Analysing GRI reports for the disclosure of SDG contribution in European car manufacturers

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ABSTRACT

Social pressure has triggered companies to report their sustainable results. However, no clear methodology is available to easily report sustainable indicators directly related to the Sustainable Development Goals (SDGs).

This paper aims at analysing sustainability reports from automotive companies with manufacturing facilities in Europe that issued sustainability disclosures in accordance with the Global Report Initiative framework.

This paper maps a classification of the main sustainability metrics and their frequency amongst the leading car manufacturers reports. The main sustainable indicators usually disclosed are identified analysing the aspects covered. Consequently, the main Sustainability Drivers Key Performance Indicators (SDKPIs) for the car manufacturer sector are highlighted, including the relationship between them and the SDGs is shown. On the other hand, the main gaps in reporting these SDKPIs are indicated by considering the coverage of goals and targets, as well as the reporting frequency of current GRI metrics.

This work is an early relevant work to provide a framework for analytics in the SDGs/GRI linkage and what flows from it. Moreover, it makes easier to compare the information disclosed. This development would help in harmonizing the language used and would also contribute to foster transparency, and hence to make sustainability efforts more visible.

1. Introduction

The sustainable development (SD) concept emerged in the 1980s to consider environmental concerns (Hák et al., 2016). In recent decades, however, the SD has evolved and includes three pillars: 1) economic growth; 2) efficient protection of the environment and natural resources; 3) global social development (Hák et al., 2016; Mayer, 2008; Rosati and Faria, 2019).

Non-financial disclosure has become increasingly popular (Bravo and Reguera-Alvarado, 2019; Manes-Rossi et al., 2018; Rosati and Faria, 2019; Russo-Spena et al., 2018), and corporate commitments to sustainability continue to grow and evolve in importance within the global business community (Jones et al., 2016; Adams et al., 2017; Orzes et al., 2020). In fact, from an early SD concept stage, the relevance of reporting and, consequently, the important role of quantitative indicators have been highlighted (Guijarro and Poyatos, 2018; Hák et al., 2016; Singh et al., 2012).

Yet, despite all the efforts made by many organisations and governments, and different methodologies having been developed, no theoretical consensus has yet been reached about how to unequivocally measure today's sustainability level (Hák et al., 2016; Hák et al., 2018; Mayer, 2008; Reyers et al., 2017; Saad et al., 2019). Moreover, sustainable reporting by individual companies does not always address the sector's key challenges with sustainability (Fernández-Vázquez and Sancho-Rodríguez, 2020; Bravo and Reguera-Alvarado, 2019; GRI, 2020; Nirino et al., 2021). This fact leads to a lack of transparency on industry contribution to the world sustainability (Caiado et al., 2018). The underlying reasons can be very diverse, and they may include a lack of clarity on a sector's most significant impacts or a lack of consistent application of the principles for defining report content for every specific sector (GRI, 2016).

In this context, society's growing awareness of global environmental, social and economic problems has led the UN to officially enact 17 SDGs as a common global agenda until 2030 (UN, 2015). These 17 SDGs are deployed in 169 globally set targets, particularly by the 193 UN Member States (UNGC, 2020a). Although the 17 SDGs have been set at the

country level, organisations worldwide can play a significant role to help achieve the much desired SD by integrating SGDs into their strategies and operations (Centobelli et al., 2020; Ike et al., 2019; Rosati and Faria, 2019).

According to the UN's 2030 Agenda, urgent and accelerated action is needed to address global challenges facing the economy, environment and society (UN, 2015).

It is noteworthy that the United Nations Global Compact (UNGC) and the GRI have recently established a joint initiative: reporting on the SDGs (GRI, 2020a, 2020b; UNGC, 2020b). The aim of this initiative is "to enable businesses to incorporate the SDGs reporting into their existing processes, empowering them to act and make the achievements of the SDGs a reality" (UNGC, 2020c). However, Schramade (2017) empirically found that only a minority of companies currently mention the SDGs in their reports. One of the main reasons could involve the difficulty found by the private sector in operationalising and achieving the SDGs (Ike et al., 2019). The proof is that, Global Sustainability Standards Board (GSSB), as an independent body of GRI, is now developing sector-specific guidance for sustainability reporting. These guidelines aim at focusing on the issues that matter most and can both reflect and set stakeholder expectations for the sector's sustainability reporting (GRI, 2020).

The GRI sector program is a new program being developed to identify specific standards to certain sectors and their correspondence to the SDGs (GRI, 2020). However, to date, not every sector has been developed. Only high-impact sectors such as mining and metals, oil and gas, or electric utilities are currently available (GRI, 2020). Nevertheless, there are still a high range of sectors with high impact and a long tradition of sustainable data disclosure not covered by this program.

Accordingly, this paper aims at analysing sustainability reports from the automotive sector to identify the commonly used indicators and their SDG coverage, using their GRI reports in a European context.

Considering that the manufacturing sector has a major impact on the three sustainability dimensions, represented by social, economic and environmental aspects (Saad et al., 2019), this research focuses specifically on the automotive industry and its coverage of the SDGs in a European context. We are not identifying the most significant impacts of this industry, but we are highlighting the most common aspects disclosed by them and their relationship with the SDGs.

This is one of the first studies to simultaneously address these indicators, and it may be of great help at the preliminary stage to determine specific standards for this industry amongst GRI–SDG sector program. On the other hand, it offers a guide for sustainability reporting to those industries using GRI guidelines and willing to include the SDGs in their annual reports.

