SDG 9-INDUSTRY, INNOVATION AND INFRASTRUCTURE: A REVIEW ON COMPANIES IN THE BIST SUSTAINABILITY INDEX

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Abstract

The Sustainable Development Goals (SDGs), adopted by the United Nations (UN) in 2015, consist of 17 goals that outline the global sustainability agenda. These goals aim to promote sustainability in economic, social, and environmental dimensions by guiding institutions and organizations in identifying priority development areas and processes. Sustainability reports, on the other hand, are reports prepared by companies and organizations to explain their impacts on environmental, social, and governance (ESG) dimensions. These reports are critical documents that comprehensively explain the sustainability performance and future goals of companies to their stakeholders (Bajwa et al., 2024). In this study, the sustainability reports of 25 companies traded on the Borsa Istanbul (BIST) sustainability index are analyzed in terms of content in the context of goal 9 (SDG 9) — building resilient infrastructure, inclusive and sustainable industrialization, and promoting innovation. Within the scope of the study, firstly the company reports were examined through keywords, then the first five company reports where the keywords were used the most were subjected to in-depth content analysis to examine the compliance of the work carried out by the companies with the SDG 9 targets and the progress made by the companies towards this target.

Keywords: Sustainable Development Goals, SDG 9, Sustainability Report

Authors' individual contribution: Conceptualization — G.K., T.U.K., and F.T.Ö.; Methodology — G.K.; Formal Analysis — G.K.; Writing — Original Draft — G.K. and T.U.K.; Writing — Review & Editing — G.K. and F.T.Ö.

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1. INTRODUCTION

Sustainable development has been a concept used in modern economic theory since the 1970s. Modern approaches to the concept indicate the need to achieve comparative goals such as economic growth, employment, environmental protection, and risk prevention. The impact and challenges of globalization have confirmed the necessity of applying this concept in all European and global development strategies, making it a key point in modern economic processes.

In 2015, the leaders of 193 countries adopted the 2030 agenda for sustainable development. This agenda is a plan consisting of 17 Sustainable Development Goals (SDGs) and 169 targets that integrate the three dimensions of sustainable development (economic, social, and environmental).

The goals include ending poverty and hunger, protecting the planet, and building peace with a global solidarity approach[1].

Sustainability reports emerged from the need for a standard reporting framework to demonstrate the approach of institutions to environmental and social issues and include information on the social, environmental, and economic performance of companies (Aversa, 2024; Poulsen & Sigurjonsson, 2024; Alatawi & Daud, 2022). These reports reveal the investments companies make in resilient infrastructure, their efforts to reduce environmental impact, the importance they give to innovation and technology, sustainability practices in business processes, and their contributions to society.

A country's development is often linked to industrialization, and with the rise of sustainable development discussions, the demand for industrial sustainability standards is growing. SDG 9 focuses on building resilient infrastructure, promoting sustainable industrialization, and fostering innovation, with an emphasis on green industry. This goal prioritizes investment in high-tech, research, and infrastructure to drive economic growth, enhance employment and social well-being, and manage resources sustainably while being mindful of environmental and social impacts. It also seeks to create a more inclusive development model by reducing inequalities, especially through investment in scientific research and innovation in developing countries.

In this study, first of all, within the framework of the goals and indicators of SDG 9, the sustainability reports of 25 companies in the BIST sustainability index for 2022 were analyzed using MAXQDA 2020 qualitative data analysis programs. This analysis aims to present the progress on SDG 9 targets from a comprehensive perspective by evaluating the extent to which companies adopt, implement, and report their sustainability targets.

The remainder of this paper is as follows. Section 2 deals with the theoretical framework and the literature on the subject. Section 3 includes the research analysis. How the content analysis was conducted, the sample taken into consideration and the analysis results are discussed in detail in this section. Section 4 presents further discussion. The study is completed with a general evaluation and a conclusion in Section 5.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Sustainability theory: conceptual foundations

The concept of sustainability has evolved significantly throughout the 20th century, with increasing awareness of environmental degradation. Sustainable development requires an integrated approach that takes into account environmental concerns as well as economic development. In 1987, the United Nations (UN) Brundtland Commission defined sustainability as "meets the needs of the present without compromising the ability of future generations to meet their own needs" and emphasized the integration of economic, environmental, and social dimensions to achieve long-term sustainability (UN, 1987, p. 11). Over time, sustainability has expanded to include not only environmental and economic concerns but also social dimensions that address issues of equity, social inclusion, and resilience, but the integration of social sustainability remains an ongoing challenge (Ly & Cope, 2023).

Environmental sustainability involves responsibly managing natural resources to maintain ecosystem health and ensure future generations' well-being (Sutton, 2004). Economic sustainability supports long-term growth, social welfare, and environmental protection without harming societal aspects (Pearce & Turner, 1989). Social sustainability, crucial across disciplines, is achieved through institutional arrangements (Littig & Griessler, 2005) and must encompass equity, social inclusion, and resilience (Ly & Cope, 2023). Despite its global significance, gaps remain in understanding social sustainability's role within the SDG framework (Raman et al., 2023).

