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Integration of the SDGs in Global Fortune 250 companies' reports: Review of current practices and derivation of a new maturity assessment method

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"The closest thing the Earth has to a strategy."
(Preston et al. 2017)

«A few observations and much reasoning lead to error; many observations and a little reasoning to truth.»
(Alexis Carrel)

"Because the more philanthropic the nature of a contribution is, the less relevant it can be considered for the core business of the company."
(Austin & Seitanidi in Grainger-Brown, 2019)

A papà, mamma e Polly che hanno sempre accettato di essere le mie radici forti, ma non i rami lunghi,
A Pietro Dogliani, Dio solo sa cosa ne sarà di noi,
E a Ezio Delfino senza il quale starei ancora aspettando una risposta dal master.

Abstract

2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) introduced by the United Nations in 2015 are meant to provide a more sustainable future for all and trace the sustainability path until 2030. They are addressed to governments, civil society, no-profit organisations and businesses. The private sector, especially large multinationals firms, is considered the key actor in achieving Sustainable Development Goals given its resources and scope of activity. This work aims at defining whether it is possible to measure firms' performance in addressing SDGs based on voluntary disclosure. The inability to measure this contribution could be a leeway for firms to use the Global Goals as a commercial opportunity and stick to a mere formal commitment. Thus, a quantitative and qualitative content analysis of sustainability and financials reports of Global Fortune 250 firms was performed. As a result, this works collects SDG-integration practices and trends across sample. Based on the results, the derivation of a new SDG-integration-maturity assessment method for the private sector is provided.

Riassunto

L'agenda 2030 per lo sviluppo sostenibile e i suoi 17 obiettivi di sviluppo sostenibile (SDGs) introdotti dalle Nazioni Unite nel 2015 hanno lo scopo di fornire un futuro più sostenibile per tutti e tracciano il percorso verso la sostenibilità fino al 2030. Sono rivolti a governi, società civile, organizzazioni no-profit e imprese. Il settore privato e in particolare le grandi società multinazionali, sono considerate gli attori chiave nel raggiungimento degli obiettivi di sviluppo sostenibile, date le risorse a loro disposizione e la loro ampia sfera di influenza. Questa tesi cerca di valutare la possibilità di misurare il contributo del settore privato verso gli SDGs tramite l'analisi dell'informazione non-finanziaria volontaria fornita dalle aziende. L'impossibilità di misurare questo contributo potrebbe fornire alle aziende una scappatoia per sfruttare gli SDGs come opportunità commerciale e limitarsi ad una adesione formale. Si è trattato di condurre un'analisi quantitativa e qualitativa del contenuto de bilancio finanziario e non-finanziario di un campione composto dalle prime 250 imprese appartenenti a Global Fortune 500. Sono state raccolte le pratiche e le tendenze di integrazione degli SDGs del campione. Sulla base dei risultati, questo documento presenta un metodo di valutazione del livello di integrazione degli SDGs nell'aziende tramite l'analisi del bilancio di sostenibilità.

Summary

List of abbreviations, glossary and general remarks

This work makes use of the term sustainability reporting as defined by the Global Reporting Initiative: "Sustainability reporting can be considered as synonymous with other terms for non-financial reporting; triple bottom line reporting, corporate social responsibility (CSR) reporting, and more. It is also an intrinsic element of integrated reporting; a more recent development that combines the analysis of financial and non-financial performance." (Globalreporting.org, 2019)

Abbreviations:

- SME: Small and Medium Enterprises
- BOD: Board of Directors
- SD: Sustainable Development
- SDGs: Sustainable Development Goals
- MNCs: Multinational Corporations
- GF: Global Fortune
- UN: United Nations
- UNGC: United Nations Global Compact
- SOE: State-owned enterprise
- ESG: Environmental, Social, Governance
- GRI: Global Reporting Initiative
- CSR: Corporate Social Responsibility
- CC: Corporate Citizenship
- ISO: International Standardisation Organisation
- IIRC: International Integrated Reporting Council
- TCFD: Task Force on Climate-related Financial Disclosures
- DJSI: Dow Jones Sustainability Index
- CDP: Carbon Disclosure Project
- IPIECA: International Petroleum Industry Environmental Conservation Association

- PRI: Principles for Responsible Investments
- SMART: Specific, Measurable, Realistic, Achievable, Time-Bound
- COP: Communication on Progress
- AR: Financial Report
- SR: Non-financial Report

1. Introduction to 2030 Agenda for Sustainable Development

1.1 Sustainable Development Goals

1.1.1 Definition

Following the Millennium Declaration (United Nations, 2000), in 2001 the United Nations issued the Millennium Development Goals (MDGs), with a time-horizon of 14 years, the initiative concluded in 2015. They represented the first commonly agreed set of (8) goals to achieve sustainable development through a global mobilisation, even if they were not formally adopted by member states (United Nation, 2015). According to the final MDGs Report, following such goals created the most-successful anti-poverty movement in history and more generally pushed several social improvements (ibidem). After Rio+20 Summit and based on MDGs' results, member states decided to continue this global initiative and negotiated the Sustainable Development Goals (SDGs), introduced in September 2015. SDGs are at the heart of the Global Agenda 2030, "plan of action", accepted by each country, to globally pursue sustainable development until 2030. The focus is balanced between the three components of sustainable development: people, planet and prosperity (United Nations, 2014). Along with the SDGs' introduction, 2015 was a pivotal moment for sustainable development: in July in Addis Ababa, a global project for financing sustainable development was approved (United Nations, 2015b) and during the 21st Conference of the Parties (or "COP") in December, the Paris Agreement to tackle the threat of climate change was signed by the parties of the United Nation Framework Convention for Climate Change (UNFCCC) gathering all nations together for this common cause (Unfccc.int, 2019).

SDGs have built upon MDGs and like them are easy to be communicated, aspirational and limited in number (Sustainable Development Goals Fund, 2019). The main differences lay in the fact that, compared to MDGs, SDGs have broadened the focus to all countries, not only developing ones, but also developed ones. Moreover, the environmental dimension has been added to the social and economic one and a specific focus on human rights has been defined. The ambition is to provide future generations with a socially inclusive, environmentally sustainable and economically developed world, where sustainable development's three components should be equally weighted. Finally, SDGs were defined

and structured following a bottom-up consultative approach: scientists, academics, politicians, the whole civil society and private sector were actively involved so the result could benefit from diverse insights and experiences (Sustainable Development Goals Fund, 2019; The Guardian, 2015; United Nations, 2014), as stated in the Rio+20 final document. The same approach was chosen for further implementation and monitoring. (United Nations, 2012). Indeed, a plurality of bodies was involved and/or created to support proposal, structuration, implementation, definition and monitoring of this initiative, linking the intergovernmental nature of discussions to involvement of Major Groups and other Stakeholders (MGoS). (Sustainabledevelopment.un.org, 2019)

The result is a set of 17 integrated and indivisible goals, characterised by an interlinked nature necessary to answer to interrelated challenges and achieve 2030 Global Agenda.

The latter is made up of four sections: "a political Declaration, a set of 17 Sustainable Development Goals, the means of implementation and a framework for follow up and review of the Agenda" (Ec.europa.eu, 2019).

The idea behind this "set" of goals showed in the second section of the Agenda is to provide a global, transformational framework. Each goal is defined and detailed through additional targets, 169 in total, and 232 official indicators have been proposed by The Inter Agency and Expert Group (IAEG) to measure national contribution to Global Goals. The first six goals were part of the MDGs, while the following eleven are the new ones. Across goals, targets and Agenda there are crucial interconnections and several transversal elements to consider (United Nations, 2015a). Indeed, environmental and social goals are complementary: no environmental gain can be achieved without considering social issues. For instance, trying to erase poverty without considering that many people leave on natural resources would be a defective effort. (Business and Sustainable Development Commission, 2017).

The Global Agenda's is going to cover 15 years, concluding this initiative in 2030. Over these years, all sustainable development actions are meant to be accomplished in the Sustainable Development Goals and Global Agenda's overarching framework (United Nations, 2015a).

1.1.2 Private sector's role in the UN framework for sustainable development

The outcome document of Rio+20 highlights the importance of having a plurality of engaged stakeholders in order to pursue sustainable development. Among them, it lists the precious contributions private sector can provide to it, if working in a responsible way, following the path traced by the United Nation Global Compact (United Nations, 2012), through the 10 principles for a sustainable business behaviour. (Unglobalcompact.org, 2019). Indeed, private sector's resources, power of innovation and scope of influence make it a key stakeholder (wbcsd 2017).

Compared to MDGs, the engagement required by businesses does not concern philanthropy and cannot be only defined in the scope of Public-Private Partnerships, but it requires to integrate sustainability concerns into core business operations, to build form the inside a sustainable corporation able to create shared value. (GRI & BCTA, 2016).

To achieve this vision, in *Better Business, Better World*, the Business and Sustainable Development Commission condemned the actual model of development as "deeply flawed", characterised by inequalities, environmental risks, violence that spread uncertainty and mistrust, while the economic situation was still unsteady and CEOs' credibility heavily declining. The Commission called upon leaders to act in order to foster long term growth instead of lingering in short-term fruitless moves. They should seize the possibility represented by SDGs by incorporating them in the core growth strategy of the business. As a matter of fact, the report demonstrated that at least US$ 12 Trillion in market opportunities could be created by achieving the SDGs, but this implied the rejection of "a lazy return to the old model", the "business-as-usual" that made people worldwide frustrated, hostile and afraid of the global economy as it resulted, but it urged to walk a whole new path to catch a share of this prize. This meant incorporating SDGs into the business strategy, rethinking all the organisation through this perspective and collaborating with peers to move faster towards SDGs achievement. Thus, the Commission encouraged government, private sector and civil society to work co-ordinately, since complex challenges needed complex solutions. Pursuing together the SDGs could ease the fractions still existing in societies, helping restoring trust in the private sectors while representing a gripping business strategy. These documents'

bottom line was that the SDGs needed businesses exactly like businesses needed the SDGs. Not leverage on responsibility, but on return on capital (wbcsd 2017).

The same importance granted by the UNs to sustainable business practices has been granted to corporate sustainability reporting in the resolution adopted to lay out the Global Goals, chiefly recommended to listed companies and large firms. The document suggested industry, governments and other stakeholders cooperating to develop a pattern of best practices towards SDGs reporting, starting form already established frameworks (United Nations, 2012).

Over the last years, several reporting frameworks have emerged along with the diffusion of sustainability reporting, some specifically meant to help corporations reporting. Even if no generally accepted reporting principle is agreed upon as of today (INTOSAI, 2013), corporations use mostly a few of these frameworks. The most common one is the last set of guidelines issued by the Global Reporting Initiative, GRI G4 Standards (Globalreporting.org, 2019). According to a survey carried out by PWC, G4 Standards are by far the most used (63% of firms in the sample referred to them), followed by the International Standard Organisation (ISO) and the UNGC principles (Scott and McGill 2018). Non-financial data in reporting can be demanding to handle compared to financial one. Main reasons are the lack of a universally accepted framework, difficulty of accessing and measuring information, especially qualitative one since data can be varying in form and patterns. (INTOSAI 2013). In the meantime, the lack of a quantitative threshold to define materiality (Mio & Fasan, 2013) and the variety of potential sustainability indicators (Hák, Janoušková, and Moldan 2016) granted sustainability reporting with the axiom of "Measuring the immeasurable".

1.2 The current state of SDGs adoption by businesses

1.2.1 Reporting about SDGs

As said above, one of the biggest innovations of MDGs and SDGs later is the fact they provide a common language in the complex, faceted field of sustainable development to foster the dialogue between different stakeholders, improve reputation, attract investors. However, reporting about SDGs is not only a matter of formal communication channels,

but also of substance since target 12.6 "requires Member States to encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle." (Globalreporting.org, 2019) As argued by GRI, sustainability reporting along with impact measurement may be used by businesses to assess their level of development contributions. The synergy between these two instruments may help businesses "improve performance, account for impact, and publicly communicate sustainability data" consequently "such information can help governments in strategic decision making, to identify appropriate business models and provide support with policy incentives". (GRI & BCTA, 2016). If used as strategic tool, sustainability reporting may "support sustainable decision-making processes, stimulate organizational development, drive better performance, engage stakeholders and attract investment"(United Nations Global Compact, GRI, and wbcsd 2015).

For this reason, there have been some attempts by governments and institutional organisations to link already existing sustainability reporting frameworks to SDGs.

One of the main tools established for firm, the SDG Compass, resulted from the collaboration between GRI, UNGC and the World Business Council for Sustainable Development (United Nations Global Compact, GRI, and wbcsd 2015). Developed for listed and large firms, it included a plethora of tools that firms can use to assess the impact of their operations on the three components of sustainable development. This resource addressed the entire spectrum of the SDGs and supported firms in aligning their measures and strategies to achieve the SDGs through five steps to improve their contribution to this cause: understanding, defining priorities, setting goals, integrating, reporting and communication. (Unglobalcompact.org, 2019a; Globalreporting.org, 2019). It pledged to help firms understand better their strategy, think out-of-the box, help innovation and assess actual and potential risks (Holling 1973). Besides supporting the alignment of business strategy with UN's Goals and Targets, the Compass provided a guide to link activities undertaken in the framework of the SDGs to the respective GRI G4 disclosure and GRI's sector-oriented indicators (United Nations Global Compact, GRI, and wbcsd 2015). This bridge built to link the SDGs to a sustainability reporting framework is essential. On one side, it helps firms understand better the Global Goals to relate them to their activities, on the other one, governments can control and make use of data coming

from businesses for national reports on aggregated progress toward Global Goals. Besides this tool, many other resources have been implemented at regional or global level or sector oriented. (Unglobalcompact.org, 2019b). For instance, the SDG Business Hub by WBCSD to update about the latest news, surveys, report, best practices and a guide for CEOs (SDG Business Hub, 2019).

1.2.2 SDGs' integration within the business

Integrating the SDGs: this concept has several meanings, the definition used in this work draws on different sources: the official guideline for the private sectors, *SDG Compass*, the latest Oxfam discussion paper *Walking the talk: Assessing companies' progress from SDG rhetoric to action* and Cici and D'Isanto study on *Integrating Sustainability into Core Business* (Holling 1973; The Conference Group 2013)

First, according to the SDG Compass, integration of SDGs is one of the five steps a firm must implement to effectively contribute to SDGs. These steps trace firm's path to make "sustainability an outcome of core business strategy". Before tackling integration, the SDG's previous steps should be mastered, as the five levels are consecutives and the previous one leads up the following one. After having understood Goals and Targets, identified the business case for action and realized their own responsibilities in the understanding step, for the following one, the prioritization step, firms should choose the goals and targets to prioritize based on the impact assessment made through the value chain mapping, to maximise the contribution to SDGs. Once chosen the goals to focus, some indicators should be defined to track progress. Before integrating and reporting, indicators will be used to measure the sustainability goals previously identified in the step three. Goals should be "measurable, specific, time-bound" as well as ambitious and based on an "outside in approach" (United Nations Global Compact, GRI, and wbcsd 2015).

Once accomplished these steps, firms are ready to integrate SDGs inside their organisation (fourth step). UNGC, WBCSD and GRI state that effective integration implies first "anchoring sustainability goals within the business" which are the goals identified in the previous SDG Compass' steps and tracked though the predetermined Key Performance Indicators in the prioritized areas. As a matter of fact, the document suggests

including sustainability goals into the typical set of a company: strategic, financial, operational as well as in the mission statement and vision. Moreover, it urge to set the right tone-at-the-top, by engaging CEO and Board of Directors so that the value created by pursuing the SDGs could resonate across all the organisation. To anchor sustainability goals, employees' motivation should be fostered, therefore sustainability goals should be part of "performance reviews and remuneration schemes across the organization with additional incentives reflecting the specific role that a function or individual has in achieving relevant goals." In this way, sustainability becomes something each employee pursue in daily activities (ibidem).

According to the SDG Compass, the second step towards effective SDG integration is to "embed sustainability across all functions": pursuing SDGs cannot involve only the sustainability department, but all functions, especially the ones where the impact assessment has identified the highest impact on sustainable development. Therefore, the most critical functions will vary depending on the firms' core business. To embed sustainability in "strategy, culture and operations", firms should make use of "awareness raising and training" to increase knowledge though the help of organisational change experts and create "cross-functional sustainability councils" and where possible a "sustainability committee at Board level" to focus on sustainability strategically.

The third step for an effective integration is to "engage in partnerships", both to integrate but also as a Global Goal (SDG17). Partnerships may take the form of "value chain, sector or multi-stakeholders" ones. Since SDGs are aspirational, collaboration is essential. It is important in this context for firms to: "set shared goals, leverage their respective core competences, depoliticize projects, develop clear governance structures, create a single monitoring framework, focus on impacts, forecast future resources needs, and create a process for knowledge management" (United Nations Global Compact, GRI, and wbcsd 2015).

Based on what detailed in previous sections, Global Goals provide a guiding framework for private sector to act pursuant a globally shared project for sustainable development. In this context of authors[1] of Oxfam's last discussion paper define integration as the

[1] From this section onwards, for simplification's reasons, when mentioning Oxfam's statements in 2018 and 2017 discussion works we refer to the authors of Oxfam's last discussion papers (Mhlanga, Gneiting, and Agarwal 2018)(Holling 1973). But we acknowledge the difference.

"degree" to which "companies utilize the SDGs as the guiding framework to determine gaps and misalignment in the SDGs impact areas that they should address for their sustainability strategies" as well as the essential step to verify that "SDG contributions are not philanthropic interventions but address core business practices of both the company's operations and its supply chain". Oxfam, drawing from the SDG Compass, does not suggest starting from the scratch, but building on the existing sustainability strategies and critically analysing them though the SDG framework perspective to find the gaps in the firm's actions and "articulating how their strategies are aligned to help meet the goal" (Mhlanga, Gneiting, and Agarwal 2018). As argued in this document, businesses first effort should be at least to "map and align their sustainability priorities across the SDGs and list concrete activities and initiatives". However to disclose the SDGs true potential, firms should aim at "using the SDGs as the guiding framework for their sustainability strategy and showing efforts to realign their practices to meet the ambition of the goals" that is, focus on "modifying their sustainability strategies based on a commitment to and analysis of the SDGs" (ibidem). Moreover, the discussion paper argues that where integration is effective, SDGs commitment go beyond the passive, cosmetic, participation to be considered in "the core business practices" and "long-term business goals and strategy" (ibidem). Oxfam alerts that where integration is not accomplished the actual SDGs potential is at stake: "the potential of the SDGs as a vehicle for more comprehensive and fundamental realignment of corporate sustainability and sustainable development, including the alignment of core business processes (e.g. wages, pricing, tax) with the SDGs." (ibidem).

Given the early introduction of the SDGs and the ongoing work to establish guidelines for the private sector reporting on the Global Goals. To examine the concept of integration in the business, using as benchmark other study on the overall integration of sustainability into the firm appeared suitable. Cici and D'Isanto defined: "Integrating sustainability in business means redesigning and redefining strategy and operative processes to face the changes and meet the needs and expectations of the market and society alike, with the ultimate goal of increasing competitiveness and supporting durable profitability". They did not stress the ethical reasons, as they may not be shared by all firms, but argued that sustainability is essential to "guarantee long-term profitability" for the private sector and should be a "primary premise in determining business strategies […]integrated into the long-term strategies, business policies and objectives, and incorporated into operational

processes and procedures", not a "separate process or an add-on to the corporate company strategy". Also, the author underlined that integration is a tool to fully meet the expectations of the firms' most relevant stakeholders as well as to answer to disruptive changes in the market. To sum up, this definition of integration is linked to the business strategy, since identifying the critical stakeholders is a relevant part of the strategy formulation and implementation (Globalreporting.org, 2019a). Similarly, addressing changes, achieving continuing profitability and improving competitiveness requires an adjustment of the strategy (The Conference Group 2013).

All three definitions here explored, although focusing on similar elements and based on the importance of strategy formulation, provide different insights useful to have a full picture of integration for the empirical part of this work.

A final remark, the aim of this work was to be able to assess the level of Global Goals integration within a business, however, only a thorough investigation of the firm's behaviours and performance could achieve it. Thus, provided the impossibility of this "insider" analysis, external stakeholders interested in assessing the level of SDGs integration must rely on a "proxy" for performance, namely what the management says about the firm's performance. From this remark, the name of this work should be clearer.

1.2.3 SDGs' double integration to reach coopetitive advantage

As we said above integrating implies both fasten SDGs across functions and closely link Global Goals to the firm's strategy as well as fostering sector partnerships towards SDGs' achievement (United Nations Global Compact, GRI, and wbcsd 2015). The first of these considerations incentivizes to look at every facet of a firm's strategy from a SDGs perspective, for instance impacting board member choice, innovating through sustainable choices, not only process' adjustment but redesigning products and service from scratch and rethinking gender dynamics inside the organisations, up to the criteria to allocate resources. According to the WBCSD, this approach eventually results in a vision aligned to sustainable development (wbcsd 2017).

Moreover, the innovation stemming from SDGs implementation is said to able to resonate in the core business and across functions: from the products to the clients, the life-cycle and way the supply chain and distribution is managed" (United Nations Global Compact, GRI, and wbcsd 2015).

The second consideration is based on the SDGs' aspirational nature: their scale and urgency, due to the early deadline and the risks today's world is facing, require sector peers to collaborate and share this challenge. Neither "business-as-usual", or single actors can make real changes. The risk is that opposed dynamics by misaligned actors in the same sector offset each other and nullify positive contributions. A systematic transition needs partnership to coordinate action in order to spot critical points, finance key technology, define new job opportunities. Collaboration has the power to increase the share price for everyone, open new market opportunities and anticipate risk linked to sustainable development disruptions (wbcsd 2017). This form of competitive collaboration was defined by Morioka as *Coopetitive advantage* (Morioka et al. 2018a). To make things more practical, the Business and Sustainable Development Commission described as an example that a global peer collaboration to create a sustainable food system, to answer to SDG2 *Zero Hunger,* could have social, environmental and economic positive outcomes: more food to sustain a bigger and bigger population as well as more decent jobs, especially if smallholders are involved in this transformation, rehabilitated ecosystems and reduced climate risk would result in an economic prize of US$2 trillion dollar before the SDGs deadline. This only for one SDGs (wbcsd 2017).

Cici and D'Isanto added to these arguments, that integrating sustainability provides already well-known advantages for firms: more investors attracted, lowered risk, improved reputation and brand loyalty, enhanced human resources relationship with the brand (The Conference Group 2013).

1.2.4 Tipping points about SDGs integration and reporting

Oxfam underlined that: "Since national governments negotiated and adopted the SDGs, they are in the driver's seat to implement the Agenda 2030, which is a state-centric framework and does not include targets or review mechanisms for business. In short, the SDGs require a certain level of translation to be meaningful for business" (Mhlanga, Gneiting, and Agarwal 2018). As a matter of fact, despite GRI, UNGC and WBCSD effort to establish the SDG Compass, today there is not a set of SDGs indicators for businesses yet. Even though, the Inter-Agency and Expert Group on SDG Indicators identified 232 formal indicators to track performance against SDGs, they are meant and built for national governments (United Division, 2019). As shown in *Measuring progress on the SDGs: A mapping of the SDG Indicators and the GRI Standards,* even though GRI standards are helpful to report about SDGs, findings "show some (limited) correlation between GRI Standards and the SDG Indicators" because "GRI disclosures measure (a part of) the business contribution to the SDG Indicator" (GRI, 2017). As a matter of fact, 60% of the SDG's indicators are not designed for businesses, but for governments and of the remaining part only 14% of indicators can be directly linked to GRI Disclosures, consequently GRI guidelines only analyse a part of "the topics covered by the corresponding SDG Indicator". Thus, according to the aforementioned study by GRI, it is "crucial to identify (other and new) modalities for reflecting the business dimension within each SDG Indicator" to overcome the aggregation issues in order to "allow meaningful use of the private sector data" by governments (ibidem). This requires specific adjustments to SDGs Indicators to be able to reflect private sector's engagement and solve this impasse (ibidem). Ultimately the issue depends on the identification of relevant indicators, performance indicators that mirror firms' contribution to the SDGs prioritized by the firm. As underlined by Hák, relevance, a measure of the relationship between "indicator-indicated fact", is the most critical characteristic of an indicator. Relevance is

necessary for a reliable assessment of the level of achievement of goals and targets. If missing the legitimacy of SDG's may be at stake (Hák, Janoušková, and Moldan 2016). The lack of a specific set of SDGs' indicators and the use of GRI's and other standards to compensate risk creating a procedural gap that indirectly affects SDGs integration and reporting, since SDG Compass' steps are interconnected as previously stated. Moreover, it may cause aggregation issues. The point with private sectors contributions relies on the fact that "even when there is a direct link to the GRI disclosures, the information companies disclose can represent just one component of the total figure required by the SDG Indicator. This is because the SDG Indicators aim at providing a broad, global picture, e.g.: *1.1.1 Proportion of population below the international poverty line, by sex, age, employment status, and geographical location (urban/rural)*
10.4.1 Labour share of GDP, comprising wages and social protection transfers.
When companies are not the only actors responsible for the impacts, then the data provided by these companies is not enough to fulfil the requirements of the SDG Indicators" (GRI, 2017). Moreover, single firms' contributions are difficult to be aggregated and added to national statistics because each firm chooses independently the performance indicators to measure and report in a large pool of sustainability measures (ibidem). In addition, the well-known sustainability reporting issues defined in section 1.1.2 makes reporting about SDGs a task even more complicated. To partially mitigate this phenomenon businesses could partner with different stakeholders as academia "to support measuring and reporting impact" (GRI & BCTA, 2016). The bottom line reveals that, given this situation, private sector has still a relevant slack in reporting about its contributions to SDGs. The result could be selective disclosure where stakeholders mistake firms' mere rhetoric with serious commitment (Mhlanga, Gneiting, and Agarwal 2018).

Integration-wise, one of the main difficulties lays in the implementation of SDGs due to interlinkages. Indeed, differently from the concept "of the Rio 'pillars' of economic development, social development and environmental protection" sustainable development's three components are interconnected and interdependent, transversal to the entire set of goals, as Figure 1 shows. Indeed, most of the goals are connected primarily to one of the three components, but all goals partially cover each one of the three pillars at target level. This is showed in a series of interactions between the Global Goals, one of the most debated issue being the "nexus between food, water and energy"

(Weitz, Nilsson, and Davis 2014) for SDG 2, please refer to Figure 2. As a matter of fact, these interdependencies are so strong pursuing the underlying targets risk to cause "trade-offs between competing interests for example, food production may compete with bioenergy production for the same land or water" (ibidem). But also, more general interactions between SDG2 and Target 3.2 (preventing childhood death), Target 12.3 (reducing food waste) and Target 12.6 (encouraging sustainable business practices) may result in the same. Not only a firm needs to face trade-offs in choosing how to set its contribution to Global Goals, but sometimes also conflicts between goals and targets may arise because there may be "positive and negative interactions" between them. For instance, a firm may contribute positively to prioritised goals/targets but negatively to non-prioritised goals/targets (McCollum et al. 2017). The WBCSD argued that "a firm may positively contribute to SDG8 through the creation of jobs, but simultaneously have a negative impact if the wage is not decent for employees to live (wbcsd 2017). Thus, the prioritisation may lead to an "overly narrow focus (that) can result in companies missing potential synergies and in unintended negative consequences" (Mhlanga, Gneiting, and Agarwal 2018). This bias at the prioritisation and integration step may be intentional or unintentional, obviously if the firm is not aware of it, it will be automatically transmitted in the reporting step. This misconception of what is the real meaning, requirements and consequences of working towards the SDGs and their targets may be caused by a superficial understanding of the interlinkages. In this case private sector contributions, even if they do not cause damage, will be incomplete: the firm will not achieve the highest potential contributions (Scott and McGill 2018). For instance, according to PWC's SDGs Reporting, 63% of the companies in the sample consider SDG 13 *Climate Change* as the second most relevant to focus their contribution on, whereas SDG 7, *Affordable and Clean energy* is not even among the top 5, although the two goals are closely linked (ibidem).

Fleming argued that there are other factors hindering the private sector in translating and adopting the SDGs: firstly specific SDGs terms are far from the business language, best practices of SDGs integration are not shared and debated to help other firms and a real integration needs a whole new business mindset and a systemic change of the organisation (Fleming et al. 2017). The same author recalled the issues concerning SDGs-integration above explored, arguing: "To what extent are SDGs a primary premise, a sustainability driver to determine long-term business strategy and implement operative processes, an overarching framework to fill in the gaps any corporate sustainability

strategy shows, rather than a cosmetic change, a rhetorical add-on to a predetermined strategy-as-usual?"

1.2.5 The risk of SDG-washing

Many institutional and professional surveys showed that SDGs have broken into the mainstream as main character in the sustainability talk of the private sector and specifically of multinational corporations (MNCs). They argued that SDGs have reached a pick of awareness and acknowledgement in 2017 (Scott and McGill 2018; Mhlanga, Gneiting, and Agarwal 2018; Blasco, King, and Jayaram 2018; World Business Council for Sustainable Development 2018). For instance, in the last Oxfam's study, most companies mentioned the SDGs in their reports (61 %). Similarly, based on PWC's last work, 72% of firms stated to support the Global Goals, an increase of 62% compared to 2016 (PWC, 2018) and a similar WBCSD's survey argued that 82% of the largest firms worldwide reported about SDGs (World Business Council for Sustainable Development 2018).

However, additional data from 2017[2] showed some dark corners of this situation.

The WBCSD showed that the most engaged departments in the SDGs talk were by far the Sustainability and Communication departments, followed by the CEO's office and the strategy department, while for 50% of the sample, other critical departments were not aware or engaged at all towards the Global Agenda (i.e. R&D, Finance, Legal). This means that SDGs awareness had not filtered in every department equally. Moreover, the study demonstrated that most companies (69%) only measured the positive impact made on sustainable development, while few (37%) also balanced this view measuring the negative impacts, to be reduced. Concerning the commitment to integration in the firm's value chain, only 37% of firms considered the impact on sustainable development of "asset not under their direct control", thus an organisation could have worked doing nothing to the detriment of the Global Agenda on its own but could have worked

[2] As of May 2019, the most recent surveys on the SDGs concern 2017 performance.

(consciously or not) with partners not engaged in sustainable development's pursue (World Business Council for Sustainable Development 2018).

As described in the SDG Compass, contribution to Global Agenda may be measured only in relative terms, compared to a benchmark like competitors or year-over-year performance (since no official standards exists and the SDG framework was not shaped on the private sector's features) thus, SMART goals should be set at the firm level (United Nations Global Compact, GRI, and wbcsd 2015).

However only 6% of firms in the WBCSD's sample set SDGs-related goals while about half of the firm supporting SDGs continued to use goals coming from the previous sustainability strategy. Additionally, only 36% of the firms analysed by WBCSD tackled the SDGs also at the target level, most firms did not go beyond the Goals. (WBCSD, 2018). This situation, being intentional or unintentional, showed poor understanding of the Global Goals as a whole set. In case of intentionality, often firms deliberately chose to "cherry-pick" (Mhlanga, Gneiting, and Agarwal 2018) the SDGs with the most obvious "business case" to approach, with an immediate link with the private sector's common features and easy to explain and be justified by stakeholders. The risk of this superficial approach, described in previous sections, is counterproductive or even negative outcomes. For instance, what happened for SDG8 *Decent work and Economic growth*, the most commonly prioritized Goal among firms in PWC's survey. Indeed, firms may argue to create new jobs, and contribute positively to an increase of occupation, however, they must guarantee a living wage for their contribution to be aligned to the Global Agenda. (Scott and McGill 2018). In case the firm unintentionally considered only the Goals and neglected the targets, this could reflect situation where the firm simply did not take the time to explore in depth all the goals at the target level. In both cases, this approach neglects the interlinkages between different goals and targets resulting in the risks we highlighted in the previous section.

Oxfam's study highlighted that in 2017 out of the companies mentioning to support SDGs, only two companies used SDGs as an overarching framework able to guide changes in the current sustainability strategy. 51% in some ways linked current sustainability strategy to SDG engagement by mapping sustainability priorities across SDGs and aligning them by citing some projects or activities undertaken, however often they were not adjusted to the SDGs' focus topics nor to the deadlines (Mhlanga, Gneiting, and Agarwal 2018).

However, for the remaining part, more than 40% of the firms analysed in the sample did not modify its actual sustainability strategy as a result of this support. Some firms only mentioned SDGs in the sustainability report, while others only did some cosmetic changes to their reports (i.e. adding a SDG icon near the paragraphs describing sustainability topics) (ibidem).

Thus, as showed in figure 3, more than half of the companies in the sample used by Oxfam, MNCs with a remarkable "impact on Sustainable Development" only loosely link actual sustainability strategy with commitment to the SDGs (ibidem). For some of these firms, the failing contribution could be caused by a gap in the procedure to implement SDGs and reporting only revealed this gap, that may result from a firms' misconception of the real meaning of SDGs (lack of deep understanding at the target level) or to the shortfalls in the design of the Global Agenda described previously (i.e. lack of indicators for businesses).
Others, as argued by Oxfam, were probably firms treating with SDGs as a "commercial opportunity" and using them purely as "window-dressing" in their reports (Mhlanga, Gneiting, and Agarwal 2018). In this case, the support to SDGs was based on a selective disclosure approach as described by Marquis (Marquis, Toffel, and Zhou 2016). Here, firms try to get the benefit in term of reputation of participating to a UN project (as the SDGs), without adjusting their strategies and operations to the principles of the project, also thanks to the lack of monitoring and enforcement of UN initiatives (Berliner and Prakash 2015). However, this risks to reinforce the business-as-usual perspective instead of reversing it, fostering business-as-usual but adding incremental environmental or social initiatives (Schaefer, Corner, and Kearins 2015). This phenomenon was defined by Berliner and Prakash as *Blue washing*, for UNGC member (Berliner & Prakash, 2015), but in this case may take the name of SDG Washing, where "the term SDG washing points to businesses that use the Sustainable Development Goals to market their positive contribution to some SDGs while ignoring their negative impact on others" (Eccles & Karbassi, 2018; Nieuwenkamp, 2017).

This companies' engagement to SDGs reveals to be simply an add-on to the current sustainability practices as described in section 1.2.2., "instead of the Global Goals shaping business, in many cases business appears to be attempting to reinterpret the SDGs by fitting them into existing sustainability strategies and initiatives" (Mhlanga, Gneiting, and

Agarwal 2018) as only 2 out of 76 companies looked at the SDGs as a sustainable development premise to their business strategy formulation in Oxfam's work.
The bottom line reveals companies acting in this way are losing the opportunities linked to SDGs (innovation, market-disruptions anticipations, reputation, lower cost of capital and more financing chances) but they are also the underestimating the risks of going on with a business-as-usual perspective. However, they do not consider that "the costs and uncertainty of unsustainable development could swell until there is no viable world in which to do business" (wbcsd 2017).

The possibility of defining and measuring firms' contribution to SDGs allows to discern true engagement from blue washing. As shown in this section, SDGs are not another corporate social initiative to be added to the list of philanthropic interventions, nor the field of expertise of the sustainability department alone. Delivering the USD 12 trillion prize "will require that business leaders weave the SDGs into their long-term business strategies and renew their thinking about stakeholder engagements and how the business is created" (Pedersen 2018). This requires performing a real SDGs integration into the organisation. Integration as we have outlined in section 1.2.2 is the qualitative leap between blue washing, whether intentional or not, and true engagement. Please refer to Figure 4 for a summary of the definition of SDGs integration provided by this work.

In the next section, we will review the work done to this date on the different topics at the heart of the research question, from the possibility to measure sustainability performance, to the implications of integration of sustainability into the business strategy and core operations to the relationship between the private sectors and this new UN' initiatives.

2. Literature Review

After years of heated debate on the real meaning, implications and objectives of sustainable development (Hopwood, Mellor, and O'Brien 1872), UN members' unanimity in adopting the SDGs seemed a step ahead for the world.

On the other hand, Sustainable Development Goals are a relatively new topic, since they were first introduced in September 2015 by the UN, have a near deadline in about 10 years and as showed in previous section are far from being an easy topic to discuss and even more to tackle.

This literature review aims at gathering relevant researches about the role granted by businesses to the Global Agenda and particularly to SDGs inside the organisation, in order to gain knowledge about the way in which firms are integrating the SDGs. The goal is to find the key concepts, the gaps and the controversial issues in the debate about SDGs and businesses necessary to define the starting point for this and other researches on the matter. To explore the scope of existing literature, the relevant works identified will be analysed based on the purpose, object of the contribution and on the techniques used to conduct the researches about businesses dealing with the SDGs.

Sachs explained the revolution MDGs and SDGs have brought in the sustainable development talk based on the fact that they provided a concrete path. Indeed, he argued that, as of 2012, all countries pursued the so-called triple bottom line (an inclusion of environmental and social concerns), yet the many different definitions of sustainable development resulted in different approaches and goals to be reached. On the contrary, engaging with SDGs could provide a common target for everyone (Sachs 2012).

For this and other features we have described in the first part of this work, SDGs have been welcomed by many. Among the positive claims about Global Goals, some highlighted the comprehensiveness and ambition of the initiative setting a whole new type of governance, a so-called *"Governance through goals with specific features: the inclusive goal-setting process, the non-binding nature of the goals, the reliance on weak institutional arrangements, and the extensive leeway that states enjoy"* (Biermann, Kanie, and Kim 2017).

Among these positive claims, researches highlighting challenges and shortcomings of SDGs have emerged too and although Global Goals design is state-centric with a framework drafted for governments, shortcomings also affect business efforts to reach SDGs. Thus, these faulty features are also relevant for businesses.

Among those who highlighted the shortcomings of SDGs, Spangenberg's opinion was negative for some aspects. He analysed the potentiality of the SDGs' targets in helping to

achieve sustainable development. The author made use of an "heuristic DSPIR framework to assess state, impact, pressure, response and driving force to sustainability challenges". This model was a "descriptive tool", more than "analytical" and did not identify "causalities" among factors but described them in "sustainability policies". The object of study was SDGs Targets. The model aimed at defining whether they represented "driving forces, pressures, states or impacts" to identify if they were formulated for the prevention and mitigation of sustainability problems, or if they focus on restoration and adaptation". Then, an actor analysis was carried out to assess the effectiveness of agency in the SDG framework. The approach followed was radical structuralist, where conflict is considered inherent to social arrangements. The analysis supported the idea that there were inherent contradictions to implement all goals, and changes seemed necessary. First of all, the author argued that the targets analysed could ease the symptoms, but were not able to tackle the root causes of unsustainable development: "While Global Targets should address unsustainable trends, at a closer look they are found to focus on changing unsustainable states and impacts, neglecting the need to change pressures and supporting counterproductive drivers such as sustained GDP growth, modernization-led development concepts, free trade and deregulation." For instance, "water pollution is addressed, but not the kind of agriculture causing it". Additionally, some driving forces endorsed were observed be counterproductive, like free trade which was encouraged but the issue of a "fair trade system" was not mentioned. Moreover, the SDGs, based on an actor analysis, were found to be weak on agency, with limited obligations to governments and none to business or consumers. He also stated that the more important role granted to business was not paired with an increased amount of accountability assigned to firms. Also, Spangenberg argued that the SDG frameworks did not pointed out that some of the actual problems were caused by the private sector's search of profit as well as it did not provide any criteria through which "Public-Private Partnerships" may support public good. Moreover, he underlined the shortcomings of analysing sustainability reports "since some of the most impressive reports were those of the Volkswagen company." To revert this trend, he proposed some remedies: to put legally binding rules and standards for all relevant agents, and for businesses, market interventions and regulation. For the same, he claimed the need to introduce hard targets and enforce limits: to resource consumption, to income inequalities and wealth concentration in order to make sustainable business models more profitable than other ones (Spangenberg 2017).

In the same article aforementioned, Biermann highlighted some challenges concerning SDGs implementation and the related institutional features to improve: stronger global governance arrangement, necessity of a general administrative reorganisation to make global aspiration regional, national and local, involving at the same time different sectors, more flexible governance mechanisms against an ever-changing global environment, new way to measure progress though indicators using innovative technologies (Biermann, Kanie, and Kim 2017).

Concerning the latter, Hák focussed on the indicators to track and report about SDGs both in 2016 and 2018. In its 2016 research, the author made use of a conceptual analysis with quality assessment and recommendations for improving actual situation. In 2016, his analysis is ex-ante, in 2018 it is ex-post publication of official SDG indicators. In 2016, in the early hours of the SDGs and before the official lists of indicators was disclosed, Hák underlined the need of relevant indicators for Global Goals, meaning relevance as closeness of indicator-indicated fact. They were pointed out as necessary to perform a sound "assessment of target-achievement" and secure SDGs credibility. As a matter of fat, tracking and assessing efforts to contribute to SDGs required target-operationalisation for which Hák considered essential overcoming the policy framework to set a conceptual framework. Overall, the author supported a more thorough methodological and conceptual work to set the indicator framework leading to a less arbitrarily choice of the same indicators. His bottom line was that to choose relevant indicators sound assumptions at the foundation of the conceptual framework should be laid (Hák, Janoušková, and Moldan 2016).

In 2018, the same author revised the topic. The bottom line was similar: although the policy framework provided by SDGs was considered firm, the conceptual framework to operationalize targets and select relevant indicators instead was considered weak. Indeed, he argued that the choice of indicators should not be based on the availability, but on the contrary, before selecting them it should be defined what is important to measure, in order to keep the indicator-indicated fact relationship. According to Hák, without a sound foundation to choose indicators, any statistical tool will not effective. A comparative analysis of four assessment tools showed the risk of confusing results when using an inconsistent set of indicators that conveyed different perspective on the same subject. Finally, the author highlighted the need that "the expert community reach full

consensus on the indicator framework and its use" to monitor progress for the SDGs (Hák, Janoušková, and Moldan 2016).

These hesitations about the overall SDG framework concerned also businesses. Indeed, as showed in section, 1.2.4 *Tipping points about SDGs' integration and reporting,* "the SDGs require a certain level of translation to be meaningful for business." (Mhlanga, Gneiting, and Agarwal 2018).Moreover, we stressed the lack of single formal set of SDGs indicators for business and how the last work by the GRI *Measuring progress on the SDGs: A mapping of the SDG Indicators and the GRI Standards* showed that even though GRI standards are helpful to disclose about SDGs, findings "show some (limited) correlation between GRI Standards and the SDG Indicators" because "GRI disclosure measures (a part of) the business contribution to the SDG Indicator" (GRI, 2017).

Szennay examined this issue to determine wheatear some similarities could be found among the SDGs. Using a weighted neighbourhood matrix and a cluster analysis, the author examined the nature of the relationships between SDGs based on their link with the GRI Standards. "GRI-homogeneous groups can be classified according to the weighted neighbourhood matrix, in which the matrix's cell values show how many times a GRI "meets" another one", this matrix made the Euclidean distance between any "GRI-vector" visible and thus provided the possibility to create categories based on this distance. Then non-hierarchical clustering was applied. This analysis method allowed merging, thus "classification of data blocks". Following the framework of the SDG Compass, this work partly confirmed GRI last study's results about the limited correlation between Global Goals and GRI G4 Standards, since 60 out of 145 indicators could not be associated to an SDG (Szennay et al. 2019).

Among the authors describing implications and features to improve the SDGs, there is a group of researchers focussing on the need to integrate Global Goals. Their analysis is not focussed on the private sector; however, these implications are also relevant for the businesses.

Nilsson worked on the topic both in 2016 and 2018. In 2016, its main contribution concerned the mutual influence of SDGs. He proposed a theoretical framework based on seven types of interaction from "cancelling", where chasing one goals made impossible to reach another, for instance "fully ensuring public transparency and democratic

accountability cannot be combined with national-security goals", to "consistent", where "no significant positive or negative interactions" were found between two Goals, for instance "Ensuring education for all does not interact significantly with infrastructure development or conservation of ocean ecosystems." In addition, some relationships were considered "indivisible", where the pursuit of a goal was "inextricably linked to the achievement of another goal", for instance "Ending all forms of discrimination against women and girls is indivisible from ensuring women's full and effective participation and equal opportunities for leadership". This could be useful for business, indeed positive interactions were pointed out as the foundation to multisector strategies, while negative interactions were "subject to trade-offs, and the target of extra regulations and policies, such as bans. But negative-scoring interactions might also attract public investment in technologies and solutions that over time might push the needle up the scale". Yet, the author underlined the need to consider context since it could influence the interactions (McCollum et al. 2017).

The same author in 2018 published a review of applications of the interaction framework (developed in his paper from 2016) to previous empirical studies. The aim was to analyse how contextual factors influenced interactions: namely governance context, the geographical context and the time horizon. The results showed that implementing the interactions framework could be helpful in "inducing joined-up learning and dialogue across different sector and stakeholders". Moreover, even though the examples risked not to be fully representative, results supported the evidence that positive interactions were more numerous than negative ones, thus giving space for synergies to chase. However, he stressed that identifying all possible interactions may be a cumbersome and difficult task. While evidences on the importance of the context in influencing the interactions were reaffirmed, the need to define what progress on target meant over the implementation and what outcomes should lead to, emerged as an issue to solve evaluating interactions. For instance, the author explained that a target about health could have different meanings and implementations based on the placed considered, since diseases could vastly differ (Nilsson et al. 2018).

In 2018, Weitz used the seven-point scale developed by Nilsson to study the interactions among a predetermined set of targets. Using a cross-impact matrix (to analyse relationships between variables) with a network analysis ("to visualize the network of

interactions and assess the role that targets play within the whole system"), the author tried to find a criterion for goals prioritization and effectiveness of strategy implementation. Interactions on the 34 targets were assessed through quality assessment; indeed, the author herself admitted this could imply subjective judgement and that bias could be transmitted to the next steps of the research methodology. As for Nilsson, she argued that "exploring clusters can thus present an effective way to organize SDG implementation and build strategic partnerships". As Nilsson, the author supported the idea that interactions must be assessed considering the context. In the end, Weitz applied the framework developed by Nilsson to Sweden, carrying out an analysis of the interactions accounting for a "whole-government" setting. Those interactions were scored though Nilsson's framework based on Sweden's institutional, environmental, social, economic characteristics. Moreover, she studied not only first-order interactions, but also second order interactions. Indeed, she demonstrated that if a target had a strong positive interaction on another, but the latter then had a strong negative interaction on other targets, this could create a "negative systemic impact" resulting in a counterproductive effort (Weitz et al. 2018).

As Weitz's and Oxfam's work showed (Mhlanga, Gneiting, and Agarwal 2018), using SDGs as an overarching sustainable development framework for action requires a "certain level of translation to be meaningful" at lower political level, namely national and private sector level. To this regard, some researchers performed conceptual analysis and proposed theoretical frameworks addressed to the private sectors for the implementation and operationalization of SDGs.

Muff studied how to translate national sustainability issues into strategic opportunities for businesses. The author proposed three tools to translate the UN SDGs into national sustainability priorities that firms could use as long-term opportunities to integrate specific actions into business strategies and models. To do so, he suggested implementing the first three steps of the SDG Compass by incorporating three tools: the Business Sustainability Typology with its BST 3.0, the Collaboratory method and the new Gap Frame. In his work the author described a theoretical framework, where he depicted the *Gap Frame*, a tool useful for "translating SDGs into local business relevance" and applied it in an descriptive case study. Basically, it consisted in a "normative framework built on the SDGs", created on the idea of striving for the safe space, a sustainability level the world

should be able to reach and that could ensure survival in the long-term. According to the author *The Gap Frame* provided "a national assessment of where each country is compared to where it should be regarding" SDGs. It categorized the SDGs into 4 sustainability dimensions, linked them to 24 issues on which a country's performance was scored. If a country had low scores against some issues, thus it was considered in a "critical" position. The bottom line was that a business should look at these shortcomings as an opportunity to deliver solutions to improve the SD national situation through its business model. As the same author affirmed the results of the analysis were inconsistent with other SDGs assessment tools (Sustainable Development Solutions Network) (Muff, Kapalka, and Dyllick 2017).

His statements recalled the warning by Hák: inconsistent assessments may lead to confusing results that witness the urgent need for a single, consistent and shared indicators' conceptual framework.

Partnerships are an important new institutional feature of SDGs; UN strongly encourages multi-stakeholders and multi-sector collaboration. Indeed, they are considered fundamental to reach Global Goals so that the 17th goal was devoted to them. However, as Spangenberg argued, SDGs do not give criteria through which partnerships may support public good.

Berrone answered in his work this claim and the ones from prior literature works highlighting the drawbacks of PPP: *high transaction costs, limited innovation, or difficulties integrating service models in the case of multiple stakeholders with conflicting interests*. He proposed a conceptual framework to assess the effectiveness of potential PPP (Public-Private Partnerships) on SDGs advancement. Partnerships between the public and private sector were considered important for the SDGs pursue since firms are characterised by specific features and provide "financing, sector-specific expertise and knowledge, managerial and enforcement capacity, and a higher willingness to take risks". Berrone proposed a model, EASIER, to assess these partnerships. It was structured in six relevant dimensions for sustainable development represented in a form of a questionnaire. The six dimensions concerned the following issues: "Engagement of Stakeholders; Access; Scalability and Replicability; Inclusiveness; Economic Impact; Resilience and Environment" and strived to provide a holistic perspective on the collaboration. The result of the questionnaire provided a measure of the impact of the PPP on SDGs. It also

showed the application of the model on a pre-established PPP as business-case (Berrone et al. 2019).

As Berrone argued the private sector has a unique role in the SDGs pursuit, given its specific features it may provide benefits to this cause. Even though SME may help too, Transnational and Multinational corporations are the key actors required to engage.

Indeed, Sachs, special advisor at UN both for MDGs and SDGs affirmed that MNCs provides "worldwide reach, cutting-edge technologies, and massive capacity to reach large-scale solutions, which are all essential to success." (Sachs 2012), while Szennay added that often these actors' gains amount to some countries GDP and that the size of their operations leads them to "have a significant impact on the whole ecosystem of the planet." These features as well as the acknowledgment that the private sector did not and do not always act in sustainable development's best interest suggested that committing with businesses should be "active, forward-looking and intensive", but also cautious (ibidem). Much has been written on the role of large corporations on CSR and sustainability, yet the International Business literature about MNCs/TNCs and SDGs was still "sparse" as of 2017 (Witte and Dilyard 2017).

In 2017, Kolk explored the role of MNCs in Sustainable Development pursue, through a systematic review of academic papers with a quality assessment, to verify what was known about SDGs from an International Business (IB) perspective and draw conclusions. The analysis was issue-based on the 4 Ps established by UN (peace, prosperity, planet, people. The methodology consisted in the study of 61 papers published in IB Journals between 1958 and 2016. The authors used "keyword search on the titles, abstracts and keywords" of the paper with a "standard Boolean operators". The aim of the work was to see what level of awareness and to what extant the topics at stake were treated before and immediately after the introduction of SDGs. The analysis showed that poverty and inequality were the most tackled issues covered by the SDGs where large corporations could have the largest impact and that partnerships as meant in the fifth P of UN Global Agenda (a way to reach SD) were not fully approached by IB academic literature. The authors' conclusion from this work was that MNEs could have a remarkable impact on sustainable development, through externalities (positive and negative) and more and more as they deliver solutions though their business. Kolk found many possible research

agendas to follow due to the scares literature and focussed on the need to examine public-private partnerships, as other authors did, anticipating Berrone's model (Kolk 2017).

In the same year, Donoher studied the reason of MNCs' engagement in SDGs pursue from a legitimacy theory perspective. His work was structured in a conceptual analysis and a review of some initiatives undertaken by Unilever and other MNCs to achieve SDGs. He found that MNCs may commit to SDGs as a legitimation tool, yet participation was more justified the more benefit were created from it. In this case, benefits came not only from increased reputation gains but also from balancing stakeholders' competing interest (that for MNCs are a large, heterogenous group) when deciding the initiatives to pursue in the context of SDGs. Thus, for MNCs Donoher considered important the "appreciation of the underlying linkage between multinational sustainability efforts and organizational legitimacy", as a guideline in deciding how to take part in these initiatives. The author highlighted that the more the initiative was structured to achieve core business purposes, the more legitimized the firm would be. He also stressed the opportunities stemming from SDG1 concerning the "bottom of the pyramid" approach and "MNE-sponsored microfinance schemes" but added that the level of effectiveness of MNCs' effort in this context was to be assessed (Donoher 2017).

