residual	26667.944	131	203.572		
Total	32977.314	139			
Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-35.533	18.886		-1.881	.062
Board Size	.179	.521	.033	.344	.731
Board Meetings Per Year	-.246	.646	-.035	-.382	.703
Independent Directors (%)	.219	.131	.151	1.680	.095*
Women on Board (%)	.419	.173	.206	2.419	.017**
CEO Duality	-7.381	3.308	-.187	-2.231	.027**
LN Energy Consumption	.371	.568	.058	.654	.515
LN Market Capitalisation	4.626	1.462	.329	3.164	.002***
Return on Asset (ROA)	-.519	.185	-.300	-2.806	.006***
a. Dependent Variable: CDI Score					
b. Predictors: (Constant), Board Size, Board Meetings Per Year, Independent Directors (%), Women on Board (%), CEO Duality, LN Energy Consumption, LN Market capitalisation, ROA					
***=Significant at 1 % level, **=Significant at 5% level, *=Significant at 10% level					
<i>Note: Results computed using SPSS 25</i>					

It can be construed that the presence of independent directors and women directors influence the climate change disclosures as they view climate change as a strategic and emerging ethical issue. Large companies disclose more climate change information as a) their visibility compels them and c) they can also ensure board diversity. Profitable companies disclose less as they have the advantage of ploughing profits back without relying on market capital.

9.7. Level of Climate Change Disclosure to CDP with the presence of Woman Directors on Board

H₀₈: There is no significant difference in the level of climate change disclosure to CDP between companies having no women director and at least one women director on their board.

Variable	Companies without women directors (N=73)		Companies with women directors (N=153)		Levene's test for Equality of Variances (Sig.)	Equal Variances Assumed (Sig.)	Equal Variances not Assumed (Sig.)
	Mean	Std. Dev	Mean	Std. Dev			
CDI	33.2191	13.9904	36.4729	18.1168	3.625 (0.058)	0.177	0.140

Note: Result computed using SPSS 25.

Table 11 shows the results of independent t-test for CDI score by companies with women directors and companies having no women directors. It is evident that the mean CDI for companies with women directors is 33.2191 and that of companies having no women directors is 36.4729. The F value stands at 3.625 with a significance value of 0.058 for Levene's test, equal variances assumed column is considered. Based on the p-value, the null hypothesis, H_{08} , is accepted. Thus, there is no significant difference in the level of climate change disclosure to CDP between companies having no women director and at least one women director on their board. It can be construed that the presence of one women director on the board cannot influence the level of climate change disclosure to CDP.

9.8. Level of Climate Change Disclosure to CDP with the presence of three (Critical Mass) Woman Directors on Board

H_{09} : There is no significant difference in the level of climate change disclosure to CDP between companies having three women directors and less than three women directors.

Variable	Companies with less than 3 women on board (N=140)		Companies with 3 women on board (N=13)		Levene's test for Equality of Variances (Sig.)	Equal Variances Assumed (Sig.)	Equal Variances not Assumed (Sig.)
	Mean	Std. Dev	Mean	Std. Dev			
CDI	35.6250	18.2048	45.6043	14.8263	0.054 (0.816)	0.057	0.038

Note: Result computed using SPSS 25.

Table 12 shows the results of independent t-test for CDI score by companies with 3 women directors and companies having less than 3 women directors. It is evident that the mean CDI for companies with less than 3 women directors is at 35.6250 and that of companies having 3 women directors is 45.6043. As the F value stands at .054 with a significance value of 0.816

for Levene's test, equal variances assumed column is considered. As the p-value in that column is less than 0.1, the null hypothesis, H_{09} , is rejected at 10% level of significance. Thus, there is no significant difference in the level of climate change disclosure to CDP between companies having three women directors and less than three women directors.

10. MAJOR FINDINGS OF THE STUDY

The following are the major findings of this study:

1. The climate change disclosure to CDP by Indian companies is increasing year after year during the study period.
2. There is significant company-wise, year-wise and sector-wise differences in climate change disclosure to CDP by Indian companies.
3. There is a significant improvement in the level of climate change disclosure to CDP after the introduction of mandatory Business Responsibility Reporting in FY 2012-13 and Paris Agreement in 2015.
4. Climate change disclosure to CDP is a) positively and significantly influenced by the percentage of women directors, percentage of independent directors and market capitalization CEO duality; and b) negatively and significantly influenced by CEO duality and return on asset.
5. Presence of three-woman directors, viz., critical mass, on the board significantly increased the level of climate change disclosure to CDP. Nevertheless, the presence of only one woman on a board did not have any influence.

11. LIMITATIONS OF THE STUDY

The following are the limitations of this study:

- a) The CDP climate change disclosure data are collected from Bloomberg database. The limitations of secondary data apply to this study.
- b) The study was conducted for a period of 6 years (from FY 2010-11 to 2015-16) only due to non-availability of data.