2.2. Corporate reporting and sustainability reports

Corporate social responsibility (CSR) and integrated reporting are closely related to sustainability theory in the literature. The CSR pyramid developed by Carroll (1991) offers a four-layered structure that includes economic, legal, ethical, and social responsibilities, and this structure determines the scope of responsibilities that companies should consider when reporting on sustainability. CSR emphasizes that companies are not only profit-oriented but also have social and environmental responsibilities (Carroll, 1999).

Sustainability reporting is the process of measuring, evaluating, and sharing with interested parties the economic, environmental, and social performance of an organization. These reports show the extent to which organizations have achieved their sustainability goals, how they have fulfilled their commitments in this area, and what future steps they plan to take (Bajwa et al., 2024; Haroon & Zaka, 2023; Santoso et al., 2023).

In its broadest sense, sustainability reporting provides stakeholders with information about a company's role and contribution to society and shows a company's performance in economic, environmental, social, and governance (ESG) matters. Sustainability reporting addresses non-financial issues, from customer service to climate change, that contribute to or affect the company's capacity to create value. Therefore, sustainability reporting helps understand and manage the impacts of sustainability developments on the organization's operations and strategy by making non-financial issues tangible and tangible (Surdurulebilirlik Raporu, n.d.).

Companies prepare sustainability reporting for a variety of reasons, including stakeholder engagement, risk management, gaining competitive advantage, legal compliance, and creating long-term value (Berthelot et al., 2012; Kolk, 2004).

Sustainability reporting provides transparency, increased reputation, continuous improvement and learning, and forward-thinking for stakeholders. Reporting aims to increase the competitiveness of businesses. Sustainability helps manage risks and demonstrates how businesses can live by values and principles related to environmental and social issues. Likewise, it provides solid foundations for dialogue and negotiation with stakeholders (Şahin & Çankaya, 2018; Adams, 2004).

[1] https://sustainabledevelopment.un.org/memberstates/turkey

Businesses that report their sustainability performance should focus on their sustainability-related work, often including this information in their activity reports and websites, while also preparing dedicated sustainability reports to inform stakeholders. These reports are guided by globally accepted frameworks that are continually updated to meet stakeholders' needs. GRI established in 1997, provides a comprehensive framework for companies to measure, manage, and report their economic, environmental, and social impacts (Willis, 2003; Etzion & Ferraro, 2010). Similarly, the Sustainability Accounting Standards Board (SASB), founded in 2011, develops industry-specific standards that enhance the transparency and comparability of sustainability performance across sectors[2]. The International Integrated Reporting Council (IIRC) promotes integrated reporting, which combines financial and sustainability-related factors to create long-term value with a focus on ESG aspects[3]. The Task Force on Climate-related Financial Disclosures (TCFD) offers guidelines for voluntary climate-related financial disclosures, encouraging companies to integrate climate risks into their corporate strategies[4]. Additionally, the Carbon Disclosure Project (CDP) facilitates the disclosure of environmental data, such as climate change and deforestation impacts[5]. International Organization for Standardization (ISO) 26000[6], provides guidance on integrating social responsibility into business practices, while the UN SDGs offer a global framework of 17 goals that companies can align with to demonstrate their contributions to sustainable development[7]. Lastly, the Corporate Sustainability Reporting Directive (CSRD) of the European Union (EU) aims to enhance sustainability reporting standards, supporting the EU's goal of achieving net zero greenhouse gas emissions by 2050[8].

2.3. Sustainable Development Goals and SDG 9

Country leaders who came together at the UN Sustainable Development Summit held in New York on September 25, 2015, adopted the SDGs, which consist of 17 goals and 169 targets to eliminate poverty in all its dimensions in the world and ensure the common prosperity of humanity by 2030. These goals aim to help businesses understand the risks and opportunities created by rapid changes in various sectors and respond more effectively to these challenges.

The focus of this study, SDG 9, is based on three interconnected foundations: infrastructure, industry, and innovation (Mantlana & Maoela, 2020). The general aim of this goal is to provide a systematic and effective approach to achieving socially inclusive and environmentally sustainable economic development. These goals and indicators are shown in Table A.1 (Appendix)[9].

The interaction between sub-goals and indicators within the SDG represents a comprehensive and synergistic approach to sustainable industrialization and infrastructure development. At the center of this network of interaction is the joint relationship between establishing quality, resilient infrastructure (target 9.1) and promoting sustainable industrialization (target 9.2). The first objective provides a basic backbone to support industrial productivity and economic growth, with indicators focusing on the transport of goods and people (indicator 9.1.2) and the integration of manufacturing value in the economic sphere (indicators 9.2.1 and 9.2.2). This interaction highlights the critical role of infrastructure in supporting economic growth and employment within the industrial sector.

Additionally, the accessibility of financial services (target 9.3), especially for small-scale industries, is a critical link for adopting sustainable and environmentally friendly practices (target 9.4). This link is critical because access to financial services (indicator 9.3.2) allows these industries to invest in cleaner technologies, contributing to the reduction of CO^2 emissions per unit value (indicator 9.4.1). At the same time, the development of scientific research and technological capabilities (target 9.5) leads to the development of durable infrastructure in developing countries (goal 9.a). Progress in research and development (R&D) (indicators 9.5.1 and 9.5.2) and international aid support for infrastructure development (indicator 9.a.1) similarly aim to develop durable infrastructure.