As Donoher, Zanten studies the reason of corporate engagement of MNCs in 2019, but from an institutional perspective. Here, the author introduced the concept of SDGs as a "Goal-based institution", like Biermann's "governance through Goals". The methodology used is structured in an exploratory quantitative survey administrated to executives managing SD challenges in 81 large European and North American MNCs among "Financial Times Global 500 companies". Respondents had to score on a five-level scale the firms' contribution to each of the 59 business-relevant targets and then list the initiative of the firms in this regards (the scale goes from "Philanthropic intervention, Sharing data, Partnership with other stakeholders, Public advocacy to Core business alignment"). The approach encompassed was interpretative, since much attention was given to the perception of people about the organisation. The two aspects of engagement under examination were: "actionability" of the target ("external or internal to the operations of the firm") and the positive or negative moral perspective that the SDGs represented ("doing good or avoiding harm"). Survey's results indicated that the highest contribution was given respectively to SDG 16, SDG 5, SDG 8, SDG 12, and SDG 17, SDG 13.

Moreover, it was revealed that MNEs engaged more with internally than externally actionable SDG targets, that higher engagement was recorded for targets aiming at avoiding harm rather than doing good and that European corporations' engagement was higher than North Americans'. From a sector-perspective, a higher engagement with targets "avoiding harm" was recorded from large companies in industrial sectors creating negative externalities. This conclusion was in accordance with prior research on general corporate sustainability engagement. The authors' assessment revealed that large companies were still immature in their engagement towards SDGs. They aligned core strategies mainly to obvious internally actionable SDGs (SDG 8, 5, 9, 12, 13), while those more complex requiring the firm to engage as "development actors", enlarge its "sphere of influence" and "solve macro challenges (i.e. institution building/ public goods".) were only tackled through philanthropy initiative (SDG1, 2, 3, 4) that did not touch the core business, while SDGs require a critical rethinking of the business. The experiment showed that companies "share data about Global Goals that represent collective action and/or public good challenges" (SDG 6, SDG 7, SDG 13, SDG 14, SDG 15). Public advocacy represented the main way of participating to SDG 16. Multi-stakeholder partnerships mainly contributed to SDGs 1, 2, 4, 6. As Kolk, also Zanten relied on cross-sectoral partnership to improve the maturity of companies' engagement, to be most effective he suggested choosing partners with complementary and actionable skills as well adapting the business model to the new opportunities provided by the SDGs. This work's main limitation was the small sample that risk not to be representative (van Zanten and van Tulder 2018).

The last two authors Topple and Schonerr both dealt with issues concerning two separates topic groups, MNCs practice for tackling SDGs and firms using SDGs as a guiding framework. Their works shared some similarities. Thus, they close the group of researches focussing on MNCs role and open the group of works whose authors conceived the SDGs as a guiding framework for the private sector.

In 2017, Topple used data from previous years to study MNCs' way of translating SDGs[3] into business practices. He performed an exploratory qualitative study on 112 MNCs (from all over the world) having subsidiaries in the ASEAN region to examine how FDI

[3] At the date of the study firms were committed with MDGs but authors believe firms would shift to SDGs

(Foreign Direct Investments) could contribute to the SDGs. The author performed semi-structured interviews with representatives from three management's levels: executives, middle managers in charge of the operations and sustainability/governance managers. Questions concerned corporate sustainability were the heart of this assessment. The answers with some additional information gathered from corporate reports were inserted into the "qualitative data analysis software package NVivo. determining, refining, defining and prioritizing sustainability issues". Overall the results confirm the importance of improving sustainability reporting because it could be a useful method for incorporating the SDGs in firms' strategy. Indeed, the study showed the importance of reporting standards (especially GRI Standards, often implemented with ISO or UNGC principles) in guiding sustainability practices at the parent company level, but these standards imposed also to subsidiaries were observed to not always be translated into businesses practices at that level. Thus, the author underlined the possibility to implement the SDGs as a guiding sustainability framework at the parent level to adjust business practices. These adjustments could then arrive to the subsidiaries located in developing countries and foster participation to the Global Goals. Finally, among the sustainability assessment tool the materiality analysis emerged as a method for "determining, refining, defining and prioritizing sustainability issues" (Topple et al. 2017).

A similar importance of the materiality analysis was underlined by Schonerr in 2017. He studied through a review of relevant works and a quality assessment how SDG as the guiding framework could help MNCs in improving their CSR engagement. Indeed, Global Goals appeared as facilitating measuring, monitoring and reporting contribution by limiting the number of material SD issues to tackle (only related to the SDG17) yet broadening the scope of the business engagement (i.e. through multi-stakeholder partnerships). However, he underlined the need for MNCS to prove in the present that their CSR engagement is not only a philanthropic activity, but they contribute to Sustainable Development though their core business connecting their value chain to the CSR activities undertaken in an interdependent way. To set CSR goals, monitor the related activities and assess the contribution to SD, firms must be able to measure their impact according to Schonerr. However, he acknowledged the lack of management system to report accurately and rapidly about impact beyond the direct boundaries of the company and few indicators to measure SD for corporations.

As Schonerr, also Morioka studied the role of SDG as guiding framework in two papers form 2018, specifically she considered them as a framework to critically assess a firms' contribution to sustainable development delivered through its business model.

In her first paper, she looked at Sustainable Business Models (SBM) as alignment tool, a way to incorporate sustainability goals in the core business and at the same time create a competitive advantage out of this for the firms. SBM were considered a way to assure the world survival while assuring a specific business survival. However, the author acknowledged that there was no unique way to design a SBM, thus, she provided context-specific examples. Through the analysis of eleven case studies of Brazilian and English firms having developed SBM, information was gathered through semi-structured interviews and content analysis by corporate managers. The sample used was by choice theoretical rather than representative to provide a "broad variety" of cases. Results showed that even if companies contribution to SDGs could be based on value creation, delivery system and cascade value, "the strongest connection between SDG's and competitive advantage is the value proposition, indicating the relevance in defining organization's purpose and offerings that can provide synergies between individual and collective goals". Her work resulted in a framework based both on theory and empirical result for the implementation of SBM. The paper contributed to the SDGs talk, using in the data collection the SDGs as a framework to critically assess contribution to Sustainable development (some questions focus on the contribution to SDGs). The bottom line was that if a SBM is aligned with the SDGs, firms may contribute to Global Goals and sustainable development and gain a unique position in the market (a.Morioka et al. 2018).

The same year, based on insights from the empirical result of her previous work and a systematic literature review, the author proposed a theoretical framework to assess SBMs from the sustainable development perspective as well as competitive advantage perspective, SVEM (Sustainable Value Exchange Matrix). The framework was a visual tool to help firms assess the extent to which through their core business they contributed to gain competitive advantage and contributed to sustainable development in the form of the Global Goals. Indeed, the first part of the framework questions was devoted to aligning sustainability challenges relevant for the firms, offering and purpose to SDGs. According to Morioka, SVEM helps a firm's strategy align to SDGs and use these Goals as a source of innovation to gain competitive advantage making any business model more sustainable (b.Morioka, Bolis, and Carvalho 2018).

While Morioka did not reject the business-as-usual idea, but wanted to complement it, Raith proposed a complete rethinking of current business models and inverted the approach in the same year. He did not look for making an existing business model more sustainable, but created a new business model, with social and environmental objective in the value proposition. He encouraged entrepreneur to create from scratch a business built around a mission centred on SDGs and make sustainability the goal of the organisation. Given that the challenges highlighted by the SDGs are like a crystal ball of what the market will demand in the long-term, this kind business model was considered also "economical". Like a framework proposal, he proposed four basic strategies for creating a SBM: whether the "mode of value capture" is "through the market" or "through the mission" and the "mode of value creation" is "target integration" or "target support". He suggested focussing the value delivery on few quantifiable target groups to facilitate the impact measurement. In the end, he showed though descriptive case studies how these strategies can be implemented to contribute to SDGs while remaining economical (Raith and Siebold 2018).

As previous authors, also Russell studied the role of SDGs as a guiding framework in 2018 but applied this idea to a specific sector, analysing how the construction sector, characterised by "adversarial relationships and a complex supply network", could support sustainable development. He performed an exploratory case study conducted through semi-structured interviews to supply chain and sustainability managers of a firm operating in the sector. The study was issue-based: two contrasting "supply network approaches" where examined, one top-down and the other bottom-up. The result of the study revealed that the bottom-up approach to supply network was more effective to integrate sustainaiblity since "it promotes alignment of goals and/or principles between the different actors in the supply network, so that all actors can gain benefit from the relationship and have the flexibility to focus on the goals that are most relevant to them". However, SDGs were observed not to provide a "practical decision-making framework" for supply networks and that addition efforts were needed to make the Goals operational across different sectors. Moreover, he encouraged to provide firms with specific sectors guidelines. This idea recalls Hák's complaint about a lack of operational framework (Russell, Lee, and Clift 2018).

As Russell other researchers examined the relationship between SDGs and specific sectors in which firms operate, focussing on the reciprocal impact of a sector on SD and

vice versa: Bosch, Betti and Jones. In 2018 Bosch and in 2017 Jones studied the role of specific sectors as the financial market to achieve the SDGs. Both highlighted the challenges of pursuing SDGs for the financial sector though theoretical works. The first author through a conceptual analysis underlined the importance of ethics in this sector and how the concept changed from market-efficiency to synonym of sustainability in the financial market. In his analysis he argued that financial markets may support and contributes to the SDGs, and that vice versa SDGs can help financial market improve and grow sustainability, because *"the stability of any goal require financial sustainability"*. The main threats to this contribution was considered by Bosch short-termism and bubbles. However, it also added that the market is made of man and woman, thus ethical and sustainability should first be shared by the society as a necessary condition for turning SDGs into reality, otherwise the effect of SDGs in the short-term are negligible. The author streamlined a process to integrate sustainability in financial market through a "*market ethical coordination"*, showing the role each actor in the sector should perform. In this work the SDGs were seen as the most important reference of sustainable development, a proxy for sustainable development, however Bosch underlined that the revolution must start from the civil society that "*assumes SDGs as targets to be achieved",* this new perspective should spread in the economic system to regulators so they demand stricter reporting rules, to rating agency so they focus more on ESG information. In this revolution, market "*incorporates the sustainability effect in prices"* and corporations are forced to issue securities in accordance with the Principles of Responsible Investment and increase the offer for sustainable products. In the end, Bosch supported the idea that SDGs may guide the transition to a new approach in financial markets. (Bosch-Badia, Montllor-Serrats, and Tarrazon-Rodon 2018)

The second author, Jones through a literature review with quality assessment, stressed the difficulties of pursuing SDGs in the financial sector in his work from 2016 (Jones, Hillier, and Comfort 2016).

In 2018, the same author examined the SDGs in the light of six advertising firms' sustainability strategies that participated in an initiative Our Common Ground developed with the UN. Through content analysis of corporate (general and sustainaiblity reports), the author described the key challenges this sector face to contribute to Global Goals. Namely, Jones recommend that all firms include a materiality assessment to improve transparency in their reports and give reasons of the SDGs' prioritized, as Schonerr and

Topple also affirmed. Moreover, he added that firms committing to SDGs should follow the guidelines of the reporting standard chosen and have external assurance. The author posited that given the contradiction between "continuing economic growth" and SD, advertising firms cannot aim for both, thus their reports should acknowledge this, however he also admitted that this is a confusing issue since UN included economic growth among Global Goals. Another "daunting challenge", firms face according to Jones is the fact they must advertise both sustainable and non-sustainable products (Jones, Comfort, and Hillier 2018).

In 2018, Betti tried to understand whether contributing to SDGs hurt financial returns for investors. To do so, he analysed the connection between specific sectors and SDGs and found that some sectors have a much higher impacts on SDGs and vice versa. The study was theoretical and quantitative. The authors followed a methodology consisting of mapping the SDGs against SASB's material issues and creating indexes to measure impacts. The analysis was conducted at the target-level. Findings revealed that an higher impact depends on the fact that either some SDGs influence more ESG material issues than others (i.e. SDG 3, SDG 12) and vice versa or it depends on the intensity of impact of certain SDGs on SASB issues (basically this impact depends on the number or on the magnitude of these connections). Betti concluded that the private sector can give more important contribution to some SDGs than others but also that while some SDGs substantially benefit from the private sector "doing well," others benefit to a lesser extent. Moreover, the author underlined that good sustainability data of corporations could be used as proxy for SDG impact (even if they are outcome impacts), because impact measures are difficult to obtain because data outside the firm's boundaries must be available. Finally, Betti considered these results useful for both governments, investors and organisations. Indeed, according to him, evidences could guide firms in choosing what SDGs to prioritize. At the same time, this could benefit investors, since they would more consciously choose where to invest and could influence government decision-making. As Schonerr, also Betti highlighted the need for the development of impact measures rather than just relying on outcome measures, which cannot assess the externalities a firm has on the environment in which it operates. In that case, for these authors, "ESG measures" would be "proxy of SDG impact" (Betti, Consolandi, and Eccles 2018).

As Jones in 2019, another author dealt with corporate reporting and SDGs: Rosati, in two papers from 2019 where he studied the role of external and internal institutional factors

in firms' reporting about SDGs. His first work contributed to the literature on sustainable development and sustainability reporting by investigating the external institutional factors related to addressing the Sustainable Development Goals in sustainability reports. He made use of an empirical quantitative model aiming at hypothesis-testing through inferential analysis. This research was conducted by considering 27 institutional factors belonging to six different institutional systems, and it relied on data from 2413 sustainability reports published by organizations located in 90 different countries. The results showed that organizations reporting on the Sustainable Development Goals were more likely to be located in countries with higher levels of climate change vulnerability, national corporate social responsibility, company spending on tertiary education, indulgence and individualism, and lower levels of market coordination, employment protection, power distance and long-term orientation. The result on the latter element seemed unreasonable. However, the author, trying to provide an explanation, affirmed that it depended on the recent introduction of SDGs (the study was conducted on 2016 corporate reports). Indeed, firms having focussed on short-term result, may have rushed in announcing their commitment to the Global Goals to get as soon as possible better result. Clearly, this related only to SDG "formal" commitment, measured through mere adoption and mention present in the reports. Finally, the author underlines that SDG can improve sustainability reporting because they provide a univocal definition of SD and a convincing call to action (Rosati and Faria 2019a).

In the second research, Rosati studied organisational factors' influence on SDGs "early adoption". The research was empirical and quantitative, aiming at hypothesis-testing through inferential analysis in the form of a logit model. He studied a sample of 408 firms identified through the intersection of firms following GRI standard and firms present in the Orbis database (from which the author retrieved economic and ESG information). He found that SDG reporting was linked to some internal corporate factors: larger size, a higher level of intangible assets, a higher commitment to sustainability frameworks and external assurance, a higher share of female directors, and a younger board of directors. Is this works Rosati affirmed that the central element of Corporate Sustainability are stakeholders' needs, and, in this context, SDG are a "shared expression of stakeholders needs", thus providing an additional interpretation of Global Goals for businesses. (Rosati and Faria 2019b)

Concerning SDGs' integration into the core business, two researchers tackled the SDGs from a strategic management perspective, Sullivan and Grainger-Brown.

Sullivan's exploratory study consisted in a scoping investigation to determine the intersections between Industrial Ecology (IE), strategic management and the SDGs. The scoping investigation was structured in three parts: first a quantitative literature review of databases on the Internet, then using Leximancer (software exploiting thesaurus-concept-association) a "text-mining analysis of the SDGs" and the "integrated assessment" of the two sets of results to detect "cross-over" between IE, strategic management and Global Goals. The results suggested that firms should consider their "critical role in a larger social-ecological industrial system and that IE principle may contribute to SDGs as well as to the competitive advantage of firms (similar to Morioka's claim), facilitating "resource efficiency, innovation, and climate change, mitigation and adaptation", all topics covered by SDGs. Sullivan explained that IE proposes new business strategies more suitable to pursue SDGs compared to traditional business strategies that often are executed "at the expense of the environment" (Sullivan, Thomas, and Rosano 2018).

Sullivan's industrial ecology principles were mentioned in the following work by Grainger-Brown. Indeed, the last papers treated is also the most recent and thus provides the reader with the most up-to-date perspective on the topic discussed.

Grainger-Brown (2019) focused on strategy management as a useful concept to examine firm's engagement towards SDGs, because of strategic management's ability to "produce transformative actions and strategy". The author performed a scoping investigation of the SDGs tools available to businesses, rather than a literature review, since the breadth of the topic required a more comprehensive methodology of research. Works issued between 2000 and 2018 were considered and academic studies and not were object of the scoping. Consequently, the tools found were analysed based on a model outlining a generic "strategic management" process, in order to assess these tools' "usefulness in impacting organisational strategy". The generic strategic management process described by Grainger-Brown encompassed three phases: Ideation, Development and Implementation phase. The first step allowed to define and articulate specific and measurable organisational goals. In the second step, the management identified and assessed the potential options to reach the pre-determined goals, it chose the most suitable pathway after evaluating external opportunities and threats, conducting a

sensitivity analysis and verifying the pathway of financial feasibility. Finally, in the implementation phase, the strategy was executed and monitored to track progress and get feedback for the improvement of previous phases. The SDG tools found through the scoping analysis were categorised in 3 groups, each divided in two groups, one for already existing instruments and another for tools developed specifically for the SDG framework. The macro categories consisted of mapping tools to help firms link their current programs and value chain to Global Goals (i.e. SDG Compass), reporting tools (i.e. GRI Standards) alignment tools ("SVEM" by Morioka). The last typology of instruments were the most strategic ones because they provided organisations with methods to align core business practices to SDGs, creating or improving the firm's competitive advantage. Results showed that most of the tools available related to monitoring and reporting, only concerning the implementation phase, while a lack of instruments to assist managers in the early part of strategy formulation, ideation and development of the strategy - "problem-definition" and "goal-setting" - was recorded. In detail, no SDG-specific alignment tool was identified, while among the adapted instruments the author described the afore-mentioned "Sustainable Value Exchange Matrix" by Morioka, helpful in strategy ideation and "the application of industrial ecology principles to create sustainable industrial systems" in order to "re-define the organisation as an entity to achieve the goals, rather than simply measuring end-state performance". Yet the author stressed how alignment tools are necessary to support strategic decision-making and find gaps in actual sustainaiblity strategies, thus in integrating SDGs into business strategy and business practices. Specifically, the author encouraged the creation of "SDG-specific" tools for the ideation phase and the design of instruments to support managers in the development phase, since as of beginning of 2019 there was none (Grainger-Brown and Malekpour 2019).

Finally, two authors described real case of firms integrating SDGs inside their business. In 2019, Fleming described the example of an organisation engaged to SDGs, which was not aware of this UN project before the experiment. Here the author made use of a qualitative empirical method consisting in an exploratory case study for which information came from semi-structure interviews with managers and documents analysis. Interviews and content analysis were guided by the decision-making framework VRK (Value – Rules – Knowledge) and the SDG Compass. The VRK framework helped in taking decision considering the "decision context" as the system resulting from value, rule and knowledge

interconnecting. Fleming argued that if well-implement it highlighted the "opportunities and limits" in the decision-making process and outcome. The framework describes a firms' decisions as guided by "informational", "value-based" or "institutional". The approach encompassed was interpretative, since much attention was given to the perception of people about the organisation. Results showed that businesses can effectively engage with the SDGs, even without "government requirements or societal expectations", however a wider interpretation of sustainaiblity appeared necessary as well as a thorough reflection about corporate values. A key finding of the work concerned the alignment of values, which was a sufficient element for firms to engage with SDGs even without official enforcing mechanisms, monitoring activity and previous knowledge. Thus, Fleming proposed to use the VRK model as an additional tool for the SDG Compass because: "the VRK model helps businesses to understand the SDGs in ways that are appropriate to them and highlight the barriers and interventions of changes that may be required, they make firms reflect about themselves in relation with contextual factors" (Fleming et al. 2017).

In 2018, provided a descriptive case study showing a business contribution to SDGs. The author considered the SDGs as the long waited "long-term political framework" to tackle SD as well as "a gift to business because the economic rewards for delivering to the needs defined in the SDG´s are very significant". Indeed, he stated that SDGs could help firms understand what future stakeholders' demand and adapt their business model accordingly, similar to what Rosati affirmed (Rosati and Faria 2019a). However, Pedersen argued that SDGs have the potential lead to higher risk if firms have "SDGs unfit products or business practices" or higher costs for firms with "SDGs unfit supply systems and raw material needs". The firms described in the case study was Novozymes. The research showed the change in the strategic approach to sustainability over the years and after the SDGs adoption. Initially the sustainability was used for managing reputation through awards and "controlling operational and supply chain risks, reducing costs, increasing transparency and reporting". Then the focus passed on products and customers with whom the firm collaborated for the definition of a Life Cycle Assessment and the integration of SDGs in business functions. This increased engagement with stakeholders and the related storytelling. In this phase sustainability was used to "support current business". The third phase started with SDGs' introduction and aimed at putting this framework at the heart of strategy development and execution, instead of integrating it

later on, as an innovation driver, business development compass and overarching decision-making framework. The author argued that firm also developed a tool to assess impact on SDGs, but the research did not disclose additional insights (Pedersen 2018).

Although the SDGs are a relatively recent framework and the literature is rather incipient, some trends in this topic's research can be drawn. These literature review tried to provide an overall picture of the state-of-art of the researches in the field of SDGs, with no presumption of exhaustivity. We gathered some relevant works on the relationship between the SDGs and the private sector as well as those analysis that may be interesting for businesses too. As we said Global Goals, targets and indicators are state-centric and designed for governments, thus many researches are focussed on governments, countries, international bodies or country-specific and sector-specific applications.

Among the works focussing on the private sector, this overview listed many exploratory theoretical works, namely large reviews, state-of-art descriptions, scoping investigations, conceptual analysis and some conceptual framework propositions. These kinds of studies were always accompanied by a qualitative assessment, a commentary and/or some recommendations. "Theoretical research is a logical exploration of a system of beliefs and assumptions. This research is very valuable in understanding the bounds, edge cases, and emergent behaviours of a system." (Edgar & Manz, 2017). Because of the recent introduction of the framework and some original concepts to analyse theory is yet to be developed and main concepts are yet to be explored. We recall the "governance-by-goals", multi-stakeholders' partnerships as the encouraged method to address sustainable development, " inclusive goal-setting process, the non-binding nature of the goals, the reliance on weak institutional arrangements, and the extensive leeway that states enjoy" (Biermann, Kanie, and Kim 2017).

Concerning empirical studies, there is not a clear trend in research. However, in this case too, researches were mainly exploratory. Qualitative studies were preferred, semi-structured interviews were often chosen while content analysis was mainly neglected. Most quantitative works did not follow a trend methodology, but many research methods were implemented. Indeed, in this literature the most used methodology design was observed to be the mixed method, both multi-method and mixed-method approaches. Among the theoretical works, Kolk used a systematic review with quality assessment to check the state-of-the-art about SDGs research from an International Business

perspective(Kolk 2017). Also, Schonerr, Biermann, Jones implemented review of prior literature but not systematic, rather they selected relevant works on the topic to give the reader an overview complemented with a quality assessment. The first focussed on impact assessment in SDGs pursue, the second on the institutional factors necessary to succeed and Jones on the challenges in the financial sector (Martinuzzi, Schönherr, and Findler 2017; Biermann, Kanie, and Kim 2017; Jones, Hillier, and Comfort 2016; Jones, Comfort, and Hillier 2018). Grainger-Brown and Sullivan preferred using a scoping investigation for their search of respectively the SDGs tools available to business and the intersections between Global Goals and Industrial Ecology's principles. Scoping allowed to progressively define the research's criteria as the investigation was carried out (Sullivan, Thomas, and Rosano 2018; Grainger-Brown and Malekpour 2019). In identifying the results of the research no quality assessment was conducted, differently from the review that involved a quality assessment in the choice of the works examined and the pre-determined definition of the research criteria (Grant and Booth 2009). Reviews helped in gathering information about the current research state on a specific topic and were necessary as starting point to conduct a research. Another type of theoretical study introduced in our literature review was the conceptual analysis and/or the derivation of a framework for the analysis and operationalisation of the topic. Bosch accomplished a conceptual analysis on the financial markets' role in achieving SDGs (Bosch-Badia & al. 2018), while Muff proposed a theoretical framework to operationalise the SDGs (Muff, Kapalka, and Dyllick 2017). Also, Hák dealt with the operationalisation of the SDGs through relevant indicators' choice using a conceptual analysis with a quality assessment and recommendations (Hák, Janoušková, and Moldan 2016; Janoušková, Hák, and Moldan 2018). Spangenberg's analysed SDGs through a framework consisting of driving force, state, pressure and impact using a DSPIR model and an actor analysis (Spangenberg 2017). This group of papers was more varied than the previous, here the authors created the theoretical background where SDGs' conversation laid. Their works strived to describe, explore and explain the concept behind Global Goals and to create tools to make the concept operational.

Among empirical studies, we acknowledge both qualitative and quantitative. The only qualitative study performed using a single method was the descriptive case study of Pedersen, which illustrated the evolution of the sustainability strategy of a sustainaiblity -award winning firm after SDGs' introduction. The comparative analysis of reports on

SDGs' advancements published by Hák in 2018 fell in this category too. The drawbacks of using only one qualitative method is the limited applicability of data (one or few participants in the sample) and evidences being not hard enough. (Salzmann, Ionescu-Somers, and Steger 2005). However, qualitative researches have been taking more and more ground in management studies, as Zikmund witnessed, because: "Human organisations and human behaviour are difficult to hold still and isolate, since they change constantly and can offer different dimensions of themselves to different audiences" (Winterton 2008).

Empirical researches encompassing quantitative approach aim at measuring "behaviour" rather than "meaning", seek a way to generalise evidences in order to improve applicability and are based on the so-called "hard reliable data" (Winterton 2008). In this review, Rosati, to examine internal and external factors influencing early adoption of SDGs by business, used a hypothesis-testing approach through inferential analysis in the first paper (Rosati and Faria 2019a) and the same methods in the form of a logit model in the following study (Rosati and Faria 2019b). The aim of these papers was to help managers, investors and decision-makers develop strategies and plan for supporting SDGs adoption, however as big as the sample might be, also in the case of quantitative analysis the risk of putting a bias on the generalisation exists. Moreover, this type of study does not reflect motivation and drivers for adoption. Betti, to define whether contributing to SDGs hurts financial investors, implemented a quantitative analysis not expressly empirical but aiming at proving practical insights. He mapped SDGs against SASB material issues and created indexes to measure impacts (Betti, Consolandi, and Eccles 2018b). On the other hand, Zanten's works consisted in a digital survey with structured closed questions to managers of 81 MNCs analysed through the SPSS software, in this way the author verified the reason for corporate engagement in SDGs from an institutional perspective (van Zanten and van Tulder 2018) (like Rosati's purpose).

Among the different categories of method designs, mixed and multi-methods are by far the most common in SDGs research and in business research as Zikmud expressed: "One of the reasons for this is "triangulation" where different methods of data collection and analysis will both enrich and confirm the picture you collect of a situation. Triangulation can also provide a check on findings from a particular method" (Winterton 2008). That is, multi and mixed method's choice is based on the ambition to take the advantages of both

methods. For instance, Morioka used in both her papers a multi-approach to describe SBMs design (empirical qualitative methods). She provided context-specific examples through eleven case studies of Brazilian and English organisations. Information was gathered through semi-structured interviews by corporate managers and document analysis. In her second papers, from 2018, the author proposed the SVEM, after a systematic review of prior literature on SBM (two theoretical research designs). Always using two different theoretical methods, Berrone performed a review with a conceptual framework proposal but also a case study with the application of the framework. He created a quantitative questionnaire to assess the effectiveness of potential PPP established in the context of the SDGs' pursue by businesses (the result was expressed in percentage from 0 to 100% as highest effectiveness). Indeed, merging a critical review with the proposition of a framework helps to legitimize the outline of the theory the framework seeks to implement (Morioka, Bolis, and Carvalho 2018b; Morioka et al. 2018a).

Similar to a framework proposal, Raith described four basic strategies for creating an SBM: whether the "mode of value capture" was "through the market or through the mission" and the "mode of value creation" is "target integration or target support" and provided case studies as example of implementation of the strategies (framework proposal and case study). On the other hand, Fleming implemented a case study based on the adoption of SDGs by a firm who was not aware before the experiment. Information came from semi-structure interviews with managers and documents analysis, this experiment was guided by the framework VRK and the SDG Compass, thus the author mixed two qualitative empirical methods (Fleming et al. 2017). Also Topple followed a double qualitative empirical method on a sample of 112 MNCs: semi-structured interviews with content analysis were examined through a qualitative analysis software, Nvivo. The exploratory work aimed at studying MNCs' way of translating SDGs into business practices (Topple et al. 2017).

Indeed, while semi-structured interviews are important to capture motivations, drivers and perceptions inside the organisation, content analysis provides a more objective examination of the reality even if it only allows report assessment, which is different from actual performance. Especially in the voluntary disclosure context where sustainability reports appear.

Russell studied the role of SDGs as a guiding framework for supporting sustainable development in the construction sector. She proposed the case study of an English contractor. Information was retrieved initially through semi-structured interviews, but then "multiple data collection methods were adopted to allow triangulation of results". Further interviews, observation of meetings, on-line survey for employees, content analysis of corporate report were performed. Information was coded through a MAXQADA software to make main topics arise.(Russell, Lee, and Clift 2018)

Using a weighted neighbourhood matrix and a cluster analysis, Szennay examined the nature of the relationships between SDGs based on their link with the GRI Standards. The author approach was quantitative, based on theory but provided immediate practical insights. Matrices helped in analysing interactions between factors and were useful for going deep into SDGs interconnected framework of goals and targets. Indeed, cluster analysis "is generally used for exploratory data analysis and serves as a method of discovery by solving classification issues" (Szennay et al. 2019).

Finally, Weitz used a matrix too to find a criterion for goals prioritization and effectiveness of strategy implementation in the context of the SDGs. He used a cross-impact matrix with Nilsson's scoring interactions, then analysed through network analysis and applied this approach to Sweden as case study. Network analysis is useful "to visualize the network of interactions and assess the role that targets play within the whole system". A drawback of this method was that SDGs interactions inside the matrix were scored through quality assessment; thus, this could imply subjective judgement and that the potential bias could be transmitted to the next steps of the research methodology (Weitz et al. 2018).

2.1 The literature gap

While the SDG initiative started only three years ago, the related topics have long been at the centre of the private sector's conversation and some firms also approached them through their sustainability strategies. Given this ambivalent situation, researchers highlighted some gaps in the current academic literature and showed future study perspectives about SDGs integration in business strategy and practice.

According to Cici and D'Isanto survey, a third of the firms respondent believed sustainability integration to have a remarkable impact on core business and the majority

demanded an assessment tool to measure the level of sustainability integration in the core business (The Conference Group 2013). Zanten proposed researchers to use the same object of study he used (contribution to the SDG targets categorized as internal or external to the firm's value chain) but a different methodology (through assessments of their sustainability/CSR reports) to verify whether different results emerged on corporate engagement towards SDGs. Similarly, he underlined the necessity to go beyond self-reported SDGs contributions of MNCs, analyse the steps that lead to integration of SDGs into business practices and thoroughly measure performance and impact. As a matter of fact, he argued that MNCs "have vast opportunities for helping achieve the SDGs. Research is now needed to understand, accelerate, and materialise these opportunities." (van Zanten and van Tulder 2018). However, a "coherent approach" in studying how international businesses may "advance sustainable development" is required to consider all aspects (sometimes contradictory) of MNC's engagement, as Kolk argued (Kolk 2017). Also, Schonerr underlined the need for further researches to explore the role of MNCS in working towards the SDGs. Specifically, he encouraged development of new impact measurement techniques as real proxy of the private sector contribution (Martinuzzi, Schönherr, and Findler 2017).

Donoher listed as interesting future researches topics, MNCs' driver for SDGs' prioritization in order to examine whether some SDGs have an higher impact on a firm's legitimization or whether using Global Agenda as overarching sustainability framework may help in regaining lost legitimation (Donoher 2017). Also Fleming stressed the topic of Global Goals as driver of "social licence" for future research, based on her study's results (Fleming et al. 2017). Among the relevant questions to be answered, Witte & Dilyard highlighted the need to understand the way in which SDGs are treated in MNCs corporate reporting and the potential new standards that may emerge from these practices (Witte and Dilyard 2017). Rosati proposed to complement such researches "by means of qualitative research methods to uncover motivations and drivers for voluntarily reporting on SDGs in different contexts"(Rosati and Faria 2019a). Grainger-Brown encouraged a quicker development of tools to "embed the SDGs throughout the strategic management process […] to meaningfully contribute to the achievement of the goals."(Grainger-Brown and Malekpour 2019) and Russell thought more studies were "really needed to explore and compare the effectiveness of different approaches in

embedding more sustainable practices in organisation operating in this (construction) and other sectors" (Russell, Lee, and Clift 2018).

From a methodology perspective, some calls for additional effort in research emerged from this literature review. Fleming demanded "More real-world case discussions of practical applications of the SDGs […] to better understand how they can begin to be applied and to achieve the broader uptake that is necessary to achieve the ambitious targets of the SDGs" as well as "new assessment mechanisms involved in the SDGs that directly link desirable SDG outcomes with the necessary systemic organisational changes" and a stronger focus on values, rules and knowledge in shaping decisions (Fleming et al. 2017).

An issue arisen in some papers was the potential bias introduced by a limited sample, particularly in qualitative studies (van Zanten and van Tulder, 2018). Concerning quantitative works, by definition they lack a qualitative judgement, notwithstanding this may be useful, as Berrone's framework to assess PPP showed, in order to supplement evaluations in complex cases (as in the case of partnerships)(Berrone et al. 2019). Betti's work on the impact of material SASB issues on SDGs demonstrated this: simply accomplishing counting risks overlooking relevant elements (Betti, Consolandi, and Eccles 2018).

Thus, considering SDGs as a political and reporting framework for the private sectors to contribute to sustainable development, this work aims at adding to the literature on the topic by saying something about the possibility to systematically measure and benchmark this contribution. This implies finding a way to define levels of corporate engagement towards SDGs. From what emerged until now, contribution depends on the maturity in the approach to SDGs. What allows a firm to progressively evolve towards SDGs, from a mere commercial approach to using this framework's insights as a premise to shape innovation, investments and develop the future business, is integration of Global Goals' perspective into the core business. The goal is to assess this contribution in quantitative terms but providing also a qualitative judgement, to be able to spot trends and behaviours but also retrieve meaning and interpretation in the meantime. The final aim of this explorative work is to derive an SDG integration-maturity assessment method.

Second part

The following section of the work describes the consequences of the literature review: an experiment performed on a group of firms to empirically assess the hypothesis emerged. Here, the reader can find the results of the experiment *Results*, as well as a commentary of them, *Discussion of results.*

3. Research design

3.1 Research question & aim

We developed our research based on the prior literature's results. The aim of this work is to gain knowledge on the relationships between the corporate world and the Global Goals. Thus, the first research question we defined was:

To what extant has the private sector integrated the Sustainable Development Goals inside the organisation?

But in order to evaluate this aspect we have posed ourselves this more operational research question:

How have the biggest 250 firms in the world addressed the SDGs in their reporting practices? Is there any pattern in their practices? How to assess SDG's integration maturity through content analysis of corporate reports?

The reader may better capture the nature, the scope and facets of this work when considering a few elements: first the lack of a specific "reporting framework" due to the recent introduction of the SDGs (Blasco, King, and Jayaram 2018). Second, the lack of consensus on the reporting standards for sustainability. Third the controversial findings on the relationship between sustainability performance and sustainability disclosure.

3.2 Research methodology

The nature of the research question and the gap found in prior literature led the choice of the research method. Given the scarce literature and the need to find a pattern in the cases studied, we chose an exploratory study with an experimental design.

The review revealed the need for a method able to reflect different dimensions of research: number-wise and word-wise. Indeed, as Rosati highlighted, in analysing corporate reports a qualitative dimension is essential to make emerge motivations, reasons and levels of engagement to SDGs (Rosati and Faria 2019a). Additionally, Berrone underlined that a quality judgment is relevant in analysing such complex issues (Berrone et al. 2019) like the effectiveness of contributions to SD through corporate initiatives. Thus, a qualitative research method is preferable to acquire rich, deep meaning, to

consider the micro level and account for context specificities (Winterton 2008). Consequently, considered the early development of the academic literature a theory-emergent methodology is suitable. However, when applying only qualitative methods, small sample bias may distort the experiment' result as Zanten warned (van Zanten and van Tulder 2018).Therefore, implementing a quantitative approach applied to a large sample should detect and measure trends but in the meantime the risk of a non-representative sample is reduced. On one hand, quantitative methods of research improve results' reliability, provides the reader with "hard, reliable data", a macro picture and results (potentially) able to be generalised. They describe behaviour and trends through numbers and allows to test already developed theories (Winterton 2008). It should be also noted that Russell called for more works to analyse and compare how different businesses embed sustainability and SDGs practices inside their organisations (Russell, Lee, and Clift 2018), while Fleming points out the lack of real cases of firms implementing Global Goals (Fleming et al. 2017).

All this considered, we look to produce an exploratory experimental study. The research method is structured in a content analysis of corpore reports, namely annual, sustainability and CSR reports. We chose corporate report analysis as the most suitable approach to the topic. Content analysis is based on the analytical analysis and interpretation of data (words, images, figures) necessary "to elicit meaning, gain understanding, and develop empirical knowledge" (Service 2009). It is preferred when statistical methodologies implied a "mismatch with the categorical censored data typically gleaned from content analysis"(Brammer and Pavelin 2008). Also, it is more likely to let a pattern emerge (Ashley and Boyd 2006), since data is codified into prefixed categories to extract presentation and reporting patterns (Guthrie et al. 2004).Content analysis also provides a tool to present several examples that "could be useful for a better understanding of the specifics of the impacts" (Fortanier and Kolk 2007), given the novelty of the topic of research. To support the choice of report analysis of MNCs as suitable research method, the reader should remind that corporate reporting is itself part of the Global Agenda as expressed by SDGs 12.6. *Number of companies publishing sustainability reports* and that UN encourages all firms, especially MNCs, to issue or improve quality of sustainaiblity reports (Globalreporting.org. 2019). Moreover, the choice of voluntary disclosure as focus of analysis was supported by Rosati's statement: "Therefore, we argue that the commitment to voluntary sustainability disclosure

programs may be an indicator that organizations already possess the skills and mindset necessary to address the SDGs in their sustainability reports" (Rosati and Faria 2019a).

In choosing whether to prefer a qualitative or quantitative approach for content analysis, we followed Lee's idea on the matter. In 2017, Lee reviewed previously used measurement methods to perform content analysis, but showed the shortcomings of using one single criterion for it, implying that "both volume (quantity) and quality should be considered for better measurement of environmental disclosures", since assessing on quantity alone may be misleading and only relying on quality risk to deliver subjective results. He proposes to merge word counting and quality scoring of narrative disclosure. (Lee 2017). Moreover, sustainability reporting (integrated in annual report or as a single document) is characterised by a low level of standardisation and high level of tailoring of measurement tools, relevant issues, reporting pattern on the single firm (Fasan and Mio 2013), all this considered, a quality judgement as well as structured measurement method are required.

These evidences resulted in the identification of a mixed empirical methodology, merging a qualitative and quantitative approach though word counting but also narrative disclosure's quality scoring, as Lee suggests. The most suitable paradigm of research for this method is, as Zikmund illustrates, a "radical humanist paradigm". Indeed, "a radical humanist paradigm would suggest again a qualitative method and looks not necessarily at the perceptions of social actors in the organization but seeks to probe a deeper level of values and social definitions, which underpin the organization". For this paradigm is suitable a research design which "looks for theory through a structured method of investigation of what is said or written (inductive) and produces categories of idea, which can then be used to characterize, develop or change organizations" (Winterton 2008).

3.3 Sample

The initial sample was based on Global Fortune 250 list, ranking these firms by total revenues "for their respective fiscal years ended on or before March 31, 2018" (Fortune, 2019). Researchers' focus on MNC's started in the 70's and then again in the late '90s onwards (Kolk 2003). Choosing this kind of firms as sample considers their visibility and their influence thus, the "potentially large impact on other firms" (van Tulder and Kolk 2001). Additionally, empirical studies showed that high quality disclosure is strongly

influenced by firms' size and sector, namely there is a positive relationship with environmentally sensitive sectors (Brammer and Pavelin 2008). In 2007, Fortanier and Kolk demonstrated that "with increasing size, firms become more visible and so do their environmental impacts, thus exposing them to increased public pressure to report more extensively"(Fortanier and Kolk 2007). Environmental accountability has been shown to increase with the size of the firm too (Adams, Hill, and Roberts 1998; Anderson et al. 2017; Gray, Kouhy, and Lavers 1995; Neu, Warsame, and Pedwell 1998). Finally, Rosati and Faria investigated the relationship between adoption of SDG reporting and a series of internal organizational factors and concluded that "SDG reporting is related to a larger size" (Rosati and Faria 2019b). Given the exploratory nature of our study looking for a pattern in the way businesses have interpreted and implemented the call to action by the United Nations worldwide, MNCs as unit of analysis was the most suitable choice for this study's aim. Specifically, in choosing the first 250 biggest firms by revenues worldwide as sample, we considered the strategic importance of this group of firms for researchers in international business. Rugman and Girod (Rugman and Girod 2003) defined it the "unit of analysis" in this field, while Ogrean acknowledged the use of this group as benchmark for studies in other several fields and affirmed that "realities and trends characterizing the world of global MNCs are not only important for the FG500 companies […]; they provide valuable insight on the (general and industry) environmental opportunities and threats, while setting "global standard" that cannot be ignored by any strategist in search for sustainable competitiveness into a global complex world […]"(Ogrean 2017). These works let emerge a role of MNCs as first movers and trend-setters for all other businesses. Moreover, Zanten reminded the reader that MNCs' relevant role in SDGs debate role cannot be disputed, also because they have participated in the creation of Global Goals through the bottom-up approach implemented by the UN for the SDGs (van Zanten and van Tulder 2018).

Sector-wise, it has been shown that the sector a firm belongs to influences corporate sustainability performance and reporting, specifically "due to e.g. industry levels of diversification, global integration or local responsiveness"(Sharfman, Shaft, and Tihanyi 2004). Drawing from this, in Fortanier & Kolk as well as in most professional studies on SDGs (Scott and McGill 2018; Blasco, King, and Jayaram 2018; Fortanier and Kolk 2007), the sample was clustered in sectors. This approach helps in considering specificities of firms operating in different industries. The classification followed in this work is the

Global Fortune Classification by sector (Business Industry, Retailing, Apparel, Aerospace and Defence, Chemicals, Energy, Engineering & Construction, Financial, Food & Drugs Store, Food & Beverages & Tobacco, Healthcare, Household products, Industrial, Materials, Media, Motor vehicle & parts, Transportation, Technology, Wholesales, Telecommunication), Industry, Region and Country (Fortune, 2019). Choosing as sample a group ranking the global largest companies by revenues gathered in industry clusters provides the relevance and breadth requirement to our work, two features stressed by Oxfam in their study on corporate approach to SDGs (Mhlanga, Gneiting, and Agarwal 2018). Indeed, in this sample, many firms had a remarkable impact on issues linked to the sustainable development: some of them were in highly environment-polluting industries like petroleum refining, crude-oil production and utilities and their size required a huge number of employees, eventually affecting (only directly) 67.7 million people worldwide. Breadthwise, the firms came from all-over the world and represented all the sectors of classification (besides business service represented only in GF 500 list not in GF 250 list) (Fortune, 2019).

To summarize, given our scope requirements, this work analysed the first 250 companies appearing in Global Fortune 500 list for F.Y. 2017 (since as of 15 July 2019, Fortune had not published F.Y. 2018 yet). We performed a content analysis, applying a qualitative and quantitative approach through the evaluation of the narrative disclosure and word counting of annual, sustainability and CSR reports.

4. Reports analysis design

4.1 Initial Remarks

As Oxfam pointed out in its study, two general remarks are in order. First, sustainable development is approached differently by each firm and our effort only strived to identify trends in the sample, not operating generalisation of the private sector applicable equally to all firms. In addition, Oxfam acknowledged that SDGs are only one of the possible frameworks used by the private sector and that it may engage in other ways towards sustainable development. However, let us recall two additional insights to Oxfam's opinion already illustrated in previous sections. The SDGs are not a type of frameworks

among others that firms can arbitrarily choose. They trace the path towards sustainable development, they were developed by a wide range of stakeholders through a bottom-up approach, they were freely adopted by all UN members and they define the borders in which businesses may focus their effort yet leaving ample room of manoeuvre in the daunting task of pursuing sustainable development. Global Goals are the political framework the private sector has long been waiting for (Pedersen 2018). Not pursuing this common road is spoiling an opportunity of focussing on the relevant actions and reduces the possibility to compare progress between business actors, moreover it bears a risk : "Instead of the Global Goals shaping business, in many cases business appears to be attempting to reinterpret the SDGs by fitting them into existing sustainability strategies and initiatives". A similar risk can appear in the case of firms only using the Sustainable Development Goals as a "commercial opportunity", operating the aforementioned "blue-washing" and silencing uncomfortable stakeholders (Mhlanga, Gneiting, and Agarwal 2018).

Thus, this work strive to find a way to identify firm's engagement either real and effective, where SDGs are embedded (or in the way to be) in the business strategy and practices, either infant or opportunistic, where SDGs are only superficially mentioned, not linked to any kind of activity or strategy while the general conduct of the firm reflects a misalignment with the Global Goals.

4.2 The experiment: design and criteria

We analysed both quantity and quality of corporate reporting about SDGs. Corporate reports analysed include both annual report and sustainability report if separated. Information in the website was taken into consideration only if there was a clear reference in the published report, otherwise it was ignored. This accounted both for reasons of scope and time and because this work's nature is cross-sectional: report published cannot be updated, information on websites may be over time and updated could not be identified.

Quantity was assessed through counting words in the report. Word counting was accomplished using Adobe Acrobat Reader DC. Words related to SDGs were *Sustainable Development Goals, SDG, SDGs, Global Goals, Global Agenda, Agenda 2030, Compass.*

Concerning the quality assessment, based on the information retrieved from the corporate reports, a questionnaire was to be filled on Microsoft Excel. The questions initially identified came, directly or indirectly, from the literature review and were administered from the simpler to the more structured and complex ones. The questions were revised at the beginning of the experiment (after having read about 10 reports) and this adjusted questionnaire was administered to the remaining firms and to the ones already analysed. Being an exploratory study, the perfect consistency of theory and practice was never assumed, since the relevance of each question was meant to be assessed through the experiment. The aim of the analysis was to derive a tool to measure SDGs' levels of integration in future, this step was considered essential to provide future reliable results. Based on this assumption, the experiment was conducted from mid-July to the end of August 2019. It involved gathering the reports on the website of the firms, creating categories in an Excel sheet, extracting data and inserting the information in the related cell. The analysis was performed by one person. In Figure a. the worktable at a glance.

4.3 The questionnaire

In Table 1, the first draft of questions assumed before the beginning of the experiment. The question were 68.

Please refer to Table 2 for the revised questionnaire. Eventually 80 questions were identified. Questions were divided in seven sections treating each a main issue, ideally the questions and thus the sections were administered following an increasing complexities and SDG-orientation. Therefore, the goal was to have in the first sections of the questionnaire simple and sustainability-basic questions, representing a bigger audience of firms, followed by the more SDG-expert topics covered in the last sections. The "General information" section gathered questions from number 1 to number 19. They were important to get the overall and sustainability profile of the firm and compare practices of firms addressing SDGs. Next to the question in Table 2, the references used to

inspire questions were mentioned, where no mentioned was made, the questions were not directly extracted from one work in the literature review but assumed potentially relevant.

The second section's questions "SDG Approach" included questions from number 20 to number 28. These questions related to the way the firm dealt and reported about SDGs as a UN's project. These issues were extracted from professional works by KPMG, PWC, OXFAM on the matter, while question 26 derived also from Donoher's work on the legitimation of sustainable development, where the author claimed that the more a firm is able to show the benefit of its commitment to SDGs, the more it is be legitimized by its stakeholders (Donoher 2017).

The third sections' questions "Goals and targets addressed" examined how the firms dealt with the Global Goals individually and the process of prioritization of Goals. Again, consulting firms and academia were the main source of inspiration to analyse firms. Along with KPMG, PWC and Oxfam's studies, Zanten's insight was used to analyse the nature of the target pursued by the firms (van Zanten and van Tulder 2018).

In the fourth part of the questionnaire "Compliance: Linking existing sustainability strategy to SDGs" the focus was on verifying the extent to which companies in the sample link their existing strategy to the Global Agenda 2030 framework, from only mentioning some initiatives to using the SDGs as the main sustainability framework to find gaps in the current sustainability strategy (Mhlanga, Gneiting, and Agarwal 2018). While the fifth section "Ambition: integrating and widening SDGs" strived to find whether the firms analysed have gone the extra-miles, beyond the mere compliance to the United Nations, to make the Global Goals at the heart of their business and be ambassador. Following, the section concerning the "Collaboration" was presented, this topic is especially relevant considering the focus put by the United Nations on the concept of *partnership*. Here Berrone's (Berrone et al. 2019) and Spangenberg's (Spangenberg 2017) works on the difficulty of measuring contribution to SDGs through partnerships were used as inspiration. The seventh section of questions gathered on purpose some of the most complex topics concerning SDGs implementation. Oxfam's, Nilsson's and Rosati studies provided valuable insights to define these questions (Mhlanga, Gneiting, and Agarwal 2018; Rosati and Faria 2019b; Weitz, Nilsson, and Davis 2014).

While these questions related to the qualitative part of the experiment, in the last section, questions to verifying quantitatively and qualitatively the way corporations report about SDGs were added.

5. Results

5.1 General Profile

As aforementioned, the first section of question provided "General information" on the corporation's profile. The sample of firms was composed of the first 250 firms from Global Fortune 500 published in 2018 and representing report describing activities of year 2017. Please refer to Table 3 for the GF 250 complete list of firms.

As shown in Figure 5, the main region represented in the sample is Asia (41% of firms, 103 units), followed by America (31%, with 77 units), respectively North America (28 %, with 70 units) and South America (3% and 7 units).

Concerning the country distribution, please refer to Figure 6. The two main country represented in the sample are U.S. with 69 presence (27.6 % of units) and China with 56 presence (22.4 % of units). From the third most represented country onwards, we respectively have Japan, France, Germany, South Korea, Britain, Netherlands, India, Brasil, Russia, Italy, Spain, Mexico, Australia, Thailand, Taiwan, Singapore, Norway, Malaysia, Luxembourg, Belgium, Britain/Netherlands, Canada.

Not all firms were public company. The legal status distribution was diverse, as shown in Figure 7 and 8 ("Global Equity Stock Screener Fundamentals And Technicals | Marketscreener" 2019; "China In Transition: The Rapid Advancement Of Chinese Private Enterprises As Revealed By The Fortune Global 500," 2019; "State-owned enterprises in the Chinese economy today: Role, Reform, and Evolution", 2018). Of the sample 182 firms, 73%, were public company. 41 firms, 16% of firms were SOE. 14 firms were listed on the stock-exchange, yet the controlling shareholder is the State. One firm was a Cooperative and 12 were private firms.

Out of the private firms, 1 was a government-sponsored enterprise, 1 was mutually held and for one the total amount of shares was held by the employees through a union.

Concerning the sector, as shown in Figure 9, Financials was the most represented sector with 62 presences, followed by Energy 37, Motor Vehicles & Parts 21, Technology 18, Healthcare 15, Telecommunication and Wholesalers 13, Drug Stores 12, Materials 11,

Food & Beverage 8, Aerospace and Engineering 7, Transportations and Industrials 6, Retailing 5, Chemicals 3, Household products 2, Apparel, Metals and Media 1.

For the Industry distribution, please refer to Figure 10. This distribution was uneven, few industries had many presences across the sample, while many industries had only one, two or three presences. Here the most represented sector was Banks: Commercial and Savings, 30 firms belonged to this industry, more than one quarter of the total group. Followed by the Petroleum Refining industry part of the Energy sector and the industry of Motor Vehicles and Parts both with 21 firms in the sample. The Telecommunication, Food and Drug Store, Trading and Metals industries had respectively 13, 12, 10 and 9 units in the sample. Seven firms belonged to the Utilities, Pharmaceuticals, Engineering and Construction, Aerospace & Defence. Mining - crude oil production-, Insurance - Property and Casualty (Stock), Electronics - Electrical Equipment were all characterised by six firms each. Mail-package-freight delivery, Healthcare: Insurance and Managed care, Food production had each six firms listed in GF 250. The industry related to diversified financials and Computer-Office Equipment had each 4 firms in the sample. 3 firms belonged to Energy, General Merchandiser, Internet services & Retailing, Wholesaler: Health Care industries. Building materials-glass, Food Consumer products, Health care: Pharmacy & other services, Industrial Machineries, Household & Personal Products, Insurance-Property & Casualty (mutual), Network and other communication equipment, Specialty Retailers and Textile had all 2 presences in the sample. Finally, Beverages, Computer Software, Construction & Farm machinery, Entertainment, Health care: Medical facilities, Insurance: Life, Health (mutual), Information Technology services, Railroads, Pipelines, Semiconductor & Other electronic components, Real Estate, Shipping, Wholesaler: Food & Grocery were all characterised by one firm in the sample.

