

Islamic corporate governance quality on carbon disclosure: an empirical study in Islamic bank

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Abstract

This study aims to explore the carbon disclosure made by Islamic banks through determinants. Using data from annual reports and sustainability reports of 55 global Islamic banks listed on the stock exchange for the period 2013-2022. This study focuses on determinants carbon disclosure through the quality of Islamic corporate governance mechanisms. Islamic corporate governance is represented by of sharia supervisory board (SSB) and board of directors (BOD). SSB and BOD are measured using a dichotomous score index that represents their respective characteristics. The study results show that the quality of SSB is able to encourage Islamic banks to be more responsive to sustainability issue, especially related to carbon emissions. In addition, the quality of the board of directors affects carbon disclosure, which means that the quality of the BOD plays a major role as a planner and executor in responding to sustainability issues, especially related to carbon emissions, and is able to meet stakeholder demands.

Keywords: Carbon emission; voluntary disclosure; corporate governance; sharia supervisory board; Islamic bank

1. Introduction

Erratic climate change is affecting different countries and has become a serious challenge. This is caused by global warming, where the Earth's temperature has increased between 1 and 1.2°C since the 1800s or pre-industrial years (Delworth *et al.*, 2016). The increase in carbon dioxide (CO₂) and other greenhouse gases from human activities contributes to global warming (Ritchie *et al.*, 2020). This condition has also led to the shrinking of green land, disruption of food security, and rising sea levels (Al-Qahtani & Elgharbawy, 2020). Meanwhile, economic growth in various countries has included greater energy, showing the production of CO₂ emissions (Niyonzima *et al.*, 2022). The Global Environment Organization continues to enhance policymakers around the world to realize a 45% reduction in emissions by 2030 and zero carbon by 2050 as stated in the 2015 Paris Agreement. Based on The Global Carbon Project data, the emissions over the past decade between 2011-2019 have increased by an average of 0.1 GtCO₂ but decreased during the COVID-19 pandemic. According to the International Energy Agency (2022), carbon

emissions in 2021 increased by 6% with the massive recovery of the world economy after the pandemic crisis. The increasing emissions are the largest on record due to the burning of coal to meet energy demand as the increase in natural gas prices despite renewable power generation. Green activists continue to urge companies to be proactive in addressing carbon emissions and disclosing related information (Reid & Toffel, 2009). Some companies in the world have participated in reducing carbon emissions and disclosing the concept (Luo *et al.*, 2012). However, the lack of regulations related to risk assessment, corporate governance, and accountability in financial statements makes entities unresponsive to climate change (Linnenluecke *et al.*, 2015). Reduced profitability, investment, and productivity are experienced when this is left unchecked and carbon emissions continue to increase in the long term (Rezai *et al.*, 2018).

Governments in many countries are gradually allowing organizations to respond to carbon effects through the introduction of trading, reduction, regulation, and disclosure (Hogan & Lodhia, 2011). As evidence to reduce the carbon effect, an entity needs to disclose information to meet stakeholders's

requirements. Disclosure of carbon information can be beneficial for the company because investors will tend to invest in companies with a good reputation which is reflected in business ethics, good governance, concern for the environment, and responsibility to stakeholders (Plumlee *et al.*, 2015). Through carbon disclosure, companies can increase stakeholder trust and reduce the risk of conflict with the community (Hasseldine *et al.*, 2005).

The risk of climate change occurs in all industries due to the inputs directly impacting environmental change (Stanny & Ely, 2008). Banking is one of the industries that does not have a direct impact on the environment, but because of the role as an intermediary, the system has a substantive share in carbon emissions (Kılıç & Kuzey, 2019). In previous studies related to carbon disclosure, many results used non-banking sectors due to active role in economic development. Therefore, this study aimed to see the extent of the role played in reducing emissions, which is mainly viewed from the disclosure of related information, focusing on Islamic banking. According to the Asian Development Bank (2022), the Islamic finance industry has grown globally to \$3 trillion in assets to support climate change mitigation since the establishment in the 1970s. Islamic banks function as collectors and distributors of funds that carry out principles, which are concerned with improving the quality of life (Haniffa, 2002). The call for responsible finance and the maqasid principle imply the responsibility of Islamic banks towards environmental management (Obaidullah & Shirazi, 2017). Responsibility for environmental impacts includes the improvement of relationships with stakeholders vertically and horizontally (Budi *et al.*, 2019). Stakeholders should be continuously convinced of the condition of Islamic banking in a growth period, specifically, investors who are starting to consider environmental risks arising from business operations.

