Department of Business and Management

Master's Degree Thesis in Strategic Management [ENG]

Chair of Financial Analysis

CLIMATE RISK IMPACT ON COMPANIES' PERFORMANCE:

"THE SAIPEM CASE"

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INTRODUCTION

Climate change has a significant impact on the present economic and environmental situation. Climate risk, often known as climate-related risk, has progressed from unknown to important corporate issue. The Kyoto Protocol, as well as the more recent Paris Agreement, established a worldwide regulatory framework to combat climate change and reduce greenhouse gas emissions. This has resulted in a variety of changes in the regulatory landscape, public perception, and financial markets. Climate risk is no longer a faraway concern to be addressed in the future; it is now having an influence on the financial performance of businesses all around the world. In this thesis, we will look at how climate risk affects corporate economies, with a particular focus on Saipem, a significant energy and infrastructure firm. To do this, we shall break the thesis into three major chapters.

The first chapter, "Macroeconomic Context", will offer an overview of the macroeconomic setting within which climate risk manifests itself. To better comprehend the global regulatory framework, we will first examine the history of international climate agreements, from the Kyoto Protocol to the Paris Agreement. Following that, we will look at the current climatic situation, identifying patterns and repercussions that are already apparent. We will next go into the specifics of potential future climate scenarios and analyze the ramifications for businesses. Finally, we will discuss climate risk and how it may influence firms' financial data, emphasizing the critical role of control systems in tackling this issue.

In Chapter 2, "Governance and Climate Change", we will look at corporate governance and how businesses are dealing with climate change. We will investigate the consequences of climate management at the business level, taking into account the various types of risks and mitigation measures used across industries. We will concentrate on the Italian landscape, looking at the difficulties and possibilities that Italian businesses face in terms of climate risk. We will also examine the components of climate hazards, both physical changes and the energy transition, and apply them to the Italian situation.

Finally, Chapter 3, "Impact of Climate Change on the Performance of the Energy and Infrastructure Sector: The Saipem Case", will be presented as the thesis' core, focusing on the analysis of the impact of climate change on the financial performance of the energy and infrastructure sectors, with a close look at the specific case of Saipem. We will study Saipem's balance sheets and financial statements using an analytical technique, comparing the financial data to the climate information in its yearly financial reports and sustainability reports. This research will reveal how climate change has already impacted and may continue to harm the financial performance of a large energy and infrastructure corporation.

Finally, the purpose of this thesis is to emphasize the critical relevance of climate risk in today's economic and financial world. The investigation is going to examine the critical role of climate change in the business agenda, emphasizing the relevance of governance and corporate initiatives in managing climate risk and adapting to a more environmentally sensitive world. It will be a journey to discover how businesses are addressing this global challenge and how this challenge is reflected in their financial performance, demonstrating how increased attention to this issue results in competitive advantages over competitors and significant profitability benefits for the company.

1. MACROECONOMIC CONTEXT

1.1 Climate background – from Kyoto Protocol to Paris Agreement

The Kyoto Protocol, which went into effect in 2005, was a ground-breaking worldwide accord aimed at lowering greenhouse gas emissions, notably those of six primary greenhouse gases generated by developed nations, such as carbon dioxide, methane, and nitrous oxide. In essence, these countries agreed to cut emissions by 5.2% below 1990 levels by 2012. Furthermore, the Kyoto Protocol established a framework for carbon trading, which allows participating nations to purchase and sell carbon credits in order to meet their emissions reduction objectives.
Despite the early success of the Kyoto Protocol, significant limitations surfaced, notably the exclusion of poor nations from emission reduction objectives and the lack of aspirational targets. These disadvantages prompted the establishment of a more comprehensive pact, the Paris Agreement, in 2015.

The Paris Agreement established a more aggressive aim of keeping global warming to less than 2°C while continuing attempts to restrict it to 1.5°C. Additionally, the Paris Agreement required all nations to submit nationally determined contributions (NDCs[1]) outlining their efforts to mitigate and adapt to climate change. Furthermore, the Paris Agreement provided a thorough structure for nations' NDCs to be reviewed and improved on a regular basis, which is crucial for successful and long-term emission reduction.
Additionally, the Paris Agreement adopted the notion of "common but differentiated responsibilities," recognizing that wealthier nations carry a heavier burden for climate change and emission reduction efforts. As a result, the Paris Agreement highlights the significance of

[1] Intended Nationally Determined Contributions (INDCs) formed the basis of states' engagement to support the legally binding international climate agreement, reflecting their national commitments to achieve the global climate objectives on tackling climate change and reducing CO2 emissions. Under the Paris Agreement adopted in December 2015, submitted INDCs automatically become Nationally Determined Contributions (NDCs) upon ratification of the Agreement - unless the State decides to submit a new NDC at the time of ratification. NDCs reflect national commitments to achieve the global climate objectives on tackling climate change and reducing CO2 emissions. For example, in 2010 the NDCs covered the 88% of the global emissions, it is intended not only through mitigation, but also through adaptation. About the mitigation targets, they can vary according to the international financial support. Kyoto Protocol was setting legally binding targets for developed countries (2008-2012), but not high enough. US was not ratifying, Canada left the agreement, which reduced the effectiveness. Developing countries had no target. While, after Paris Agreement, National Determined Contributions were for all countries (both developed and developing) and were not binding. For sure here the goals are more ambitious but not enough to limit warming below 2°C, a global stocktake and increase of ambition is therefore essential. (United Nations Climate Change; (2022); "*What are the Nationally Determined Contributions?").*

the capacity building and financial assistance for poor nations in order for them to meet their climate targets.

To summarize, whereas the Kyoto Protocol was a game-changer in the battle against climate change, the Paris Agreement provides a more comprehensive framework for reducing and adapting to the effects of climate change. It acknowledges the differing obligations of developed and developing nations while emphasizing the need for international collaboration and commitment to a sustainable future.

1.2 Climate current state

The current situation of climate change is concerning, and quick action is required. According to the Intergovernmental Panel on Climate Change (IPCC), the Earth's average surface temperature has risen by around 1°C, over pre-industrial levels, with a notable warming trend in recent decades. The release of greenhouse gases into the atmosphere, mostly from the combustion of fossil fuels, deforestation, and other human activities, is ascribed to this temperature rise.

This rising trend has had serious consequences, such as more frequent and intense heatwaves, wildfires, and extreme weather events like storms and flooding. Rising sea levels, melting glaciers and ice caps, and ocean acidification have all resulted, posing a danger to ecosystems, biodiversity, and human cultures.

Climate change not only has physical consequences, but it also exacerbates existing social and economic inequities. While contributing the least to the problem, the most vulnerable groups, such as the poor, marginalized communities, and developing nations, experience the most severe repercussions of climate change.

To confront the climate catastrophe, immediate and bold action at all levels is required, from individual behavior changes to international collaboration. This involves lowering greenhouse gas emissions as quickly as possible, shifting to renewable energy sources, and adopting adaptation measures to safeguard vulnerable populations and ecosystems. Adopting a just and equitable strategy that recognizes and addresses the differential consequences of climate change on different populations and sectors of society is critical.

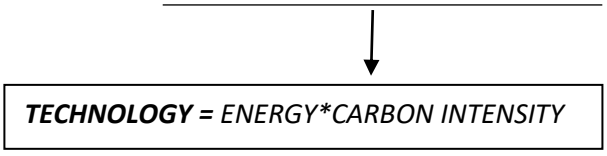
Finally, the current status of climate change necessitates quick action and worldwide collaboration. To maintain a sustainable and liveable planet for future generations, the world must act swiftly and forcefully to reduce and adapt to the consequences of climate change in a just and equitable way.

1.3 Climate possible future scenarios

Many scenarios have been devised to forecast likely future greenhouse gas emission trajectories and their influence on the climate system. Shared Socioeconomic Pathways (SSPs) are a collection of probable storylines for future world development that include population increase, economic expansion, energy consumption, and land-use change.

The Kaya Identity, which represents global carbon dioxide emissions as a product of population, GDP per capita, energy intensity of GDP, and carbon intensity of energy, is one technique to analyzing future emissions. The Kaya Identity can help you identify the causes of greenhouse gas emissions and possible reduction levers.

- *CO2 EMISSIONS = POPULATION * GDP/PERSON * ENERGY/GDP * CO2/ENERGY*



The most optimistic scenario, SSP1, is based on the world transitioning to a sustainable, low-carbon economy with an emphasis on renewable energy, energy efficiency, and a circular economy, according to the SSPs. This scenario calls for considerable reductions in emissions, with the goal of attaining net-zero emissions by 2050 and keeping global warming to less than 2°C by the end of the century.

SSP5, on the other hand, predicts a high degree of fossil fuel usage, population expansion, and limited international cooperation. This scenario calls for a large increase in emissions, resulting in a temperature increase of more than 4°C over pre-industrial levels by 2100.

The other SSPs sit somewhere in the middle, with varied degrees of ambition and difficulty in meeting their carbon reduction objectives. SSP2 envisions a slow evolution of energy systems with moderate emissions reductions, but SSP3 envisions a future of fragmentation and inequality with high emissions owing to a lack of global collaboration.

In particular, by focusing on two axes, "challenge to mitigation" and "challenge to adaptation," the following features for each scenario type may be highlighted:

- *SSP1 SUSTAINABILITY (low degree of mitigation and low degree of adaptation):* worldwide collaboration, rapid technological progress, strong environmental regulation, low population growth, reduced inequalities, emphasis on renewables and efficiency, dietary adjustments, and forest conservation.
- *SSP2 MIDDLE OF THE ROAD (medium degree of mitigation and medium degree of adaptation).*
- *SSP3 REGIONAL RIVARLY (high degree of mitigation and high degree of adaptation):* Regional rivalry, limited technological progress, environmental and social goals not prioritized, emphasis on local resources, large population expansion, sluggish economic growth in industrialized countries.
- *SSP4 INEQUALITY (low degree of mitigation and high degree of adaptation):* Inequality across and across areas, deterioration of social cohesiveness, little technological progress, environment priority for the few wealthy, restricted commerce.
- *SSP5 FOSSIL FUELED DEVELOPMENT (high degree of mitigation and low degree of adaptation):* fast economic expansion, free commerce driven by carbon-intensive fuels, rapid technological advancement, disregard for the global environment and the SDGs, technology solutions low population and high mobility.

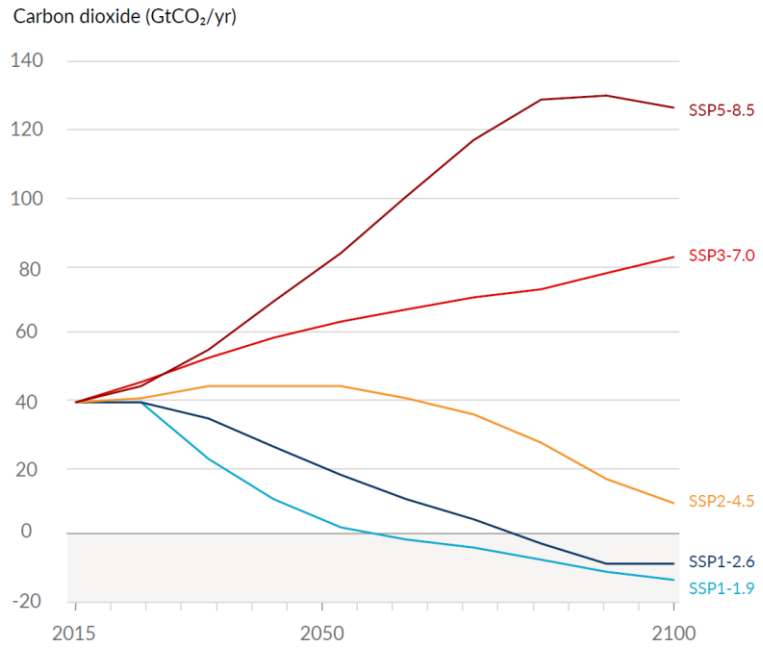


Figure 1 Source: IPCC 2021: AR6 WGI Summary for Policy Makers

Finally, the SSPs present a variety of possible futures, emphasizing the importance of governmental decisions, technological advancement, and social transition in deciding future greenhouse gas emissions. The Kaya Identity may help you understand the causes causing these emissions and determine the most efficient solutions to reduce them.

