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The Concept of Green Transition in the Annual Disclosures of European Oil and Gas Companies

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Abstract

The success of the green energy transition lies for the most part in the hands of major oil and gas companies as significant contributors to greenhouse gas emissions and key players in the global energy markets. The goal of transitioning to the use of green energy is a crucial objective but it faces substantial challenges. The global economy continuously relies on fossil fuels as a primary engine for economic growth and energy security, therefore, achieving a balance between the goals of reducing carbon footprints and transitioning while maintaining corporate profitability, growth of GDP, and energy stability remains a complex task especially with the European Union's declared climate goals of a 55% reduction in emission by 2030 and climate neutrality by 2050. The targets set are being tested and challenged by geopolitical tensions among which is the ongoing conflict in Ukraine, the US's stance vis-a-vis of green energy and fossil fuels, and other factors that are putting unrelenting pressure on the transition and accelerating the need to diversify energy sources. The study looks to present an analysis of the sustainability reports from the top 10 oil and gas companies in the EU and assessing their alignment with the EU decarbonisation policies. It evaluates financial planning, decarbonisation strategies and scenarios, carbon targets, and policy engagement. Moreover, the research explores the alignment between corporate sustainability strategies and the EU's broader decarbonisation agenda, with a focus on long-term implications for petroleum-exporting countries like Norway. By examining the interplay between corporate actions, policy frameworks, and geopolitical dynamics, this study offers insights into the complex realities of achieving a green transition in Europe's oil and gas sector.

Keywords: green transition, oil and gas industry, sustainability strategies, European Union, decarbonisation, carbon taxation.

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1. Introduction

The European Union's climate-change strategy is anchored in the European Green Deal, which aims to make Europe the first climate-neutral continent by 2050 through binding interim targets, market-based mechanisms, and sectoral directives (Apostu et al., 2022; Chenguel & Mansour, 2024). Europe's path towards climate neutrality by 2050 hinges on the willingness and capacity of its major oil and gas companies to adapt and lead in the green transition. Key pillars include the "Fit for 55" package to reduce emissions by at least 55% by 2030, the Renewable Energy Directive to boost the share of renewables, and the Carbon Border Adjustment Mechanism to prevent carbon leakage (Apostu et al., 2022; Midttun et al., 2022). Despite representing nearly 50% of global oil production, European energy conglomerates are under growing regulatory and societal pressure to align their long-term strategies with ambitious EU targets—55% greenhouse gas reductions by 2030 and net-zero emissions by mid-century.

Oil and gas extraction and processing contribute roughly one-quarter of the global energy-related greenhouse-gas emissions, driven by both CO_2 from combustion and methane from fugitive releases (Hughes & Zabala, 2023; Midttun et al., 2022). In response, the EU Emissions Trading System caps and prices carbon, while upstream methane regulations and international commitments such as the Paris Agreement compel firms to integrate emissions mitigation into core operations (Hughes & Zabala, 2023; Jenkins, 2023).

Stakeholders now demand that energy incumbents publish detailed transition plans outlining how they will decarbonise their core assets. Studies show that companies with science-based targets, explicit capital allocations for low-carbon projects, and scenario analyses tied to 1.5 °C pathways achieve higher investor confidence and exhibit more resilient strategies (Crowley-Vigneau et al., 2023; Demartini et al., 2023). Yet many firms still lack rigorous links between executive incentives and climate KPIs or third-party validation of their roadmaps (Demartini et al., 2023). Recent geopolitical upheavals, from the war in Ukraine constraining gas supplies to shifting US policy support for domestic fossil fuel output, have underscored the urgency for diversified and resilient low-carbon energy systems.

This study combines a structured content analysis of CDP (2023) disclosures with annual report data to identify the defining features of credible climate transition plans in Europe's top ten oil and gas firms and to measure the degree of isomorphic reporting across the sector. The resulting insights fill gaps in our understanding of financial planning, transparency, governance alignment, and policy engagement.

Section 2 reviews the literature on mitigation/adaptation technologies, EU regulatory frameworks, transparency reforms, transition plan credibility, and institutional theory. Section 3 outlines our content analysis and scoring protocol. Section 4 presents the results across five dimensions—Strategy, Financial Planning, Scenario Analysis, Policy Engagement, and Carbon Targets—followed by cross-company comparisons. Section 5 concludes with policy implications, limitations, and suggestions for future research. This paper investigates how leading European oil and gas firms articulate, plan, and govern their transition efforts within annual

and sustainability reporting frameworks, drawing on both CDP disclosures and corporate annual reports.