This study is based on several objectives of determining the extent of Islamic institutions in handling climate change issues through carbon disclosure due to previous results by Choi *et al.*,

(2013); Liao *et al.* (2015); Elsayih *et al.* (2018); Al-Qahtani & Elgharbawy (2020); Pittrakkos & Maroun (2020); Mateo-Márquez *et al.* (2020) focused on conventional institutions. The analysis related to voluntary disclosure in Islamic institutions has been conducted by Farook & Roman (2007); Hassan & Syafri Harahap (2010); Aribi & Gao (2011); Farook *et al.* (2011) on the topic of CSR reporting. These conditions show that studies related to carbon disclosure are still lacking. Therefore, the previous literature review fills the gap and explores more deeply the carbon disclosure practices in Islamic-based institutions. The results have the potential to conclude the ability of Islamic-based business models to promote accountability through disclosure practices.

Several factors influence companies to disclose carbon emissions, such as corporate governance, which impacts disclosure and has been proven by several studies. Good corporate governance mechanisms can create good relationships with stakeholders (Welford, 2007). This factor serves to ensure the interests of all stakeholders are met through monitoring of management procedures such as planning, internal control, performance, and disclosure (Haddad *et al.*, 2017). According to Rankin *et al.* (2011) and Choi *et al.* (2013), the quality of corporate governance affects the extent of carbon disclosure. Additionally, the characteristics of companies such as board size, gender diversity, CEO-chair duality, board independence, and environmental committee have a positive effect on the variable (Liao *et al.*, 2015; Krishnamurti & Velayutham, 2018; Kılıç & Kuzey, 2019). Several studies related to corporate governance on carbon disclosure measured by the number of company directors and presence of CEOs conducted by Prado-Lorenzo *et al.* (2009); Krishnamurti & Velayutham (2018); He *et al.* (2019) showed a negative relationship. The majority of these studies were carried out in conventional companies. Due to the diverse results and samples limited to conventional companies, this study aimed to examine corporate governance mechanisms in Islamic institutions. The empirical results are expected to be

used as consideration for policymakers in making appropriate regulations and standards to further promote company management to improve carbon disclosure, specifically in the Islamic bank sector.

2. Literature Review and Hypothesis Development

The carbon issue is an important discussion for stakeholders such as government, society, media, customers, employees, and environmental activists considering climate change affects resource scarcity which is a common problem (Guenther *et al.*, 2016). Furthermore, stakeholders as resource owners influence company performance (Harrison *et al.*, 2010). In this context, companies are accountable for ensuring transparency regarding the appropriate utilization of resources invested (Schaltegger & Burritt, 2006). Organizations that are not responsive to stakeholders' demands in the environment cannot survive due to the effects on the results (Pfeffer *et al.*, 1978). Stakeholder theory shows the company's accountability in obtaining information related to activities for decision-making purposes.

Stakeholders in the Islamic view, are individuals or groups who have rights with the risk of voluntary or involuntary company actions (Iqbal & Molyneux, 2005). These individuals have an explicit relationship stated in a written contract or transaction between two parties and the contract is the core of Islamic Sharia (Iqbal & Mirakhor, 2012). Islam has laws related to the corporate economy different from the conventional system. Therefore, the company's business policies and directions will also pay attention to stakeholders through Islamic rules (Budi *et al.*, 2019). In essence, humans as leaders on earth automatically have an implicit contract with God in every activity, with the resources used to fulfill Islamic objectives (Islam *et al.*, 2012). This can be realized through social responsibility, where the activities carried out by the entity can improve living conditions in compliance with religious regulations and norms (AAOFI, 2010).

Non-financial information disclosure such as government, society, and environment has been

regulated by several theories that predict corporate disclosure activities based on characteristics (Desai, 2022). The definition of carbon disclosure in terms of the theoretical basis of environmental disclosure is a report, providing more information to stakeholders (Berthelot & Robert, 2011; Alfani & Diyanty, 2020) and ensuring business continuity (Akbaş & Canikli, 2019). According to Zvevdov *et al.* (2016), carbon accounting is the process of measuring emissions generated by the company, controlling steps, and reporting results to stakeholders with the aim of sustainable development as a response to climate change.

