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GOOGLE'S SUSTAINABLE BUSINESS STRATEGY: SYNTHESIS OF THE 5PS FRAMEWORK, CREATING SHARED VALUE, ESG, AND SDGS

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Abstract

This paper aims to describe Google's sustainable business strategy as a single, document-based case study. This study uses a descriptive qualitative approach with a documentary case study method, analyzing the Google Environmental Report 2026 as the main source of cases, complemented by supporting academic literature. Five analytical lenses are used in an integrated manner to describe the strategy, namely Henry Mintzberg's 5Ps of Strategy, Deliberate Strategy and Emergent Strategy, Porter and Kramer's Creating Shared Value, and ESG and SDGs frameworks. The results show that Google's sustainability strategy includes large-scale clean energy procurement, supply chain transformation, circular product innovation, and structured sustainability governance. In terms of emissions, Google reported a 3% decrease in Scope 2 emissions, while Scope 1 and Scope 3 emissions increased by 20% and 25%, respectively, in the same reporting period. This research contributes to providing an integrated picture of how the five frameworks can be used together to describe the sustainability strategy of a global technology company.

1. INTRODUCTION

Today's world business leaders are increasingly aware of the power of sustainable business strategies that not only address the world's most pressing challenges, but also drive their company's success by creating a corporate competitive advantage. The goal of a sustainable business strategy is to generate corporate profits by having a positive impact on the environment and society with proper governance. The world's business leaders can learn from Google on how to design, develop and implement successful sustainable business strategies.

For Google, the development of AI and technology has opened up enormous economic opportunities. However, these opportunities are also accompanied by a big challenge for the environment, namely carbonization. Therefore, Google is working to get carbon-free energy for their operations and supply chain. In its quest for clean energy, Google faces important challenges: limited transmission networks, higher costs, fragmented and inadequately connected power grids, energy technology constraints, regulations and taxes, and other obstacles. This challenge is particularly prominent in certain regions such as Asia Pacific and parts of the United States.

Realizing this challenge, Google integrated the concept of ESG (Environmental, Social, Governance) sustainability into its business strategy and turned the business strategy into a real action that it claimed to be able to answer challenges while having a real impact on nature. Google uses its strengths in digital-based technologies and AI to help unravel the complexity of problems and create shared value to drive meaningful change while generating profits for the company (Google Environmental Report 2026).

The urgency of this topic is even more evident given the rapid growth in global data center energy consumption due to the expansion of AI. The International Energy Agency (IEA) estimates that global data centers will consume around 460 TWh of electricity by 2024 with an emission implication of around 182 million tons of CO2, and this demand is projected to continue to increase sharply as AI workloads expand (International Energy

Agency, 2025). Peer-reviewed studies also show that the environmental footprint of AI data centers is relatively complex to be measured consistently due to the diversity of methodologies and limitations of systems used between organizations (Siddik et al., 2021; Xiao et al., 2025). It is in this context that a systematic understanding of how one of the world's largest technology companies develops its sustainability strategy becomes relevant, both for academics and business practitioners.

From the academic side, the research gap that this paper aims to address is that there are still limited studies that explicitly integrate management strategy frameworks (5Ps and Deliberate/Emergent Strategy from Mintzberg), shared value creation frameworks (Creating Shared Value from Porter and Kramer), and sustainability measurement and reporting frameworks (ESG and SDGs) in a case study of technology companies. Google was chosen as the object of the research because it is one of the largest corporate clean energy buyers in the world and a mainstream market maker of the 24/7 energy transition in the technology sector and has a complete set of sustainability reporting data that is relatively rare for similar companies, making it a representative case to describe the application of the five frameworks in an integrated manner. The novelty of this paper lies in the integrative synthesis of the five analytical lenses in a case study of global technology companies, which have rarely been discussed simultaneously in a single analytical framework. The significance of this contribution is two-way: academically, this synthesis results in an analytical matrix (Section 2.2.6) that can be replicated in case studies of other companies to build a cross-company comparison database in the future; Practically, this structured description can be a reference for managers and business strategy teachers in understanding how the five frameworks complement each other when applied to a single real-world case.

It should be emphasized that the design of this research is a documentary case study that is analytical-interpretive. Therefore, this paper is not intended to prove the effectiveness of these frameworks in developing and executing strategies, but rather to analyze and illustrate how the five lenses the 5Ps of Strategy, Deliberate/Emergent Strategy, Creating Shared Value, ESG, and SDGs can be used in a complementary manner to read a single case study of global technology companies.

This paper was created in an attempt to find answers to some of the following research questions:

1) How does Google structure and develop its sustainability strategy?
2) What are Google's sustainability strategies?
3) To what extent does the strategy successfully address the challenges facing Google, driving the company's sustainable growth while contributing to global sustainability?

2. LITERATURE REVIEW

The literature review in this paper includes two main parts, namely an empirical review of previous studies relevant to sustainability and ESG strategies, and the theoretical framework on which the Google case study analysis is based.