2. Problem Statement

2.1 Climate Change Mitigation and Adaptation in the Oil and Gas Industry

The oil and gas sector is essential to the global economy, providing the main source of energy and supporting economic growth (Midttun et al., 2022). In Europe, this area ensures energy security and generates significant tax revenues. However, the dependence on fossil fuels has raised concerns about climate change, requiring a rapid transition to cleaner and renewable energy sources. Literature highlights emission mitigation technologies such as carbon capture, use, and storage (CCUS), methane leak detection and remediation systems, electrification of operations and integration of renewables into offshore infrastructure (Li et al., 2021; Midttun et al., 2022). Adaptation research focuses on strengthening infrastructure's resilience to physical risks—rising sea levels and extreme weather events—by strengthening offshore facilities, diversifying supply sources, and including climate risk assessments in asset valuation (Halttunen et al., 2023).

2.2 Regulatory Framework of the European Oil and Gas Industry

Oil and gas companies in Europe operate under a layered regulatory regime, which includes the EU-wide Emissions Trading System (ETS), which sets a price for CO_2 and emission limits; the Renewable Energy Directive (RED), which imposes binding targets for the share of renewable energy; and the Carbon Border Adjustment Mechanism (CBAM), aimed at preventing carbon leakage by applying customs duties on imports (European Commission, 2021). At the national level, regulations such as the UK's Offshore Petroleum Licensing Regulations and Norway's CO_2 tax for offshore production are stepping up investment in low-carbon technologies (Norwegian Ministry of Foreign Affairs, 2024).

2.3 Effects on Corporate Transparency: EU Taxonomy

The EU Taxonomy (Regulation 2020/852) (EUR-Lex, 2020) is the European Union's central classification system for environmentally sustainable economic activities. It provides a detailed framework for identifying which corporate actions contribute to climate objectives, such as mitigation and adaptation, while doing no significant harm (DNSH) to other sustainability goals. The taxonomy sets out technical screening criteria and disclosure obligations related to CapEx, OpEx, and revenue alignment. According to Hao and Dragomir (2025), the EU Taxonomy plays a pivotal role in shaping business models in the energy sector. Their analysis of five leading renewable energy companies shows that taxonomy-aligned reporting fosters transparency, improves investor trust, and serves as a benchmark for climate strategy credibility.

Early studies indicate an increase in the consistency of data disclosure, although challenges remain regarding data quality and the delineation of accounting boundaries (Eccles & Krzus, 2018).

2.4 Defining a Credible Climate Transition Plan

A credible climate transition plan must include: (1) externally validated short-, medium-, and long-term emission reduction targets (e.g. by the Science Based Targets initiative) (Dragomir et al., 2023); (2) budget allocations and capital reallocations dedicated to low-carbon projects; (3) scenario analyses testing resilience within the 1,5 °C and 2 °C trajectories; and (4) governance mechanisms linking executive remuneration and board oversight to climate performance indicators (Feng et al., 2022). Transparency through the disclosure of methodologies and assumptions, as well as independent verification, are essential for credibility (Demartini et al., 2023).

2.5 Institutional Theory and Climate Disclosure

Institutional theory explains variations in information disclosure through coercive forces (regulatory mandates), normative (professional standards and industry best practices), and mimetic (imitation of market leaders) (Holder-Webb & Cohen, 2012). In the oil and gas sector, coercive forces come from EU directives; the normative ones, from organisations such as IPIECA and the TCFD recommendations; and the mimetic ones, from the tendency of companies to reproduce the practices of the most advanced companies to legitimise their climate reports (Jenkins, 2023). Therefore, the research question is:

RQ: Which are the main characteristics of climate transition plans for European companies in the oil and gas sector, based on their CDP disclosures?

Addressing the increasing threat of climate change should be an urgent priority. Halttunen et al. (2023) contribute to this dialogue by creating a detailed framework of diversification pathways for global oil companies based on an in-depth review of existing literature and on insights from interviews with industry professionals. The authors highlight the widespread adoption of a mimetic behaviour whereby companies replicate the strategies of top industry leaders to navigate unclear regulatory and market changes. This imitative behaviour puts the credibility of the CDP disclosures at risk, as they end up being similar due to this copycat behaviour. Furthermore, Halttunen et al. (2023) notes that companies vary in their positioning, ranging from cautious maintenance of traditional fossil fuel operations to investing in green energy.

The research by Halttunen et al. (2023) also bring to light a troubling issue: while some companies are genuinely committed to implementing climate change strategies in their planning and business transforming, others advertise their compliance by appearing to shift towards sustainability and green energy adoption – in other words, “greenwashing”. All of this showcases the need for stakeholders to rigorously scrutinise claims. Finally, the research underscores the concerns and high stakes for

global oil companies and recommends further investigation into their potential to lead the green energy transition.

Dragomir et al. (2023) show that when utilising the institutional theory, strategies are informed by both the institutional legitimacy and will to conserve the environment. Mimetic, normative, and coercive isomorphism have an impact on the way companies disclose their sustainability efforts, the study reports. Mimetic isomorphism is particularly visible in the drive of both high and low emitters to imitate one another, and frequently benchmark against industry leading players rather than develop solutions specific to their context. This results in the convergence of strategies with regard to reputational alignment and not innovation.