12. SCOPE FOR FUTURE RESEARCH

- a) The present study considers only climate change disclosure to CDP. Future studies can source climate change-related information from sources such as annual reports, sustainability reports, business responsibility reports, integrated reports, and corporate websites as these channels are also used for reporting climate change-related information to stakeholders.
- b) This study analysed the influence of women on boards on the level of climate change disclosure to CDP. Future studies can be done on the quality of these disclosures.

13. IMPLICATIONS OF THE STUDY

Rosener (1995) indicates, one woman on the board is often regarded as a token, two women on the board might not be enough to influence the board's decision process. Konrad et al. (2008), Torchia, Calabrò and Huse (2011) and Joecks, Pull and Vetter (2013) argue that women representation on boards needs to reach a 'critical mass' level before it can affect boards' decision-making and it is suggested that at least three women on boards constitutes a critical mass (Konrad et al., 2008). The findings of this study revealed that the presence of independent directors and women directors significantly and positively increases the climate change disclosure to CDP by Indian companies. Hence, the Indian regulator (SEBI) should enhance the legal requirements and mandate the companies legally to have more than one female director (instead of the present legal requirement of having at least one woman director as a practice of tokenism) to reach the 'critical mass'. Further, women director can be made as chairman of environmental and corporate social responsibility committees to handle the new strategic and emerging ethical issues of climate change and social responsibility.

14. CONCLUSION

This study supports the previous studies on board capital theory (Ciocirlan and Pettersson, 2012; Ben-Amar et al., 2017; Hollindale et al., 2017; and Hossain et al., 2017) that companies having women as board of directors tend to consider ethical aspects in decision making, especially when it is related to stakeholders of the company. This study also supports the previous studies on critical mass theory (Konrad et al. 2008; Torchia et al. 2011; Joecks et al. 2013 and Ahmed, Monem, Delaney and Ng., 2017) that companies with three women on board (critical mass) tend to influence decision making that results into ethical decisions which in turn promote more disclosure and transparency. This study proved the Board Capital Theory and Critical Mass Theory on appointing women to improve board performance in reporting climate change disclosure to CDP in the Indian context. There is more hope that regulators, based on the performance of woman directors, may increase the number of woman directors on board than ever before.

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Annexure 1– Carbon Disclosure Index (CDI)	
A	Reporting Period
1	StartDate of CDP Reporting Year
2	End Date of CDP Reporting Year
3	CDP Survey Year
4	CDP Reported Fiscal Year
B	Risks and Opportunities
5	Regulatory Risk Exposure
6	Physical Risk Exposure
7	Other Risk Exposure
8	Regulatory Opportunities Present
9	Physical Opportunities Present
10	Other Opportunities Present
C	GHG Emissions
11	Scope 1 Activity Emissions Globally
12	CH ₄ Emissions (CO ₂ e)
13	N ₂ O Emissions (CO ₂ e)
14	HFCs Emissions (CO ₂ e)
15	PFC Emissions (CO ₂ e)
16	Emissions NF ₃ (CO ₂ e)
17	SF ₆ Emissions (CO ₂ e)
18	Location-based Scope 2
19	Market-based Scope 2
20	Scope 2 Emissions
21	Revenue Emission Intensity
22	Company Selected Emission Intensity
23	Scope 3 Purch Goods/Services
24	Scope 3 Use of Sold Produces
25	Scope 3 Use of Sold Products
26	Scope 3 Investments
27	Emissions from Travel
28	Emissions of Bio Sequestered Carbon
29	CDP Level of Uncertainty Scope 1 Emissions
30	CDP Level of Uncertainty Scope 2 Emissions
31	CDP Percentage Data Verified Scope 1
32	CDP Percentage Data Verified Scope 2
33	CDP Percentage Data Verified Scope 3
D	Energy Use
34	Total Fuel Consumption
35	CDP Fuel Used - Biodiesels
36	CDP Fuel Used - Biogas
37	CDP Fuel Used - Crude Oil
38	Low Carbon Energy
39	Total Electricity Consumption
40	Total Purchased Elec Consumption
41	Total Electricity Production
42	Total Renewable Electricity Produced
43	Total Production & Consumption of Renew Electricity
E	Trading
44	Purchased Allowances (ETS)
45	Other Compliance Programs
46	Carbon Offsets
47	Trading Allowances (ETS)

F	Targets and Initiatives	
48	Emission Reduction Targets	
49	Renewable Energy Target	
G	Governance and Strategy	
50	Incentives for Management	
51	Engages Policy Climate Change	
52	Climate Change Strategy	
53	Internal Price of Carbon	
54	Third Party Avoided Emissions	
55	Emission Reduction Activities	
56	Value Chain Engagement	