2.1 Theoretical and Conceptual Background

2.1.1 Mintzberg's Theory: *5Ps of Strategy*, *Deliberate Strategy*, and *Emergent Strategy*

Most conventional views view strategy as a formal, written and rigid plan that cannot be changed. As a result, strategy often becomes a hindrance to growth when the situation changes. These rigid strategies limit the process of learning, adaptation and creativity of the organization, causing the strategy to lose relevance, be unresponsive to changes in technology, markets and regulations and ultimately experience implementation failures in the long term.

In this regard, Mintzberg (1987a) introduces a broader perspective than just a plan. Mintzberg defines strategy comprehensively in 5 frameworks of perspective called the *5Ps of Strategy*, namely:

- *Plan*, which is strategy as a plan a guide or plan of action that is based on and deliberately designed to achieve a certain goal before action is taken.
- *Ploy*, which is strategy as a tactic a specific tactic or a specific maneuver used deliberately to outperform competitors.
- *Pattern*, which is a strategy as a pattern of past actions consistency in behaving or acting over time, which can arise organically even if it is not formally planned at the beginning.
- *Position*, which is a strategy as a way of placing the organization in the environment determining the organization's position in the environment or market.
- *Perspective*, which is the way an organization sees the world the embodiment of the organization's vision, culture, and ideology.

By looking at strategy more broadly and comprehensively, organizations can improve the function of strategy as a source of culture, a way to win competition, decision patterns, positions in the environment and market, as well as organizational insights and learnings for continuous improvement. This perspective also opens up opportunities for more contextual and realistic adjustments based on experience and implementation feedback.

To produce strategies that are consistently relevant and adaptive to a complex and rapidly changing environment, Mintzberg (1994) also introduced two ways of strategizing, namely *deliberate* and *emergent*. *A deliberate strategy* is a strategy that is structured at the beginning with data and assumptions that were in place at the

time of compilation; this strategy is important as a guide for the organization's movement to achieve its goals, but the initial data and assumptions can become irrelevant as conditions change. Therefore, it is necessary to have a strategy that emerges outside the initial plan in response to developments that occur over time, namely *the Emergent Strategy*.

Emergent Strategy is a strategy that is formed after the existence of *a Deliberate Strategy*, arising from new insights, new initiatives and best practices that emerge from the bottom *up* and forming a series of consistent actions into a new pattern without any formal initial intention. This process by Mintzberg (1987b) is also called *crafting* (*Crafting Strategy*) because its formulation and implementation are integrated in a dynamic, iterative and simultaneous learning process, and play an important role in generating new categories and innovations that take organizations to higher levels.

2.1.2 Porter and Kramer's Theory: *Creating Shared Value*

Creating Shared Value (CSV) is a concept that is directly related to and is the main supporter for sustainable development. CSV emphasizes that businesses can make profits while doing good for society. According to Porter and Kramer (2011), by solving societal challenges and needs, companies can actually find new sources of innovation, productivity, and sustainable growth. A systematic review of 242 CSV articles by Menghwar and Daood (2021) reinforces the validity of this concept empirically, concluding that CSV is a meaningful contribution to the field of strategy not just a popular term although its application in the field still varies depending on how the value is defined and distributed among stakeholders.

CSV goes beyond the traditional *concept of Corporate Social Responsibility* (CSR) by making ESG a company's core business strategy that is able to create economic value and social value jointly and sustainably through three strategies, namely: (1) re-perceiving products and markets by meeting social needs; (2) increase the productivity of the value chain through resource efficiency; and (3) building an ecosystem/supporting cluster at the company's operational location. Referring to this theory, the achievement of the company's goals related to global *Environment, Social, Governance* (ESG) issues is no longer a cost burden but a driver *of competitive advantage* for the company.

2.1.3 Strategy in the ESG (*Environmental, Social, Governance*) Framework

ESG stands for *Environmental* , *Social* , and *Governance* . ESG has now become an issue as well as a global standard used by investors, creditors and other stakeholders to evaluate the long-term value and social impact of an investment or business run by a company (Atan et al., 2018). This ESG concept is directly related to the main goals of the United Nations Sustainable Development which aims to achieve global sustainability by 2030.

The Environmental pillar is used to evaluate how companies operate and their impact on nature, including the protection of the natural environment, the handling of climate change, the efficiency of resource use, and the reduction of pollution. Reporting carbon emissions in this pillar is divided into three *scopes*: *Scope 1* direct emissions from assets owned or controlled by companies; *Scope 2* indirect emissions from energy purchases such as electricity and heating; and *Scope 3* other indirect emissions from the entire value chain.

The Social Pillar is used to evaluate a company's relationship with internal and external stakeholders, including employees, customers and local communities, with a focus on human rights enforcement, gender equality, diversity in the workplace, occupational health and safety, and tangible contributions to society at large.

The Governance pillar is used to evaluate the internal systems, controls and procedures that a company uses in managing itself to ensure transparency and accountability of the company.

