

The Balanced Scorecard as a Tool for Evaluate the Impact of Social Responsibility on Strategic Performance: Case Study of Sonatrach

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Abstract:

This study aims to assess the impact of Social Responsibility on the strategic performance of Sonatrach-Algeria- using the Balanced Scorecard as an evaluate tool. The findings indicate that integrating Social Responsibility into the Balanced Scorecard framework significantly contributes to improving Sonatrach's strategic performance. This impact was reflected in the company's commitment to reducing gas flaring, lowering operating costs, enhancing resource efficiency, decreasing workplace accidents, and ensuring environmental compliance.

Keywords: Social Responsibility, Strategic Performance, Balanced Scorecard, Sonatrach

First: Introduction

Social Responsibility has become one of the fundamental pillars underpinning the strategies of organizations operating in an increasingly volatile and uncertain business environment. Social Responsibility extends beyond mere legal and financial compliance to encompass environmental and social indicators that directly influence organizational sustainability and competitiveness. The Balanced Scorecard emerges as a strategic management tool for measuring and evaluating the performance of economic organizations, offering a comprehensive and precise overview of the various activities and processes they undertake. It achieves this through the integration of financial and non-financial indicators, thereby contributing to the translation of strategic vision and objectives into measurable indicators. Social Responsibility is no longer regarded as a supplementary activity; rather, it has become a core dimension integrated within the pillars of the Balanced Scorecard as a tool capable of assessing the impact of Social Responsibility practices on strategic performance. Sonatrach, as a leading national company in Algeria's hydrocarbon sector and a major economic actor at both the national and

¹ Received: February 15, 2026; Accepted: July 12, 2026; Published: September 17, 2026

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international levels, constitutes a suitable case for this study, given its substantial social and environmental commitments toward local communities and the environment, alongside its strategic objectives.

1. Research Problem:

the research problem can be formulated as follows:

How does the Balanced Scorecard contribute to evaluate the impact of Social Responsibility on the strategic performance of Sonatrach?

This central research question gives rise to the following sub-questions:

- ✚ What is the level of Social Responsibility indicators within Sonatrach?
- ✚ What is the level of Sonatrach's strategic performance according to the dimensions of the Balanced Scorecard?

2. Study Hypotheses:

a. Main Hypothesis: The Balanced Scorecard contributes effectively to evaluate the impact of Social Responsibility on the strategic performance of Sonatrach.

b. Sub-hypotheses:

- ✚ Sonatrach exhibits a high level of Social Responsibility indicators.
- ✚ Sonatrach demonstrates a high level of strategic performance across the various dimensions of the Balanced Scorecard.