Najmudin (2011) defined corporate governance in the Islamic view as a system directing and controlling the entity to fulfill the company's objectives while protecting the interests and rights of all stakeholders based on the Qur'an and Sunnah. According to Bhatti *et al.* (2010), ICG designed economic agents, legal systems, and corporate governance to be directed by moral and social values based on Islamic law. Conventional-based corporate governance tends to have several objectives that conflict with stakeholders. From the Islamic perspective, corporate governance has the welfare of all stakeholders without exception (Abu-Tapanjeh, 2009). Islamic corporate governance consists of two elements, namely corporate and sharia governance (Jan *et al.*, 2021). Meanwhile, Sharia governance functions to ensure the products, services, and activities of the entire entity are consistent with the rules and laws while corporate governance ensures accountability, transparency, and business efficiency (Ajili & Bouri, 2018).

Islamic corporate governance is a system oriented towards the interests of larger stakeholders and in line with the principles of *maqashid* sharia (Dusuki *et al.*, 2007). The components of governance must be able to carry out the role of leaders and show accountability for the activities carried out (Taufiq, 2015). The roles can be performed by disclosing information related to the entity's economic growth, social contribution, and protection of the environment

which has become an important activity for top management (So *et al.*, 2021). Several analyses related to carbon disclosure show a close relationship with environmental performance which is also a component of corporate sustainability. Therefore, this study aims to examine the relationship between Islamic corporate governance mechanisms and carbon disclosure. Jan *et al.* (2021) and So *et al.* (2021) showed the influence of Islamic corporate governance on sustainability performance and disclosure. The opposite results were shown by Budi *et al.* (2019), where ICG did not expand ISR disclosure. Based on the findings, there are inconsistencies since the quality of Islamic corporate governance on carbon disclosure of Islamic banks is examined in several countries around the world.

The Sharia supervisory board is one of the main components of corporate governance in Islamic institutions and banks. The board functions as a supervisor that ensures the company carries out business operations based on values (Jan *et al.*, 2021). Corporate responsibility for the environment is an effort to conduct Islamic values in line with Islamic stakeholder theory. According to Farook *et al.* (2011) and Wijayanti & Setiawan (2022), the Sharia supervisory board measured by IG-Score allows companies to disclose CSR and Islamic social reporting. Rahma & Bukair (2015) and El Hussein (2018) also found a positive effect of the existence of a Sharia supervisory board on the quality of CSR reporting. Therefore, the number of supervisory boards affects the disclosure of sustainability reports because the monitoring is more effective.

Hipotesis 1: Sharia supervisory board quality influences Carbon Disclosure

Besides the sharia governance component in the Islamic corporate governance system, there is corporate governance functioning to ensure accountability, transparency, and business efficiency (Jan *et al.*, 2021). Recently, companies need to effectively address external demands, particularly those from stakeholders providing resource support. Among the demands is the requirement for greenhouse

gas emissions disclosure, which forms an integral part of the company's strategic considerations aimed at improving appropriate conduct to achieve optimal performance through social and environmental responsibility (Chakroun *et al.*, 2017). Therefore, corporate governance mechanisms have a role in monitoring greenhouse gas emissions and climate change risks. Previous studies by Luo & Tang (2021); Moussa *et al.* (2020); Liao *et al.* (2015); and Choi *et al.* (2013) showed the important role of corporate governance on carbon performance. In this context, several measurement elements can be used as variables such as the size of the board of directors, frequency of meetings, and educational background of directors.

Previous studies have shown that the board of directors as a decision maker is responsible for determining the role and appropriate actions related to carbon control in the company (Elsayih *et al.*, 2021). Based on stakeholder theory, a large board of directors can represent a more diverse group in reaching out to the stakeholders (Kaymak & Bektas, 2017). Furthermore, various capabilities and knowledge are possessed in providing greater funds to meet social and environmental responsibility objectives (Ananzeh, 2022). Previous analysis by (Chithambo & Tauringana (2014) and He *et al.*, (2019) where CG represented by the size of the board of directors has a positive effect on climate-related disclosure. The effectiveness has a positive effect on carbon voluntary disclosure (Ben-Amar & McIlkenny, 2015). According to Liao *et al.* (2015); Jaggi *et al.* (2018); Krishnamurti & Velayutham (2018) and He *et al.* (2019), board independence has a positive effect on carbon voluntary disclosure.