Normative isomorphism, influenced by professional norms and reporting frameworks like GRI or TCFD, and validation efforts, for example SBTi, forces enterprises towards standardised language and frameworks. Although this eases comparability and raises commitment to stakeholders, it also facilitates symbolic compliance. Dragomir et al. (2023) note that many companies report to have accomplished, or almost accomplished low-ambition targets without going into details on these achievements, raising greenwashing concerns.

Coercive pressures such as EU regulations, national climate policies further strengthen this convergence, but do not guarantee a transformative change. The study recommends stronger governance arrangements for actions that are ambitious, quantifiable, and verifiable and not just limited to disclosure requirements. In this regard, institutional conformity has to transform from an aspect of formality into a force for credible, long-term environmental operations.

According to the research conducted by Dragomir et al. (2023) and Hilger et al. (2023), the carbon and energy transition targets of large European firms demonstrate the interplay between environmental ambition and institutional legitimacy. In carbon-intensive industries, especially in oil and gas in Central and Eastern Europe, companies follow similar targets through the mimetic isomorphism, comparing themselves to leading peers instead of adjusting the targets to their operations. Simultaneously, coercive isomorphism brought by EU regulations (such as the European Green Deal) and national climate policies forces firms to comply with the frameworks such as the EU Taxonomy. This combination results in homogenous goals which can look robust but run the risk of being devoid of real applicability.

Normative isomorphism standardises disclosures even further through the global reporting frameworks. The Global Reporting Initiative (GRI) outlines what are the environmental metrics that should be reported, the Task Force on Climate-related Financial Disclosures (TCFD) define expectations on governance, strategy, risk management and climate metrics, while the Science Based Targets Initiative (SBTi) ensures corporations' targets are aligned with the pathways of the Paris Agreement. Embracing these frameworks increases comparability and stakeholder trust but can also result in symbolic compliance. Hilger et al. (2023) provide an example of how peer-driven reporting supported by professional associations and sustainability ratings like Corporate Knights contribute to the cementing of this norm.

Finally, coercive, normative, and mimetic pressures interact with investor and public scrutiny to influence disclosure behaviours. Companies under high ESG scrutiny tend to show ambition with complex reports. However, Dragomir et al. (2023) caution against decoupling –when firms make commitments in disclosures in the form of promises that are ahead of actions in the real world – which is an indicator of greenwashing. Regulators should insist on verifiable intermediate milestones, external assessment of progress, and clear connections between goals and operational changes. This will make sure that institutional conformity delivers legitimate long-term sustainability instead of rhetoric reporting.

3. Methodology

The research design is based on content analysis. This methodology has been widely used in the field of research concerned with corporate disclosure (Dumay & Cai, 2014; Guthrie et al., 2020; Trane et al., 2023). This semi-objective method relies on developing a scoring scale and awarding points for fragments (text units) of public disclosure that would fit each item on the scoring scale. There is an interpretative (subjective) dimension to this procedure (Hilger et al., 2023) but the scale development, detailed instructions, and potential for replication are sufficient arguments to consider that content analysis is a reliable method for analysing the extent to which companies discuss certain aspects of their strategy and operations (Clarkson et al., 2008).

The sample comprises the largest twelve oil and gas companies in Europe (excluding Russia). The sample companies are enumerated in Table 1. We downloaded and analysed the CDP Climate Change Questionnaires for each company for the financial year 2022. Responses to the questionnaire were submitted by each company to the CDP in a standardised format during the year 2023 for the previous financial year. Each CDP Climate Change Questionnaire response is a PDF document that has at least 300 pages. For this reason, content analysis serves to extract and code the most relevant information while eluding the high level of detail included in the questionnaire responses. The current methodology offers a comparative perspective on influential companies that have been analysed in the previous literature at the level of case studies (Llavero-Pasquina et al., 2024; Si et al., 2023; Wiśniewska & Markiewicz, 2021).

The scoring scale has been developed based on the CDP Technical Note regarding climate transition plans (CDP, 2023). This technical note identifies the points in the CDP Climate Change Questionnaire that pertain to climate transition plans. CDP also offers guidance on how organisations can demonstrate (through disclosure) the implementation of a credible climate transition plan. In the vision proposed by the CDP, a climate transition plan has nine elements, and each element is linked to certain sections and items from the CDP Climate Change Questionnaire: governance, strategy, scenario analysis, financial planning, value chain engagement and low-carbon initiatives, policy engagement, risks and opportunities, targets, and carbon accounting and assurance. For the development of the content analysis scale, we proceeded inductively to analyse the actual disclosures of sample companies and

extract the elements which are specific to the oil and gas industry, in addition to aspects which are generally applicable to any corporation. For example, governance aspects are non-specific, while value chain engagement and low-carbon initiatives have particularities for this industry.