In the general profile of the firm described for all 250 companies before accounting for SDGs, we also considered whether they produced an integrated or separated report and what type of report it was, as shown in Figure 11.

For the year 2017, 162 out of 250 firms (64.5%) produced two separated reports, one for financial requirements and one on non-financial topics. 49 companies (19.6%) produced a only document describing both financial and non-financial issues. 3 firms were excluded from the experiment, because they were financial holdings producing no reports on their own, but having each subsidiary producing its own report. Two firms produced only a

financial report and did not provide any ESG information. A company produced a report every quarter, and the website of a firm was not accessible. 32 firms did not produce reports for many reasons: one only produced the report in Chinese, 9 did not produce sustainability information at all, 22 did not produce any sustainability report but provided sustainability information on their website.

Besides the 36 report not gathered, for the firms having produced an accessible report in English, the typology of report was diverse. Among the separated reports, the majority published 72 "Sustainability Reports" followed by 61 "CSR Reports", 9 a "Citizen Report" like the number of "ESG Report".

The remaining firms produced non-financial reports named after SD like "Communication on Progress for SD", there was also a "GRI Report", "Highlights and data book". Some reports recalled the idea of responsibility "Responsible Business Update" or "Responsible Investment Report" other of the concept of value "Share Value Report" or "Value Creation Report". Finally, some chose a different name than sustainability report but linked to that idea: "Sustainable Living Report plan", "Sustainable Business Report", "Sustainable Impact Report", "Sustainable Value Report".

Among the integrated report, 29 firms produced a unique document called "Integrated Report", 17 firms produced an integrated report named "Annual Report", 4 French firms published a "Registration Document".

5.2 Sustainability Profile

Gathered this information on the initial sample, we focussed on those firms mentioning the Sustainability Development Goals in their reports and we analysed these firms from several perspectives to assess their level of SDG-integration in the business.

As shown in Figure 12, almost two third of the firms, 62%, (156) mentioned at least once in any of their reports the word "Sustainable Development Goals" compared to 23%, 58, of firms not mentioning ever the SDGs. The remaining 15%, 36 organisations, was not part of the study as aforementioned.

Of the firms mentioning SDGs in their reports at least once, 91 mentioned them only in their non-financial report, for easiness *SR* in Figure 13, 2 organisations mentioned them only in their financial reports, for easiness *AR* in Figure 9, while 34 mentioned the Global

Goals in the single document they produced, for easiness *IR* in Figure 9. Finally, 19% of organisations, 29, mentioned the UN's project both in the financial and non-financial reports, as shown in Figure 9.

Concerning where the SDGs were treated in the documents, no general trend was identified, standardisation of structure was minimal, however we underlined that 67 firms dedicated a specific section (one or two pages) to the Global Goals, while we observed 3 documents where the SDGs were mentioned all over them, almost in every pages. In 51 reports, the Goals were mapped to sustainability topics or initiatives, while in 23 reports we noticed SDG icons had been placed next to certain issue description. Other reports treated the SDGs in the strategic sections and other ones mentioned them in the commentary by the expert or at the beginning of the report with other sustainability frameworks used to disclose about ESG practices.

Before showing the sample's practices in disclosing the SDGs, please refer to Figure 14. For reason of time and scope, we only analysed printed/online reports, however 30%, 47 firms mentioning the Goals also provided in the document a link to the website for further details. Mostly we did not consider the web pages, we only checked in some cases to verify the consistency of information, but it was not reported in the experiment.

Concerning the sustainability standards used to report and the certification held by the firms mentioning the SDGs, we considered the following frameworks: GRI G4, IIRC, ISO, CDP, DJSI inclusion, IPIECA, SDG PIONEER, VIGEO 120 WORLD index, SCIENCE-BASED TARGET commitment, TCFD, FTSE BLOSSOM JAPAN, UNGC status.

Before going in detail, we considered the average number of certifications or standards followed by each firm. As shown in Figure 15, most firms, 46 out of 156, had two/three certifications/ standards, while a similar number, 30 firms, only followed one reporting standard and 27 followed four or more standards.

The number of firms mentioning SDGs and using the GRI G4 guidelines, as shown in Figure 16, represented the majority, 128 organisations (82%) compared to 28 firms (18%) not making use of these guidelines in their reporting.

Of the aforementioned 128 organisations, different levels of application were observed as reported in Figure 17. Here, 56 firms (42.7%) reported in accordance with the "core" level, 19 (14.06%) in accordance with the "comprehensive" level and 53, did not clearly

disclose this information, but mapped the GRI disclosures they referred to, treating each topic over the reports. The level of disclosures was not clearly reported because either the index linking topics to GRI disclosures was not included in the report but published online or GRI was not the main frameworks used. For instance, some firms used the IIRC as main framework because they produced an integrated report or belonged to highly regulated industries like Banks: Commercial and Saving or Petroleum Refining having specific reporting standards (i.e. IPIECA). Speaking of IIRC, of the 49 firms producing a single document as reports, only 15 mentioned to follow the IIRC guidelines.

A similar result was obtained when considering the number of firms holding a ISO certification: two third of firms (103) had at least one certification, while one third (53) did not. Please refer to Figure 18 for the number of organisations holding a specific certification. The majority, 60 firms, had the 14001-certification, concerning the criteria to have an environmental management system, followed by 27 firm which held ISO 26000, concerning how to conduct operations in a socially responsible way. Certifications 9001, 27001 and 5001 were held by respectively 23, 19 and 12 firms and concerned insights on quality management and information security management. 5 firms appeared to have certifications 22301 and 31000, respectively on societal security and risk management. We observed four firms holding certifications 22000 and 37001 respectively on Food Safety Management and anti-bribery management systems. Three firms had their business certified through ISO 14062 on Eco-design and ISO 20400 on Sustainable Procurement, while two firms had certifications 17025, 18000, 19600 (Testing and calibration laboratories, Information technology, Compliance Management Systems). The rest of certifications mentioned 13482,14021,14065,14067,14404, 17021, 17717, 18001, 19011, 19863, 26262 were held each by one firm.

Concerning the CDP, please refer to Figure 19 for results: half of the firms did not participate in this project (78), 34% (53 firms) participated and disclosed the score obtained, while 16% (25 organisations) participated but did not disclose the results.

The firms disclosing their scores allowed us to provide a consumptive table, as reported in Table 4. For the program on Climate Change, 45 out of 53 firms disclosed their scores: 20 organisations ranked best with an A, 16 received an A minus, 8 got a B and one ranked worst with a C. For the program on Water: 24 out of 53 firms disclosed their scores: 11 organisations ranked best with an A, 8 received an A minus and 5 got a B. The Supply

Chain program scores only reflect a positive effort by the firms: 5 firms received an A and one an A minus. Finally, one firms was scored on its effort to avoid deforestation and received an A.

For a complete understanding of the sustainability profiles across the sample, we considered other frameworks. Results by the 156 firms mentioning the SDGs are reported in Figure 20 and Table 5. 69% of firms (107) followed other sustainability frameworks, reporting standards or certifications, 31% (49) did not. In Table 5, distribution of the other certifications, awards, standards for the 156 firms considered. Considering the indexes: 55 firms were included at least in one of the DJSI, 20 were included in the VIGEO 120 World and 4 in the FSTE Blossom Japan. For the reporting framework used: 41 firms followed the TFCD for their reporting such as 12 organisations were part of the IPIECA associations and followed its guidelines and 24 firms were PRI signatories. Concerning the projects: 29 firms took part in the Science-Based Targets project, of which 14 committed to set target and 15 already had targets set. 15 organisations disclosed based on the IIRC and one on the Grenelle 2 framework.

Moreover, three firms' leaders were awarded the SDG Pioneer award: BASF, Microsoft and Total's managers. This award is granted to "business leaders who are doing exceptional job to advance the Global Goals through the implementation of our Ten Principles on human rights, labour, environment and anti-corruption" (Unglobalcompact.org 2019c).

While 4 firms (Tesco, Nestlé, Walmart, Unilever) leaders were nominated Champion 12.3, among the "executives from governments, businesses, international organizations, research institutions, farmer groups, and civil society dedicated to inspiring ambition, mobilizing action, and accelerating progress toward achieving SDG Target 12.3 by 2030" (Champions 12.3, 2019). SDG 12.3 focuses on halving per capita food waste by 2030 and reducing food loss across the value chain.

Another participation considered as relevant when speaking of firms' commitment to SDGs, is the UNGC membership as it is the UN's initiative born to encourage the private sector to operate in an environmentally friendly and socially responsible way. 60% of the firms mentioning the SDGs (100) were member of the initiative, the remaining 40% (56

firms) were no. Of the 94% member of the initiative, 4 were founding members, 30 signatories and 11 participants, as shown in Figure 21.

On the other hand, as shown in Figure 22, not only the members of the UNGC followed the 10 principles stated by the UNGC, but also other organisations not members followed those principles (71%, 110 organisations) compared to the 46 firms (29%) not following the guidelines.

5.3 SDG Approach

After having analysed the sustainability framework adhesion across the sample, we focused on the Global Goals. As previously discussed, the SDG Compass created by the UNGC, The WBCSD and GRI is the tool closer to a reporting standard the firms may use in disclosing about the SDGs. However, only the 4% of the sample mentioned to use it as shown in Figure 23.

Similarly, please refer to Figure 24 to see the number of firms mentioning the person/people in charge of the Global Goals inside the organisation: only 12 firms out of 156 (8%) spoke about this aspect in their reports.

Four firms affirmed that part of or all employees were trained to deal with the SDGs. While other four organisations mentioned that a transversal Sustainability Committee composed of members of different departments oversaw the Global Goals, for instance an organisation decided to give this task to an executive committee working in cooperation with all Business Units, another firm entrusted the segments' managers and all managers having an impact on any ESG issue with this duty and one asked the core departments' managers to work along with the BOD members to implement the SDGs. In another organisation, both employees and a sustainability committee oversaw the 2030 Agenda. 2 firms asked independent actors to oversee this issue, in one only an independent director oversaw SDGs, in another one an independent selection panel was required to pick projects based on their contribution to the SDGs.

Considering what the firms said about the SDGs in their reports, as reported in Figure 25, 27 organisations (17%) clearly created a link between the Global Goals and their corporate strategy, while 129 firms did not make this link (83%). As described in chapter

1.2, the more the Global Goals are considered a premise to strategy formulation, thus included in the vision or mentioned as part of the strategic approach, the nearer these Goals are to the core business.

We also considered the top-management engagement with the Global Agenda 2030 and measured the number of firms' leaders mentioning the SDGs in their reports. 62 among firms' CEOs and CSR managers (40%) addressed the Global Goals in their messages as shown in Figure 26.

As Oxfam affirmed, fully integrating the SDGs means using them as the main sustainability framework overarching the business' activities. Please refer to Figure 27 for the number of firms mentioning, at the beginning of the reports, that the Global Goals inspired the reporting along with other frameworks such as the GRI guidelines, ISO, UNGC principles. About a third of the organisations considered reported to have used the Global Goals as inspiration to write the report, while about two third (66%) did not acknowledged 2030 Agenda as a reporting framework.

KPMG in its study from 2018 on the SDGs (Blasco, King, and Jayaram 2018), stressed the importance to disclose a compelling reason to engage with the SDGs for investors and stakeholders, considering the different types of interests they bear towards the organisation. As shown in Figure 28, 53 firms (34%) provided a reason to engage to Global Goals. Among the reasons provided, the most used one was linked to Corporate Social Responsibility: 37 firms affirmed that their engagement was guided by the responsibility they had towards the society. 4 added to this reason also the advantages for the business, 3 firms said that their commitment was guided by the alignment with the corporate values. The same number of organisations (3 firms) recalled expectations form their stakeholders as main reason to engage. Alignment with the sustainability strategy was reported as reason to commit by two firms. One organisation reported as rationale to adhere to SDGs alignment with values, vision as well as possibilities to grow provided by the Global Goals. Another one as reason provided both alignment with the firm's values but also pression to answer to stakeholders' expectations and another double reason to engaged mentioned was related to both CSR justification and value alignment. One firm, committed to the UNGC principles, felt that this commitment extended also to the SDGs.

KPMG suggested firms to provide a reason to engage linked to the business development and it also recommended to disclose both the opportunities and risks concerning this decision: to provide a balanced view of the situation, but especially to show investors and stakeholders that the Global Goals were not only another philanthropic initiative, but were linked to the future outlook of the competitive environment (Blasco, King, and Jayaram 2018). Please refer to Figure 29 for the statistics: only 10% (15) of the organisations mentioning the Global Goals undertook this effort, while 141 organisations (90%) not considered essential providing this information.

As previously shown, SDGs should be considered an indivisible set of interconnected goals and targets. Many researchers as well as professional works demonstrated the importance of considering this aspect and the risk of neglecting it (McCollum et al. 2017; Scott and McGill 2018). Therefore, we considered it in our study and found out that 10 firms out of 156 acknowledged this aspect in their reports.

5.4 Goals and targets addressed

The second group of questions concerns the analysis of the approach the firms across the sample had to the Sustainable Development Goals.

Firstly, we measured the number of organisations addressing directly at least one out of the 17 SDGs, since there were firms only treating the Goals as an overarching initiative and not approaching each one specifically. Please refer to Figure 30 to observe results: most of the organisations, 132 firms (85%), mentioning the SDGs also addressed at least one specific SDGs, while 24 firms (15%), only dealt with the SDGs as an indivisible abstract set.

The distribution of number of goals addressed per each firm is reported in Figure 31, in decreasing order. As above said, 24 firms did not address any specific goals, while 23 firms addressed all 17 goals. This symmetrical situation will be further explained in the discussion section of the work. The most addressed number of goals per firm following no one or all SDGs observed was seven goals by 15 firms, 8 goals by 12 firms, 6 goals and 5 goals by 10 firms, 9 goals by 9 firms, 11 goals by 8 firms, 10 goals by 8 firms, 4 goals by

7 firms, 12 goals by 6 firms, 3 goals by 6 firms, 14 goals by 4 firms, 2 goals by 4 firms, 15 and 13 goals by 3 firms, 1 and 16 goals by one firms

Considering the topic most addressed by the sample, the distribution was diverse, as shown in Figure 32. As found by KMPG, Oxfam and PWC, the most addressed Goals in 2017 were SDG8, SDG13, SDG12 and SDG3. However, Oxfam and PWC observed a difference, indeed Goal 3 was the third most addressed and Goal 12 the fourth one, but this was because of the differences in the samples analysed. SDG8 was the most addressed goal by 105 organisations, followed by SDG13 with 103 organisations, SDG12 by 91 organisations, SDG3 by 90, SDG7 by 88, SDG4 and SDG7 by 82, SDG 11 by 78 firms and SDG 5 by 76 firms, SDG17 by 63 firms, SDG15 by 62 firms, SDG10 by 61 firms, SDG6 by 59 firms, SDG16 by 54 firms, SDG1 by 48 firms, SDG2 by 47 firms, SDG14 by 43 firms.

After having analysed the most addressed Goals overall, we considered also the inter-sectoral differences. As reported in Table 6, we found clear preferences in the Energy, Financials, Healthcare and Motor Vehicle and Parts for specific SDGs considered more relevant than other ones. For the other sectors, we did not observe a clear trend as for the aforementioned ones. Moreover, for some sectors the number of firms was not representative, for instance in the Household Products' sector only one firm clearly addressed goals and thus our reflections may be limited. For the Energy sector, SDG7 was the most addressed in the group of firms belonging to it, followed by SDG13 and SDG8. For the Financials sector, the most tackled SDG was SDG8, followed by SDG13 and SDG11. For the Healthcare sector, SDG3 and SDG 7 were the most addressed. Motor Vehicles and Parts' organisations chose as most relevant respectively SDG13, SDG11 and SDG3.

We compared the number of firms addressing a specific Goal to the number of firms addressing a specific target, out of the number of firms mentioning Global Goals at least once in their reports in Figure 33. While most of the organisations were noticed to mention at least one SDG Goal, the same could not be affirmed for SDG Targets. Indeed, the situation was inverted. Only 20 firms mentioned at least one of the 169 targets behind the Global Goals and 136 did not. While 132 firms addressed at least one Goals and 24 did not. This specular situation will be examined in the next section.

Of the 20 firms having addressed at least one target, as reported in Figure 30, 4 belonged to the Financials sector, 3 to the Food, Beverages and Tobacco sector, 2 to the Food & Drug

store, Materials, Technology and Telecommunications sectors. While the Energy, Healthcare, Household products, Retailing, Wholesaler all had one firm each addressing at least one target, as reported in Figure 34.

We examined the targets addressed by these 20 firms, as shown in Table 7. Not all 169 targets were mentioned in the reports, but 5 targets out of 5 for the SDG1, 4 out of 5 for the SDG2, 6 out of 9 for the SDG3, 6 out of 7 for the SDG4, 4 out of 6 for the SDG5, 6 out of 6 for the SDG6, 3 out of 3 for the SDG7, 8 out of 10 for the SDG8, 5 out of 5 for the SDG9, 2 out of 7 for the SDG10, 7 out of 7 for the SDG11, 7 out of 8 for the SDG12, 3 out of 3 for the SDG13, 2 out of 7 for the SDG14, 5 out of 9 for the SDG15, 2 out of 10 for the SDG 16, 4 out of 17 for the SDGs 17. Thus, the firms in the sample mentioned all the targets behind SDGs 1, 6, 7, 9, 11, 13.

Concerning the most addressed target across the sample, target 7.2 ("By 2030, increase substantially the share of renewable energy in the global energy mix") was tackled by 8 firms and 7.3 ("By 2030, double the global rate of improvement in energy efficiency") by 7 organisations. 6 firms addressed targets 8.3 ("Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services"), target 8.5 ("By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value"), target 12.4 (By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment") and target 13,1 ("Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries")(GRI, UNGC, and wbcsd 2016). While only one firm across the sample addressed some targets, specifically targets belonging to SDGs 1 and 2 were neglected.

As Oxfam underlined many papers "have highlighted the need for impact-based prioritization as a key step towards meaningful SDG engagement by business.", however it also noticed the lack of robust justifications for choosing certain goals and risk of "cherry-picking" the most obviously related SDGs to the firm's business, not examining in-

depth the impact had on the Goals (Mhlanga, Gneiting, and Agarwal 2018). Please refer to Figure 35 to analyse the rationales provided by the firms across the sample for the choice of the Goals. We noticed an even result when comparing the firms providing a reason why they chose certain goals and firms not providing their stakeholders with this information. Indeed, we observed 66 firms, 42% in both cases, given that 24 firms not addressed from the beginning any specific goal. Most of the organisations provided as rationale the potential contribution or impact they could have on the topic coverage by that SDGs, accordingly to what recommended by many researchers. However, the second most provided reason for the choice of the goals was relevance for the firms' business, this is what was recommended to avoid, as we reported above. Interestingly, 14 organisations provided as reason for picking certain goals the alignment with their sustainability strategy, while 2 firms reported to have chosen the SDGs based on the alignment with the material topics identified. 2 firms mentioned as reason for engagement both relevance for the firm's business and potential contribution and one affirmed to have followed the SDG Compass guidelines for this choice.

Linked to the idea of addressing goals based on the impact, we examined how many firms not only chose goals likewise but also listed the most-impacted ones. Please refer to Figure 36 for results: only 16% (24 organisations) of firms defined the most important goals, compared to 69% (108 firms) not focussing on this aspect in their report and 24 firms (15%) not addressing any goals in the beginning.

The pattern identified for prioritising Goals was not homogeneous as the one for addressing Goals. The most common approach observed was to prioritize one or two Goals (5 firms) or prioritize 5 or 6 goals (4 firms). Two firms prioritized 3 goals and one firm prioritized either 8, 9 or 12 Goals, as shown in Figure 37 and Table 8.

Concerning the distribution of times each goal was priorities, please refer to Table 9. Differently from what other studies did, we did not report here the order of priority because almost no firm gave an order to the prioritisation. For those organisations doing this we will discuss results in the next section. We noticed that SDG13 was the most recurrent to be prioritised: 12 firms out of 24 (50%) chose it as one of the most important. While this result and the third most prioritised Goal (SDG3 with 10 occurrences) are consistent with the figures showed above when measuring the most addressed SDG. We cannot say the same for the second, fourth and fifth most prioritised SDG: indeed, SDG 9,

11 and 4 were not among the most addressed, but they ranked as sixth, seventh and eighth one. The least prioritised SDG were SDG 14, 16 and 15. SDG14 was also the least addressed Goals, but SDG15 was quite addressed with 62 occurrences. SDG12, the third most addressed goals, was chosen by only 5 firms and thus was the ninth most prioritised SDG. Misalignments between the trends in the SDG addressed and prioritised are due to the different pools of firms involved, as a matter of fact only 15.4% of firms mentioning the SDGs also prioritised them. We will go in depth in the next section.

As for choosing, also for prioritizing we looked for a justification to define priorities, for the same reason we described above. As shown in Figure 38, of the 24 prioritising firms almost all beside one provided a reason for this prioritization. The reasons provided by the sample's firms were similar to the rationale for choosing Goals. Most firms affirmed to use as rationale to make prioritises the potential contribution or impact on the SDGs. For 3 firms, the most important SDGs were aligned to the sustainability strategy. In this case the firms affirming this were more than those affirming to prioritise based on the relevance for the business, while this reason was less provided to justify the choice of the goals. Alignment with the firms' activities and with the firm's strategy as rationales were chosen by two firms. Finally, one organisation identified as most important those SDGs aligned to the mission and another one those SDGs appearing among its stakeholders' priorities.

To measure the level of integration of the SDGs in the firms' business beyond simply acknowledging the use of Global Goals as sustainability framework at the beginning of the report, we considered the number of firms also integrating the SDGs in one or more steps of the material topics' identification, as shown in Figure 39. 34 out of 156 (22%) firms mentioning the SDGs at least once in their reports also integrated the Global Goals in the materiality analysis, while the remaining 78% not considered this approach. As reported in Figure 40, most firms, 21 out of 34, used SDG as an input to find material topics, thus as source of relevant topics for the stakeholders of the firm. 6 firms reported to have chosen the SDGs to address based on the output of the materiality analysis, meaning that as output of these process some topics linked to the Global Agenda arose. 3 organisations out of 34 affirmed that SDGs were both input and output of their materiality process. For two firms, SDGs were one of the material topics, meaning that they were relevant both for the stakeholders and the firms or for the SD in general, based on how the organisation

understood the GRI guidelines for this process. 2 firms after the materiality analysis mapped the results to the SDGs, one of them also identified the contribution/impact had on the Global Goals.

Inspired by Zanten's work from 2018 on MNCs' engagement with SDGs, we adapted one question based on the insights retrieved from his work. He created an index linking SDG target topics to some characteristics. Here, targets may be "actionable" within or without the value chain of the firm and they may be more prone to "avoid harm" or to "doing good" (van Zanten and van Tulder 2018).

As show in in the literature review, the author found that MNCs engaged more with "internally actionable" targets "avoiding harm" and underlined how this represented an childish attitude which made firms "passive actor of sustainable development". We applied the same experiment to our work, linking the SDGs targets addressed by the firms to Zanten's categorisation. We observed, as shown in Table 10 that among the firms addressing any specific target (20), most organisations engaged with "internally actionable" SDGs, yet also the main part focussed on "doing good". Thus, we partly found the same result as Zanten, however with a clear distinction on the second dimension. This difference could be explained by the fact that only some firms chose to address some targets behind the Goals (20 out of 156) and this difference could be the cause of the misalignment. However, we will go in depth in the next sections.

5.5 Compliance: Linking existing sustainability strategy to SDGs

The third section gathered the questions concerning the process of linking the existing sustainability strategy to the Global Goals, described by Oxfam as one of the most common SDG-related integration mechanisms (Mhlanga, Gneiting, and Agarwal 2018).

As reported in Figure 36, most of the firms mentioning at least once in their reports the SDGs, in 2017 somehow created a link between what they were doing and the 2030 Agenda for SD, 113 organisations (72%) compared to the 43 firms (28%) which did not do this.

Mapping was one of the most common activities implemented by firms when dealing with the SDGs, as highlighted by Oxfam's work. However how they assessed types of mapping was not disclosed, thus creating some ambiguity in our work that will be treated in the

next section. For now, please refer to Figure 42, showing the most common types of mapping we found in the reports analysed. We highlight that 17 firms performed a thorough alignment, mapping all sustainability topics treated to the Global Goals, 5 firms linked the sustainability priorities identified, 4 firms only put an SDG icon next to the sustainability section described, 3 firms also described and explained the mapping providing relevant information.

Concerning the narrative provided by the firms, we observed that many provided examples when describing the commitment to the SDGs, for instance citing pre-existing initiatives that contributed to that SDGs. As shown in Figure 43, more than half of the firms mentioning SDGs in their reports (90 units, 58%) also disclosed contribution to the Global Goals through pre-existing or new initiatives undertaken, compared to the 66 firms not disclosing any practical initiative.

Out of the 43 firms not mapping at all the sustainability strategy to the Global Goals, half of them (21 firms) at the same time did not pursue any goals, nor they provided proofs of initiatives undertaken. This means they mentioned the SDGs and do not operationalised them at all.

Something stressed in Oxfam, KPMG, PWC' works is the unbalanced disclosure of negative impact on the SDGs compared to positive impact. Indeed, far from increasing trustworthiness, this approach of only showing shiny results may lead to mistrust. It is obvious that a large MNC will have some negative impact on SD, thus the key is to admit when the outcome was negative but especially to disclose how the business took measures to compensate for it (Blasco, King, and Jayaram 2018).

In the reports examined, most firms only disclosed positive contribution while neglected the obvious negative outcomes the business had on SD. As shown in Figure 44, organisations reporting about unfortunate outcomes were 14 (less than 10%) compared to 142 organizations not going in depth about this matter.

5.6 Ambition: integrating and widening SDGs

After having checked for the sample compliance in linking the current situation to the 2030 Agenda for SD, the fourth section went more in depth about the SDG-integration

level shown by firms. Indeed, as we previously described, sections' order was meant to represent an increasing level of integration.

Both professional works and academic studies, stressed the importance of operationalise SDGs Goals, Targets and official indicators (Hák, Janoušková, and Moldan 2016) (Janoušková, Hák, and Moldan 2018), because they are mainly addressed to governments and not always representative of the private sector (Mhlanga, Gneiting, and Agarwal 2018). This entails creating specific goals for the firm accompanied by quantitative KPIs, showing results over the years (SDG Compass). Please refer to Figure 45 for results: again, the number of organisations having set this kind of target was limited, less than one fifth of firms mentioning the SDGs (29 units, 19%), compared to 81 %, 127 units, which did not operationalise the SDGs.

Of the 29 firms having set SDG-related goals, almost all (24) set them to be SMART, as reported in Figure 46.

23 Firms out of the 29 having set SDG-related goals also chose and disclosed the KPIs identified to measure contribution to the Global Goals. For all the organisations aforementioned, indicators chosen were quantitative, as reported in Figure 47 and 48.

A different result emerged from Figure 44, where almost half of the firms pursuing SDG-related goals did not provides the milestones reached over the years. Thus, the stakeholder did not have the possibility to compare results over the years. The reader will be reminded of this concept in the next section.

Finally, we were inspired by Oxfam to verify whether GF 250 firms "tackled the root causes of SDGs, driving systemic changes", set "long-term goals and targets that align with and directly contribute to the SDGs" and designed and implemented "new policies and programmes to achieve these goals and targets" (Mhlanga, Gneiting, and Agarwal 2018). Briefly, we checked whether the sample's organisations were so involved in the path to SD to widen the SDGs scope and ambitiously introduce original proposals. As shown in Figure 50, only 6% (10 firms) went the extra-mile, compared to 146 organisations sticking to a less ambitious approach.

5.7 Collaboration

As proven by the introduction of the seventieth goals: "Partnership for the Goals", 2030 Agenda for Sustainable Development is so ambitious no single actor in society can achieve it. Thus, comprehension and integration of the SDGs framework entails accounting for collaboration along all the value chain.

As shown in Figure 21, almost half of firms established partnerships to achieve sustainability topics covered by the Global Goals, 69 firms out of 156 organisations mentioning the SDGs in their reports (representing 44%), compared to 87 firms not having signed these agreements. However, some distinctions are in order: out of the 69 organisations characterised by this choice, only 2 disclosed to have established such partnerships to reach specifically the SDG-related goals they set. The remaining 67 firms, 97%, did not mention SDGs as a reason for those partnerships nor they disclosed when they had established such agreements, thus we could not infer whether these partnerships were the result of Global Goals integration or not.

As Berrone and Spangenberg described, partnerships were proven not to be always effective. What is essential is to oversee the results and progresses made to be able to make decisions to continue, modify or change the collaborative agreement (Berrone et al. 2019; Spangenberg 2017).

Please refer to Figure 52 for the number of organisations having disclosed quantitative KPIs to track the progress made through the partnership established. Here, 42% of firms, 29 out of 69, reported SDGs' progress through a quantitative KPI (monetary or not), while 43 units, 58%, did not.

KPMG underlined how the highest value would come from partnerships created with suppliers along the value chain, collaborating to reach the Global Goals (Blasco, King, and Jayaram 2018). As shown in Figure 53, again only 3 out 31 firms worked with the suppliers to reach specific sdg-related goals, the remaining 28 worked with their suppliers to reach general sustainability targets.

5.8 Other integrating elements of very engaged firms

The last section gathered some of the most SDG-integration-oriented questions, it was meant to represent those firms which let 2030 Agenda penetrate the core of the business such as the value chain and the employees' compensation.

First, we proposed an activity introduced by the SDG Compass and applied by Oxfam of analysing the current value chain of the firm, identify the high-impact operations both positively and negatively to enhance/minimise. This activity helps rethinking the processes and procedures to perform the core business, rathe rather than keeping the SDGs a lateral or juxtaposed (SDG Compass; Oxfam, 2018).

Please refer to Figure 54 for results, where only 3 firms out 156 (2%) took this approach towards the Global Goals.

Following George's idea that introducing sustainability criteria in performance management system could improve management and sustainability integration (George et al. 2016), we verified the number of firms having introduced sustainability goals' achievement as part of the compensation of their workers and then whether these goals were linked to the SDGs.

As shown in Figure 55, 60% of firms (93) did not disclosed the criteria for employees' in their reports, thus they were excluded by the counting. 45 firms (29%), did not include sustainability aspects in the performance management system, while 18 organisations (11%) did it. Among these 18 organisations, sustainability achievement criteria involved executives' remuneration in one case, while for three firms, criteria were addressed to both middle management and executives' compensations. Among the firms having sustainability aspects integrated in the performance management system, only 3 firms included among these criteria also SDG aspects.

We were inspired by Rosati's study proving that SDG reporting was positively influenced by the external assurance on sustainability (Rosati and Faria 2019a) and we verified this aspect across the sample. Please refer to Figure 57 for results. Here, most of firms reported to have had their sustainability practices assured (90 firms, 62%), while 36 firms did not (23%) and 24 firms (15%) did not reported any information about external assurance of sustainability information in their reports. Among the firms having received an external assurance, 2 firms only made some indicators part of the assurance and 11 organisations only had their GHG emissions assured.

Of the 96 organisations characterised by an external assurance, 86 chose a limited assurance, 4 a reasonable assurance, 6 firms reported about external assurance, but they

did not disclose the typology. Out of the 86 firms with a limited assurance, only for 3 organisations the Global Goals were part the assurance statement.

In Figure 52, we represented an interesting result found from the analysis of the reports. 27 firms out of 156 asked experts for a third-part opinion of their sustainability reporting practices. Two third of the experts (panel of experts) mentioned the SDGs in 18 commentaries, while 9 opinions did not refer to the Global Goals.

From the results above described, we may outline some general trends towards SDGs among the firms analysed for the year 2017.

On one hand, The Sustainable Development Goals were welcomed by most firms across our sample (62%, 156 out of 250 firms), almost all identified the most relevant Goals to pursue (85%, 132 out of 156 firms) and this demonstrates they started to operationalize the UN's frameworks. Moreover, many organisations (72%, 113) linked their actual sustainability practices and the Global Goals, conveying an effort to align the firm's situation to the 2030 Agenda, moreover many disclosed contributions to this cause through practical initiative undertaken (58%, 90).

On the other hand, the results described above are not fully representative of the actual situation across the sample for the year 2017. Indeed, the figures above showed were reversed when considering other aspects. For instance, while some kind of operationalisation signs appeared, its link with the strategy pursued by the firms was disclosed by only 17% (27) of organisations, restricting Global Goals to the peripheral place granted to philanthropic activities. This secondary place was stressed by the fact that only 4 firms (2.5%) provided a business case to engage with SDGs, going beyond CSR rationales. Even though the UN's and many influential bodies publicized the potential 12 trillion $ prize for the private sector coming from the implementation of the Global Goals. Moreover, while most firms tackled one or more specific SDG, the situation was inverted when considering the targets behind the Goals. Indeed only 20 firms (12.8%) mentioned a specific target addressed, showing that the operationalisation process started remained shallow. We also underline that the disclosed SDG-contribution towards SDG was strongly unbalanced: the wide majority of firms, 142 organisations representing 91% of the

total sample, only disclosed the positive contribution to the Global Goals while neglecting the negative outcomes their business had on SD.

Thus, at first sight the SDGs entered the private sector mainstream and started to be operationalised in 2017. However, our results showed an ambiguous situation: The Global Goals did not penetrate the core business of the firms, beyond the sustainability department, restricting the provocative role they were meant to have against the business-as-usual attitude.

In this, our findings are in line with the works published for the year 2017 by WBCSD, Oxfam, PWC, KPMG on the Global Goals.

We also stress how the situation outlined was not homogenous across the sample as these summary graphs reported. Indeed, many differences were observed across the sample, we will discuss them providing examples in the next section of the work and examine how the methodology implemented captured the reality of the sample.

6. Discussion

6.1 General and sustainability profile

It is important to underline that the results described in the previous section did not represent the situation of all firms in the sample, rather they pointed out some general trends. In this section we will revise each question and examine the several approaches to SDGs implemented across the sample, providing examples to support our analysis. This analysis accounts for the heterogeneities observed during the experiment towards each aspect considered. By going into the details, we expect to verify the resilience of each question against this heterogeneity of results and the overall level of representativeness of the framework.

The structure of the first section of questions was straight-forward. Outlining the general profile of each firm was meant to provide additional information to draw conclusions on the SDG-implementation by spotting trends at the sector/industry level. Most of the firms, as it may be guessed, were public companies, followed by SOE, which were for the most part Chinese firms and few Indian or Russian firms. Private firms or cooperative were limited in number. In 2017, North America still had the biggest presence in the list, followed by China. Each question in this section was characterised by homogeneous answers. We underline that across the sample, most firms produced a separated report, while a single financial and non-financial report was produced by about one fifth of the sample. What is interesting to notice is that most of these firms did not followed the IIRC guidelines and produced a single report but not integrated. They only merged the financial and non-financial part, that could be easily separated. This choice also depended on each state's regulation, for instance some French companies as Total published a Registration Document, covering the financial and non-financial information, but not reflecting the elements of an integrated report as conceived by the IIRC (Integratedreporting.org, 2019).

The first question representing a variety of approaches concerned the type of report published (question n.9), however, here the question's answer was easy to retrieve, and the grouping of name was simple. Even though Sustainability, Sustainable Development, ESG issues and CSR and CC may be used as synonyms, each word has different shades. The

majority published either a Sustainability or CSR report. However, we observed also a GRI report (focussing on the link between the sustainability topics and the GRI guidelines) and some COPs for the UNGC network. Other firms personalized the name of the report, like Tesco's *Little Helps Plan* or Unilever's *Sustainable Living Report*. The choice of many specific names for the non-financial reports communicated different perception of non-financial information/disclosure (Tesco SR, 2018; Unilever SR, 2017).

Performing the experiment, answers' complexity was inversely proportional to SDG reporting standardisation. For instance, the question concerning whether a firm mentioned the Global Goals or whether it mentioned them in the AR, SR or both were solved immediately. The only difficulty concerned finding some reports, indeed one website was not accessible (Albertson Cos.), while another report was not available in English (China North Industries). Differently, standardisation of answers was minimal for the question regarding where the SDGs where treated in the reports. In the results we tried to create large categories, however there were many possibilities, and, in some cases, pre-determined categories could not be defined. Thus, we counted the number of times each organisation treated the Global Goals in a certain way, for instance the number of firms dedicating one or two pages to the SDGs or the number of firms mentioning the SDGs at the beginning of the report among other reporting standards. However, the categorisation was not univocal since one firm could treat the SDGs in many ways. We expect this heterogeneity to decrease as the SDG reporting becomes a common technique. To define the questionnaire, we recommend this question to have a predetermined number of possible answers. We observed that almost all firms dedicated a specific section of the report to SDGs, where they reported what, why and how they pursued the Global Goals. Often, in that section the firm provided a mapping of sustainability topics/initiatives to the Goals. Some organisations only mentioned there the Global Goals, other firms disseminated the SDGs all over the report, in almost every section of the document, other ones treated the SDGs partially in the dedicated section partially along with the related sustainability issues.

One of the first elements we did not retrieve form theory, but observed in many reports, concerned firms not treating fully some aspects but providing the link to the website for more information. We only analysed reports, thus we did not examine the information on the web. In some cases, organisations only used the website to go in depth about what

disclosed in the reports and to provide details, while other did not treated important aspects in the report but only on the web. Concerning the latter, we acknowledge that the page of a website may be constantly updated, and the disclosure may be wider, however relevant information, related to the SDGs or not, may not be omitted from the report which is the first and most trustworthy source of information. As an expert's panel recommended Shell: "While the report provides a thorough review of Shell's material issues, we would like to see more detailed disclosure of social issues, including Shell's holistic approach to contributing to the UN's sustainable development goals (SDGs), human rights due diligence, and operating in sensitive areas. We are aware that Shell provides some information on these topics on www.shell.com but we would urge the company to ensure that sufficient depth is provided in the report on these important topics" (Shell SR, 2017).

We will recall the reporting frameworks, certifications etc. later in this work and show their main contribution to the assessment.

Concerning the aspects covered by the SDG Approach section, an interesting element emerged from the analysis concerned the relationship between the organisations and the UNGC. We initially defined two questions on the matter: *Is the firm member of the UNGC*? and *Does the firm follow the UNGC principle for Human Rights?* With the first firms the answers seemed positive for both questions, however as the analysis went by, we noticed that not all firms following the UNGC principles were members of the UNGC (11 organisations). This could signal the aforementioned phenomenon of the Blue-washing, firms wrapping themselves in the UN' prestige yet minimising the responsibilities required by the membership.

As previously described, even though the SDGs were not shaped to represent specifically the private sector, many institutional organisations started an ongoing process to provide firms with guidelines to adapt the 2030 Agenda to their business, as the *Business Reporting on the SDGs: An Analysis of the Goals and Targets the SDG Compass* (GRI, UNGC, and wbcsd 2016; United Nations Global Compact, GRI, and wbcsd 2015). Only 6 out of 156 firms mentioned to have followed any of these documents to implement and report about the SDGs. Nestlé helped create a set of indicators for the *SDG for Business Reporting Platform*, Enel and Lukoil specifically mentioned the SDG Compass as reporting guideline used to create the document, Allianz used the *Business Reporting on the SDGs: An Analysis*

of the Goals and Targets to report about the impact of the SDGs (Nestle' SR, 2017; Enel SR, 2017; Lukoil SR, 2017; Allianz SR, 2017). Arcelor Mittal used the SDG Compass to align the sustainability priorities to the SDGs (Arcelor Mittal SR, 2017). Indeed, SDGs are a layered initiative, they are simple to communicate and limited in number, but complex to fully understand, implement and report about for the private sector. As a matter of fact, work is still ongoing to create a set of indicators specifically made for businesses. Thus, across the sample, firms probably thought to have grasped the general meaning of this project but showed a shallow understanding of the matter. Probably some organisations across the sample, knew and used those documents to report, but did not disclose to have used them since reporting and performance are different, even though in this work we use information disclosure as proxy for performance. Thus, the question about the SDG Compass is interesting to verify the level of awareness of the official documents, that was revealed to be limited and led us to realise that firms could not report in a complete way about the Global Goals if they had not examined the guidelines. Many firms were aware of the need that the top management should have been involved in the Global Goals implementation to set the right tone-at-the-top, so that the value created by pursuing the SDGs could resonate across all the organisation and to assures investors on the link between SDG engagement with business strategy. Thus, we posed this question: "Are the SDG mentioned in CEO message". Indeed, if the CEO message was lacking, we considered the CSR managers or Vice-president message too. 62 firms had the CEO message include a mention to the SDGs. However, we observed that often the CEO message at the beginning of the non-financial report focussed on CSR rationales behind the SDG engagement and did not pointed on the link with the strategy. Concerning the strategy, we also included a specific question on the direct mention between SDGs and strategy in the report, but only 27 firms (17%) described it in the report. Among the firms, however, this link with the strategy was not always direct or clearly disclosed. Hitachi made the SDGs the overarching framework to communicate its sustainability strategy based on the idea of Social Innovation Business, as shown in Figure 58 (Hitachi IR, 2017). It explains this in a section named "Tackling the SDGs with Our Business Strategy" where the firm reported: "Achieving a "sustainable society" (the sustainability of society) enables "Hitachi's sustainable growth" (the sustainability of Hitachi). Hitachi's future business opportunities and growth depend on achieving the SDGs and sustainability (solving social issues)". This focus on how the sustainability of the society affects the sustainability of the firm is

relevant and compelling, however both the expert panel commentary as well as the firm acknowledged the need for a further step in the strategic role of the Global Goals, especially explaining "how Hitachi's Social Innovation Business will help achieve the SDGs" (ibidem). The risk is that a wide strategy formulation is not operationalised, thus strategy formulation does not become strategy implementation, making the SDGs as an "ideal" rather than a path.

On the other hand, a firm having clearly explained what the role of the SDGs in the firms' strategy is was LG, it described graphically, though facts and figures this link. Please refer to Figure 59. The firm started from the formulation of the three aspects of the strategy: the products (Technology that cares - Improve the quality of life for everyone with differentiated products and technology), the allies (Trustworthy Partners - Communicate and cooperate with stakeholders based on sympathy) , the impact (Contribute to the local community through honest and voluntary participation) whose goals is contributing to the SDGs that addresses the vision (Cooperating towards a better life for all) expressed in the tagline (Life's Good with LG).

However, what made this firm's report different form Hitachi's was the implementation plan linked and following the strategy formulation. The firm set a five-step implementation plan for the Global Goals describing how each SDGs chosen as relevant was supposed to support the strategy, as shown in Figure 60 and 61 (LG SR, 2017).

In accordance with the previous question, we considered a further engagement to SDGs to treat the them both in the SR and AR, because the financial report gathers the most important aspects the organisation had to face over the year. Thus, mentioning the Global Goals along with other issues considered material to stakeholders and specifically to investors signals the relevance the 2030 Agenda has for the firms. An interesting example of this was Hitachi which described the SDGs approach from a strategic point of view both in the sustainability report as well as in the integrated report, however this is a peculiar case since they did not produce a financial report but an integrated report, which also included a non-financial part (Hitachi IR, 2017). Differently, Unilever produced two separate and distinct documents and the company tackled extensively the SDGs in both. The firm's showed the strategic role granted to SDGs as driver for value creation in the mission description. In CEO message, a survey's results pointed out commitment to the SDGs as competitive advantage for the firm and the firm also revealed how the value

creation model impacted the Global Goals. Moreover, over this strategic review, contribution to specific Global Goals was described through quantitative KPIs: "we will contribute to a number of the Sustainable Development Goals, principally Climate Action (SDG13) and Responsible Consumption & Production (SDG12). Our manufacturing operations have seen a reduction in total waste disposed to landfill, or incineration without energy recovery, of around 98% per tonne of production since 2008. We maintained zero non-hazardous waste to landfill across our global factory network during 2017. We are more than halfway towards meeting our 2020 commitment to reduce waste associated with the disposal of our products. This has reduced by about 29% since 2010 due to increases in consumer recycling and changes in our portfolio" (Unilever AR, 2017).

The SDG mentions in the CEO message and the link with the strategy should be accompanied by a compelling reason to engage with the Global Goals disclosed to the stakeholders. The SDG Compass recommended communicating the business case at the heart of the commitment. If the firm also wants to convince investors, it should act as ambassador and explain why contributing to SDG will benefit the firm. The related challenges, threats, opportunities etc of contribution (or not) to each SDG must be defined and described, not only mentioned (United Nations Global Compact, GRI, and wbcsd 2015). However, as shown in the results' section, only 6 firms disclosed a business case to commit, most organisations mentioned CSR reasons as drivers for engagement. Unilever, again, fully supported its activity with figures. In the Annual Report, in the first page of the financial report Unilever's management wrote: "Our scale and reach mean we are well placed to capture the economic opportunities presented by the United Nations Sustainable Development Goals (SDGs). Find out more about how we are creating value from the SDGs on page 15". In addition, the firm dedicated one page of the Financial Report to go in depth about the business opportunities coming from a sustainability strategy focussed on the Global Goals implementation, here the company mentioned the 12 trillion US$ prize as well as official researchers evidences (McKinsey, WBCSD) on issued covered by the Sustainable Development Goals. Another statement going beyond ESG rationales was reported by Tata Motors' management in the Sustainability Report 2017. The firm praised the "innovative mindset" coming from the Global Goals spreading to all aspect of the business and more: "By aligning our work with the Sustainable Development Goals, we have begun to use our creative and innovative minds to bring

about transformational changes not just within our business but also drive change within our societies that we serve globally" (Unilever AR, 2017).

However, an interesting example was provided by Engie. Indeed, in the first year of commitment the firm disclosed the rationale to engage in the CEO message: "By focusing on financial and CSR targets that fully comply with the United Nations Sustainable Development Goals, ENGIE will be better able to respond to the financial, environmental and social challenges of both today's and tomorrow's world." However, in 2017 no rationale was provided. The problem is that the environmental situation changes, new threats arise, but above all stakeholders change. It is not enough to disclose the rationale only once. There is the risk that firms only disclosed the business case for engaging with the SDGs in the first year of their commitment and the following years they only provide a remark (Engie IR, 2017).

The institutional documents issued as well as professional work by KPMG highlighted the need to disclose also the opportunities and risks linked to the SDGs' engagement or the lack of engagement to boost confidence in investor and stakeholders (Blasco, King, and Jayaram 2018). Only 15 firms disclosed this kind of information. As for almost all issues analysed, the approaches were different. Most firms only described general opportunities and risks that could have fit any large organisation. For instance, DuPont's new (at the time) sustainability manager reported both challenges and opportunities of engaging with the SDGs for innovative companies willing to develop "unique solutions or entirely new ways of doing things" in many sectors: $2.3 trillion for food and agriculture, $4.3 trillion for energy and materials, and $1.8trillion for health and well-being. But she also addressed risks: "On the flip side, the risk of inaction is too great. Not working to improve our resource efficiency, combat climate change, and reduce poverty and inequality will continue to place strains on our already fragile systems and create an untenable environment for everyone, including business." (Dupont SR, 2017). Similar to the latter, MS&AD Insurance affirmed that organisations which are sensitive to the context they live in will be better at facing new arising risks and grasp opportunities to grow (MS&AD IR, 2017). This approach lets emerge a shallow analysis and operationalization of Goals, lack of trustworthiness and confidence before the stakeholders. An organisation which personalized more those general opportunities and risks was POSCO, which communicated them as self-recommendations. Specifically, the firm understood that

simply implementing the SDGs was not enough to make the effort useful and effective, the way the action was shaped was essential for success: "I believe we can effectively promote sustainability management by analysing and achieving the social values required in our time and age through the SDGs. POSCO must also match its sustainability management activities to the SDGs and continuously manage related outcomes. POSCO must select the SDGs it can effectively fulfil by using its competencies, establish internal goals and promote related activities. In particular, considering the characteristics of POSCOs business and its competitive edge in the market, POSCO must establish goals that reflect the demands of the local communities where it performs business activities. The entity that establishes the SDGs is a company. However, local communities are more clearly aware of what they need. So, it is important to identify the needs of the local community and establish goals accordingly" (POSCO IR, 2017).

All this being said, the second step toward effective SDGs integration is to "embed sustainability across all functions", not only as the effort of top management. To embed sustainability in "strategy, culture and operations", firms should make use of "awareness raising and training" to increase knowledge through the help of organisational change experts and create "cross-functional sustainability councils" and where possible a "sustainability committee at Board level" to focus on sustainability strategically (United Nations Global Compact, GRI, and wbcsd 2015). Thus, we analysed the reports trying to find an answer for the following question: "Does the firm disclose who is in charge of the SDG inside the organisation?". 14 out of 156 firms answered positively. One firm disclosed that the sustainability department oversaw the implementation of the Global Goals. Walgreens trained its employees, so each one would have been able to make an impact through online classes on SDGs, while Toyota Thusho also made awareness questionnaire on the SDGs after the training (Walgreens SR, 2017; Toyota Tshusho IR, 2017). Interestingly BMW used competitions and start-up program to integrate Global Goals across all functions and raise awareness, for instance the firm asked all departments to propose ideas to implement a project linked to SDG11 (BMW SR, 2017). Other firms specifically trained certain roles to oversee and implement the SDGs. Mitsui trained specifically the sustainability managers of each business units on the SDGs and charged them to oversee the Goals (Mitsui SR, 2017). BP charged an independent committee to decide which project contributing to the SDGs to implement, based on the highest impact (BP SR, 2017). This may be a way to reduce SDG's cherry-picking and avoid choosing

projects like already existing ones, because of the expertise or comfort**.** Three firms organised a task force on the SDGs, making top management oversee and guide different business units in implementing the Goals. Hitachi created an executive sustainability committee (with top managers charged with different aspects of the business) working in collaboration with all the business units where a "sustainability promotion officer" was chosen to "to strengthen the measures and organizations needed to help achieve the Sustainable Development Goals (SDGs)" (Hitachi, SR, 2018). Lukoil charged core departments managers to work with the BOD to tackle the Global Goals, while Johnson & Johnson asked a committee composed business segments' leaders to work with all the managers in charge of activities with an impact on ESG issues to implement the 2030 Agenda (Lukoil SR, 2017). These transversal work teams allow to involve the top management able to provides a strategic approach to SDGs, but to involve also the core functions having the highest impact on those Goals.

6.2 SDGs' choice and prioritization

The next sections focussing on *Goals and targets addressed, Compliance: Linking existing sustainability strategy to SDGs, Ambition: integrating and widening SDGs, Collaboration* were meant to reflect a more structured approach to SDGs*.* The questions outlined at the beginning and the interpretation given to such definitions were not always representative of the different realities we found examining the reports, especially for those original features of the Global Goals we could not infer from previous empirical studies. In the section concerning *Goals and targets addressed,* the first ambiguity arose. We noticed that some firms only mentioned the Global Goals as a general initiative, a UN's project, and referred only to the whole set, without broking into it into specific SDGs. Thus, no operationalisation was made. Firms like Boeing, Disney, Bank of America showed this approach. Disney only mentioned the SDGs once in the CEO message and the never again (Disney SR, 2017). Bank of America affirmed to support the Global Goals, but it did not explained how, or what goals (Bank of America SR, 2017), Boeing not only mentioned once the SDGs but in the meantime showed the image of a plane decorated with the SDGs logo and colours (Boeing SR, 2017)(please refer to Figure 62). We did not examine online content; thus, the firm may have disclosed additional information there, however as

Shell's expert panel underlined it is important to report relevant information both in the document and on the website.