Integrating ESG into a company's business strategy has been proven to optimize financial performance and brand image, driving technological innovation and business model transformation, thus laying a solid foundation for long-term value creation.

2.1.4 Strategies within the Framework of SDGs (*Sustainable Development Goals*)

The Sustainable Development Goals (SDGs) are a global agenda known as the 2030 Agenda for Sustainable Development. The SDGs were officially adopted by world leaders on September 25, 2015 at the United Nations (UN) Headquarters, New York, and stated in a resolution document entitled *Transforming our world: the 2030 Agenda for Sustainable Development* (United Nations General Assembly, 2015). The SDGs are designed as a call for all countries, both developed and developing, to work together in a global partnership to tackle humanitarian and planetary challenges, focusing on the four pillars of sustainable development, namely the social, economic, environmental, and legal and governance pillars. The SDGs are outlined in 17 main goals along with specific goals to be achieved by 2030.

The traditional view assumes that economic or operational growth is directly proportional to negative impacts on the environment, such as the exploitation of natural resources and increased greenhouse gas emissions. Through the SDGs, world leaders are calling for economic growth and business operations to no longer always be followed by increased negative impacts on the environment, as affirmed in Target 8.4 of the SDGs on the efficiency of global resource use (United Nations General Assembly, 2015). Empirically, Urbieta's (2024) study of 24 global companies with best-in-class SDGs reporting shows that deep engagement with the SDGs — rather than just superficial reporting is characterized by the integration of the SDGs into corporate goals, disclosure of SDGs-related investments, and measurable progress monitoring metrics, a pattern referenced in reading Google's SDGs engagement in Part 4.

2.1.5 Inter-Framework Boundaries and Overlapping Controls

Since this paper applies five analytical lenses simultaneously, the boundaries between frameworks need to be asserted so that there is no repetitive mapping of the same evidence to different theories without generating new analytical findings. *The 5Ps of Strategy* (Mintzberg, 1987a) is used to classify the *types of* Google strategy statements (whether they are plans, tactics, patterns, positions, or perspectives), while *Deliberate/Emergent Strategy* (Mintzberg, 1994) is used to classify the *process of* forming such strategies (whether they are designed at the outset or emergent in an adaptive manner). These two frameworks operate on different dimensions content versus process so they don't overlap each other, even though they both originate from Mintzberg.

To control for the overlap between CSV, ESG, and SDGs, this paper treats the three in a tiered and asymmetrical manner: ESG is used as a *reporting and measurement* framework (providing structured data at the operational level, e.g. Scope 1–3), SDGs are used as a *global goal alignment* framework (indicating which goals are supported by Google's activities), while CSV is used as *an interpretive* framework to explain the business logic behind ESG data and the alignment of the SDGs i.e., how meeting environmental-social goals has the potential to generate economic value. With this division of roles, a single unit of evidence (e.g. Scope 2 data) is only quantitatively analysed once in the ESG framework, and is only interpreted not recalculated in the CSV and SDGs frameworks.

2.1.6 Integrative Synthesis Matrix Framework Analysis

Table 1 summarizes the five analytical frameworks, the operational indicators used, the units of evidence analyzed, and the relationships between the frameworks, as the basis for the analysis in Section 4.

Table 1. Analytical Frameworks

Framework	Analytical Role	Operational Indicators	Unit of Evidence
5Ps of Strategy	Classify the types of strategy statements	Category Plan/Ploy/Pattern/Position/Perspective	Google's public statement & corporate targets
Deliberate/Emergent Strategy	Classify the strategy formation process	Presence/absence of formal targets vs adaptive initiatives	2030 ambition vs granular energy initiatives
Creating Shared Value	Logical interpretation of economic-social value	Three CSV strategies (product, value chain, cluster)	CEA Program, ASR The Dalles, Circular Products
ESG	Operational measurement & reporting	Scope 1/2/3 (tCO2e) emissions, PUE, board composition	Google Environmental Report's annual emissions data
SDGs	Global alignment of goals	Mapping on Objectives 7 & 13	Target 24/7 carbon-free energy

2.2 Empirical Studies and Hypothesis

The following empirical studies are the basis for understanding the relationship between sustainability strategies, ESG factors, and company performance.

"The Impacts of Environmental, Social, and Governance Factors on Firm Performance: Panel Study of Malaysian Companies"

The results of this scientific article show that ESG factors, either partially or aggregatedly, do not have a significant influence on the company's profitability and value. Nevertheless, the ESG score was shown to have a combined positive and significant effect on cost of capital (WACC), although each component individually did not show a significant effect (Atan et al., 2018).

"Sustainability Transitions: Policy and Practice"

Based on the EEA Report No. 09/2019, it is emphasized that achieving the European Union's long-term vision towards an ecologically prosperous life requires a fundamental change in policy paradigm.

Modern environmental problems are understood as systemic, interconnected, and cross-border issues, so sectoral and top-down approaches are no longer adequate. Therefore, transformative, adaptive, and integrated governance is needed. In this development, the government needs to play a role as a facilitator that encourages innovation, experimentation, collective learning, and cross-actor collaboration.