The scoring scale is an original contribution of this article because it strikes a balance between the goal of comparing several companies on their climate transition plans and managing the high level of detail that is common to CDP Questionnaire responses. We relied on the items included in the questionnaire and the options provided to the responders. In some cases, we also considered the detailed responses provided for the relevant items. The analysed aspects are:

- Financial planning for green transition
- Decarbonisation strategy
- Policy engagement
- Scenario analysis
- Carbon reduction targets.

The purpose of this scoring scale was to capture three types of isomorphism (Holder-Webb & Cohen, 2012; Liu et al., 2024): normative isomorphism (when companies create incentive structures in line with climate transition strategies), coercive isomorphism (when corporate strategies and practices converge under regulatory pressures, especially in the European Union), and mimetic isomorphism (when industry peers adopt similar strategies and practices to demonstrate that they adequately respond to stakeholder demands). The full scoring scales are presented in Appendix.

4. Findings

4.1 Financial Planning for Green Transition

Analysing the results for the 12 companies regarding financial planning, we observe significant variation in the scores. The distribution is approximately uniform across the range of scores. The top-ranked companies are OMV, Orlen, and Snam with scores of 13, 12, and 12 respectively, which indicates comprehensive coverage of the criteria. On the other hand, BP and Repsol scored the lowest with 5 points each. Most companies, except these two, fall between a score of 7 and the maximum of 13 scored by OMV. This suggests a balanced distribution of adherence to the financial planning criteria according to which the companies were evaluated. The following criteria: financial impact on capital allocation, access to capital, capital expenditures, acquisitions and divestments, and the CAPEX reported according to the EU Taxonomy criteria were identified and disclosed by most companies, ranging between 8 to 10 points on this dimension.

Detailed Analysis of OMV. The company, achieving a total score of 13 has strong and solid coverage of the financial planning criteria. OMV projects align with EU taxonomy or support OMV's 2030 Sustainability Framework and climate targets. Notable investments are reported in areas such as R&D (linked to the ReOil 2000 chemical recycling demonstration plant at Schwechat refinery), hydrogen

(UpHy project), organic basic chemicals (Borealis' propane dehydrogenation), photovoltaic technology (PV plants in Schonkirchen and Lobau), wind power (Gullfaks Hywind Tampen project), and biogas/biofuels (Schwechat refinery). The exploration and production business segment will invest a total of 5 billion euros in geothermal energy and CCS (carbon capture and storage) to contribute to sustainability and leverage OMV's subsurface and surface expertise, existing reservoirs, and infrastructure. Urban heating solutions include the joint venture with Wien Energy to develop geothermal energy opportunities for Vienna. Related transition investments include methane leak detection, energy efficiency programs, optimising fuel use, reducing emissions within the refinery, low-carbon road transport (hydrogen filling stations, electric charging points), and the installation of renewable energy technology (solar panels and heat pumps). In terms of R&D, OMV patented the Reoil as a chemical recycling process that converts plastic waste into synthetic feedstock for the petrochemical industry. The ReOil pilot plant has been operational in Schwechat since 2018 and is dedicated to the manufacture of high-quality plastics.

4.2 Decarbonisation Strategy

The analysis of the results for the 12 companies regarding their transition strategy reveals a reliance on stakeholder engagement for the purpose of identifying risks and opportunities in the value chain. Regarding the climate transition plan, 9 out of the 12 companies comply and align with the 1.5°C world requirement except for Aker, Galp, and Shell. In terms of shareholder feedback, it appears that it is a common practice among the 12 companies, except for Aker, Galp, and Shell that do not collect feedback from their shareholders on climate transition plans. Moreover, when it comes to the frequency of the feedback collection, we found out that only 7 out of the 12 companies collect this type of feedback annually. All companies have integrated climate-related risks and opportunities across diverse influences into their overall strategies. Finally, 6 companies out of the 12 have scored the maximum score attainable in terms of compliance. We will analyse the details provided by Neste in the following paragraphs.

Detailed Analysis of Neste. Neste, achieving a score of 7 has a solid coverage of the strategy criteria. Neste exhibits a comprehensive approach to its strategy regarding climate transition and aligns with the 1.5°C world criteria. One of Neste's goals is to achieve a carbon-neutral value chain by 2040 but for the immediate short-term they aim to reduce scope 1 & 2 emissions by 50% by 2030, achieve carbon-neutral production by 2035, and reduce the emissions intensity of the sold products by 50% by 2040. Moreover, Neste collaborates with partners and suppliers to reduce emissions across the value chain (scope 3). A critical component of Neste's strategy is stakeholder engagement. The board of directors collects feedback on the climate transition plan and is collected through the annual strategy review, biannual sustainability materiality assessments, and from the advisory council on sustainability and new markets. This regular engagement with equity analysts and

investors through financial communication, conference calls, roadshows, and annual events ensures continuous feedback integration.