Thus, we decided to separate the questions about SDGs mentioning in general and single Goals mentioning. Thus, we defined the question as: "Does the firm expressly pursue any goal?". However, we could not spot a single definition of pursuing while examining the reports. For instance, some firms did not write ever the Goal pursued but only put SDG icons in the text. Thus, we started to define firms pursuing goals only if they extensively spoke and explained the Goals pursued, but again many firms were not represented by this definition since their approach was different. It was not a complete no or a complete yes. Moreover, we needed to have statistics on the favourite SDGs by sector meaning that we should have recorded any sing of preference by firms. Eventually, we decided to create a wide question encompassing most of the realities found in the reports: "Does the firm address any specific goal beyond the overall set of SDGs?" and reporting in the comments the main differences noticed. Clearly, we found firms describing in detail the SDGs chosen and firms putting only SDG icons, like Indian Oil (Figure 63) (Indian Oil SR, 2017). Also, State Grid and Sinopec (ranked 2nd and 3rd) did not address any SDGs clearly (State Grid SR, 2017; Sinopec SR, 2017). They put SDG icons at the beginning of each chapter, without explaining the reason to engage, contribution, initiatives. Moreover, being SOE they largely spoke about China's and CP projects rather than focusing on the firms' strategy. This also introduced a consideration on the relationship between SDG-integration and size of the organisation, we did not observe a directly proportional link, as a matter of fact State Grid and Sinopec were respectively the second and third largest firms of the sample.

These conditions were found again for the questions on the SDG target choice, which was simpler, because no icons for the targets had been produced, thus we searched the word "target", or the number of each Goal followed by a period (i.e. 8.) to find them even if the word target was not reported. We will shortly comment some results previously shown.

We used Zanten's chart (van Zanten and van Tulder 2018) to verify the characteristics of the target pursued by the firms and compare them with the author findings. Indeed, we found that most of the targets mentioned by the firms addressing them addressed Internal targets focussing on Doing Good. This partially confirmed Zanten' results where most of the MNCs analysed pursued internally actionable targets but focussing on avoiding harm on the SD rather than doing good. Thus, compared to those findings, we observed that the

role occupied by GF 250 in sustainable development was less narrow than what considered by Zanten and the firm across this sample were more prone to create positive externalities. However, these differences could also be due to the difference in the sample and year of study (Zanten used FT500 list from 2015), thus firms could have improved the approach to the Global Goals over those two years. Another possible explanation may be the fact that we only considered those firms having addressed specifically targets (20 out of 134), indeed there could exist a relationship between firms having fully understood the SDGs framework (and thus addressing specific targets) and firms choosing targets producing positive externalities rather than minimising negative ones. The paradox found in the results describing a situation where the majority of firms addressed specific Goals but neglected to mention specific targets was in line with what disclosed in professional and institutional works on the SDGs (Mhlanga, Gneiting, and Agarwal 2018; Blasco, King, and Jayaram 2018; Scott and McGill 2018; World Business Council for Sustainable Development 2018). This could be linked to the lack of understanding of the Global Goals framework, where firms probably did not deepen the topics behind the easy-to-communicate appearance of the Goals.

As we saw in the results, the approach of firms in the sample to SDG reporting was various and misalignments or inconsistencies were found. For instance, concerning the number of Goals addressed, the two most numerous groups were the firms not addressing specifically any goals (24) and the firms addressing all (23). This extreme distribution's rationale could be based on the fact that these specular approaches are simpler to implement. Indeed, we noticed that some firms seemed to not have chosen what goals to address or to have addressed all Goals for the same reason, a shallow commitment to the SDGs. While this is sure for the former, for the latter approach we guess that either the firm's approach was superficial and no analysis was made to decide which goals were more impacted, either the firm was so proactive from a sustainability point of view that it really perceived the impact it had on each topics, like Unilever did because of its scale and influence (Unilever, AR, 2017).

Another misalignment found concerned Goals and Targets addressed. Indeed, the most addressed SDG was SDG8, followed by SDG13, while the most addressed targets were 7.2 and 7.3. This misalignment is mainly explained by the different pool of firms addressing Goals and Targets. As a matter of fact, only 20 out of 156 addressed at least one target,

while 134 out of 156 addressed at least one Goals. It is true that inconsistency is not extreme because 8.3 and 13.1 represent the fourth most addressed targets, however it is interesting to notice that the most represented sector among those addressing target 7.2 is financials with three firms tackling, followed by 2 firms belonging to the Energy sector. For instance, Allianz through its proprietary assets invested in renewable and efficient energy assets (real estate), but also provided investors with the chance to finance funds focusing on renewable energy (Allianz, SR, 2017).

Always part of the section on Goals and Targets addressed, a complex question to apply to reports concerned prioritization. In the last section we saw some misalignments between the Goals addressed and prioritised by the firms. Indeed, the most addressed goal was SDG8, while the most prioritized one was SDG13 and SDG8 was not considered as a priority, it had the sixth place. This should not be considered a misalignment, because SDG13 was the second most addressed goal, however concerning the lack of prioritization of SDG8 probably the private sector considered it the most obviously related goal to any kind of business thus they addressed it, but not a priority because it was considered usual normal activity of any business.

Concerning prioritization, as the SDG Compass affirmed, it should be impact-based. Thus, when speaking about prioritization, we considered as prioritized only those SDGs clearly mentioned and addressed in the form of SDG#, Goal# such as we did to find the number of goals addressed. As a matter of fact, we observed firms generally stating their contribution to all 17 SDGs indirectly and then saying that their most important contributions were addressed to some of those. Consequently, these firms only spoke about those Goals pointed out. Given this situation and the fact that to our best knowledge no academic or professional work explained how to tackle this situation, we did not acknowledge this approach as prioritizing. In this work we considered prioritizing as defining the most important SDGs among the one already addressed because otherwise comparation of impact was difficult and also assessment of contributions in the report, indeed firms only disclosed impact/contribution of the SDGs addressed singularly, not of the SDGs indirectly followed. Moreover, as already discussed, as of today no organisation can affirm to not be affected or affect more or less all the topics covered by the Global Goals. This being said, compared to what forecasted, the prioritisation of SDGs was conducted differently by most firms. Most firms chose and pursued as priorities some of

the goals. For instance, BP first identified the goals its core business most directly impacted and those indirectly impacted among those addressed out of the 17 (BP SR, 2017). The idea of a list of priority with the most prioritised, the second-most prioritised, etc., among the SDGs addressed by firm was not observed in the experiment often. On the other hand, we often found organisations disclosing two/three goals more relevant than others or separating Goals based on impact/contribution. For instance, Telefonica categorised the SDGs in three levels of priority, please refer to Figure 64 for results. SDG9 which was the most obviously related to the firm's operations, was the most prioritised too. Followed by SDG 13, 11, 8, 5, 4, which affected SDG 12,7,17,16,10,1. The remaining Goals were addressed though a secondary contribution. It is interesting to notice the links among goals provided by the firms, showing that the firms acknowledged the SDGs' interconnectedness. For instance, by addressing SDG13 through efficiency programs for reducing emissions, the firm contributed indirectly to SDG7 and 13 since they helped saving energy and educated customers to save it (Telefonica IR, 2017).

About the trends of Goals and Targets prioritised, we observed that the most addressed goal was SDG 8 while the most addressed target was 12.8. This difference probably depends on the different pool of firms considered for the statistics, 134 mentioning at least one SDG and 20 firms mentioning at least one target.

Also, Ford performed a two-level prioritisation, affirming that Goal 3,6,9,11,12,13 were priority compared to the other goals addressed (SDG 4,5 7,8,10,16,17) and supported the reasons the issues covered by that SDGs should to be prioritised. This reason concerned global sustainability trends as well as firm's operations: "Access to safe drinking water and adequate sanitation is a fundamental human right and was identified as a major issue in our 2018 human rights assessment. Water resources are unevenly distributed, and water security is high on the global agenda. Water is also critical to our manufacturing operations, so we continually strive to reduce our water consumption, as well as that of our supply chain" (FORD, SR, 2017). Proving a rationale for the choice of the Goals is essential to increase accountability and confidence, the SDG Compass recommend to choose Goals and targets based on the impact they can have, meaning that firms should choose where to focus their effort based on the possibilities to increase a positive impact and reduce a negative impact. We observed a case which explains this clearly. Panasonic only mentioned specifically SDG14, even though affirmed to contribute to other Global

Goals by putting an SDG icon next to the link where information could be found (another firm which used these icons and did not write all relevant information in the report, but only provided a link to online content). The firm mentioned the fourteenth goal as part of marine protection activities and affirmed to have only served sustainable seafood in two sites' canteens thus contributing to SDG14 and change of employees' behaviour. What the firm reported is true and the initiative undertaken was compliant with SDG suggestions, however the firms' (belonging to the electronics, electrical equipment industry) highest impact probably does not concern issued covered by SDG14, as shown by the SDGs addressed by peer group, where no competitors chose to address SDG14. Moreover, the firms described an activity not linked to the core business of the firm, something not meant to last in bad times and change the system (Panasonic SR, 2017).

The questions, as defined at the beginning of the experiment, were simple to apply to the report, however among the organisations' rationales provided for the Goals and Targets we noticed a variety of drivers. For instance, BPCE Group admitted having addressed specific SDGs after a rating agency asked for them (BPCE IR, 2017). Following the SDG Compass recommendation, almost half of the firms provided the reason they chose certain goals, half of which reported to have chosen potential contribution, impact. For instance, Siemens categorised the impact on SDGs in high, medium and low and showed for each SDGs prioritised how the highest impact was obtained through the core business (Siemens SR, 2017). Interestingly, ENI developed with the Columbia Centre on Sustainable Investment a model to help firms prioritise the Goals based on the core business of the firm and its configuration, for Eni results are shown in Figure 65 (Eni SR, 2017). For the firm, the SDGs prioritised at global level were SDG7 and SDG13, the SDG that could be reached through the business approach were 5,8,9,16. The SDG to focus on by carrying out firm's operations in a sustainable way were 6,12,14,15. Finally the models indicated those Goals more philanthropic that the firm may pursue locally like SDG 1,2,3,4,10,11,17(Eni SR, 2017).

Arcelor Mittal followed the recommendations of the SDG Compass to choose the goals to address (Arcelor Mittal SR, 2017). In the end, the reasons for choosing and prioritising Goals were similar, the same rationales for which an organisation addressed certain SDGs was at the heart of the prioritisation. In this context, we noticed that for many organisations the reasons were linked to the materiality process. For instance, China

Mobile Communication prioritised the SDGs based on the potential contribution but also on the stakeholders' needs (China Mobile Communication SR, 2017). While the aforementioned prioritization procedure of Ford was based on the saliency assessment in line with UN Guiding Principle Framework to report the most important human rights issues. This analysis let emerge those issues "at risk of the most severe negative impact through the company's activities and business relationships". Then, the SDGs aligned to those issues were chosen and prioritised (Ford, SR, 2018).

Based on the evidence above mentioned we added a question, since relevant, material or salient, the way organisations chose Goals was not subjective in these cases. For 21 firms SDGs were one of the guidelines used as input of the material analysis, for instance Walgreens and China mobile Communication (Walgreens SR, 2017; China Mobile Communication SR, 2017). Moreover Legal & General group reported to, after having used the SDGs as input for material topics, have carried out surveys among stakeholders to find out wheatear they agreed with the choice of the SDGs to focus. In this case the Global Goals were considered proxy for global trends and stakeholder's interests. For 6 firms the SDGs addressed and prioritized were the results of the alignment of material topics found to the 2030 Agenda. For 3 firms the Global Goals were both input and output of the material process, like Aviva. Please refer to Figure 66 for results: after having considered the Global Goals as inspiration for potential material issues, the firm defined the strategic SDG priority as those SDG where the firms had both the highest impact on and whose issues had the highest impact on the firm (Aviva SR, 2017).

However, the most complex material assessment where the SDGs were involved was produced by Crédit Agricole, which drew a Matrix of Sustainable Development Goals. As shown in Figure 67, the organisation categorised the SDGs on the ethical, climate and inclusion axis and placed them on the matrix according to the importance for the stakeholders and for the group. The biggest the circle next to the SDGs, the more aligned that SDGs were to the strategic priorities of the firms (Credit Agricole IR, 2017).

Two firms after having found the material topics, aligned them to the SDGs, like Unilever which aligned all sustainability issues related to the sustainability strategy of the firm to the SDGs, showing the most impacted ones. Please refer to Figure 68 for results (Unilever SR, 2017).

6.3 Mapping sustainability topics to SDGs

The approach of aligning the material topics found to the SDGs reflects another ambiguous question at the heart of our experiment: "Does the firm map and align its sustainability priorities across the SDGs?". We were inspired by Oxfam's work about this question that aimed at assessing the link between the sustainability strategy and the Global Goals. Indeed, the authors of the work found that the main progress achieved by the organisation implementing the SDGs related to "integration, particularly by linking, mapping and aligning the presentation of their sustainability strategies with the SDGs"(Mhlanga, Gneiting, and Agarwal 2018). Initially we used the question as above defined, however as we performed the analysis, we noticed that most firms did not link the sustainability priorities to the SDGs but linked some general topics, with no connection to the sustainability strategy. In many cases, the result was a mere matching exercise. Moreover, in some cases (17) the firms started from the SDGs rather than from the sustainability priorities, thus trying to find an ESG issues or an initiative for each Goal, rather than starting from the material topics listed in order of relevance. For instance, Pemex linked all 17 the SDGs to the chapters of the reports as well as to general issues, but it did not disclose the sustainability priorities, as shown in Figure 69, thus this link was not clear (Pemex SR, 2017). While other firms like ChemChina and Indian Oil only put SDG icons next to the related sustainability issues in the report and never describe the link between those Goals and the sustainability strategy (Indian Oil SR, 2017; ChemChina SR, 2017).

Only six firms created a link between the sustainability priorities and the Global Goals addressed. One of these was Wilmar, operating in the agri-food industry, which both graphically and verbally described this link, thus it indirectly explained the reason for the choice of the Goals too, alignment with the sustainability strategy (Wilmar SR, 2017). Also, KDDI defined the material topics and mapped them to the SDGs (KDDI IR, 2017). Among the firms linking all SDGs to some sustainability issue we find also organisations fully explaining the mapping, for instance the above-mentioned Unilever's table in Figure 68. There, the firm linked its material ESG issues categorised in groups representing the four sustainability priorities as well as wider sustainability topics. What is different compared to Pemex was the disclosure of the sustainability priorities. Through that table, the firms

also justified the choice of addressing all the Goals, based on the fact that it affected all the SDGs directly or indirectly (Unilever SR, 2017). Another firm doing a complete mapping of all material topics to SDGs was Nestlé helped by SustainAbility (Nestlé SR, 2017).

However, clearly indicating the sustainaiblity priorities linked to the SDGs compared to mapping all the material topics makes simpler for the reader to grasp the meaning of the mapping. Probably the clearest example came from the insurer company, Allianz. In two pages, the firm was able to communicate the Goals addressed, the sustainability strategy, linking them and accounting for the interconnectedness of the Goals, as shown in Figure 70. The three strategic priorities were the result of the materiality assessment, the SDG addressed were the most impacted by the firms and the arrows linking them show how each priority could be related to more than one Goals. Moreover, the organisation described the sustainaiblity strategy and its relations to the SDGs in the following page, thus providing the reader with all the information summarised to assess the company's trustworthiness. Choosing this approach made easier to grasp the full picture, so that the reader was not forced to gather and connect information disseminated all over the report with a poorly communication effectiveness (Allianz SR, 2017).

Observing such variety of outcomes, we adjusted the question in the first days of the experiment in order to make it encompass everything. We wrote it down in the following way: "Does the firm do a sort of mapping of sustainability topics to the SDGs? Are these topics the priorities for the firm's sustainability strategy?". It was a two-steps question, first we verified whether the firm did any kind of mapping, then whether it showed the link with the sustainability strategy. Indeed, providing a reasonable link to the existing sustainability strategy also allows the firm to indirectly justify the choice of Goals. Thus, along the analysis we recorded two information, the presence of the mapping and the strategic approach to this mapping. However, we noticed that this question could be misleading in assessing the level of SDG-integration, because this word itself reminds of a connected and holistic approach to the Global Goals inside the business. The firm through this mapping shows first the consistency of the sustainability approach itself, by reporting the material topics categorized by level of relevance. Then, the level of understanding of the SDG framework by choosing the suitable Goals to be linked, those most impacted by the firms' business encompassing the sustainability priorities. Accepting any type of mapping, even though with distinctions, risks of diluting the importance of the mapping.

For the final set of questions, we suggest either looking for those firms only linking the sustainability strategy to the SDGs through the sustainability priorities, thus considering only those firms like Allianz, Nestlé, Unilever with a clear strategic approach to the Global Goals and discarding the remaining firms. Either separating the two parts of the question, but considering loose mappings negatively as representing a shallow understanding of the SDGs and/or of their overall sustainability strategy. Eventually the outcomes are equal, however in second possibility the questionnaire would provide more information to the evaluator, by inferring on the level of SDG commitment of the remaining firms too. To be fair, firms not doing any kind of mapping are not like firms doing a loose mapping. The solution could be setting the assessment framework in order to offset the results of the two questions in case of loose mapping. For instance, scoring the first question "Does the firm do any kind of mapping" with a positive amount equal to the negative one assigned in case the firm lacked a "strategic" mapping.

6.4 Reporting contributions to the Global Goals

Another ambiguous issue lied at the heart of our effort: the measurement of the contribution or impact an organisation had on the Global Goals. As we said above, the choice and the prioritisation of the SDGs should be impact-based, however, how to measure this contribution was not defined. As the SDG Compass recommended, context must be considered when addressing contribution and impact (United Nations Global Compact, GRI, and wbcsd 2015). As proxy for contribution to the Global Goals, we considered the reporting of initiatives already existing or newly undertaken to address the SDGs.

About two third of firms having addressed Goals listed initiatives undertaken to contribute to SDGs (90 out of 156). Most of the firms did not specify whether the initiative had been undertaken before or in response to Global Goals. Some firms listed initiatives for all SDGs addressed, others did not do this systematically, like Engie and Sony which mentioned only one initiative (Engie IR, 2017; Sony SR, 2017). Some firms listed many

initiatives but did not describe the context, the link with the sustainability strategy nor how the way those initiative contribute to the Goals. Again, we identified loose listing disconnected from the whole SDG commitment. For instance, as shown in Figure 71, Korea Electric Power linked some general initiatives to the Goals addressed. This kind of contribution is separated from its context, no detail is shared, and the contribution cannot be measured. An example is the initiative considered by the firm a contribution: "Help the culturally underprivileged enjoy culture and art performances, including movies". The questions that arise concern who are the culturally underprivileged, what "help in enjoying" mean and above all how this advance SDG10 (Korea Electric Power SR, 2017).

Even more complex to define is the amount of impact a firm has on the SDGs. Indeed, both institutional and professional works on the SDGs analysed suggested firms to provide a quantitative measure of contribution in reporting their effort. PWC also supported the idea of monetizing contribution in order for all stakeholders to understand it and for the management to make "cost/benefit" analysis (Scott and McGill 2018).

AB InBev, leader in the beverage industry, disclosed how its "work is aligned with UN Sustainable Development Goals 3 (Good Health and Well-Being), 11 (Sustainable Cities and Communities), and 17 (Partnerships for the Goals). In 2017, we expanded our Budweiser "Give A Damn. Don't Drink Drunk" program in partnership with Lyft, distributing more than 85,000 safe rides across nine US states and Washington, D.C., in just over three months. In the state of São Paulo in Brazil, we continued to work with government and local partners to implement a road safety intervention program in 62 cities. From 2015 to 2017, road fatalities were reduced by 13% in those 62 cities, representing 496 lives saved" (AB InBev, SR, 2017).

The disclosure of this initiative contained the context in which it was borne, what Goals it affected, the time range, a quantitative measure of safe rides and the locations served, the link with the sustainability strategy of reducing the harmful use of alcohol and the increased safety while driving, the impact this initiative had on the cities both in terms of car accidents and in terms of deaths. This type of disclosure was not located in a SDG-dedicated section but was described in the report and mentioned more times. These elements were not disseminated over the reports in different section categorised by reporting topics, but were connected through a "story", which made communication

about the impact more effective and where the reader could immediately assess the overall SDG-contribution for that initiative.

Johnson & Johnson operating in the healthcare sector dedicated two whole pages at the beginning of the SR to discuss difficulties of reporting about contribution to SDGs. The management did not put this information as footnote or separately at the end of the document, but right after having described results. The firm supported its statements by acknowledging the importance of partnerships yet the difficulties of "quantifying impacts and benefits" for several collaboration. Indeed, the organisation claimed that data accuracy suffered from "limitations including estimates, extrapolations and reliance" on figures provided by other partners and assumption that could lead to misstatements of results" (J&J, SR, 2017). Interestingly the company did not stop there the description, but added specific details concerning the most complex data to gather: "Health Workforce, Women's and Children's Health", "Essential Surgery" and "Environmental Health". Moreover, the adjustments and solutions to fix these inaccuracies were explained. However, the company reckoned the need to increase trustworthiness among stakeholders on the SDG-contribution reporting process, thus disclosed to have asked for external assurance on this procedure (ibidem).

While waiting for more guidelines and indicators to report on the Global Goals, the private sector could enhance transparency about reporting on this impact through independent assurance. However, only two firms implemented it, besides Johnson and Johnson: POSCO and Reliance Industry, operating respectively in the Metals and Petroleum Refining Industries, both having a limited assurance performed. The assurers of Reliance Industries only reported that the firm had incorporated the principles of the UN SDGs in its reporting along with other reporting frameworks, but this information did not provide much added value to the trustworthiness of the firm, because no details were disclosed (Reliance Industry SR, 2017). On the contrary, in the recommendations following assurance, POSCO was recommended to set a quantitative target for its contribution to the Global Goals, however no mention of the SDGs was made in the reporting scope of the assurance. Anyway, this signals that the SDGs were included in the assurance (Posco SR, 2017). Moreover, we underline how linking a list of initiatives to the SDGs does not automatically mean to perform a loose description of contribution. For instance, this very firm disclosed a table at the end of the report where it linked for each SDGs the most

relevant initiatives undertaken and for each initiative the exact pages of the document were indicated, so that the reader could easily build the full picture of the commitment towards Global Goals. Please refer to Figure 72 for an insight of this image. We underline how the firm did not mapped its activity to all SDGs but only to those addressed.

Considering the proxy, we used for contribution to Global Goals, practical activities undertaken, and the fact that the WBCSD suggested focussing on core business' activities to unlock the potential prize from the SDGs, the private sector has a variety of ways of contributing through its core business. We observed in our analysis that the firms belonging to the financial sector had some peculiarities in reporting about initiatives and impacts, the most relevant being their indirect contributing to the SDGs (through investment allocation). Aegon, Dutch company operating in the insurance industry, explained the shortcomings the financial sector meets when trying to contribute to the SDGs. First, the aforementioned data inaccuracy firms operating in other industries experiment is spread to the financial organisations willing to invest in those. Thus, directing investments to SDGs contribution suffers from this ambiguity. Moreover, the firm stated that "the UN has provided guidance as to what constitutes a contribution towards each SDG, but what that means in terms of assessing investments is not always clear". The company underlined how every firm contributed positively and negatively to SD and how missing and inaccurate data affect contribution assessment. Moreover, directing investments towards certain SDGs, as SDG7, was considered simpler compared to others, because of their clear link with the topic, the firm stated. Moreover, the room of manoeuvre on investments was seen as limited to the general account base, reportedly reducing over time for that firm. To take care of this, the organisation along with others affirmed to be "developing a methodology to calculate a fund's impact across environmental and social themes linked to the SDGs. The aim is to develop impact metrics that are easy to understand, yet scientifically robust" (Aegon SR, 2017).

While Aegon reported these difficulties, another firm belonging to the financial sector revealed its approach, BNP Paribas developed instruments for investors to directly finance SDGs-contributing initiatives. For instance, a mapping was reportedly available for investors to be aware of what Goal their savings were contributing to. Or instruments were created for investors to allocate capital based on an SDG-related index, whose price was "indexed to exemplary companies" contributing to the Global Goals (BNP Paribas SR,

2017). Among the firm's performance indicators, BNP disclosed the "share of loans to companies contributing strictly to the achievement of UN Sustainable Development Goals", as reported in Figure 73. In this way the contribution of the firm could be easily extracted and effectively communicated, even though no SDG was specifically addressed, no official mapping disclosed, and the above-mentioned ambiguity partially offset. The company also reported the total amount of contribution to sectors directly impacting the SDGs but did not explain where this figure came from, however it committed to increase it from 155 to 185 million Euros in the following two years.

The bottom line is that we decided to add a question to verify whether the firm only mentioned the initiative as Korea Electric Power or also provided quantitative data about that contribution systematically, meaning for each contribution at least one indicator of performance as BNP Paribas.

a. Negative impacts

As Aegon stated, firms contribute at the same time positively and negatively to SD (Aegon SR, 2017). Indeed, few firms mentioned the negative impact coming from their operations, only 14 out of 156, but at least they acknowledged this possibility. Arcelor Mittal only mentioned trying minimising the negative impacts but did not added other details, other talked about potential negative impacts like Samsung as shown in Figure 74 (Arcelor Mittal SR, 2017; Samsung SR, 2017). The Korean mobile company disclosed a table where each goal was defined by the level of relevance for the firm, the link with the firm's sustainability priorities and the future projects regarding them. All aspects were potential or lacked details, however this summary table expressed connectivity helping the reader in grasping the full picture including the link between the Goals and the firm's activities, something relating to the past/current performance and something related to future plans. A potential negative impact disclosed by the firm was "Exert a direct or indirect impact on the environmental destruction that may affect local resident's livelihood" (Korea Electric Power, 2017).

An interesting example of balanced reporting on impact came from Unilever's Annual Report, the company disclosed the positive impacts in reducing water consumer use but

admitted that positively results had partially been offset by elements not under the firms' control: "We have made significant reductions in the water used in manufacturing – 39% per tonne of production since 2008. Our biggest water impact occurs when consumers shower, bathe and clean clothes with our products. Our target is to reduce by half the amount of water per consumer use by 2020. We have reduced water use by 2% through innovations such as low rinse laundry products. However, this has been offset by the growth of products with higher water use in the portfolio, including conventional laundry products" (Unilever, AR, 2017). This realistic approach as well as the disclosure of details enhances transparency and accountability, indeed as PWC affirmed in its 2018 Reporting Challenge no organisation can affirm to be exempted from SDGs mutual influence as of today. Thus, the unbalanced reporting of firms in favour of positive contributions (91% of firms mentioning the SDGs) cannot be accepted as actual situation, but most probably it is a matter of neglect or lack of deep knowledge of the Global Goals framework (Scott and McGill 2018). For the questionnaire, we reckon that a potential impact is more similar to a risk than a negative impact, thus for the question we suggest using only experienced negative impact but given the immaturity of the private sector in this context, we suggest not considering the regularity of the disclosure (basically whether the firm reports systematically information on a certain aspect).

6.5 SDG-related goals

The promise BNP Paribas made in 2017 about increasing the total amount of contribution from 155 to 185 million Euros, the commitment to keep the indicator concerning the amount of loans granted to companies directly contributing to the SDGs at least 15% for 2018 can be considered what KPMG in its survey on the Global Goals defined "SDGs-related Goals", based on the SDG Compass' third step recommendations of setting "specific, measurable and time-bound" goals to monitor performance (Blasco, King, and Jayaram 2018; United Nations Global Compact, GRI, and wbcsd 2015). Indeed, they are necessary to operationalise the Global Goals, considered the lack of specific standards to report for the private sector as well as the ambitious nature of the SDGs. Setting a goal requires a performance indicator to communicate progress over time (United Nations Global Compact, GRI, and wbcsd 2015). Based on these insights we proposed in the first

draft of questions a section dedicated to SDG-related goals: *Ambition: integrating and widening SDGs.*

The reports analysis confirmed some aspects we assumed at the beginning but showed misalignments with others. As a matter of fact, while analysing the first reports, we observed that many organisations across the sample set sustainability target to achieve, also concerning topics covered by the SDGs, but did not mention the Global Goals. Thus, based on Oxfam's findings that firms used to try to make SDGs fit into their current sustainability strategy Mhlanga, Gneiting, and Agarwal 2018), we decided to consider SDG-related goals only those goals with a direct mention to the Global Goals. Even if the time horizon set by the firm was 2030 as the Global Agenda expiration date, we decided to consider SDG-related goals only if the organisation linked this framework to the target set, because 2030 has overall become a milestone year for economic, social and environmental changes. The firms compliant with this definition were 29 out of 156 (19%).

Then we summarised the attributes described in the 3rd step of the SDG Compass in the SMART definition. Indeed, 5 firms among the aforementioned 29, set target either not specific, measurable, achievable, realistic or time bound. If any of these attributes lacked, we reported the firm as not compliant. However, the main part of the firms having set targets, set them SMART. An example may be LG, operating in the technology sector, which did not set all goals to be SMART. Some commitments were SMART, others were not, as shown in Figure 75. For instance, among the "Promote intelligent lifestyle" commitments, the firms reported the following target: "Help customers live a healthy lifestyle by launching innovative products with social and environmental changes in mind." Or always in the same commitments section: "Contribute to creating a sustainable society through continuous development of environmentally friendly businesses such as renewable energy and EVs". In these commitments the company did not disclose specifically the scope of action, the time horizon, in quantitative term what she wanted to achieve. These targets' indefiniteness was highlighted by the details of other commitments (*Pursue Zero Carbon)* accompanied by SMART goals like "Reduce carbon emissions in the production level by 150,000 tons by 2020 compared to the base year 2008". Here the firm disclosed the details of its commitment, the scope of its action, the Key Performance Indicator used to track progress, the quantitative intervention desired,

the baseline year and expiration date (LG SR, 2017). LG set 2020 as expiration date, while other firms applied the Global Goals' expiration (2030) date also to their targets, however the SDG Compass recommended to set milestone earlier than 2030, because "the longer the time horizon, the shorter the accountability to deliver"(United Nations Global Compact, GRI, and wbcsd 2015).

As for setting SMART goals, almost all the firms which disclosed SDG-related goals disclosed quantitative KPIs to monitor progress, 26 out of 29.

What we hardly found in reports was a way to allow stakeholders to compare progress. Indeed, only half of the firm disclosing SDG-related goals provided a way to make year-over-year analysis. Not only most companies did not report the baseline year to determine results, but the majority also stated the year's achievement without providing a percentage increase from the baseline year or the prior year. Other ones did not report in a systematic way year-over-year results for all SG-related targets. This reduced the effectiveness of the results. Other organisations gathered the year-over-year comparations (usually providing three consecutive years' data) at the end of the report along with all other data. This approach's shortcomings made harder for the reader grasp the full picture of the firm's engagement towards the SDGs. As we showed when observing contributions' disclosure, the main information about the SDG-relate goals should be gathered in summary tables. An outstanding example of complete year-over-year results was provide by Hitachi. As shown in Figure 76, over the report next to the related description, the firms revealed easy-to-use, summary tables of comparation from baseline year to current year, the explanation of the KPI formula, an measurement detail.

Please refer to Figure 77, for the comparison over a three-years period performed by Hitachi. The company tailored SDG8 and adapted to the firm's specificities, highlighting the most relevant aspects covered by the Goals: "we are primarily addressing SDGs in the recognition that it is indispensable for business management to develop environments in which the people working in the Hitachi Group can work safely and without anxiety about physical and mental health". Below, the firm provided not only a three-year evolution of work accidents rate within the firm, but also disclosed the same ratio for all industry, manufacturing industries and the electrical machinery sector to which Hitachi belongs to. Moreover, and above all, this analysis was made systematically by the firm for each SDG-related goal identified (Hitachi SR, 2017).

Among the firms tackling in a dedicated section the relevant information about the SDG-related goals there were Unilever, Nestle' and Johnson and Johnson (Unilever SR, 2017; Nestle' SR, 2017; Johnson & Johnson SR, 2017). They decided to report about SDG-related goals in a more visual way. For instance, Johnson & Johnson created the summary table showed in figure 78. The company reported for each commitment the general aspirations operationalized in a five-year-target, the progress form the baseline year to the current year, the most relevant initiatives to contribute and the status of the target, either "achieved" if already met, "on track" if expected to achieve according to the timeline scheduled, "in progress" and "off-track" if the expectation were respectively negative but with adjustments made to improve progress or negative and at risk of not achievement.

But analysing the reports, we noticed that no one explicitly affirmed the SDG-related goals to come from an impact assessment as recommended by the SDG Compass. Indeed, as we will show in the next paragraph, this approach was not often adopted.

The last aspect we verified among the topics covered by this section of questions was inspired by Oxfam's work on the Global Goals. Oxfam's analysts verified the extent to which firms addressed "thorny issues" and "tackled the root causes" of the sustainability issues covered by the SDGs. Thus, the extent to which firms aligned all their sustainability strategy to change the system, rather than be comply to single aspects of the 2030 agenda (Mhlanga, Gneiting, and Agarwal 2018). This issue proved to be tricky. As a matter of fact, it required a holistic qualitative judgement on the firm's performance. Thus, we realised the need to operate in two steps to reflect this perspective in the assessment framework.

First, we looked for those organisations extending the requirement of the SDGs, not increasing it (given their already ambitious nature) but tackling them beyond compliance and mentioning some aspects related to *ambition*. For the way we structured this work this topic was one of those that better reflected SDG-integration, despite the ambiguity of its scope. We found 10 firms doing this in 2017.

For instance, Walmart and Kroger reportedly tried to go beyond Global Goals concerning the expiration date. Indeed, they both reduced the deadline to achieve their SDG-related goals as well as committed not only to halve food waste throughout their operations, as proposed by target 12.3, but achieving zero waste. For instance, Walmart aimed for Zero Waste in its operations in Canada, US, UK, Japan by 2020, while Kroger aimed at achieving

zero waste in their operations by 2020 and donating three billion meals by 2025 (Walmart SR, 2017; Kroger Sr, 2017).

Making a brief aside, we observed that for certain SDGs and targets like 12.3 concerning food waste, public attention was higher, and firms set specific and detailed SG-related goals. Indeed, around target 12.3 a coalition of international leaders arose, publications and resources to go in depth about the topics were issued on the web sites and documents on worldwide advancement of goals were provided (Champions 12.3, 2019). This kind of partnership could help as stimulus to take action both the members and for other feeling the pressure to act.

The second way we assumed our framework could reflect Oxfam's idea of ambitious action is through a summary, full picture of each firm's contribution to the Global Goals. Based on our analysis, we assume that those firms that most extensively comply with the topics we propose in the framework be the ones showing the fully engaged behaviour described by Oxfam. Indeed, to identify those organisations a summary qualitative judgement seems more appropriate than pre-determined reporting codes. Therefore, beyond the way we structured the above question, we consider that only through a complete SDG-integration profile of a firm we could implemented an assess what Oxfam' analysis intended to verify.

6.6 Collaboration

As we stated above, collaboration is not only an important stimulus for the partners and third parties but are necessary to reach the SDGs given the ambitious nature of this framework. The introduction of the 17th goal revealed this. The questions of the section dedicated to collaboration focussed on general partnerships and partnerships along the value chain. Concerning the general partnerships, we found issues like those related to the SDG-related goals. Analysing the first reports, we observed that firms reported to work with partners but did not mentioned the SDGs in that description, others did not link the partnership with the SDG17 even though in the section dedicated to the Global Goals reported to address that specific SDGs. Indeed, among the firms specifically addressing SDG17, no organisation mentioned that SDG in the description of the

partnership. We assumed that these firms considered all partnerships as contributing to that Goals and once defined no additional link was needed. However, reasons for the private sector to mention and address again that Goal while describing the partnership may be varied. First, SDG17 encompasses 19 targets, that is 19 different aspects partnerships may represent, second a partnership could have been started to answer a topic covered by another SDG, third as Hitachi did, personalisation and operationalisation of the SDG addressed may increase understanding of the firm's intentions and trustworthiness. Therefore, we specifically looked for those firms mentioning SDG17 as well as other SDGs the partnership contributed to when describing a partnership. The firms having addressed specifically SDG17 were 64 across the sample, however the firms which specified a link to the Global Goals when describing their partnership were only 2, none having addressed specific Global Goals. Of the 64 reportedly having tackled SDG17, 29 did not reported any partnership in the report, this attitude could be considered either a shallow, inconsistent approach, lack of basic understanding of the framework or SDG-Washing (we will remind this issue below). As shown above, organisations across the sample not always provided a reason for the choice of the Goals to tackle and many reported to address zero or 17 SDGs. Thus, we considered compliant with the definition those firms having specified the link with the SDG framework when describing a partnership, while we did not consider as complaint those firms having only disclosed to address SDG17. Indeed, this reveal that firms should be more careful in doing their mapping and look not only what they do, but also how they do it as well and remember to provide a reason, a link with the SDGs for each issue they disclose. Finally, to operationalize the partnerships and manage the impact measurement, organisations should describe how each partnership contributes to the achievements of the SDG-related Goals rather than the Global Goals in general.

For instance, a firm reporting about partnerships while creating a link with SDG-contribution was Verizon, operating in the Telecommunication industry. Please refer to Figure 79 for visual representation. Verizon systematically linked partnerships undertaken to SDG-related Goals. In the partnership section, the firm did not mention once again what SDG it addressed but specified how the partnership established contributed to the SDG-related goals set, all them having been explained at the beginning of the report. In Figure 79, Verizon explained how working with the leader in smart parking meters allowed reduction of time to park and lowered CO2 emission by 34,192

metric tonnes only in 2017. For most partnerships this firm not only made a link with the SDG-related Goals but also provided quantitative data to measure the impact (Verizon SR, 2017).

We observed another firm providing quantitative data to measure partnership's impact: Allianz. The German insurer described the partnerships it undertook (internally/externally actionable or avoiding harm/doing good using Zanten's categorisation), explained the link between the partnerships and the contribution to the Global Goals addressed and set goals related to those partnerships for future years. For instance, through its partnership with SOS Children Village the firm aims at improving "youth employability" and "emergency preparedness". Both these aspects related to the firm's core business and could affect future trends linked to the insurance business. Even though a link existed, this kind of activities were outside the direct influence of the firm's operations and aimed at doing good, thus making Allianz one of those firms whose contribution to SD was not limited to directly influenceable operations only striving to reducing negative impact. The organisation reached the goals set for 2017 and committed to reach with this initiative the 50 most vulnerable countries by 2020 (Allianz Group, SR, 2017).

Even though these two firms started to comply with disclosure best practices related to SDGs, much work was still ahead in 2017. As Johnson & Johnson reported at the beginning of its report: "We do not have a direct line of sight to the data collection processes, as the data are gathered by our partners on the ground. Some of our partners have data quality assurance protocols, but some do not" (J&J, SR, 2017). Moreover, the firm admitted that some data arrived after reporting deadlines, thus sometimes the report could undercount, provided that requiring an earlier deadline did not always work, to compensate the firm revised and update the reports with the new data once they arrived.

Provided that more guidelines, standards, coalitions to report about the Global Goals have come and are to come in next years, we expect impact measurement and disclosure to be more precise and pregnant both for single contributions and in partnerships. The regularity requirement could be added to the questionnaire in future e.g. systematic disclosure.

Even if few firms linked the partnership undertaken to the SDG-contribution, 67 out of 156 reported to collaborate with partners to reach sustainability goals, meaning that collaboration on SD issues was well-established in 2017. According to the CEO guide developed by the WBCSD collaborating across the value chain could accelerate 2030 Agenda (WBCSD, 2017). Inspired by KPMG, which proposed a similar question in its survey (Blasco, King, and Jayaram 2018), we addressed collaboration along the value chain to contribute to the Global Goals. Indeed, KPMG addressed SDG-related goals in its survey, but added that collaboration across the value chain with suppliers could also strengthen the relationship with them beyond accelerating SDG-related goals achievement. Initially we used their exact words to verify this aspect in the report, using as question: Has the firm brought on board suppliers to support its SDG or better its SDG related goals?

Again, we found that most firms (27) worked with their suppliers to reach sustainability targets, but the Global Agenda was never mentioned or linked. Only four firms collaborated with their suppliers to make their effort towards SDG-related goals (or SDG in general) more effective.

LG reported to work with supplier to advance achievements of SDG-related goals, but did not disclose any quantitative KPIs for progress, although the firm committed to provide metrics for the following report (LG SR, 2017). Tesco reported have set a commitment for upcoming years with 25 of its largest suppliers to accelerate progress towards SDG 12.3, reducing waste from farm to fork, report data about food waste in their operations and help customers providing tips on food waste reduction in their household (Tesco SR, 2017). One more time, we would like to underline how target 12.3 reputation put a pressure on the private sector to comply. Making neglected targets renown may increase engagement and contribution from the private sector.

Again, to make a distinct between the firms reporting to collaborate and those providing quantitative data on collaboration with supplier we added the related question. Among the firms standing out for their impact data measurement and reporting, we highlighted Unilever's work. The firm through its "Knorr Partnership Fund invests €1 million every year in cofounded Projects with suppliers for their farmers". They provided overall figures: "we have funded over 70 projects, and farmers who've been in our programme for three years have together saved 10.6 million litres of irrigation water. That's the

equivalent of 55,000 average showers. Farms that demonstrate the highest standards are awarded Knorr Landmark Farm status". As well as focussed on specific initiatives. Moreover, their collaboration with suppliers, especially farmers, not only aimed at receiving help to achieve the Unilever's goals but above all aimed at providing help to improve farmers' work and life condition. One aspect the company put much effort was tomatoes. For instance, the firm provided Greek farmer with a technological tool to define times and amount of irrigation for tomatoes, thus saving water, easing the burden on farmer's shoulders and receiving back sweeter tomatoes. Similarly, the firm created a new ketchup recipe launched in April 2017 made from red and green tomato that used to be discarded from all producers only for aesthetic reasons, saving 2.5 tomatoes from being waste (Unilever AR, 2017).

Concerning collaboration's impact reporting much work was still ahead in 2017. Indeed, the private sector should not only link initiatives to SDGs or SDG-related goals contribution but should clearly show how each partnership impacted achievement of SDGs addressed. But this requires different kind of engagement from most of the firms part of the experiment, more concerned about integration across the whole value chain than reporting.

6.7 Engagement across the value chain

Based on what read in Oxfam's 2018 study, we already knew that "in many cases business appears to be attempting to reinterpret the SDGs by fitting them into existing sustainability strategies and initiatives" (Mhlanga, Gneiting, and Agarwal 2018). As said above, most firms in the sample reported to have addressed certain Goals based on the impact, contribution they perceived to have on the SDGs. However, most organisation did not report how that impact was assessed. As said in the first part of this work, the SDG Compass recommended to assess the most impacted SDGs based on a value chain assessment. Mapping the most impactful parts of the value chain to the Global Goals was considered necessary to find gaps in the current sustainability strategy of the firm and adjust accordingly, according to the SDG Compass (United Nations Global Compact, GRI, and wbcsd 2015).

Thus, when deciding whether proposing this question we considered this a higher level of SDG-integration compared to other questions. Indeed, the SDG Compass

recommendation's aim was to help firms in defining the positive and negative impacts on SD and align the choice of the SDGs addressed to this situation. The question pat of the experiment concerned: "Does the firm map the SDGs against the value chain to identify high-impact areas (positive and negative) and find gaps in the sustainability strategy implemented". Only 3 firms disclosed this kind of value chain assessment: Unilever, Woolworth and Ford Motors (Unilever SR, 2017; Woolworth SR, 2017; Ford Motors SR, 2017).

Daimler affirmed to have chosen to address those Goals most affected by the firm's core business and value chain, described briefly the impact on them but did not explained how it defined and measure it, as shown in Figure 80 (Daimler SR, 2017). Here, the firm defined as most impacted SDGs 8,9,11,13 but how could a reader trust this choice provided that the management did not disclose the method implemented. Thus, we could define this a value chain assessment as the SDG Compass described.

On the other hand, for each value chain level, POSCO addressed the sustainability effort and the most affected SDGs. There are no details in the description, no quantitative data. It looked more like a mapping with the related value chain levels. Again, we did not accept this as value chain assessment (POSCO SR, 2017).

Graphically, Woolworth in the Food and Drug store sector, described the link between the SDGs and the value chain in the clearest way, as shown in Figure 82. They linked the SDGs most affected with each value chain part and added each business' segment as well as the sustainability effort put (Woolworths SR, 2017).

On the other hand, Ford fully described the most impacted issues by each step in the value chain as well as the value created from that value chain's segment. This value chain assessment was immediately followed by the explanations of the SDGs addressed as a result of the value chain information with the saliency assessment performed. The link made was clear, but it could have been better explained with more details added. Again, no quantitative or monetary data was disclosed and no information on the role of the SDGs in filling the gaps of the sustainability strategy was provided (Ford Motors SR, 2017).

Finally, Unilever deserved a specific mention. The firm dedicated a section to the value chain model creation starting from consumer insights to product development and distribution, to advertising. The organisation also disclosed quantitative data to describe

the impact it had across the steps of the value chain: "our value chain is a set of defining strengths which set us apart from our competitors: our portfolio of global brands and local jewels; a presence in more than 190 countries with 58% of our turnover in emerging markets; deep distribution capability through ever more complex channels and a talent pool of local management – 70% of our leaders are local" (Unilever AR, 2017). This sentence is just an example among many, in few lines the food company explained the influence it had both globally and locally, the impact on the emerging markets economy and the relevant role as employer. Then, Unilever reported the strategy and the value for the stakeholders. Finally, some example of what SDGs the firm addressed based on the value chain analysis, the strategy, the value for stakeholders was provided. The analysis was thorough however, a reader could find difficult to grasp the full picture, because related data were disseminated over the AR, SR (having together about a thousand pages) and the content online. This way of reporting lack conciseness but it is complete. To increase effectiveness of communication without losing relevant information, this kind of firm should complement descriptive section with graphics, summary tables, images.

Along the experiment, we have realised that the private sector had not fully understood the SDG Compass' suggestion concerning the impact assessment based on the value chain analysis. Even the three firms which resulted compliant to this definition, did not addressed all the steps included in the recommendation. This may be due to the fact that few firms affirmed to have used the SDG Compass and other tools' suggestions to report about the effort towards the SDGs, because they did not grasp the meaning of those steps, or even because this approach entailed disclosing much information about the firms' structure or because it required a change in the way the entire value chain was designed and managed. Despite the immature stage of integration found across the sample on this aspect, this approach is important. Thus, we suggest keeping this question in the final framework, even though verifying the compliance could be difficult since no firm fully adhered to the definition provided by the SDG Compass and thus no benchmark was provided by the experiment. However, as the SDGs awareness increased over the first two years since the introduction, we expect it will increase even more in next ones and integration will follow. This was also witnessed by a group of firms reporting about upcoming new measurements, plans and projects to integrate the Global Goals inside the businesses, starting from the following year (2018). Waiting for this evolution, we suggest accepting as compliant to the definition those firms at least creating a link between the

value chain part concerned and the SDG most impacted from that part as well as disclosing the sustainability plans for each one. In future this question could be adjusted to the evolution of the private sector approach, clearly the most complete approach would be disclosing quantitative data about the impact each value chain part has on the SD both positive and negative.

6.8 Compensation based on SDG-related goals achievement

Based on the definition of integration provided by the SDG Compass that suggested making the SDG-related goals part of the remuneration scheme to "anchor" them in the business, first we verified whether the performance towards sustainable development was part of the compensation system and then whether the SDGs were involved in the remuneration scheme. As for the value chain assessment, we considered this a characteristic of those organisations having a high level of SDG-integration. As a matter of fact, we observed only three firms having included SDG-focused criteria in the remuneration process, Unilever, Intel and BNP Paribas. An example of SDG-integration in the remuneration policy came from BNP which linked 20% of the executives' long-term variable compensation to the SDG-related goal focusing on providing at least 15% of direct investment to SDG-contribution realities (BNP Paribas SR, 2017). Through the experiment, we reckoned the importance of this question along with the value chain assessment question.

6.9 Third-part opinion about the non-financial report

As for the case of Shell's, we noticed that an independent commentary about the report may be useful both for the firms and for enhancing transparency and trustworthiness before stakeholders. Indeed, three of the largest petroleum refining companies showed this kind of opinion in their reports, Lukoil, ExxonMobil, Shell (Lukoil SR, 2017; ExxonMobil SR, 2017; Shell SR, 2017). All three times, the panel composed of expert suggested these firms how to improve the reporting. In the case of Shell, 2017 was the second year the same independent panel of expert proposed its recommendations. Interestingly, the firms compared the recommendations from 2016 with the adjustments the company made in 2017 to align the report to the best practices. On the contrary, we

observed that Chinese firms having their report revised like Sinochem, JD.com and China Southern Power Grid by independent actors only received compliments for their efforts, even though based on the other questions their SDG-integration was rather limited (JD.com SR, 2017; Sinochem SR, 2017; China Southern Grid SR, 2017). Clearly, these two approaches to independent commentary results in different contribution to the firm's reporting practices. This last approach provides less incentive for improvement, since no report can be so complete not to have room for enhancement. Nonetheless we suggest creating a two-step assessment like the question concerning mapping. First verify whether the firm has an expert panel mentioning the SDGs and then whether expert provide useful suggestions to make the report more effective. In the same way, we suggest proposing a question about the interconnectedness of Goals, since it may reveal the level of understanding of the SDG framework.

6.10 SDG-Washing

The aim of our work was identifying those firms "paying lip service" to the SDGs in their report for the year 2017 (Mhlanga, Gneiting, and Agarwal 2018). Even without a scoring system, along the reports analysis we found some organisations whose reports were not in accordance with the SDG framework. One of these was Sinopec (Sinopec SR, 2017). This firm (ranked 3rd in the GF 250 list for F.Y. 2017) reported that "EPEC, one of the e-commerce platforms of Sinopec Corp., was selected as Best Practice of Chinese Enterprise in Realising SDGs by the Global Compact Network China", however they did not explain why, nor they mapped their sustainability strategy to SDGs, nor they addressed specific goals. SDGs were mentioned in the CEO message, but in general, with no specific reference to what the firm did, but speaking of China's involvement with the Global Goals. "The 2030 Agenda for Sustainable Development has been launched in full swing across the world. In particular, joint efforts have been made in material issues such as addressing climate change and eradicating poverty" (ibidem). Sinopec produced as non-financial report a COP for SD instead of a common type of report, meeting the "advanced level criteria" they reportedly met. The firms placed SDG3, SDG8 and SDG5 icons over the report. However, we noticed that important indicators had deteriorated year-over-year, but no explanation was provided, such as death and occupational safety or women in management positions.

These worsening indicators paired with the lack of explanation and the iterative display of SDG icons, reference to SDG-awards and statement of SDG support revealed that the firm potentially benefited from the SDGs and UN's logos and status but did not commit to report about the real contribution to the Global Goals. This misalignment between what the firm stated and the what emerged from the report probably reflected a low engagement towards SDGs in the actual performance. Another firm with a low reporting engagement was Disney, which only mentioned once the SDGs, in CEO message, and never again over both the AR and SR (Disney SR, 2017).

6.11 Philanthropy vs Business opportunity

As the SDG Compass stressed, integration is essential to "ensure that sustainability is an outcome of core business strategy" rather than a mere philanthropic juxtaposed activity (United Nations Global Compact, GRI, and wbcsd 2015). However, this approach requires to rethink and redesign the core business as well as a new attitude towards innovations. Besides the examples showed before, some organisations welcomed this new approach. An example of SDGs treated as business opportunity and considered a driver for core business innovation came from Unilever; the organisation affirmed "We have reduced water use by 2% through innovations such as low rinse laundry products" (Unilever, AR, 2017). The UNGC and WBCSD affirmed that looking at the Global Goals as source of insights on the outlook of the business future environment rather than another sustainability initiative or reporting framework allows to link global sustainable development issues with priorities at the firm's level (wbcsd 2017). Through the product redesign, Unilever affected SDG6 on water consumption as well as SDG12 on consumption patterns. Indeed, Kramer, one of the main researchers on shared value, pointed out in an article published on the Harvard Business Review: "Corporate philanthropy and CSR can never deliver the scale of impact that the SDGs require. Even if all corporate philanthropy, a mere $20 billion in the United States in 2018, were entirely dedicated to the SDGs, it would be an immaterial addition to the $149 billion in development aid mobilized by the MDGs" (Harvard Business Review, 2019).

In the SDGs framework philanthropy is not opposed to core business opportunity, firms may contribute to SDGs through both mechanisms, what is important is to not restrict the

SDGs to the philanthropic section, since it would be the first thing to be abandoned in a difficult moment (financial, governance, political crisis) and would not drive systemic changes. For instance, Walmart in tackling food waste addressing Goal 12.3 worked both through core business adjustments (improve demand forecasting, increased turnover, employee training in managing food products) but also philanthropy (food donations). The firm also provided monetary data to define this intervention's impact. What was unsold, was donated, the company said. The firms stressed that this initiative contributed both to SDG2 and SDG12, thus increasing the scope of the contribution (Walmart SR, 2017).

