The Level of Environmental Disclosure in Sustainability Reports in Major Companies
Case study of six Major Companies in Oil and Gas sector
مستوى الإفصاح البيئي في تقارير التنمية المستدامة لكبرى الشركات
دراسة حالة ستة شركات كبرى في قطاع النفط والغاز

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Received:15/03/2022; Accepted for reviewing:06/04/2022 Accepted for publishing: 03/06/2022

Abstract**:** Over the last decades, many global initiatives have been developed to be used in company sustainability reporting, among them the Global Reporting Initiative. This paper aims to study the level of environmental disclosure in worldwide Major oil and gas companies. As a research method, we chose a case-study of six selected largest companies in this sector .We found that the level varies from one company to another and ranges from level C to A under GRI.Besides, the voluntary nature and the multiplicity of standards made the environmental reports differ in terms of the content and depth of the disclosed environmental information.

Keyswords: Sustainability reporting, Environmental accounting, Environmental Performance Indicators, Largest oil and gas companies, GRI.

JEL classification code: Q56.

ملخص**:**على مدى العقود الماضية، تم تطوير العديد من المبادرات لاستخدامها في تقارير التنمية المستدامة للشركات، من بينها المبادرة العالمية للتقارير. تهدف هذه الورقة إلى دراسة مستوى الإفصاح البيئي في أكبر شركات النفط والغاز في العالم. واخترنا دراسة حالة 6 من اكبر الشركات في هذا القطاع. وجدنا ان المستوى يختلف من شركةلاخرى ويتراوح من المستوى ا إلى ج حسب المبادرة العالمية للتقارير. كما ان ، الطبيعة الطوعية وتعدد المعايير جعلت التقارير البيئية تختلف من حيث المحتوى وعمق المعلومات البيئية المفصح عنها.

الكلمات المفتاحية: تقارير التنمية المستدامة، المحاسبة البيئية، مؤشرات الأداء البيئي، الشركات الكبرى في قطاع النفط والغاز، مبادرة التقارير العالمية.

تصنيف JEL:Q 56

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1. INTRODUCTION

In a world; conscious of environmental issues and the risks that future generations will face, the demand for environmental information is increasing day by day. Largest oil and gas companies, especially those whose are behind a third of all carbon emissions in the world, face great pressures from stakeholders. One of the most effective ways to help companies to disclose their environmental performance is the environmental Performance Indicators of their sustainability performance**.**

Over the past decades, a large number of companies have been involved in cases of concealing environmental information and reports to avoid responsibility for ethical issues regarding climate changes. (Hardy, 2003, p. 3). Global temperatures have significantly increased in the past half century and extreme weather events, such as cold and heat waves, droughts and floods, as well as natural disasters, are becoming more frequent and severe. These changes in the distribution of weather patterns (i.e., climate change) are not only affecting low-income countries, but also advanced economies (Matthew E. Kahn, 2019, p. 1). In other words, it has become a global problem.

Companies such as ExxonMobil knew about climate change for years and continued to downplay it, even with this knowledge; ExxonMobil issued ad campaigns that mislead the public on climate change (McElmeel, 2018, pp. 3-4). This has fueled debates around the impact of company's activities for decades, the topic of climate change and environmental and social responsibility has been one of the most important and frequently debated discussions.

Environmental and sustainability issues have assumed significance, leading to social and legal pressures on the companies across the world to take steps to reduce and prevent adverse impact of their activities on the environment and to disclose this information to the concerned stakeholders (Majumdar K. K, 2021), many corporations have begun to report their eco-friendly activities and environmental performance. Hence, the mechanisms for environmental reporting and disclosures have drawn much attention from company management, researchers, accounting bodies and the media, especially in industrialized countries.

Environmental reporting has become international (Holland, 2003, p. 2). Nearly three out of four companies include environmental

information in the annual report. One in four companies produces separate environmental reports (1996, KPMG).

Currently the world consumes about 100 million barrels of oil a day, and the global demand for natural gas is expected to rise by 29% by 2040, the oil and gas sector will play a fundamental role in providing the world's energy. As the world transitions to a low-carbon future, oil and gas companies will need to develop robust Environmental sustainability strategies that demonstrate active assessment, reporting and improvement upon their ESS performance. The necessity of imposing declaration of environmental reports on institutions has not become important, at least for the major companies, as the latter face various pressures make them be prepared voluntarily (Conor Chell, 2021).

Today, most studies and statistics confirm that most of the major companies in the world disclose environmental information either in separate reports or within their annual reports, but the problematic that arises is**:**

What is the level of disclosure of environmental performance in the environmental reports of the largest companies operating in the oil and gas sector?