This study has been carried out in automotive industry. This selection was based on the fact that it is deemed representative of a wide variety of sustainability issues such as carbon dioxide emissions, or fossil fuel dependence (Sukitsch et al., 2015). It is especially exposed to legal and public pressure, as far as socio-environmental issues are concerned (Azevedo and Barros, 2017; Russo-Spena et al., 2018; Salvado et al., 2015; Schöggl et al., 2016; Sukitsch et al., 2015). In spite of that, it is not included in the GRI sector program. In addition, the automotive sector's environmental impacts may be more easily isolated than other industries (i.e., mining, financial sector, etc.) and European autos' unique global footprint in combination with stricter reporting standards reinforces the decision to choose this sector.

Therefore, this research aims to answer the following questions: 1) Do the main automotive companies report the same indicators? 2) Which aspects are covered, and which are not? 3) Is there a direct, clear relationship between the key indicators in their reports and the SDGs? 4) Which are the most commonly reported SDGs by this industry?

The remainder of this paper is arranged as follows. Sections 2 and 3 describe the theoretical background and research methods. Section 4 provides the results and discussion. Finally, Section 5 includes the main conclusions, describes the relevant constraints and provides suggestions

for further research.

2. Theoretical background

As stated above, the automotive sector is a spotlight of socio-environmental issues. One of the most widely used methodologies in this sector is reporting sustainable issues in the GRI. Therefore, this section includes a brief theoretical review on the relevance of both the automotive sector and sustainability reporting.

2.1. Automotive sector in Europe

Although in 2018 the market capitalisation of the top 15 mobile tech and web digital companies was approximately 5 times as high as that of the top 50 auto players (KPMG, 2019), the European automotive sector is highly relevant in the worldwide industrial context and is a high priority for the European Union (EU) (EUC, 2018). This sector represents 10.9% of the EU's manufacturing employment (i.e., 12.6 million people), and there are 137 car automobile factories in Europe, which made 16 million passenger cars in 2015. Thus, about 25% of all the cars produced around the world are built in Europe. Some 5.7 million European cars were exported worldwide in 2016, worth over 129 billion Euros (ACEA, 2017). Generally speaking, European car manufacturers currently occupy a leading position in terms of financial excellence, especially in comparison to China and the United States (US) (EUC, 2016). Besides, big European automotive companies have the highest shares of R&D investments, spending globally in 2015 about 50 billion Euros on R&D. This amount is comparable to the sum of the R&D spending of Japan, US and China together (EUC, 2016).

Europe has a comparative advantage in added value terms and currently has the highest share of value added within the automotive sector (Konrad et al., 2018). Regarding the number of enterprises in the top 2500 list, Europe has the second highest share of big companies specialised in automotive and parts, only behind Japan (Lejarraga et al., 2016).

For our analysis, the following car manufacturers with assembly plants in Europe were chosen: Volkswagen Group, BMW Group, Daimler Group, Ford, PSA Group, Renault Group and FCA Group. These manufacturers have accounted for about 80% of new passenger vehicle registrations in the EU and EFTA (European Free Trade Association) from January to March 2019 period (ACEA, 2019). During the first quarter of 2019, the first three largest car manufacturing corporations in the EU were (in this order): Volkswagen Group, PSA and Renault Group.

2.2. Sustainability and SDG reporting

In this subsection, the authors present the emerging literature on SDG reporting and discuss the potential role of sustainability reporting in the advancement of the SDGs. Sustainability.

As it has been stated in previous works, sustainability reporting can be defined as the practice of reporting publicly on an organization's economic, environmental and/or social sustainability impacts (GRI, 2016). And particularly, SDG reporting refers to the reporting on how an organization addresses the SDGs (García-Sánchez et al., 2020; Rosati and Faria, 2019).

Recent policy changes in sustainability reporting, such as the ones related to the new European Directive on non-financial disclosure (Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014, 2014) or the GRI standards by the GSSB stress the importance of extending the disclosure of ethical, social and environmental risks within financial and social-environmental reporting (Avrampou et al., 2019; García-Sánchez et al., 2020; Truant et al., 2017). Social pressure has triggered large companies to report their sustainability results. Particularly, from 2018 onwards, it is a European requirement for large companies to provide annual information on the economic, ecological and social effects of their activities (2014/95/EU;

Folkens and Schneider, 2019; Siew, 2015).

Most companies had to adapt their corporate reporting, including socio-ecological contents. Consequently, organisations that integrate the triple bottom line in their corporate reports are becoming increasingly more frequent (i.e., integrating financial profitability, environmental protection and social responsibility as part of their corporate sustainability reports) (Fernández-Vázquez and Sancho-Rodríguez 2020; Ihlen and Roper, 2014; Moldavska and Welo, 2019; Rosati and Faria, 2019; Siew, 2015; Truant et al., 2017). Effective sustainability reporting is increasingly seen as a vital element in communicating with stakeholders about how companies are performing against strategic environmental and social goals (Centobeli, 2020; Jones et al., 2016; Kraus et al., 2020; Nikolaou and Tsalis, 2013; Rosati and Faria, 2019; Truant et al., 2017). Nowadays, there is a number of sustainability reporting frameworks, such as GRI, Carbon Disclosure Project (CDP, 2020) or Conflict Free Sourcing Initiatives (CFSI, 2020), have been develop. However, the GRI appears to be one of the most widely used sustainability reporting frameworks around the world (Marimon et al., 2012; Rosati and Faria, 2019; Truant et al., 2017). It is one of the most popularly recognised set of voluntary guidelines and commonly used reporting methods for corporate sustainability, particularly in the automotive sector (Chen et al., 2015; Sukitsch et al., 2015).

Due to pressure to report, more importance is being attached to sustainability metrics and performance evaluations. There is a growing number of publications that provide suggestions for suitable frameworks and methods (Garbie, 2014; Iddrisu and Bhattacharyya, 2015; Janoušková et al., 2018; Mani et al., 2014; Nirino et al., 2021; Salvado et al., 2015; Schöggl et al., 2016; Taticchi et al., 2015). However, the vast majority of these papers do not deal with any clear methodology that enables companies to report sustainable indicators directly related to the SDGs. Therefore, the contribution of any industry on the achievement of the SDGs cannot be easily analysed.