Neste is making significant investments across various areas to support its targets. One of Neste's focus areas is on renewable products and technologies. The company emphasises research and development, especially new raw materials and technologies. Noteworthy areas include municipal solid waste, carbon capture, and renewable hydrogen storage. Moreover, Neste has undertaken remarkable projects such as the joint operation Martinez Renewables in California and the Singapore refinery. Neste has implemented a risk management framework that addresses financial, strategic, reputational, and health and safety risks. This approach is to be found in initiatives such as the SHARC project for green hydrogen supply and partnerships with companies like Rolls-Royce and Coca-Cola Europacific Partners to reduce GHG emissions. Another cornerstone of Neste's strategy is operational excellence. In 2020, Neste set a target to achieve carbon-neutral production (Scopes 1 & 2) by 2035. By 2021, Neste identified over 100 measures for emission reduction, including numerous wind power agreements with suppliers like Vattenfall, Fortum, IImatar, and Statkraft. Neste hit its target to use 100% renewable electricity globally by 2023 ahead of schedule in Finland. In conclusion, Neste's climate transition strategy is aligned with its long-term sustainability goals, strengthened by substantial investments, stakeholder engagement, and risk management practices.

4.3 Policy Engagement

The analysis of the 12 companies' results pertaining to their policy engagement unveils considerable disparities in their approach on engaging with trade associations and policy makers on climate-related issues. BP scored 83 which makes BP stand out significantly amongst its peers. BP was able to participate or engage with 22 policies, laws, or regulations and 59 trade associations. This indicates a proactive and thorough way to deal with strategy commitment. On the other hand, Aker and Equinor scored the least, with just 3 points each, showing minimal engagement. All businesses, with the exception of Equinor, have publicly committed to or stated their positions in order to adhere to the objectives of the Paris Agreement. Additionally, all companies, aside from Equinor, have implemented frameworks that present the plans and obligations they have made to protect the environment. In conclusion, despite the fact that BP and a few other companies have taken a very proactive approach, the levels of engagement and commitment clearly differ within this sample. The following analysis focuses on BP as the holder of the highest score.

Detailed analysis of BP. The company has managed to score the highest engagement score, demonstrating a proactive and thorough approach to their climate transition goals and a commitment to align with the goals of the Paris Agreement targets. BP's comprehensive aim is to reach net-zero emissions by 2050 but in the short-term they are focusing on significant reductions in methane gas emissions and on the transition to low-carbon fuels. Regarding methane and the management of emissions, BP has positioned itself as an advocate of the US Environmental Protection Agency (EPA) rules on the detection and monitoring of methane gas

leaks. In addition to that, BP has backed legislation such as the Climate Change Bills in Australia in 2022, which highlights the need for the reduction of emissions to foster certain energy investments. Furthermore, BP engaged with the national electric vehicle strategy of Australia by providing critical feedback on smart charging and market access as a way to support the infrastructure needs for the low-carbon energy transition. This demonstrates BP's commitment in aligning its strategies to fit climate policies and legislation.

Meanwhile in the US, BP has been promoting low-carbon fuel standards and programs like California's LCFS (Low Carbon Fuel Standard) and EPA's renewable fuel standard, encouraging and pushing for policies that foster the adoption of renewable fuels. To achieve their goals, BP has also influenced the application of the Inflation Reduction Act in the USA with a focus on incentives like tax credits for sustainable aviation fuels and electric vehicle infrastructure. BP commitments are marked by proactive advocacy for policy changes through active participation in legislative discussions. These initiatives underscore its commitment to transitioning from a pure oil and gas company to an integrated energy company (IEC). This recurring engagement with trade associations and policymakers allows BP to succeed in integrating stakeholder feedback into its strategy formulation and planning to attain its climate transition goals. BP's proactive strategies reflect the comprehensive policy engagement that we have been discussing, in addition to the company's support for clean energy initiatives within the framework of global climate policy leadership.

4.4 Scenario Analysis

The analysis of climate-related scenario use for the sample companies reveals a wide spectrum of diligence. With the highest score (8) in this category, Equinor leads in terms of the implementation of climate-related scenario analysis for strategy formulation which demonstrates comprehensive assessments across various scenarios including IEA NZE 2050 and IEA STEPS among others. Moreover, companies like Galp, Repsol, OMV, and Neste also show considerable engagement with multiple scenarios obtaining scores of 6, 7, 6, and 7 respectively. Shell scored the lowest involvement score (3). The most commonly adopted scenario is the IEA 2050 (net zero emissions) and the RCP 4.5 from the physical climate scenarios by eight companies. The assessment of the net present value (NPV) of the portfolio was the least common, conducted by only two companies. All companies except Aker, Shell, and Snam assessed their transition risk. Finally, all companies except Aker, Neste, and TotalEnergies have assessed physical risks. We will analyse the details provided by Equinor in the following paragraphs.