Moreover, supporting domestic technology development (objective 9.b) is in a complementary relationship with the goal of providing universal access to information and communication technology (objective 9.c). Progress in the value added by medium and high technology industries (indicator 9.b.1) not only supports but also benefits from the expansion of information technology (IT) infrastructure (indicator 9.c.1). This mutual reinforcement emphasizes the advancing nature of technological progress and the spread of IT.

2.4. Literature review

Studies show that large corporations in particular are incorporating the SDGs into their corporate reporting (Elalfy et al., 2021). A comparative analysis of national and corporate sustainability indicators by Malay (2021), focusing on the pharmaceutical and retail sectors in Belgium, found significant differences, particularly in terms of SDGs 9, 10 (reduced inequalities), and 11 (sustainable cities and communities). The role of sustainable finance in achieving the SDGs has also been the subject of research (Ziolo et al., 2021; Tay & Tay, 2023). However, the difficulties of applying SDG frameworks to specific industries have been highlighted in Franco et al. (2020) study on sustainable resource management in the small-scale mining industry in Bolivia. A study conducted by De Melo and Barbosa (2023) in the gas and biofuel sectors found that companies frequently disclose SDGs related to core activities in their SDG reporting, but there are discrepancies between the declared SDG compliance and the actual implementation of these goals.

Singh and Ru (2023) and Cabrita et al. (2023) systematically reviewed the literature on SDG 9. In addition to the literature review, Cabrita et al. (2023) examined how sustainable intellectual capital (SIC) can support industrialization and innovation within the scope of SDG 9 and proposed a framework for SIC management processes to achieve SDG 9 targets.

[2] https://sasb.org/
[3] https://www.integratedreporting.org/
[4] https://www.fsb-tcfd.org/
[5] https://www.cdp.net/en
[6] https://www.iso.org/iso-26000-social-responsibility.html
[7] https://sdgs.un.org/2030agenda
[8] https://www.gsghukuk.com
[9] https://sdgs.un.org/goals/goal9

Studies investigating the relationship between the COVID-19 pandemic and SDGs have also been conducted. Wang et al. (2024) examined the impact of industrialization and trade openness on carbon emissions in Sub-Saharan Africa (SSA) and discussed their relationship with SDGs 8, 9 and 13. Burhan (2024) compared the performances of the EU countries and Turkiye within the scope of SDG 9 using multi-criteria decision-making (MCDM) methods and found that Sweden showed the best performance and Turkiye reached a medium-level position over time, especially emphasizing the importance of high-speed internet coverage and railway transportation. Weerasinghe et al. (2024) examined the SDG disclosures of Sri Lankan companies and observed that although SDG 9 (industry, innovation, and infrastructure) and SDG 17 (partnerships for the goals) were frequently disclosed, their overall disclosure levels remained low.

3. RESEARCH METHODOLOGY

This research involves a content analysis of the explanations related to SDG 9 in sustainability and integrated reports of 25 organizations listed on the BIST sustainability index for the year 2022, summarizing the significant developments in this area. Understanding the approaches of selected companies to this topic is also important in demonstrating the extent of progress our country has made on this journey towards these goals. The content analysis method was preferred in this study because it provides a general framework by initially measuring the frequency of keywords, and then enables us to more comprehensively evaluate the companies' actual commitments and sustainability performance towards SDG 9 targets by deeply analyzing the contextual use of these keywords.

The objectives of this research can be summarized as follows:

- to contribute to the literature on SDG 9;
- to summarize the work in company reports listed on the BIST25 sustainability index related to SDG 9;
- to make suggestions regarding future research areas related to SDG 9.

In line with these objectives, the following research questions have been identified, and the study is designed to answer these questions:

RQ1: What is the awareness level of companies regarding SDG 9?

RQ2: What is being done to achieve the goals of SDG 9?

RQ3: What are the gains of SDG 9?

RQ4: Are the studies carried out compatible with the United Nations SDG 9 targets?

RQ5: What are the promising areas for future research?

The sustainability studies of the companies listed in Table 1 are accessed from their websites. The obtained reports have been coded in the MAXQDA 24 program within the framework of the keywords determined under SDG 9 and presented in Table 2.