1.4 Climate Risk Overview

Climate change is a crucial issue that offers considerable risks to firms in a variety of industries, according to an ASSIREVI position paper titled "Climate risk and Financial reporting", which was issued on November 30, 2022. To successfully manage these risks, the article underlines the significance of incorporating climate factors into financial reporting and decision-making processes.

Climate change consequences are complex and far-reaching, affecting organizations in a variety of ways, including increasing frequency of extreme weather events, sea level rise, legislative changes, technology advancements, and reputational harm. Physical climate change risks, such as damage to infrastructure and supply chains, may have an impact on a company's ability to deliver products and services, whereas transitional risks, such as changes in policy, regulations, and technology, can disrupt entire industries and result in stranded assets. Conversely, reputational hazards can result in a loss of customer trust, investor confidence, and brand value, eventually affecting a company's bottom line. Climatic dangers to which businesses are exposed, as well as their magnitude, are obviously dependent on the sector, industry, geographic location, and characteristics of the business itself. The TCFD rules aim to provide a framework for the disclosure of these risks, requiring enterprises to account for the possible financial repercussions. The TCFD has developed an array of illustrated examples to assist businesses in recognizing and analyzing climate risks, covering numerous main risk categories:

- *Regulatory and legal risks* include the possibility of increased operating expenses as a result of higher GHG emission pricing, greater reporting requirements for GHG emissions, or new rules affecting existing goods or services.

- *Technology-related risks* include the prospect of early market departure or reduced demand as a result of the adoption of lower-emission alternatives, investment failures in new technologies, or increased costs connected with the transition to low-carbon technologies. *Market risks* include shifts in customer tastes and demand, uncertainty in market signals, and increases in raw material costs, which result in higher operating costs. Regarding

reputational risks, consumer tastes may change, resulting in lower revenue, stigmatization of some businesses, or more scrutiny and unfavourable input from stakeholders (including investors), resulting in a reduction in available capital.

- *Physical risks*[2] may have an influence on enterprises, both *acute* (such as an increase in extreme weather occurrences) and *chronic* (such as changes in precipitation, temperature, or sea level rise).

To handle these risks, firms must include climate concerns in their governance, strategy, risk management, KPIs, and targets:

- In terms of *governance*, corporations should evaluate how their board of directors and other governance bodies supervise the management of climate-related risks, as well as how climate problems are integrated into their overall strategy. Enterprises, in particular, should seek board members with environmental and climate knowledge and ensure that the board has a sufficient awareness of climate-related risks.

- In terms of *strategy*, businesses should assess how climate change may impact their business model and how they might capitalize on the possibilities given by the transition to a low-carbon economy. Enterprises should, in particular, identify the aspects of their company that are most vulnerable to climate risks and establish plans to reduce those risks, as well as identify and capitalize on the possibilities associated with the transition to a low-carbon economy.

- When it comes to *risk management*, organizations should evaluate how they handle climate-related risks, such as physical hazards, transition risks, and reputational threats. Physical climate-related risks, such as floods and droughts, should be identified and policies developed to reduce these risks. Moreover, businesses should analyze transition risks[3] associated with the transition to a low-carbon economy and build measures to mitigate these risks. Lastly, businesses should examine the reputational risks associated with their environmental policies and devise mitigation methods.

[2] *Physical risks* result from the damage caused directly by meteorological conditions (heatwaves, droughts, a rise in sea level, extreme weather events, etc.)

[3] Transition risks stem from adjustments, most often regulatory, to put economies on a low carbon trajectory (stricter environmental regulations, introduction of a carbon tax, information disclosure requirements, technological development and deployment, evolution of consumer preferences, and litigation).

- In terms of *metrics and targets*, businesses should evaluate how they monitor and share information about them. In particular, businesses should implement GHG emissions indicators such as SCOPE 1, SCOPE 2, and SCOPE 3.
  Scope 1 emissions are those emitted directly by sources owned or controlled by the firm. This includes emissions from on-site combustion of fossil fuels, such as those used for heating or powering machines, as well as emissions from company-owned automobiles. These emissions are thought to be under the company's control and so the easiest to assess and regulate.

  Scope 2 emissions are those produced indirectly as a result of the creation of bought energy, heat, or steam. This includes emissions from power plants or other energy sources that supply the firm with electricity. While the corporation cannot directly control these emissions, they do contribute significantly to the company's carbon footprint and may be reduced by purchasing renewable energy or improving energy efficiency.

  Scope 3 emissions include any additional indirect emissions that occur across the company's value chain, including both upstream and downstream operations. This includes emissions from the manufacture of purchased products and services, as well as emissions from their transportation and distribution. These emissions are frequently the most difficult to detect and manage since they occur outside of the company's direct control, but they may also account for a sizable amount of the company's carbon footprint.

  The amount of control that the corporation has over the emissions is one of the fundamental differences between the three scopes. Scope 1 emissions are managed directly by the firm, whereas Scope 2 emissions are controlled indirectly through energy purchase decisions. Scope 3 emissions, on the other hand, are mainly outside the company's control and must be managed in partnership with suppliers and partners. Another distinction is the proportion of each scope's contribution to a company's total carbon footprint. Scope 1 emissions typically account for the least percentage of a company's carbon footprint, but Scope 2 emissions are frequently greater. Scope 3 emissions might be the most significant and difficult to regulate since they involve a wide variety of indirect pollutants across the value chain.

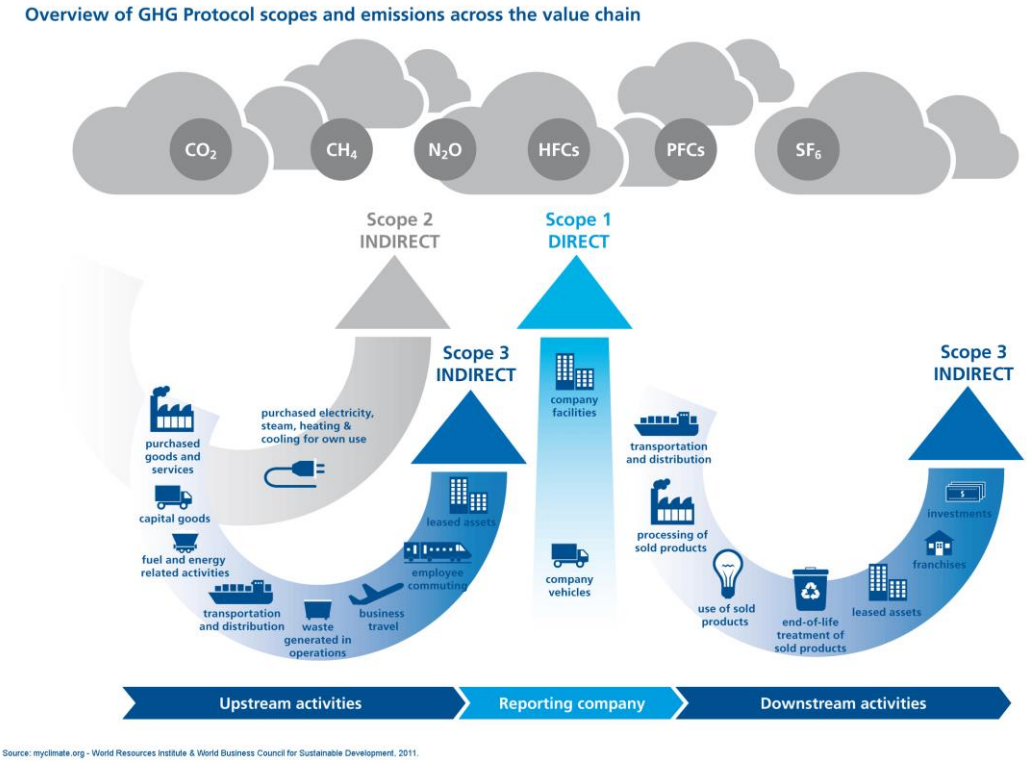


Figure 2 World Resources Institute and World Business Council for Sustainable Development, 2011

Companies must, in general, build strong governance structures and assign clear roles and duties for managing climate risks, while also incorporating climate issues into their corporate goals and decision-making processes. Businesses may identify possible climate hazards and implement suitable mitigation and adaptation strategies with the support of effective risk management procedures such as scenario analysis [4]and stress testing. Companies should also declare their climate risk exposure and management strategies to guarantee openness and accountability, using standardised frameworks such as those produced by the Task Force on Climate-related Financial Disclosures (TCFD). "Notably, the number of firms supporting these recommendations has risen sharply since 2017. In addition, the published 'Guidelines on non-financial reporting: Supplement on reporting climate-related information', which implements the recommendations of the TCFD in the Non-Financial Reporting Directive. Finally, it must be noted that at the end of 2020, more than 110 governments, including those of Canada, Japan, Sweden and Belgium, supported the TCFD. Certain governments, including those of New Zealand, France and the UK, have gone a step further and announced plans to make TCFD-aligned climate reporting mandatory". (Amar, J.; Demaria, S.; Rigot, S.; (2022); *Enhancing*

[4] Scenario analysis is a procedure for finding and evaluating alternative outcomes of future occurrences under unclear situations. Scenarios, for example, in the case of climate change, allow a company to investigate and create a knowledge of how the physical and transition hazards of climate change may affect its companies, strategies, and financial performance over time.

Financial Transparency to Mitigate Climate Change: Toward a Climate Risks and Opportunities Reporting Index).

1.5 Potential impacts on financial statement items and financial reporting

Climate-related risks have the potential to have a significant influence on financial reporting because they can affect the level of uncertainty in accounting estimations. The changing climate can complicate the construction of estimations based on future events, and this complexity may compel the development of innovative models to depict the consequences of climate change in financial statements. Moreover, collecting data for these estimations may entail the use of non-traditional accounting sources. Businesses must analyze how climate threats affect their business models, supply chains, and numerous organizational factors. Management must also consider the regulatory environment, economic circumstances, interest rates, and other external variables that may have an impact on their operations. Inadequate climate risk information can make it difficult to meet disclosure obligations, as well as affect the availability of funding and the risk of credit portfolios.

In terms of the internal control system, management is responsible for considering the consequences of climate risk on the budgeting process, assessing its importance and probability, and taking necessary action. In this environment, management may need to examine how climate-related risks, such as those connected to weather and climate change, affect accounting estimates and financial reporting, which may need the creation of new models and the use of non-traditional data sources.