Second: Literature Review

1. The Balanced Scorecard

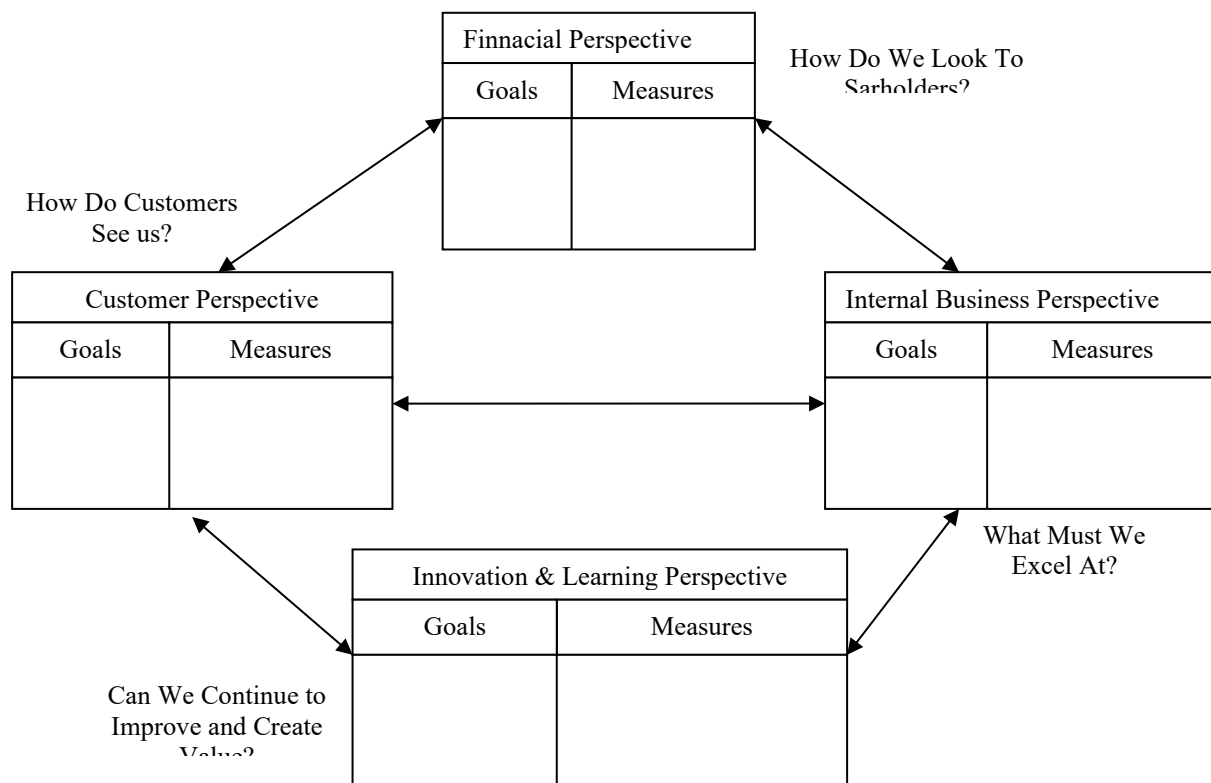
Kaplan & Norton (1992) defined the Balanced Scorecard as a set of financial and non-financial measures that provide managers with a clear and comprehensive picture of the organization's future performance (p. 71).

Niven (2006) defined it as a set of quantifiable measures derived from the organization's strategy, whereby it translates the organization's strategic vision into a set of objectives; it is further regarded as a communication tool between management, employees, and external stakeholders, given the integrated information it provides on organizational performance (p. 90).

It has also been defined as a system that translates an organization's mission and strategy into a set of performance measures, by providing a framework for implementing organizational strategy through a focus on achieving both financial and non-financial objectives (AL-Dweikat & Ibrahim, 2018, p. 147).

Kaplan & Norton (1992) established a connection between the Balanced Scorecard and performance measures through the following figure, which provides answers to four fundamental questions:

Figure (01): The Balanced Scorecard Links Performane Measures



Source: (Kaplan & Norton, 1992, p. 72)

2. Social Responsibility

Carroll defined Social Responsibility as encompassing economic, legal, ethical, and discretionary expectations; fulfilling these four dimensions requires organizations to comply not only with legal and regulatory requirements but also to take into account unwritten rules and societal norms and values, and to go further by contributing to the resolution of social problems (Gaudencio, Coelho, & Ribeiro, 2017)

Social Responsibility refers to the ongoing commitment of organizations to ethical conduct and to contributing to economic development, while improving the quality of the working environment for the workforce (Mapingure, Zengeni, Mahach, & Mwando, 2015, p. 99).

It is defined as the commitment of organizations to contribute to sustainable development, to the interests of stakeholders, and to the enhancement of social conditions (Famiyah, 2017, p. 02).

3. Strategic Performance

McDonnell & Ansoff defined it as the performance that achieves a balance between short-term and long-term survival requirements, in accordance with indicators of the organization's life cycle and its level of profitability (Ben omer, AL- Maida, & Ben Omer, 2020).

Dahlan (2019) views strategic performance as the activity that provides the organization with the appropriate design of its strategic orientation and the means of responding to the reactions of competing organizations and to various strategic challenges (Shareef, 2022, p. 601).

Hunger & Wheelen (2010), meanwhile, regarded it as the final outcome of an organization's activity, reflecting how the organization utilizes its material and human resources in order to achieve its objectives (Ramli, 2017, p. 300).