Detailed Analysis of Equinor. With a score of 8, Equinor demonstrates an encompassing approach to climate-related scenario analysis. Equinor uses quantitative climate related scenario analysis to form its strategy, split into three transition scenarios (IEA NZE 2050, IEA APS, IEA STEPS) and two physical climate scenarios (RCP 8.5 and RCP 4.5). These scenarios assist Equinor to understand and prepare for various future pathways and their impact on financial

performance and operations aiming to align with the 1.5°C target. Equinor's strategy included detailed assessments of the NPV of its portfolio, transition risks, and physical risks. All transition scenarios predict how much money Equinor will make in the future starting with 2023 as a result of the transition. Each scenario adds USD $2 for every barrel of oil for transportation and none excludes new oil exploration. The first and second scenarios, IEA NZE 2050 and IEA APS respectively, share similar findings and price predictions. IEA NZE 2050 focuses on reducing emissions to almost zero by 2050 while IEA APS is based on pledges from signatory countries.

The last, IEA STEPS, is less aggressive and follows current policies and trends using Equinor's future price assumptions but not entirely considering the profitability of renewable energy projects. Multiple scenarios provide a broad perspective on how different conditions could affect Equinor's operations. For developing climate scenarios, Equinor worked with Jupiter Intelligence to assess the impact of six weather problems (wind, heat, fire, flood, hail, and rain) on 118 of their assets. Most assets are at low risk except for offshore assets in the US Gulf of Mexico, which face the highest current risk, and renewables projects in South America, which face the highest future risks. Each asset needs a specific risk check as resilience varies. RCP 8.5 assumes more extreme weather while RCP 4.5 assumes moderate global warming by 2050. Scenario analysis results show that the NPV increases by 41% under STEPS, 17% under APS, and decreases by 22% under NZE 2050. Equinor's break-even prices for new projects by 2030 are approximately $35 a barrel and below $30 a barrel for sanctioned projects. Equinor has made two major decisions: postponing the Wisting project in the Barents Sea and maintaining investments in renewables projects, expected to have returns of 4-8%. By maintaining a robust scenario analysis framework and integrating the insights gained into its strategic decisions, Equinor demonstrates industry leadership in climate resilience and strategic foresight, particularly in its commitment to green energy transitioning.

4.5 Carbon Reduction Targets

The analysis of the twelve companies across the different target setting criteria shows disparities and commonalities in their approach to emissions targets. Almost all companies meet the essential criteria for having Scope 1, Scope 2, Scope 3, and intensity targets. The only exception is Aker, which lacks scope 3 targets. Low-energy consumption and production targets are less frequently disclosed and only Aker, Galp, Neste, and OMV set these targets. All companies except Aker have set net zero targets. Moreover, all companies except Aker, ENI, and Orlen have established targets related to low-carbon products or services. Regarding methane reduction targets, only seven of the twelve companies (Snam, Aker, ENI, Equinor, Galp, and Neste) are compliant. None of the companies, except Aker, have set science-based targets. Additionally, only BP disclosed the requirement for annual investment in transition products. Regarding low-energy consumption or production targets, we can see that only Aker, Galp, Neste, and OMV included these targets in

the CDP disclosure. Finally, for energy efficiency targets, only Aker, OMV, and Repsol set such targets. While there is a balance in certain areas such as scope 1 and 2 targets, there is a noticeable disproportion in the low-carbon energy initiatives and other intensity metrics. OMV and Repsol scored the highest in this category with 9 and 8 points, respectively. The details provided by Repsol will be analysed in the following paragraphs.

Repsol's detailed analysis. Repsol has scored a high score of 8 points in its approach to climate-related emissions targets. Their ambition is reflected in their goal of reducing scope 1 and 2 emissions by 55% from their 2016 levels. This target is not a science-based target, but the company plans to set such a target within the next two years. Since 2016, the company has reduced its emissions by around 37%. Repsol prioritises actions including lowering methane emissions, increasing operational effectiveness, and reducing flaring in exploration and production (E&P) activities in order to further decrease its emissions. In addition to embarking on innovative projects such as turning legacy operations into low-carbon energy supply hubs and producing renewable hydrogen, Repsol's critical measures include electrification projects, energy integration, process optimisation, and improved plant efficiency. Furthermore, Repsol wants to reduce its operational carbon intensity by 15% by 2025, from 77.7 gCO2e/MJ in 2016 to 66.045 gCO2e/MJ. As of the analysed year, Repsol has successfully reduced this intensity by 9.6%.