Hipotesis 2: Board of Director quality influences Carbon Disclosure

3. Methods

3.1. Sample

This study focuses on Islamic banks operating in various countries and listed on the stock exchange. A

total of 57 Islamic banks covering 15 countries were obtained and provided related information through annual and sustainability reports, as well as ESG Reporting in English accessed through the websites of Islamic banks or stock exchanges of related countries in the 2013-2022 period using nonprobability sampling techniques (Sekaran & Bougie, 2016). Based on these criteria, 457 observations of 53 Islamic banks were obtained.

3.2. Variable Measurement

This study uses quantitative analysis, where carbon disclosure is the dependent variable with indicators or items. The measurement indicators used refer to the index developed by Choi et al. (2013) and Islamic corporate governance acts as an independent variable.

ICG is represented separately, consisting of Sharia and corporate governance. The measurement of sharia governance (SSBQ) uses an index developed by Boudawara et al. (2023) which is taken from several sources such as AAOIFI, IFSB, and BNM. Meanwhile, the measurement of corporate governance uses a board of director quality by Ajili & Bouri (2018) to represent corporate governance through more than an indicator expected to be accurate.

The control variables used in this study are bigfour, ROA, and size. Bigfour is measured by a dummy variable when the bank is audited by a company worth 1, otherwise, it is worth 0. ROA is calculated by the ratio of net profit to total assets which is a measure of company performance. In addition, the size variable of a company is assessed from the total assets.

Table 1 Variable Measurement

Variable Code	Details	Measurement
CD	Carbon disclosure score on bank <i>i</i> at year <i>t</i> (A.2)	Ratio of total disclosed items divided by total index item (Bae Choi et al., 2013).
SSBQ	Total quality index of sharia supervisory board at bank <i>i</i> year <i>t</i> is 17 items which are: 1) SSB has a minimum educational background of bachelor's degree in sharia; 2) SSB education in banking or finance; 3) SSB has experience in Islamic bank; 4) SSB has cross-membership in other bank; 5) SSB is a member of sharia council; 6) SSB is not an executive member or ex-senior employee; 7) there are female members in the SSB; 8) there are foreign SSB; 9) composition of SSB change annually; 10) the number of SSB between 3-8 people; 11) there is an internal shariah audit; 12) there is an internal sharia audit; 13) training sharia; 14) there is an SSB secretary; 15) SSB issue sharia report; 16) meeting attendance of each SSB member; 17) meeting's frequency at least 6 times in 1 year.	The ratio of total disclosed items divided by total items in the index (Boudawara et al., 2023). (each index uses dichotomous operations, if the information disclosed is in accordance with the index then it is worth 1, otherwise it is 0).
BODQ	The quality index of the board of directors of bank <i>i</i> in year <i>t</i> is 5 items which include: 1) there are more than 50% non-executive directors; 2) there are 1/3 independent members on the board of directors; 3) if the chairperson is independent; 4) the CEO and chairperson are different people; 5) board meetings are held 6 times a year. CEO and chairperson are different people; 5) board meetings are held 6 times a year.	The ratio of total items disclosed divided by total items in the index (Ajili & Bouri, 2018). (each index uses dichotomous operations, if the information disclosed is in accordance with the index then it is worth 1, otherwise it is 0)
BIGFOUR	If bank <i>i</i> is audited by a Bigfour company at year <i>t</i>	If the bank is audited by Bigfour given score 1, otherwise 0
ROA	Return on Asset bank <i>i</i> at year <i>t</i>	Net income ratio / Total assets
SIZE	Size of bank <i>i</i> at year <i>t</i>	Logaritma Natural Total asset

4. Results and discussion

4.1. Descriptive Statistics

The descriptive statistical analysis results in Table 2 shows that the dependent variable CD has average, minimum, and maximum values of 0.0857, 0, and 0.7222, respectively. The minimum value of 0 shows that there are Islamic banks that do not disclose information related to carbon disclosure. SSBQ has average, minimum, and maximum values of 0.3951, 0, and 1.2352, respectively. The minimum value is obtained because some information based on the SSB quality index is not reported by the bank.