As a research strategy, we chose a case-study of six selected largest companies in the oil and gas sector, five of which were classified as among the twenty companies that cause a third of gas emissions in the world, and we assumed the following:

H1: All major companies in the oil and gas sector produce separate environmental reports.

H2: Major companies in the oil and gas sector disclose their environmental performance through quantitative and qualitative indicators.

H3: Major companies in the oil and gas sector rely on environmental accounting as a basic tool in preparing the environmental reports.

H4: Major companies in the oil and gas sector disclose the financial environmental information.

H5: Major companies in the oil and gas sector disclose that they have obtained the International Standardization Organization certificates related to the environmental performance.

2. Literature and environmental reporting framework

2.1 Literature review

A review of the relevant literature reveals that the corporate environmental reporting has received attention by researchers. In the early 1990s, the issue of sustainability reporting was dealt within in the context of environmental accounting and reporting focused on the environmental impacts of business operations (Soner G, 2020, p. 108) . Although there are studies that focus on environmental reporting:

Gray's (1995) study discussed that many researchers have applied theories to explain the existence of sustainable initiatives. Some of them explained the tendency of these companies to engage in sustainable development initiatives and environmental reporting using the theory of legitimacy

(Holland, 2003) In a comparative study between UK and US environmental reporting practices, found that the volume of environmental legislation has increased dramatically in both UK and US. However, the requirement to disclose the environmental information within annual reports has not kept pace with legislative reform in matters of environmental performance. Voluntary disclosures of the environmental information have created many differences between UK and US environmental reporting practices.

(Alzzani, 2013) In this study the researcher aimed to determining the level of data reporting by oil and gas companies (in developing nations) and which is needed to allow the assessment of environmental practices, to answer these questions, he evaluated the environmental practices of eight oil and gas companies against the Sustainability Reporting Guidelines issued in 2006 by the Global Reporting Initiative (GRI). It has been concluded that these companies made reasonable efforts to disclose their environmental performance in accordance with the GRI Sustainability Reporting Guidelines.

(Carlos Larrinaga, 2021) He provided an account of the period prior to the creation of the Global Reporting Initiative (GRI), The author demonstrates that a combination of actors (such as epistemic communities, carriers, regulators and reporters) as well as the presence of certain conditions (such as the societal context, analogies with financial reporting, environmental reporting and reporting design issues) contributed to the development of SR which was consolidated; as well as extended in 1999 with the advent of the GRI.

2.2 Environmental reporting framework

2.2.1 Environmental reporting

Environmental reporting is relatively a new concept, it was introduced in the early 1990s and since then it has rapidly gained acceptance as the means of communicating and demonstrating a company's commitment to improving corporate environmental performance to its stakeholders (Akparhuere, 2019, p183). **Environmental reporting** can be called in different names depending on its purpose and contents, such as a **sustainability reporting** or a **social and environmental** reporting (CSR). According to (GRI, 2019): **"**Sustainability reporting is the process whereby companies disclose their economic, environmental and social impacts on society and environment as a result of their daily business activities**"**.

The Exxon Valdez **1989**, along with other events like the Union Carbide explosion in India in 1984, can be regarded as the turning point when stakeholders began to request information about the environmental impacts of companies' operations. In other words, this event can be regarded as the starting point of the period of emergence (Soner G, 2020, pp. 107-108).

Due to global interest in environmental issues and. stakeholders pressures; governments of many Countries, began systematically to adopt regulations and standards on corporate reporting about potential harmful effects on the environment. The first created regulations in the field of environmental audit appeared in the form of laws, amendments, and acts in the US, Great Britain, Holland, Belgium, Japan etc. These were followed by national, European and international standards aimed at environmental protection and improvement (S Ljubisavljević, 2017, p. 525). In addition, to the legislations and laws witnessed during the period extending from the mid-nineties to the present day, we have registered many national or international initiatives to develop various national and international reporting standards as a response to the recent trend to regulate this type of disclosure. In this context, Marimon et al, claim that there is a wide list of sustainability reporting standards including initiatives such as UN Global Compact Principles, OECD Guidelines for Multinational Enterprises, Global Reporting Initiative GRI, Oil and Gas Industry Guidance on Voluntary Sustainability Reporting, Greenhouse Gas Protocol Initiative, ISO 26000, AA1000, ISO 14001 and SA88000 etc. However, there is still a need for an

internationally recognized and accepted framework to achieve uniformity in environmental disclosure (Michaela Bednárová, 2019, p. 2) & (Helfaya A, 2016).

This paper focus on environmental reporting under two major initiatives:

ISO 14000: Industry-led initiatives such as the ISO 14000 series (although voluntary) also require Companies to devote increasing attention to environmental issues. ISO 14000 environmental standards provide a globally recognized framework for management, measurement, assessment and auditing. Instead of prescribing environmental performance targets, they represent a means for organizations to assess and control the environmental impact of their activities, products and services (ISO, 2010). The **ISO 14060** family provides clarity and consistency for quantifying, monitoring, reporting and validating or verifying **GHG emissions** and removals to support sustainable development through a low – carbon economy and the benefit organizations (ISO 14064).