To achieve these intensity targets, Repsol's strategy includes energy efficiency improvements, reducing flaring, methane emissions, and integrating advanced biofuels and renewable hydrogen into its industrial process. Repsol's ambitious immediate targets for reducing carbon intensity were set at 15% reduction by 2025, 28% by 2023, and 55% by 2040 backed by considerable investments in renewable energy and low carbon technologies. Repsol aims to reduce methane intensity to near zero (0.2%) by 2025. Their strategy to achieve their net-zero emissions by 2025 across all scopes is to use advanced technology such as drones and aircraft to enhance monitoring, accurate detection, and quantification methodologies, reducing methane emission, and transitioning to a lower emissions portfolio. Repsol's Carbon Intensity Indicator (CII) is calculated by including emissions from its own activities and the use of its fuel products (scope 3). This indicator is set to be net zero by 2050, prioritising the decarbonisation of energy products first and using carbon offsetting as an additional measure for any remaining emissions. Repsol, with this robust framework and comprehensive strategies, demonstrates its commitment to the low-carbon transition.

The patterns observed correspond to the three sorts of institutional isomorphism described by Holder-Webb and Cohen (2012). There is strong evidence of coercive isomorphism in the regular reporting of both CAPEX and emissions data by most companies. With the exception of BP, all participating businesses had scores ranging from eight to thirteen on the financial planning criteria that are identical to those set by the EU Taxonomy (OMV scored thirteen and BP scored five). Sustainability reports under the Taxonomy Regulation require information to be presented in table format. These tables do not give a clear picture of trade-offs among the company's

own strategic options. Almost all of these companies have chosen targets based on obligations and trends from standard-setting bodies.

Where the requirements are not well defined, mimetic and decoupling isomorphism are apparent. Companies often follow the example set by successful leaders. Mid-rankers often use elements such as OMV's special R&D and hydrogen investments or Neste's strategy to please key stakeholders, even when it is not necessarily believed in. Normative isomorphism also occurs because professional consultants and ESG ratings groups promote using the same limited set of terms and indicators, just as was found in U.S. ethics codes. Thus, we get the appearance of strong climate actions and policy involvement, but these may only superficially affect the way businesses function.

5. Conclusions

Our analysis reveals that while most leading European oil and gas companies articulate climate-transition objectives, only a minority publish externally validated targets, dedicated low-carbon budgets, or rigorous scenario analyses aligned with a 1.5 °C pathway. Convergence is clear in minimal compliance disclosures, but divergence persists in governance links and financial-planning transparency. These findings underscore the need for stronger reporting frameworks and assurance protocols to advance genuine decarbonisation.

Oil and gas firms should seek Science Based Targets Initiative (SBTi) validation for their GHG goals (Dragomir et al., 2023), allocate capital to low-carbon initiatives, embed internal carbon pricing in all project evaluations, and link executive remuneration to climate performance. Enhancing board-level climate expertise and publishing periodic progress updates will strengthen credibility and investor trust.

To speed up corporate decarbonisation, policymakers can increase the acceptance criteria set by the EU Taxonomy, include additional areas in technical screening, and reduce the Emissions Trading System charges for those who quickly move towards exceeding their baseline targets. Additionally, requiring companies to disclose climate impacts by sector in both 1.5 °C and 2 °C scenarios would increase how transparent and accountable they are when it comes to EU objectives (Apostu et al., 2022).

Building on the recalibration of EU sustainability policy in February 2025—which proposes more growth-oriented regulatory adjustments—future reporting frameworks will enable greater strategic flexibility for companies (European Commission, 2025). While this may ease implementation and allow for greater buy-in, it runs the risk of making compliance more superficial. As Jenkins (2023) puts it, flexibility should not come at the cost of sustainability. A just transition in oil and gas requires not updated disclosures but social equity, procedural fairness, and active support for workers and communities who are disproportionately affected by decarbonisation. Adaptive policy can work without any safeguards to entrench carbon lock-ins and shift transition costs onto vulnerable groups.

Policy suggestions should not just show regulatory drive but also expect the compromises of real-life action. As seen in the Climate Policy special issue, advancing a just transition hinges on inclusive governance, transparent decision-making, and mechanisms that steer private investment toward equitable outcomes. Countries pursuing flexible, growth-aligned climate pathways must also institutionalise public participation and labour protections. When recalibration is guided by justice principles—such as those proposed by Atteridge and Strambo (2020) —the EU can transform regulatory adaptation from a compliance loophole into a lever for far-reaching, legitimate, and socially resilient decarbonisation.

This study relies on publicly available disclosures, which may omit proprietary strategic initiatives; future work could incorporate interviews with corporate insiders to validate reported practices. The present research lacks insights into private company strategies. Further efforts might involve talking with business executives to verify the results. Examining data collected after EU Taxonomy is in place will show how companies are improving their reports and what results their climate commitments bring about.