To that aim, examples of hypothetical conditions to examine, such as the influence of climate threats on the *"going concern"* assumption, are relevant. The applicability of this assumption may be modified by a number of factors, including the impacts of climate change and extreme weather events on a company's operations, assets, liabilities, revenues, expenses, and cash flows. The difficulty in projecting the occurrence of climate-related catastrophes can also make estimating their impact and developing models to support business strategies and financial predictions difficult. Additionally, natural catastrophes that are not covered by insurance plans or are inadequately covered can have a substantial impact on a company's capacity to function, while large legal issues relating to climate risks can also have an influence on a company's ability to continue operations. As a result, management must pay special attention to assessing

these conflicts, any regulatory or legal limits, and generating estimates about their probable outcomes and the accompanying economic and financial implications. Failure to account for the impact of climate hazards on financial reporting can ultimately result in noncompliance with disclosure rules, hampered access to funding, and increased credit portfolio risk.

Climate-related hazards, in addition to the previously listed issues, might have an impact on the *impairment assessment of both tangible and intangible assets*. Businesses may need to adapt their investment and R&D spending as a result of climate-related challenges. This may need a reassessment of asset recoverability and useful life, as well as impairment testing. Businesses that operate in industries that are vulnerable to extreme weather occurrences may struggle to keep their operations running. For example, power producing businesses that use fossil fuels may need to replace or eliminate some assets sooner than expected. Climate-related hazards may also cause long-term company plans to deteriorate, investment returns to fall, and the need for corporate strategy and operations restructuring. These considerations highlight the importance of taking into account climate-related risks in impairment assessments and overall asset management.

Climate concerns can potentially affect *leased assets*, in addition to owned ones. Leases of assets with high climate effect may have consequences for future usage or renegotiation of conditions, such as non-exercise of renewal options or contract termination. These risks should be addressed when determining the recoverability and impairment of leased assets. As a result, it is critical for businesses to analyze and assess their leased assets in order to identify and manage any possible climate-related risks.

Climate-related concerns may necessitate the inclusion of *liabilities* in financial statements, accounting for both financial and non-financial risks, including reputational risk. These may involve environmental taxes or levies, compliance with regulatory obligations to remediate environmental damage, onerous contracts as a result of legislative changes, restructuring to rethink products or services, or adjusting to new technology or competitors joining the market. Accounting for climate-related liabilities correctly is critical for businesses to appropriately assess their financial health and reputation.

Climate change risks can emerge in the financial industry as *credit risks for financial instruments*, particularly in circumstances where there is vulnerability to extreme climatic disasters such as floods and fires. Financial institutions must modify their risk assessment

models to account for climate risks and monitor them throughout the credit process, which includes identifying relevant climate risk elements. Regulation changes may also have an influence on a company's capacity to satisfy its debt commitments, lowering the value of guarantees issued to financiers. Fund managers may be required to disclose information on industry investments as well as identify areas vulnerable to environmental hazards or market concentration. Overall, climate-related hazards need proper attention from financial institutions and investors to guarantee correct credit and investment risk appraisal.

Another financial risk associated with climate change is the influence on *financial covenants*, which are contractual restrictions and conditions that businesses must follow in order to continue receiving funding. In certain circumstances, such as with green bonds, these covenants may be tied to environmental sustainability goals. Climate-related risks may have an impact on how these financial instruments are classed and measured, necessitating the usage of derivative financial instruments. As a result, enterprises must be aware of these risks and take them into account when entering into financing arrangements. This emphasizes the significance of using climate risk assessments in financial risk management strategies.

Climate-related hazards have an influence on *revenues and inventories* in financial accounts. Consumers and the market may have expectations about a company's sustainability goals, which can be included in commercial contracts and related to rewarding or punishing processes. Climate hazards can have an impact on a company's product demand, rendering inventories outdated, lowering sales prices, or raising acquisition costs. Hence, difficulties linked to the net realizable value might occur. Future laws, for example, might jeopardize an automobile company's valuation of diesel and combustion engine car inventory.

Contracts with collaborators and workers that include environmental sustainability goals may have ramifications for *remuneration calculations*. This is especially important for defined benefit plans and long-term incentive programs, where actuarial assumptions and measurement methods must take these goals into account over time.

Acquisitions and restructuring activities can have an impact on financial reporting in the context of corporate sustainability. The attainment of environmental sustainability targets may be used to determine or alter the purchase price in acquisitions. Moreover, such activities may necessitate restructuring or divestments, which must be properly accounted for in financial

statements. These consequences emphasize the need of including sustainability elements in financial reporting for organizations that engage in such activities.

Companies should emphasize the key principles on which they base their assessment of the significance of climate risks in their disclosure policies. Management should examine the significance of climate risks by referring to both qualitative and quantitative factors, taking into consideration reputational and legal concerns related with the company's influence on climate and the environment. Companies are expected to make public or refer to the methodology, definitions, and criteria used when they release data, metrics, and applicable objectives. These disclosures help to adequately communicate the company's risk profile to market players, especially in terms of limiting reputational and legal threats. As a result, it is critical for businesses to establish *consistency between their financial statements and other communications and information delivered to stakeholders.*

Climate change risk may have a considerable *impact on businesses*, especially those with unsustainable business strategies or those located in geographically vulnerable places. Furthermore, businesses that rely significantly on natural resources, such as oil and gas, mining, construction, agriculture, and food and beverage, are particularly exposed to climate-related threats. Yet, climate change may have an impact on a wide range of firms in a variety of industries. As a result, corporations must include climate-related risks into their overall company strategy and financial reporting, as well as non-financial information such as sustainability reports, environmental statements, and corporate governance reports. Companies must ensure that the climate-related information they present is accurate, consistent, and in accordance with the financial information in their annual reports.

1.6 The key role of the control systems

As we have been able to intuit up to this point, the impact of climate risk on business performance can have a devastating significance for companies, which risk, in extreme cases, no longer being able to guarantee even business continuity. It is precisely in these terms that it is inevitable to highlight the role of control systems in this context.

The function of measurement and control systems is critical in ensuring long-term economic balance as well as social, environmental, and corporate sustainability. The following points should be underlined in this regard: it is critical to have an income perspective while developing

an integrated accounting and budgeting system for a business. Therefore, it is critical to avoid overemphasizing single financial performance metrics and instead apply a systemic approach to understanding the complete collection of economic and social data. Furthermore, in order to improve the value produced inside the supply network, manufacturing elements must be chosen in a circular fashion and adequately compensated, with strategic suppliers recognized as partners. Lastly, rather than depending exclusively on reporting systems for external stakeholders, a culture of sustainability must be embedded into staff planning, control, and reward systems, combining financial and sustainability metrics.

1.6.1 Focus on evolution of internal-external control systems

Control systems are increasingly taking on an outward projection in order to defend the interests of many stakeholders. More broadly, it is considered that internal control systems must inherently incorporate economic and social elements, not just in public organizations, but also in private firms, regardless of whether they are non-profit or for-profit.

The growth of planning, control, and reporting systems leads to greater integration between different levels and between distinct internal-external views, both in the economic-financial and economic-social dimensions. It is thought beneficial to emphasize the following ideal directions of progression in such an integration framework:

- Income-equity-based integrated accounting and budgeting systems must be built.

- In order to achieve a sustainable economic-social balance, it is crucial to avoid placing excessive emphasis on specific performance indicators, particularly financial ones. This is because without a "systemic reading" of the set of indicators at the economic-social level, there is a risk of confusion between the means, namely financial results, and the end, so economic-social balance worthwhile over time. Such confusion can lead to taking a short-term view, which is commonly referred to as "managerial myopia." Therefore, it is important to adopt a holistic approach that takes into account the long-term effects of various indicators on the economic and social aspects of the organization.

- To consolidate structural capital, human capital, and relational capital, productive forces in the supply network must be assured circular choice and equitable pay. Corporate value added is the value generated internally in the network with the involvement of strategic

suppliers who must be partners of the firm in order to achieve the necessary economic-social balance over time.

- It should be stressed that, in terms of sustainability, there is not only the protection of the land from an economic, social, and environmental standpoint with regard to business operations, but also the preservation of each particular company's conditions of existence as a generator of wealth.

- Finally, a "culture of sustainability" must be implemented not only in external reporting systems, but also in personnel planning, control, and reward systems (integrating financial indicators with sustainability/risk reduction indices connected to sustainability).

1.6.2 Climate risk impact on earnings management

Few studies, however, have examined the impact of climate change on financial policy and business decision making. *Huang et al. (2018),* for example, show that enterprises operating in areas with higher climate risk tend to store more cash and issue more long-term debt.
The purpose of this study is to investigate the influence of climate risk on alternative accounting decisions that managers may make when selecting reported accounting data.

Managers are heavily motivated to manipulate revenues to maximize their own wealth as a result of agency conflict, which is mostly attributable to the separation of ownership and control (Jensen and performance-based compensation). Many motivations for managers to control earnings have been described in the literature.
For example, they may manage profitability in the time preceding the stock offering in order to avoid breach of loan arrangements or to maximize CEO stock option pay. Yet, there is a void in the research on the impact of climate risk on financial reporting decisions such as profitability.

As Huang et al. illustrate, when enterprises are exposed to significant climate risk, managers have a larger motivation to manipulate results in order to reduce the detrimental effect of climate risk on performance and earnings volatility (2018).
Climate risk has a genuine impact on an organization's performance since it may cause physical damage to fixed assets, lowering not just the economic worth of assets but also the production that could have been created by such assets.

Climate risk has the potential to reduce the value of physical assets through at least two mechanisms. First, it can directly accelerate the depreciation of capital assets, such as via exposure to extreme weather events like floods or fires. Second, it can alter (typically decrease) the output obtainable with a given level of inputs, resulting in a change in the return on capital goods, knowledge productivity, and/or labor productivity. Furthermore, given the worldwide prevalence of climate consequences and possibly extended holding periods, it is difficult to adequately hedge climate risk (*IPCC, 2014*)[5]. As a result, climate risk can have a detrimental impact on a company's financial success.

Positive accounting theory holds that managers select the accounting technique that best serves their self-interest.

According to Huang et al. (2018), company performance, as measured by return on assets and operational cash flow, is poorer in climate-risk nations. Poor climate risk performance may raise the chance of debt covenant violations or reduce performance-based CEO remuneration.

It is believed that managers in nations more susceptible to climate risk are more inclined to manage earnings to offset the negative consequences of climate risk in order to avoid debt covenant violations or lower CEO remuneration.

Firms can manipulate earnings through accruals and assets, as described in the literature. Accrual-based earnings management primarily influences the timing of earnings by changing the accounting techniques for specific transactions. Real earnings management, on the other hand, alters transactions, resulting in inferior company outcomes in the long run. In contrast to this theory, it could be argued that if a company experiences a negative earnings shock as a result of extreme weather events, managers could justify the lower earnings by claiming that climate risk is beyond their control and that they should not be held liable for the company's poor performance. Managers might potentially take a "huge bath" by manipulating profits downward in the future to generate flexibility for earnings management, implying a bad outcome. (*Rong D.; Mingzhi L.; Tingting W.; Zhenyu W.; (2021); The impact of climate risk on earnings management: International evidence*).

1.7 The Task Force on Climate-related Financial Disclosures

[5] Some businesses may be able to obtain insurance to offset the loss from climate risk. Nonetheless, it has been proposed that not all risk associated with extreme weather occurrences can be insured, and insurance coverage is unlikely to totally reduce the impact of climate risk. (Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans.")