Table 1. Companies in the BIST sustainability index

Order	*Code*	*Company*	*Sector*
1	AKBNK	Akbank T.A.Ş.	Finance
2	ARCLK	Arçelik A.Ş.	Production
3	BIMAS	Bim Birleşik Mağazalar A.Ş.	Wholesale and retail trade
4	CIMSA	Çimsa Çimento Sanayi ve Ticaret A.Ş.	Production
5	DOHOL	Doğan Şirketler Grubu Holding A.Ş.	Financial institutions/holdings and investment companies
6	DOAS	Doğuş Otomotiv Servis ve Ticaret A.Ş.	Wholesale and retail trade
7	ENJSA	Enerjisa Enerji A.Ş.	Electricity, gas, and steam
8	ENKAI	Enka İnşaat ve Sanayi A.Ş.	Construction and public works
9	EREGL	Ereğli Demir ve Çelik Fabrikaları T.A.Ş.	Production
10	FROTO	Ford Otomotiv Sanayi A.Ş.	Production
11	SAHOL	Hacı Ömer Sabancı Holding A.Ş.	Financial institutions/holdings and investment companies
12	KCHOL	Koç Holding A.Ş.	Financial institutions/holdings and investment companies
13	MGROS	Migros Ticaret A.Ş.	Wholesale and retail trade
14	PGSUS	Pegasus Hava Taşımacılığı A.Ş.	Transportation and storage
15	PETKM	Petkim Petrokimya Holding A.Ş.	Production
16	TAVHL	Tav Havalimanları Holding A.Ş.	Financial institutions/holdings and investment companies
17	TOASO	Tofaş Türk Otomobil Fabrikası A.Ş.	Production
18	TCELL	Turkcell İletişim Hizmetleri A.Ş.	Information and communication
19	THYAO	Türk Hava Yolları A.O.	Transportation and storage
20	TTRAK	Türk Traktör ve Ziraat Makineleri A.Ş.	Production
21	GARAN	Türkiye Garanti Bankası A.Ş.	Finance
22	ISCTR	Türkiye İş Bankası A.Ş.	Finance
23	SISE	Türkiye Şişe ve Cam Fabrikaları A.Ş.	Financial institutions/holdings and investment companies
24	VESTL	Vestel Elektronik Sanayi ve Ticaret A.Ş.	Production
25	YKB	Yapı ve Kredi Bankası A.Ş.	Finance

In the research, the content analysis method is used to examine the data. Content analysis is a research method used to systematically analyze the content of textual, visual, or auditory information. It involves examining and interpreting the content of various forms of communication to identify patterns, themes, and relationships. Content analysis can be applied to a wide variety of materials, including written texts, images, audio recordings, video content, and more (Harwood & Garry, 2003).

The keywords presented in Table 2 were determined based on SDG 9 indicators[10], and local and company statements on various platforms[11].

[10] https://sustainabledevelopment.un.org/memberstates/turkey
[11] https://sdgmapturkey.com/sdg/9/

Table 2. Keywords

No.	*Keyword*	*No.*	*Keyword*
1	Infrastructure	13	Employment
2	R&D	14	Business development
3	Waste management	15	Women entrepreneurs
4	Environmentally friendly	16	Mobile/Mobility
5	Value chain	17	Robot
6	Digitalization	18	Zero emissions
7	Circular economy	19	Sustainable development
8	Economic development	20	Sustainable production
9	Industry 4.0	21	Renewable energy
10	Energy efficiency	22	Innovation
11	Recycling, zero waste	23	High technology
12	Entrepreneurship		

Although the method used in this study includes a frequency analysis of keywords in sustainability reports regarding SDG 9 since this method alone will not fully reflect the sustainability initiatives of companies, a comprehensive content analysis was conducted that not only measures keyword frequency but also analyzes how these keywords are used in context and how they are included in the reports in general. This analysis aims to gain a deeper understanding of companies' real commitments to sustainability regarding SDG 9 and how these commitments overlap with the UN SDGs. In addition, it is aimed to examine which specific sustainability strategies or projects each keyword is associated with and to reveal more clearly whether the reports are simply studies aimed at increasing corporate reputation or a true reflection of sustainability performance.

4. ANALYSIS AND FINDINGS

This analysis shows which areas the companies in the BIST Sustainability 25 index focus on to achieve SDGs and the intensity of their activities in these areas. The frequencies of the keywords determined in this context are presented in Table 3.

Table 3. The frequencies of the keywords

No.	*Keyword*	*Frequency*	*Percentage*
1	Innovation	1688	18.51%
2	Digitalization	1164	12.76%
3	Mobile/Mobility	1104	12.11%
4	R&D	980	10.75%
5	Infrastructure	690	7.57%
6	Renewable energy	596	6.54%
7	Sustainable development	469	5.14%
8	Recycling, zero waste	398	4.36%
9	Value chain	365	4.00%
10	Energy efficiency	360	3.95%
11	Circular economy	214	2.35%
12	Waste management	207	2.27%
13	Entrepreneurship	187	2.05%
14	Employment	178	1.95%
15	Robot	146	1.60%
16	Environmentally friendly	94	1.03%
17	Zero emissions	76	0.83%
18	Women entrepreneurs	60	0.66%
19	Business development	50	0.55%
20	Industry 4.0	38	0.42%
21	High technology	21	0.23%
22	Economic development	19	0.21%
23	Sustainable production	16	0.18%
Total		**9120**	**100.00%**

These codes reflect the significant aspects of companies' efforts towards sustainable development. In particular, activities focused on innovation and digitalization, R&D investments, and infrastructure development, as well as issues such as renewable energy and energy efficiency, are highlighted.