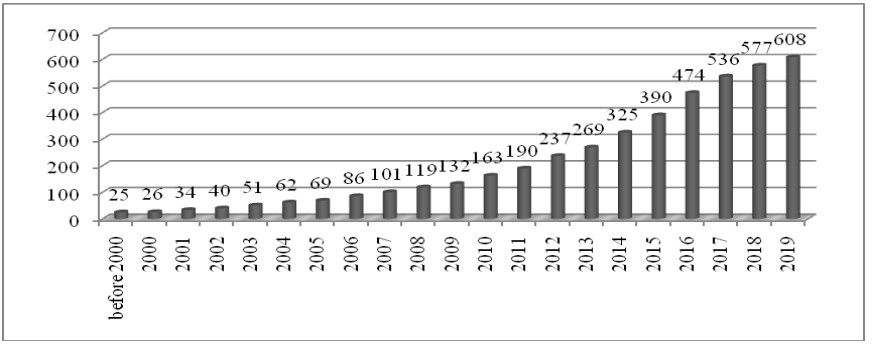
The Global Reporting Initiative GRI: was founded in Boston in 1997 following public outcry over the environmental damage of the Exxon Valdez oil spill (globalreporting.org). Reporting under the GRI **does have 'levels of application'** however, so just because a company reports using the GRI framework, it does not mean it will report at the same level as another organization using the GRI. Part of the GRI requirements is that a company must disclose what level of reporting it is using (Tilt, 2014, p. 14):

- **Level A** is the most comprehensive. A-level companies must respond to every core indicator, either reporting on it, or explaining why it is not material to their business.
- **At level B**, companies are asked to report on **at least 20 indicators**, taking at least one from each area.
- **At the lowest level, C**, companies must report on just **ten indicators.** Unlike the higher levels, C-level companies do not have to disclose their management approach to sustainability. Neither must they comply with some of the guidelines' principles, including 'accuracy', or commit to producing a balanced report.

The field of sustainability reporting has expanded not only in quantity but also in the type of information required. According to the 2020 edition of the **Carrots & Sticks report**, by 2020 there were over 600

sustainability reporting instruments in 87 countries worldwide (Sticks, 2020, p. 15). The following Graphic shows the evolution of companies' dependence in preparing their environmental reports on the Global Reporting Initiative in the period between **2000-2019**.

Graphic N°1: Number of global sustainability reporting instruments (cumulative)



Source: (Sticks, 2020, p. 15)

2.2.3 The disclosure of environmental accounting data as one of the key elements in an environmental report

According to (Jones, 2010, p. 123) the traditional accounting paradigm with its narrow focus on accounting numbers does not capture the environmental consequences of organizational activity. A new environmental accounting system would need to measure, capture and disclose the full range of environmental corporate impacts.

Gray and al. (1987) provide the most useful and commonly used definition of what we mean by **SEA**. They describe it as: **"**Communicating the social and environmental effects of organizations' economic actions to particular interest groups within society and to society at large. As such it involves extending the accountability of organizations (particularly companies), beyond the traditional role of providing a financial account to the owners of capital, in particular, shareholders**"** (Tilt, 2014, p. 13).

Information obtained from environmental accounting by companies is given in two forms: **monetary value** and **physical units** (EAG, 2002, pp. 7-13):

"**Environmental conservation cost** refers to the investment and costs, measured in **monetary value**, allocated for the prevention, reduction, and/or avoidance of environmental impact, for example:

- Cost for preventing air pollution
- Cost for preventing water pollution
- Cost to restore the natural environment back to its original state
- Cost for recycling industrial waste.etc.

Environmental conservation benefit is measured in **physical units** and is the benefit obtained from the prevention, reduction, and/or avoidance of environmental impact, such as: Decrease in energy consumption, Decrease in water usage, Decrease in the emission of environmental pollutants, Decrease in emission of hazardous waste.etc

3. Case study as a research strategy

Energy is a key driver of economic growth and sustainable development. Oil and gas have been fundamental sources of the world's energy, contributing to economic growth and poverty reduction. Currently, oil and gas are the world's most actively traded commodities. Together, they represent the most important resources for electricity production, providing over 50% of the total supply. In 2020, 90% of the transportation sector's energy needs were met by oil products. The oil and gas sector today also meets much of society's needs for raw materials used in the production of specialty chemicals, petrochemicals, and polymers (GRI11, 2021, p. 10). The activities of oil and gas companies have many negative impacts on the environment, which are becoming increasingly significant due to the increased use and transport of oil and gas. Many environmental disasters associated with the activities of oil and gas companies also have material effects on the companies' financial reports (Alzzani, 2013, p 19).