This section provides assistance to organizations interested in assessing and disclosing the financial consequences of climate-related risks and opportunities. It highlights the significance of providing information that helps investors, lenders, and insurance underwriters to understand how climate-related concerns might affect an organization's long-term financial performance, position, and enterprise value. The Task Force's proposals aim to increase the transparency of *actual and potential financial consequences* [6]linked with climate change, enabling for more efficient pricing and capital allocation of climate-related risks and opportunities.

Some *financial filing*[7] obligations may conflict with disclosing the possible financial effect of climate change, according to the Task Force. Organizations are urged to disclose relevant information in other official reports that are widely circulated, released at least yearly, and subject to internal governance mechanisms comparable to those used for financial reporting in such circumstances. The financial exposure of an organization to climate-related concerns is determined by its unique risks and opportunities, its planned responses to manage those risks or exploit opportunities, and the consequences of those responses on its financial statements.

Financial impact evaluations should take into account both the possible financial repercussions of taking no action and the financial implications of risk management and opportunity maximizing that are aligned with the organization's overall business strategy. Climate-related scenario analysis is frequently utilized as a primary technique for determining potential financial consequences. While considerable progress has been made in revealing possible financial consequences, it remains one of the categories with the lowest levels of disclosure. Preparers mentioned organizational alignment, data availability, risk appraisal, effect attribution in financial accounts, longer climatic horizons, and obtaining clearance to share results as challenges.

The Task Force's consultation and user input highlight the importance of information on the impact of climate-related challenges on an organization's financial performance and decision-making position. Users are increasingly incorporating preparer disclosure results into their financial decision-making processes, sometimes completing their own financial impact

[6] *Actual impact* refers to financial impact that has already occurred as a result of climate-related risks or opportunities. *Potential impact* refers to financial impact that may occur in the future due to climate-related risks or opportunities. (Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans.")

[7] *Financial filings* refer to the annual reporting packages in which companies are required to deliver their audited financial results under the corporate, compliance, or securities laws of the jurisdictions where they operate. While reporting requirements differ internationally, financial filings generally contain financial statements and other information such as governance statements and management commentary. (Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans.")

evaluations and participating in discussion with companies. The section continues with additional guidelines on how to use climate-related measurements, objectives, and transition plans as inputs for calculating financial consequences, as well as considerations for revealing financial performance and position. This data is useful for businesses trying to improve their knowledge and communication of climate-related financial risks and possibilities. *(Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans.")*

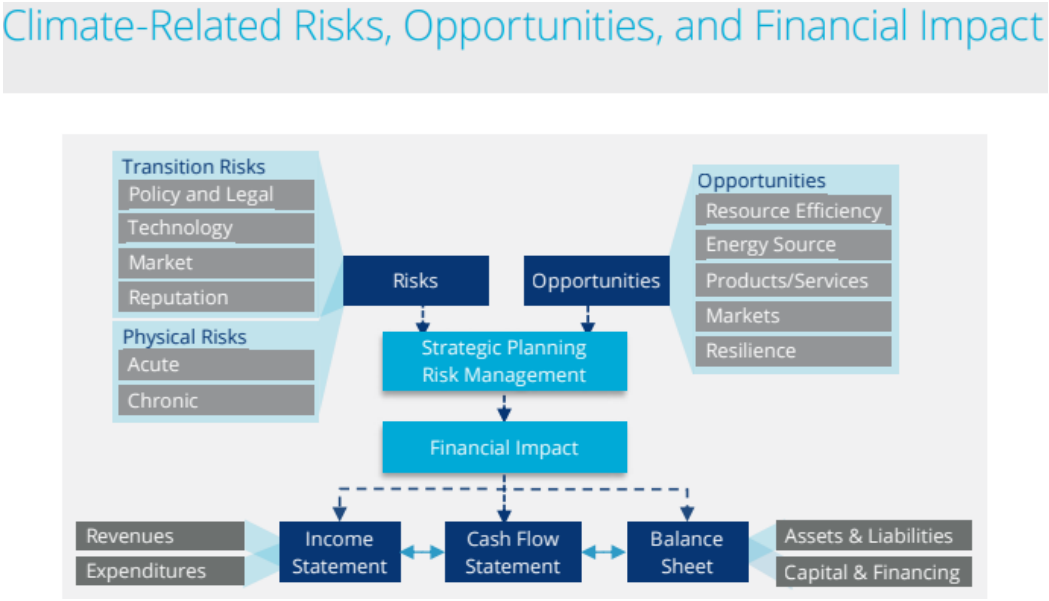


Figure 3 Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans."

1.7.1 Inputs For Estimating Financial Impacts

Climate-related indicators, objectives, and information from transition plans disclosed by organizations are critical in calculating the current or projected financial implications of climate change. These disclosures give critical insights for evaluating an organization's financial outlook and performance in light of climate-related risks and opportunities.

Indicators that are consistent with cross-industry climate-related categories might help estimate financial implications. For example, estimating the amount of revenue, assets, or company activities matched with climate-related possibilities can assist quantify their contribution to overall revenue. Estimating greenhouse gas emissions and carbon pricing allows possible

projects to be cost-benefit analyzed. Scenario analysis of future emission paths and carbon pricing allows for a wide variety of estimations of future carbon costs.

Organizational goals also influence financial impact evaluations. Organizations can examine how different parts of their financial performance and position may be affected by examining the possible consequences of targets on their whole business. Users can also assess how an organization's goals can affect its financial prospects. A goal of upgrading a given percentage of transmission lines by a certain year, for example, might suggest a possible decrease in future expenses associated with business disruptions.

Transition plans[8] help to inform financial impact analyses. Organizations create transition plans by estimating the financial consequences of planned activities and aligning their financial strategies accordingly. Users can examine the feasibility of an organization's disclosure of critical information from its transition plan as an input for assessing the organization's probable financial performance and position. Descriptions of planned projects, as well as the method for monitoring and meeting emissions reduction objectives, can give important insights into an organization's possible financial consequences, such as predicted revenue from renewable energy or capital expenditures for low-carbon asset renovations.

Generally, transparency of climate-related measurements, objectives, and transition plans is critical for understanding and assessing the financial consequences of climate change on companies. In the face of climate-related risks and opportunities, these disclosures enable stakeholders to make informed decisions and deploy resources effectively.

The Task Force divides financial impact disclosures relating to climate-related risks and opportunities into two categories: *effect on financial performance* and *impact on financial position*. These categories give information on a company's management goals and strategic activities. For each category, below are the specifics and sample disclosures:

Impact on Financial Performance:

Disclosure of actual or projected changes to income statements, cash flow statements, or other relevant financial performance metrics aids in understanding the implications of climate-related risks and opportunities. The following factors may have an influence on financial performance:

[8] Transition plan refers to an aspect of an organization's overall business strategy that lays out a set of targets and actions supporting its transition toward a low-carbon economy, including actions such as reducing its GHG emissions.

- Increased revenue from innovative climate-related products or services.
- Carbon pricing, company disruptions, contingencies, or repairs all result in cost rises.
- Changes in operating cash flow as a result of upstream cost adjustments.
- Charges for assets subject to transition risks.
- Physical hazards cause changes in predicted losses.

Figure 4 is an example of real financial impact disclosure, which shows the percentage of profits before interest, taxes, depreciation, and amortization (EBITDA) attributable to low-carbon products, services, and technology. *Figure 5* depicts another example of the possible long-term impact of excessive rainfall on financial performance.

Example Disclosure: Enel

Main climate change indicators

		2020	2019	2020-2019	
Direct greenhouse gas emissions - Scope 1 [1]	(million/t_{eq})	45.26	69.98	(24.72)	-35.3%
Indirect greenhouse gas emissions - Scope 2 - Purchase of electricity from the grid (location based)	(million/t_{eq})	1.43	1.55	(0.12)	-7.7%
Indirect greenhouse gas emissions - Scope 2 - Purchase of electricity from the grid (market based)	(million/t_{eq})	2.28	2.30	(0.02)	-0.9%
Indirect greenhouse gas emissions - Scope 2 - Distribution grid losses (location based)	(million/t_{eq})	3.56	3.82	(0.26)	-6.8%
Indirect greenhouse gas emissions - Scope 2 - Distribution grid losses (market based)	(million/t_{eq})	5.57	6.00	(0.43)	-7.2%
Indirect greenhouse gas emissions - Scope 3	(million/t_{eq})	47.70	56.92	(9.22)	-16.2%
- of which emissions connected with gas sales	(million/t_{eq})	*21.48*	*23.92*	*(2.44)*	*-10.2%*
Specific direct greenhouse gas emissions - Scope 1	(gCO_{2eq}/kWh)	214	298	(84)	-28.2%
Specific emissions of SO_2	(g/kWh)	0.10	0.59	(0.49)	-83.1%
Specific emissions of NO_x	(g/kWh)	0.36	0.60	(0.24)	-40.0%
Specific emissions of particulates	(g/kWh)	0.01	0.12	(0.11)	-91.7%
Zero-emission generation	(% of total)	63.4	54.9	8.5	15.5%
Total direct fuel consumption	(Mtoe)	23.9	30.1	(6.2)	-20.6%
Average efficiency of thermal plants [2]	(%)	44.2	42.0	2.2	5.2%
Water withdrawals in water-stressed areas [3]	(%)	22.9	25.4	(2.5)	-9.8%
Specific water withdrawals for total generation [4]	(l/kWh)	0.20	0.33	(0.13)	-39.4%
Reference price of CO_2	(€)	24.72	24.8	(0.1)	-0.3%
Ordinary EBITDA for low-carbon products, services and technologies [5]	(millions of €)	15,616	16,241	(625.0)	-3.8%
Capex for low-carbon products, services and technologies	(millions of €)	9,575	9,131	444.0	4.9%
Ratio of capex for low-carbon products, services and technologies to total	(%)	94.0	92.0	2.0	2.2%

(1) Specific emissions are calculated considering total emissions from thermal generation as a ratio of total renewable, nuclear and thermal generation (including the contribution of heat).
(2) The calculation does not consider Italian O&G plants being decommissioned or of marginal impact. In addition, the figures do not take account of consumption and generation for cogeneration relating to Russian thermal generation plants. Average efficiency is calculated on the basis of the plant fleet and is weighted by generation.
(3) The figure for 2019 has been recalculated on the basis of the change in scope of plants in water-stressed areas.
(4) Specific withdrawals consist of all water withdrawals from sources on the surface (including recovered rainwater), underground, third-party, the sea and wastewater (supplies from third parties) used for generation processes and for closed-cycle cooling, excluding sea water returned to the sea after the desalination process (brine).
(5) The comparative figure for 2019 has been adjusted to take account of the fact that in South America and Mexico the values relating to large customers managed by the generation companies have been reallocated to the End-user Markets Business Line.

Figure 4 Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans."

Example Disclosure: Meridian Energy

	Top Risks	
Risk drivers	Extreme rainfall in hydro catchments	Negative demand disruption - emissions intensive industries
Type	Physical	Transition
Scale	Medium	Medium
Likelihood	About as likely as not	About as likely as not
Timeframe	Long-term (30 years)	Long-term (30 years)
Impacts	Increasing intensity of extreme rainfall events in hydro catchments.	Sudden drop in electricity demand as emissions-intensive industries are disrupted by ambitious climate change legislation or shifting consumer preferences for sustainable goods and services.
Financial implications	Increase in intensity of extreme rainfall events may require the lowering of dam water levels (reducing assets' generating capacity) and/or the strengthening of dam structures.	Reduced electricity demand may negatively impact on Meridian's revenue, for example if the dairy industry was curtailed due to climate action policy.
Quantification	-$11 million	-$12 to -$17 million
Methodology	Estimated potential financial impact is an annualised figure over a 30 year time horizon of estimated civil construction costs and negative revenue impacts.	Estimated potential financial impact is an annualized figure over a 30 year time horizon, calculated by modelling the impact of a step-change reduction in demand and comparing it to our Evolution scenario. There is significant uncertainty to this calculation.
Management response	Probable Maximum Flood values are reviewed once every ten years to incorporate climate change.	Meridian supports of climate action policy that would increase electricity demand in other sectors, in particular the use of electricity in the transport and industrial heat sectors of the economy.