Third: Evaluating the Strategic Performance of Sonatrach Using the Balanced Scorecard

1. Presentation of the Organization: The organization is presented through the following profile:

Table (01): Profile of Sonatrach

	Information
Founded	1963
Field of Activity	Natural gas, oil, renewable energy, petrochemical products
Legal Form	Public enterprise
Subsidiaries	More than 150
Number of Employees	More than 20,000
Training Centers	Algerian Petroleum Institute (IAP); Sonatrach Management Academy; and business activity training centers
Regional and International Ranking	Leading company in Africa Top gas supplier in the Mediterranean region Third-largest supplier of natural gas to Europe Tenth-largest producer of natural gas worldwide 13th-ranked company globally in the oil sector

Source: (Presentation on the Sonatrach Group, 2025)

2. Proposed Dimensions of the Study

In order to measure the impact of Social Responsibility on the organization's strategic performance using the Balanced Scorecard, a fifth dimension is added to incorporate Social Responsibility indicators, as shown in the table below:

Table (02): Proposed Dimensions of the Study

Dimensions	Performance Indicators
Financial	Sales growth; asset turnover ratio
Customer	Market share
Internal Process	Employee productivity
Learning and Growth	Supervisory ratio; recruitment rate; training
Social Responsibility	Energy savings; carbon emission reduction; governance and transparency; workplace accident rate; social affairs; social investment; environmental safety

Source: Prepared by the researchers based on previous studies

2.1 Financial Dimension:

a. Sales Volume:

Table (03): Sales Volume

Unit: Million Tons

Year	2019	2020	2021	2022	2023	2024
Sales ³⁴¹	149.8	139.9	159.4	158.3	164.2	162.9
Growth Rate	-	-6%	14%	-0.6%	3.7%	-0.7%

Source: (Annual Reports, 2021-2024)

Table (03) reveals notable fluctuations in sales volume, in 2020 sales declined to 139.9 million tons due to the COVID-19 crisis which led to a global economic shutdown, Sales subsequently recovered and rose again in 2023 in both the domestic and international markets, as Sonatrach was able to meet domestic market needs while fulfilling its commercial commitments in the international market, a slight decline of 1% is also observed for 2024 according to Sonatrach's Annual Report (2024) this decrease is attributable to the export market, which fell by 4% due to milder winter weather conditions that reduced demand for natural gas for heating purposes, particularly in Europe. In contrast, the domestic market recorded a 3% increase compared to 2023.

b. Asset Turnover Ratio: Calculated by dividing revenue (turnover) by total assets.

Table (04): Asset Turnover Ratio

Unit: Billion DZD

year	2020	2021	2022	2023	2024
Revenue	2 855	5 154	8 909	7 218	6 523
Total Assets	12 055	12 655	14 432	12 801	13 369
Asset Turnover Ratio	23.68%	40.72%	61.73%	56.38%	48.79%

Source: (Annual Reports, 2021-2024)

Table (04) shows that revenue declined to its lowest level in 2020 due to the COVID-19 pandemic which led to a decline in global demand. It then peaked in 2023 owing to the global rise in hydrocarbon prices, before declining once again as the average price of a barrel of crude oil fell. Accordingly, Sonatrach's asset turnover ratio is influenced more by external price fluctuations (the price of a barrel of oil and gas) than by the magnitude of cumulative changes in the asset base itself.

2.2 Customer Dimension:

a. Market Share: This can be measured by tracking the evolution of revenue over the period 2019–2024.

Table (05): Evolution of Revenue

Unit: Billion DZD

year	2019	2020	2021	2022	2023	2024
Revenue	4303	2 855	5 154	8 909	7 218	6 523
Rate of development	-	-33.65%	80.52%	72.85%	-19%	-9.62%

Source: (Annual Reports, 2021-2024)

According to Sonatrach's Annual Reports (2021-2024) ,the decline in the company's revenue is attributed to the rise in the average price of a barrel of crude oil, which increased from USD 41.9 in 2020 to USD 72.3 in 2021. Revenue subsequently fell by 19%, reflecting a decline in the average crude oil price from USD 104 in 2022 to USD 84 in 2023, followed by a further decrease of 9%, corresponding to a drop in the average price from USD 84 in 2023 to USD 82 in 2024.

2.3 Internal Process Dimension:

a. Employee Productivity: Calculated by dividing total annual production by the total number of employees.