The insurance provider MS&AD affirmed to contribute to the SDGs through the core business grounding its effort on the strategy, values and the "value creation story" of the firm. Indeed, it stated that the best way to contribute to the Global Goals was through "offering insurance and financial services" but listening to the needs the society expressed. It provided an example concerning health, stating that to support people and SD, an insurer should provide specific insurance solutions created on current economic, social and environmental trends such as low birth rate and aging population, same for the risk linked to climate change and biodiversity reduction (MS&AS SR, 2017). Thus, we suggest adding a question concerning this aspect even though the boundary between philanthropy and business redesign may be blurred.

What emerged from this chapter was at the same time the fragmented situation of the private sector's SDG-integration level, but also some improvement signals concerning SDG-reporting. Indeed, in 2017, the SDG-framework had been recently introduced and although the MDGs addressed similar concerns, as we saw in the first chapter, many differences exist among the two.

To represent this situation but also reflect the different level of engagements we observed, a wide structured framework yet able to retrieve details and accounting for qualitative judgment should be provided. In the next chapter, we streamline the characteristics a prototype framework should have based on the insights the experiment let emerge.

Third part

After having examined the result emerged from the experiment conducted in this work, the third part of this study aims at gathering insights on the sample's approach towards the Sustainable Development Goals in 2017, to glean meaning for a general SDG-maturity assessment framework for the private sector. The last chapter will show the ultimate questionnaire adjusted to the full picture and some guidelines for the application of the questions revealed through the experiment.

7. Prototype framework to assess SDG-integration level for private sector's non-financial reporting

The experiment implemented in this work was based on a directed content analysis. This approach assumes theory as baseline for the experiment. Following this methodology, we identified codes before and during the analysis based on the theoretical outline described as well as on "relevant research findings" (Hsieh and Shannon 2005). Therefore, at the end of the experiment, we had two set of questions used to analyse the reports. The first one had been developed based solely on theoretical insights. The second one was built on theoretical insights compared to research findings.

In chapter 6, we described the differences emerged between the two set of questions, since what the theory and previous professional works were telling about the relationship between the private sector and the SDGs was not entirely confirmed by the empirical work on the reports. Initially the interpretation made from these works was misleading. Indeed, the maturity of reporting on the SDGs was overestimated, other times it was underestimated or facets, shades were neglected, for instance the impact assessment described in the SDG Compass was not fully implemented by any organisation across the sample. Moreover, the experiment made emerge unknown practices, like the third-part opinion on the report asked to experts or to stakeholders. However, even the second questionnaire built while the analysis was ongoing was not fully representative of the actual situation emerged at the end of the experiment.

In this section, we will introduce a third revised set of questions, composed of aspects coming from the theory and confirmed by the results, aspects based on theoretical insights but adjusted to the practices and original aspects emerged at the end of the empirical analysis from the full picture. Along with these details, we will also introduce an assessment approach to combine and communicate in a nutshell the level of SDG-integration of each firm. The goal is to derive a descriptive framework, whose insights could be effectively conveyed and compared without the need to explain each element of the content analysis.

7.1 The final questionnaire

Before describing the final set of questions proposed, the reader need a remark about the scoring system that will be fully explained in the section 7.2 on the assessment approach. Each question is structured to receive a positive or negative answer. Only positive answers are considered. Each positive answer represents one point in this scoring system.

The first section of questions concerning general and sustainability information are important as a benchmark for SDG adoption and reporting, especially use of UNGC membership and participation in the CDP as Rosati showed that SDG adoption is linked to these two engagement with these two framework that support commitment to the Global Goals (Rosati and Faria 2019b).

1. *Rank*
2. *Firm*
3. *Legal status*
4. *Country*
5. *Region*
6. *Sector*
7. *Industry*

We used the GF sector and industry classification; however other types may be used as long as they are used consistently, and the evaluator is aware of the differences that may result due to the number and definition of categories.

8. *Producing an integrated report or a separated report?*
9. *Name of the report*
10. *Are the SDGs mentioned at least once in one of the reports?*
11. *Are the SDGs mentioned in SR, AR or both?*

Concerning the type of report, analysing the last reports we realised that many firms produced a non-financial report and an annual report. In the latter rather than reporting merely financial information, some firms merged financial information with highlights and excerpts from the non-financial report. Eventually producing a complete non-financial report and a document like an integrated report, as Hitachi did. In its integrated

report from 2017, the disclosure was so thorough that initially the presence of a further document dedicated to non-financial information was not assumed. This digression's purpose is only to clarify previous assumptions. Nonetheless, the interpretation given to those firms disclosing about the SDGs in both reports does not change, if the Global Goals are treated in the document especially shaped for the investors, its scope goes beyond the environmental and social responsibility of the firm and affects entirely the management of an organisation. Therefore, this element could point an additional strategic role granted to the Global Goals.

12. *Where are the SDG treated?*

13. *Does the firm provide a link to the website in the report to go in depth about the firm's engagement to SDGs?*

Questions twelve requires predefined potential answers, otherwise each firm would almost have its own answer and no univocal allocation of a firm to a category could be possible, as we shown in chapter 5. Therefore, we propose three categories for the Global Goals location: *mentioned in the initial or final part of the report, but not treated in relation to the relevant issues of the documents*; *mentioned almost exclusively in a section dedicated to SDGs (one or two pages maximum); mentioned all over the report in relation to the relevant issues.*

To the first category will be allocated firms mentioning the Global Goals as reporting frameworks used as inspiration, or organisations providing a link between the GRI disclosures and the SDGs. Based on our analysis a firm belonging to this category, would be Volkswagen for the year 2017. Indeed, the German car manufacturer did not link the SDGs to any relevant issues discussed in the report. Firms with a high level of SDG-integration in their reports will probably not choose this approach. The second approach was the most implemented across the sample from 2017. Firms dedicating one or two pages of the reports to the SDGs (and hardly mentioning them elsewhere or in connection with will fall in this category. Usually, this section encompasses the SDGs addressed mapped to the related sustainability issues, this approach requires a higher engagement than the previous one, often a reason for choosing certain SDGs is provided, however SDGs are often treated as a separate topic, rather than using it as a lens to assess all the aspects of the business. Among the firm analysed, Lenovo dealt with the Global Goals in this way. Finally, firms belonging to the third category were able to connect the SDGs to many parts of the 2017 reports. However, we observed both firms mentioning many times the Global

Goals because they linked them to relevant issues and firms mentioning them many times but not linking them to material topics. Enel and Nestlé belonged to the former, while the Chinese online trader JD.com and the Siemens belonged to the latter. This question may be used as background to assess the firm's performance using the insights above reported or different integration-score could be provided for each question. As a matter of fact, either no numerical evaluation is assigned to this answer or each category should be assigned a score increasing with the category's number. This aspect will be clearer with next paragraph's insights.

Based on our analysis, there were two kind of firm providing a link to the website concerning the Global Goals: those that disclosed a lot of information on the SDGs and suggested the readers to look at the websites for examples or updates and those that disclosed few information in the report and disclosed the biggest part of data online. We cannot evaluate the total SDG-integration level since the website is a tool that may be updated in a simple and quick way, however we stress again that the expert panel recommended Shell to report all the relevant information also in the sustainability report: "We are aware that Shell provides some information on these topics on www.shell.com but we would urge the company to ensure that sufficient depth is provided in the report on these important topics" (Shell SR, 2017). Again, based on 2017 GF 250 firms, we found that many organisations disclosing the core contribution to the SDGs in the report and providing a link to the website for additional examples and initiatives usually had high level of SDG-integration.

14. *Total benchmarks*

15. *GRI*

16. *ISO*

17. *CDP*

18. *IPIECA/DJSI/OTHERS*

Question 14 sums all the frameworks and standards used by each firm and may be useful for gathering and grasping all the sustainability engagements the firms assumed and for comparison between organisations, however it will not be part of the scoring system. Questions 15 verified whether the firm used the Global Reporting Initiative G4 guidelines to report and what "in accordance" level choose. Thus, the answer will be a slash in the

case these guidelines were not followed, or the level of reporting commitment chosen if the guidelines were followed e.g. GRI Comprehensive or Core. Question 16 will gather all the certifications from the International Standard Organisation held by a firm with the related code e.g. ISO 1400. For question 17, the same is true, besides specifying for each topic the score received or whether the score was not disclosed e.g. (Climate A) (Forest B). Often when the score received was below *B,* firms did not report it. As a matter for fact, we suggest relying not only on the report to retrieve this information but also on official source of data like the CDP webpage. In question 17, all other frameworks and Standards are collected: Dow Jones Sustainability Index inclusion (we picked firms included in any of these indexes); IPIECA; Science-Based Target with specification of type of engagement, only commitment or target set; TCFD guidelines followed, PRI signatory, Viageo World 120, FTSE blossom Japan, SDG Pioneer, IIRC.

19. *Is the firm member of the UNGC?*

20. *Does the firm follow the UNGC principle for Human Rights?*

Question 19 and 20 are the final questions of the *sustainability profile* section. were proven not to be answered in the same way for all the sample's firms, not all firms following the UNGC principles were also members of the UNGC. Thus, we suggest proposing both. The answer expected is positive or negative in both, however for the first one the type of commitment may be reported. However, we noticed to check it one the UNGC website, since some firms did not disclose the type of commitment (signatory/participant) in the report.

21. *Does the firm mention to follow the SDG Compass or any of the official documents related*[4] *to implement the SDGs inside the organisation?*

22. *Does the firm disclose who oversees the SDGs inside the organisation?*

23. *Who oversees the SDGs inside the organisation?*

24. *Does the firm seek an expert panel commentary?*

    24.b Do the experts provide useful suggestions to make the report more effective?

25. *Does the firm acknowledge that the SDGs are interconnected?*

[4] Business Reporting on the SDGs: An Analysis of the Goals and Targets

With questions 21, 22, 23, 24, 25 the section about firms' approach towards the Global Goals in the reports begins. The first two questions as well as question 25 require a positive or negative answer, the third one is viable only for the organisations disclosing who oversee the SDGs. Questions 24 and 24.b must be addressed together based on the scoring system we implemented. If both receive a positive answer, only one result will be recorded, and it will be a YES. If both receive a negative answer, only one results will be record and it will be a NO. In the case of the first question positively answered and the second one negatively, only one result will be recorded, and it will be a NO. Indeed, based on arguments revealed in chapter 6, we suggest not considering only flattering commentary as higher signs of engagement to the Global Goals. As shown above, we suggest including a slash symbol or writing *not disclosed* for the organisations which did not reported this information, to avoid leaving any cell of questionnaire empty.

26. *Are the SDGs mentioned in CEO message (this includes also Board & CSR manager)?*
27. *Does the firm mention a direct link between SDGs and corporate strategy?*
28. *The firm expressly mention to use SDGs as a sustainability framework for reporting along with others (GRI, ISO)?*
29. *Does the firm provide a rationale for engaging with SDGs?*
30. *Does this rationale is or include business reasons?*
31. *Does the firm disclose opportunities to engage with the SDGs or potential risks (of engaging and not engaging)?*
32. *Are the SDGs treated as symbol of the ever-changing economic, social and environmental situation?*

The rationale for the inclusion of the above-mentioned questions have already been explained in Chapter 7. All questions require a positive or negative answer, only for question 28 we suggest reporting the kind of rationale provided. Thus, if the answer is positive, no additional explanation is needed, if the answer is negative, we suggest reporting the type of rational provided as additional information for the evaluator to glean knowledge about the firm. This kind of question provides the context, backgrounds and depth to the analysis. For easiness of use we are suggesting gathering rationales not concerning the business case in fewer categories than the ones used for this experiment, for instance *CSR reasons, stakeholder's expectations, values, mixed rationales.* The latter

encompassing organisations providing more than one reason to engage, but not prioritising it. Questions 26 and 32 are similar, they provide insights on what role the organisation grant to the Global Goals in the report. However, while the former question's topic emerged often from the beginning, the latter question's issue was found few times across the sample but could be interesting to verify in a future analysis. In this case, some firms reported about the SDGs as a proxy for global changes and trends. We suggest proposing this question in future experiments, to understand the link between this approach and the level of SDG-integration. Indeed, as above described, firms treating the Global Goals almost only at the beginning of the report seemed to have a low level of commitment to the Global Goals, but to verify this aspect additional analysis and statistics-inferential experiments should be performed.

33. *Does the firm address any specific goal beyond the overall set of SDGs?*

34. *Does the firm pursue any target?*

Questions 33 requires a positive or negative answer, while question 34 only requires specifying the number of the targets addressed, if the answer is positive.

35. *How many goals the firm addressed?*

36. *Which one?*

To Question 35, the analyst performing the experiment should provide the number of Goals addressed by each organisation and for the following one listing all the SDGs, each followed by a comma e.g. 1,4,7,8.

37. *END POVERTY*

38. *ZERO HUNGER*

39. *GOOD HEALTH*

40. *QUALITY EDUCATION*

41. *GENDER EQUALITY*

42. *CLEAN WATER*

43. *AFFORDABLE ENERGY*

44. *DECENT WORK*

45. *INDUSTRY*

46. *REDUCED INEQUALITIES*

47. *CITY & COMMUNITIES*

48. *RESPONSIBLE CONSUMPTION & PRODUCTION*

49. *CLIMATE ACTION*

50. *LIFE BELOW WATER*

51. *LIFE ON LAND*

52. *PEACE & JUSTICE*

53. *PARTNERSHIPS*

The questions going from number 37 to number 53 only need a yes or not as answer. They are structured in this way for easiness of use in Microsoft Excel, for instance using filters to perform comparisons among organisations in the same sector.

54. Does the firm do a value chain analysis to find the most positively and negatively impacted SDGs?

We rephrased the question about the impact assessment previously located in the SDG-related goals section. Indeed, we noticed that no firm had implemented this approach as revealed in the SDG Compass. However, we noticed that the firms across the sample developed another attitude to operationalise the Global Goals. To enhance representativeness, the question was rephrased and displaced from the last section of questions to the one concerning *Goals and target addressed*. It was made simpler, from *"Does the firm map the SDGs against the value chain to identify high-impact areas (positive and negative) and find gaps in the sustainability strategy implemented? (impact assessment)"* which involved several actions to question 54, potentially fitting more approaches. Moreover, by bringing it backward to section 3, it may be at the heart of the Goals' choice and help explain it. Please refer to the section dedicated to the value chain in Chapter 6 for details. Overall, the simpler the structure of the question, the wider the range of entities it represents. Yet we suggest implementing this approach because of the little maturity the largest 250 firms worldwide still showed in 2017.

55. *Are the SDGs involved in the materiality analysis?*

Following previous question, we propose also question 55 for the final questionnaire. As for question 54, it may help in identifying what led the firm's choice, even if it does not report them. The link between the materiality analysis and SDG-reporting emerged from the sample's observation, four main ways of treating it were noticed along that led to the definition of the codes we propose: SDGs as input of the materiality analysis, output of the materiality analysis, both input and output of the materiality analysis and SDGs as one of the material topics. Please refer to chapter 5 and 6 for details about the meaning of the codes. The answer may help in understanding what role the firm grants to the Global Goals and how it conceives this framework. For instance, it may be interesting to verify whether the firm making the SDGs both input and output of the materiality analysis, better integrated the Global Goals in the business or choosing the Goals aligned with material topics helps in choosing the one with the highest impact. Also, this question may allow to check whether using the SDGs as material topics per se (e.g. as international project) reduces the level of operationalization in the report.

56. *Does the firm provide a reason for the choice of the goal?*

57. *Is the choice impact-based?*

58. *Does the firm disclose how they measured this impact?*

59. *Does the firm prioritize the goals?*

60. *What are the goals prioritised?*

61. *Is there a rationale provided for prioritization?*

62. *Is the prioritization impact-based?*

Question 56 to question 62 focus on the choice and prioritization of the SDGs and targets. All questions require a positive or negative answer, besides question 60 where the Goals prioritised should be reported. We observed that few firms did a progressive prioritisation, indeed most organisation did a two-levels prioritization. In any case, we suggest gathering the SDGs granted the same relevance in brackets and use distinguishing marks for different levels of prioritization e.g. in case of two-step prioritization (1,2,4)

(5,3,9) e.g. in case of progressive prioritization (1), (2), (4). Additionally, we suggest defining and collecting categories for question 56 and 61 beyond positive or negative answers.

For question 56, in case of negative answer no additional information is needed. In case of positive answer, we suggest collecting information thorough simple predefined codes: alignment with the sustainability strategy, relevance for the firm, potential contribution/impact, other or mixed rationales. Providing a reason, any reason for the choice of the Goals witnesses understanding and alignment of the Global Goals framework leading to increase accountability before stakeholders.

However, the SDG Compass and other institutional sources stressed the importance of putting efforts on those issues that may be most influenced given the strategy and operations of the firm, thus we added two specific questions (57 and 62). Indeed, in Chapter 6 we showed the example of Panasonic, technology giant, operating in the electronics industry and (as reported) focussing its impact on SDG14, providing sustainable seafood in the canteens of two sites. We showed that its peers, addressed and prioritised other Goals and even more we called into question the choice of the initiative to tackle SDG 14. As a matter of fact, it was not linked to the core business of the firm but was a useful but juxtaposed activity keeping unchanged the business-as-usual attitude of the firm and the sector. Please refer to Chapter 6 for details.

Question 58 was added because many firms reported to have chosen the SDGs to addressed based on the impact or contribution the firm could provide. However, no data for this impact was provided, nor description of the characteristics of it, nor a mention to the impact the issue had on the business, this mutuality was seldom reported. Please refer to Chapter 6, on the section about the SDGs addressed, especially to Unilever and Allianz's example.

The same predefined codes used for question 56 may be applied to question 61 and we propose to verify the impact reported also in the case of prioritization.

63. Does the firm engage more with internally or externally actionable SDGs? (Zanten, 2018)

64. Does the firm engage more with SDGs doing good or avoiding harm? (Zanten, 2018)

We propose for the final questionnaire to verify the potential distinctions described by Zanten (van Zanten and van Tulder 2018), concerning the characteristics of the targets

addressed by each organisation. In cross-sectional studies like the one proposed in this work, this analysis may be useful to monitor the attitude the largest MNC's have when engaging with the SDGs. To define whether a firm mainly engaged with one type or another of the SDGs targets, we aligned each target addressed to one element of the summary list of targets created by Zanten Each element of that list was classified both for the actionability and the positive or negative orientation. We recorded the two attributes for each target addressed by each firm and counted the number of targets with a certain attribute. Eventually, each firm was characterised by the most recurrent attributes for each category e.g. in 2017 Mitsui engaged more this "Externally actionable" targets oriented at "doing good" (*ibidem*).

65. Does the firm disclose any negative impact it had on the SDG-related goals and the adjustment made?

Question 65 requires only a positive or negative answer, we recommend verify not potential impact, but past happened negative impacts.

66. Does the firm do any kind of mapping of ESG issues to SDGs?

65.b Are these topics the priorities for the firm's sustainability strategy?

Questions 66 and 66.b must be addressed together based on the scoring system we implemented. If both receive a positive answer, only one result will be recorded, and it will be a *YES*. If both receive a negative answer, only one results will be record and it will be a *NO*. In the case of the first question positively answered and the second one negatively, only one result will be recorded, and it will be a *NO*. Consequently, the firm will not receive an additional point, since as arguments in chapter 6 revealed if a "loose" mapping is performed, but the priorities for the sustainability strategy are not included this does not witness a higher SDG-integration level, on the contrary the organisation does not show a relevant understanding and commitment to the Global Goals. However, as previously described some sector do not fit very well in this mapping concept, for instance the financial sector. In this case the first question may be negatively answered while the second one positively. Thus, we suggest considering it as a yes for the financial sector. In future this exemption may be applied to other sectors, if this misalignment is demonstrated.

67. Does the firm list specific existing initiatives aligned to the SDGs pursued?

68. Does the firm disclose its contribution through these initiatives, providing quantitative data of impact?

Questions 67 and 68 requires only a positive or negative answer, they should be separate because a firm may mention the initiative through which it contributes to the Global Goals but not disclose any quantitative data related to them. For details about these topics, please refer to Chapter 6 analysis. Along the experiment, the question about the firm monetarizing the impact it has on the SDGs was removed, because the only organisations disclosing this data were the one contributing to the Global Goals through philanthropic activities like fundraisings. For instance, in 2017 State Grid reported the amount of money donated to contribute to Global Goals through its philanthropic activities, while Unilever whose reporting based on the evidences shown in the previous chapters has integrated the SDGs in many aspects of the business mainly reported as proxy of impacts tonnes of waters, additional number of shower or hand washed per person, grams of sugar reduction in snacks for kids, women reached with Dove self-esteem project (Unilever SR, 2017; State Grid SR, 2017).

A brief summary about best practices for disclosing mapping and contributions emerged throughout the experiment. The reports often are not clear and simple, linking each SDG to the initiatives, project, partnership that tackles it, and putting the contribution near. If it has been done for multiple years, a table (better graphically) describing the contribution over the years near the section where the SDG and topic at issue are treated is important. If the project is contributing to an SDG-related goal, should be stated. A summarising table with SDG pursued, goals, contribution, deadlines and progress done and ongoing is helpful. Putting SDG icons and mapping is not enough for a firm. At least the addressed SDGS must be highlighted, indicated. The firm should state what SDG she chooses.

69. Does the nature of the firm's contribution is more core business oriented or more philanthropic?

Based on what stated above, we added question 69 to the final questionnaire. Clearly, the average type of contribution should be assessed by the evaluator. We propose some insights in section 6.10 and suggest counting the types of initiatives of each type as done for questions 63 and 64 to enhance objectivity.

70. Does the firm identify SDGs-specific goals?

71. *Are they SMART?*

72. *Does the firm disclose the KPI chosen to track performance for SDG-related goals?*

73. *Are the measures provided by the KPI quantitative?*

74. *Can progress be measured YoY?*

75. *Has the firm defined new ambitious goals stemming from the SDGs engagement? Or has it implemented/widened SDGs?*

Questions from 70 to 75 only require a positive or negative answer and their relevance was confirmed throughout the experiment. Even if few firms operationalized these Goals For insights on how a scorer may verify firms' compliance please refer to Chapter 5 and Chapter 6, section 6.5.

76. *Has the firm established partnerships to better pursue SDGs and clearly reported this link?*

77. *Does the firm disclose partnerships' contribution to SDGs through KPIs providing quantitative data?*

78. *Do suppliers have a role in the firm's commitment to SDG-related Goals?*

79. *Does the firm provide quantitative data about suppliers' effort in supporting the SDG-related Goals?*

Questions 76 to 79 are gathered in the section about collaboration and only require a positive or negative answer. As disclosed in Chapter 6, a clear mention to the SDGs framework is necessary, since, based on this sample evidences, partnerships are a well-established approach in the private sector beyond 2030 Agenda. Question 78 was simplified, as the question concerning impact assessment, to increase representativeness. Indeed, only four firms mentioned the Global Goals when describing collaboration with the suppliers and only one reported the contribution to the SDGs.

For both questions 77 and 79, regularity of disclosure is not included in the criteria for compliance given the limited maturity of the SDG-reporting showed by the largest firms of the world in 2017. It could be added in future if private sector's SDG awareness increase, as described in Chapter 6, section 6.6.

The final section concerning *Other integrating elements of very engaged firms* was redesigned after the experiment. To streamline the questionnaire, we removed the

questions about the SD in general included as compensation criteria: "Is the performance towards sustainable development part of the compensation system?". We initially included it to check the relevance of the questions and wide the range analysis to gather insights, however question 80 is at the same time representative and punctual.

80. Is the performance towards SDGs part of the compensation system?

81. Are SDGs cited in the external assurance?

Similar approach for the external assurance, in the final questionnaire the straightforward question is included, indeed having an external assurance with no mention to the Global Goals that does not reveal an higher SDG-integration level. Indeed, Rosati showed that firms having their reports externally assured were more to address the SDGs in their reports, but this in only a potential correlation and this questionnaire aims to verify actual characteristics. Please refer to table 11 for the final questionnaire.

7.1 The assessment approach

This section will focus on the assessment approach used to evaluate the SDG-integration level of each firm. On account of the limited space available, in the last chapter, only the questionnaire could be disclosed, since the Microsoft Excel file where data had been gathered had about 22 thousand cells of data. This document provided a full picture about the SDG-reporting practices of the across the sample, however "is difficult to communicate to non-expert stakeholders" (Hubbard 2009). Moreover, firms were proven to be "complex entities that need complex measures" as well as examples of "the effectiveness of simplicity" (*ibidem.).* As shown in chapter 4, the experiment was carried out from a quantitative and qualitative point of view to reduce the bias each method implied. Thus, inspired by Atkinson and Hatcher's work on the sustainability index (Atkisson and Hatcher 2005), we created a questionnaire reflecting qualitative and quantitative dimensions concerning reporting on the Global Goals. Each dimension was investigated through one or more questions.

The qualitative dimensions aimed at assessing the level of integration of the Global Goals inside the business. Most of the questions examined the qualitative aspect. For each question the answer could be a Boolean variable (true/false) or could provide contextual information. Concerning the latter, sometimes positive or negative answers were not

applicable to certain aspects of a firm. For instance, if an organisation was an holding with subsidiaries producing each their reports, thus excluded from the study, like EXOR S.P.A., any aspect after question n. 7, industry, could not be answered. If using Microsoft Excel, we considered suitable and suggest not leaving empty cells, but using a symbol like a slash to avoid mistakes when counting and checking the results. As described in chapter 4, the questions were structured to reflect a better performance in case of positive answer. The aim being to obtain a single final indicator, each positive answer represents one point. All questions are worth one score. The final indicator would be the sum of all points. Negative answers and context information were not accounted for.

To consider the quantitative dimension, word-counting was proposed, as shown in Chapter 4. Words related to the Global Goals were counted and summed for the sustainability and financial report separately. The words to verify were *sdg, SDG, sdgs, SDGs, Sustainable Development Goals, Sustainable Development Goals, Global Goal, Global Goals, Target, Agenda, Compass*. Capital letters were not accounted for as well as repetitions of words part of layout or index was not considered 5. The aim was to obtain a second final indicator reflecting amount of disclosure.

As Hubbard affirmed: "a single sustainability indicator is intuitively attractive and consistent with single economic indicators" (Hubbard 2009). It improves the effectiveness of communication: may be compelling for stakeholder, but also used for to management awareness and decision-making. Moreover, it makes intersectoral comparisons and benchmarks easier. To enhance comparability, especially intersectoral, these indicators were turned in ratios.

The Disclosure Coverage Ratio reflected the quantitative dimension. It represented the number of SDG-related words over the number of report pages. Two separate indicators were derived in case of separated reports.

The SDG-Integration quality ratio reflected the qualitative dimension. To compute it, the first step was counting the positive answers (e.g. the points each firm obtained). Then, this score was reduced by the number of goals addressed, because, the choice of the SDGs to address were included in this sum, but the number of Goals chosen did not express a lower or higher level of SDG-integration inside the business, as we described in chapter 6.

[5] For this work experiment, Adobe Acrobat Reader DC was used for word-searching.

Finally, the number obtained is divided by the potential number of positive answers the questionnaire has. Basically, this ratio reflected the reporting quality a firm had, compared to the maximum reporting quality it could have had.

The average number of words related to the Global Goals in SR and IR found was 16, while the same computed for the firms mentioning the Global Goals in the AR was 5.7. The average number of pages the SR and IR analysed had were 122.5, the average number of pages the AR analysed had were 249. Thus, the average coverage disclosure ratio emerged from the SR and IR analysed was 17%, while the same computed for the AR analysed was 4%. For the qualitative dimension, the average number of questions positively answered was 6.4. Thus, the average SDG-integration quality ratio is 26%. Clearly, these results were not representative of the different approaches showed by the sample but were only the arithmetic average of single results.

In Figure 83 and 84, the distribution's results of the Disclosure Coverage Ratio respectively for the SR and IR analysed and for the AR analysed. From the graph, we observe that most firms' disclosure coverage ratio distribution gathered around the mean, about 17%. Few firms disclosed from 30% onward, with some outliers represented by Siemens, Aviva and Bosch which had respectively a ratio of 188%, 95% and 93%.

Concerning the same ratio computed for AR, most of the firms having mentioned the SDGs in their annual reports has a ratio below 8%, only three firms are characterised by ratios above 8%, respectively Hitachi with 34%, Cisco System 30%, Unilever 19%.

Compared to the quantitative indicator, the ratio reflecting qualitative information had a more homogenous distribution, as shown in Figure 85. Assumed that the higher the ratio, the better the performance of the firm towards SDG-reporting, 22 organisations performed well below the mean with a results ranging from 3% to 12%, 35 firms had a results worse than the average (26%), the largest group of firms, 49 out of 156, receive a score near to the average mean. Thus, for two third of the firms, 106 units, performance was similar or worse than the total average. The remaining 50 firms showed a better performance, 38 firms were characterised by an SDG-integration quality ratio ranging between 30% and 48%. 12 firms outperformed their peers, with a result going from 48% to 75%. The highest ratio was showed by Unilever with 75% (with 30 out of 38 questions positively answered), followed by Nestle', Enel, Ford Motors and Hitachi.

These graphs revealed better the situation of the sample and even though qualitative and quantitative perspective were considered when analysing the performance of the sample, yet the issue of two different measures still existed, making the communication and use of the results less effective than a single, compelling indicator. To remedy, we proposed a way to communicate these results.

The most recent applications of the method we used to account for quantitative disclosure was implemented by Bowhman and Hair in 1976, and Trotman and Bradly in 1981. The authors measured the quantity of CSR disclosure as percentage of total disclosure. "In order to measure or scale the level of such activities, the authors chose to measure the amount of discussion of such activities, line-by-line, in the annual report as a percentage of total discussion of all issues" (Bowman and Haire 1976; Trotman and Bradley 1981). The first two authors divided the sample in 4 disclosure ranges (1% - 6%, 6% - 12%, 12% - 18%, over 18%) showing that the largest group of firms belonged to the lowest disclosure ranges. The same ranges were used in this work's experiment and the organisation's sample was divided among the four groups.

Please refer to Table 12 for the summary results of the experiment and framework application. The first 15 firms showed in the table had a Disclosure Coverage ratio above 18%, based on Bowhman and Hair's work as well as considering the average mean of the ratio across the sample (17%), this criteria was introduced to limit scorer's subjectivity as supported by Lee's work (Lee 2017). However, it is important to underline that controversial findings still exists between quantity of disclosure and sustainability performance following the debate on the predominance of legitimacy theory or voluntary disclosure theory. Thus, based on the univocal relationship between high-quality disclosure and high sustainability performance found by Hummel (Hummel, 2017), we did not define any threshold for the quality disclosure assessment, but we ranked the firms' performance from the highest to the lowest.

The first 15 firms according to this framework's proposals were in order: Unilever with a Coverage Disclosure Ratio of 50% and an SDG-Integration quality Ratio of 79%. Following by Nestle' with respectively 56% and 66%. Enel ranked third, with a lower coverage disclosure ratio (19%) and 61% of SDG-integration quality ratio. Hitachi had the fourth place in the list, with a much higher indicator reflecting quantitative information, 61%, while the indicator reflecting qualitative information is at 58%.

From the fifth firm to the fifteenth, in order: Vodafone Group (18%; 55%) Allianz (60% and 53%), Johnson & Johnson (21%; 53%), Intel (28%; 50%), Tesco (25%; 50%), Wilmar (35%; 47%), Aviva (95%; 47%) KDDI (20%; 45%), POSCO (19%; 45%), BNP Paribas (40%; 45%), Deutsche Telekom (21%; 42%).

The most represented sector in the list were the financial sector (Allianz, Aviva, BNP Paribas) and Telecommunication sector (Vodafone Group, KDDI, Deutsche Telekom), followed by the Technology (Hitachi, Intel) and Food & Beverages (Nestle', Wilmar). Finally, the following sector had one presence in the list: Unilever in the Household Products' sector, Enel in the energy sector, Johnson & Johnson in the Healthcare sector, Tesco in the Food and Drug Store's sector, Posco in the materials' sector. All firms were listed in the Stock Exchange and were public. Only Enel had a state participation in its shareholder's base.

Some positive signs of this framework's robustness emerged. First, 8 out of 13 firms (61.5%) producing two separate documents for corporate reporting mentioned the Global Goals both in the sustainability report and annual report. Hitachi was the firm disclosing more information about the SDGs in the AR, with a Coverage Disclosure Ratio of 34%, followed by Unilever (19%), Nestle' (13%) and Deutsche Telekom (7.2%). As we shown in previous chapters, this is a positive sign of integration. The most represented country of origin in the list (60%) was Europe. This was in line with what Oxfam and KPMG found in their studies(Mhlanga, Gneiting, and Agarwal 2018; Blasco, King, and Jayaram 2018). Asia had three presences in the lists and North America two. 10 out of these 15 firms were listed in at least one of the DJSI, 7 were listed in the Viageo World 120 ranking and the same number of firms had set or committed to set published goals through the Science-based Targets. 13 out of 15 were members of the UNGC, 11 firms participated in the CDP and received a score not below B in all categories, 10 had ISO certifications, 6 followed the TFCD guidelines and 3 the PRI.

Conclusions: contributions limitations and future researches

This work provides a way to define and measure the integration's maturity of the Global Goals within any business through the analysis of corporate reporting documents, mainly non-financial but also financials.

Thus, providing stakeholders (particularly potential investors) with a tool to assess the level of engagement of a firm to the SDGs. Indeed, in the framework proposed are outlined the following: the questions treating the most relevant issues concerning the SDGs, the approach to interpret the answers in the reports accounting for the characteristics of special industries e.g. financial sector, a method to derive two ratios reflecting quantitative and qualitative dimensions. The bottom line is that firms having low results in both dimensions are potentially characterised by a low level of engagement to Global Goals, acknowledging the importance of showing the SDGs' logo in their reports but mainly as a commercial opportunity. While firms showing a low qualitative result, but an high quantitative result appear to treat extensively these topics in the report, but do not show much integration in the core business, thus the possibility to be affected by the 2030 Agenda. These two attitudes could intentionally or not lead to the so-called phenomenon of SDG-washing, since low integration may come from low understanding of the SDG framework that may lead to inconsistent decisions in the sustainability strategy. Indeed, as we have seen in Chapter 6, any organisation have in the same time a positive and negative impact on Sustainable Development and the Sustainable Development Goals are an interconnected set of goals for which it is essential to accurate examine the trade-offs, to avoid having a negative influence higher than a positive one at the end of the day. On the other hand, organisations with high results in both dimensions of reporting are potentially characterised by a high level of engagement and integration of the Global Goals in their business.

This work shows also some limitations that could be used as future researchers' hints. First, as any study based on content analysis of corporate reports, also this one faced the constraints of analysing what firms say about themselves, rather the actual performance. Second, for reason of scope we only analysed the 250 largest firms worldwide and this may have led to sample's bias. Third, the debate about the advantages and shortcomings

of using word-counting rather than sentence-counting is on-going with controversial findings. Fourth, we analysed only a part of the non-financial disclosure, since we excluded web content from this study, for reasons explained in Chapter 3 and 4. However, studying the website we could have understood better the actual performance, having more data available, as in the case of Shell. Fifth, being the sample international, the reports examined has slightly different reporting time frames, thus European firms used as time horizon 1st of January to 31st of December, United States' used 1st of February to 31st of January, Japanese ones used 1st of April to 30th March. Sixth, only one analyst examined the reports and inserted data into Microsoft Excel sheets, this could have led to digitations' mistakes or analysis bias. Finally, in the questionnaire all positively answered questions were scored one point, even though they represented different levels of SDG engagement: positive answers in the first section of the questionnaire are less relevant for SDG-integration level than positive answers in the last sections, since the questionnaire was structured to reflect an increasing level of engagement.

The SDG-maturity assessment method proposed in this work is not perfectly representative of the actual SDG-integration situation of the firms. Indeed, the qualitative aspect is more important than the quantitative since to extract information from data judgement is essential and questions are not weighted based on their relevance. Moreover, the low level of standardisation in sustainability and SDGs reporting makes everything more ambigous such as the lack of a threshold to define something sustainable. The bottom line is that using numerical summary indicators to communicate about qualitative dimensions has some relevant shortcomings. On the other hand, using indicators may help communication, debate and benchmarks on such complex issues as SDG-reporting (the idea behind any sustainability ranking). Beyond this study's scope, the creation and use of these indicators is based on the fact that the level of not representativeness of the results is compensated by a numerical summary measure of SDG-engagement. Clearly, this compensation is reduced if results are not accompanied by some specific remarks about each firm's practice accounting for the shortcomings of "measuring" quality dimensions.

If after having proposed remedies for certain extent of not representativeness due to the use of a numeric single indicator, this approach (the one we propose or any other framework) is still considered biased, unacceptable as tool to make decisions and

eventually useless, the bottom line is that SDGs cannot be measured and as the saying goes “If you can't measure it, you can't manage it”. Any kind of framework reducing such a complex situation into a numeric dimension to benchmark performances would meet similar shortcomings. Based on these remarks, two aspects are important to consider in this regard: first, any indicator or index trying to communicate all the sustainability dimensions a corporation supports should be called in question for its effectiveness. Second, as everything in the current economic system the world operates, corporate reporting is based on an essential element, mutual trust. While social trust decreases, mechanisms for monitoring, assurances and sanctions increase. Focussing only on the latter, creating and refining certification systems and forgetting to deal with the former will hardly create a more accountable and trustworthy system.

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Appendix: tables and figures

Figure 1 (Szennay et al. 2019)

Figure 1: Cross cutting themes of SDGs

Source: GreenBiz

Figure 2 - Food, Water, Energy nexus (Nilsson, Weitz, and Davis 2014)

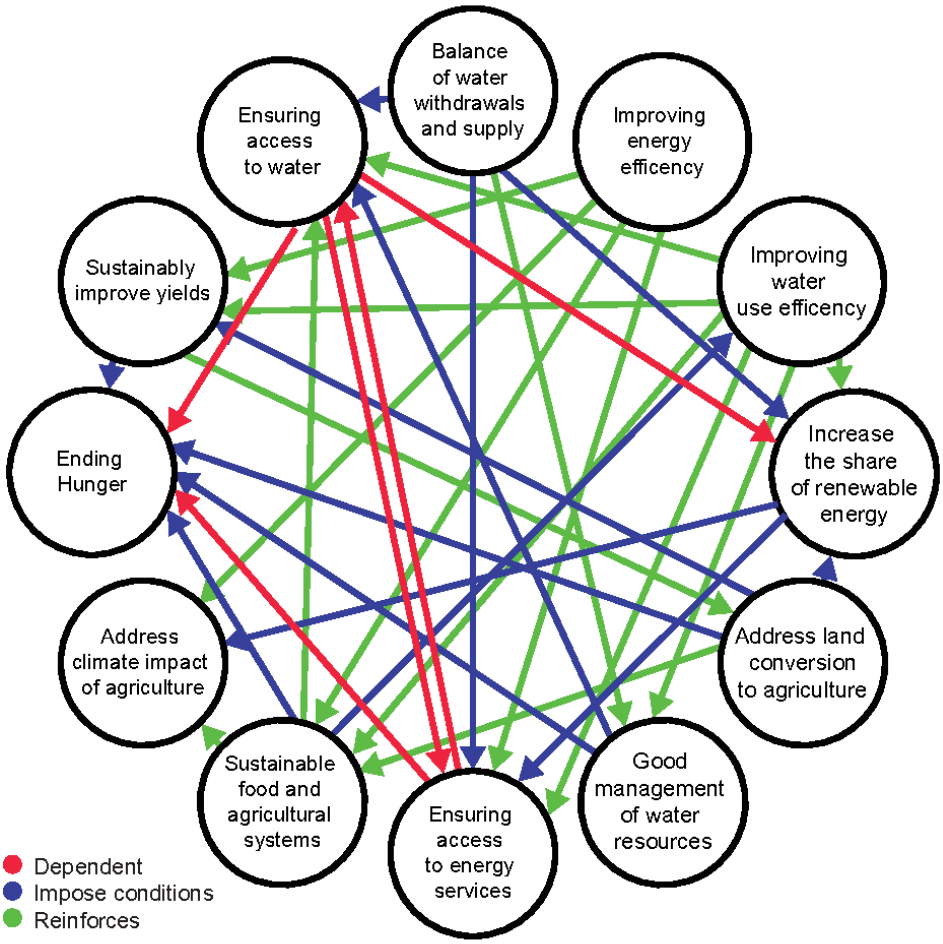


Figure 2: Interactions between proposed water, energy and food targets.

Figure 3 - SDG integration into corporate sustainability strategy (Ruth, Uwe, and Namit 2018)

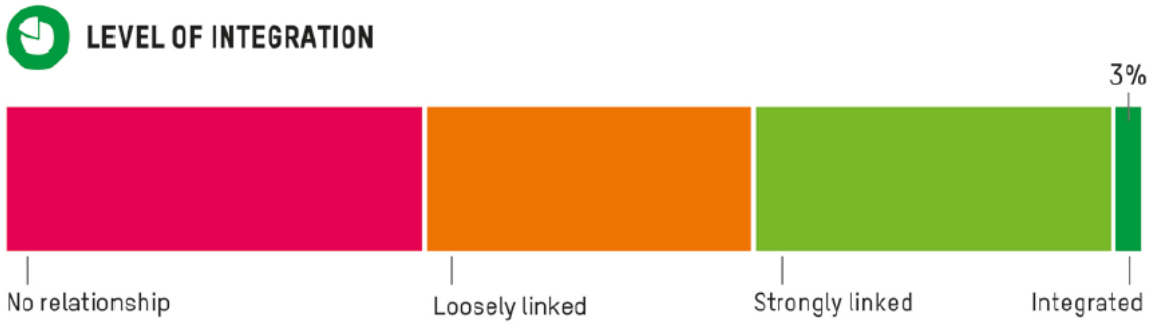


Figure 4 - SDGs integration criteria

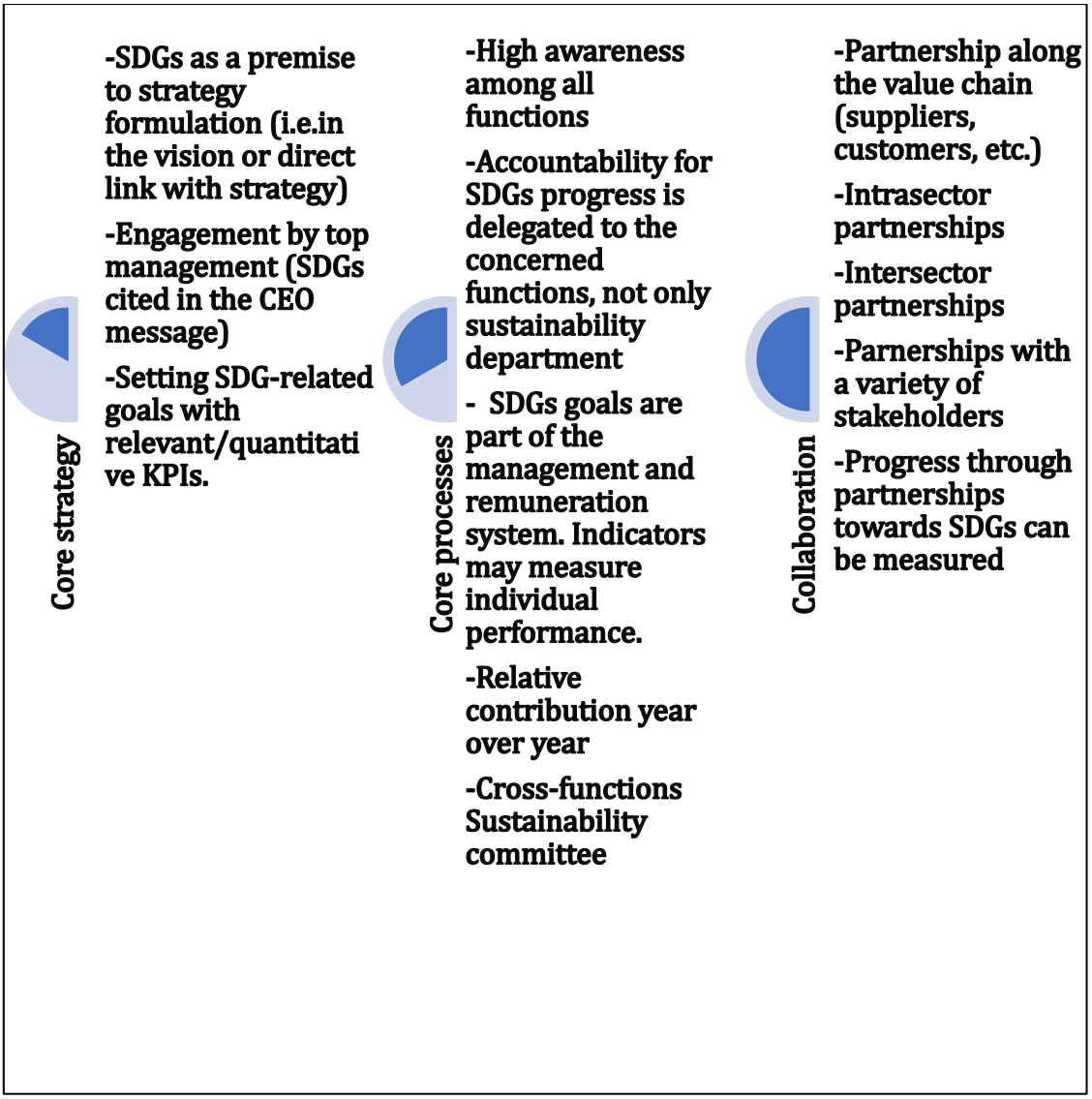
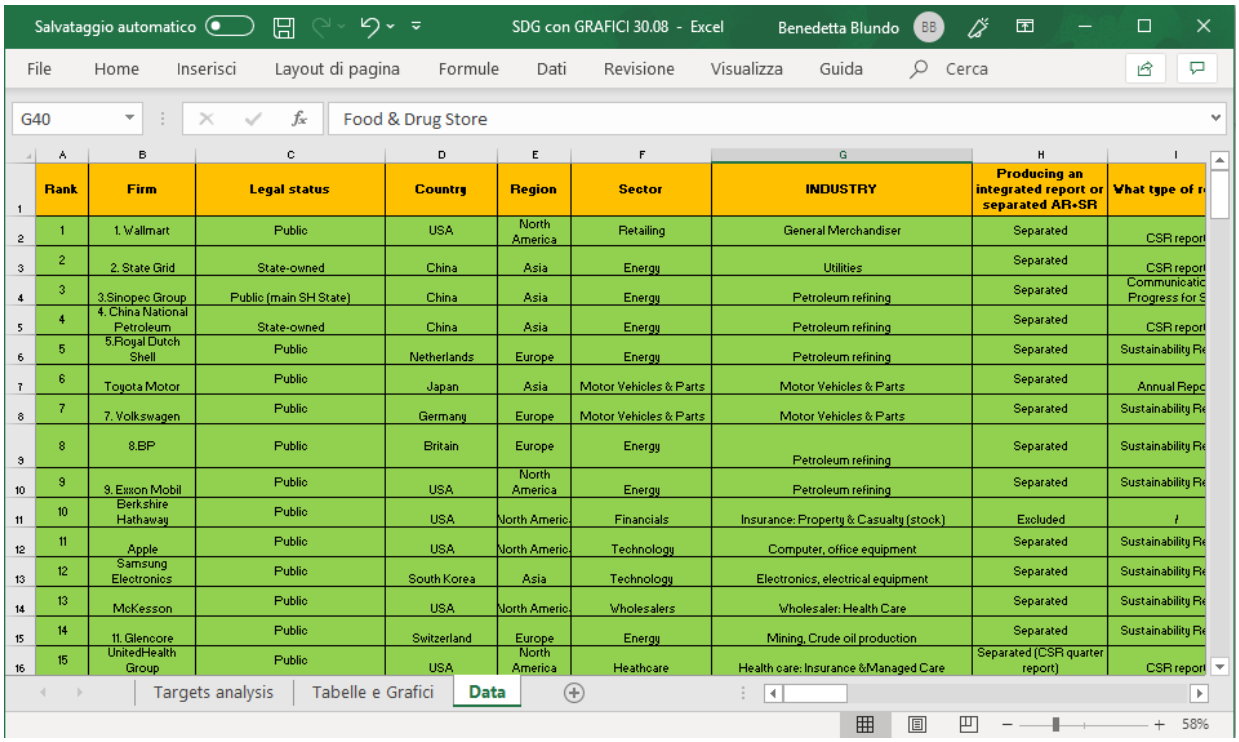


Figure a. – Excel worktable at a glance



Rank	Firm	Legal status	Country	Region	Sector	INDUSTRY	Producing an integrated report or separated AR+SR	What type of r
1	1. Wallmart	Public	USA	North America	Retailing	General Merchandiser	Separated	CSR report
2	2. State Grid	State-owned	China	Asia	Energy	Utilities	Separated	CSR report
3	3.Sinopec Group	Public (main SH State)	China	Asia	Energy	Petroleum refining	Separated	Communicatio Progress for S
4	4. China National Petroleum	State-owned	China	Asia	Energy	Petroleum refining	Separated	CSR report
5	5.Royal Dutch Shell	Public	Netherlands	Europe	Energy	Petroleum refining	Separated	Sustainability Re
6	Toyota Motor	Public	Japan	Asia	Motor Vehicles & Parts	Motor Vehicles & Parts	Separated	Annual Repo
7	7. Volkswagen	Public	Germany	Europe	Motor Vehicles & Parts	Motor Vehicles & Parts	Separated	Sustainability Re
8	8.BP	Public	Britain	Europe	Energy	Petroleum refining	Separated	Sustainability Re
9	9. Exxon Mobil	Public	USA	North America	Energy	Petroleum refining	Separated	Sustainability Re
10	Berkshire Hathaway	Public	USA	North Americ	Financials	Insurance: Property & Casualty (stock)	Excluded	/
11	Apple	Public	USA	North Americ	Technology	Computer, office equipment	Separated	Sustainability Re
12	Samsung Electronics	Public	South Korea	Asia	Technology	Electronics, electrical equipment	Separated	Sustainability Re
13	McKesson	Public	USA	North Americ	Wholesalers	Wholesaler: Health Care	Separated	Sustainability Re
14	11. Glencore	Public	Switzerland	Europe	Energy	Mining, Crude oil production	Separated	Sustainability Re
15	UnitedHealth Group	Public	USA	North America	Heathcare	Health care: Insurance &Managed Care	Separated (CSR quarter report)	CSR report

Table 1 – First draft of questions

1. Rank in GF 250 list 2. Firm's Name 3. Country 4. Sector 5. Does the firm produce only an annual report with ESG data or also a sustainability (ESG/CSR) report? 6. Are the SDG mentioned in corporate reports?	7. Are the SDGs mentioned in AR or SR or both? 8. Where are SDG treated inside the reports? 9. Are the SDG mentioned in the CEO Message in AR? 10. Does the firm mention a direct link between SDGs and corporate strategy? Do SDGs have a role in the implementation of the firm's strategy according to the firm?
11. Does the firm mention to use SDGs as a sustainability framework? 12. Does the firm pursue all or some SDGs? 13. How many SDGs? 14. What SDGs?	15. END POVERTY *yes/no* 16. ZERO HUNGER *yes/no* 17. GOOD HEALTH *yes/no* 18. QUALITY EDUCATION *yes/no* 19. GENDER EQUALITY *yes/no* 20. CLEAN WATER *yes/no*
21. AFFORDABLE ENERGY *yes/no* 22. DECENT WORK 23. INDUSTRY *yes/no* 24. REDUCED INEQUALITIES *yes/no* 25. CITY & COMMUNITIES *yes/no*	31. PARTNERSHIPS *yes/no* 32. Does the firm acknowledge to follows the Global Compass, especially for choosing relevant indicators to measure contribution to SD?