It is important to highlight that sustainability reporting can not only be an important driver of an organisation's sustainability orientation (Rosati and Faria, 2019) but also an enabler of the SDGs actions, investments and strategies (GRI, 2016; Schramade, 2017). It can, thus, led organisations to measure, understand, drive and communicate any SDG efforts, set internal goals and manage the transition towards more sustainable development (GRI, 2020b). At the same time, the SDGs can also play an important role in advancing sustainability reporting. Moreover, companies providing relevant SDG data to investors help them to make better decisions by directing capital towards investments with a positive real-world impact (Mohin et al., 2019).

Only a small amount of works has been attempted to link GRI reports to the achievement of the SDGs so far. Avrampou et al. (2019) have developed a methodology to rank European banks leading in sustainability management according to the Dow Jones Sustainability Index. Rosati and Faria (2019) Investigate external institutional factors related to the organization's country of origin and their willingness of addressing SDG in their sustainability report. Hu et al. (2016), develops an evaluating framework based on SDGs and GRI in the context of ICT firms in Taiwan. However, this work includes novel suggestions as to how to craft GRI reports to address the SDGs in the car manufacturing industry, it maps the linkage between GRI metrics and the SDGs.

Therefore, this work may contribute to the achievement of the SDGs by offering a methodology to identify the contribution on the SDGs, based on the information included in the GRI reports. Thus, the GRI Framework can be used to help organizations align their contribution to the SDGs.

All these facts justify the vital relevance of aligning sustainable reports with the SDGs.

3. Methods

This research follows a constructivist approach, based on the following activities: recompilation, analysis and study of scientific knowledge, acquisition of main postulates and construction of initial framework (Kasanen et al., 1993; Coughlan and Coughlan, 2002). This is a constructive process that allows the continuous enrichment of the initial framework, which ends once the initial requirements, regarding the framework, have been reached.

The initial elements considered in the present constructivist approach were the following:

- The requirements detected by the pilot enterprises that the GRI on SDG should cover.
- The requirements theoretically covered by SDG and GRI.
- The own existing KPI on SGD in the GRI reports within this ambit (European car manufacturers).

The methodology that we selected to undertake this study was content analysis, as it has been previously seen as an appropriate research method to classify companies regarding their contribution to SDGs (Bengtsson, 2016; Elo et al., 2014; Horne et al., 2020; Landrum & Ohsowski, 2018; Moldavska & Welo, 2017; Nunhes et al., 2020, 2021; Vaismoradi et al., 2013). Content analysis is defined as a systematic approach to compress a large amount of text and words into predefined content categories based on rules of coding (Bengtsson, 2016; Elo et al., 2014; Seuring and Gold, 2012; Vaismoradi et al., 2013).

In this study, the approach is used to create SDG categories based on coded keywords from KPIs in GRI reports. The methodology consisted of a background analysis complemented with a descriptive data analysis. The survey referred to the biggest European companies in the automotive sector, which represents about 80% of new passenger vehicle registrations in the EU and EFTA (European Free Trade Association) from January to March 2019 period (ACEA, 2019). It was based on data from the GRI database, which was last checked for validity in July 2019.

Seven GRI reports were analysed. The most recent nonfinancial reports of the selected companies were located and downloaded from the GRI website (GRI, 2020c). It should be noted that these reports were heterogeneous from a standardization point of view, so it was necessary to perform preliminary classification activities.

As a first step, the reports were analysed to identify the sustainability metrics that the different firms reported on. This was an activity that involved identifying all the KPIs that appeared in each report, keeping into account that the GRI reports presented both different and equal KPIs due to their heterogeneous nature. Usually, the KPIs were already classified into one of the sustainability dimensions within the report and, when not, the authors classified them according to what they were measuring. A code was given to each metric. Finally, the number of times that each metrics appeared was recorded (counting only a maximum of one per report).

The next step was to link these metrics to the different SDG goals and targets to check the extent to which the seven car manufacturer practices were aligned with these goals, considering what they had published in their GRI sustainability reports.

To integrate a practical perspective when performing the analysis and establishing a relationship between the SDGs and KPIs from GRIs, the findings of the aforementioned review were presented to a panel of experts from the automotive sector. They provided feedback and further in-depth insights into the findings. In particular, the findings were shared with 12 managerial experts, who represented research, policy and practice. These peer-review discussions aimed to gain an understanding of the automotive sector's current state and to provide a better understanding of the KPIs currently included in their GRI reports. The main conclusions were used to frame and reflect on the findings obtained with the review and to offer relevant recommendations for policymakers and practitioners. This multidisciplinary approach ensured pluralism and any disagreements were overcome by reaching a consensus.

The next step was to identify the SDKPIs, which were the result of carrying out a coverture analysis to identify the minimum number of

metrics from the GRI reports needed to cover all the identified goals and targets. Finally, a global sectorial analysis is presented, which considered not only these SDKPIs, the goals and targets covered but also the frequency that these SDKPIs were present in GRI reports.

4. Results

4.1. Classification of GRI metrics

The first step was to classify the GRI metrics into the three sustainability dimensions. The results of this classification are shown in Tables 1 (Economic metrics), 2 (Social metrics) and 3 (Environmental metrics), including the codes for each metrics. The number of times that a metric appeared in the different GRI reports is highlighted; for example, a metric of seven (7) means that the specific metrics appear in all seven analysed reports.

From these tables, it can be seen a high degree of heterogeneity amongst the different sustainability reports, illustrated by the large number of metrics that are repeated either only once or twice in the seven reports.