While there are many sectors in which we could have done a case study for the topic of our research paper. Six of the largest oil and gas companies in the world were selected. To clarify the reasons for choosing this sample, we present the following answers:

3.1. Why Oil and Gas sector?

This sector is selected from one of the five groups within chosen environmentally sensitive industry groups. This is based on the argument that the nature of a company's industry has been identified as a factor potentially affecting corporate social disclosure practices (Gray, Kouhy, & Lavers, 1995, p. 49). So, Companies whose economic activities directly modify the environment are more likely to disclose information about their environmental impacts than are companies in other industries (Holland, 2003, p. 3).

3.2.Why a sample of six companies ?

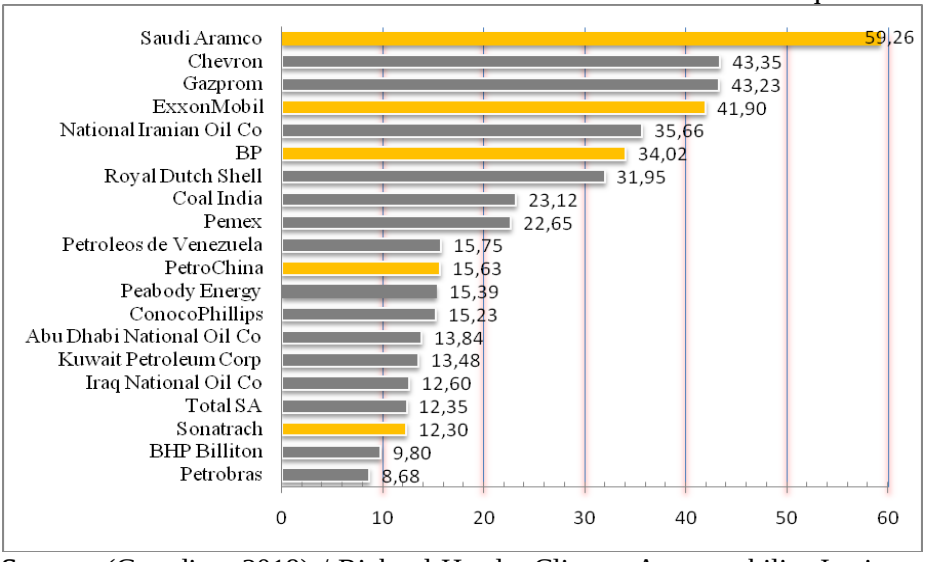
Five companies selected because they are revealed (Guardien, 2019) among 20 fossil fuel companies whose relentless exploitation of the world's oil, gas and coal reserves can be directly linked to more than one-third of all greenhouse gas emissions in the modern era.They are all located in Asia, Europe, America and Africa**.**

The sixth company called Woodside was chosen because it is the second largest in Australia (Forbes, 2021)-we aimed to diversify the sample-. Additionally, four of these companies occupied the top five ranks in the world (Forbes, 2021), which is based on returns in its ranking: China National Petroleum Corporation, Aramco, British Petroleum and ExxonMobil.

The Graphic n° 2 shows the presence of five companies from the selected sample, in the list of the twenty companies that cause a third or more greenhouse gas emissions in the world.

Graphic n° 2: The top 20 companies have contributed to 480bn tones of carbon dioxide equivalent

Billion tonnes of carbon dioxide équivalent



Source: (Guardien, 2019) / Richard Heede, Climate Accountability Institute.

Note: table includes emissions for the period 1965 to 2017 only.

3.3.Why largest companies?

In fact, we highlighted the big companies because the relationship between company size and environmental disclosure is positive, which

was demonstrated by Patten, 1992; Gray and al, 1995; Deegan and Gordon, 1996; Hackson and Miline, 1996, who have proven that there is an association between company size and corporate social disclosures. In other words, 'super-large' companies are significantly more like to disclose all types of corporate information (Holland, 2003, p. 9).

3.4.The data collection and analysis methods

The case study is based on data triangulation. We collected several types of data (qualitative and quantitative data) from three data sources (annual and sustainability reports, websites of companies, media). We used the documentary analysis method, during the study period (2016 - 2020).

3.5.The sample of study The sample consists of six companies that are considered among the largest in the field of oil and gas, namely:

Aramco it is one of the largest companies in the world by revenue. Saudi Aramco has both the world's second-largest proven crude oil reserves, at more than 270 billion barrels (43 billion cubic metres), and largest daily oil production of all oil-producing companies (EIA, 2020) & (www.aramco.com, 2021). It is the single greatest contributor to global carbon emissions -4, 38% of the total global emissions- of any company in the world since 1965.