Figure 5 Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans."

These disclosures give stakeholders a better understanding of an organization's performance and strategic focus by providing useful information about the financial ramifications of climate-related risks and opportunities. Thus, financial impact disclosure is critical for analyzing the financial consequences of climate-related aspects and assisting decision-making processes. These disclosures assist effective risk management, capital allocation, and the transition to a sustainable future by giving transparency and insight into an organization's reaction to climate-related risks and opportunities.

Position: Impact of Climate-Related Risks or Opportunities on Financial Position

The following changes to the balance sheet statement may occur as a result of climate-related risks and opportunities:

- Changes in asset carrying amounts as a result of exposure to physical and transition risks;

- Changes in expected portfolio value as a result of climate-related risks and opportunities;
- Changes in liability and equity as a result of asset increases or decreases (e.g., as a result of low-carbon capital investments or the sale or write-off of stranded assets).

Figure 6 depicts an example disclosure showing the possible impact of climate-related risks and opportunities on an organization's financial situation in terms of asset fair value under the International Energy Agency's (IEA) Sustainable Development Scenario. *Figure 7* depicts a corporation reporting the possible impact of climate-related risks and opportunities on its financial situation as a result of a change in value under a 1.5°C scenario against a 3°C scenario. *(Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans.")*

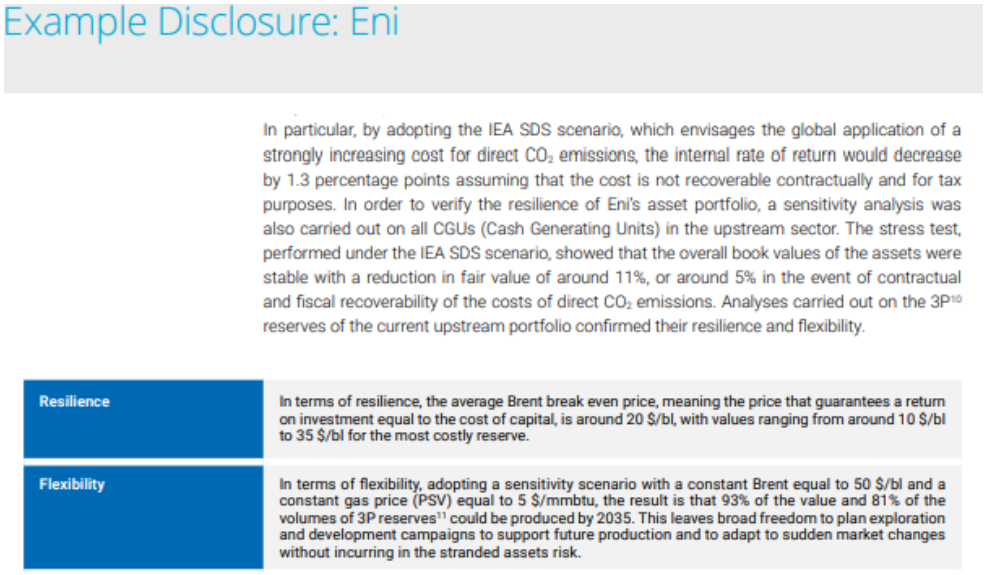


Figure 6 Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans."

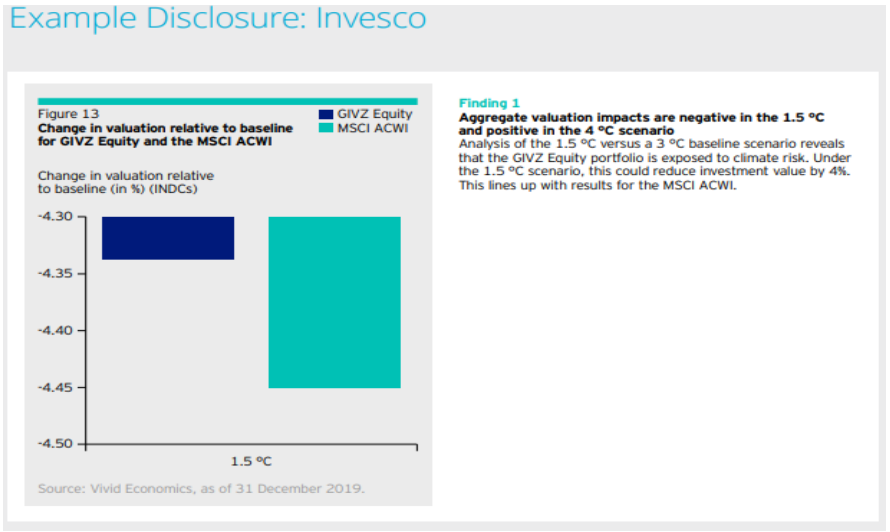


Figure 7 Task Force on Climate-related Financial Disclosures; (2021); "Guidance on Metrics, Targets, and Transition Plans."

2. GOVERNANCE AND CLIMATE CHANGE

2.1 Climate Change: Governance implications

Climate change has been identified as one of the most important hazards to our global economy, which is why action by governments and institutions will not enough; the private sector can and must play a key role in tackling this issue.

As a result, corporations must adjust their business models to anticipate government regulations and market processes in strategy formulation, business planning, and risk management, in accordance with corporate sustainable objectives and purpose.

Furthermore, investors are increasingly investigating the nature of climate-related risks and opportunities in enterprises, as well as how to structure their portfolios in relation to climate change in the short and long term. As a result, investors are increasingly interested in how companies have assessed their exposure to climate change risks, as well as any potential modifications to their business models.

This necessitates close inspection by corporate boards and investor understanding of what enterprises must do to position themselves sustainably in a dynamic climate policy environment under such a governance structure.

Although climate-related risks may have a bigger impact on some industries than others, businesses in all industries must acquire more sensitivity to the effects of climate risk and global climate policy, both in a systemic and individual company context.

In this context, many businesses are incorporating climate change risk analysis into their risk management efforts in order to align their business system with significant legislative developments in the sector.

Reporting on material climate concerns has become an essential topic of governance and transparency for corporations because to its relevance and constructive size as a risk factor and as a strategic issue.

Corporate governance reports can allow companies and their boards of directors to provide information that adds value to this process, such as the extent to which climate change is on the board's agenda, whether companies have integrated different energy and climate scenarios into corporate planning, developed their own carbon pricing model, or formally assessed the impact of climate risks on the company.

Climate risk management is gradually becoming a "must" component for various commercial enterprises. To emphasize its importance, even the greatest accounting firms have been chastised for failing to appropriately account for climate risks in the financial statements of several significant corporations. The Big Four global accounting firms, Deloitte, EY, KPMG, and PwC have also been challenged by the energy revolution. As the climate conference began in Glasgow, some large investors wrote to each of the four firms that control the majority of the global auditing business, chastising them for the almost non-existent assessment of climate change risk in corporate financial statements and urging them to be more thorough in their analysis or risk losing their confirmation as auditors.

"The strategic response of companies to the changing business environment as a result of climate and environmental risks will impact the resilience of their business model over time: the benefits for companies go far beyond reducing emissions; companies that are able to assess and understand climate-related risks and opportunities will be able to make better decisions in the long run, becoming a real business opportunity thus proposing a new model of corporate governance." (Macrì, L. (2021); "*IL CAMBIAMENTO CLIMATICO: IMPLICAZIONI DI GOVERNANCE*")

2.2 Climate Change: Corporate Risk Management

As we said previously, the global climate is changing dramatically, mostly as a result of human activity, resulting in higher quantities of greenhouse gases. These changes pose dangers to organizations, which are referred to as climate risks, necessitating the deployment of appropriate risk response strategies. Physical, regulatory, and commercial risks[9] are the three types of climate hazards (see paragraph 1.4).

The purpose of some studies is to fill gaps in the current literature by giving a complete review of firms' views and responses to particular climate hazards across three categories. To identify possible disparities in risk appraisal and reaction, the analysis includes regulated and non-

[9] See paragraph *1.4 "Climate Risk Overview"*

regulated businesses. The report relies on data from the Carbon Disclosure Project (CDP)[10] and focuses on corporations situated in Europe.

According to the research, firms prioritize risk reduction above risk elimination and place a short-term priority on regulatory concerns. Companies in high-emitting industries that are exposed to climate laws respond more quickly to regulatory concerns. These findings have important implications for legislators and business leaders, emphasizing that legislation is vital in promoting corporate climate change solutions.

These studies contribute to our understanding of risk management techniques in the context of climate change by providing important insights on firms' perceptions and responses to climate hazards. The findings underline the importance of understanding the sector context for developing successful climate change policies, as well as the necessity for both regulatory measures and market pressures to drive corporate actions.

2.2.1 Types of risks and sectors: responses and strategies of companies

Past research on *regulatory climate risks* has focused on defining the sorts of risks that businesses face and investigating the techniques they adopt to deal with current or future climate policies, particularly those involving carbon pricing[11]. Regulatory uncertainty, defined as uncertainty about the timing and impact of new or altered rules, has been identified as a major risk and impediment to climate action.

According to studies, businesses manage with regulatory uncertainty primarily by gathering new information from multiple sources and streamlining their internal decision-making processes by lowering the number of uncertain elements evaluated. Businesses are also becoming more engaged in the policy-making process, such as through lobbying, in order to influence the stringency and type of rules that may have an impact on their financial success.

[10]CDP is an international nonprofit organization that provides businesses, local authorities, governments and investors with a global environmental measurement and reporting system.
CDP provides a system for measuring, tracking, managing and sharing information regarding climate change globally. There are four programs supported by CDP: Climate Change Program, Water Program, Forests Program and Supply Chain Program, plus a specific program dedicated to cities and regions, the Cities, States and Regions Program.

[11] Carbon pricing is an instrument that captures the external costs of greenhouse gas (GHG) emissions—the costs of emissions that the public pays for, such as damage to crops, health care costs from heat waves and droughts, and loss of property from flooding and sea level rise—and ties them to their sources through a price, usually in the form of a price on the carbon dioxide (CO2) emitted. Carbon pricing can take different forms and shapes: (primarily carbon taxes, ETSs, and carbon crediting mechanisms.

Companies have used political non-market techniques to attain reduced levels of regulatory stringency, such as persuading lawmakers toward market-based solutions and seeking self-regulation. Businesses in North America have increasingly committed to voluntary emission reductions in response to regulatory pressure. Moreover, firms have used non-market political techniques to alter the parameters of carbon trading programs in order to lower their stringency.

Apart from political non-market tactics, lowering greenhouse gas (GHG) emissions is a key strategy for addressing regulatory concerns. GHG compensation (e.g., emissions trading[12] or offsets), GHG reduction (e.g., creative technological solutions that cut emissions in processes and goods), and GHG independence can all be used to achieve this (e.g., innovative technology solutions that completely avoid emissions). Businesses have explored these techniques on their own or in partnership with third-party entities.