4.2. Linking GRI metrics to SDGs

Having identified and classified the GRI metrics, the next step was to assess whether those metrics were aligned with SDGs or not. To do so, the following conditions were taken into account:

- Not all the metrics presented in Tables 1, 2, 3 were aligned with the SDGs. It was not possible to find a meaningful match between the GRI KPIs and the SDGs ones.
- The metrics presented in Tables 1–3 were meaningfully aligned with the SDGs. This happens when the metrics from the report considerably coincided with the SDG metrics.
- The metrics presented in Tables 1–3 were fully aligned. This happens when the metrics from the report completely coincided with the SDG metrics: S4, S6, S16, V2 and V3.

Table 1
Economic metrics.

Code	Metrics	#Times	Manufacturer/s
E_1	Sales revenue	7	M1-M7
E_2	Profit	7	M1-M7
E_3	Sales and service satisfaction	3	M1, M4, M3
E_4	Dividends	2	M3, M7
E_5	Market share	2	M2, M3
E_6	Value added	1	M7
E_7	Wages, salaries, benefits to employees	1	M7
E_8	Direct economic value generated and distributed	1	M2
E_9	Financial assistance received from government	1	M2
E_{10}	Ratio of basic salary and remuneration of women to men	1	M2
E_{11}	Customer satisfaction (in the 3 first months)	1	M4
E_{12}	Security calls	1	M4
E_{13}	Car-dealers satisfaction level	1	M4
E_{14}	Sales volume automobiles (in thousand units)	1	M1
E_{15}	Sales of electric and electrified vehicles (number)	1	M1
E_{16}	Share of production-relevant purchasing volume in the CDP Supply Chain Programme (in%)	1	M1
E_{17}	Capital expenditure	1	M1
E_{18}	Income taxes	1	M1
E_{19}	Research and development expenditure	1	M1
E_{20}	Tangible assets	1	M5
E_{21}	Financial investments	1	M5
E_{22}	Total financial security	1	M5
E_{23}	ROE (return of equity)	1	M7

Table 2
Social metrics.

Code	Metrics	#Times	Manufacturer/s
S_1	Number of employees	7	M1-M7
S_2	Accident Indexes	7	M1-M7
S_3	Proportion of women	5	M1, M2, M3, M4, M7
S_4	Comply with anti-corruption/bribery regulations	4	M1, M2, M3, M7
S_5	Sickness rate	4	M1, M3, M4, M7
S_6	Investments in employee qualification (in E millions)	4	M1, M2, M3, M7
S_7	Employee turnover	3	M1, M4, M7
S_8	People satisfaction	3	M1, M2, M4
S_9	Company contribution (pensions)	3	M1, M3, M7
S_{10}	Trafficking	3	M1, M4, M5
S_{11}	Level of qualification	2	M1, M7
S_{12}	Community engagement	2	M1, M2
S_{13}	Charity contributions	2	M4
S_{14}	Apprentices	1	M7
S_{15}	Employee average age	1	M7
S_{16}	Share of women in management positions (in%)	1	M1
S_{17}	Average period of employment	1	M7
S_{18}	Absenteeism	1	M7
S_{19}	Parental Leave	1	M1
S_{20}	Accident Severity	1	M7
S_{21}	Costs for training and advanced professional development (in E millions)	1	M3
S_{22}	Qualification days per employee/year	1	M3
S_{23}	Qualification days per employee/year	1	M3
S_{24}	Qualification hours per employee/year	1	M3
S_{25}	Employee contribution to the Group's sustainability profile	1	M2
S_{26}	Work-life balance	1	M2
S_{27}	Occupational health and safety	1	M2
S_{28}	Engagement in prevention	1	M2
S_{29}	Working alongside the community	1	M2
S_{30}	Membership in associations or organisations	1	M2
S_{31}	Voluntary work	1	M4
S_{32}	Expenditure on corporate citizenship (in € thousand)	1	M1
S_{33}	Hiring for permanent contract	1	M5
S_{34}	Change in number of employees under permanent or fixed-term contracts over 3 years	1	M5
S_{35}	Change in permanent contract turnover rate	1	M5
S_{36}	Number of temporary employees	1	M5
S_{37}	Paid absences for sickness	1	M5
S_{38}	Corporate Social Responsibility	1	M6

Table 4 shows the results of this linking process and highlights the metrics from Tables 1–3 that serve to measure the correspondent SDG goals and targets, which are found in Annexe I.

Table 4 indicates that the KPIs from the GRI reports cover 32 targets of 12 goals. Some targets are aligned with the metrics from one or a maximum of two sustainability dimensions. Some of these metrics are repeated (i.e., S_{38}), which implies that one metric is related to more than one target/goal. Then, this makes possible to create a coverage table that identifies the minimum combination of the metrics to cover all the targets. As there are many possible solutions, the followed approach involved:

- When one target is covered with only one GRI metric such a metric will always form part of the solution,
- The metrics of the GRI that coincide (are equal) with those defined in the SDGs will be kept (6 in all), as they measure the same concepts.
- For a group of metrics to which the same importance is attached, the method will keep that which appears more often in the seven GRI reports of the research. The concept of importance of a metric is the number of targets covered by each GRI KPI.

Table 3
Environmental metrics.