Another independent variable BODQ which is measured by the board of director quality has average, minimum, and maximum values of 0.5422, 0, and 1, respectively. The minimum value of 0 is because some banks do not have detailed information matching the index to measure BOD quality. For the control variable, BIGFOUR has average, minimum, and maximum values of 0.7155, 0, and 1 due to dummy measurement. ROA describes bank performance with average, minimum, and maximum values of 0.0152, -0.1428, and 0.43. Meanwhile, SIZE has average, minimum, and maximum values of 19.9876, 0.2822, and 29.1995, respectively..

Table 2 descriptive statistics result

Variables	Obs	Mean	Std. Dev	Min	Max
CD	457	0.0857	0.1390	0	0.7222
SSBQ	457	0.3951	0.1926	0	1.2352
BODQ	457	0.5422	0.2255	0	1
BIGFOUR	457	0.7155	0.4516	0	1
ROA	457	0.0152	0.0427	-0.1428	0.4300
SIZE	457	19.9876	3.6134	0.2822	29.1995

Note: CD=Carbon disclosure; SSBQ= kualitas SSB; BODQ= kualitas board of director; BIGFOUR= audited by bigfour or not; ROA=return on assets; SIZE= ukuran perusahaan

4.2. Correlations Test

To determine multicollinearity problems, a correlation test is conducted. Table 2 shows the test results with a pairwise correlation test, where the

regression model does not correlate with each other ($p < 0.80$).

Tabel 3. Correlation test

	1	2	3	4	5
SSBQ	1				
BODQ	0.2897	1			
BIGFOUR	0.1232	0.2304	1		
ROA	0.0722	0.0187	0.1175	1	
SIZE	0.1140	-0.0634	0.0561	0.1167	1

Sources: data analyzed by authors (2024)

4.3. Regression results and discussions

Before regressing on this model, the Chow and Hausman tests are carried out to obtain the fixed effect model. In models 1 and 2, the coefficient values are 0.2292 ($p < 0.01$) and 0.2130 ($p < 0.01$), respectively. The models show consistent results where the quality of SSB has a positive effect. Therefore, hypothesis 1, stating that the quality of

SSB affects carbon disclosure, is accepted. Islamic banks with a good SSB quality index can respond to carbon issues as part of business. In this context, stakeholders' demand for information related to carbon as a climate change issue can be fulfilled. Islamic banks that make extensive carbon disclosures will be able to attract investor confidence. These results were consistent with Boudawara *et al.* (2023),

where the quality of SSB promoted ESG of Islamic banks.

The quality of the board of directors also has a positive effect with a coefficient value in models 2 and 3 of 0.1133 ($p < 0.01$) and 0.0894 ($p < 0.05$). These results are consistent with hypothesis 2, where the quality has a positive effect on carbon disclosure. Therefore, a qualified and capable board of directors can enhance wider carbon disclosure. These results were in line with Ben-Amar & McIlkenny (2015) that the effectiveness of directors affected carbon voluntary disclosure. Chithambo & Tauringana

(2014) and He *et al.* (2019) stated that directors had a positive effect on climate-related disclosure. The effectiveness of directors had a positive effect on carbon voluntary disclosure (Ben-Amar & McIlkenny, 2015). These results also proved the stakeholder theory that the board of directors could represent the fulfillment of groups (Kaymak & Bektas, 2017). Furthermore, different capabilities and knowledge were reported to provide greater funds in meeting social and environmental responsibility objectives (Ananzeh, 2022).

Tabel 4. Regression test

		Results	
SSBQ	0.2292*** (0.0000)		0.2130*** (0.0001)
BODQ		0.1133*** (0.0040)	0.0894** (0.0234)
BIGFOUR	0.0787 (0.0024)	0.0864 (0.0010)	0.0713 (0.0062)
ROA	0.4200 (0.0085)	0.4484 (0.0055)	0.4418 (0.0056)
SIZE	0.0061 (0.0194)	0.0061 (0.0229)	0.0059 (0.0250)
Adj R2	0.4155	0.4000	0.4197
F-Statistics	6.8024	6.4288	6.7991
Prob F-Statistic	0.0000	0.0000	0.0000
Data Observation	457	457	457

Sources: data analyzed by authors(2024)

Among the control variables, the results show that bigfour has a positive effect on carbon disclosure. Therefore, entities audited by bigfour companies will disclose more information (Ding *et al.*, 2021) since the accounting firms are showing environmental issues related to carbon and climate change. In this context, ROA and SIZE have a positive effect on carbon disclosure.