China National Petroleum Corporation CNPC is the world's 3rd largest oil company based in China and plays a leading role in China's petroleum industry. They integrate the business portfolios of both an oil company and an oilfield service provider, with operations covering the entire oil and gas industry value chain. Having oil and gas assets and interests in over 30 countries (CNPC).

British Petroleum BP formerly British Petroleum then BPAmoco, is a British petroleum exploration, extraction, refining and sales company founded in 1909. After its merger with Amoco, Atlantic Richfield (Arco) and Burmah Castrol, it became the largest company in the UK and the third largest oil company in the world. The BP London division is valued at around 50 billion USD (around 39 billion Euros). Internationally, BP is present in more than 100 countries and employs approximately 115,000 people (www.techno-science.net) & (BP).

ExxonMobil is an American multinational oil and gas corporation headquartered in Irving, Texas. Also it is the largest private oil company in the world. The immense size of the company is

indicated by its financial flows: In 2021, the company had a record net income of USD 17.7 billion with total revenues exceeding USD 230 billion (ExxonMobil.com, 2020)

Woodside Petroleum Ltd is an Australian petroleum exploration and production company. Woodside is the operator of oil and gas production in Australia and also Australia's largest independent dedicated oil and gas Company. It is a public company listed on the Australian Securities Exchange and has its headquarters in Perth, Western Australia. In the 2020 Forbes Global 2000, Woodside was ranked as the 1328th-largest public company in the world (WoodSide).

Sonatrach The Sonatrach group has been chosen as **the first African company** for the year 2021(Jeune Afrique, 2021), according to the annual ranking of the best 500 African companies carried out by the magazine JeuneAfrique. It is an Algerian multinational oil and gas group integrated across the entire hydrocarbon chain. It owns in whole or in absolute majority, more than twenty important companies in all trades related to the oil industry such as drilling, refining (JeuneAfrique, 2022) & (Sonatrach).

3.6. Oil and gas sector production and GHGs emissions

The International Panel on Climate Change (IPCC) warns that continuing to emit greenhouse gas (**GHG**) at the current rate could result in dangerous global temperature increases leading to magnified risks of extreme weather and climate events (GRI11, 2021, p. 10). To shed light on the GHGs emitted of the six companies, we present the following table, which shows the volume of **production** and **GHG – Scope1**- (co2e) emitted for the period (2016-2021).

Table n°1: Productions and GreenHouse Gases emissions GHGs - scope1-for the six companies

company	*Label*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
CNPC	*TH Production (m metric tons)*	*162.98*	*171.34*	*176.37*	*181.03*	*178.64*	*ND*
	GHG Emission- Scope 1	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
Sonatrach	*TH Production (M TEP)*	*192.3*	*196.5*	*192.28*	*186.8*	*175.9*	*ND*
	GHG Emission- Scope 1-	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*
WoodSide	*TH Production (Mboe Annual)*	*94.90*	*84.40*	*91.40*	*89.60*	*100.3*	*91.1*
	GHG Emission-S1 (M Tons)	*10.08*	*9,88*	*9.767*	*8.80*	*9.20*	*8,90*
Exxon	*TH Production (thousands boepd)*	*4.053*	*3.833*	*3.833*	*3.952*	*3.761*	*ND*

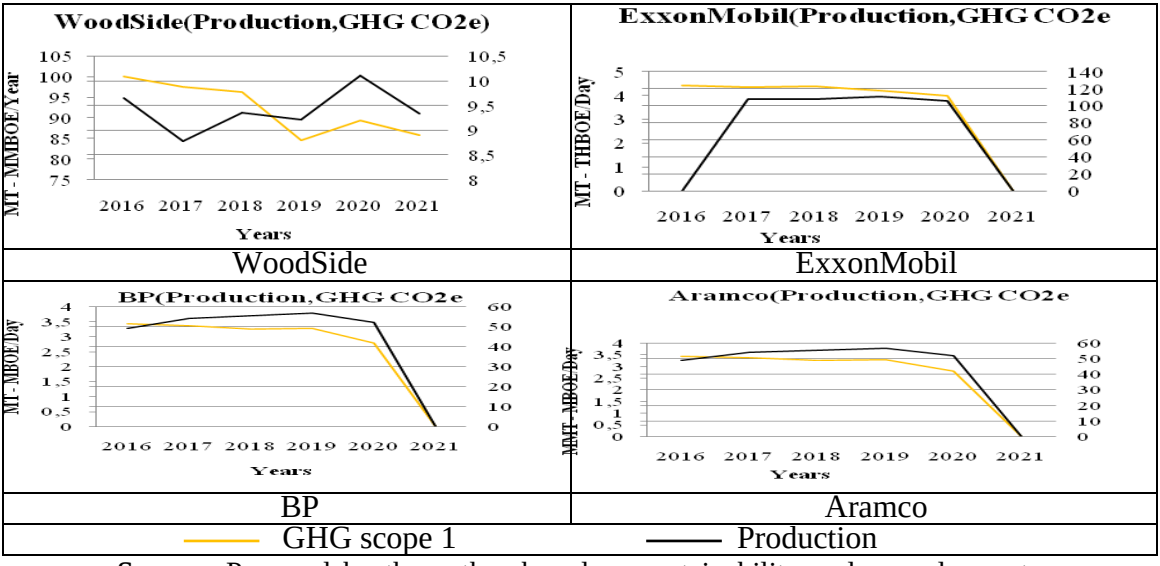
Mobil	***GHGEmissionS1, (million tons)***	***124***	***122***	***123***	***118***	***112***	***ND***
BP	***Production TH (mboe/d)***	***3,27***	***3,59***	***3,68***	***3,78***	***3,47***	***ND***
	GHGEmission S 1 (millions ton)	***51,40***	***50,50***	***48,80***	***49,20***	***41,70***	***ND***
Aramco	***production TH (mmbod)***	***13,50***	***13,10***	***13,58***	***13,17***	***12,39***	***ND***
	GHG Scope 1 emissions (Million metric tons of CO2 e)	***ND***	***ND***	***46,60***	***52,00***	***49,10***	***ND***