While earlier research has shown that corporations are aware of the regulatory risks connected with climate change and take different efforts to reduce these risks, past studies have mostly focused on particular subsets of tactics. There is a greater need for a more thorough understanding of the whole range of business strategies and the extent to which they are used.

In summary, available research reveals that corporations employ a variety of tactics to mitigate the regulatory risks posed by climate change. Nevertheless, the research has only examined a subset of strategies, creating a knowledge vacuum on the complete range of strategies and their frequency across businesses.

Companies' knowledge of *physical climate hazards* has grown as the frequency of weather extremes has increased, pushing them to include these risks into their response plans. According to studies, businesses view climate change as a serious business concern and use traditional risk management methodologies to detect, analyse, and respond to physical climate threats.

Scholars in management have looked into the corporate management of physical climate hazards, concentrating on three major areas. To begin, conceptual recommendations on how businesses might establish integrated plans to prepare for coming physical climate

[12] The EU ETS works on the 'cap and trade' principle. A cap is set on the total amount of certain greenhouse gases that can be emitted by the operators covered by the system. The cap is reduced over time so that total emissions fall. Within the cap, operators buy or receive emissions allowances, which they can trade with one another as needed. The limit on the total number of allowances available ensures that they have a value. The price signal incentivises emission reductions and promotes investment in innovative, low-carbon technologies, whilst trading brings flexibility that ensures emissions are cut where it costs least to do so.

consequences have been given. Contributions from research on sustainable management, crisis management, risk management, resilience, and adaptive organizational transformation are included. Moreover, frameworks for incorporating corporate relocation choices into climate change adaptation plans have been developed.

Second, empirical research has studied adaptation techniques[13] in industries sensitive to climate change-induced physical consequences, frequently using industry-specific or case study data. Insurance, agriculture, tourism, and other industries confronting resource supply issues are among them. Agricultural enterprises, for example, use strategies such as geographical and product diversification, the development of alternative farming practices, and insurance coverage for asset loss and supply chain interruptions. To offset physical climate concerns, enterprises in the tourist sector adapt the schedule of holiday activities and offer alternative services. Insurance businesses create new insurance products, disclose risks, and raise awareness through public policy.

Finally, studies have been conducted to determine how organizational factors and contextual variables impact a company's ability to control physical dangers. Corporate capacities, traits, management attitudes, and awareness and experiences with physical threats have all been highlighted as important factors. The ability of a corporation to produce and absorb physical risk information, operational flexibility, and the integration of physical climate risk management into overall strategies, for example, all contribute to its ability to successfully manage physical climate risks.

Previous research indicates that, while certain industries, such as agriculture and insurance, are more vulnerable to physical climate changes, negative implications may extend to a larger variety of industries. Physical threats are purposefully included in organizations, according to empirical research. However, it is uncertain how physical hazards are perceived and managed in compared to other dangers.

So, existing research shows that firms are becoming more aware of physical climate threats and incorporating them into response strategies. It focuses on the importance of integrated methods and investigates specific industry adaptations, as well as the impact of organizational

[13] Adaptation is an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

characteristics. Further research is needed, however, to completely understand how physical threats are viewed and managed in relation to other risk categories.

Research have also looked at how businesses adapt to *climate-related market concerns*, such as altering customer demand and non-governmental organization pressure (NGOs). While there are few studies on this topic, existing research frequently examines reputational hazards and how businesses manage them through better disclosure and communication of their carbon strategy. *Pellegrino and Lodhia (2012)*, for example, use a legitimacy theory framework[14] to examine the environmental disclosure practices of key bodies in Australia's mining industry, discovering that different legitimation strategies are employed in annual reports, sustainability reports, and corporate websites. Additional research suggests that regulatory climate risk response mechanisms, such as emissions reduction[15], avoidance, or compensation, can potentially act as market risk remedies.

The study found factors that influence corporate responses to climate-related market threats. The sort of stakeholders or market partners a corporation has, the extent of control over critical resources, and the institutional and commercial framework of the home nation all impact corporate reactions to market risks (Levy and Kolk, 2002). Furthermore, corporate response approaches have been connected to the intensity of a company's emissions rather than specific stakeholder groups (Sprengel and Busch, 2011). The incorporation of market-related risks into overall corporate risk management is dependent on company characteristics, tools, and factors such as the presence of a formal carbon strategy, senior management involvement, internal audit oversight, resource availability, and industry affiliation, according to Subramaniam et al. (2015).

Finally, while some carbon policies are driven by market pressures and reputational concerns, empirical research on climate-related market risks and corresponding corporate activities is limited. It is also suggested that government legislation may motivate more extreme climate change than market pressures (Okereke and Russell, 2010). More research is needed to better

[14] Theory of legitimacy asserts that the organization seeks to ensure that they are perceived as operating within the bounds and norms of their respective societies, that is they attempt to ensure, that their activities are perceived by outside parties as being "legitimate".

[15] To help countries achieve their emission reduction targets, the Kyoto protocol introduced two market-based mechanisms: The Clean Development Mechanism (CDM) and the Joint Implementation (JI). Under Joint Implementation (JI), a developed country with a relatively high cost of domestic GHG reduction can set up a project in another developed country that has relatively low cost and earn carbon credits that may be applied to their emission targets. The Clean Development Mechanism (CDM), defined in Article 12 of the Protocol, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol to implement an emission-reduction project in developing countries.

understand corporate reactions to climate-related market concerns, as well as the factors that drive these reactions.

2.2.2 How to understand differences between sectors and risks: overview of empirical study

This study (Sakhel, A; (2017); *"Corporate climate risk management: Are European companies prepared?")* fills gaps in past climate risk management research by using an empirical method to investigate organizations' real perceptions and responses to climate hazards. With its varied variety of major firms and the ETS's regulation of carbon-intensive industries, the study combines qualitative and quantitative analysis and focuses on the European Union (including Liechtenstein and Norway) as the research setting. The study's data comes from the Carbon Disclosure Project (CDP), which gathers company-level information on climate change and other environmental concerns. The study examines publicly accessible climate risk management reports from 2011 to 2013, using a sample of 218 organizations that provided consistent risk disclosure data. The sample is separated into two subsamples: those controlled by climate policy through the ETS and those that are not. Firm size is used to match ETS and non-ETS enterprises so that the two groups may be compared. The sample selection is analyzed to address any selection bias, and the results show that disclosure drivers do not differ significantly between reporting and non-reporting organizations. Overall, the study gives useful insights into organizations' risk perception and reactions to climate concerns while taking sector affiliations and regulatory settings into account.

The findings in Fig. 3 show that corporations perceive individual climate risks differently in terms of chronology, chance of occurrence, and size of impact. Generally, regulatory risks are regarded as the most important and pressing in the near future, while physical and market concerns are regarded as less important. Nonetheless, market-related concerns, particularly reputation hazards, are regarded as very pressing. Although market risks are considered significant if they occur, corporations anticipate a very low possibility of occurrence. Figure 4 depicts the estimated exposure for each individual risk, whereas Figure 5 depicts the aggregated exposure per risk category for the full sample. Cap and trade systems, fuel/energy taxes and restrictions in the regulatory area, changes in precipitation extremes and droughts in the physical category, and changing consumer behavior and potential reputational harm in the market category were highlighted as the most significant concerns. Businesses believe that climate-related laws provide the greatest threat to their operations, whereas market-related concerns are regarded as relatively minor. These findings add to a better understanding of companies' risk perception and exposure in the context of climate change.

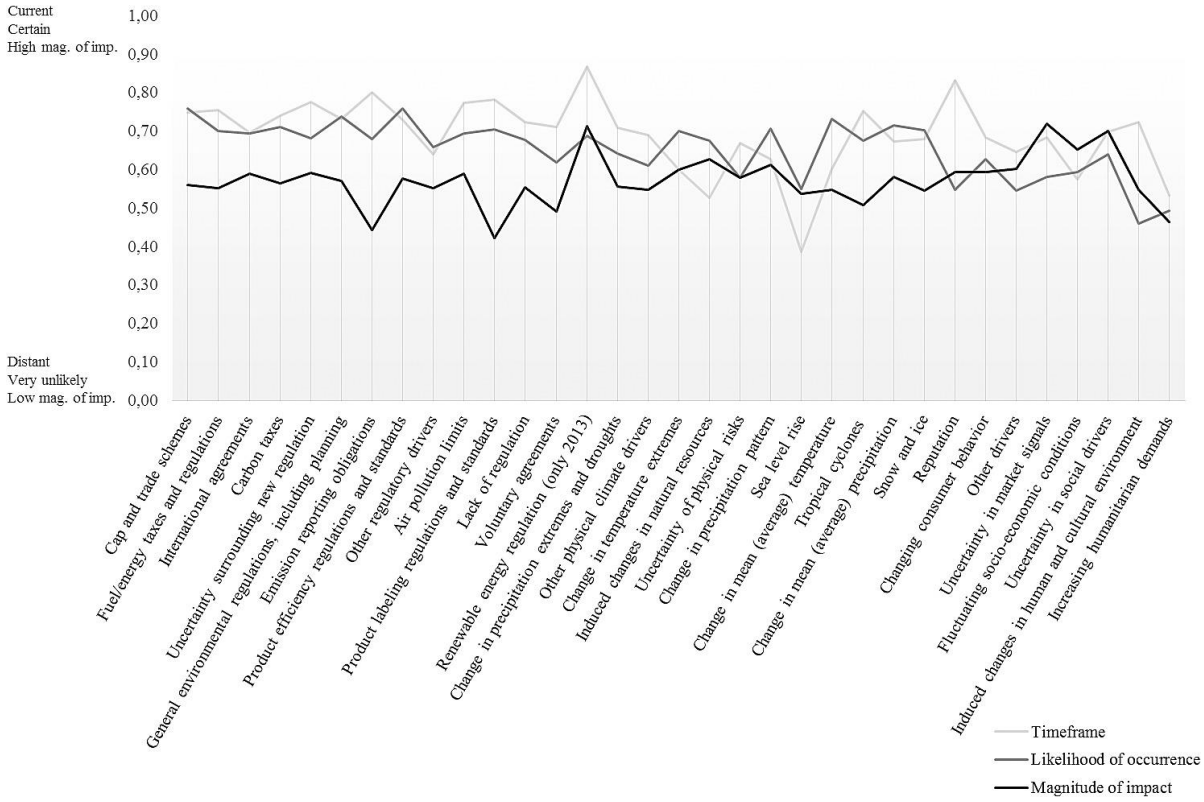


Figure 8 Risk assessment (average of the years 2011-2013). (Sakhel, A; (2017); "Corporate climate risk management: Are European companies prepared?")