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Appendix

Table A1. Transition plan element for all the companies in the selected sample

Transition plan elements	Aker	BP	ENI	Equinor	Galp	Neste	OMV	Orlen	Repsol	Shell	Snam	Total Energies
Financial planning												
Financial impact on capital allocation		1	1	1			1	1	1	1	1	
Financial impact on access to capital	1	1	1				1	1	1	1	1	
Financial impact on direct costs	1		1			1	1	1		1		1
Financial impact on indirect costs							1				1	1
Financial impact on carbon pricing				1								
Financial impact on revenues	1		1		1		1				1	1
Financial impact on capital expenditures	1			1	1	1	1	1		1	1	1
Financial impact on acquisitions and divestments	1			1	1		1	1		1	1	1
Financial impact on asset evaluation	1				1					1	1	1
Financial impact on investment criteria / portfolios		1		1								
Financial impact on liabilities	1					1	1				1	1
Low-carbon products and/or services: Power	1	1	1	1	1			1	1			
Low-carbon products and/or services: Heating and cooling								1				
Low-carbon products and/or services: Hydrogen				1								
Low-carbon products and/or services: CO2 storage				1								
Low-carbon products and/or services: Biofuels					1	1			1		1	
Low-carbon products and/or services: Chemicals and plastics								1				
Low-carbon products and/or services: Infrastructure					1		1	1				
Low-carbon products and/or services: Technologies							1					
Low-carbon products and/or services: Energy products										1		1
CAPEX reported according to the EU Taxonomy		1	1	1	1	1	1	1	1		1	1
Revenue / turnover reported according to the EU Taxonomy			1		1	1	1	1			1	
OPEX reported according to the EU Taxonomy			1		1	1	1	1			1	
Total Financial planning	8	5	8	9	10	7	13	12	5	7	12	9
Decarbonisation strategy												
Climate transition plan that aligns with a 1.5°C world	0	1	1	1	0	1	1	1	1	0	1	1
Feedback is collected from shareholders on your climate transition plan	0	1	1	1	0	1	1	1	1	0	1	1
Feedback is collected annually or more frequently	0	0	1	1	0	1	1	1	1	0	0	1
Climate-related risks and opportunities with influence on products and services	1	1	1	1	1	1	1	1	1	1	1	1
Climate-related risks and opportunities with influence on supply chain strategy	1	1	1	1	1	1	1	1	1	1	1	1
Climate-related risks and opportunities with influence on investments in R&D	1	1	1	1	1	1	1	1	1	1	1	1

Transition plan elements	**Aker**	**BP**	**ENI**	**Equinor**	**Galp**	**Neste**	**OMV**	**Orlen**	**Repsol**	**Shell**	**Snam**	**Total Energies**
Climate-related risks and opportunities with influence on operations strategy	1	1	1	1	1	1	1	1	1	1	1	1
Total Strategy	4	6	7	7	4	7	7	7	7	4	6	7
Policy Engagement												
Number of policies, laws, or regulations on which the organisation is engaging with policymakers		22	2	3	2	1	17	4	9	11	12	6
Number of trade associations the organisation is a member of, or engages with	1	59	10		9	2	14	12	21	15	9	6
Public commitment or position statement in line with the goals of the Paris Agreement	1	1	1	0	1	1	1	1	1	1	1	1
Processes are consistent with climate commitments and climate transition plans	1	1	1	0	1	1	1	1	1	1	1	1
Total Policy Engagement	3	83	14	3	13	5	33	18	32	28	23	14
Scenario Analysis												
IEA NZE 2050 (net zero emissions)	1		1	1		1	1		1		1	1
IEA Stated Policies Scenario (STEPS)	1			1	1	1	1				1	
IEA Announced Pledges Scenario (APS)				1		1	1		1			
IEA Sustainable Development Scenario (SDS)					1		1		1			
Paris Ambitious 1.5°C / RCP 1.9		1				1				1		
Paris Aligned Well-Below 2°C / RCP 2.6		1			1	1		1			1	1
RCP 4.5	1			1	1	1		1	1	1		1
RCP 8.5 - Worst case			1	1			1		1		1	
Assessment of the NPV of the portfolio	1			1								
Assessment of transition risk		1	1	1	1	1		1	1			1
Assessment of physical risks		1	1	1	1		1	1	1	1	1	
Total Scenario Analysis	4	4	4	8	6	7	6	4	7	3	5	4
Carbon Reduction Targets												
Scope 1 targets	1	1	1	1	1	1	1	1	1	1	1	1
Scope 2 targets	1	1	1	1	1	1	1	1	1	1	1	1
Scope 3 targets	0	1	1	1	1	1	1	1	1	1	1	1
Intensity targets	1	1	1	1	1	1	1	1	1	1	1	1
Low-energy consumption or production target	1				1	1	1					
Science-based targets	1	0	0	0	0	0	0	0	0	0	0	0
Energy efficiency target	1						1		1			
Methane reduction target	1		1				1	1	1	1		1
Annual investment in transition products		1										
Net zero target	0	1	1	1	1	1	1	1	1	1	1	1
Targets related to low-carbon products or services	0	1	0	1	1	1	1	0	1	1	1	1
Total Targets	7	7	6	6	7	7	9	6	8	7	6	7

Source: data collected by the authors.