The report also formulates ten key policy messages that focus on two main dimensions, namely fostering innovation and system change through grassroots experimentation, diffusion of green innovation, structural transformation, strengthening the role of cities, and mobilizing financing; and managing the complexity of the transition through long-term vision setting, cross-level policy coordination, adaptive risk management, and transformation of knowledge and skills systems (Geels et al., 2019).

"The Role of ESG Strategy Implementation in Long-Term Value Creation for Companies"

The results of this study show that ESG (Environmental, Social, and Governance) strategies play a role in creating long-term value for companies amid global demands for sustainability. This strategy is rooted in three main pillars, namely the Concept of Sustainable Development which emphasizes the balance between economic growth and environmental protection, the Concept of Stakeholders which extends corporate responsibility to all relevant parties, and the Concept of CSR which integrates social responsibility into the core business strategy.

ESG implementation has succeeded in creating value through several key mechanisms: improving financial performance through cost efficiency and lowering the cost of capital, strengthening reputations that increase stakeholder trust and loyalty, and encouraging innovation, especially in the development of environmentally friendly solutions. ESG strategies also open up new opportunities, such as access to green financing at lower costs, strengthening sustainable supply chains to mitigate risks, utilizing government policy incentives, and accelerating digital transformation through technologies such as big data, artificial intelligence, and blockchain to improve the accuracy and effectiveness of ESG performance management (Lin, Y. 2024).

"The Impact of Corporate Sustainability on Organizational Processes and Performance"

The results of this scientific article show that companies with a high sustainability commitment have a more mature organizational transformation, characterized by the integration of sustainability issues in governance (the involvement of the board of directors and the formation of special committees), the alignment of management incentives with ESG indicators, and the involvement of stakeholders that are more systematic, transparent, and long-term oriented.

In terms of performance, over a period of 18 years, these companies significantly outperformed comparators, both in stock market performance and accounting indicators such as ROA and ROE, with abnormally higher annual returns. This advantage is even stronger in companies operating in reputation-based, consumer-oriented (B2C), and natural resource-intensive sectors. Overall, this study shows that sustainability has become a source of competitive advantage that is internalized in corporate systems and strategies (Eccles et al., 2014).

"The Economic Benefits of Google's Cloud Application Modernization Solutions"

The report from this scientific article shows that the use of Google Cloud application modernization solutions such as GKE, Anthos, and Cloud Run provides significant benefits both operationally and financially. Organizations are able to accelerate application migration and modernization up to 2.5 times faster with operational cost savings of up to 61%, while increasing application development and delivery speed by 77% and developer productivity by 30–54%. This has a direct impact on increased revenue and results in a very high estimated ROI, reaching 586% with a potential annual benefit of up to $194 million (Kaufmann et al., 2021).

"Sustainable Business Strategies"

In the Encyclopedia of the UN Sustainable Development Goals entitled Decent Work and Economic Growth, sustainable business strategies are discussed as the integration of economic, environmental, and social goals in corporate activities to create long-term value for companies and stakeholders.

The study highlights that market imperfections, such as negative externalities and information asymmetry, actually open up opportunities for profitable strategy innovation while improving the system. This strategy is supported by a natural-resource-based view approach that emphasizes pollution prevention, product lifecycle management, and sustainable development, as well as the concept of shared value that integrates business and community interests through product innovation, value chain efficiency, and strengthening local industrial clusters. Its implementation progresses through maturity stages, starting from a compliance-based defensive approach, moving to efficiency and social legitimacy, then towards clean production practices, to reaching a proactive stage where sustainability is fully integrated and becomes a source of competitive advantage that redefines the company's business model (Long, 2021).

"The Environmental Footprint of Data Centers in the United States"

This peer-reviewed study shows that the environmental footprint of data centers is highly dependent on the estimation methodology and data coverage used, so that data center energy consumption and carbon emissions figures often cannot be directly compared between sources. These findings are relevant as a methodological warning that data center emissions including those reported by Google need to be read with regard to system boundaries and accounting methods (Siddik et al., 2021).

"Environmental Impact and Net-Zero Pathways for Sustainable Artificial Intelligence Servers in the USA"

This study analyzes the emission trajectory of AI servers in the United States and shows that the growth of AI computing demand can push absolute emissions to remain upward even as efficiency per compute unit increases (Xiao et al., 2025). These findings are relevant as a general context in describing the relationship between technology efficiency and the scale of demand growth in the data center/AI industry, including in Section 4.

Corporate and Institutional Reports

In addition to the above academic sources, this paper also uses two corporate/institutional reports as case data, namely: (1) Google Environmental Report 2026 (Google, 2026) as the main source of case documentation containing Google's sustainability data; and (2) the Energy and AI report from the International Energy Agency

(International Energy Agency, 2025) as comparative data on the scale of global data center energy consumption. These two sources are treated as case data and quantitative comparative data, different from the academic literature that has gone through the peer review process in the previous section.