Code	KPI	#Times	Manufacturer/s
V_1	Energy consumption	7	M1-M7
V_2	Direct CO_2 emissions	7	M1-M7
V_3	CO_2 equivalents	7	M1-M7
V_4	Waste for recycling	6	M1, M2, M4, M5, M6, M7
V_5	GHG emissions	4	M1, M5, M6, M7
V_6	Waste for disposal	4	M1, M2, M6, M7
V_7	Volatile organic compounds (VOC) per vehicle produced (in kg/vehicle)	3	M1, M5, M6
V_8	Energy averages per vehicle	2	M1, M5
V_9	Direct Nox and SO_2 emissions	2	M5, M7
V_{10}	Fleet fuel consumption	2	M1, M4
V_{11}	Freshwater and wastewater	1	M7
V_{12}	Wastewater discharges	1	M7
V_{13}	Environmental protection costs	1	M7
V_{14}	Water Recycling Index	1	M2
V_{15}	Number of Environmental Violations	1	M2
V_{16}	Emissions and fuel economy	1	M2
V_{17}	Waste to landfill	1	M2
V_{18}	Overall consumption of recycled plastic	1	M6
V_{19}	Alternative fuels	1	M2
V_{20}	Fuel economy for major renewals of FCA US vehicles	1	M2
V_{21}	Materials used in vehicles	1	M2
V_{22}	Efficient powertrains and technologies	1	M2
V_{23}	Share of renewable energy purchased from third parties (in%)	1	M1
V_{24}	Hours dedicated to environmental training	1	M5
V_{25}	ISO 14001 Certified plants	1	M5
V_{26}	Investments in energy savings	1	M5

Fig. 1 presents the results of applying the method and the created coverage table. The GRI metrics that resulted from this figure are named SDKPIs.

Fig. 1 generally shows that the car manufacturer companies of the study report metrics that cover 12 goals. Hence, this paper reveals that, by reporting some other metrics, these companies might better reflect their impact on many SDGs instead of limiting their coverage to only a few. Table 5 summarises the SDKPIs and the direct goals and targets that they cover to provide an overview of their importance in coverage terms.

5. Discussion

To date, SDG progress measurement relies on the results of national progress along the SDGs, however, the contribution of a specific stakeholder group to the achievement of the SDGs is not tracked scientifically (Horne et al., 2020). This piece of research sheds light on the contribution of a specific sector to the achievement of SDG. amongst all the different tools available for companies to disclose their sustainable performance, Global Reporting Initiative (GRI) has been chosen for being the most widely used in the world (Halkos and Nomikos, 2021; Horne et al., 2020; Horner and Wilmshurst, 2016; Isaksson and Steimle, 2009; Landrum & Ohsowski, 2018; Milne and Gray, 2013). This tool has been also used to measure sustainable performance (Lozano, 2015; Milne and Gray, 2013; Nunhes et al., 2020; Roca and Searcy, 2012)

However, despite all the work done by companies in sustainability, and specially within car manufacturers sector, they do not always show all the efforts they are doing in this context and, they neither show their contribution to the SDG. Therefore, and considering that, sustainability reporting is not only an important driver of an organisation's
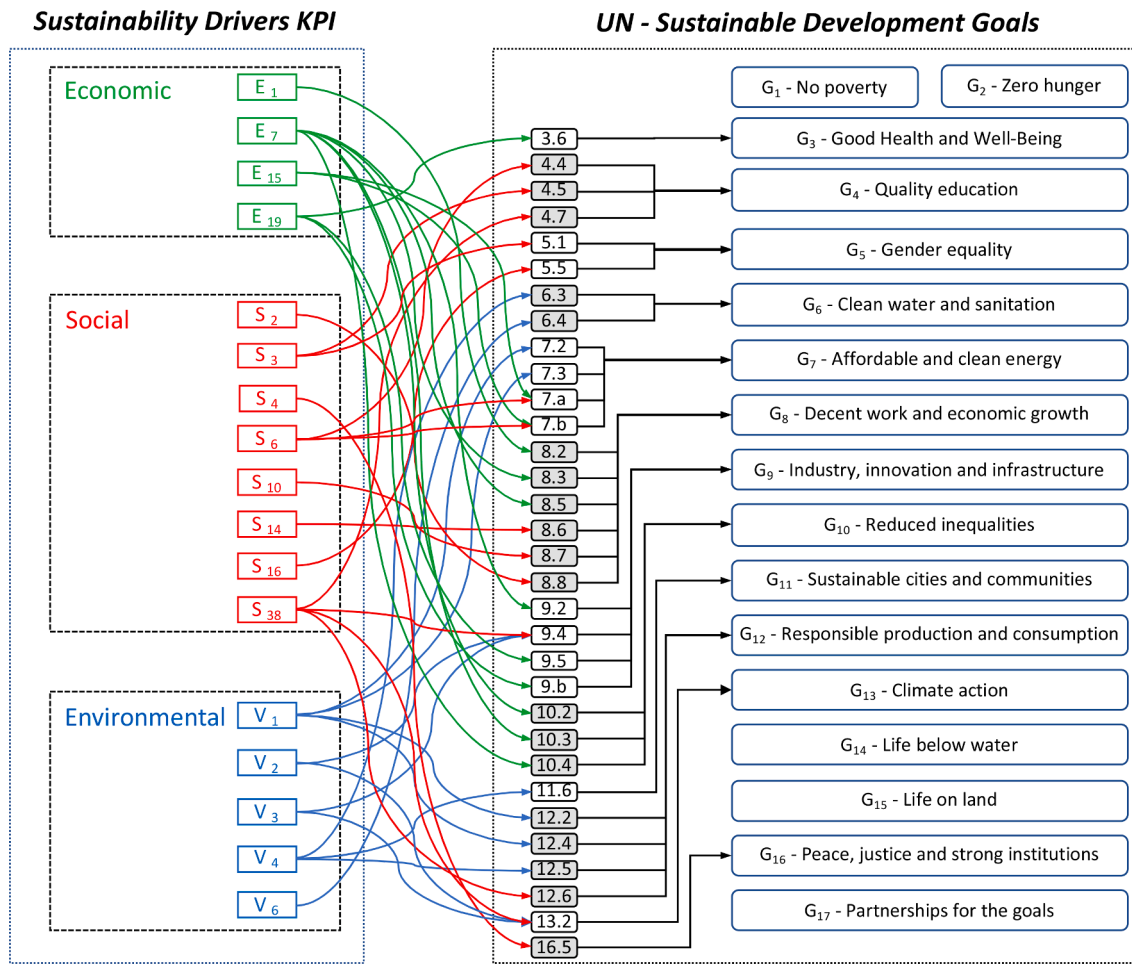
Table 4
Alignment of the GRI metrics with SDG goals and targets.