Table (06): Evolution of Employee Productivity Rate

year	2020	2021	2022	2023	2024
Production (Million Tons)	175.9	185.2	189.6	193.8	193.7
Number of workers	55 816	55 661	65 991	66 025	66 779
Productivity (Tons/Employee)	3 135	3 324	2 864	2 923	2 890
Rate of development	-	6.02%	2.4%	2.06%	-1.1%

Source: (Annual Reports, 2021-2024)

Table (06) shows that 2020 and 2021 recorded the highest levels of worker productivity, owing to the reduction in the total workforce compared to subsequent years. This is attributable to the layoff of some temporary workers at the onset of the COVID-19 pandemic and the temporary suspension of recruitment; despite the overall decline in production, the proportionally larger reduction in the workforce base relatively increased the employee productivity indicator or vice versa. It is also observed that the organization managed to achieve stability in employee productivity over the past three years.

2.4 Learning and Growth Dimension

a. Recruitment Rate:

Table (07): Recruitment Rate

year	2020	2021	2022	2023	2024
Total workers	55 816	55 661	65 991	66 025	66 779
Rate of development	-	-0.3%	18.55%	0.05%	1.14%

Source: (Annual Reports, 2021-2024)

Table (07) shows a slight decline in the number of workers in 2021 attributable, as previously noted to the recruitment freeze and the layoff of some workers as a result of the COVID-19 pandemic (contraction phase), it also shows an 18% increase in recruitment as deferred hiring resumed (expansion phase), followed by near-total stability, as the organization adopted a policy of replacing departing and resigning workers in order to maintain an optimal workforce size (stability phase).

b. Supervisory Staff Ratio:

Table (08): Supervisory Staff Ratio

year	2020	2021	2022	2023	2024
Number of Supervisory Staff	-	28 833	29 143	31 318	31 398
Total workers	55 816	55 661	65 991	66 025	66 779
Supervision Ratio	-	52%	44.1%	47.4%	47%

Source: (Annual Reports, 2021-2024)

Table(08) shows that the Supervision Ratio remained stable, ranging between 44% and 52%, which is consistent with the nature of the organization's activity as one based on exploration, production, and refining operations, requiring a substantial workforce of engineers, experts, and technicians. A decline in the Supervision Ratio is observed in 2022, attributable to the recruitment of operational staff to accommodate new projects, which led to overall workforce growth (approximately 10 330 workers) at a faster pace than the growth of the supervisory staff category. This was followed by a period of balance, as each increase in total workforce was accompanied by a proportional recruitment of supervisory staff.