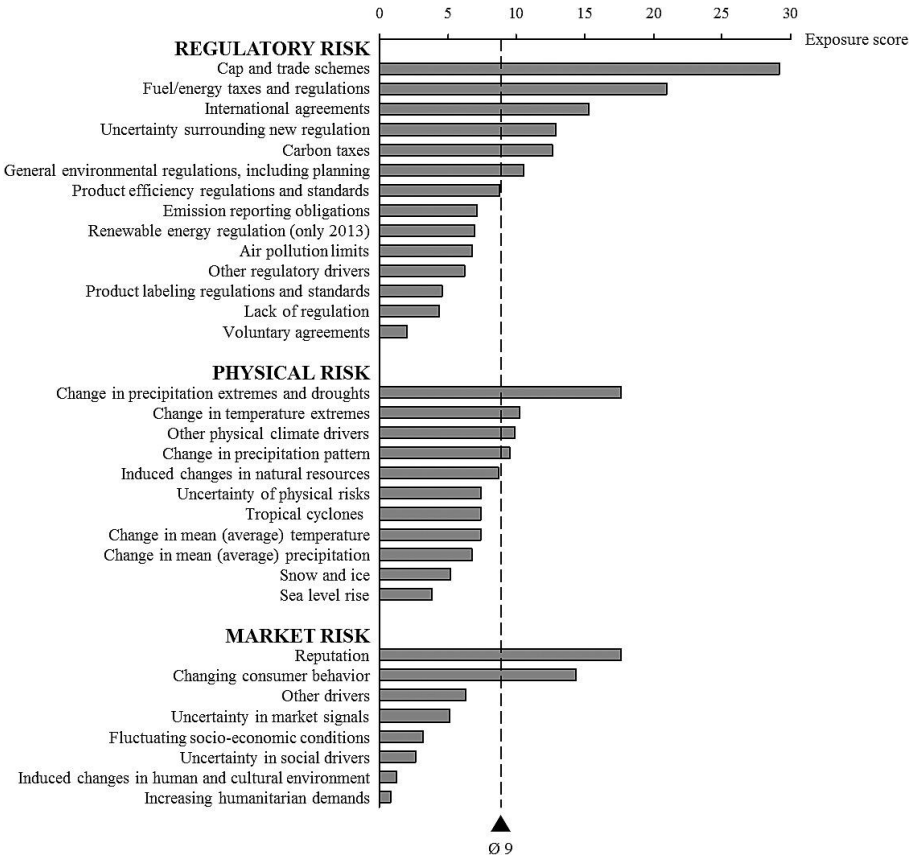


Figure 9 Sample risk exposure scores (average of the years 2011-2013). (Sakhel, A; (2017); "Corporate climate risk management: Are European companies prepared?")

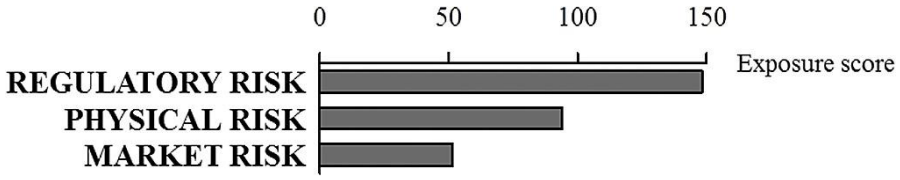


Figure 10 Sample risk exposure scores, aggregated per category (average of the years 2011-2013). (Sakhel, A; (2017); "Corporate climate risk management: Are European companies prepared?")

Three significant contributions are highlighted in the findings. To begin, organizations have different perspectives of regulatory, physical, and market risks, with regulatory risks being the most serious. This implies that firms prioritize the impact of climate change through laws, potentially due to their concentration on the near term. Second, most risk responses implemented by businesses are focused on regulatory risks rather than physical or market threats. This dependence on risk-aversion tactics may be problematic in the long run, since it ignores the requirement for complete risk-management planning for physical and market threats. Finally, the analysis finds that regulated, high-polluting businesses vary from non-regulated, low-polluting industries primarily in terms of regulatory risk perception. High-polluting enterprises perceive more regulatory risks, leading to a greater inclination to employ risk-reduction measures. Market-related hazards, on the other hand, are not viewed as considerably different across the two types of industries. The findings imply that legislation is a powerful motivation for businesses to address climate concerns and cut emissions, but market forces and physical threats may be insufficient.

2.3 Focus on Italian Scenario: Challenges and Opportunities for Companies

In an analysis conducted by KPMG in 2018, which examined the non-financial information of Italian businesses in accordance with the D.Lgs. 254/2016, the environment emerged as one of the most important issues addressed by businesses in terms of policy and materiality during the first year of the Decreto's implementation. In particular, 58% of the sample identified climate change as a significant theme, and *90% had chosen at least one performance indicator related to emissions* (according to GRI Standard 305 - 'Emissions'). The same attention to

environmental issues is shown in the identification of risks; in fact, 93% of the businesses studied identified risks related to current or potential environmental impacts.
The tendency of paying attention to environmental issues is confirmed by analyses conducted in 2019, the second year of the survey.

Businesses see noncompliance risk as one of the most frequent environmental threats, followed by climate change and environmental damage risks, the latter being especially important for enterprises in the Industrial Products and Services sector.
The Italian Observatory for Sustainable Finance performed a poll in March 2019 to examine the level of maturity of the Italian financial industry in terms of climate risk. According to the poll and industry efforts, all firms agree on the significance and desirability of developing greater sensitivity to climate change threats. Yet, there is still a need to create analytical tools that will allow for more effective use of information concerning environmental repercussions and how they affect the economy and financial sector. It is probable that in the next years, this industry may be forced to respond to increased regulatory demands in order to examine the implications of climate change on its investments. Although Italian businesses have begun to become aware of and monitor their environmental impacts, there is still a gap to be filled, namely the management of indirect impacts and related risks, such as those associated with their own supply chain and the company's value chain, both upstream and downstream. Speaking about climate change and future hazards, it will be critical for businesses to begin analyzing their own sphere of environmental effect from a larger perspective, covering the full area of influence of their operations. This may be accomplished by closely monitoring indirect emissions and expanding the study of climate change risks in the many nations and fields in which the firm is involved. Companies can use international rules and recommendations, such as those provided by the Task Force on Climate-related Financial Disclosures or the European Commission, to achieve this goal.

"Greater knowledge of their impacts and their exposure to climate risks and opportunities will enable companies to be able to assess increasingly accurately their current and potential impacts and, as a result, be able to develop mitigation and adaptation strategies appropriate". (KPMG; (2019); *"L'informativa relativa ai rischi climatici: Opportunità e rischi per le aziende italiane".*)
In order to fill the lack of information on the way of managing these risks (physical risks and transition risks), the TCFD published its final recommendations according to four thematic areas applicable in all sectors and in all jurisdictions, supported by 11 informative and

sectoral guidance: governance, strategy, risk management and metrics and targets (see paragraph *1.4 "Climate Risk Overview"*).

In Italy, eleven enterprises have expressed their support for the TCFD guidelines, and six have begun reporting on their approach to managing climate risks in accordance with these standards. The six organizations studied publish the required information in a variety of methods, including the Annual Financial Report, the Sustainability Report Sustainability (as an annex or by including comparable material to the reporting dedicated to climate risks), and a separate report.

The TCFD recommends that firms make their climate change disclosures public within existing financial reports to ensure that the information reaches investors and stakeholders and to facilitate the incorporation of climate risk assessments into current risk management frameworks.

The identification of hazards and the development of plans to respond to risks and opportunities associated with climate change climate varies between firms, both in terms of how it is processed and the format in which information is provided. Political and legal risks, which include firms' expectations for the introduction of new rules or limits that limit companies' activities or increase their operating expenses, are among the risks cited by companies that report according to the TCFD. Market risks, on the other hand, include uncertainty about future energy consumption and the financial consequences of future developments (for example, the danger of 'stranded assets', or assets that are not recovered owing to temperature objectives).

Companies assess physical hazards in the short, medium, and long term that are mostly connected to extreme weather occurrences, as well as rising temperatures, changes in precipitation patterns, and solar irradiation.

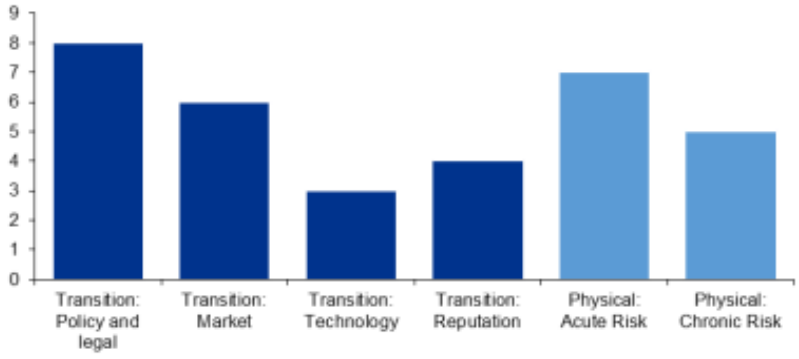


Figure 11 KPMG; (2019); "L'informativa relativa ai rischi climatici: Opportunità e rischi per le aziende italiane".

Examples of climate risks and potential long-term financial impacts

SECTOR	CLIMATE RISK POTENTIAL	FINANCIAL IMPACT
Energy sector	*Physical - acute risk*: Significant incidents occurring at strategic assets, due to the increased severity of weather events extremes such as cyclones and floods.	The risk may result in the cancellation, early retirement or damage to existing assets.
Public services	*Transition - political and legal*: Review of the tariff framework for CO2 emissions. (reduction of free allocation of allowances and, consequently consequently, a further increase in prices) through European emissions market (European Emissions Trading Scheme - EU ETS), the main tool used by the European Union to achieve its CO2 reduction targets.	Operating costs, investments and capital allocation.

Figure 12 KPMG; (2019); "L'informativa relativa ai rischi climatici: Opportunità e rischi per le aziende italiane".

Examples of opportunities and potential long-term financial impacts

SECTOR	OPPORTUNITIES	POTENTIAL FINANCIAL IMPACT
Public services	*Products and services:* Technological maturity and full competitiveness of energy renewables, both large-scale and small-scale, with positive effects on return on investment.	Return on investment
Public services	*Products and services:* Development and/or expansion of (new) assets (ex. storage) and/or low-carbon services (e.g., energy-as-a-service) in response to advances in technology and shifting investment from the supply side to the demand side of energy in order to move beyond the Paris Agreement with benefits in terms of new revenue opportunities.	Turnover

Figure 13 KPMG; (2019); "L'informativa relativa ai rischi climatici: Opportunità e rischi per le aziende italiane".

"What has been reported so far is in the direction of greater transparency on the performance of organizations, however companies are required to make a greater effort to quantification of the financial impacts of risks identified, as well as opportunities. In addition, the effort to identification of risks must increasingly include in a systematically all risks and opportunities related to the supply chain and test the resilience of the company's strategy to climate scenarios." (KPMG; (2019); "L'informativa relativa ai rischi climatici: Opportunità e rischi per le aziende italiane".)

2.3.1 The components of physical and transition risk: application on the Italian field

Before delving into the investigation of a specific case study, it is worthwhile to unbundle what, as previously said, are the major hazards associated with climate change: physical risk and transition risk. We may study the two categories of hazards in depth thanks to the "*Sustainable Italy 2022 Report*", created by *Cerved Group* in collaboration with *Innovation Team*, a research institution of the firm *MBS Consulting*, with a focus on the Italian territory.

The components of physical risk:

- *Flood risk*: The existence of flood risk is connected to the likelihood of temporary flooding produced by river, stream, canal, lake, or sea overflow. The physical qualities of the land and human settlement activities can have an impact on this danger. Cerved identified the manufacturing units most vulnerable to flood danger using ISPRA's mapping of the hazard of such threats in Italy.

  According to data on the distribution of firm premises and workers based on flood risk class, the majority of Italian enterprises (79.8 percent) operate in surroundings with little exposure to this sort of risk. Local offices in high and extremely high-risk zones account for more than 550,000 of the 6.3 million mapped production units (8.8 percent). A total of 1.7 million people work in producing units with high or very high hydrogeological risk, accounting for 10.2 percent of all private-sector employees.