Goal/s covered		Target/s covered	Sustainability KPI Economic	Environmental	Social	Manufacturer/s
G_3	Good Health and Well-Being	3.6	E_{19}	V_{21}		M1, M2
G_4	Quality education	4.4			$S_6, S_{11}, S_{21}, S_{22}, S_{23}, S_{24}$	M1, M2, M3, M7
		4.5	E_{10}		S_3, S_{16}	
		4.7			S_{25}, S_{38}	
G_5	Gender equality	5.1	E_{10}		S_3	M1, M2, M3, M4, M7
		5.5	E_{10}		S_{16}	M1, M2
G_6	Clean water and sanitation	6.3		V_4, V_6, V_{12}, V_{14}		M1, M2, M4, M5, M6, M7
		6.4		$V_6, V_{11}, V_{12}, V_{14}$		M1, M2, M6, M7
G_7	Affordable and clean energy	7.2, 7.3	E_{15}	V_1, V_8, V_{23}		M1-M7
		7.a	E_{15}			M1
		7.b	E_{15}, E_{19}			M1
G_8	Decent work and economic growth	8.2	$E_1, E_2, E_3, E_4, E_6, E_{15}, E_{19}$			M1-M7
		8.3	E_7, E_{19}			M1, M7
		8.5	E_7, E_{10}		$S_{14}, S_{16}, S_{33}, S_{34}, S_{35}$	M2, M5, M7
		8.6			S_{14}	M7
		8.7			S_{10}	M1, M4, M5
		8.8			S_2, S_{20}, S_{28}	M1-M7
G_9	Industry, innovation and infrastructure	9.2	E_7		S_{25}, S_{38}	M2, M6, M7
		9.4		V_2, V_3		M1-M7
		9.5	E_{19}			M1
		9.b	E_{19}			M1
G_{10}	Reduced inequalities	10.2	E_7, E_{10}		S_{32}	M1, M2, M7
		10.3	E_7, E_{10}			M2, M7
		10.4	E_7		S_9, S_{37}	M1, M3, M5, M7
G_{11}	Sustainable cities and communities	11.6		V_4, V_6, V_7, V_{17}		
G_{12}	Responsible production and consumption	12.2		V_1, V_8, V_{18}		M1-M7
		12.4		V_1, V_8, V_{18}		M1-M7
		12.5		V_4, V_{14}		M1, M2, M4, M5, M6, M7
		12.6		V_{25}	S_{38}	M5, M6
G_{13}	Climate action	13.2		$V_2, V_3, V_5, V_9, V_{16}$		M1-M7
G_{16}	Peace, justice and strong institutions	16.5			S_4	M1, M2, M3, M7
# goals covered: 12		# targets covered: 32	# Economic KPI: 9	# Environment KPI:18	# Social KPI: 10	
			# Sustainability KPI: 37			

Fig. 1. Link between GRI metrics and UN-SDGs.

Table 5
Sustainability drivers KPIs.

Goal/s covered	# Goals covered	Target/s covered	# Targets covered	Sustainability drivers KPI		
G_8, G_9, G_{10}	3	8.3, 8.5, 9.2, 10.2, 10.3, 10.4	6	E_7		
G_6, G_{11}, G_{12}	3	6.3, 11.6, 12.5	3		V_4	
G_7, G_{12}	2	7.2, 7.3, 12.2, 12.4	4		V_1	
G_3, G_9	2	3.6, 9.5, 9.b	3	E_{19}		
G_4, G_{12}	2	4.7, 12.6	2			S_{38}
G_4, G_5	2	4.5, 5.1	2			S_3
G_9, G_{13}	2	9.4, 13.2	2		V_2/V_3	S_{38}
G_7	1	7.a, 7.b	2	E_{15}		S_6
G_4	1	4.4	1			S_6
G_5	1	5.5	1			S_{16}
G_6	1	6.4	1		V_6	
G_8	1	8.2	1	E_1		
G_8	1	8.6	1			S_{14}
G_8	1	8.7	1			S_{10}
G_8	1	8.8	1			S_2
G_{16}	1	16.5	1			S_4
# goals covered: 12		# targets covered: 32		4	5	8
						# SDKPI

and investments.

Thus, sustainable reports have been analysed one by one, and Sustainable metrics, grouped into the three main sustainable dimensions: economic, social and environmental, and finally, related to one or more SDG, as it has been shown in the previous section.

As stated before, the main results obtained were presented to a panel of experts from an automotive cluster association in Spain. The participants of the panel were members of one of the car manufacturers included in the study (M4) together with some of its main first-tier suppliers as well as some expert members of such an association. Their contribution came from commenting and discussing the results, especially when comparing which SDGs they reported in their own GRI and what they could have reported, as their contribution was wider than they reported. Additionally, they contributed with comments and recommendations that enriched the method; i.e. they help to refine the classification of some of the GRI KPIs and to check the coverage table. In this context, discrepancies amongst the experts came up, for instance when classifying some of the KPIs as either fully or partially aligned with SDGs targets/goals. These disagreements, due to different points of view, experience and backgrounds, were solved with dialogue and allowing the different parties time to explain and convince with reasons and facts the other parties and playing the authors a moderator role.