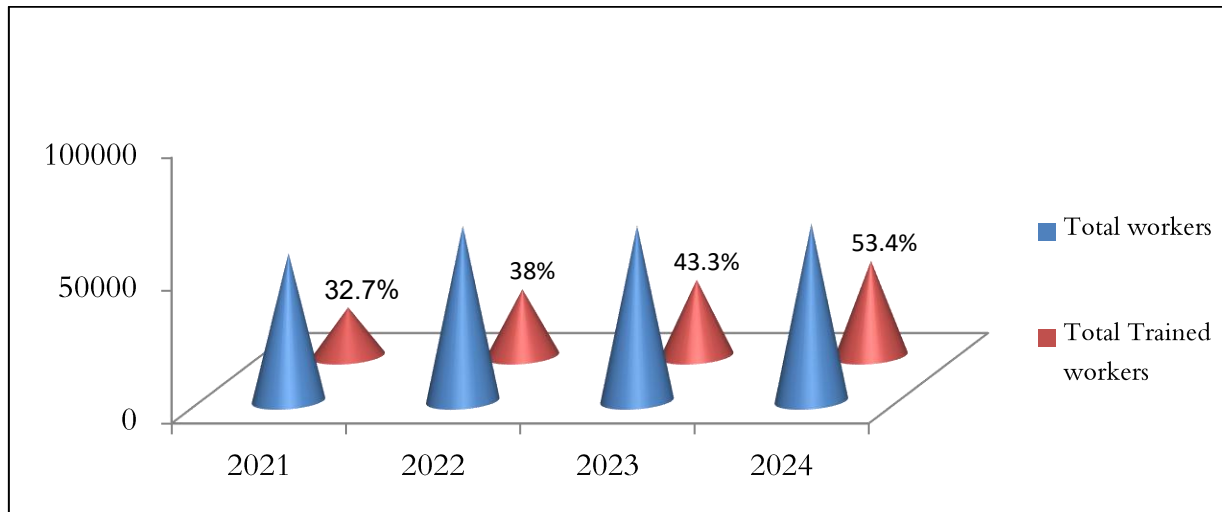
c. Training

Table (09): Statistics on Trained Employees for the Period 2021–2024

Employee Category	2021		2022		2023		2024	
	Number	%	Number	%	Number	%	Number	%
Executives	11 088	61	15 564	62.2	17 862	62.4	23 337	66
Supervisors	6 585	36	8 839	35.3	10 124	35.4	11 557	32
Operational Staff	545	3	620	2.5	628	2.2	801	2
Total Trained workers	18 218	100	25 023	100	28 611	100	35 695	100

(Annual Reports, 2021-2024)

Figure (02): Number of Trained Employees Compared to Total Workforce



Source: Prepared by the researchers based on Tables (08), (09)

According to the Annual Reports (2021–2024), Sonatrach targets the training of permanent employees through its training centers, namely the Algerian Petroleum Institute, the Sonatrach Management Academy, and the business activity training centers. A continuous increase in the number of trained individuals is observed from year to year, as follows:

- **2021:** The organization dedicated 194 216 person/day to training 18 218 permanent employees, thereby recording a notable improvement in performance compared to 2020 (81 757 person/day), owing to the decline of the COVID-19 pandemic.
- **2022:** The number of permanent employees who benefited from training reached 25 023 out of a total workforce of 65 991 employees, representing a 37% increase compared to 2021. The training volume in 2022 amounted to approximately 205 546 employee/day, i.e., an average of 8 employee/day.
- **2023:** The number of permanent employees who benefited from training reached 28 611 out of a total workforce of 66 025 employees, representing a 14% increase compared to 2022. The training volume in 2023 amounted to approximately 301 029 hours/day, i.e., an average of 10 hours/day per employee.
- **2024:** The number of permanent employees who benefited from training reached 35 695 out of a total workforce of 66 779 employees, representing a 25% increase compared to 2023. The training volume in 2024 amounted to approximately 329 583 hours/day, i.e., an average of 9 hours/day per employee.

2.5 Social Responsibility Dimension

a. Energy Savings: Sonatrach's energy-savings initiatives are reflected primarily in the implementation of several photovoltaic solar power projects. In 2021, the company commissioned its second photovoltaic solar plant BRN2 with a capacity of 10 megawatts, linking it to the first plant BRN1 which had entered service in 2018. This project has enabled a reduction in electricity costs of USD 100 000 per month, gas savings of 180 million m³, and an estimated cut in greenhouse gas emissions of 300 kilotons of CO₂ equivalent over the project's operational lifetime. In 2023, the company completed a third solar power generation plant across its industrial sites, reaching a production capacity of approximately 1.3 gigawatts, with the stated ambition of covering 80% of the energy requirements of its oil-producing sites by 2030 a target designed to progressively curb on-site fossil fuel consumption and greenhouse gas emissions. Throughout 2024, Sonatrach continued rolling out its program to equip production sites with solar energy capacity, engaging in the construction of multiple grid-connected solar plants across its major production zones. Within this framework, the second phase of the BRN photovoltaic solar plant project, developed in partnership with Eni, is expected to become operational during the first quarter of 2026. Collectively, these initiatives are designed to reduce reliance on carbon-based energy sources in electricity generation, lower the company's overall environmental footprint, strengthen the energy autonomy of its facilities through diversified energy sourcing, and improve operational cost efficiency (Annual Reports, 2021-2024).

b. Carbon Emission Reduction: (Annual Reports, 2021-2024)

In pursuit of reducing carbon emissions and reinforcing the role of renewable energy, Sonatrach has undertaken a series of projects aimed at curbing carbon-based energy consumption in electricity generation, strengthening the energy independence of its facilities through diversified energy sourcing, and enhancing operational cost efficiency. These initiatives include:

- Rolling out a program to equip production sites with solar energy infrastructure, including the construction of several grid-connected solar power plants across production areas;
- Launching afforestation projects for carbon sequestration, and recycling and managing treated industrial wastewater, in line with the company's broader sustainability strategy;
- Developing a portfolio of green hydrogen projects, encompassing: Green Petrochemicals, Green Steel, Hydrogen Transport Infrastructure Development, a second hydrogen corridor.