3. RESEARCH METHODOLOGY

This paper uses a type of qualitative research, which is a research method that emphasizes the aspect of understanding by describing a problem or phenomenon systematically, accurately, in-depth, and as clearly as possible (Furidha, 2023). The approach used is qualitative descriptive with a documentary case study method, with Google as the object of a single case study.

3.1 Design, Data Corpus, and Source Selection Criteria

The design of a single case study was chosen because the purpose of this study is exploratory-interpretive, i.e. to illustrate the application of five analytical lenses in an integrated manner in a case that has a completeness of sustainability reporting data that is relatively rarely found in similar companies, rather than to generalize the findings to the overall population of technology companies. The limitations of this generalization are explicitly stated as limitations of the research in Sections 5 and 6.

It should be emphasized that the Google Environmental Report 2026 is positioned as a source of corporate documentary and a primary case source, not as primary data in a methodological sense, namely data collected directly by researchers through interviews, surveys, or observations. All quantitative figures in this paper are sourced from the report.

The corpus of data analyzed in this paper consists of two main documents, as follows:

1) Google Environmental Report 2026, published by Google in 2025, contains environmental data for the period 2025 to the first half of 2026, used as the primary source of data on Google's operations, emissions, and sustainability initiatives.
2) Energy and AI, the International Energy Agency report (2025), is used as independent benchmarking data on the scale of global data center energy consumption, to contextualize the magnitude of Google's emissions against industry trends.

The criteria for inclusion of documents are: (a) issued by an official entity (company, governmental/intergovernmental agency) with a clear reporting period; (b) contain quantitative data that can be traced from the source; and (c) is directly relevant to the 2025 first half of 2026 analysis period. This period was chosen because it was the most recent reporting period available at the time the study was conducted and includes one full Google sustainability reporting cycle. Supporting academic literature (Section 2.1) is selected with additional criteria: (d) it is a journal article or research institution report that discusses ESG or the environmental impact of AI/data centers; and (e) published within the last ten years, except for references to classical theories (Mintzberg, Porter & Kramer) which are used as the framework of the core analysis.

3.2 Content Analysis Procedure

Content analysis is done through two stages of manual coding. First, the unit of analysis is set at the statement-level and figure-level levels contained in the Google Environmental Report 2026. Second, each unit is coded into one of five categories of analytical frameworks (5Ps, Deliberate/Emergent, CSV, ESG, SDGs) using a concise codebook: for example, a time-bound quantitative target statement is coded as a Deliberate Strategy, while initiatives that emerge in response to operational constraints (such as granular energy certificates) are coded as Emergent Strategies.

Because this research was conducted by a single researcher, the steps to maintain dependability are carried out in two ways: (a) trail audit in the form of recording the source of the direct quotation on each number and material statement (see citation in Section 4), so that the coding process can be re-traced by the reader or reviewer; and (b) re-check) on the consistency of the cross-section figures of the source report before citing, in particular for the Scope 1–3 emissions data presented in Section 4. Follow-up research is recommended using peer debriefing or coding by more than one researcher to strengthen dependability.

4. RESULT AND DISCUSSION

4.1 Result.

4.1.1 History and Development of Google

Google's story began in 1995 at Stanford University, when Larry Page and Sergey Brin built a search engine that used individual page links on the World Wide Web. They named this search engine Backrub, which soon changed its name to Google. In August 1998, Google Inc. was officially born with the mission of "managing the world's information and making it useful and universally accessible." This mission continues to live on today and its influence is very strong as the soul of the company.

In the following years Google grew rapidly and moved to its headquarters "The Googleplex" in Mountain View, California. Today, Google makes hundreds of products that are used by billions of people around the world, ranging from Google Search, Gmail, YouTube, Android and various other AI-based products. Google became a global market leader in its industry.

4.1.2 Google's Commitment to Sustainability

Google has demonstrated a strong commitment to sustainability across its operations, products, and partnerships. Here is concrete evidence of Google's sustainability commitment in the period from 2025 to the first half of 2026 (Google Environmental Report 2026).

Commitment in Operations

1) Acquiring 12 GW of new clean energy Google signed an agreement to buy more than 12 GW of new clean energy, making Google one of the largest buyers of clean energy in the world.
2) Avoid 58 million tCO2e across its operations and supply chain through collective carbon reduction initiatives.
3) Reduced the energy and carbon footprint of Gemini's median text messages by 33 times and 44 times over a 12-month period, respectively.
4) Achieve 3.7 times increase in carbon efficiency with Ironwood TPU.
5) Replenishing 78% of their freshwater consumption.

AI Solutions

1) Enabling a reduction in emissions of 41 million tCO2e Google's nine AI solutions help individuals, cities, and partners collectively reduce approximately 41 million tCO2e.
2) Achieving 7 times greater environmental benefits than the carbon footprint of the condensation footprint model.
3) Providing river flood forecast information that can be reached by more than two billion people in 150 countries.
4) Provides AI-based rainfall forecast information (NeuralGCM) that helps the Government of India deliver early rainy season forecasts to 38 million farmers more accurately.
5) Provides better wildlife tracking information through SpeciesNet, a *Earth AI* open-source capable of recognizing more than 2,000 animal species with an identification accuracy of over 94%.