Then, and considering such a feedback, this paper offers a simple methodology that shows how European car manufacturers could include in their reports their contribution to the coverage of 12 SDGs and 32 specific targets, by using the information they already used to disclose the 17 SDKPIs identified, as it can be seen in Table 5.

This paper offers a simple methodology that shows how European

sustainability orientation (Rosati and Faria, 2019), but also an enabler of the SDGs actions, investments and strategies (GRI, 2016; Schramade, 2017), this piece of work may help car manufactures to rethink their sustainable policy, and to better define the orientation of their actions

car manufacturers could include in their reports their contribution to the coverage of 12 SDGs and 32 specific targets, by using the information they already used to disclose the 17 SDKPIs identified, as it can be seen in Table 5.

More specifically, and considering the analysed reports, car manufacturers may disclose sustainable information about their activity in the following SDKPIs:

- Four metrics from the Economic dimension (i.e., E_7, E_{19}, E_{15} and E_1), which cover five different goals and 12 targets.
- Five metrics from the Environmental dimension, (i.e., V_4, V_1, V_2, V_3 and V_6), which cover six different goals and 10 targets.
- Eight metrics from the Social dimension (i.e., S_{38}, S_3, S_6, S_{16}, S_{14}, S_{10}, S_2 and S_4), which cover six different goals and 10 targets.

Six of these goals were covered only by one specific SDKPI (i.e., G_3 with E_{19}, G_6 with V_6, G_{10} with E_7, G_{11} with V_4, G_{13} with V_2 and V_3 and G_{16} with S_4). Thus, from a managerial decision-making viewpoint, it would be necessary to study all this information from the perspective of the associated reporting frequency of the SDKPIs. Then, each car manufacturer should carry out its own analysis and decide which SDKPI to include in their GRI report.

From a car manufacturing sector point of view, we worked from a global perspective to analyse the identified SDKPIs, together with the covered goals and targets, as well as the number of times that those metrics are reported in SGI reports (see Fig. 2).

Some well-differentiated groups are observed in Fig. 2, of which it is important to highlight the following:

- Some of the most important SDKPIs, in coverage terms, are not being properly reported in terms of the number of times they appear in GRI reports, especially E_7, E_{15}, E_{19} and S_{38}.
- Other important SDKPIs, such as V_1, V_2, V_3 and V_4, are widely reported.
- Many SDKPIs are reported with either a high (i.e., E_1, S_2) or medium (i.e., V_6, S_4, S_6, S_{10}) frequency, which cover only one goal and one target.

From a sectorial perspective, we can generally conclude that,

currently, the GRI reports cover many of the SDGs. However, in the individual car manufacturer context, the reported metrics (23 from the Economic dimension, 38 from the Social dimension and 26 from the Environmental one) cover only a few of them, 32 targets out of 169 and 12 goals out of 17, even though most of the companies are contributing but not disclosing their metrics.

As global analysis it is possible to affirm that:

- Car manufacturers report more GRI KPIs in the social dimension (38) than in both the economic (23) and the environmental (26).
- For the three dimensions, there are many GRI KPIs that have been reported only once. This happens in 23 economic KPIs, 24 social KPIs and in 15 environmental KPIs.
- There are three car manufacturers –M1, M2 and M7- out of the seven of the study that report on many of the GRI KPIs; other two –M2 and M4- that report on several KPIs; and the other two – M3 and M6- that report on few KPIs.
- Derived from the previous, it is possible to establish differences amongst the car manufacturers regarding the KPIs they report in both quantity and frequency. Additionally, it has been observed that all the seven car manufacturers report on KPIs that have to do with classic measurement such as profit, sales, number of employees, accident indexes, CO_2 emissions or energy consumption. However, the trend is that some of them start to report on other KPIs that can be considered as newer, especially regarding the social ones, for example the KPIs related to women proportion, employee qualification level, temporary work or parental leave.

Finally, the connection between the results obtained with the research questions is next presented:

- Do the main automotive companies report the same sustainable indicators? They do not; in fact, this paper is a first attempt to raise awareness of the heterogeneity regarding GRI KPIs, and map the current situation.
- Which aspects are covered and which are not? All the three sustainability dimensions are covered, 32 targets out of 169 and 12 goals out of 17.
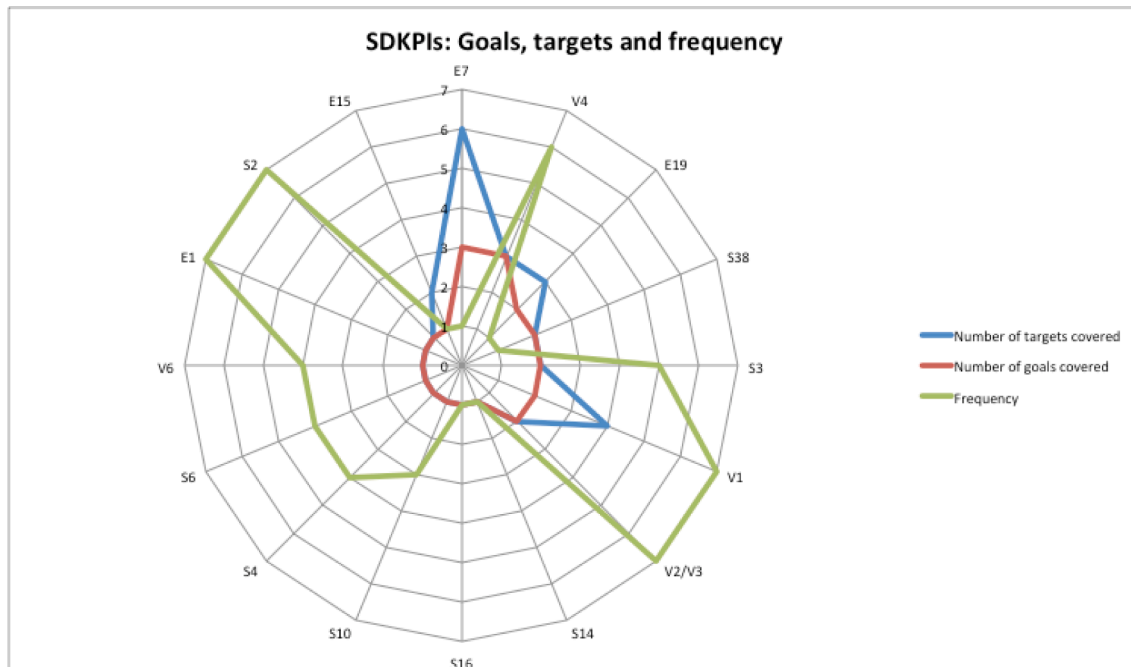