c. Governance and Transparency:

Sonatrach has entered into two agreements with the Algerian Institute for Standardization for support throughout the certification process for the ISO 37001 and ISO 26000 standards, the former concerning anti-bribery management systems, and the latter concerning corporate social responsibility. The adoption of ISO 37001 is intended to reinforce ethical business conduct within Sonatrach, while fostering a culture of transparency and integrity through appropriate control mechanisms designed to safeguard the company's assets and personnel against misconduct. ISO 26000, for its part, reflects Sonatrach's social commitment with respect to the impact of its decisions and operations on local development and the environment (Annual Report, 2024).

d. Workplace Accident Rate:

- **Occupational Accidents:** According to Sonatrach's Annual Reports (2021-2024), 373 workplace accidents were recorded in 2021, compared to 305 in 2020, an increase attributable to the resumption of activities in 2021 following the marked slowdown caused by the COVID-19 pandemic. A total of 442 workplace accidents were recorded in 2022, and 426 in 2023, representing

a 4% decrease compared to 2022, this rise or decline is mainly attributable to accidents resulting from falls at the workplace as well as traffic-related incidents.

- **Material and Environmental Incidents:** According to Sonatrach's Annual Reports (2021-2024) (2021–2024), the number of material and environmental incidents in 2021 reached 398, representing a 12% decrease compared to 2020 results; this decline is attributable to a 26% reduction in pipeline hydrocarbon leaks, which fell to 144 leaks in 2021. During 2022, the number of incidents reached 392, a 2% decrease compared to 2021, an improvement attributable to a 21% reduction in the number of hydrocarbon leaks.

e. Social Affairs: (Annual Reports, 2021-2024)

Sonatrach places considerable emphasis on enhancing employees' working conditions and cultivating an environment that supports their overall well-being. Particular attention is given to preserving employee health, providing comprehensive medical coverage, and ensuring their welfare and personal development through a range of social services, assistance programs, and community-oriented initiatives. To this end, the company addresses several areas that directly affect employees' working and living conditions, most notably:

- **Health Services:** Occupational health monitoring (with periodic medical check-ups achieving a 90% coverage rate), social medicine services (including 273,153 specialized medical consultations, 267,245 medical tests, and 36,635 medical examinations), third-party payment arrangements, as well as pharmaceutical and medical equipment provision.
- **Social Services:** Sports and recreational programs, welfare initiatives, and child protection measures.

Such benefits extend not only to active employees but also to their dependents, retirees and their dependents, and the families of deceased staff members.

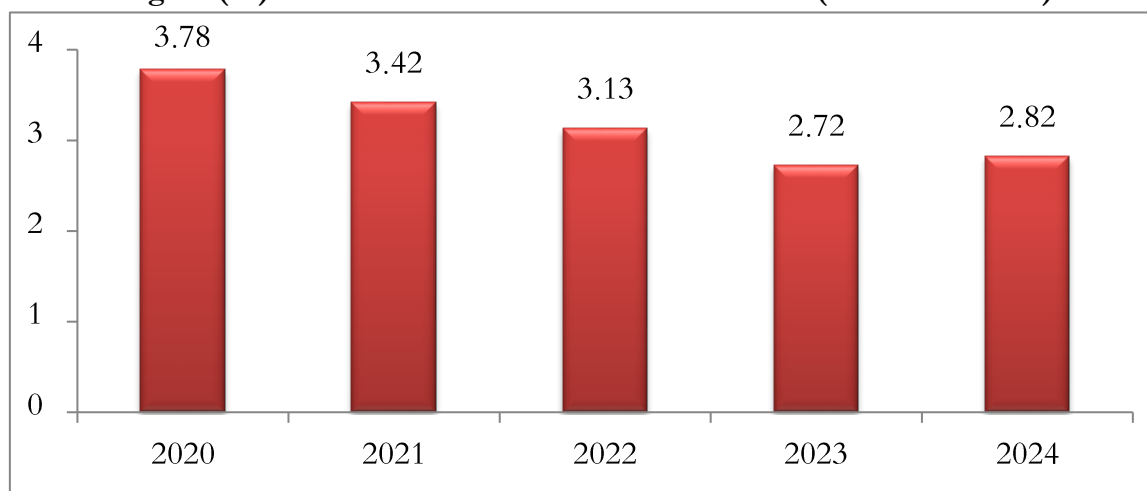
f. Social Investment: (Annual Reports, 2021-2024)