Source: Prepared by the author based on sustainability and annual reports (2016-2021).

Note: GHG Scope 1-CO2 equivalent emitted: The universal unit of measurement to indicate the global warming potential of each of the seven greenhouse gases. **boepd**: barrel oil equivalent per day (million tons or metric).**TH**: total production hydrocarbons. **ND**: Not Disclosed.

In order to clarify the relationship between production and greenhouse gas emitted, we use the following graphic.

Graphic N°3: more productions mean more GHGs emissions



Source: Prepared by the author based on sustainability and annual reports 2016-2021

The graph analysis:

The main tool used for analyzing the published data was content analysis, as the graph n°3 shows, there is a **positive relationship**

between the volume of production and the volume of greenhouse gases-scope1- emitted.

We recorded a decrease in emissions for the scope 1, for example 11, 70% decrease for Woodside for the period 2016-2021.

The decrease might be thanks to the advanced technologies in the field of carbon dioxide capture and storage, or the real reason might be due to the decrease in the quantities produced in this period. For Petro China, it does not disclose the volume of emissions, and only discloses the changes from year to another whether positive (decrease) or negative (increase). Also, Sonatrach, does not disclose the volume of emissions or the changes, and we have noticed that it is the only company that does not publish a sustainability report, Aramco disclosed it in its annual report.

3.7. Reporting under the GRI

It can be said that the Global Reporting Initiative provides one of the best frameworks that companies rely on in preparing environmental reports. In addition, this initiative provides standards for reports specific to specific sectors, such as **GRI 11: oil and gas sector Standard.**

GRI 11 focuses on the sector's most pressing challenges for sustainable development, with guides on reporting across 22 material topics: for example Reporting on GHG emissions (GRI302, GRI 305), reporting on biodiversity (GRI 304), reporting on waste (GRI 306), Reporting on water and effluents (GRI 303), Reporting on occupational health and safety (GRI 403).

To determine the level of disclosure in the sustainability annual reports, we examined these reports (2020) for the sixcompanies (only Woodside published its 2021 Sustainability report) , where we focused on **environmental indicators**. The obtained results are summarized in Table n° 2.

Table N°2: disclosure of environmental performance indicators under GRI 11:Oil and Gas sector

Standard	*Disclosure*	*Exxon*	*Wood Gi*	*Aramc*	*Sonatr ach*	*BP*	*Shin*
GRI 302: Energy 2016	*Disclosure 302-1 Energy consumption within the organization*	+	+	+	-	+	+
	Disclosure 302-2 Energy consumption outside of the organization	-	-	-	-	-	-
	Disclosure 302-3 Energy intensity	+	+	+	-	+	+
GRI 305: Emissions 2016	*Disclosure 305-1 Direct (Scope 1) GHG emissions*	+	+	+	-	+	-
	Additional sector recommendations						
	• *Report the percentage of gross direct (Scope 1) GHG emissions from CH_4.*	-	+	-	-	-	-
	• *Report the breakdown of gross direct (Scope 1) GHG emissions by type of source (stationary combustion, process, fugitive).*	-	+	-	-	-	-
	Disclosure 305-2 Energy indirect (Scope 2) GHG emissions	+	+	+	-	+	-
	Disclosure 305-3 other indirect (Scope 3) GHG emissions	+	+	-	-	+	-
	Disclosure 305-4 GHG emissions intensity	+	+	+	-	+	-
GRI 3: Material Topics 2021	*Management of material topics*						
	• *Describe policies, commitments, and actions of the organization to prevent or mitigate the impacts of the transition to a low-carbon economy on workers and local communities.*	+	+	+	+	+	+
	• *Report the level and function within the organization that has been assigned responsibility for managing risks and opportunities due to climate change.*	+	+	+	+	+	+
	• *Describe the board's oversight in managing risks and opportunities due to climate change.*	+	+	+	-	+	-
	• *Report whether responsibility to manage climate change-related impacts is linked to performance assessments or incentive mechanisms, including in the remuneration policies for highest governance body members and senior executives.*	+	-	-	-	+	-
	• *Describe the climate change-related scenarios used to assess the resilience of the organization's strategy, including a 2°C or lower scenario.*						
	201-2 Financial implications and other risks and opportunities due to climate change	-	-	-	-	-	-
	Additional sector recommendations:						
	• Report the emissions potential for proven and	-	-	-	-	-	-