Fig. 2. SDKPIs: Number of goals, targets and frequency.

- Is there a direct clear relationship between the key indicators in their reports and the SDGs? 37 KPIs out of the 87 extracted from the GRI reports were either fully (5) or meaningfully aligned (32) with the SDGs.
- Which are the most commonly reported SDGs by this industry? These are the following SDG goals: G6-Clean water and sanitation, G8-Decent work and economic growth, G9-Industry, innovation and infrastructure, G10-Reduced inequalities, G11-Sustainable cities and communities and G12-Responsible production and consumption.

6. Conclusions

SDGs are extremely important objectives to be met by society. However, it is difficult to not only quantify how individual companies contribute to achieve SDGs but also identify which SDGs each company is aligned with. Accordingly, both standards and methodologies are lacking to link sustainability practices and impacts to SDGs. There is then a clear need for developing a standard able to increase transparency, credibility and quality in sustainable issues.

This paper argues that the SDGs are unevenly deployed across the automotive industry sector and examines the results of this lack of standardisation. The UNGC and the GRI's SDGs, as a common project, so far lacks methodological standardisation, impairing comparison of gains made by different companies (or the same company over time). This is a serious barrier to implementation and accounting. To overcome this weakness, a thorough analysis of the ways in which the European car manufacturers report their sustainable efforts through GRI reporting has been carried out, aligning the relationship of the information reported by their SDKPIs with the SDGs.

This paper offers a replicable methodology to identify how one of the most added-value industries, car manufacturing, impacts some specific SDGs on the basis of the current information included in their GRI reports. To do so, GRI metrics were firstly analysed and classified from seven representative car manufactures. These metrics were then linked to both the goals and targets defined in the SDGs by identifying a minimum number of metrics from the GRI, called SDKPIs, which need to be reported to accomplish maximum SDG coverage. Finally, by reporting 17 SDKPIs, it was possible to cover all 12 goals and 32 associated targets. This number by far exceeds the perception that the individual companies in the automotive sector have in SDG terms and the impact they have through their industrial practices.

It does not mean that car manufacturers should report only 12 goals and 32 associated targets; however, they could have disclosed at least those 12 goals and the 32 associated targets amongst the 17 SDKPIs.

This paper contributes to the extant research in two ways. First, this paper shows a new approach in identifying and disclosing sustainability results that contribute to the achievement of the SDGs in the context of the car manufacturers with assembly plants in Europe, starting from the GRI reporting methodology. Second, this paper provides an exploratory descriptive analysis of the relationship between the SDKPIs included in the GRI reports and the SDGs, as a useful preliminary stage for the future development of the GRI sector program, not developed yet for this specific sector. This development would help in harmonizing the language used within public and private sector and would also contribute to foster transparency, and hence to make sustainability efforts more visible.

On the other hand, as far as practice implications concerns, this paper provides a valuable methodology to analysing the ways in which the SDGs are operationalised by a major industrial sector. It also points out how, despite the lack of transparency of both current methodologies and priorities to select information to be disclosed, the SDGs are being considered, although they are not always well communicated. Furthermore, following the guidelines set down in this paper and starting from the current indicators disclosed all along the GRI reports, European car manufacturers could include their data regarding at least 32 targets from 12 SDGs, which is more than what has been done so far in this context.

Thus, the contribution of car manufacturers with assembling plants in Europe toward the achievement of the SDGs would be more efficient, transparent, and well communicated. Moreover, this paper shows how and where they can be taken up from the GRI reporting. Therefore, this paper advances both theory and practice.

A methodological limitation must be taken into account when assessing the findings. The analysis relies on information published by the companies themselves. This means there may be definitions, structures or processes that companies have chosen not to comment upon in their formal sustainability reports, which may imply bias in the information analysed.

Finally, this paper has determined some lines of future research. Given the limited scope of our research, it is strongly recommended that future research establish stronger evidence for the relationship between the GRI and the SDGs, with regard to the whole car manufacturing industry, analysing the differences by geographical areas. Another possible line of future research might include an in-depth study of business cases with the purpose of identifying all the metrics and indicators relating to the most relevant SDGs, as well as their specific targets. Additionally, it would be of interest to establish the relationships of the KPIs with the qualitative aspects of the targets/goals, which would involve the interaction with the car manufacturers.

CRediT authorship contribution statement

M Rosario Perello-Marin: Conceptualization, Validation, Visualization, Writing – original draft, Writing – review & editing, Supervision. **Raúl Rodríguez-Rodríguez:** Conceptualization, Methodology, Resources, Formal analysis. **Juan-Jose Alfaro-Saiz:** Conceptualization, Methodology, Validation, Data curation, Visualization.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.techfore.2022.121744.

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