As a socially engaged, publicly-owned enterprise and a driving force behind national economic development, through the following actions:

- Constructing and rehabilitating social and educational facilities;
- Carrying out charitable works;
- Donating medical equipment;
- Providing support for individuals with special needs.

g. Environmental Safety: Reducing greenhouse gas emissions through a partnership with Eni, alongside the implementation of other emission-reduction technologies. (Annual Reports, 2021-2024).

- **Reduction in Gas Flaring Volume:** The total volume of gas flared across Sonatrach's operational activities in 2024 stood at approximately 2.82 billion standard m³, of which 2.41 billion standard m³ was attributable to exploration and production operations.

Figure (03): Evolution of the Volume of Gas Flared (10^9 Standard m^3)

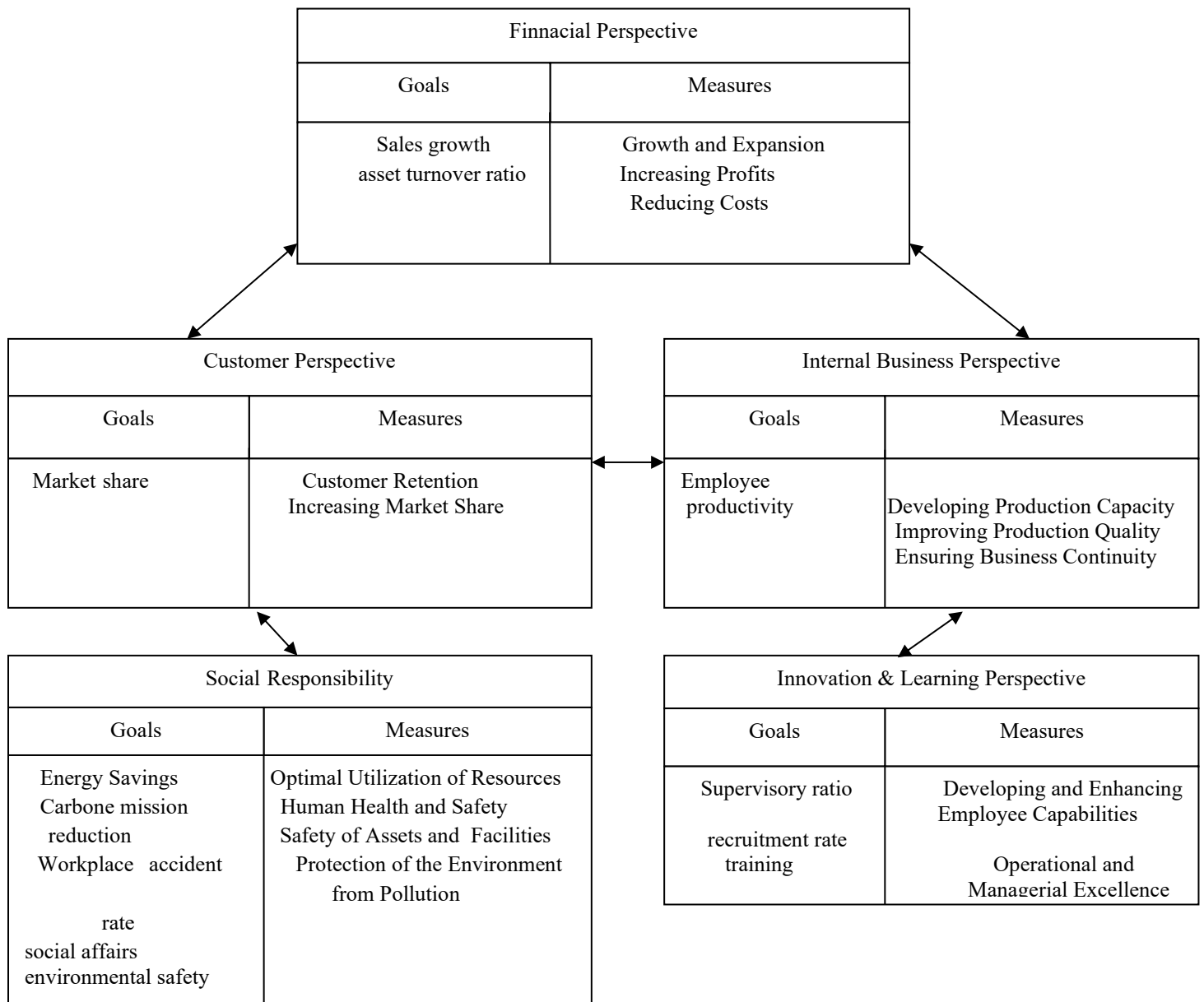
Source: (Annual Reports, 2021-2024)