4.1.3 Google's Sustainability Challenges

Although Google has shown significant efforts to minimize the carbon footprint of its AI solutions and maximize its positive impact on the environment, Google is still struggling to address the following sustainability challenges (*Google Environmental Report 2026*):

1) Increasing the scalability of AI infrastructure the increasing demand for AI services makes building infrastructure that is able to meet service needs while minimizing energy and carbon footprint a significant challenge.
2) Accelerating clean energy adoption efforts to source clean energy for global operations have experienced interconnection delays, market fragmentation, and regulatory barriers, especially in the Asia Pacific region and parts of the United States.
3) Navigating ever-evolving standards ever-evolving reporting frameworks complicate the reporting landscape, making it increasingly difficult to align strategies with changing reporting requirements.
4) Addressing policy and regulatory uncertainty fluctuating climate and energy policies and regulations bring uncertainty and volatility to a company's energy planning and emissions forecasts.
5) Bridging the supply chain transformation gap global supply chain decarbonization requires coordination with a broad network of independent organizations that each navigate its own context, regulatory, infrastructure, and financial constraints.

4.1.4 Google's Sustainable Business Strategy

a. Strategy in the 5Ps of Strategy Framework

By applying Mintzberg's *5Ps of Strategy* framework as a classification lens rather than as proof of strategy effectiveness Google's public statements and corporate targets can be interpreted as follows:

1) *Plan*: Execute a long-term plan until 2030.
2) *Ploy*: Set ambitious targets *24/7 carbon-free energy* and *net-zero emissions*.
3) *Pattern*: Uphold and consistently execute its mission of "managing the world's information and making it useful and universally accessible" to drive progress in solving environmental issues.
4) *Position*: Becoming one of the largest clean energy buyer companies in the world, helping to shape the development and expansion of the ecosystem *Green Contract* globally.
5) *Perspective*: Building a better sustainable future for everyone, advancing the next generation and preserving the earth.

b. Google's Deliberate Strategy and Emergent Strategy

Google's sustainable business strategy is a combination of *a mature* Deliberate Strategy *and a responsive Emergent Strategy* (*Google Environmental Report 2026*).

Google's Deliberate Strategy includes setting long-term goals through 2030, including:

1) Energy ambition: using 24/7 carbon-free energy in every power grid where Google operates by 2030.
2) Climate ambition: achieve net-zero emissions across operations and value chains by 2030.
3) Water ambition: replacing 120% of the volume of fresh water consumed, on average, across offices and data centers by 2030.

4) Waste ambition: achieving Zero Waste to Landfill for global data centers, diverting all food waste from landfills by 2025, and using recycled or renewable materials in at least 50% of plastics in the consumer hardware product portfolio by 2025.

Regarding Energy Ambition, Google faces complex process challenges and inadequate technology and support systems. Google's electricity needs have increased by more than 250% since 2019, mainly due to the growth of Google Cloud, Google Search, YouTube, and AI. For this reason, Google relies on the *Emergent Strategy* that continues to be developed, including:

1) Establishing a clean energy agreement, which is buying electricity from environmentally friendly energy sources such as solar, wind, water or geothermal.
2) Using granular energy certificates (*Granular Certificates*) so that clean energy use can be recorded in more detail, specific and transparent based on time and location.
3) Encourage policy advocacy and cross-industry sustainability coalitions, including advocating for policies at the state and federal levels in the United States, Europe and Asia-Pacific, and forging partnerships with international organizations and nonprofits.
4) Undertake long-term clean energy innovations and breakthroughs, such as the development of nuclear energy from small modular reactors, geothermal technology, the latest generation of carbon capture, and the construction of resilient infrastructure for a clean energy landscape.

c. Creating Shared Value in Google's Sustainable Business Strategy

Google has massively created *Creating Shared Value* through an approach that combines cross-sector collaboration, supply chain transformation, public infrastructure investment, product innovation, and global policy advocacy. Google not only focuses on reducing negative impacts, but also actively creates social, economic, and environmental benefits simultaneously, as follows:

1) Carry out public policy collaboration and advocacy in various regions of the world, while building partnerships with international organizations and non-profit institutions to accelerate the transition to a more sustainable system.
2) Empowering suppliers in the supply chain through the program *Google Clean Energy Addendum* (CEA) which requires major suppliers to use 100% clean energy by 2029, as well as investing in public infrastructure such as groundwater storage (ASR) systems in The Dalles.
3) Running a circular economy (*circular economy*) through responsible product design, such as the Pixel 10 series made with the highest recycled materials compared to previous products Pixel 10 Pro uses at least 30% recycled materials and Pixel 10a uses at least 36% recycled materials and *Casing* The exterior is made of 100% recycled aluminum throughout the Pixel 10 series.
4) Creating innovations in socially impactful products and technologies, such as Waymo (an AI-based electric vehicle that reduces emissions by more than 18,000 tons of CO2), Green Light (AI-based traffic optimization that reduces emissions by more than 13,000 tCO2e), and Flood Hub (a river flood forecasting system up to H-7 that covers more than 2 billion people in around 150 countries).
5) Strictly measure and manage emissions, including indirect emissions such as employee travel, to ensure accountability and transparency in managing their environmental impacts.

d. Google's Sustainability Strategy in the ESG Framework

As one of the leading companies in sustainability commitments, Google's strategy is an ESG strategy that fulfills all three pillars.