In the context of SDGs, the concepts of 'Innovation', 'Digitalization', 'R&D', 'Infrastructure', 'Renewable energy', 'Value chain', and 'Energy efficiency' are interrelated and support each other and emerge as empowering concepts. Innovative and innovative applications form the basis of R&D studies, and these studies support digitalization and infrastructure development, allowing the development of sustainable technologies such as renewable energy. In addition, applications in the field of digitalization contribute to raising sustainability standards at every stage of the value chain by providing energy efficiency and resource optimization through data analysis and automation of business processes (Seydioğulları, 2013; Ak & Genç, 2018; Öztürk, 2021). While these processes reduce the negative impacts of businesses on the environment, they increase the use of renewable energy resources and contribute positively to zero waste and recycling activities. By considering these concepts holistically, a model is put forward to create a sustainable economy and society.

It is possible to say that SDG targets have an impact on the financial performance of businesses. Businesses that invest in innovation and digitalization gain a competitive advantage, and these investments increase the growth potential of businesses in the long term. R&D and innovation activities enable the development of environmentally friendly products, making it easier for businesses to

enter these markets. At the same time, efforts to ensure the use of renewable energy resources reduce the operational costs of businesses and contribute positively to the company's market image in terms of environmental sustainability in the eyes of investors and consumers. The adoption of sustainable value chains and effective recycling practices increases resource efficiency and reduces waste management costs, providing a positive contribution to financial results. Therefore, the adoption of sustainability-focused strategies helps businesses reach a more solid position socially and economically, supporting their long-term financial success.

The statements regarding the SDGs and SDG 9 were also analyzed in the relevant reports. The keywords 'Sustainable development', 'Infrastructure', 'Digitalization', and 'Innovation' are found in all 25 documents. The least common expression is 'Technology center', which is only found in four reports.

Statements regarding the SDGs and SDG 9 in the relevant reports were also analyzed. SDG 9 targets are addressed with the concepts of digitalization, R&D activities, technological innovations, and innovation. Table 4 summarizes the frequency of the phrase sustainable development in the reports and whether any statements regarding SDG 9 have been made. While the phrase sustainable development is included in all reports, it is seen that Garanti BBVA uses this phrase the most. The explanation regarding SDG 9 is included in all reports except one.

Table 4. Frequency of the phrase sustainable development and whether statements regarding SDG 9 have been made

Company	*Sustainable development*		*SDG 9 description*	
	Frequency	*Percentage %*	*There is*	*None*
Garanti BBVA	53	11.30%	+	
Isbank	41	8.74%	+	
YKB	32	6.82%	+	
Doğuş Otomotiv	31	6.61%	+	
TAV	31	6.61%	+	
Sabancı Holding	27	5.76%	+	
Turkcell	26	5.54%	+	
Çimsa	23	4.90%	+	
Migros	23	4.90%	+	
SOCAR	23	4.90%	+	
ENKA	20	4.26%	+	
Akbank	19	4.05%	+	
DOHOL	18	3.84%	+	
THY	16	3.41%	+	
Enerjisa	15	3.20%	+	
TOFAŞ	12	2.56%		-
Ford Otosan	10	2.13%	+	
Arcelik	9	1.92%	+	
Vestel	9	1.92%	+	
Koç Group	7	1.49%	+	
Ereğli	6	1.28%	+	
Şişecam	6	1.28%	+	
Türk Traktor	5	1.07%	+	
Pegasus	4	0.85%	+	
BİM	3	0.64%	+	
Total	**469**	**100%**		

In this section of the study, how the first five companies in Table 4, where the SDG 9 statement is most frequently used, contribute to SDG 9 efforts is examined in detail. In particular, explanations are made regarding specific texts reflecting SDG 9 efforts. In this analysis, which SDG 9 sustainability strategies the explanations are related to, what concrete results these strategies produce, and how these results overlap with the UN SDG 9 are discussed in depth. Thus, the sustainability performances of the companies are evaluated within a broader framework.

SDG 9 disclosures on a company basis are summarized below:

1. Garanti BBVA[12]: As one of the leading financial institutions in the country operating in the banking sector, Garanti Bank Inc. (Garanti BBVA) has made significant commitments in line with SDG 9. The bank plays an active role in establishing resilient infrastructures, developing innovative products, and promoting sustainable industry. The bank aims to serve the purpose of increasing energy efficiency and reducing carbon emissions by offering green financing products. In addition, it contributes to industrial and infrastructure development within the scope of SDG 9 with its investments in digitalization and innovation. These investments support the modernization of the industrial sector and the dissemination of sustainable technologies and are directly aligned with the UN's SDG 9 targets.

The bank supports relevant projects to promote energy efficiency and the use of renewable energy in industry, which increases the environmental sustainability of the industry. In addition, it contributes to the modernization of the industry and the increase in its competitiveness with its digitalization and innovation investments. Reducing carbon emissions, improving energy efficiency, and disseminating innovative financing products are among the concrete results of the bank's strategies. These results are directly related to the UN's SDG 9 sub-goals of sustainable industrialization and promoting innovation.

Among the issues addressed in Garanti BBVA's 2022 report within the scope of SDG 9 is increasing access to financial services for small-scale industrial

[12] https://www.kgk.gov.tr/Portalv2Uploads/files/Duyurular/v2/Surdurulebilirlik/Raporlar/Garanti%20BBVA%202022%20Entegre%20Faaliyet%20Raporu.pdf

enterprises and other enterprises in the fields of industry, innovation, and infrastructure. The bank focuses on policies such as making infrastructure and industrial processes more sustainable, promoting innovation, developing scientific research, and expanding the technological capabilities of industrial sectors.