	probable reserves.						
	• Report the internal carbon-pricing and oil and gas pricing assumptions that have informed the identification of risks and opportunities due to climate change.	-	-	-	-	+	-
GRI 201: Economic Performance 2016	• Describe how climate change-related risks and opportunities affect or could affect the organization's operations or revenue, including:	+	+	+	-	+	+
	- development of currently proven and probable reserves;	+	+	+	-	+	+
	- potential write-offs and early closure of existing assets;	-	-	-	-	-	-
	-oil and gas production volumes for the current reporting period and projected volumes for the next five years.		+	+	-	+	-
	• Report the percentage of capital expenditure (CapEx) that is allocated to investments in:	+	-	-	-	+	-
	-prospection, exploration, and development of new reserves;	+	+	+	-	+	-
	-energy from renewable sources (by type of source);	-	+	-	-	+	-
	-technologies to remove CO from the atmosphere and nature-based solutions to mitigate climate change;	-	+	-	-	-	+
	-other research and development initiatives that can address the organization's risks related to climate change.	+	+	+	-	+	+
	• Report net mass of CO_2 in metric tons captured and removed from the atmosphere (CO_2 stored less the GHG emitted in the process).	+	-	+	-	-	-
GRI 305: Emissions 2016	• Report how the goals and targets for GHG emissions are set, specify whether they are informed by scientific consensus.	+	+	+	-	+	+
	• Report the Scopes (1, 2, 3) of GHG emissions, activities, and business relationships to which the goals and targets apply.	+	+	-	-	+	-
	• Report the baseline for the goals and targets and the timeline for achieving them.	+	+	+	+	+	+
GRI 416: Customer Health and Safety 2016	403-1 Occupational health and safety management system	+	+	+	+	+	+
	403-2 Hazard identification, risk assessment, and incident investigation	+	+	+	+	+	+
	403-3 Occupational health services	+	+	+	+	+	+
	403-9 Work-related injuries	+	+	+	+	+	-
	403-10 Work-related ill health	-	+	-	-	-	-
GRI 304: Biodiversity 2016	Disclosure 304-1 :Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	+	+	+	-	+	+
	Disclosure :304-2 Significant impacts of activities, products and services on biodiversity	-	-	-	-	-	-

GRI 306: Waste 2020	***Disclosure 306-1 Waste generation and significant waste-related impacts***	+	+	-	-	+	-
	Disclosure 306-2 Management of significant waste-related impacts.	-	+	+	-	+	-
	Disclosure 306-3 Waste generated Additional sector recommendations	-	-	-	-	-	-
	Drilling waste (muds and cuttings) - Scale and sludges – Tailings	-	-	-	-	-	-
	Disclosure 306-5: waste directed to disposal	+	+	+	-	-	-
GRI 303: Water and Effluents 2018	***Disclosure 303-1 Interactions with water as a shared resource***	+	+	+	-	+	-
	Disclosure 303-2 Management of water discharge-related impacts	+	+	-	-	+	+
	Disclosure 303-3 Water withdrawal	-	-	-	-	+	-
	Disclosure 303-4 Water discharge	+	+	-	-	+	-
	Disclosure 303-5 : water consumption	+	+	+	-	+	-
	Total indicators	***31***	***35***	***26***	***08***	***34***	***16***
	Quantitative indicators	***17***	***19***	***14***	***02***	***18***	***05***
	Qualitative indicators	***14***	***16***	***12***	***06***	***16***	***11***

Source: Prepared by the author based on sustainability and annual reports 2020.