26. RESPONSIBLE CONSUMETION & PRODUCTION *yes/no* 27. CLIMATE ACTION *yes/no* 28. LIFE BELOW WATER *yes/no* 29. LIFE ON LAND *yes/no* 30. PEACE & JUSTICE *yes/no*	33. Does the firm provide a rationale for choosing the SDGs addressed? 34. Are they prioritized? 35. Is there a rationale for prioritization disclosed? 36. What is the first goal prioritised?
37. Does the firm map and align its sustainability priorities across the SDGs? 38. Does the firm list specific existing initiatives that may be aligned to the SDGs? 39. Does the firm map the SDGs against the value chain to identify high-impact areas (positive and negative) and find gaps in the sustainability strategy implemented? 40. Does the firm identify SDGs-specific goals? 41. Are they SMART?	42. Are they stemming from the impact assessment? 43. Does the firm disclose the KPI chosen to track performance for SDG-related goals? 44. Is the choice explained? 45. Are these KPIs chosen to represent contribution the previously defined high-impact areas 46. Are the measures provided by the KPI quantitative? 47. Does the firm mention target behind the goals pursued too?
48. Does the firm pursue specific targets? 49. Does the firm implement a materiality analysis? 50. Does the firm specify that the impact is on SD not on the firm? 51. Does the firm mention the stakeholders involved in the materiality process, what are the tool to engage with them ad how many times per year this engagement happens? 52. Is the choice/prioritization of SDGs and targets based on the materiality analysis?	53. Does the firm acknowledge that SDGs are interdependent? Is there a signal showing this? 54. Does the firm provide the business case for engaging with SDGs? 55. Does the firm cite opportunities, risks, costs, benefits to engage? 56. Does the firm disclose the negative impact it has on the SDGs? 57. Is this impact expressed also in monetary terms?
58. Does the firm engage more with Internally or externally actionable SDGs? (attach Zanten's list) If external 59. Does the firm engage more with SDGs doing good or avoiding bad? *If doing good* 60. What sustainaiblity standard does the firm use? 61. Does the firm follow UN Global Compact Principles? 62. Does the firm have a third-party assurance? 63. Is there a sustainability committee?	64. Is the sustainability committee cross-functional? 65. Is there a sustainability expert in the BOD? 66. Are the values of the organisation aligned with the SDGs pursued? 67. Has the firm established partnerships to better pursue SDGs? 68. Has the firm brought on board suppliers/customers to support its SDGs-related performance goals?

Table 2 - Revised set of questions

General Information 1. Rank 2. Firm 3. Legal status 4. Country 5. Region 6. Sector 7. Industry	8. Producing integrated/separated reports? 9. What type of report? 10. Are SDGs mentioned? Yes – No 11. Where are they mentioned? AR – SR – Both 12. Where are the SDG treated? 13. Is a link to the website provided to go in depth on the firm's engagement to SDG?
14. Are GRI guidelines followed? 15. Are ISO certification held? 16. Do the firm participate in CDP? 17. Are other standards/awards held? 18. Is the firm member of the UNGC? 19. Does the firm follow the UNGC principle for Human Rights?	*SDGs approach* 20. Does the firm mention to follows the SDG Compass to implement SDG inside the organisation? (Blasco, King, and Jayaram 2018) 21. Does the firm disclose who oversees the SDG inside the organisation? (Mhlanga, Gneiting, and Agarwal 2018) 22. Who oversees SDGs inside the organisation? (Oxfam, 2018) 23. SDG mentioned in CEO/CSR manager message? (Scott and McGill 2018)
24. Does the firm mention a direct link between SDGs and corporate strategy? (Scott and McGill 2018)) 25. The firm expressly mention to use SDGs as a sustainability framework for reporting along with other ones (GRI, ISO)? 26. Does the firm provide the business case for engaging with SDGs? (Donoher, 2018) 27. Does the firm cite opportunities, risks, etc of engaging SDGs? (Blasco, King, and Jayaram 2018)) 28. Does the firm acknowledge that the SDG are interconnected? (Nilsson and Mccollum, 2016))	*Goals and targets addressed* 29. Does the firm address any specific goal beyond the overall set of SDGs? 30. Does the firm pursue any target? ((Blasco, King, and Jayaram 2018)How many goals the firm addressed? 31. Which one? 32. END POVERTY *yes/no* 33. ZERO HUNGER *yes/no* 34. GOOD HEALTH *yes/no* 35. QUALITY EDUCATION *yes/no*
36. GENDER EQUALITY *yes/no* 37. CLEAN WATER *yes/no* AFFORDABLE ENERGY *yes/no* 38. DECENT WORK 39. INDUSTRY *yes/no* 40. REDUCED INEQUALITIES *yes/no* 41. CITY & COMMUNITIES *yes/no* 42. RESPONSIBLE CONSUMETION & PRODUCTION *yes/no* 43. CLIMATE ACTION *yes/no* 44. LIFE BELOW WATER *yes/no* 45. LIFE ON LAND *yes/no* 46. PEACE & JUSTICE *yes/no*	47. PARTNERSHIPS *yes/no* 48. Is there a rationale provided for the choice of the goals? (Scott and McGill 2018) 49. Are the goals addressed prioritized? (Scott and McGill 2018)What are the goals prioritised? 50. Is there a rationale provided for prioritization? (Blasco, King, and Jayaram 2018) 51. Are SDGs involved in the materiality analysis? (Mhlanga, Gneiting, and Agarwal 2018) 52. Does the firm engage more with Internally or externally actionable SDGs? (van Zanten and van Tulder 2018) 53. Does the firm engage more with SDGs doing good or avoiding harm? (van Zanten and van Tulder 2018)
Compliance: Linking existing sustainability strategy to SDGs	60. Are the measures provided by the KPI quantitative? (Scott and McGill 2018) 61. Can progress be measured YoY?

54. Does the firm do a sort of mapping of sustainability topics to SDGs? Are these topics the priorities for the firm's sustainability strategy? (Mhlanga, Gneiting, and Agarwal 2018) 55. Does the firm list specific existing initiatives that may be aligned to the SDGs pursued? (Mhlanga, Gneiting, and Agarwal 2018) 56. Does the firm disclose also negative impacts on the SDGs? (Scott and McGill 2018) *Ambition: integrating and widening SDGs* 57. Does the firm identify SDGs-specific goals? (Blasco, King, and Jayaram 2018) 58. Are they SMART? (Blasco, King, and Jayaram 2018) 59. Does the firm disclose the KPI chosen to track performance for SDG-related goals? (Blasco, King, and Jayaram 2018)	Has the firm defined new ambitious goals stemming from the SDGs engagement? Or has it implemented/widened SDGs? (Mhlanga, Gneiting, and Agarwal 2018) *Collaboration* 62. Has the firm established partnerships to better pursue SDGs? (Berrone et al. 2019)(Spangenberg 2017) 63. Does the firm disclose partnerships' contribution to SDG through quantitative KPIs? 64. Has the firm brought on board suppliers/customers to support its SDG or better its SDG related goals? (Blasco, King, and Jayaram 2018) 65. Does the firm provide quantitative data about suppliers' effort in supporting SDG-related performance goals? (Blasco, King, and Jayaram 2018)
Other integrating elements of very engaged firms 66. Does the firm map the SDGs against the value chain to identify high-impact areas (positive and negative) and find gaps in the sustainability strategy implemented? (Oxfam, 2018) 67. Is the performance towards sustainable development part of the compensation system? 68. Is the performance towards SDGs part of the compensation system?	69. External Assurance?(Rosati and Faria 2019a) 70. Reasonable or Limited? 71. Are SDGs cited in the external assurance? 72. Stakeholder Panel/Expert Opinion SDG mentioned? *Word counting* 73. n. of words related to SDGs in SR (SDG, sustainable development goal, Goal, Global Goal, Target, Agenda, Compass) 74. n. of words related to SDG in AR (SDG, sustainable development goal, Global goal, Agenda, United Nations) 75. Density of density of coverage of sustainability/integrated report
76. Density of coverage of annual report 77. N. of questions answered positively without goals addressed	78. N. of questions answered positively with goals addressed n. of questions answered positively without goals addressed

Table 3 - GF 250 firms for 2017

1	Walmart	126	Nippon Life Insurance
2	State Grid	127	Archelor Mittal
3	Sinopec Group	128	Lowe's
4	China National Petroleum	129	Mitsubishi Corp.
5	Royal Dutch Shell	130	Marubeni
6	Toyota Motor	131	Marathon Petroleum
7	Volkswagen	132	Tewoo Group
8	BP	133	Itaú Unibanco Holding
9	Exxon Mobil	134	Renault
10	Berkshire Hathaway	135	Procter & Gamble
11	Apple	136	MetLife
12	Samsung Electronics	137	Indian Oil
13	McKesson	138	UPS
14	Glencore	139	Aegon
15	UnitedHealth Group	140	China North Industries
16	Daimler	141	China Telecommunications
17	CVS Health	142	Zurich Insurance Group
18	Amazon.com	143	Aviva
19	EXOR Group	144	PepsiCo
20	AT&T	145	Daichi Life Insurance
21	General Motors	146	Intel
22	Ford Motor	147	DowDuPont
23	China State Construction Engineering	148	Reliance Industries
24	Hon Hai Precision Industry	149	CITIC Group
25	AmerisourceBergen	150	Equinor
26	Industrial & Commer. Bank of China	151	Groupe BPCE
27	AXA	152	Archer Daniels Midland
28	Total	153	Unilever
29	Ping An Insurance	154	Aetna
30	Honda Motor	155	FedEx
31	China Construction Bank	156	Groupe Auchan
32	Trafigura Beheer	157	Albertsons Cos.
33	Chevron	158	Vodafone Group
34	Cardinal Health	159	United Technologies
35	Costco	160	Prudential Financial
36	SAIC Motor	161	Aviation Industry Corp. of China
37	Verizon	162	China Baowu Steel Group
38	Allianz	163	PTT
39	Kroger	164	Telefonica
40	Agricultural Bank of China	165	Toyota Tsusho
41	General Electric	166	Banco Bradesco
42	China Life Insurance	167	ChemChina
43	Walgreens Boots Alliance	168	Bank of Communications
44	BNP Paribas	169	Roche Group
45	Japan Post Holdings	170	Anheuser-Busch InBev
46	Bank of China	171	ING Group
47	JP Morgan Chase	172	Legal & General Group
48	Fannie Mae	173	Louis Dreyfus Commodities

49	Gazprom	174	Sysco
50	Prudential plc	175	Banco do Brasil
51	BMW	176	Walt Disney
52	Alphabet	177	Mitsubishi UFJ Financial Group (MUFG)
53	China Mobile Communications	178	LG Electronics
54	Nissan Motor	179	Seven & I Holdings
55	Nippon Tel. & Tel.	180	America Movil
56	China Railway Engineering	181	JD.Com
57	Home Depot	182	Power China
58	China Railway Construction	183	Humana
59	Assicurazioni Generali	184	POSCO
60	Bank of America Corp.	185	Shandong Weiqiao Pioneering
61	Express Scripts Holding	186	Tokyo Electric Power
62	Wells Fargo	187	Pfizer
63	Lukoil	188	Korea Electric Power
64	Boeing	189	Lloyds Banking Group
65	Dongfeng Motor Group	190	HP
66	Siemens	191	Petronas
67	Phillips 66	192	Sumitomo Mitsui Financial Group
68	Carrefour	193	Bayer
69	Nestlé	194	Sinopharm
70	Anthem	195	Wesfarmers
71	Microsoft	196	Finatis
72	Huawei Investment & Holding	197	Oil & Natural Gas
73	Petrobras	198	Nippon Steel & Sumitomo Metal
74	Valero Energy	199	JBS
75	Bosch	200	Lockheed Martin
76	Citigroup	201	CNP Assurances
77	Banco Santander	202	Guangzhou Automobile Industry Group
78	Hyundai Motor	203	Novartis
79	Hitachi	204	Itochu
80	Comcast	205	Sberbank
81	Deutsche Telekom	206	Continental
82	Credit Agricole	207	AIG
83	Enel	208	Christian Dior
84	SK Holdings	209	Tokyo Marine Holdings
85	SoftBank Group	210	Centene
86	China Resources National	211	Deutsche Bahn
87	China National Offshore Oil	212	Cisco Systems
88	Uniper	213	China Merchants Bank
89	ENI	214	RWE
90	HSBC Holdings	215	HCA Holdings
91	China Communications Construction	216	State Bank of India
92	IBM	217	Energy Transfer Equity
93	Dell Technologies	218	ThyssenKrupp
94	Électricité de France	219	Kia Motors
95	State Farm Insurance Cos.	220	China Pacific Insurance
96	Pacific Construction Group	221	MS&AD Insurance
97	Sony	222	Aluminum Corp. of China
98	Sinochem	223	Deutsche Bank
99	JX Holdings	224	Banco Bilbao Vizcaya Argentaria
100	Johnson & Johnson	225	Orange

101	China Energy Investment	226	Vinci
102	Tesco	227	Shanghai Pudong Devel. Bank
103	AEON	228	Woolworths
104	Engie	229	Denso
105	Airbus Group	230	Evergrande Real Estate Group
106	Freddie Mac	231	Saint-Gobain
107	Pemex	232	Tata Motors
108	Peugeot	233	Bunge
109	China Minmetals	234	Shandong Energy Group
110	China Southern Power Grid	235	Hengli Group
111	Amer International Group	236	KDDI
112	BASF	237	Industrial Bank
113	China Post Group	238	Caterpillar
114	Panasonic	239	HBIS Group
115	Rosneft Oil	240	Lenovo Group
116	Target	241	Manulife Financial
117	People's Insurance Co. of China	242	China South Industries Group
118	Royal Ahold	243	China National Building Material Group
119	Deutsche Post	244	Hanwha
120	Munich Re	245	China Shipbuilding Industry
121	Societe Générale	246	Mitsui
122	COFCO	247	Nationwide
123	U.S. Postal Service	248	Wilmar International
124	Beijing Automotive Group	249	Morgan Stanley
125	China FAW Group	250	Sumitomo

Figure 5 – Region (out of 250)

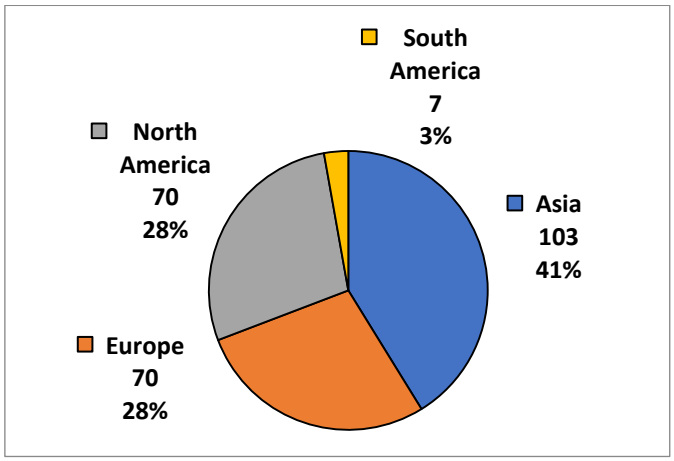


Figure 6 – Country distribution (out of 250)

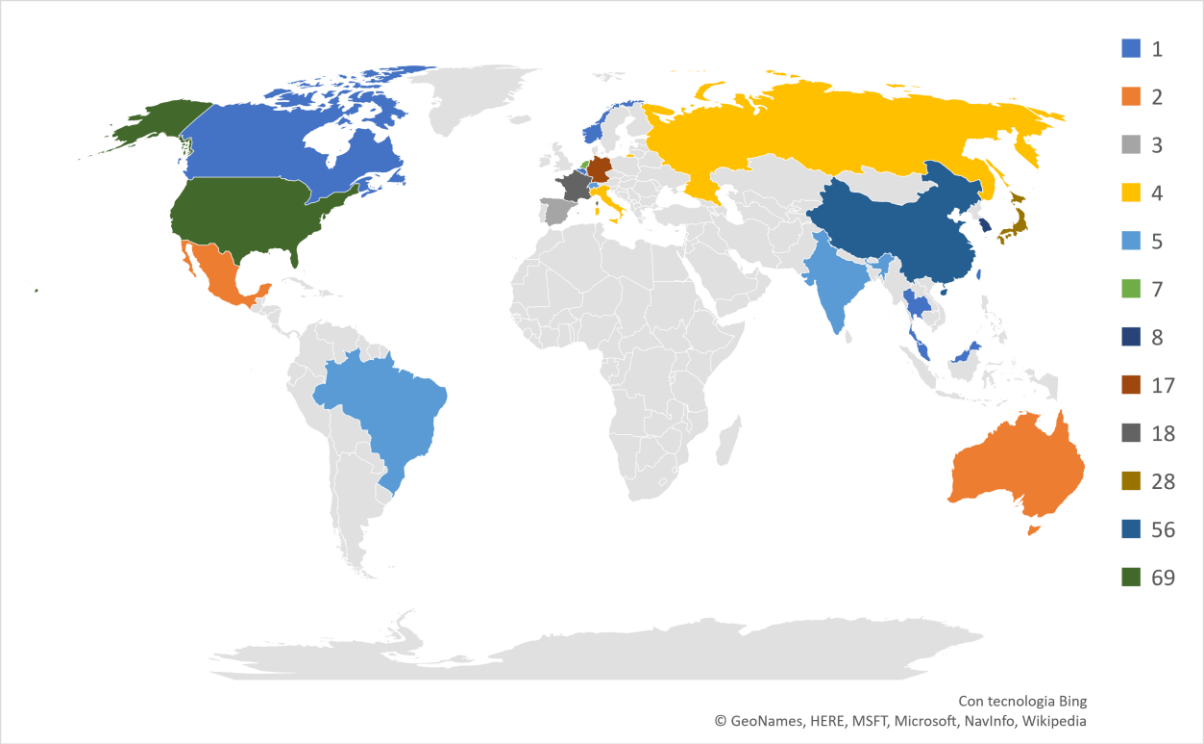


Figure 7 - Legal Status

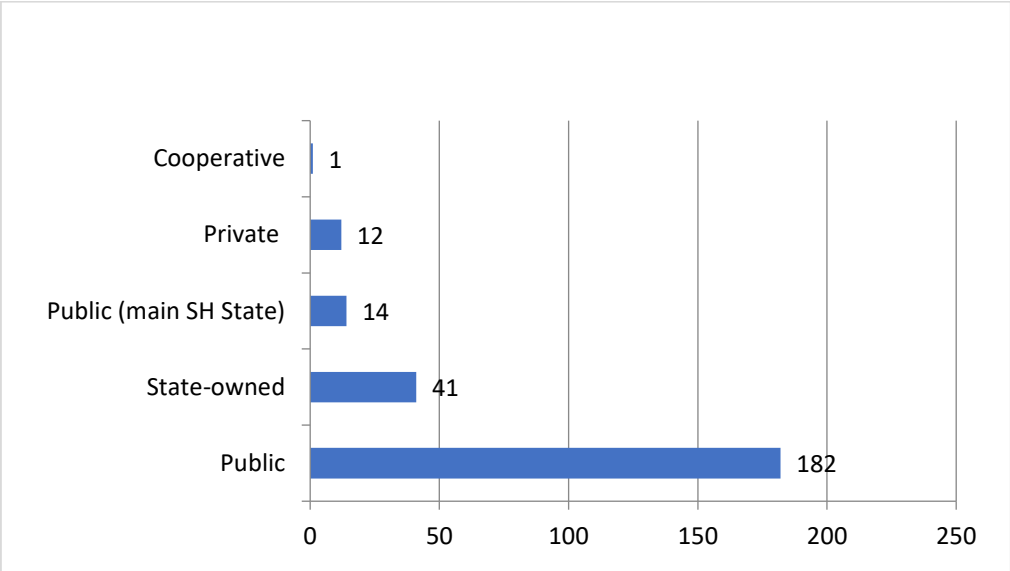


Figure 8 - Typology of private firms

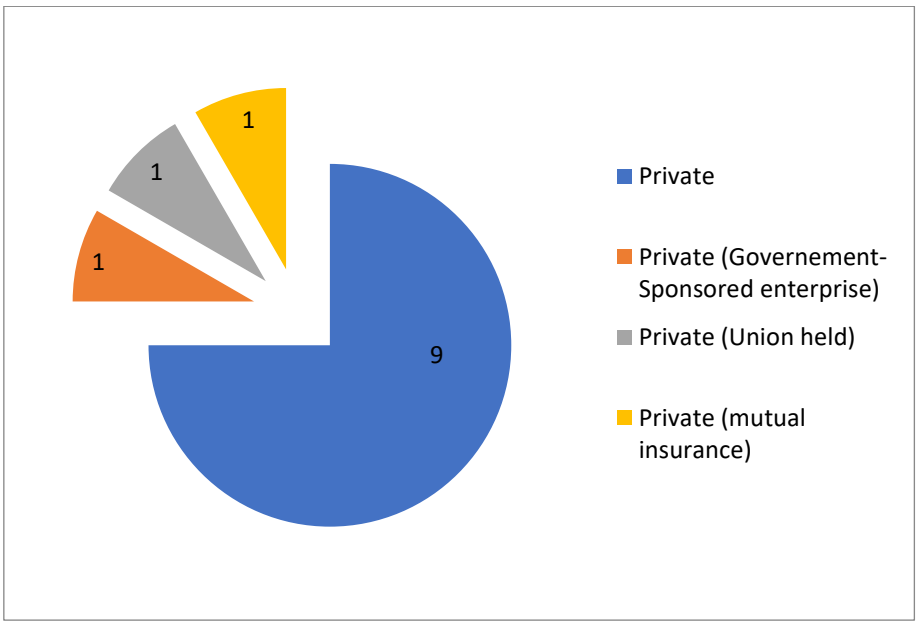


Figure 9 – Sector

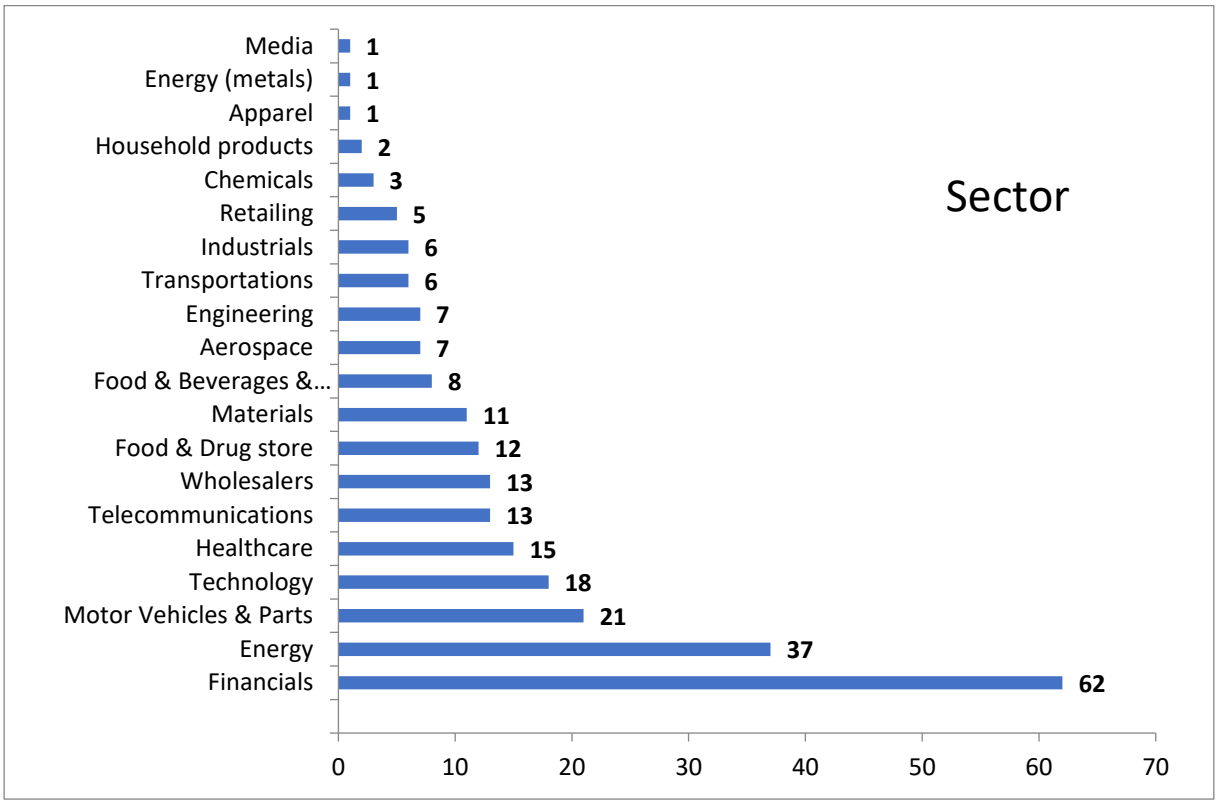


Figure 10 - Industry

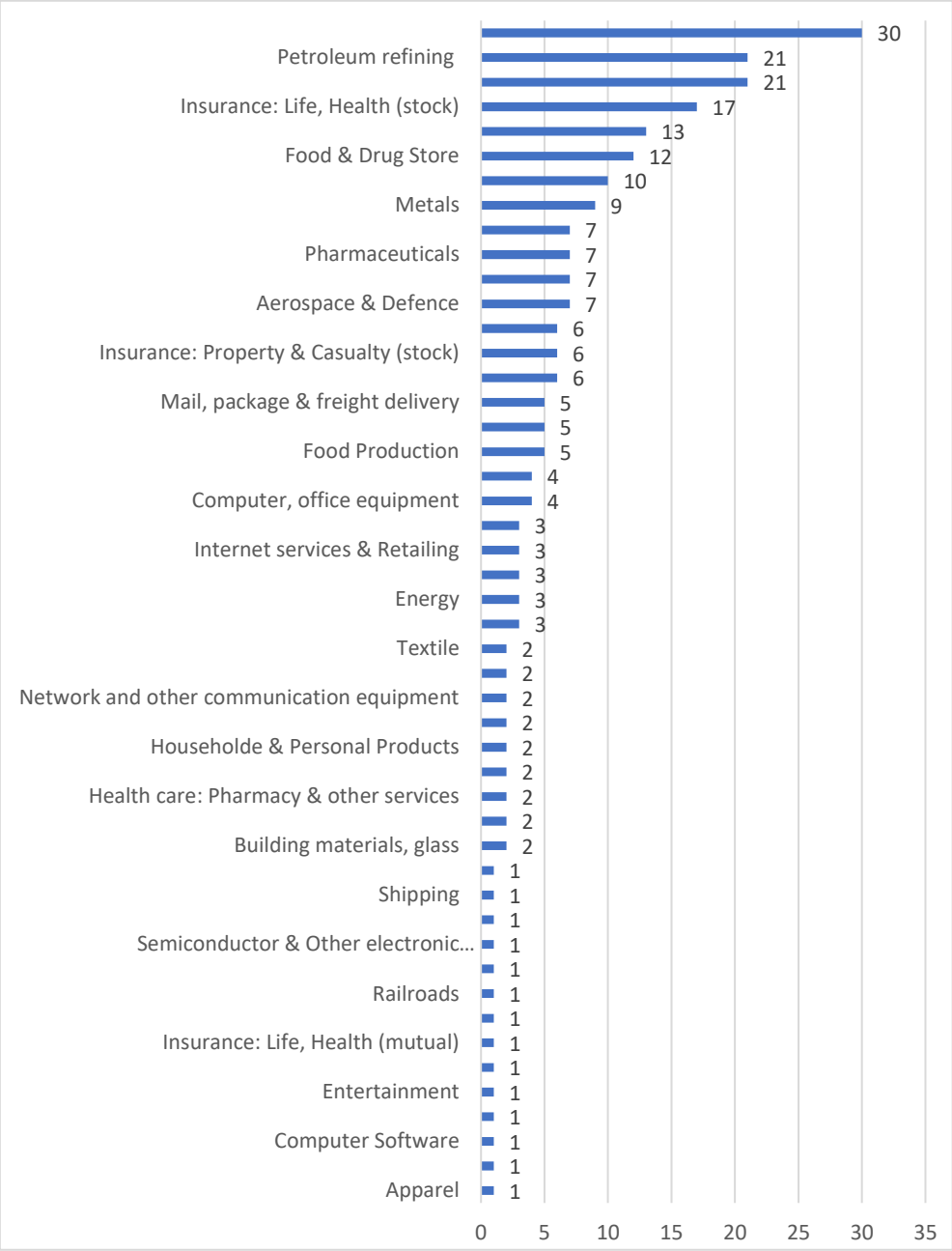


Figure 11 - Kind of report

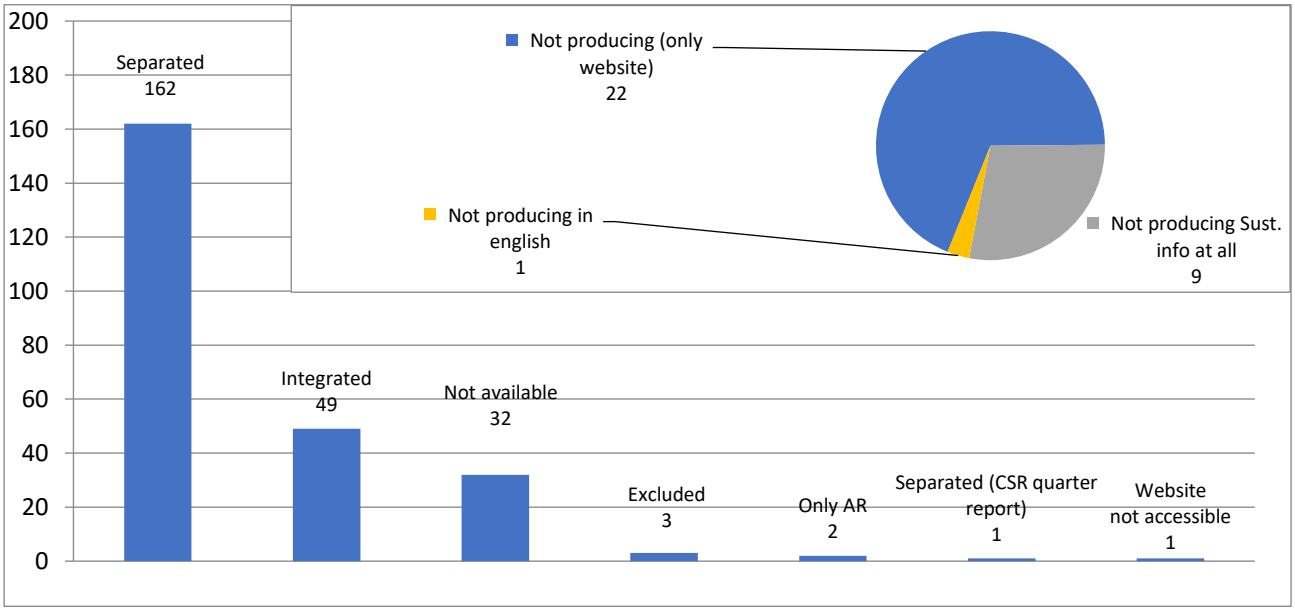


Figure 12 - Firms mentioning SDGs in their reports (out of 250)

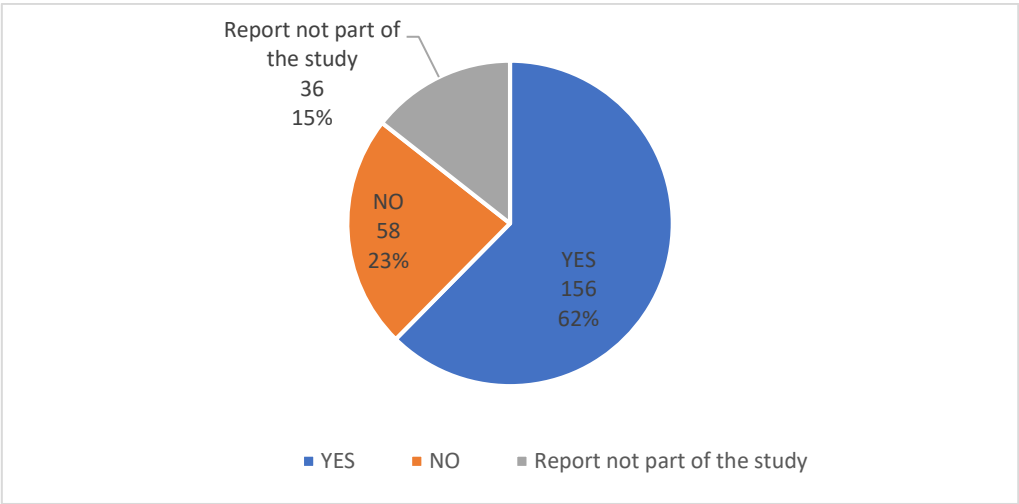


Figure 13 - SDGs mentioned in AR/SR/Both

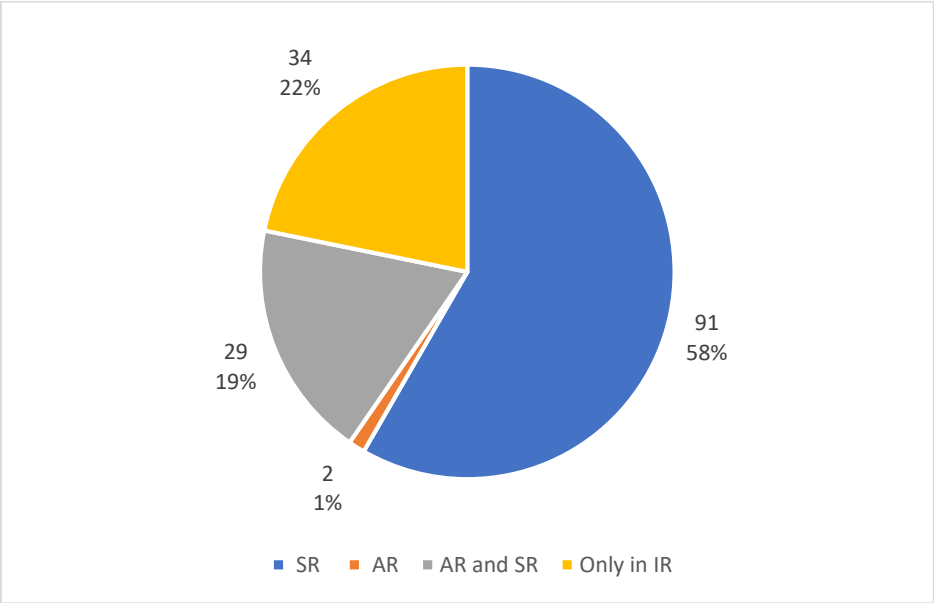


Figure 14 - Link to the firm's website for details

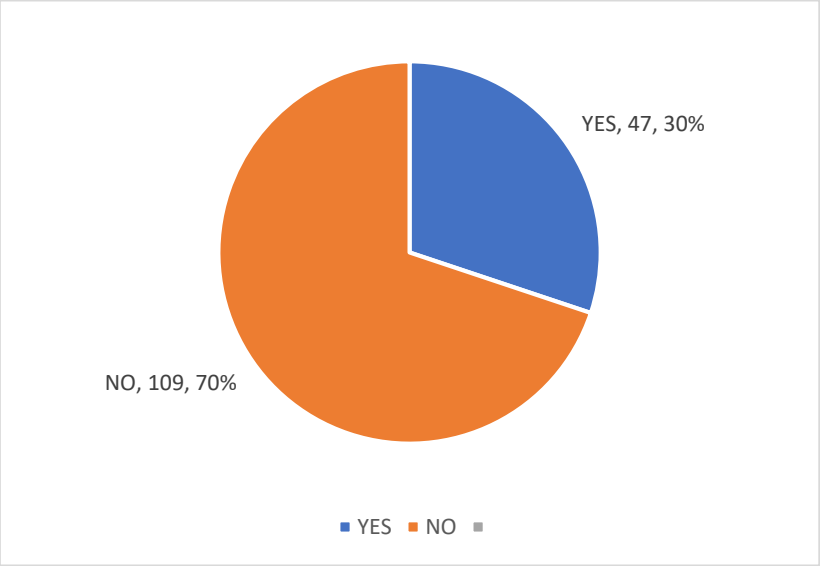


Figure 15 - Average number of certifications/standards held/followed

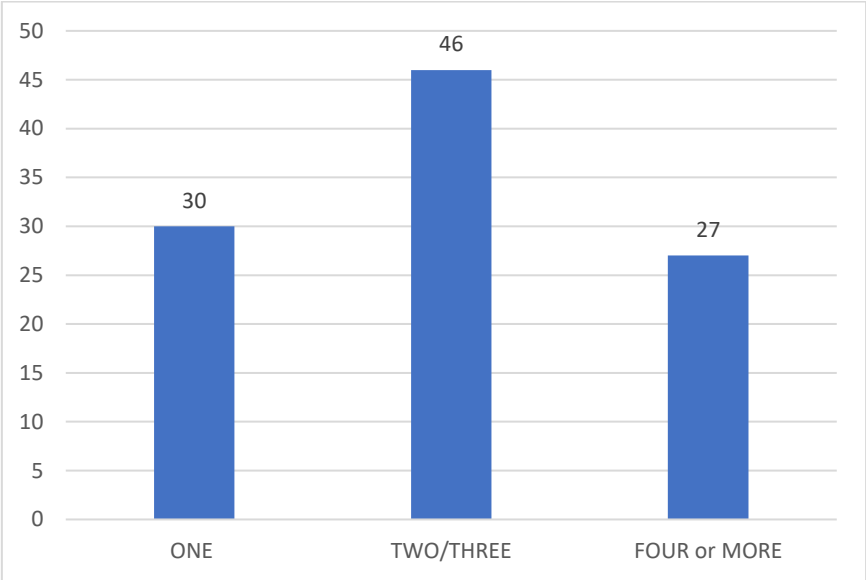


Figure 16 - GRI G4 guidelines used (out of 156)

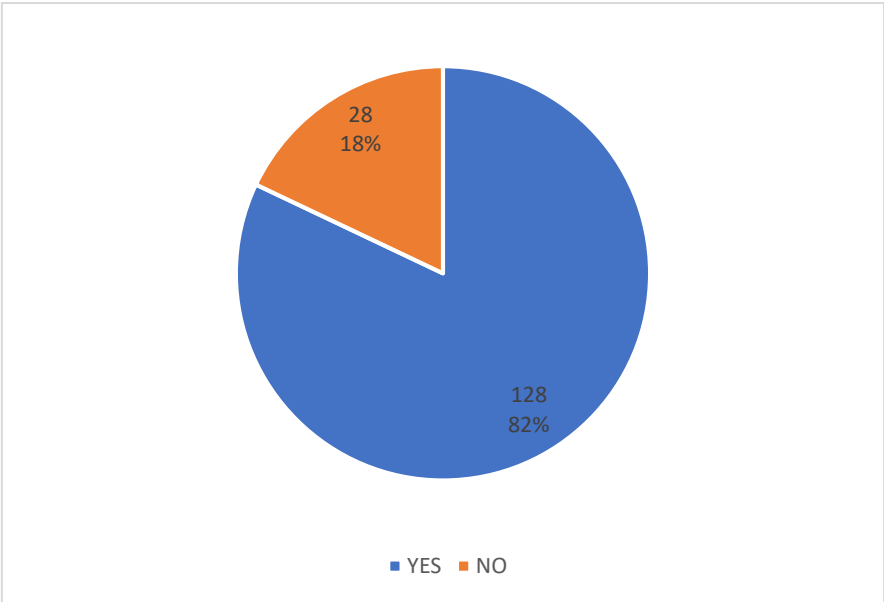


Figure 17 – GRI application levels (out of 128)

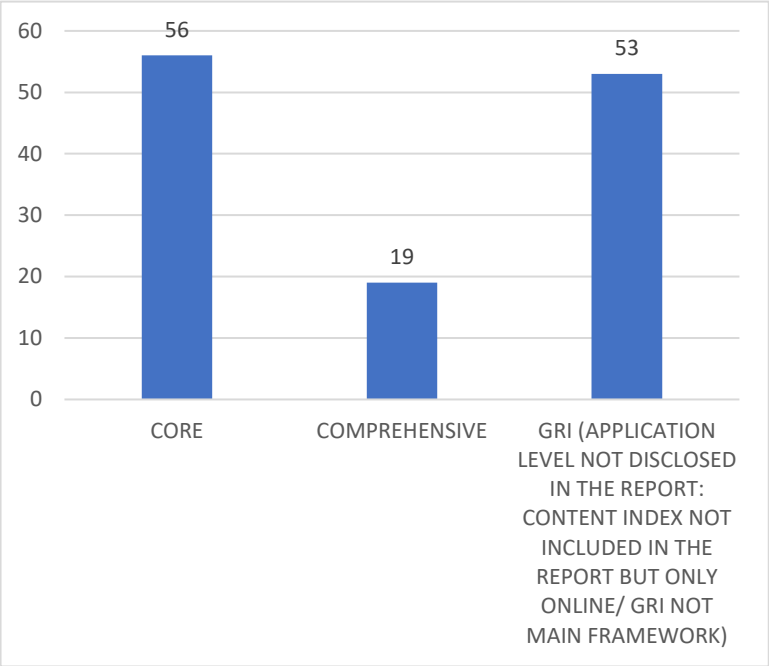


Figure 18 - Iso certifications held by firms mentioning SDGs (out of 103)

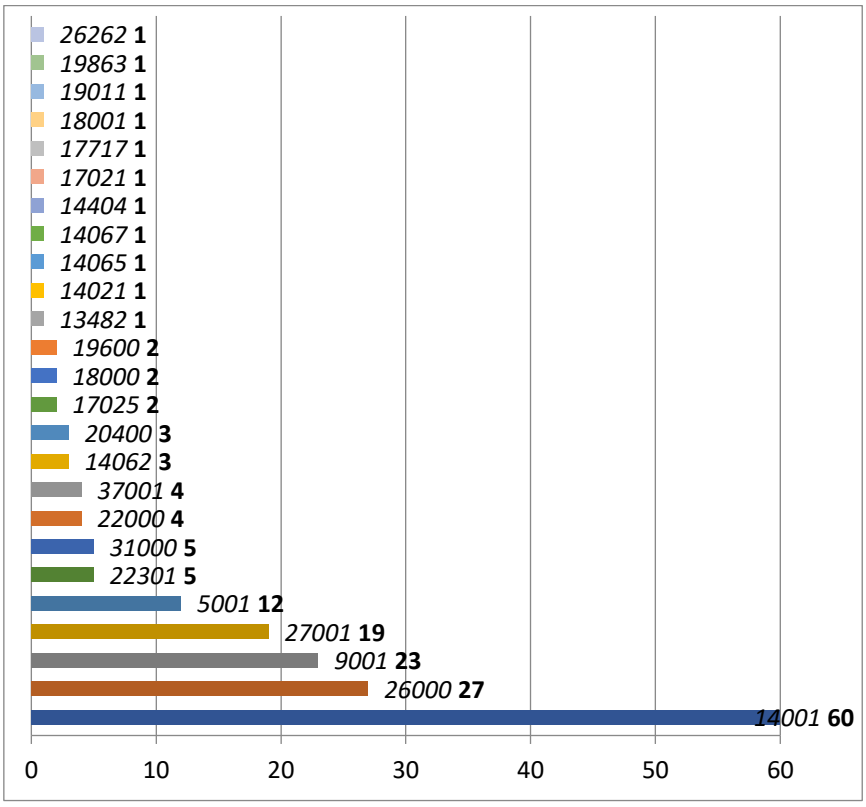


Figure 19 - Firms participating in the CDP (out of 156)

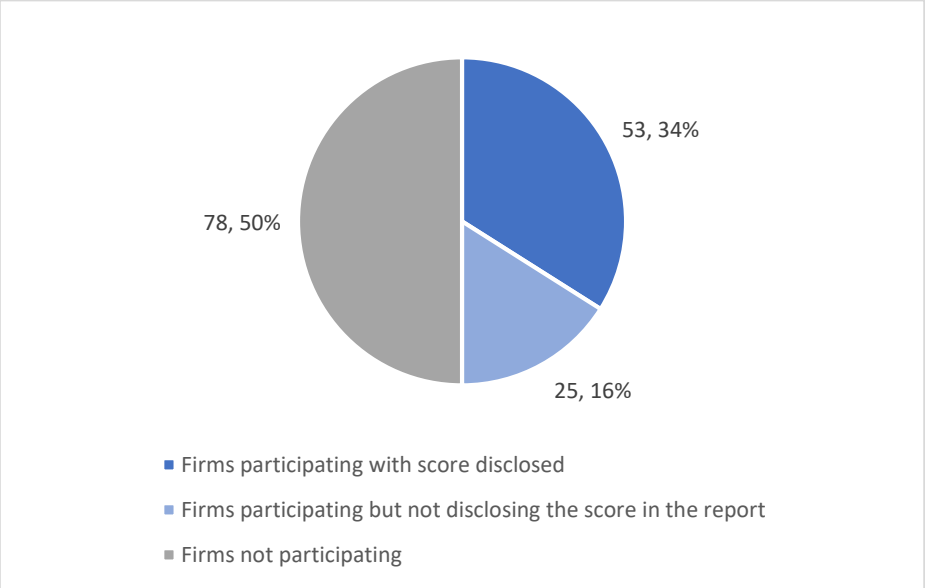


Table 4 - CDP Scores

Of the firms having their efforts scored by CDP, n. of firms scored respectively on climate change, water, supply chain engagement efforts		%
Climate change	**45**	**100%**
A	20	44%
A-	16	36%
B	8	18%
C	1	2%
Water	**24**	**100%**
A	11	46%
A-	8	33%
B	5	21%
Suppply Chain Engagement	**6**	**100%**
A	5	83%
A-	1	17%
Forest	**1**	**100%**
A	1	100%

Figure 20 - Firms with other certifications besides GRI, ISO, CDP

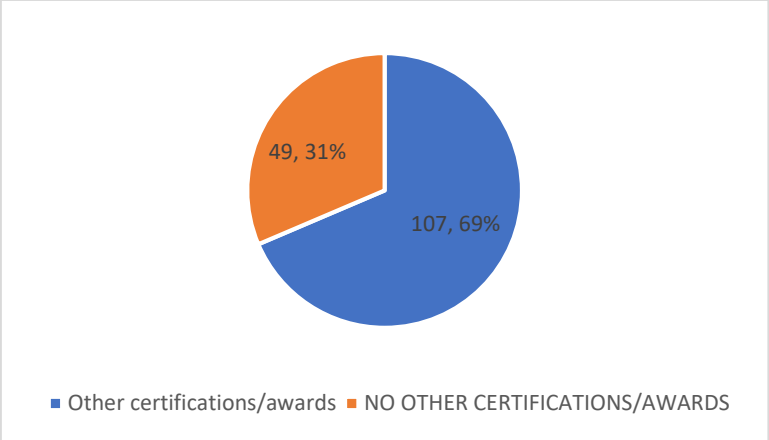


Table 5 - Names of additional certifications, standards, awards

Firms having other certifications or named in sustainability ranks (among the firm mentioning SDG)	
Other certifications/awards/standards	107
DJSI	55
PRI SIGNATORY	24
SCIENCE BASED TARGETS PROJECT	29
TARGET SET	*15*
COMMITTED	*14*
IPIECA	12
TCFD	41
VIGEO WORLD 120	20
SDG PIONEER	3
FSTE BLOSSOM JAPAN	4
IIRC	15
GRENELLE 2	1
NO OTHER CERTIFICATIONS/AWARDS	49
Totale	156

Figure 21 – Membership of the UNGC (out of 156) and type of membership (out of 94)

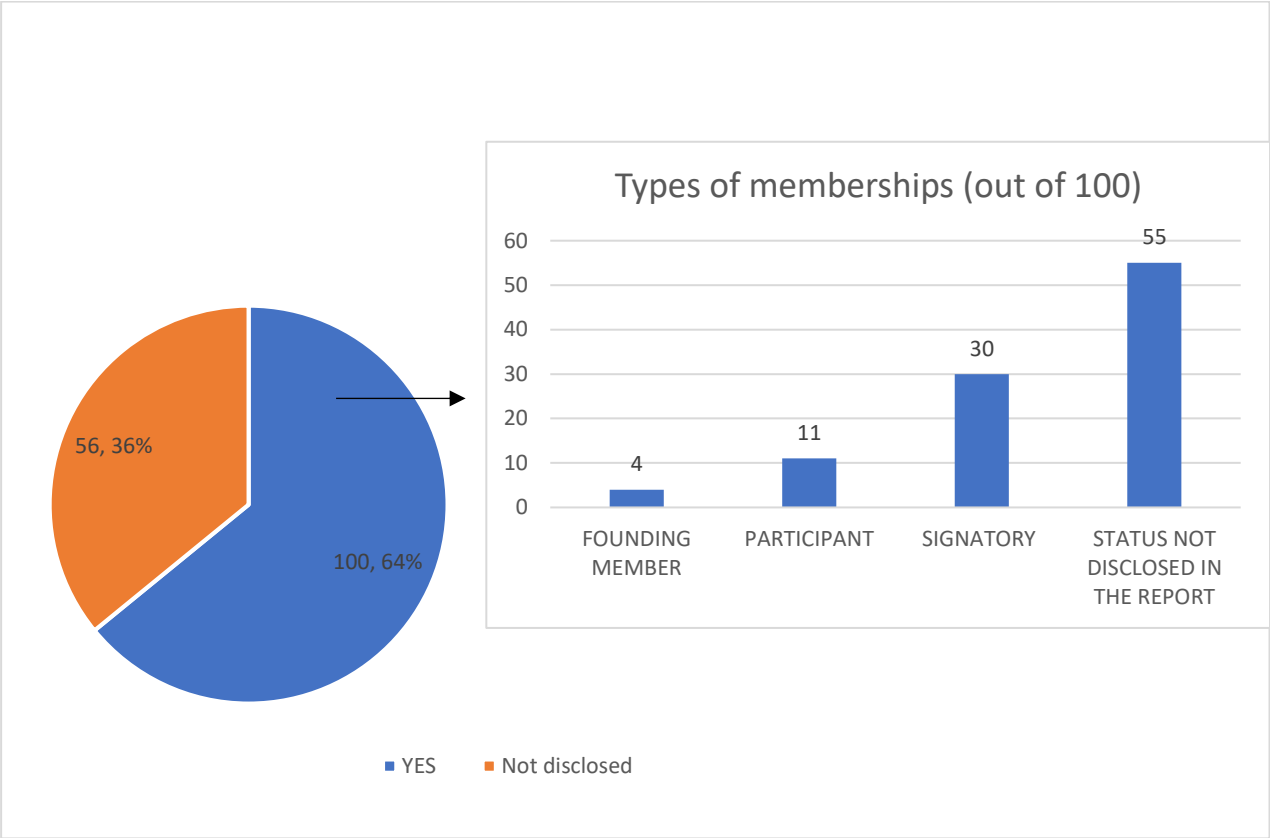


Figure 21 - Firms following the UNGC 10 principles (out of 156)

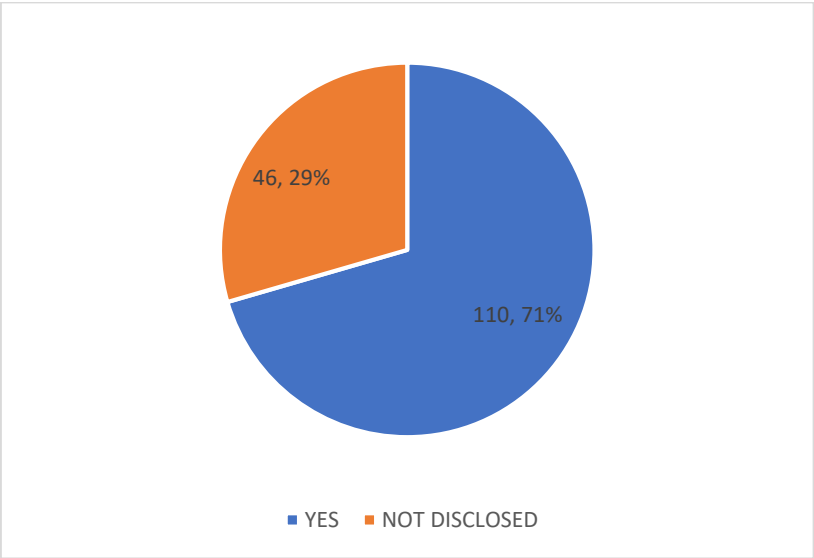


Figure 23 - Firms following the UNGC 10 principles (out of 156)

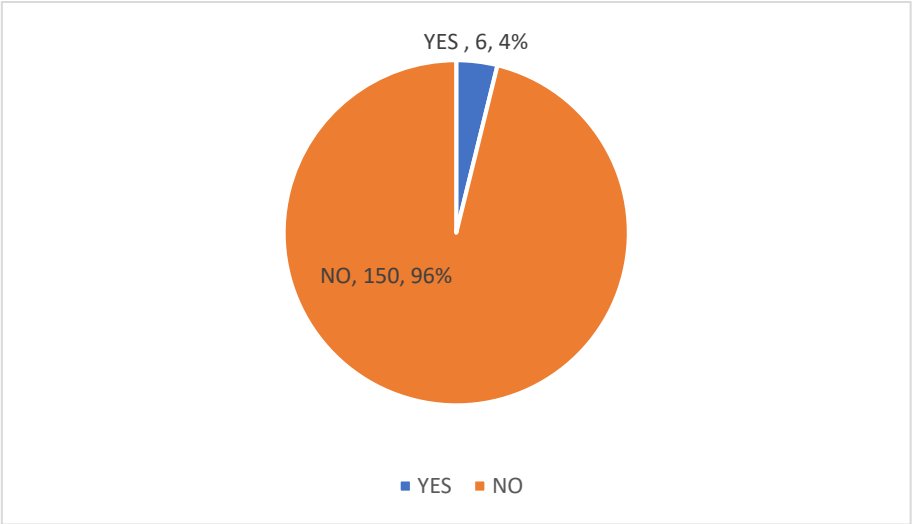


Figure 241 - Firms mentioning who oversees the SDGs (out of 156)