As of 2022, Garanti BBVA's contribution to sustainable development is USD 5.30 billion. It aims to provide sustainable financing support of USD 9.04 billion in the 2018–2025 period. In addition, the bank offers support for green transformation and capacity building with sustainability-themed loan packages for commercial and small and medium-sized enterprises (SME) customers. Garanti BBVA's R&D expenses for 2022 were reported as USD 15.91 million. These financial data show that important steps have been taken towards the realization of SDG 9 and that financial support is being provided effectively. Garanti BBVA contributes to the implementation of SDG 9 by supporting sustainable industry and infrastructure projects.

According to the 2022 report:

- In 2022, the Green Housing Loan disbursement amount was realized as USD 12.89 million.
- In 2022, the total disbursement amount of the Corporate Green Vehicle Loan provided for hybrid and electric vehicles reached USD 12,47 million. In addition, the amount of the Environmentally Friendly Vehicle Loan disbursed to individual consumers exceeded USD 20.42 million.
- In 2022, the volume of sustainable finance products offered by Garanti BBVA exceeded USD 234.94 million.
- As of the end of 2022, the total volume of green assets within the loans allocated under project and acquisition financing was USD 2.5 billion. In addition, the cumulative amount of financing provided to renewable energy investments exceeded USD 6.26 billion.

These data demonstrate Garanti BBVA's strong commitments and significant financial contributions in the field of sustainability and green financing.

2. ISCTR[13]: *Türkiye İş Bankası A.Ş.* is among the leading banks in the country. *İş Bankası's* 2022 report covers in detail the work carried out in the fields of industry, innovation, and infrastructure in relation to SDG 9. The bank has carried out various financial and operational activities in line with this goal. The bank's financing for renewable energy projects and its support for various projects to make industrial processes more sustainable are in line with the SDG 9 targets. The bank supported 162 renewable energy projects in 2022 and the total loan amount provided to these projects reached USD 544 million.

In addition, the bank provides financing on the themes of green transformation and sustainable economy. In 2022, a total of USD 227 million was provided for projects and products contributing to the green economy. This resource was provided to be used in areas such as women entrepreneurs and renewable energy and energy efficiency.

In terms of innovation and R&D investments, the bank's strategies for investing in technology-focused initiatives and supporting innovation processes are also stated in the report, but there is no data on the amount of specific R&D expenditures.

In general, *İş Bankası's* activities and financing in line with SDG 9 are in line with the UN's goals in this area and provide significant contributions to industrial and infrastructure development.

3. YKB[14]: *Yapı ve Kredi Bankası A.Ş.* is another leading bank in the country. YKB attaches great importance to sustainable industrial and infrastructure investments, especially within the scope of SDG 9. In this context, it is emphasized that the bank plays an active role in the transition to a low-carbon economy and supports the industry and infrastructure with innovative projects. The bank promotes sustainability and innovation in the industrial sector with the projects it finances.

As of 2022, YKB has provided approximately USD 1.8 billion in funding for renewable energy projects and other projects supporting the transition to a low-carbon economy. Seventy-two (72) percent of these fundings were carried out in accordance with sustainability criteria. Although YKB's specific R&D expenditure amounts for 2022 are not specified in the report, it is stated that the bank has increased its investments in digital banking and that these investments have increased customer interaction and digital channel penetration. In particular, significant increases have been recorded in the number of active digital banking customers.

The work carried out by YKB and the financing it provides are largely in line with the UN's SDGs. The bank contributes to SDG 9, particularly in the transition to a low-carbon economy and the development of innovative financing tools. The financing provided to renewable energy and sustainable infrastructure projects directly overlaps with the industrial and infrastructure targets of SDG 9.

4. DOAS[15]: *Doğuş Otomotiv Servis ve Ticaret A.Ş.* (*Doğuş Otomotiv*) is an automotive importer and automotive distributor network operating in Turkiye since 1994. *Doğuş Otomotiv* carries out various activities supporting SDG 9 as an important part of its sustainability strategy. In this context, it focuses especially on innovation, digitalization, and sustainable infrastructure. The company makes investments in digital transformation projects and energy efficiency to make its operations more efficient and environmentally friendly.

In 2022, an electric vehicle financing loan of USD 9.13 million was used to import electric vehicles. This financing supports the company's commitment to combating climate change and sustainable financing. In 2022, the company established a solar power plant at the *Şekerpınar* logistics center with an investment of USD 2.4 million. Thanks to this investment, all of the energy used in the logistics center is provided by renewable energy sources. In addition, *Doğuş Otomotiv* invested USD 7.81 million in digital transformation projects, and significant savings were achieved as a result of these projects.

These studies are in line with the UN SDG 9 targets. *Doğuş Otomotiv* makes significant contributions to industrial and infrastructure development, especially with the steps it takes in the areas of transition to a low-carbon economy, energy efficiency, and digitalization. Electric vehicle financing and renewable energy investments directly serve the sustainable industry and innovation issues targeted by UN SDG 9.