4.4 Robustness Test

In a robust test was conducted to analyze the robustness of the model. The test was conducted by (i) excluding the dependent variable that did not disclose carbon-related information from the beginning to the end of the year (2013-2022). The disclosed carbon-related information during the study year was included in the test and further analyzed with ordinary least square or OLS regression. In addition, the study (ii) replaced the measurement of carbon disclosure using the GRI index to test the robustness of the model.

Tabel 5. Robustness test

	(i)	(ii)
SSBQ	0.2062*** (0.0005)	0.6007*** (0.0000)
BODQ	0.1096** (0.0131)	0.2854*** (0.0002)
BIGFOUR	0.0689 (0.0117)	0.0762 (0.1301)
ROA	0.4916 (0.0047)	-0.3285 (0.2865)
SIZE	0.0088 (0.0069)	0.0105 (0.0400)
Prob F-Statistics	0.0000	0.0000
F-Statistics	6.2750	6.0221
Adj R2	0.4002	0.4618
Observation	412	457

Sources: data analyzed by authors (2024)

Model (i) shows that the quality of SSB has a positive effect on carbon disclosure with a coefficient of 0.2062 ($p < 0.001$), while the quality of the board of directors also has a positive effect on carbon disclosure with a coefficient of 0.1096 ($p < 0.05$) since the results are robust. Model (ii) shows that the quality of SSB and the board of directors have a positive effect on carbon disclosure with a coefficient of 0.6007 ($p < 0.001$) and 0.2854; ($p < 0.001$) since the results are robust.

5. Conclusions

In conclusion, this study was conducted to examine the effect of SSB quality and board of directors on carbon disclosure in Islamic banks. The total observed data was 457 from Islamic banks in the world and listed on the stock exchange in the 2013-2022 period. The results showed that the quality of SSB had a positive effect on carbon disclosure in Islamic banks according to hypothesis 1 (H_1). Therefore, a quality SSB could enhance Islamic banks to be more responsive to sustainability issues, specifically related to carbon emissions. The quality of the board of directors affected carbon disclosure, and hypothesis 2 (H_2) was proven. A qualified board of directors represented the performance of BOD, which played a major role as a planner and executor

in responding to sustainability issues, specifically related to carbon emissions.

The results provided information for regulators as public stakeholders, specifically in the sharia sector to maximize the company's role in reducing carbon emissions and disclosing as a form of responsibility through elements of corporate governance. This study was limited to measuring the quality of SSB and board of directors cumulatively. For future analyses, the influence of each indicator component on carbon disclosure should be measured.

Credit authorship contribution statement

Affiah Oki Nilasakti: Conceptualization, Methodology, Data curation, Formal analysis, Project administration, Visualization, Writing – original draft, Writing – review & editing. **Doddy Setiawan:** Conceptualization, Methodology, Data curation, Investigation, Formal analysis, Visualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have known competing financial interests or personal relationship that could have appeared to influence the work reported in this paper.

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List of Appendices

A.1 Sample Bank List

Bank	Country	Stock Exchange
1 Dubai Islamic Bank	Dubai UAE	Dubai Financial Market
2 Abu Dhabi Islamic Bank	Dubai UAE	Abu Dhabi Securities Exchange
3 Emirates Islamic bank	UAE	Dubai Financial Market
4 Sharjah Islamic bank	UAE	Abu Dhabi Securities Exchange
5 Amlak Finance	UAE	Dubai Financial Market
6 Islami Bank Bangladesh	Bangladesh	Chittagong Stock Exchange
7 First security islami bank	Bangladesh	Chittagong Stock Exchange
8 EXIM bank bangladesh	Bangladesh	Chittagong Stock Exchange
9 Al Arafah Islami Bank	Bangladesh	Chittagong Stock Exchange
10 Social Islami Bank	Bangladesh	Chittagong Stock Exchange
11 Shahjalal Islamic Bank	Bangladesh	Chittagong Stock Exchange
12 Islamic Finance and Investment Limited	Bangladesh	Chittagong Stock Exchange
13 ICB Islamic Bank Limited	Bangladesh	Dhaka Stock Exchange
14 Al Baraka Banking Group	Bahrain	Bahrain Bourse