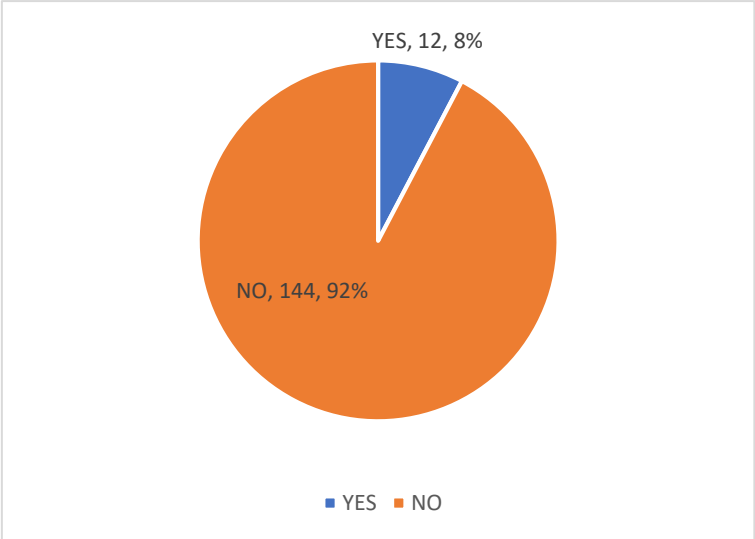


Figure 25 - Link between SDGs and corporate strategy (out of 156)

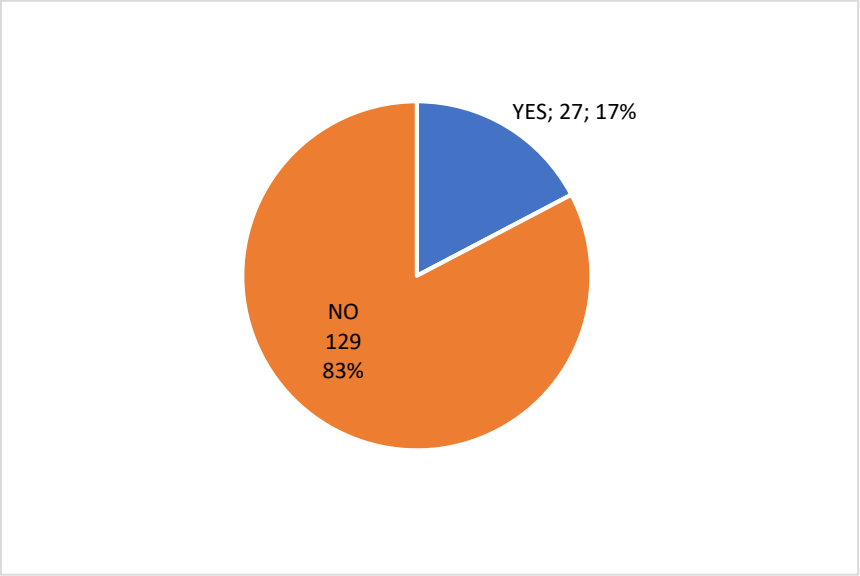


Figure 26 - Firms' leaders mentioning the SDGs in their message (out of 156)

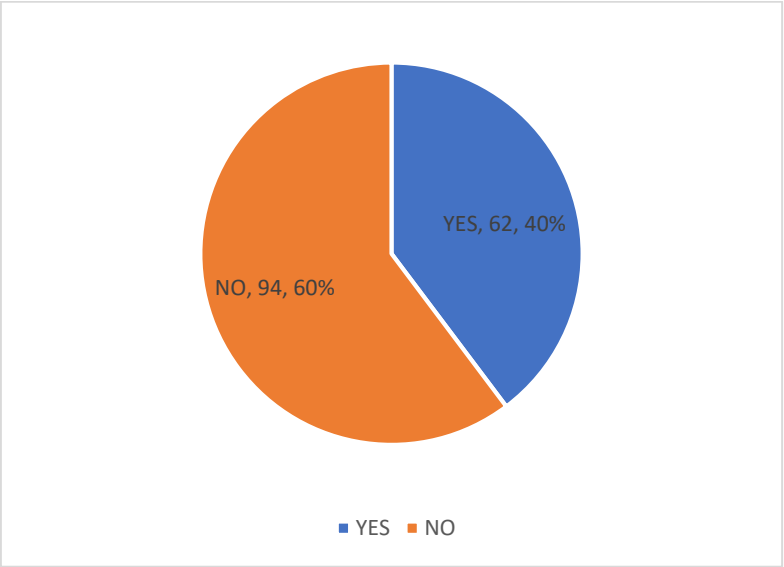


Figure 27 - Firms mentioning SDGs among the sustainability frameworks used (out of 156)

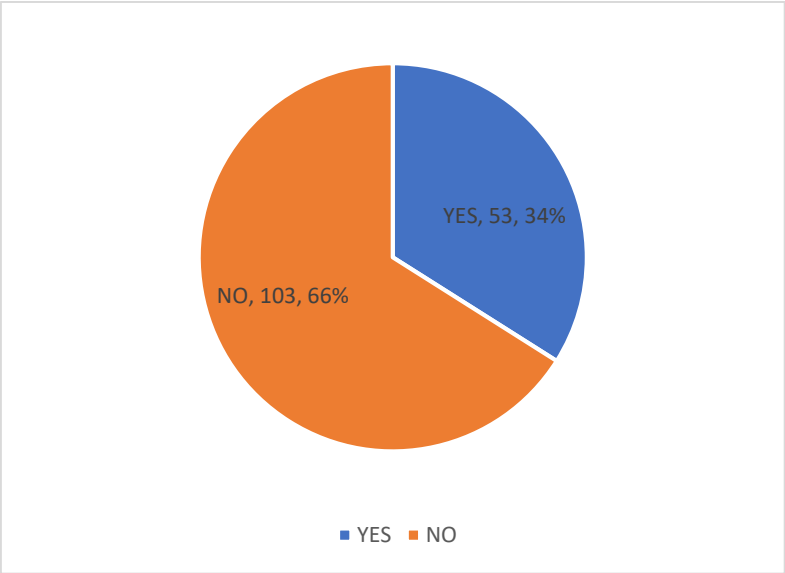


Figure 28 - Firms providing reasons to engage with SDGs and types of business case

Figure 29 - Firms citing opportunities, risks, etc of engaging with the SDGs (out of 156)

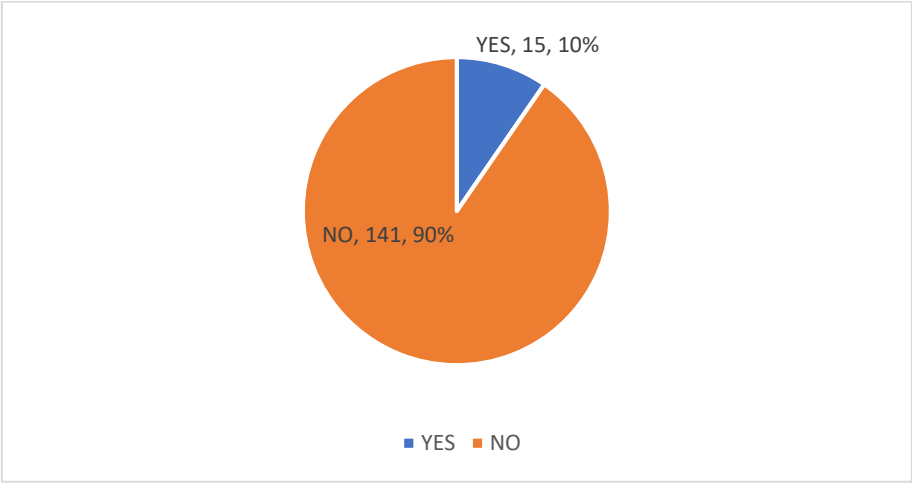


Figure 30 - Firms addressing specific SDGs (out of 156)

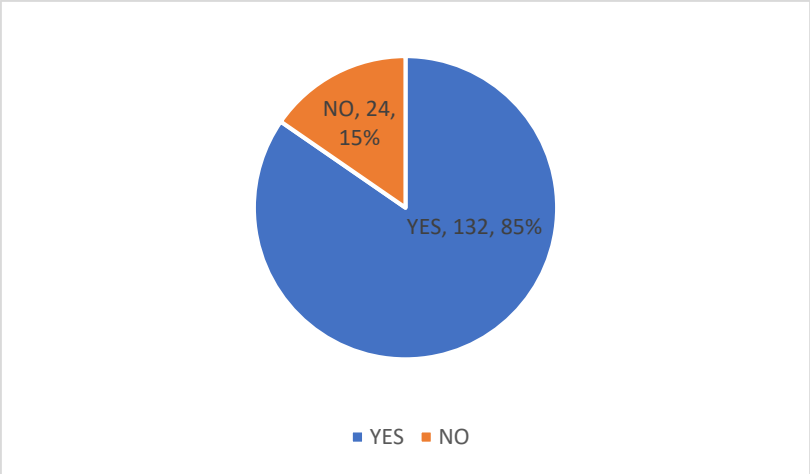


Figure 31 - N. of goals addressed per firm (out of 156)

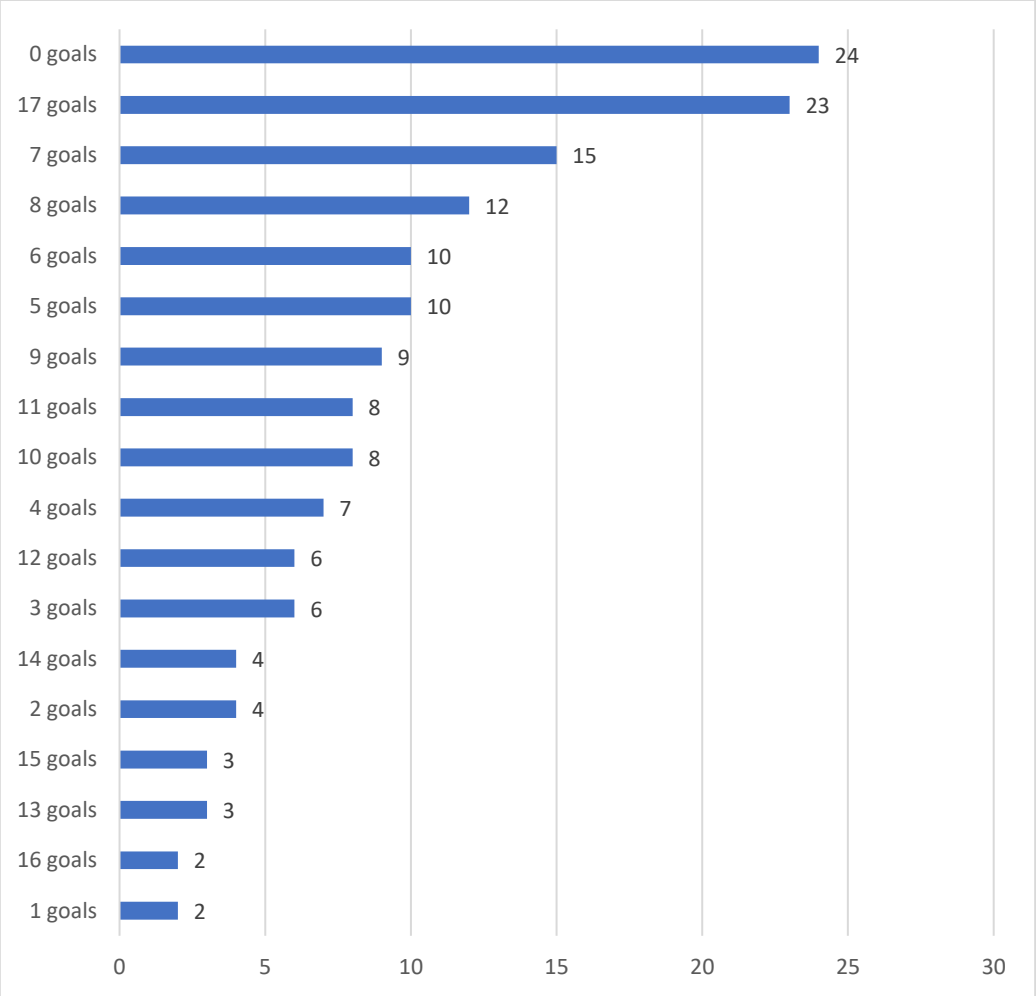


Figure 32 - N. of firms addressing a specific SDG Goals (out of 156)

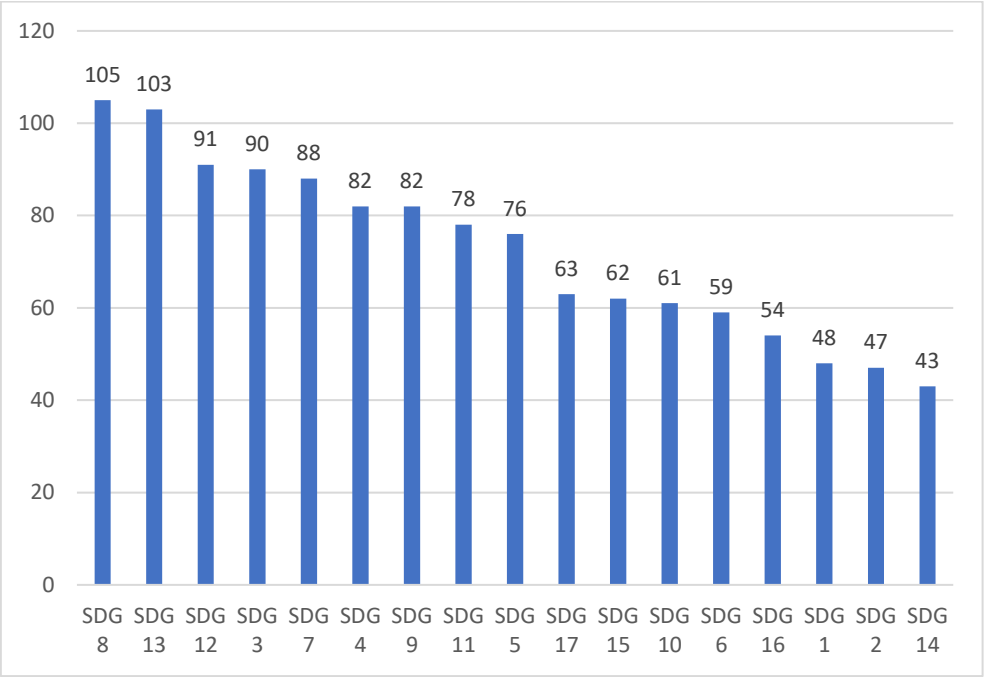


Table 6 - Most addressed SDG by sector

Most adressed SDG by Sector	n.1	n.2	n.3
Aerospace	4-5-8-9-12-13-16-17	ALL	ALL
Chemicals	1-2-3-7-12	ALL	ALL
Energy	**7**	**13**	**8**
Metals	ALL	ALL	ALL
Engineering	ALL	ALL	ALL
Financials	**8**	**13**	**11**
Food / beverages	**8 - 12**	**2 - 6 - 13 - 15 - 17**	**3 - 4 - 5 - 9**
Food and drug store	2 - 3 - 8 - 13	5 - 7 - 10 - 14 - 15	4 - 16
Healthcare	**3**	**7**	**5 - 12 - 13 - 17**
Household (only 1 firm)	5	6	ALL
Industrial machines	3-7-9-11-13- 4-5-8- 12- 16-	/	/
Materials	9	1 - 3 - 4 -5 -6 -7 -8 - 10 -	2 - 14 - 16
Motor Vehicles & Parts	**13**	**11**	**3**
Technology	4 - 8 - 17	5 - 7 - 8 - 12 - 13	3 - 6 - 11
Telecommunications	1 - 4 -5 - 7- 8- 9- 10- 11- 12 - 13 - 16 - 17	2 - 3- 6- 15	14
Transportations	4-8-11-13-17	ALL	ALL
Wholesaler	3 - 7 - 13 - 17	2 - 4 - 5 - 8 - 9 - 10 - 12 -	6 - 11 -15

Figure 33 - Firms addressing a specific SDG target (out of 156)

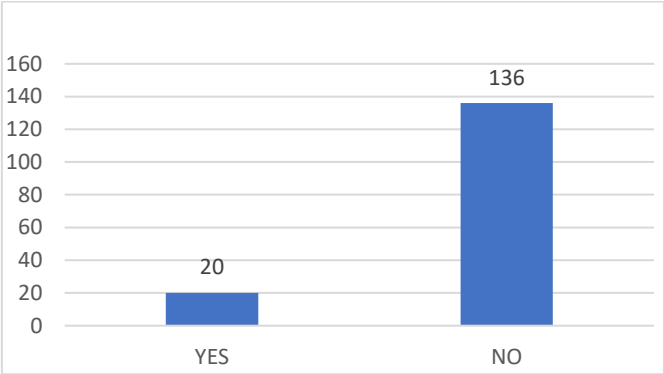


Figure 34 - Firms addressing targets by sector (out of 20)

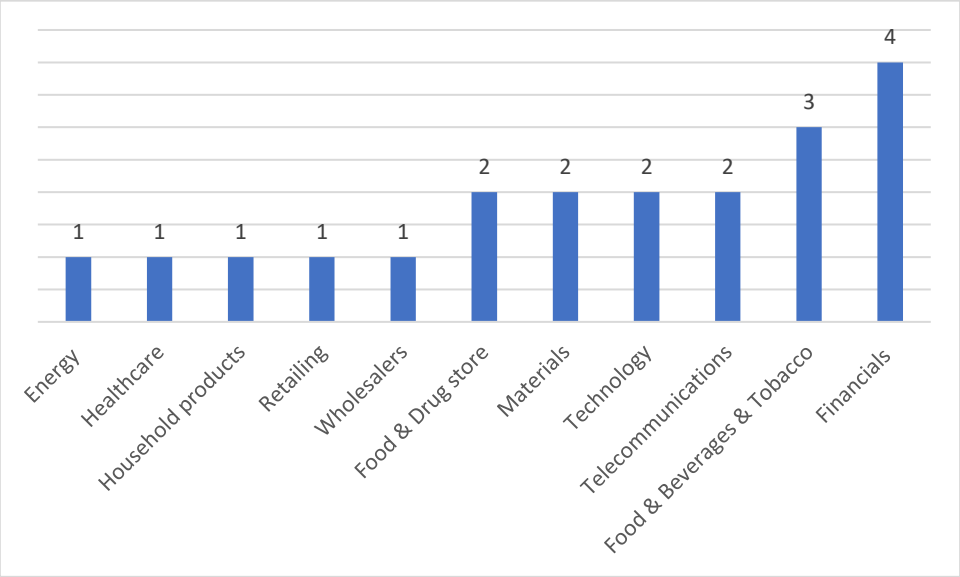


Table 7 - Most addressed targets

Target addressed	n. of firms addressing it	Target addressed	n. of firms addressing it
7,2	8	4,1	2
7,3	7	4,5	2
8,3	6	4,6	2
8,5	6	6,1	2
12,3	6	6,2	2
12,4	6	6,3	2
13,1	6	6,5	2
1,4	5	7,1	2
8,6	5	8,2	2
8,8	5	10,2	2
9,4	5	11,2	2
9,5	5	11,4	2
12,2	5	12,8	2
12,5	5	14,2	2
12,6	5	15,5	2
3,8	4	15,7	2
4,3	4	16,6	2
4,4	4	1,3	1
5,5	4	2,2	1
8,4	4	2,3	1
11,6	4	3,1	1
13,3	4	3,2	1
1,2	3	3,4	1
5,1	3	3,6	1
6,4	3	3,7	1
8,7	3	4,7	1
8,1	4	5,2	1
9,1	3	5,6	1
9,3	3	6,6	1
12,7	2	9,2	1
14,1	3	10,5	1
15,1	3	11,1	1
15,2	3	11,3	1
16,5	3	11,5	1
17,16	3	11,7	1

17,17	3	13,2	1
1,1	2	15,4	1
1,5	2	17,3	1
2,1	2	17,7	1
2,4	2	-	-

Figure 35 - Rationales provided for choice of the goals (out of 156)

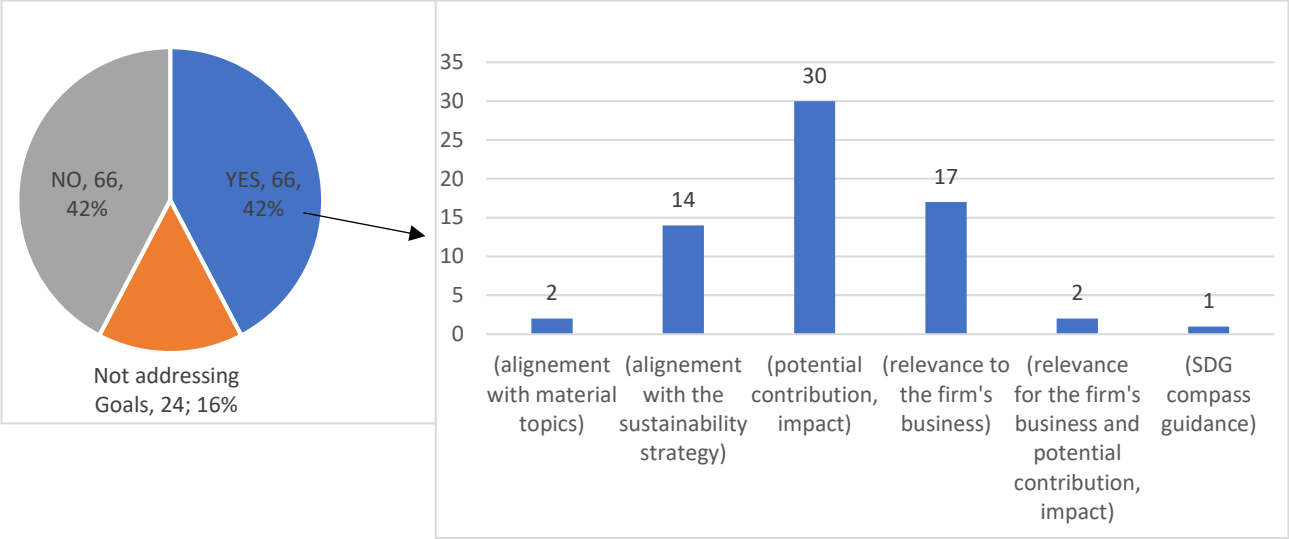


Figure 36 - Prioritization of goals (out of 156)

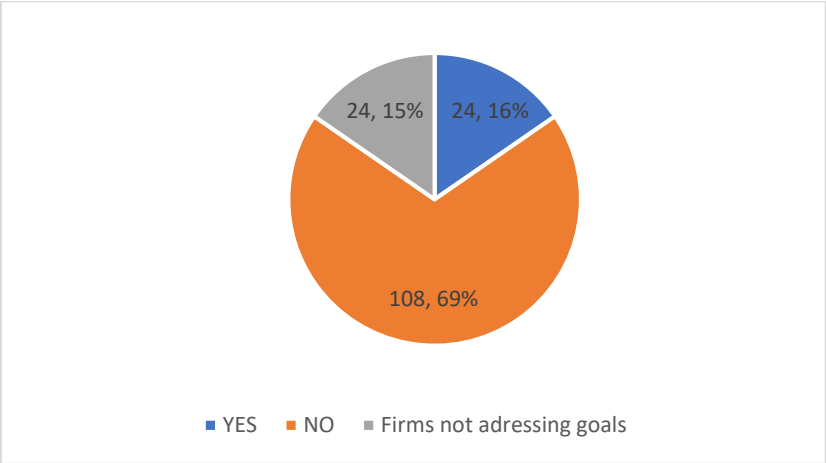


Figure 37 - Distribution of SDGs prioritized

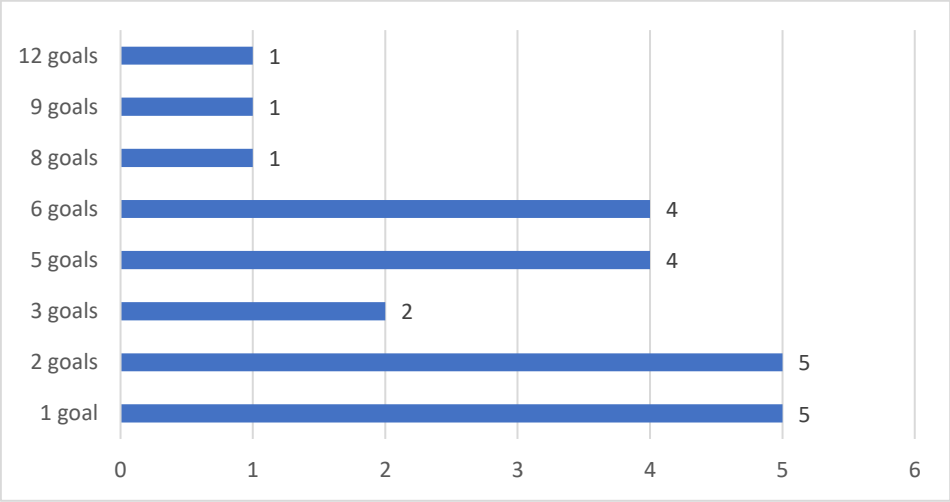


Table 8 - Average number of SDGs prioritized

Avarage number of SDG prioritized	
n. of SDG prioritized	**n. of firms**
1 Goals	5
2/3 Goals	7
4/5 Goals	4
more than 5 Goals	7
Totale	23

Table 9 - The most prioritised Goals

	The goals most prioritized	
SDG n.	SDG	n. of firms prioritizing this goal
13	CLIMATE ACTION	12
9	INDUSTRY	11
3	GOOD HEALTH	10
11	CITY & COMMUNITIES	10
4	QUALITY EDUCATION	9
8	DECENT WORK	9
7	AFFORDABLE ENERGY	8
6	CLEAN WATER	6
5	GENDER EQUALITY	5
12	RESPONSIBLE CONSUMETION & PRODUCTION	5
1	END POVERTY	4
10	REDUCED INEQUALITIES	3
2	ZERO HUNGER	2
17	PARTNERSHIPS	2
14	LIFE BELOW WATER	1
16	PEACE & JUSTICE	1
15	LIFE ON LAND	0

Figure 38 – Reasons for prioritization

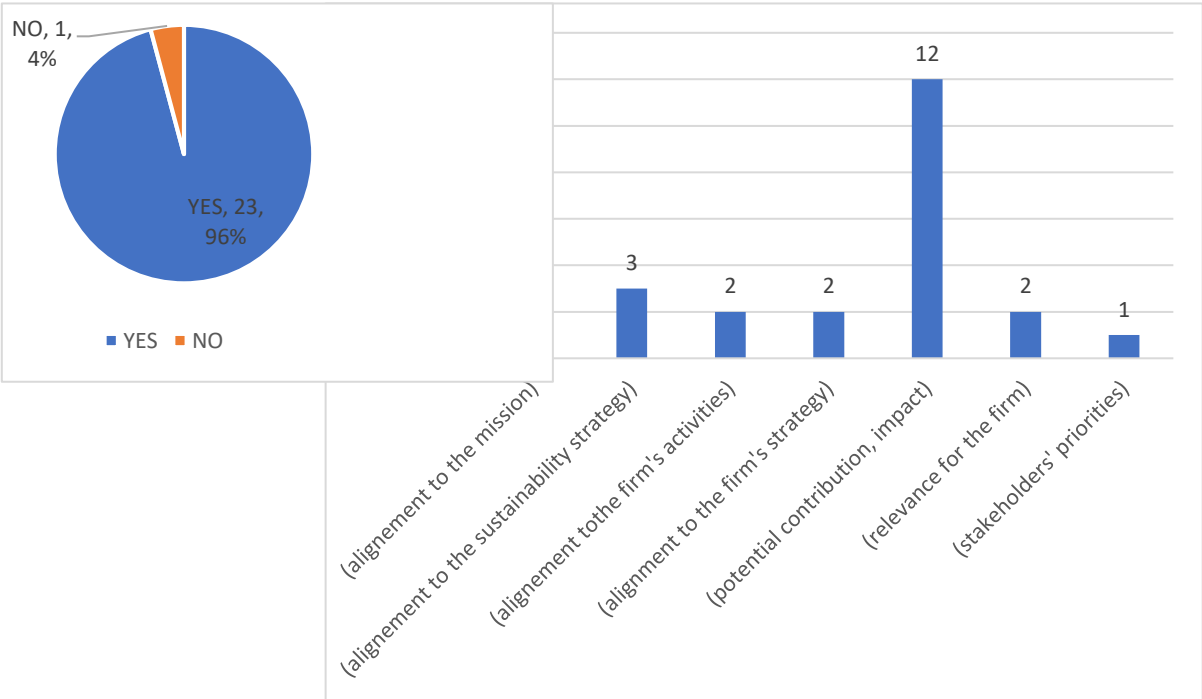


Figure 39 - Firms involving SDGs in the materiality analysis (out of 156)

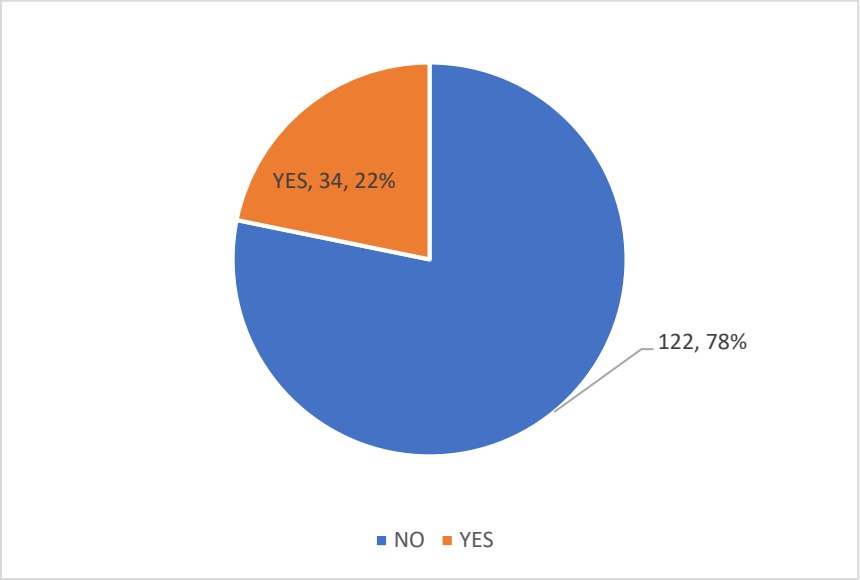


Table 10 - Categorisation of targets

Types of target pursued according to Zanten, 2019		
Internally Actionable	**12**	Totale
Externally Actionable	5	
BOTH EQUALLY	3	20
Doing Good	**11**	Totale
Avoiding Harm	8	
BOTH EQUALLY	1	20

Figure 40 - Types of involvement in the materiality analysis

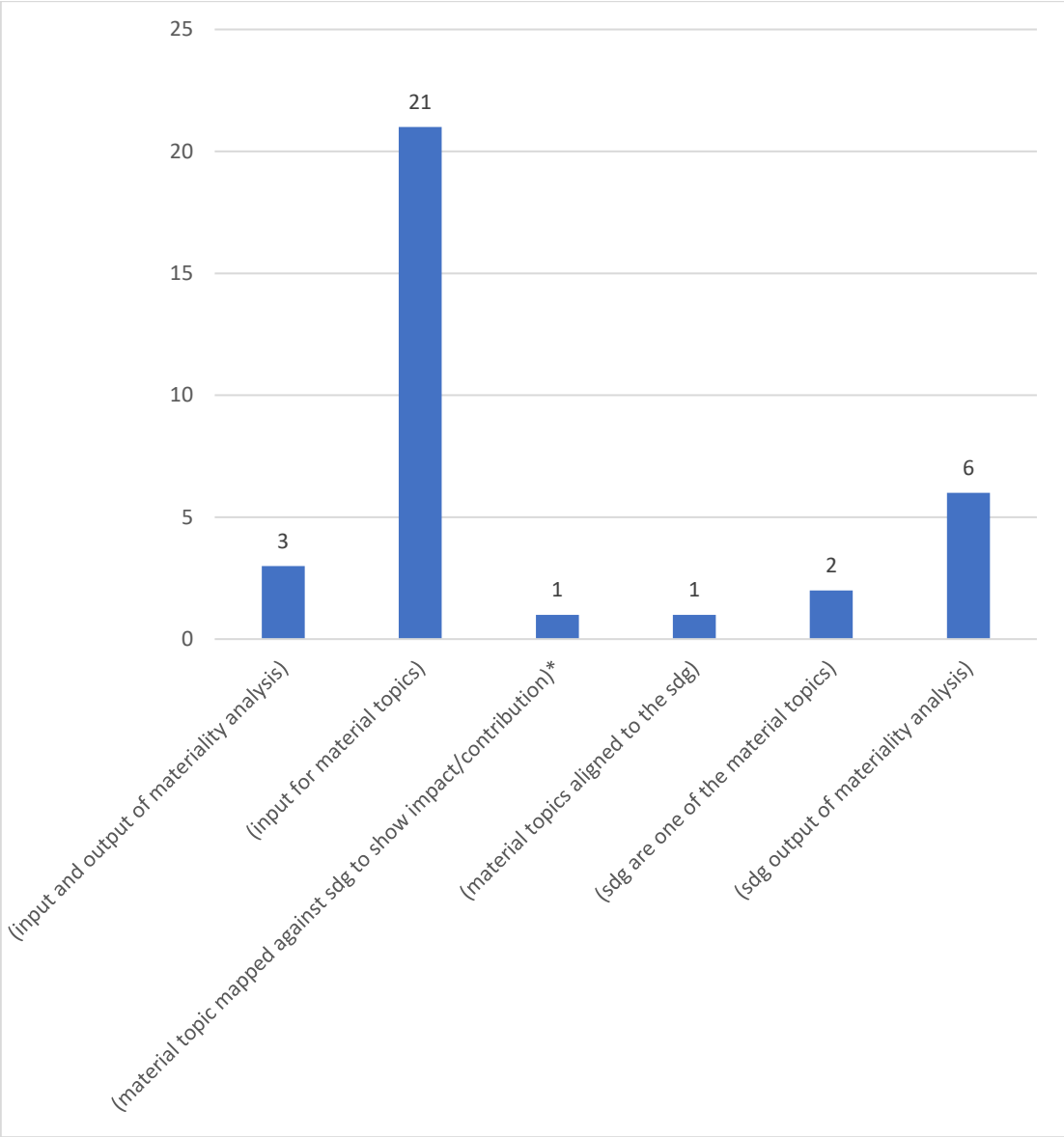


Figure 41 - Mapping of SDGs to sustainability topics of the firm (out of 156)

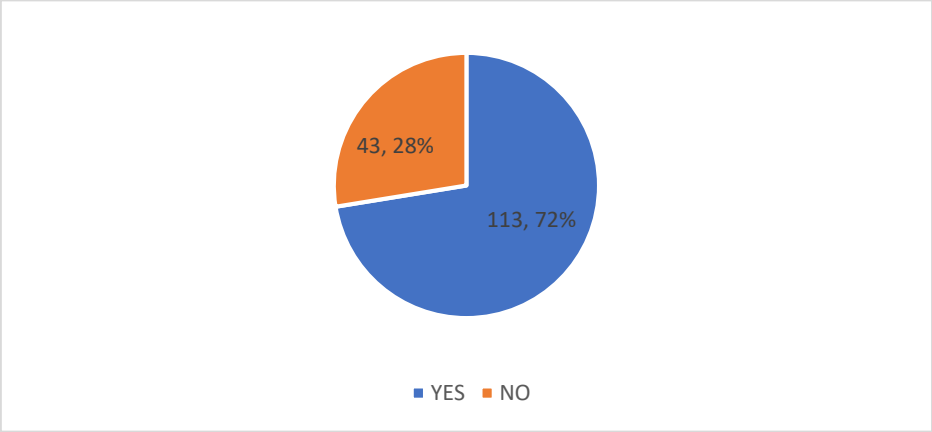


Figure 42 - Types of mapping done by the firms

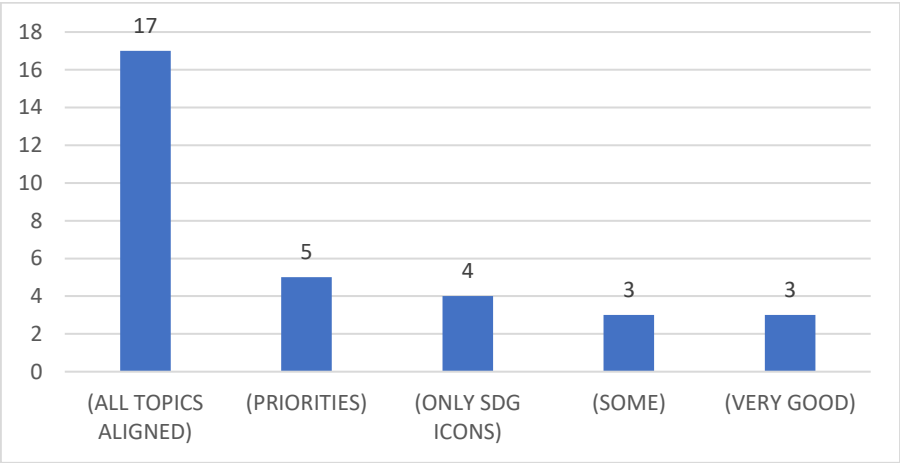


Figure 43 - Initiatives disclosed by the firm (out of 156)

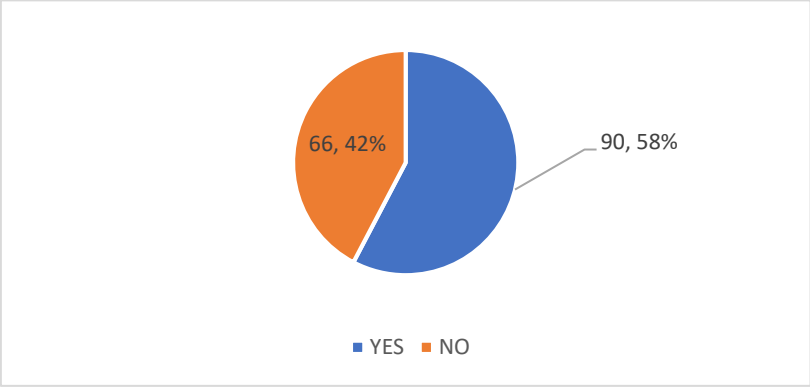


Figure 44 - Firms disclosing negative impact (out of 156)

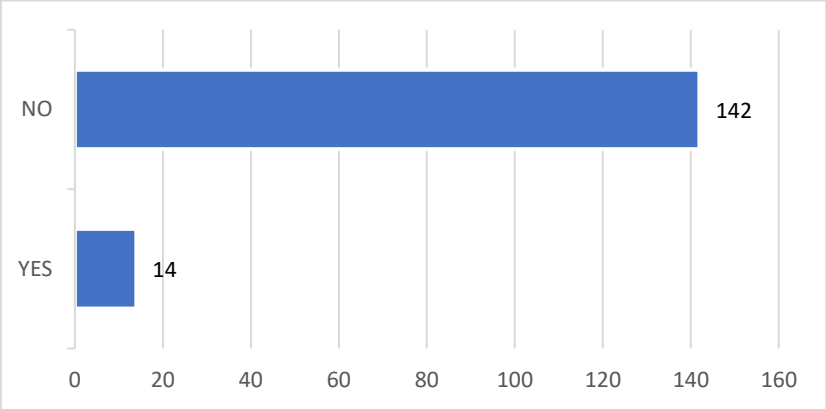


Figure 45 - Firm identifying SDGs-specific goals (out of 156)

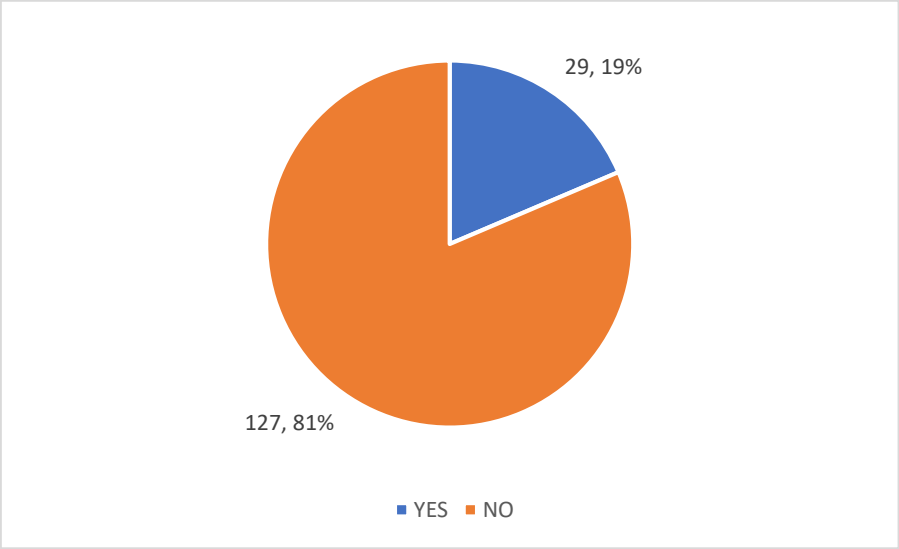


Figure 46 – Firms setting SMART SDG-specific goals

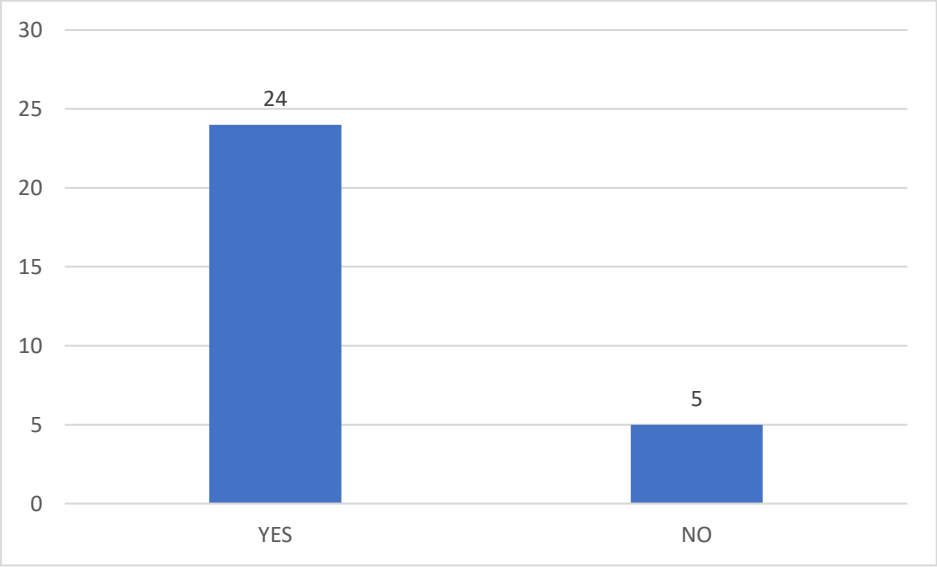


Figure 47 - Firms disclosing KPIs chosen

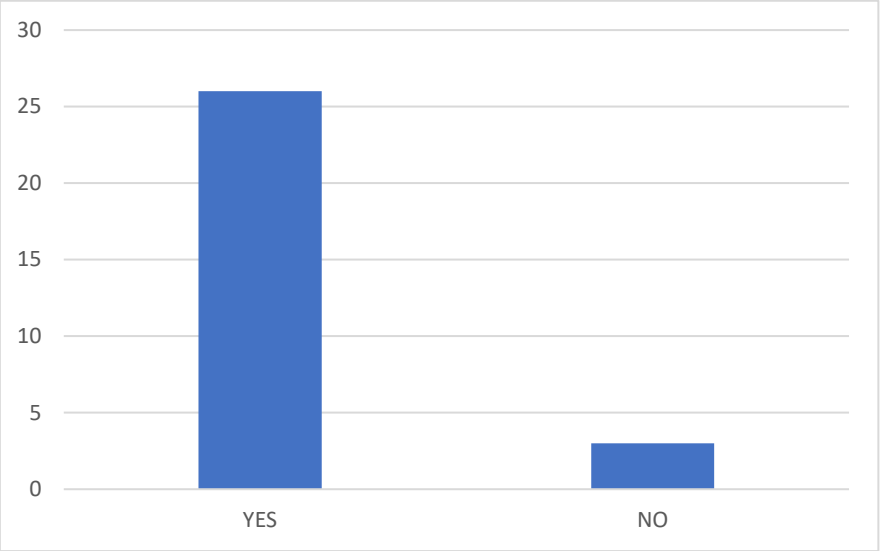


Figure 48 - Quantitative KPIs disclosed

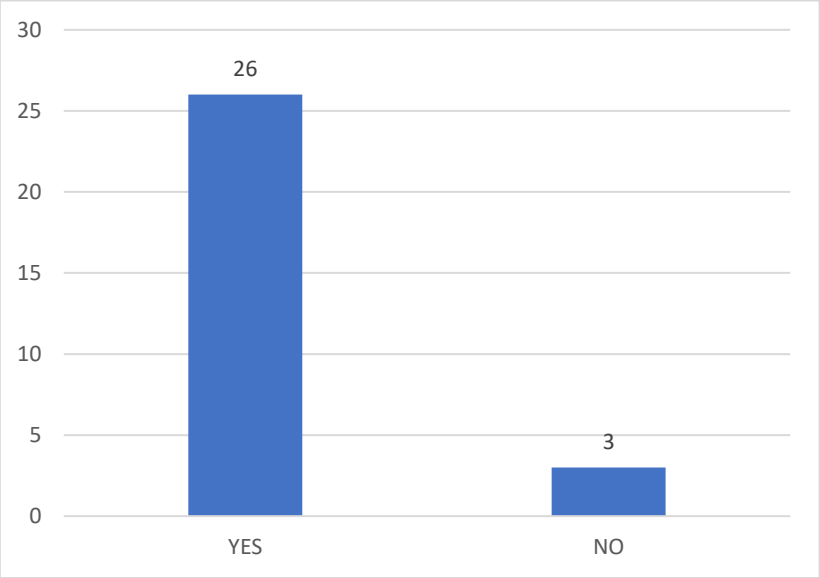


Figure 49 - YoY comparison of SDG-related goals milestones

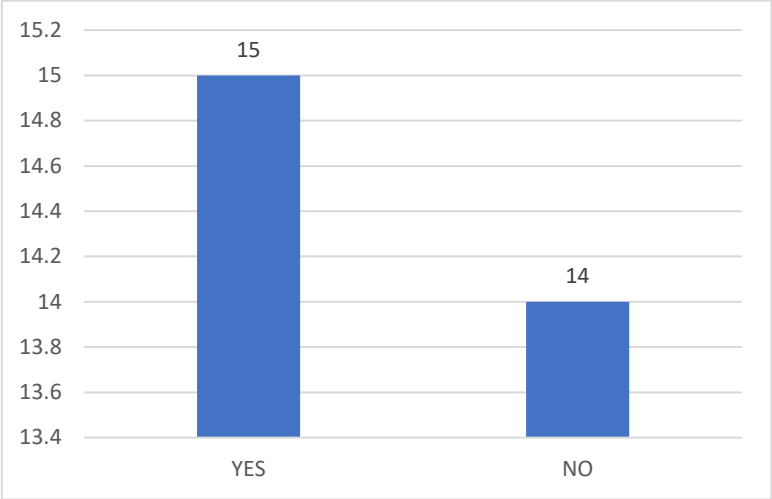


Figure 50 - Firms widening the 2030 Agenda with ambitious goals (out of 156)

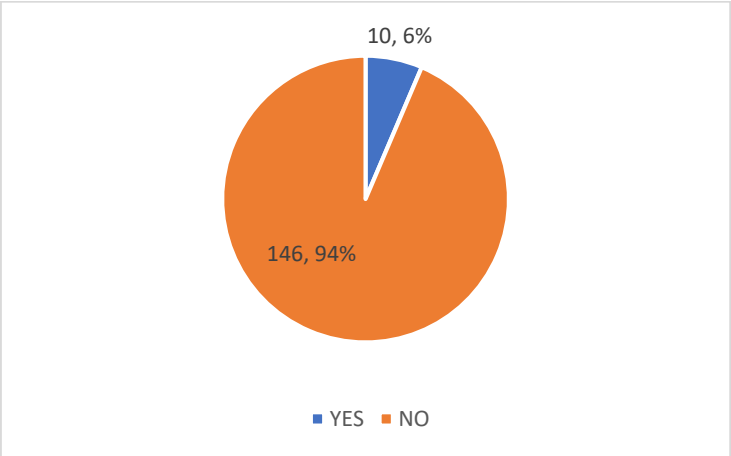


Figure 51 - Firms having established partnership to better pursue SDGs (out of 156) and typologies of partnerships (out of 69)

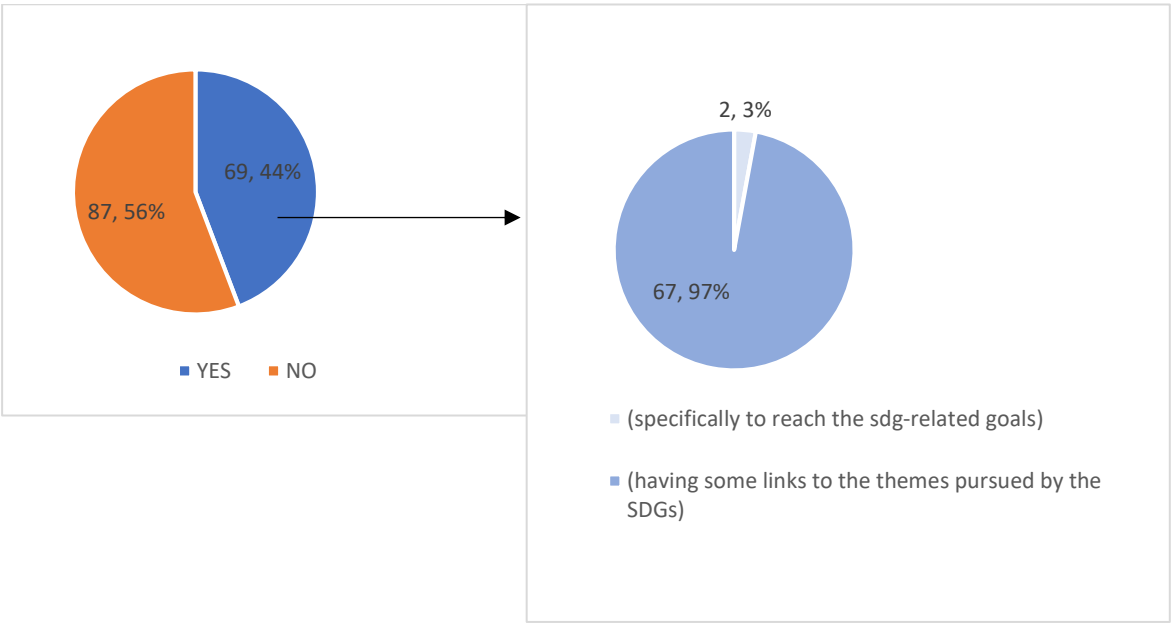


Figure 52 - Firms having disclosed partnership's contribution to SDGs through quantitative KPIs (out of 69)

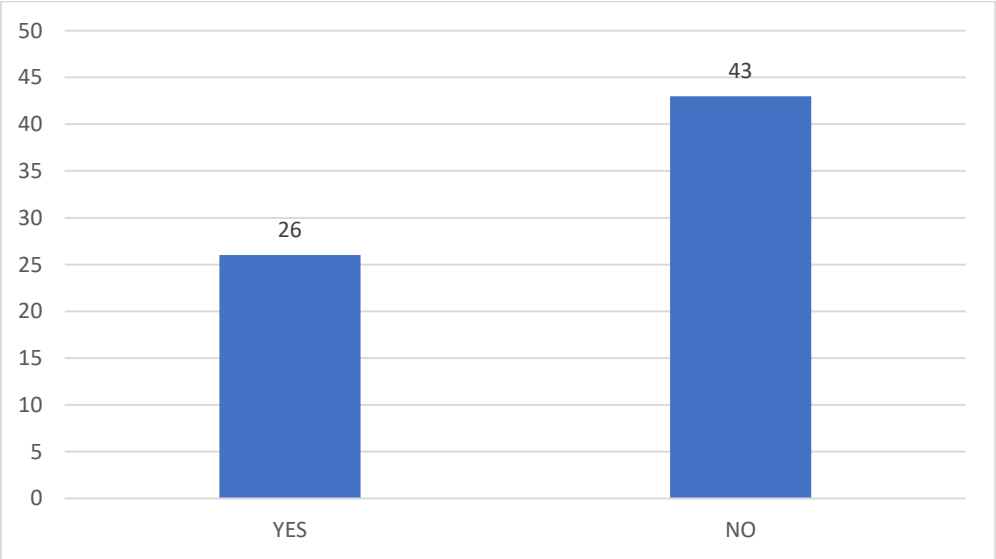


Figure 53 - Firm having brought on board suppliers/customers to support its SDG related goals