Results and discussion

The above table was prepared based on the 2020 companies' sustainability reports for the six companies (as mention before Sonatrach does not prepare an annual sustainability report). We relied on the information's (quantitative and qualitative) disclosed in these reports to assess the level of disclosure for each company. We have found varying results, ranging from 08 to 35 indicators disclosed. The collected results for each company were as follows:

Woodside: Woodside recorded the **highest level of disclosure (35** indicators of which **19** are quantitative**).** The company mentioned**,** in its annual report on page 35, that the environmental performance data have been prepared in accordance with the GRI Standards core option and with reference to the IPIECA API and IOGP (2020) Sustainability Reporting Guidance for the oil and gas industry GRI. Woodside responds to every core indicator it is classified accordingly at **level A**.

ExxonMobil: Of all the oil and gas companies in the world, ExxonMobil is perhaps the most exposed to pressure and perhaps the most followed by all stakeholders. This is due to the environmental disasters that it caused in addition to hiding environmental information for decades. Today, it appears that ExxonMobil has redressed this according to its sustainability reports**;** through which**,** it disclosed a large number of environmental indicators. In the year 2020,

ExxonMobil recorded **31** indicators and it is classified accordingly at **level A**.

Aramco: Although Aramco did not disclose the preparation of sustainability chapter in its annual reports in accordance with the standards of the Global reporting Initiative, it achieved **26** environmental indicators including14 quantitative; it is classified at **level B**, because Aramco is not responding to every core indicator.

Sonatrach: it does not prepare a separate sustainability report; rather, it provides some information related to the environmental aspect within its general annual report Sonatrach recorded the weakest level of disclosure by **8** indicators (Outside the Global Reporting Initiative classification).

BP: British petroleum company reports have been prepared in accordance with the core option of the Global Reporting Initiative GRI standards. We recorded **34** indicators that classified it in **level A**, including 18 quantitative indicators and 16 qualitative indicators.

China Petroleum: For China Petroleum, we recorded **16** environmental indicators, most are non-quantitative; this is what classified it in **Level C** of **d**isclosure under GRI. We also noticed that China Petroleum does not disclose most of the key environmental indicators, such as greenhouse gases emissions from the first or second scope. Besides that, sometimes it only presents percentages indicating decreasing or increasing of the indicators. **Although**, Petro China stated**,** on page 2 of its report for the year 2020**,** that it is preparing this report based on the guiding principles of the Global Environment Reporting. In general, its report is descriptive more than quantitative.

3.8. Disclosure of ISO certifications

Obtaining ISO 14001 environmental management certification is proof of the environmental responsibility that these corporate bear. ISO 14001 certification is the most recognized standard in this regard in the world, but there are many other industry-specific standards such as **14064: Greenhouse gases**. The table n°3 includes the disclosure of obtaining certificates from the International Organization for Standardization in the period 2016-2020.

TableN°3: disclosure of obtaining of environmental management certification

Standard	*Disclosure certification or attestation to ISO in the process to achieve attestation*	*ExxonMobil*	*Woodside*	*Aramco*	*Sonatrach*	*BP*	*CNPC*
ISO 14000 series	*Environmental management system.*	+	+	+	+	+	+
ISO 14064 series	*Greenhouse gases*	+	+	+	-	+	-

Source: Prepared by the author based on sustainability, annual reports, websites of companies and media.

Results: Through our examination of the environmental and annual reports, most companies neglected to obtain ISO certificates. Through the websites of these companies and some media sources, we obtained the data summarized in the above table.

3.9. The disclosure of environmental accounting data

Through our examination of the financial and sustainability reports of the companies under study, we recorded a complete absence of the Environmental conservation cost, such as the cost of preventing water pollution .etc, as well as the value of environmental assets .etc). Disclosure of total environmental expenditures existed only in ExxonMobil and British Petroleum reports.

4. Conclusion

From this study, it is concluded that:

The level of disclosure in major companies in the oil and gas sector varies from one company to another and ranges from level C to A under GRI, In addition to companies outside the classification.

The adoption of disclosure according to the Global Reporting Initiative GRI enables companies to disclose their activities and to follow the development of their indicators and the extent to which they achieve their established objectives. It also enables shareholders, governments and various organizations to obtain sufficient environmental information to compare it and hold these companies to account.

Four sample-companies from this study (BP, ExxonMobil, Woodside and Aramco) have recorded a continuous improvement and a significant decrease in the greenhouse emissions.

We noticed that even the companies that disclose their data at the same level vary in terms of the kind of disclosed indicators.

Not all large companies prepare separate environmental reports, and through this study, Sonatrach approves to be one.

Although the report**,** under the cover of the Global Reporting Initiative**,** is still voluntary, it has become binding due to the pressure these companies face with regard to environmental issues. Disclosure of environmental information, whether (quantitative or non-quantitative, financial or non-financial) has become a necessity in the light of social and legal pressures.

These reports are mechanisms to enhance a firm's image, public relations, and marketing and are aimed largely at concerned stakeholders.

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