15	Ithmaar Holding BSC	Bahrain	Bahrain Bourse & DFM
16	Al Salam Bank Bahrain	Bahrain	Bahrain Bourse
17	GFH Financial Group	Bahrain	Bahrain Bourse
18	Bahrain Islamic Bank	Bahrain	Bahrain Bourse
19	Khaleeji Commercial Bank	Bahrain	Bahrain Bourse
20	Faisal Islamic Bank Egypt	Egypt	The Egyptian Exchange
21	Al Baraka Bank Egypt	Egypt	The Egyptian Exchange
22	Abu Dhabi Islamic bank egypt	Egypt	The Egyptian Exchange
23	BRI Syariah / BSI	Indonesia	Bursa Efek Indonesia
24	Bank Panin Dubai Syariah	Indonesia	Bursa Efek Indonesia
25	Aladin Bank	Indonesia	Bursa Efek Indonesia
26	Bank BTPN Syariah	Indonesia	Bursa Efek Indonesia
27	Kurdistan International Bank	Iraq	Iraqi Stock Exchange
28	Jordan Islamic Bank	Jordan	Amman stock exchange
29	Safwa Islamic Bank	Jordan	Amman stock exchange
30	Kuwait Finance House KFH	Kuwait	Kuwait Stock Exchange
31	Boubyan Bank	Kuwait	Kuwait Stock Exchange
32	Ahli United Bank	Kuwait	Kuwait Stock Exchange
33	Kuwait International Bank	Kuwait	Kuwait Stock Exchange
34	Warba Bank	Kuwait	Boursa Kuwait Stock Exchange
35	Aayan Leasing and Investment	Kuwait	Kuwait Stock Exchange
36	BIMB Holdings Berhad	Malaysia	Bursa Malaysia
37	Affin Islamic Bank	Malaysia	Bursa Malaysia
38	Jaiz Bank PLC	Nigeria	Nigerian Exchange Group (NGX)
39	Nizwa SAOG	Oman	Muscat Stock Exchange
40	Alizz Islamic Bank	Oman	Muscat Stock Exchange
41	Meezan Bank	Pakistan	Pakistan Stock Exchange
42	Bank Islami Pakistan	Pakistan	Pakistan Stock Exchange
43	First Habib Modaraba	Pakistan	Pakistan Stock Exchange
44	ORIX Modaraba	Pakistan	Pakistan Stock Exchange
45	First National Bank Modaraba	Pakistan	Pakistan Stock Exchange
46	Qatar Islamic Bank	Qatar	Qatar Stock Exchange
47	Masraf Al Rayan QSC	Qatar	Qatar Stock Exchange
48	Qatar International Islamic Bank	Qatar	Qatar Stock Exchange
49	Qatar First Bank LLC (Lesha Bank)	Qatar	Qatar Stock Exchange
50	Al Rajhi Bank	Saudi Arabia	Saudi Exchange
51	Alinma Bank	Saudi Arabia	Saudi Exchange
52	Al Jazira JSC	Saudi Arabia	Saudi Exchange
53	Bank AlBilad	Saudi Arabia	Saudi Exchange

A.2 Carbon disclosure index by (Bae Choi et al., 2013)

Category	Code	Item Details
CC	CC1	Assessment of risks and opportunities
	CC2	Financial implications
	GH1	Methodology for calculation
	GH2	External verification
GH	GH3	Total emissions
	GH4	Disclosure by scope
	GH5	Disclosure by source
	GH6	Disclosure by facility or segment
	GH7	Historical comparison of emissions
EC	EC1	Total consumed
	EC2	Disclosure consumption from renewable source
	EC3	Disclosure by type, facility or segment
RC	RC1	Plans to reduce GHG emissions
	RC2	Targets for GHG emissions
	RC3	Reductions achieved to date
	RC4	Costs of future emissions factored in capital expenditure planning
AC	AC1	Explanation of where responsibility lies for climate change policy and action

A.3 Carbon disclosure index by GRI

Category	Code	Item
Management	PM1	Explanation why emission gas material is a topic for the company
Approach	PM2	Explanation of how the company manage its gas emission
(GRI 103)	PM3	Statement of emission management objectives
	PM4	Company's policy or commitment description related to gas emission
	PM5	Management approach evaluation related to gas emission
Emission (GRI 305)	CD1	Gas emission total presented in a metric ton
	CD2	Disclose the source of emission factors
	CD3	Disclose base year calculation
	CD4	Disclose standard, methodology, assumption an or calculation tool used
	CD5	Emission gas intensity ratio
	CD6	Reduction of gas emission

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