Environmental Pillar

According to *Google's Environmental Report 2026* (Google, 2026), Google manages the environmental footprint of its operations by focusing on increasing the availability of abundant and affordable clean energy globally and advancing technological innovations that reduce emissions. The Scope 1–3 data in this section are sourced from the report.

Scope 1 emissions are direct emissions from data centers, offices, and other assets owned and operated by Google, including fuel use for backup generators, fuel consumption of vehicles and aircraft operated, methane and nitrous oxide emissions from biogenic fuel sources, natural gas use, and refrigerant leaks. By 2025, Google's Scope 1 emissions will be recorded at around 86,100 tCO2e, less than 1% of Google's total carbon footprint, an increase of 20% compared to 2024 due to the expansion of its data center portfolio and increased fuel consumption of backup generators (Google, 2026).

Scope 2 emissions are indirect emissions derived from purchased electricity, natural gas use and refrigerant leaks in rental offices, as well as steam, hot water and cold water purchased from the district's energy system. By 2025, Google's Scope 2 emissions will reach approximately 2.8 million tCO2e (19% of the total carbon footprint), a decrease of 3% compared to 2024 despite a 37% increase in total electricity use, mainly due to advances in clean energy procurement in key power grid regions such as the United States and Japan (Google, 2026).

Scope 3 emissions are other indirect emissions from Google's entire value chain, which are grouped into eight categories: purchased goods and services; capital goods; fuel and energy-related activities (other than Scope 1 and 2); upstream transportation and distribution; operational waste; business travel; employee travel; and upstream

rental assets and use of products sold. By 2025, Google's total Scope 3 emissions will reach approximately 11.6 million tCO2e (80% of the total carbon footprint), an increase of 25% compared to 2024, mainly due to hardware manufacturing, technical and logistics infrastructure and data center construction (Google, 2026).

Social Pillar

Through Google.org's philanthropic initiatives, Google is committed to advancing social causes for people and the planet, harnessing the power of AI and data in three areas of impact: knowledge, skills, and learning; scientific advancement; and more resilient communities. This initiative is carried out through: (1) encouraging early-stage innovation by supporting global academic, non-profit, and scientific organizations, including *the PhD Fellowships* program and support for *the XPRIZE Quantum Applications* competition; (2) create broad-scale impact by bridging research and practical application through initiatives such as *Google.org Impact Challenges*; and (3) collaborating with the public, private, and non-profit sectors to address pressing challenges such as wildfires and food security.

Pillars of Governance

Google has an Audit Committee and a Risk and Compliance Committee that is responsible for overseeing business risks, including sustainability risks. Google's sustainability governance is run by the *Sustainability Focus Area* team led by Alphabet Inc.'s Head of Technology, Learning and Sustainability, comprised of cross-functional executives.

In risk management, environmental risk is assessed as part of the company's overall risk management framework. Google's two priority areas are climate-related risk assessed using qualitative and quantitative approaches as recommended by the TCFD as well as the IPCC and NGFS scenarios for the short (2030), medium (2040), and long term (2050) as well as water-related risks, which are assessed annually against data centers and offices using the Aqueduct Water Risk Atlas 4.0 (WRI) and Water Risk Filter 6.0 (WWF).

e. Google's Sustainability Strategy in the SDGs Framework

Google's sustainability strategy, directly or indirectly, shows alignment and support for the 17 SDGs. Google is a *market maker* and *system shaper* in the global energy transition with ambitious *targets of 24/7 carbon-free energy* and large investments in clean energy such as solar, wind, geothermal and nuclear. These targets directly and significantly support Goal 7 (Clean and affordable energy) and Goal 13 (Addressing climate change).

f. Google Emissions Trends Summary

In summary, of the three emission scopes reported in the 2024–2025 period, Scope 2 shows a downward trend (-3%), while Scope 1 (+20%) and Scope 3 (+25%) show an upward trend in the same period.

Google's efforts to manage these emissions include three key initiatives: (1) AI *stack efficiency* Google's data centers will operate with an average PUE (*Power Usage Effectiveness*) of 1.09 by 2025, 83% more energy-efficient than the industry average, plus *performance-per-watt* seventh and eighth generation TPUs); (2) clean energy procurement (PPA) of 12 GW; and (3) the use of granular certificates to ensure carbon-free electricity fulfillment (Google, 2026). This increase in efficiency per compute unit goes hand in hand with the growth in the scale of AI computing demand, a pattern that is also documented at the industry level by Xiao et al. (2025). This pattern confirms the relevance of the Environmental pillar in the ESG framework discussed in Section 2.2.3: reporting Scope 1–3 emissions separately allows the reader to see that technical efficiency (PUE, performance-per-watt) and clean energy procurement are most effectively reducing emissions in scopes that are within Google's direct operational control (Scope 2), while scopes that rely on external supply chains (Scope 1 and Scope 3) require a broader approach to ESG governance Involving partners and suppliers.