[13] https://www.isbank.com.tr/bankamizi-taniyin/raporlarimiz

[14] https://www.yapikrediinvestorrelations.com/tr/images/pdf/faaliyet-raporlari/2022/yk22_faaliyet_tr-220223-cift.pdf

[15] https://www.dogusotomotiv.com.tr/tr/surdurulebilirlik/surdurulebilirlik-1/surdurulebilirlik-raporlari

5. TAVHL[16]: Tav Havalimanları Holding A.Ş. (TAV airports) is a Turkiye-based company engaged in the development, construction, and management of airports. TAV airports' 2022 sustainability report includes studies related to SDG 9. Within the scope of SDG 9, the company attaches particular importance to studies in the areas of innovation, digitalization, and sustainable infrastructure.

TAV Airports carries out studies in areas such as improving customer experience, investing in digital transformation and technology, supporting sustainable transportation solutions, and modernizing infrastructure projects. These studies are in line with the industry, innovation, and infrastructure goals that SDG 9 focuses on. In particular, customer experience management, digitalization, technology investments, and innovation issues are addressed within the framework of SDG 9. The company supports its global sustainability policy by aligning its strategic goals with the SDGs.

Among TAV airports' innovative investments, investments in digitalization and technology stand out. The company stated in the report that its activities in the field of innovation and digital transformation are in line with SDG 9.

Although specific financial data (e.g., R&D expenditures) are not included in detail in the company's relevant report, it can be said that the company's activities in 2022 are generally in line with the UN SDG 9 target and that important work has been done in this area.

5. DISCUSSION

When all these reports are examined, it is seen that large companies in Turkiye have taken important steps towards SDG 9 and developed strategies in line with these goals. This finding is similar to the results of the study conducted by Elalfy et al. (2021), which revealed that publicly traded companies are more likely to include SDGs in their reporting frameworks. As understood from the reports, leading companies such as Garanti BBVA, *Türkiye İş Bankası A.Ş.*, YKB, *Doğuş Otomotiv*, and TAV airports have carried out various projects and investments in the fields of sustainable industrialization, innovation, and infrastructure development. In terms of compliance with the UN's SDG 9 targets, investments in areas such as energy efficiency, digitalization, and green financing stand out. These studies carried out by the companies contribute to the adoption of sustainability principles in industrial and infrastructure projects.

However, it is also seen that some statements in the reports are not directly related to SDG 9 targets. This situation shows that companies present their sustainability studies as part of their general performance evaluations. In general, these reports reveal the awareness of large companies in Turkiye on SDG 9 and their concrete contributions to sustainable development processes. The focus of the country's leading banks on SDG 9 in particular shows that the financial sector plays a critical role in sustainable development processes. Banks can directly contribute to the development of industrial and infrastructure projects in line with sustainability principles through their financing functions, which form the basis of economic growth and development. In particular, through their work in areas such as innovative financing products, green loans, and digitalization investments, banks ensure that not only their own operations but also the projects they finance are sustainable. This shows that banks contribute to SDG 9 and support the sector in achieving environmental and social sustainability goals. The financing power of banks facilitates the scaling and expansion of sustainable industrial and infrastructure projects, which contributes to the formation of a more resilient and innovative economic structure in the long term. In addition, the leading role of banks in this area encourages other sectors to join similar sustainability efforts and helps increase sustainability awareness in the economy as a whole.

When evaluating sustainability efforts carried out by banks and large corporations, the concrete contributions of these activities to SDGs such as SDG 9 should be carefully investigated. In many cases, these activities are likely to be used only as a public relations (PR) tool. In some cases, certain texts in sustainability reports contain very general statements or it is possible to say that some of them are prepared only to meet legal requirements. As a result of the study conducted by Franco et al. (2020), the need for effective stakeholder participation in sustainability efforts was emphasized and it was argued that without targeted efforts, SDG targets may remain desirable rather than achievable. If sustainability strategies are not based on concrete action plans and only offer superficial commitments, the impact of such efforts may be limited and the targeted sustainability results may not be achieved. This shows that SDG statements are often superficial and serve as a legitimacy tool rather than truly integrating sustainability into corporate strategies (Weerasinghe et al., 2024).

As a general assessment of all reports published by the 25 companies covered in this study, it is seen that many companies are taking concrete steps towards achieving their sustainability goals. For example, practices such as developing green financing products, reducing carbon emissions, and increasing energy efficiency are initiatives that directly contribute to SDGs. The adoption of such strategies as part of long-term business plans shows that companies are committed to sustainability and are truly contributing to these goals. In addition, these companies usually undergo independent audits and their sustainability reports are prepared according to international standards. This makes companies' work in this area more transparent and accountable.