Analysis of the trend in flared gas volumes between 2020 and 2024 points to a 25% decline, equivalent to roughly one billion standard m^3 . This reduction was recorded mainly within exploration and production operations, driven primarily by the commissioning of several associated gas recovery projects, notably in the Hassi Messaoud region..

- **Environmental Protection:** The year 2024 was marked in particular by the updating of the "Environmental Monitoring" platform, in both its regulatory and normative dimensions, in line with best practices for assessing environmental compliance levels — notably with regard to policy frameworks and the ISO 14001, ISO 26000, and ISO 50001 standards, as well as adherence to the provisions of the Hydrocarbons Law, its implementing regulations, and related procedures. As part of its hazardous waste management efforts and compliance with environmental legislation, the company carried out several measures concerning the transport and export of equipment containing PCB substances for the purpose of disposal (Annual Report, 2024).

Based on the preceding analysis of the Balanced Scorecard dimensions incorporating CSR indicators, the Balanced Scorecard for Sonatrach can be presented as follows:

Figure (04): Balanced Scorecard Model for Sonatrach for Evaluate Strategic Performance



Source: Prepared by the researchers based on the preceding analysis

Conclusion:

The level of Social Responsibility at Sonatrach is assessed based on the Annual Reports (2021–2024), Following the analysis, the findings reveal the following:

- **Environmental Dimension:** High level, reflected in the reduction of carbon emissions, the launch of afforestation projects for carbon capture, and water resource management.
- **Social Dimension:** High level, reflected in the creation of employment opportunities for the local workforce and support for national activities (cultural, sports, solidarity, charitable, donation-related, and health initiatives).
- **Occupational Health and Safety Dimension:** Medium-to-high level, reflected in the decline in the workplace accident rate resulting from reduced hydrocarbon leakage.

- **Governance and Transparency Dimension:** Medium-to-high level, reflected in the disclosure of sustainability reports and anti-corruption and transparency measures through the adoption of ethical codes of conduct.

The level of Sonatrach's strategic performance is assessed based on the consolidated Annual Reports (2021–2024). Following an analysis of this performance according to the dimensions of the Balanced Scorecard, the following findings emerge:

- **Financial Dimension:** High performance level, reflected in record revenues and net profits resulting from the stability of hydrocarbon export flows and the renegotiation of long-term contracts; the group is characterized by high financial efficiency and the capacity to finance large-scale projects, including solar energy projects dedicated to supplying production fields.
- **Customer Dimension:** High performance level, as Sonatrach succeeded in supplying the European market with natural gas, thereby consolidating its position as a globally trusted strategic supplier, while enhancing its brand image through gradual compliance with the requirements of international markets committed to environmental standards and to reducing the carbon footprint of exported gas.
- **Internal Process Dimension:** Medium performance level, reflected in the increase in total production volume, new oil discoveries, and the reduction rate in gas flaring; Sonatrach recorded improvements in the efficiency of its refining and pipeline transport chains, as well as reductions in waste through gas flare recovery projects and the recycling of industrial water within production lines.
- **Learning and Growth Dimension:** High performance level, achieved through training programs across the group's regions and the localization of national expertise; Sonatrach invested in human resources and in the development of quality and safety standards to build a qualified human capital base.

Overall, Sonatrach's strategic performance level tends toward a high level, as the organization shifts from a focus on financial performance alone toward the implementation of balanced and sustainable performance that links internal process efficiency with environmental compliance.

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