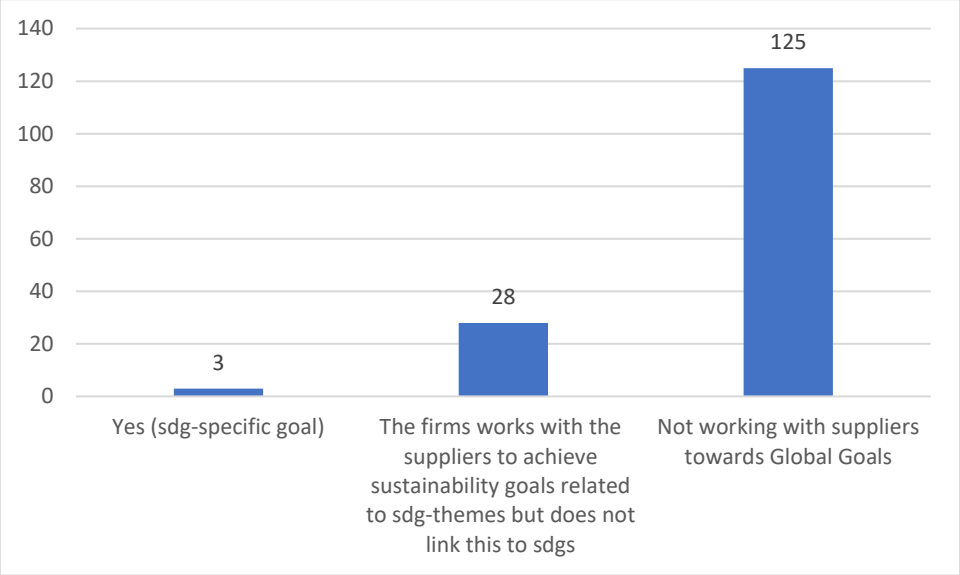


Figure 54 - Firm mapping the SDGs against the value chain to identify high-impact areas (positive and negative) and find gaps in the sustainability strategy implemented (out of 156)

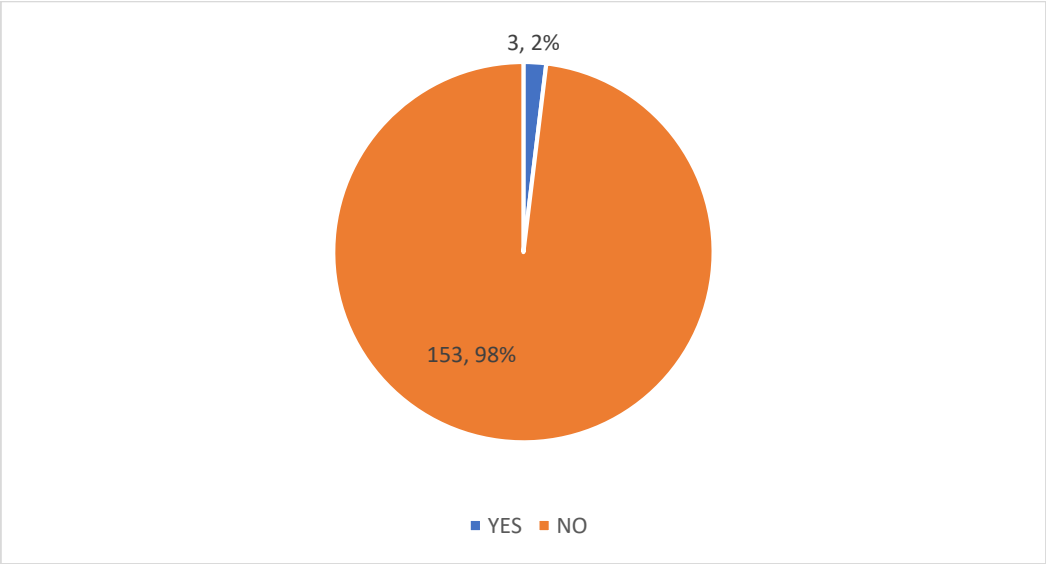


Figure 55 - Performance towards sustainable development part of the compensation system of firms (out of 156) and compensation's actors

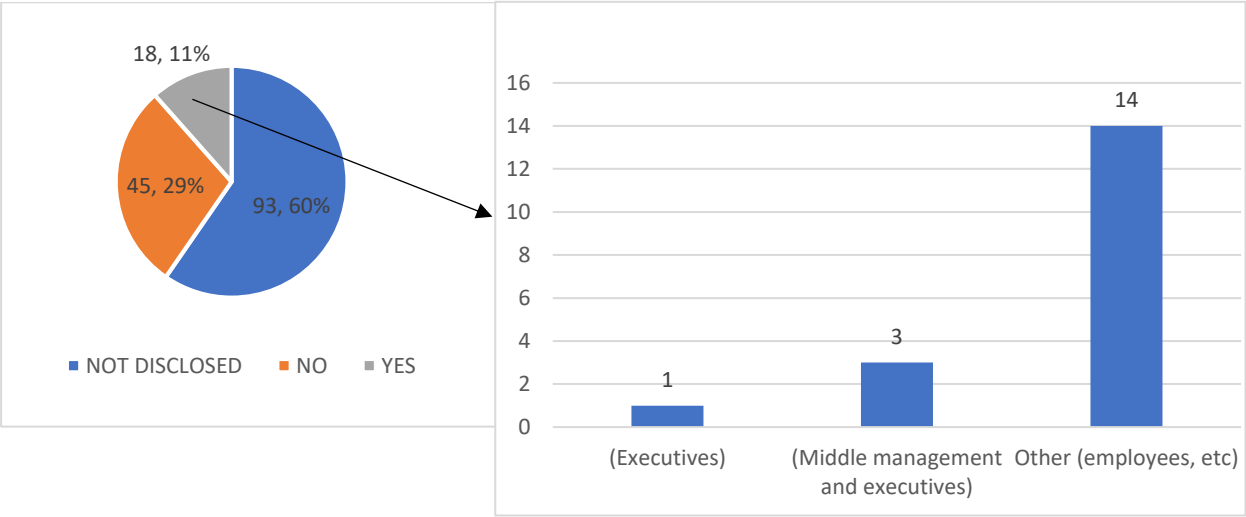


Figure 56 - Firms having their sustainability externally assured and typology of external assurance

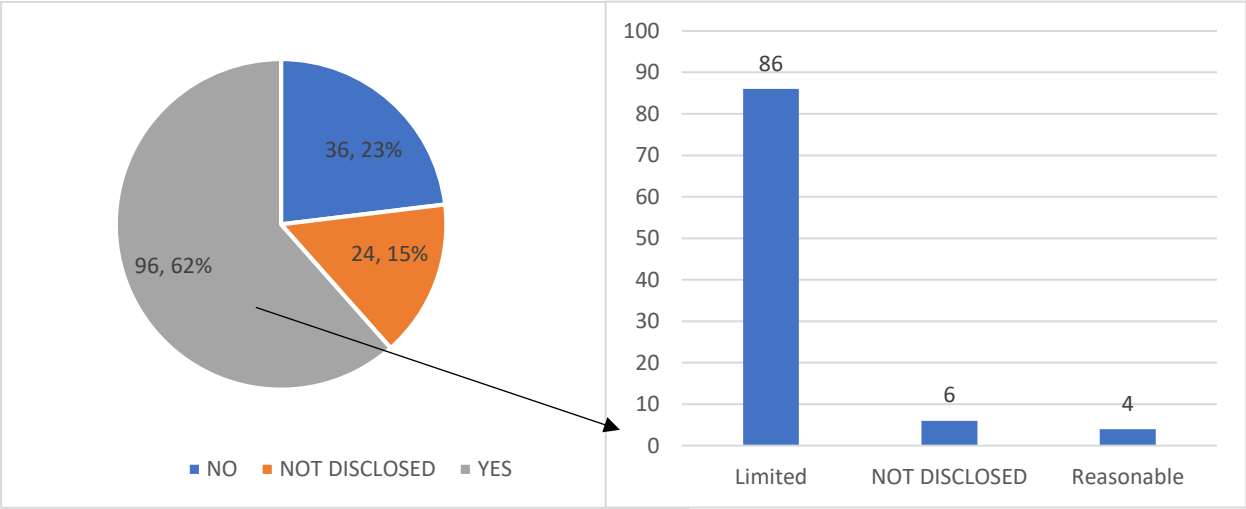


Figure 57 - Stakeholder Panel/Expert Opinion SDG mentioned (out of 156)

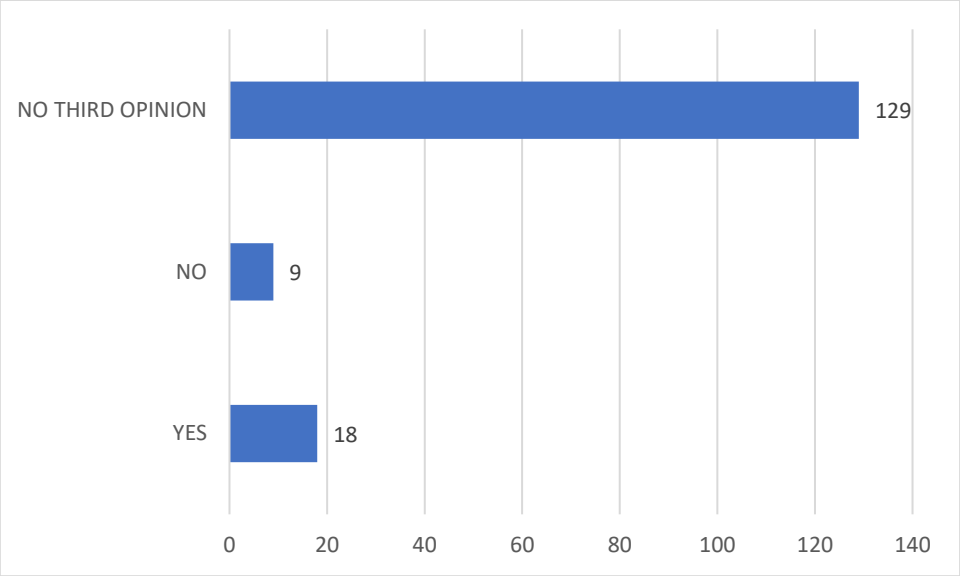


Figure 58 – Hitachi IR, link with the strategy

Figure 59 – LG SR, Strategy formulation and implementation description

Figure 60 – LG SR, Steps for SDGs implementation

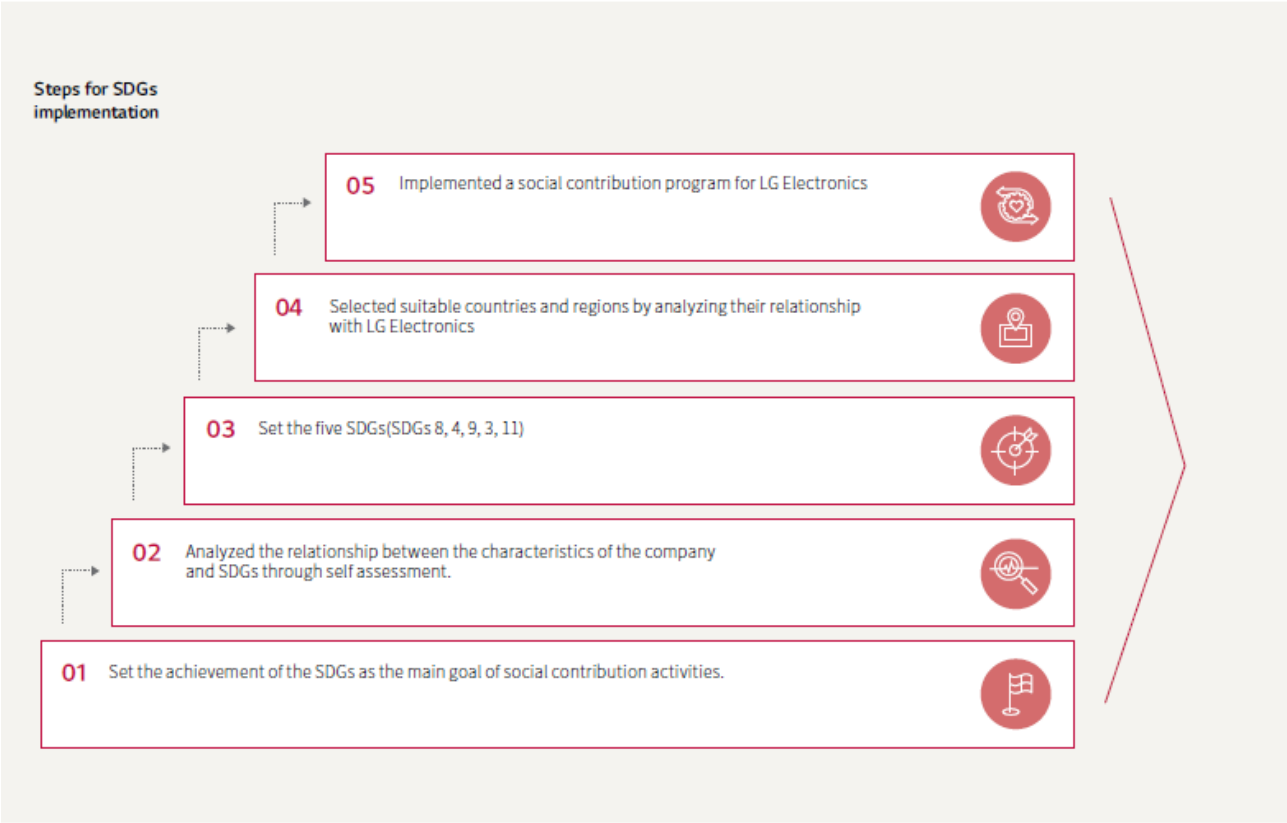


Figure 61 – LG SR, SDGs strategic implementation

Relevant_SDGs	Relevance to LG Electronics	Programs and Impacts
8.3 Create jobs and promote the growth of SMEs through creativity and innovation support. **8.6** Drastically reduced the rate of absence in the training class and unemployed young people.	· Development and enhancement of competencies. · Education and training support using the core competencies of the company. · Easier access to financial services.	· Provide space for socio-economic businesses in the area of the environment at the LG Social Campus in Korea and provide financial support. · Establishment of vocational schools in Ethiopia and Vietnam.
4.3, 4.4 Advanced educational support including necessary technical training, vocational training, and college education for finding jobs, better jobs, and business activities.	· Talented people are required to provide quality services. · Development of human resources through cooperation between industry and academia.	· Opened a vocational school for electrics repair jobs in Ethiopia and enhanced the students' technical capabilities through special lectures by Master Repair Engineers and on-site training at the service center in UAE. · Training for instructors at vocational schools.
9.a Increased financial and technical support for the least developed countries in Africa. **9.c** Improved ICT accessibility.	· Improved the brand image in new markets. · Establishment of infrastructure in developing countries.	· Solar power supply to hospitals and libraries in Pakistan and Syria. · Limb operation in Kenya. · Established the LG IT Library within the vocational school and offered scholarships to outstanding students in Vietnam.
3.8 Realized UHC (Universal Health Coverage) by ensuring access to quality health care services, necessary medications, and vaccines.	· Promoted the use of home appliances such as refrigerators, washing machines, and water purifiers	· Provided mobile clinic service for improving hygiene and public health in Asia · Improved hygiene for underprivileged people in Nigeria by opening free laundry rooms · Provided Vaccination against Japanese Encephalitis in Indonesia
11.4 Protection and Preservation of World Cultural and Natural Heritage sites.	· Protection of World Cultural Heritage sites · Improve the awareness by using the company's advertising channels · Partnership with government organizations related to cultural heritage	· Employees at 45 business sites volunteered to participate in local community services to protect World Cultural Heritage sites. · Played promotional films on World Cultural Heritage sites on the digital billboard in Piccadilly, London.

Figure 62 – Boeing SR

Figure 63 – Indian Oil SR, SDG approach

Figure 64 – Telefonica IR, prioritization scheme

Figure 2 – ENI SR, model developed to help firm in prioritizing SDGs

Figure 66 – Aviva SR, Aviva's approach to prioritization

	Impact we can have on the goal	Impact of the issue on our business (materiality)	Aviva strategic priority
1. No poverty	✓	✓	✓
2. Ending hunger			
3. Health and well-being	✓✓✓	✓✓✓	✓✓✓
4. Quality education	✓	✓	
5. Gender equality	✓✓	✓✓	✓✓
6. Water and sanitation			
7. Affordable and clean energy	✓	✓	
8. Decent work and economic growth	✓✓✓	✓✓✓	✓✓✓
9. Infrastructure	✓✓	✓✓	✓✓
10. Reduce inequality	✓✓	✓✓	✓
11. Sustainable cities and communities	✓✓✓	✓✓✓	✓✓✓
12. Sustainable consumption and production	✓✓	✓✓	✓✓
13. Climate action	✓✓✓	✓✓✓	✓✓✓
14. Life below water	✓		
15. Life on land	✓		
16. Peace and justice	✓✓	✓✓	✓✓
17. Partnerships	✓✓✓	✓✓✓	✓✓✓

Figure 67 – Credit Agricole SR, matrix of CSR challenges and SDGs

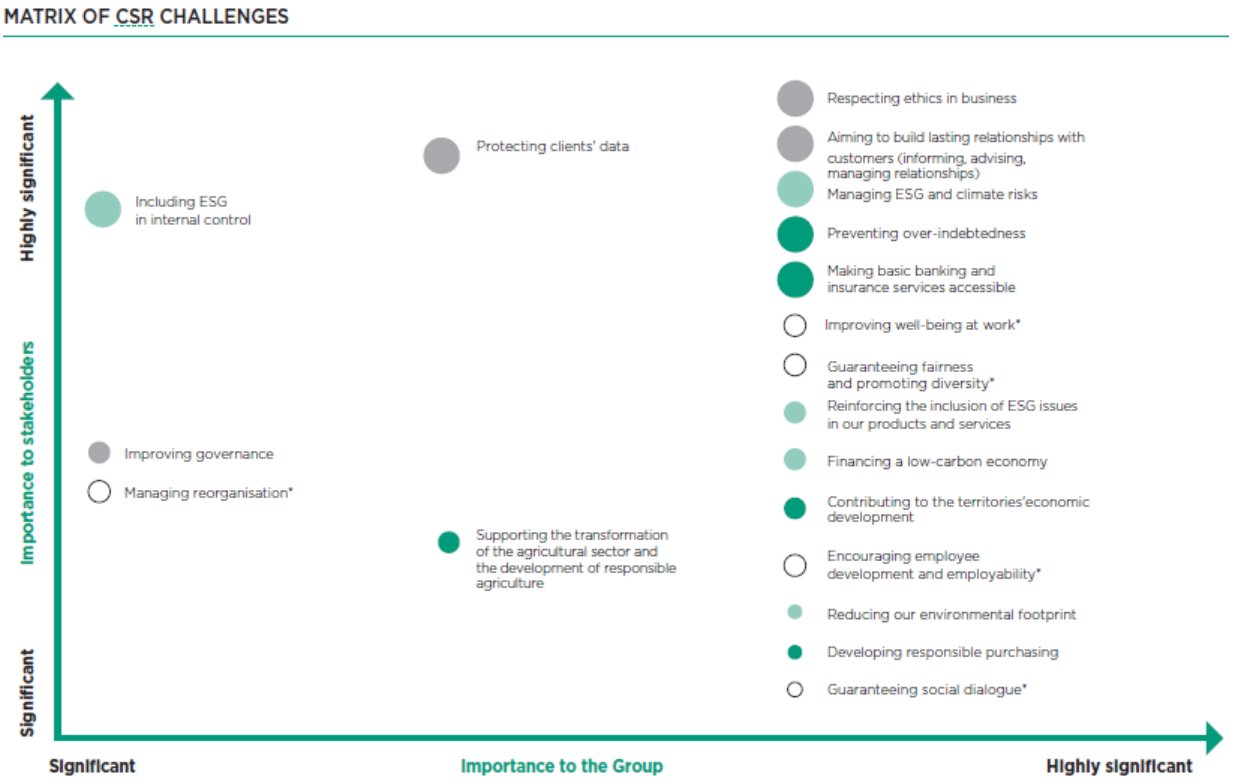


Figure 68 – Unilever SR, materiality issued mapped to SDGs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Nutrition & Diets		●	●														●
Sanitation & Hygiene						●											●
Agricultural Sourcing		●													●		●
Climate Action							●						●				●
Deforestation													●		●		●
Packaging & Waste												●		●	●		●
Water			●			●						●	●	●			●
Non-agricultural Sourcing															●		
Human Rights				●	●			●		●							●
Women's Rights & Opportunities				●	●			●		●							●
Economic Inclusion	●				●			●		●							●
Employee Well-being			●					●									
Fair Compensation	●				●			●		●							
Ethics, Values & Culture																●	
Data Security & Privacy																	
Governance & Accountability																●	
Responsible Marketing & Advertising																	
Tax & Economic Contribution										●						●	
Responsible Use of Innovation & Technology												●					
Trusted Products & Ingredients												●					
Animal Testing & Welfare																	
Consumers & Sustainability												●					●
Talent				●				●									
Communicable Diseases			●														

Figure 69 – Pemex SR, link between sustainability topics and SDGs

ODS	Chapter in this report	Some actions made
2 ZERO HUNGER	• Our Social Commitment • Economic-Financial Performance	Our support mechanism for granting includes the following. • 1400 ecological stoves. • 3 kitchen-dining rooms in schools. • 1 classroom-dining room in school. Of the ammonia production that is generated in Pemex Fertilizantes, 80% of the commercialized ammonia is used as fertilizer or becomes solid fertilizer, which contributes to increase the productivity and development of the agricultural field.
3 GOOD HEALTH AND WELL-BEING	• Safety and Health • Our People	• Pemex offers health services for all its workers, dependents and retirees. • 73% of Medical Units are certified. • Integral attention to overweight, obese and diabetes patients: 91,745 consultations. • Mental health and addictions: 16,198 patients attended. • Health Bonus: 9,962 workers were encouraged. • High Performance Award for Safety, Health and Environmental Protection to Pemex Exploración y Producción for having achieved in 2016 the lowest accident frequency rate in its history, with 0.25 injuries per million man-hours worked.
4 QUALITY EDUCATION	• Our People • Our Social Commitmentl	Training: • 7,079 courses. • 455,678 hours. • 74,685 participants. • $96 millions of investment. • 10,511 scholarships. • Pemex University. Education Support: • 13 restored schools. • 9 classrooms. • 1 classroom-dining room in school. • 2 dining rooms in schools. • School equipment. • Supplies for schools. • 6 bleachers and bathrooms in sports fields. • 3 training programs.
5 GENDER EQUALITY	• Ethics and Transparency	• HRC (Human Rights Campaign) Equity MX Award. • Diagnosis to identify challenges and opportunities for the women workers who hold positions of decision making in Pemex.

Figure 70 – Allianz SR, link between sustainability priorities to SDGs

Figure 71 – Korea Electric Power SR, mapping of SDGs to initiatives

Goal 3 Ensure healthy lives and promote well-being for all at all ages	• Conduct eyesight recovery operation for low-income patients in danger of blindness in Korea and abroad • Operate employee health management for employee health management
Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	• Support the learnings at childcare centers • Support the job experience programs after school • Provide scholarship to the underprivileged
Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all	• Expand the renewable energy business such as wind power and solar power • Build EV charging stations • Provide the underprivileged with solar power generation facilities free of charge
Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	• Carry out projects to foster startups in the energy new industry • Expand the recruitment of local talents
Goal 10 Reduce inequality within and among countries	• Help the culturally underprivileged enjoy culture and art performances, including movies • Carry out global social contribution activities (repair village facilities, install solar street lights, etc.)
Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable	• Build the Bitgaram Energy Valley • Run the KEPCO119 Disaster Relief Squad • Build an eco-friendly facility
Goal 13 Take urgent action to combat climate change and its impacts	• Jointly respond to climate change with KEPCO Group power generation companies (carbon management diagnostic index, GHG reduction roadmap, etc.) • Develop eco-friendly technologies

Figure 72 – POSCO SR, SDGs contribution table

UN SDGs(Sustainable Development Goals)

NO.	SDGs	Related content in the Report	Page
Goal 1.	End poverty in all its forms everywhere		
Goal 2.	End hunger, achieve food security and improved nutrition and promote sustainable agriculture		
Goal 3.	Ensure healthy lives and promote well-being for all at all ages		
Goal 4.	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	· POSCO Center Music Concert, POSCO Concert and music concerts in the company building · POSCO Art Museum, POSCO Museum, POSCO Hyoja Art Hall/ Baekun Art Hall · POSCO Youth Volunteer Corps, "Beyond" · Do Dream · Dream Bridge · Chin Chin Rainbow Projects · POSCO Educational Foundation and POSCO TJ Park Foundation	124~128
Goal 5.	Achieve gender equality and empower all women and girls		
Goal 6.	Ensure availability and sustainable management of water and sanitation for all	· Participation in 'Water Management Project' hosted by World Steel · Improvement of the water management program using the 'WBSCD Water Tool' of the World Business Council for Sustainable Development(WBCSD) · Participation in the CDP Water Disclosure project	70
Goal 7.	Ensure access to affordable, reliable, sustainable and clean energy for all	· 2020 POSCO Greenhouse Gas Reduction Target · Recovery and use of byproduct gas or use in independent power generation	85, 89, 90~92

Figure 73 – BNP Paribas SR, KPI to measure SDGs contribution

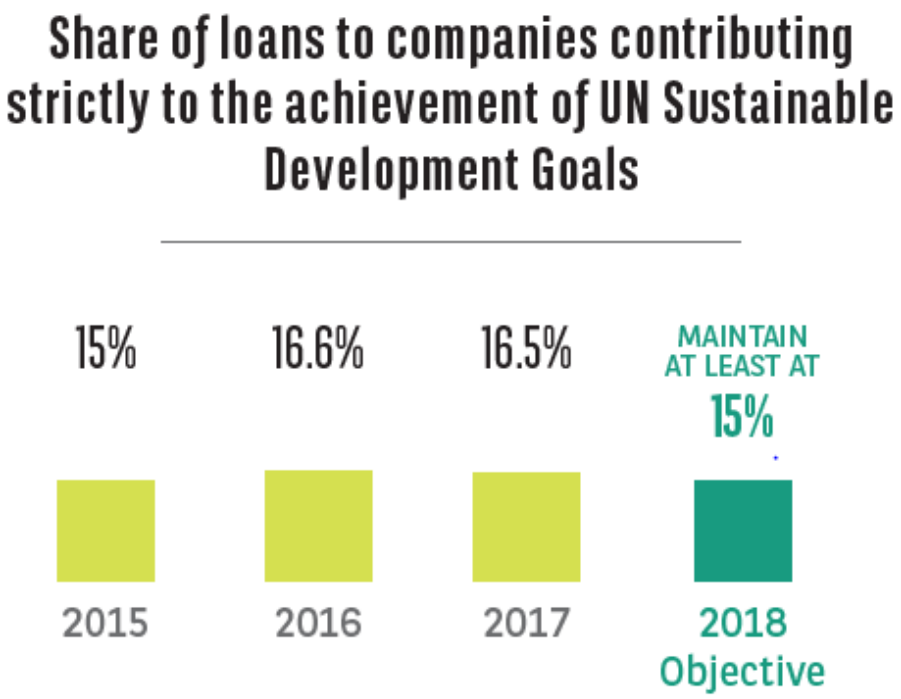


Figure 74 – Samsung SR, table with SDGs, relevance, impact, initiatives

GOAL	RELEVANCE[1)]	POTENTIAL IMPACT[2)]	OUR STATUS	FUTURE PLAN
SDGs #1		Improve access through technology, information and communication services Exert a direct or indirect impact on environmental destruction that may affect local resident's livelihood	• Operate citizenship programs that guarantee access to information to all regardless of abilities or economic status • Operate the Tech Institute digital skills program to offer employment training to underprivileged/marginalized populations so that they become economically independent	• Pursue technological innovation that meets social needs • Improve the quality of employment trainingprograms and expand employment support
SDGs #4		Increase access to education by using ICT	• Provide quality education and training programs in the EU • Provide career development programs aligned with the life cycle needs of employees	• Expand and improve education and digital skills program • Support individuals with strengthening their job expertise
SDGs #5		Strengthen female leadership in the workplace and support female-led businesses	• Operate education programs for females - Designer School in Nepal, programs for women domestic violence in Italy • Operate work programs that ensure maternity protection (Mommy Room in Vietnam)	• Expand support for digital education for women • Strengthen gender equality as part of our corporate culture

Figure 75 - LG SR, SDG-related Goals table

Commitments	Goals / Relevant SDGs	Targets
Promote Intelligent Lifestyle	Establish Intelligent Living Environment	- Improve the life of customers by providing more easy-to-use products applied with AI and future technology. (Create a better living environment by adding more sentimental value to products and services with intelligent connectivity.)
	Pursue Healthy Life for Customers	- Help customers live a healthy lifestyle by launching innovative products with social and environmental changes in mind. (Guarantee a healthy lifestyle tailored to customer needs through the convergence of future technologies (hardware, software, AI, 5G, etc.) in consideration of the society and environment.)
	Expand Green Business	- Contribute to creating a sustainable society through continuous development of environmentally friendly businesses such as renewable energy and EVs. (Ensure sustainable industrial growth in the areas of renewable energy and EVs that are future oriented, and provide environmental and human value.)
Realize Zero Carbon and Circular Economy	Pursue Zero Carbon	- Reduce carbon emissions in the production level by 150,000 tons by 2020 compared to the base year 2008. (1 million tons in cumulative reductions) * A mid- to long-term carbon management strategy will be reestablished and announced in the 2nd half of 2018.
	Reduce the Environmental Impacts of Products	- Achieve 80% Green 3 Star Products by self-assessment of environmentally friendly products by 2030. (In terms of the number of development projects) *Percentage of Green 3 Star Products as of 2017: 45%

Figure 76 – Hitachi SR, SDG-related goals

SDG Focus

13 CLIMATE ACTION

Hitachi promotes initiatives to minimize environment-related risks, principally climate change, and contribute to resolving environmental issues.

- **Rate of Reduction in CO_2 Emissions from Use of Products and Services (Hitachi Group)**

From base year 33% reduction

- **FY2010 (base year)** $\frac{CO_2 \text{ emissions}}{\text{Function size*}} = 100\%$ → **FY2017** $\frac{CO_2 \text{ emissions}}{\text{Function size}} = 67\%$

* Major functions of products correlated to CO_2 emissions.

- **Reduction in Per-Unit Energy Use by Factories and Offices (Hitachi Group)**

From base year 14% reduction

- **FY2005 (base year)** $\frac{\text{Energy used 2.06 GL*1}}{\text{Activity amount*2}} = 100\%$ → **FY2017** $\frac{\text{Energy used 2.00 GL}}{\text{Activity amount}} = 86\%$

*1 Energy volume used both in and outside the organization (Scope 1 and 2).
*2 A value closely related to energy use at each business site (for example, production quantity, output, building floor space, and number of employees).

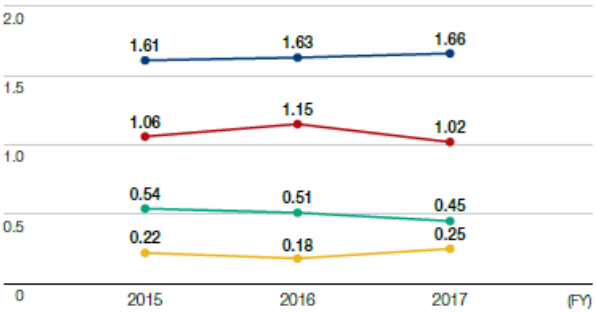
Figure 77, Hitachi SR, YoY results for the SDG-related goals

SDG focus

8 DECENT WORK AND ECONOMIC GROWTH

We are primarily addressing SDGs in the recognition that it is indispensable for business management to develop environments in which the people working in the Hitachi Group can work safely and without anxiety about physical and mental health.

Occupational Accident Rates



* Occupational accidents are defined as those involving fatality or work-time loss of one day or more. Hitachi Group figures for Japan, including Hitachi, Ltd., are for 240 Group companies in fiscal 2015; for 200 Group companies in fiscal 2016; and for 201 Group companies in fiscal 2017.

Figure 783 – Johnson & Johnson SR, SDG-related goals table

- **Achieved**
- **On track:** expected to meet the Goal by 2020
- **In progress:** so far progressing more slowly than expected; plans are in place to meet the Goal by 2020
- **Off track:** not progressing as expected; currently at risk of not meeting the Goal by 2020

Aspiration	5-Year Target (2016-2020)	Progress for 2016-2018 implementation years	Notable	Status
1. Health Workforce: A world where the current and future healthcare workforce has the necessary competencies to deliver high quality healthcare.	650,000 health workers will have received training to better deliver quality healthcare.	324,900 healthcare providers (50% of overall goal achieved).	Recipients of leadership training, skills training, and education programs focused on health workforce development - including China Neonatal Resuscitation Program, NurseConnect, mothers2mothers, North Star Alliance, Uganda Academy for Health Innovation and Impact, and Management Development Institute. Learn more	In progress
2. Women's & Children's Health: A world where every woman and child survives and has the opportunity for a healthy future.	60 million women and children will have received support and tools to enable a healthy future.	33.6 million women and children (56% of overall goal achieved).	Programs including MomConnect, mMitra, Grameen Foundation, War on Worms, Born On Time, DREAMS Thina Abantu Abasha, and projects on CARINGCROWD provide access to quality care, optimal development, and gender equality and empowerment. Learn more	In progress

Figure 79, Verizon SR, SDG-contribution through partnership

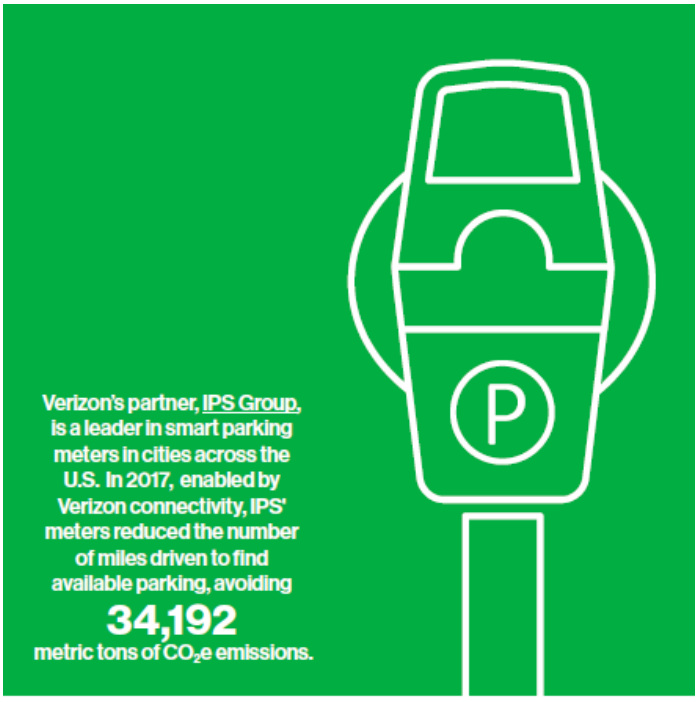


Figure 80 – Daimler SR, value chain analysis

- **Step 3:** Finalizing the strategy. In the third step, we transferred the topics that were judged to be material into the final strategy. It consists of four focal topics and 11 fields of action, which are associated with specific key figures and goals. Once this was done, the strategy was approved by the Board of Management.

- **Step 4:** Acting consistently. During the strategy process, we were able to intensify our sustainability management and realign it toward key future-oriented topics. These topics include our activities for respecting and upholding human rights as well as our research and development activities for innovative drive system technologies and the safety of our vehicles. The incorporation of the objectives of the Sustainability Strategy 2030 into an in-house management and reporting system aims to permanently implement our sustainability activities.

Our Sustainability Strategy 2030 supports the implementation of the Sustainable Development Goals (SDGs) that were approved by the United Nations in September 2015. Although the SDGs are directed primarily at governments and countries, the achievement of these goals will depend greatly on businesses because of their innovative spirit and extensive ability to make investments. As a result, we also took the SDGs into account during the realignment of Daimler's Sustainability Strategy. We focused our sustainability-related activities on those SDGs that are greatly influenced by our business model and value chain and where we can actually bring about change. This mainly affects the following SDGs and the associated sustainability activities:

- **SDG 8 – Decent Work and Economic Growth**
  By developing and implementing a risk-based management approach to respecting and upholding human rights in our own units and our supply chain, we support the implementation of decent work as defined by SDG 8.

- **SDG 9 – Industry, Innovation and Infrastructure**
  Through the advanced development of automated and autonomous driving and the expected benefits for safety and climate protection, we demonstrate the long-term potential of digital innovations.

- **SDG 11 – Sustainable Cities and Communities**
  As the global leader for flexible carsharing (car2go), we support the creation of sustainable urban spaces for traffic and community life.

- **SDG 12 – Responsible Consumption and Production**
  By significantly reducing and reinforcing the material cycles of primary raw materials that are needed for our e-drive system, we are setting the course for sustainable production models in line with this SDG.

- **SDG 13 – Climate Change**
  By setting ambitious targets for reducing the emissions of our fleets, we are helping to protect the planet from the effects of climate change.

Figure 81 – POSCO SR, value chain analysis

	Supplier	Operations	Customer/Society
UN SDGs Goal	12, 16	6, 7, 13, 14	4, 8, 11, 17
POSCO Commitments	**12 Ensure sustainable consumption and production patterns** POSCO is striving to prevent risks to sustainable management that can occur in the supply chain and to establish a healthy supply network ecosystem by promoting shared growth with SMEs. - Prepare code of conduct for suppliers (human rights, labor, environment, health and safety) - Assess supplier performance(including sustainable management elements) - Operate programs for technological cooperation, partnership with SMEs and financial support for them	**6 Ensure availability and sustainable management of water and sanitation for all** POSCO recognizes the global risk of short water, and thus strives to reduce this risk by increasing water recycling and developing replacement water sources. - Participate in "Water Management Project" led by World Steel Association - Continuously improve water management programs by using the "WBCSD(World Business Council for Sustainable Development) tool" - Participate in CDP Water Disclosure project	**4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all** POSCO provides various opportunities for performance and exhibitions to underprivileged neighbors, local residents and rising artists. - Organize POSCO Center Music Concert, POSCO Concert and music concerts in the company building - Operate POSCO Art Museum/POSCO Museum - Operate POSCO Hyoja Art Hall/Baekun Art Hall - Operate POSCO Youth Volunteer Corps, "Beyond" - Implementation of Do Dream, Ream Bridge, and Chin Chin Rainbow Projects - Operate POSCO Educational Foundation and POSCO TJ Park Foundation

Figure 82 – Woolworth SR, link between the impact assessment and the SDGs

Table 11 – Final questionnaire

1. Rank
2. Firm
3. Legal status
4. Country
5. Region
6. Sector
7. Industry
8. Producing an integrated report or a separated report?
9. Name of the report
10. Are the SDGs mentioned at least once in one of the reports?
11. Are the SDGs mentioned in SR, AR or both?
12. Where are the SDGs treated?
13. Does the firm provide a link to the website in the report to go in depth about the firm's engagement to SDGs?
14. Total benchmarks
15. GRI
16. ISO
17. CDP
18. IPIECA/DJSI/OTHERS
19. Is the firm member of the UNGC?
20. Does the firm follow the UNGC principle for Human Rights?
21. Does the firm mention to follow the SDG Compass or any of the official documents related to implement the SDGs inside the organisation?
22. Does the firm disclose who oversees the SDGs inside the organisation?
23. Who oversees the SDGs inside the organisation?
24. Does the firm seek an expert panel commentary? *24.b Do the experts provide useful suggestions to make the report more effective?*
25. Does the firm acknowledge that the SDGs are interconnected?
26. Are the SDGs mentioned in CEO message (this includes also Board & CSR manager)?
27. Does the firm mention a direct link between SDGs and corporate strategy?
28. The firm expressly mention to use SDGs as a sustainability framework for reporting along with others (GRI, ISO)?
29. Does the firm provide a rationale for engaging with SDGs?
30. Does this rationale is or include business reasons?
31. Does the firm disclose opportunities to engage with the SDGs or potential risks (of engaging and not engaging)?
32. Are the SDGs treated as symbol of the ever-changing economic, social and environmental situation?
33. Does the firm address any specific goal beyond the overall set of SDGs?
34. Does the firm pursue any target?
35. How many goals the firm addressed?
36. Which one?
37. END POVERTY
38. ZERO HUNGER
39. GOOD HEALTH

40. QUALITY EDUCATION
41. GENDER EQUALITY
42. CLEAN WATER
43. AFFORDABLE ENERGY
44. DECENT WORK
45. INDUSTRY
46. REDUCED INEQUALITIES
47. CITY & COMMUNITIES
48. RESPONSIBLE CONSUMPTION & PRODUCTION
49. CLIMATE ACTION
50. LIFE BELOW WATER
51. LIFE ON LAND
52. PEACE & JUSTICE
53. PARTNERSHIPS
54. Does the firm do a value chain analysis to find the most positively and negatively impacted SDGs?
55. Are the SDGs involved in the materiality analysis?
56. Does the firm provide a reason for the choice of the goal?
57. Is the choice impact-based?
58. Does the firm disclose how they measured this impact?
59. Does the firm prioritize the goals?
60. What are the goals prioritised?
61. Is there a rationale provided for prioritization?
62. Is the prioritization impact-based?
63. Does the firm engage more with internally or externally actionable SDGs? (Zanten, 2018)
64. Does the firm engage more with SDGs doing good or avoiding harm? (Zanten, 2018)
65. Does the firm disclose any negative impact it had on the SDG-related goals and the adjustment made?
66. Does the firm do any kind of mapping of ESG issues to SDGs? *66.b Are these topics the priorities for the firm's sustainability strategy?*
67. Does the firm list specific existing initiatives aligned to the SDGs pursued?
68. Does the firm disclose its contribution through these initiatives, providing quantitative data of impact?
69. Does the nature of the firm's contribution is more core business oriented or more philanthropic?
70. Does the firm identify SDGs-specific goals?
71. Are they SMART?
72. Does the firm disclose the KPI chosen to track performance for SDG-related goals?
73. Are the measures provided by the KPI quantitative?
74. Can progress be measured YoY?
75. Has the firm defined new ambitious goals stemming from the SDGs engagement? Or has it implemented/widened SDGs?
76. Has the firm established partnerships to better pursue SDGs and clearly reported this link?
77. Does the firm disclose partnerships' contribution to SDGs through KPIs providing quantitative data?
78. Do suppliers have a role in the firm's commitment to SDG-related Goals?

79. Does the firm provide quantitative data about suppliers' effort in supporting the SDG-related Goals?
80. Is the performance towards SDGs part of the compensation system?
81. Are SDGs cited in the external assurance?

Figure 83 – SR and IR Disclosure Coverage Ratio distribution's results

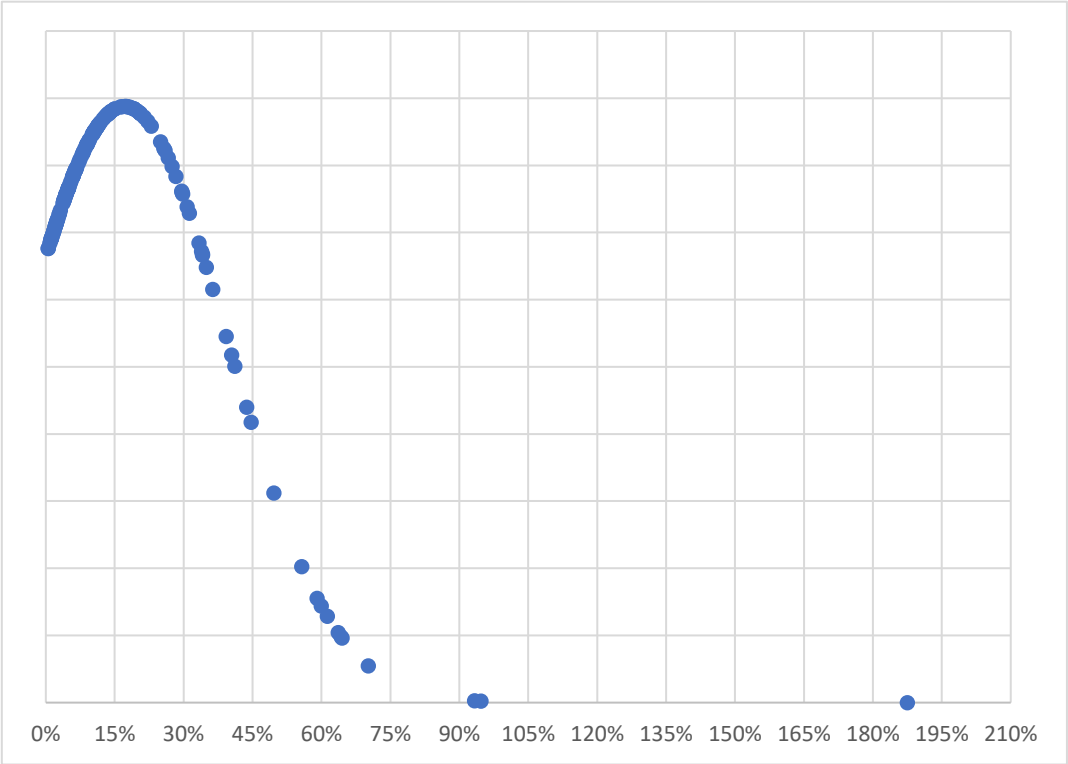


Figure 84 - AR Disclosure Coverage Ratio distribution's trends

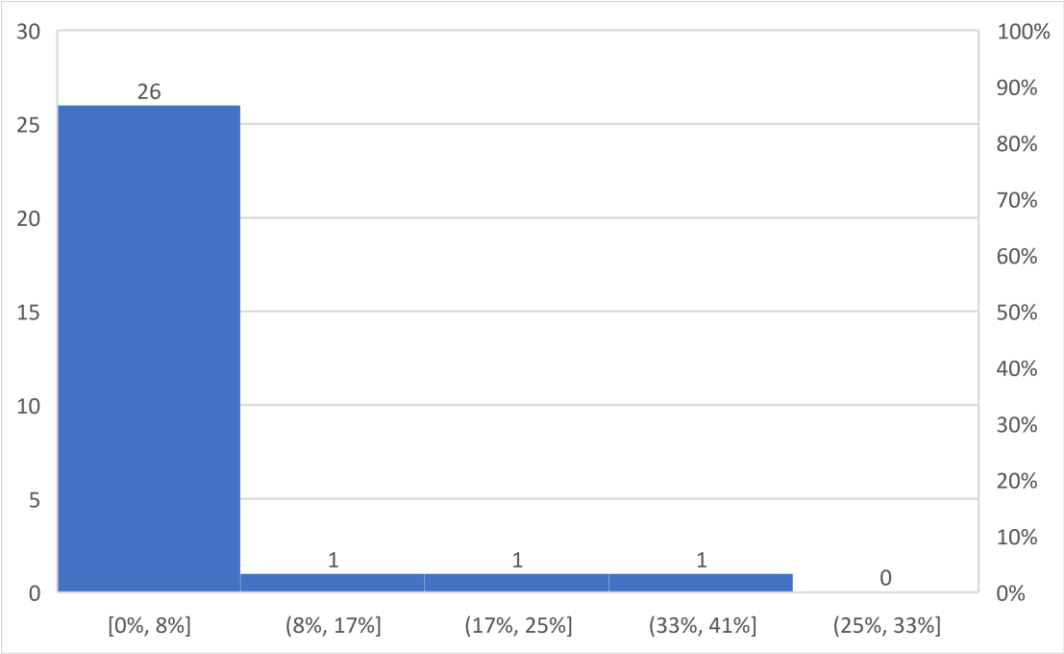


Figure 85 - Distribution of results of the SDG-integration quality ratio

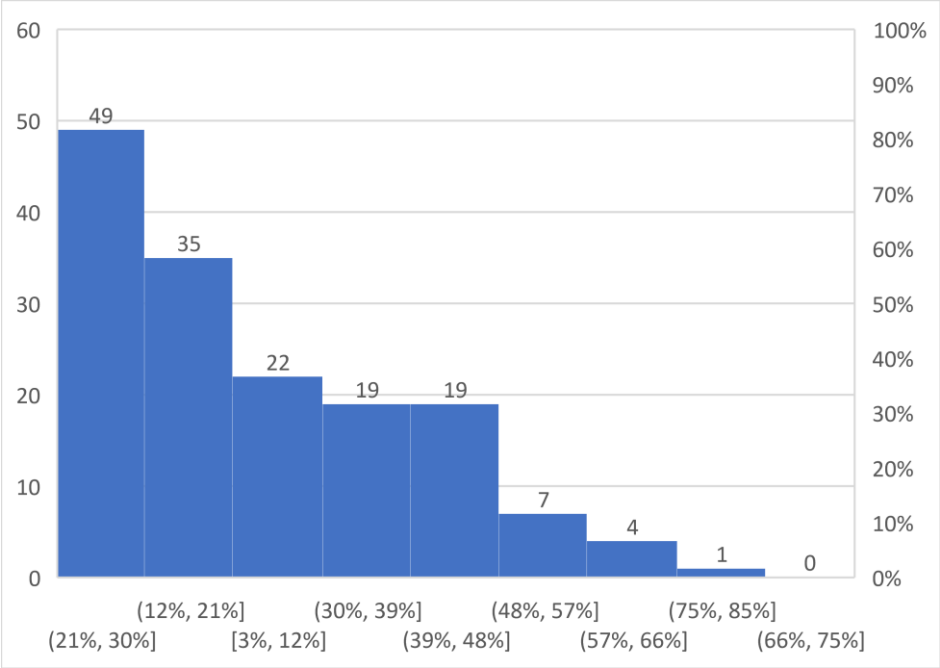


Table 12 – Summary table with qualitative and quantitative results

Rank	Firm	Legal status	Country	Region	Sector	Industry	Coverage Disclosure ratio SR/IR	Coverage Disclosure ratio AR	N. of questions positively answered	SDG-integration quality ratio
153	Unilever	Public	Britain/ Netherlands	Europe	Household products	Household & Personal Products	50%	19%	30	79%
69	Nestlé	Public	Switzerland	Europe	Food & Beverages & Tobacco	Food Consumer product	56%	13%	25	66%
83	Enel	Public (main SH State)	Italy	Europe	Energy	Utilities	19%	1%	23	61%
79	Hitachi	Public	Japan	Asia	Technology	Electronics, electrical equipment	61%	34%	22	58%
158	Vodafone Group	Public	Britain	Europe	Telecommunications	Telecommunications	18%	0.4%	21	55%
38	Allianz	Public	Germany	Europe	Financials	Insurance: Life, Health (stock)	60%	/	20	53%
100	Johnson & Johnson	Public	USA	North America	Healthcare	Pharmaceuticals	21%	/	20	53%
146	Intel	Public	USA	North America	Technology	Semiconductor & Other electronic components	28%	/	19	50%
102	Tesco	Public	Britain	Europe	Food & Drug store	Food & Drug Store	25%	1%	19	50%
248	Wilmar	Public	Singapore	Asia	Food & Beverages & Tobacco	Food Production	35%	/	18	47%
143	Aviva	Public	Britain	Europe	Financials	Insurance: Life, Health (stock)	95%	1%	18	47%
236	KDDI	Public	Japan	Asia	Telecommunications	Telecommunications	20%	/	17	45%
184	POSCO	Public	South Korea	Asia	Materials	Metals	19%	/	17	45%
44	BNP Paribas	Public	France	Europe	Financials	Banks: Commercial & Saving	40%	1.4%	17	45%
81	Deutsche Telekom	Public	Germany	Europe	Telecommunications	Telecommunications	21%	7.2%	16	42%