6. CONCLUSION

This study analyzes the areas of focus and the work carried out by the companies listed in the BIST Sustainability 25 index towards SDGs. In this context, basic keywords related to sustainability have been determined and the important aspects of the activities have been tried to be determined according to their frequency in the relevant company reports. The analysis reveals that companies attach particular importance to innovation on the path to sustainable growth, while digitalization increases their efficiency and performance. In this context, R&D activities are an indispensable element for sustainable development, and innovation supported by strong infrastructure investments emerges as the driving force behind sustainable growth. In addition, the use

[16] https://ir.tav.aero/tr-TR/

of renewable energy resources and combating climate change are sustainable development efforts that include using resources wisely to minimize environmental impacts in line with the concept of social justice. Creating sustainable value chains and optimizing energy use through energy efficiency are other basic practices that stand out in companies' sustainability efforts.

Innovation, digitalization, R&D and infrastructure development, and the development of sustainable technologies are interrelated concepts that support and strengthen each other in companies' sustainability efforts. Energy efficiency and resource optimization have an impact on increasing sustainability standards throughout the sustainable value chain. All these processes play an important role in building a sustainable economy and society and supporting financial success.

This study is one of the first comprehensive content analyses that deeply examines the commitments of companies listed on Borsa Istanbul (BIST) to SDG 9. Therefore, this study provides an important basis for future research in sustainability reporting and evaluating corporate strategies for SDG 9. The findings of this study can be guiding, especially in areas such as comparative analyses of companies in different sectors, monitoring changes over time, and conducting similar studies for other sustainability goals.

Among the limitations of this study is that only the 2022 sustainability reports of companies listed on BIST were examined. The fact that similar reports from companies in other countries or data from different years were not included may limit the generalizability of the results. In addition, it should be noted that the findings obtained with the content analysis method are based only on the textual content of the reports and may not fully reflect the actual performance of the companies in some cases.

The results of this study show that companies' strategies for SDG 9 generally focus on areas such as digitalization, innovation, and energy efficiency. These findings provide important indicators for both policymakers and investors to consider when evaluating the sustainability performance of companies. In addition, another important result of this study is that more stringent regulations and standards should be introduced for companies' sustainability reporting. In this context, it is evaluated that the findings of this research can guide strategic planning to increase sustainability performance.

Future research could benefit from a detailed analysis of corporate sustainability reports by examining these reports annually to analyze specific success stories, the processes involved in achieving sustainability goals, the challenges encountered, and the strategies employed to overcome them. Additionally, a thorough examination of public institutions' activities and regulations related to SDG 9 over the years would provide valuable insights into how these projects, infrastructure works, and regulations impact businesses and society at large. It would also be beneficial to concretize the specific contributions of businesses in achieving sustainability goals by assessing their impact on the general economy, local communities, the environment, and overall business performance. Furthermore, focusing on the collaboration and relationships between businesses and stakeholders would emphasize the critical role these relationships play in the process of achieving SDG 9 and their overall value to sustainability.

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APPENDIX

Table A.1. Sustainable development goal No. 9 and indicators

Target code	*Target definition*	*Indicator*	*Indicator definition*
Target 9.1	Establish quality, reliable, sustainable, and resilient infrastructure to support economic development and human well-being, including regional and cross-border infrastructure focused on equitable access and affordability for all.	**9.1.1**	The proportion of the rural population living within two km of roads that are passable in all seasons.
		9.1.2	Passenger and cargo volume by transportation types.
Target 9.2	Promote inclusive and sustainable industrialization and, by 2030, significantly increase industry's share of employment and gross domestic product (GDP), in line with national conditions, and double this share in the least developed countries subtract.	**9.2.1**	Manufacturing industry value added per capita and as a proportion of GDP.
		9.2.2	Ratio of manufacturing industry employment in total employment.
Target 9.3	Increasing the access of small-scale industrial enterprises and other enterprises, especially in developing countries, to financial services, including credit on favorable terms, and their integration into value chains and markets.	**9.3.1**	Proportion of small-scale industries in total industrial value added.
		9.3.2	The proportion of small-scale industries that have a loan debt (cash or non-cash).
Target 9.4	By 2030, all countries will take action within the framework of their relative capabilities, upgrading infrastructure and innovating industry to ensure sustainability by increasing resource use efficiency and greater use of clean and environmentally friendly technology and industrial processes.	**9.4.1**	CO^2 emissions per unit value added.
Target 9.5	By 2030, to increase scientific research and raise the technological capabilities of industrial sectors in all countries, especially developing countries, including by supporting innovation and substantially increasing the number of R&D workers per one million people and public and private sector R&D expenditures.	**9.5.1**	Share of R&D expenditures in GDP.
		9.5.2	Number of researchers per million population (full-time equivalent).
Target 9.a	Facilitate sustainable and resilient infrastructure development in developing countries through the provision of enhanced financial, technological, and technical support to African countries, least developed countries, landlocked developing countries, and small island developing states.	**9.a.1**	Total international official support to infrastructure (other official flows in addition to official development assistance).
Target 9.b	Supporting domestic technology development, research, and innovation in developing countries by ensuring a conducive policy environment for industrial diversification and increased value added to commodities.	**9.b.1**	The proportion of manufacturing industry sectors producing high and medium-high technology added value in total added value.
Target 9.c	To strive to significantly increase access to information and communications technologies and to ensure universal and affordable access to the Internet in least-developed countries by 2020.	**9.c.1**	Proportion of population covered by a mobile network by technology type.