4.2 Discussion

4.2.1 Answers to Research Questions

The first research question how Google develops and develops its sustainability strategy can be answered that Google combines *the Deliberate Strategy* in the form of formal targets with deadlines (Ambition 2030) with *the Emergent Strategy* in the form of adaptive initiatives arising from operational constraints, such as granular energy certificates and cross-regional policy advocacy (Section 4.1.4). These two processes operate in tandem, so Google's strategy pattern can be described as *a hybrid* between a planned and adaptive approach.

The second research question what are Google's sustainability strategies was answered through mapping on the 5Ps, CSV, ESG, and SDGs framework in Section 4.1.4, which shows that Google's strategy includes clean energy procurement, supply chain transformation, circular product innovation, and cross-industry policy advocacy.

The third research question the extent to which the strategy addresses the challenges facing Google can be answered based on the emissions data in Section 4.1.4: Google's achievements show a pattern of varying emissions coverages, namely downward trends in Scope 2 and upward trends in Scope 1 and Scope 3 in the same reporting period. This pattern shows that the implementation of Google's sustainability strategy is going hand in hand with the ongoing growth of the business and the expansion of its AI infrastructure.

4.2.2 Theoretical Interpretation

In Henry Mintzberg's perspective, Google's strategy pattern illustrates the simultaneous implementation *of Deliberate Strategy* and *Emergent Strategy*, where the strategic direction of sustainability is not only designed *top-down*, but also evolves adaptively through the exploration of technology, data, and dynamic global needs.

Google's sustainability activities e.g., CEA programs and water infrastructure investmentscan be illustrated in line with Porter and Kramer's proposition in *Creating Shared Value* (CSV), which is that integrating social-environmental issues into core business models has the potential to generate economic and social value simultaneously.

From an ESG perspective, this case study illustrates that ESG can function not only as an evaluation standard, but also as a reporting mechanism that shapes an organization's capabilities, as demonstrated by Google' s *Sustainability Focus Area* governance structure and Net-Zero Ambition.

4.2.3 Practical Implications

The contribution of this paper is to show how the synthesis of management strategy frameworks (5Ps, Deliberate/Emergent) with sustainability measurement frameworks (ESG, SDGs) and value creation frameworks (CSV) can be used together to describe the sustainability strategy of a technology company, an approach that has the potential to be replicated in other technology companies to build a broader comparison base.

The practical implication for the management of other technology companies is that integrating sustainability into core business models through a combination of long-term formal targets and adaptive initiatives can be a relevant approach to adopt. For academics, the five frameworks used in this paper can serve as a reference for describing sustainability strategies in case studies of other technology companies.

5. CONCLUSION

From the discussion in this paper, the following points can be deduced:

1) Google's sustainability strategy demonstrates a pattern of strategic transformation that places sustainability as part of its business model, as illustrated through its clean energy procurement initiatives, Net-Zero Ambition governance, and circular product innovations. Google's emissions data shows a pattern that varies between coverages: Scope 2 shows a downward trend, while Scope 1 and Scope 3 show an upward trend in the same reporting period.
2) Framework *5Ps of Strategy* and *Deliberate/Emergent Strategy* of Henry Mintzberg, *Creating Shared Value* by Michael E. Porter and Mark R. Kramer, as well as ESG and SDGs are used in this paper as an analytical lens that the authors apply in an integrated manner to describe a single case of a technology company.
3) The contribution of this paper lies in the integrative synthesis of the five frameworks in a single case study, which results in a more thorough description of how the sustainability strategy of a technology company can be read from multiple strategic management and sustainability perspectives at the same time.
4) The practical implication of these findings is that companies can consider consistently reporting emissions trends across periods and across scopes (Scope 1–3) as part of more comprehensive sustainability communication to stakeholders.

Research Limitations

This research has limitations that need to be stated. First, the design of a single case study limits the generalization of findings to other technology companies; The patterns found on Google may not apply to companies with different business structures, regions of operation, or reporting methods. Second, all emission data in this paper is sourced from *the Google Environmental Report 2026*, so the scope of analysis follows what is presented in the report.

Advanced Research Agenda

- Based on the above limitations, follow-up research is recommended to: (a) conduct multi-case studies on several large technology companies to describe the patterns of sustainability strategies more broadly and comparatively; (b) use emissions and output data at a more granular line of business level (e.g. Google Cloud data) where publicly available; and (c) develop coding by more than one researcher (*inter-coder reliability*) to strengthen the dependability of content analysis in similar documentary case studies.

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