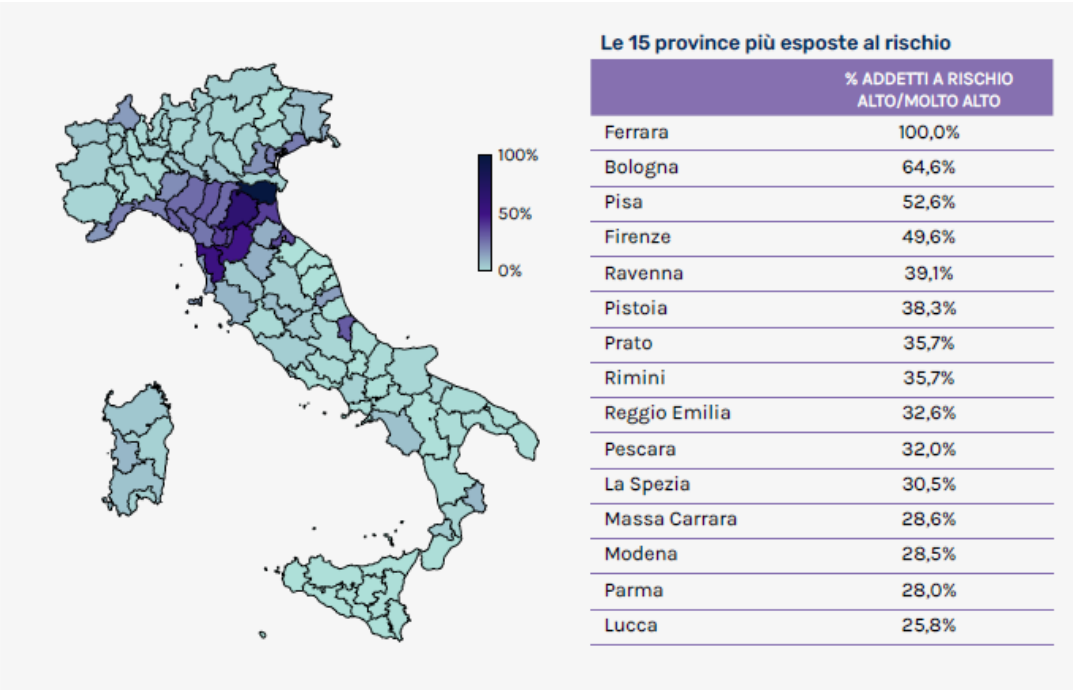
  The geographical distribution of flood risk appears to be relatively varied, reflecting variable exposure to risk factors and the concentration of industrial facilities near flood-prone streams and maritime regions. In general, flood danger is higher in central and northern regions like as Emilia Romagna, Tuscany, and Liguria.

Ferrara, located in the Po Delta area, has the largest exposure to this sort of danger, with all manufacturing units and personnel categorized as high or very high risk (100 percent). Bologna is next, with 64.6 percent of employees exposed to flood risk, and the biggest risk cause is the Reno River catchment region. Employee exposure to flood risk is especially high in Pisa (52.6 percent) and Florence (49.6 percent), both of which are traversed by the Arno River.

In essence, the research demonstrates that while many Italian enterprises operate in low-risk flood zones, numerous manufacturing units and people are located in high or extremely high-risk zones. The risk distribution in Italy is varied, with a higher concentration in the center and northern areas. These findings highlight the need of appropriately addressing and controlling flood risk in various parts of the country.

	SEDI LOCALI		ADDETTI	
Classe rischio alluvioni	**Numero**	**%**	**Numero**	**%**
Molto basso	4.340.948	68,9%	11.295.692	65,7%
Basso	687.386	10,9%	1.972.343	11,5%
Medio	716.082	11,4%	2.172.236	12,6%
Alto	416.383	6,6%	1.363.339	7,9%
Molto alto	141.249	2,2%	397.258	2,3%
Totale	**6.302.048**		**17.200.868**	

Figure 14 Floods: local locations and employees by hazard class; Cerved: (2022); "Rapporto Italia Sostenibile"



Le 15 province più esposte al rischio

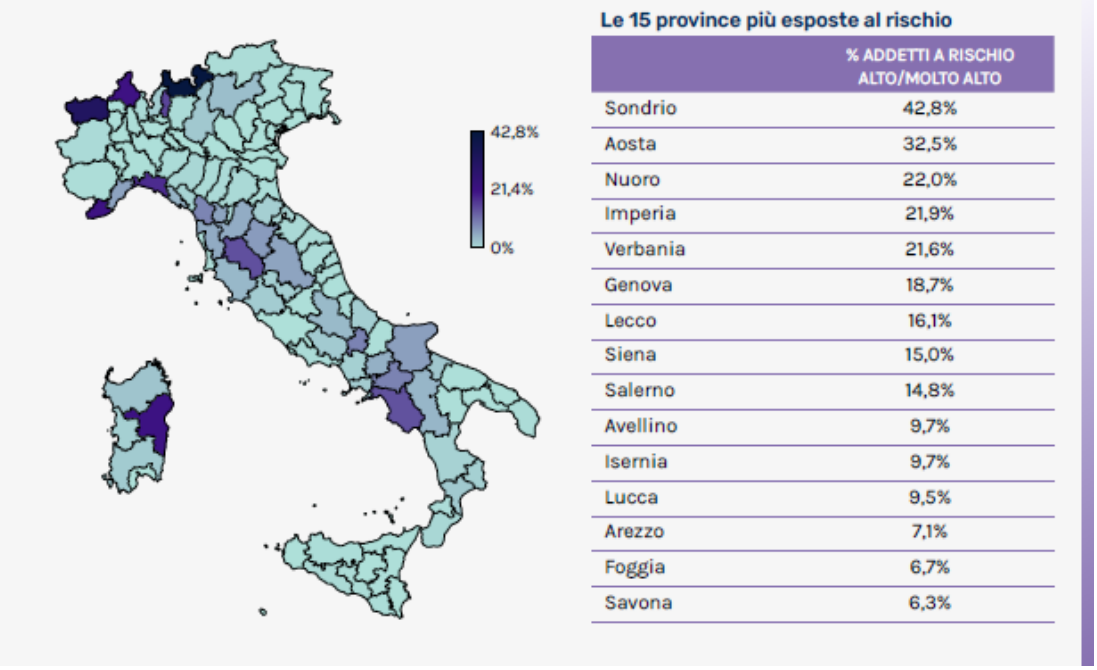
	% ADDETTI A RISCHIO ALTO/MOLTO ALTO
Ferrara	100,0%
Bologna	64,6%
Pisa	52,6%
Firenze	49,6%
Ravenna	39,1%
Pistoia	38,3%
Prato	35,7%
Rimini	35,7%
Reggio Emilia	32,6%
Pescara	32,0%
La Spezia	30,5%
Massa Carrara	28,6%
Modena	28,5%
Parma	28,0%
Lucca	25,8%

Figure 15 Floods Risk; Cerved: (2022); "Rapporto Italia Sostenibile"

- *Landslide risk*: A small number of businesses are at risk of landslides. According to statistics, just 2.6 percent (165 thousand) of manufacturing units in Italy are located in high landslide risk zones, employing little more than 352 thousand persons (2.0%). However, slightly higher values are observed in medium-risk areas, with 300 thousand local units and nearly 700 thousand employees at risk (4.9 percent and 4.0 percent of the total, respectively), while the majority of settlements production facilities (92.5 percent of the total with 93.9 percent of employees) are located in areas of our territory with low or very low landslide risk. At the territorial level, the phenomenon is more prevalent in provinces with a large portion of their territory covered by mountainous and hilly terrain, with the Alpine provinces of Sondrio (42.8% of employees in the high or very high-risk classes) and Aosta (32.4 percent) having the highest riskiness rates. The provinces of Genoa (18.7 percent) and Salerno (14.8 percent) also have quite high levels of landslide risk exposure.

	SEDI LOCALI		ADDETTI	
Classe rischio frane	**Numero**	**%**	**Numero**	**%**
Molto basso	5.268.410	83,6%	14.903.621	86,6%
Basso	562.445	8,9%	1.248.892	7,3%
Medio	306.090	4,9%	696.073	4,0%
Alto	152.269	2,4%	329.779	1,9%
Molto alto	12.834	0,2%	22.503	0,1%
Totale	**6.302.048**		**17.200.868**	

Figure 16 Landslide: local locations and employees by hazard class; Cerved: (2022); "Rapporto Italia Sostenibile"



Le 15 province più esposte al rischio

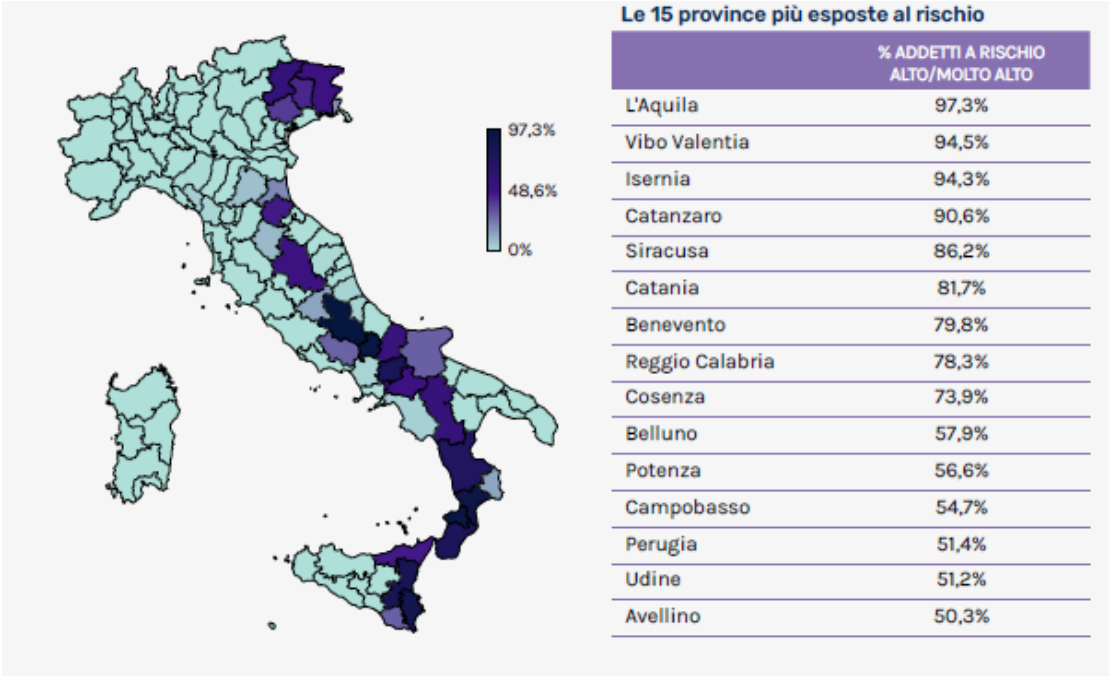
	% ADDETTI A RISCHIO ALTO/MOLTO ALTO
Sondrio	42,8%
Aosta	32,5%
Nuoro	22,0%
Imperia	21,9%
Verbania	21,6%
Genova	18,7%
Lecco	16,1%
Siena	15,0%
Salerno	14,8%
Avellino	9,7%
Isernia	9,7%
Lucca	9,5%
Arezzo	7,1%
Foggia	6,7%
Savona	6,3%

Figure 17 Landslide Risk; Cerved: (2022); "Rapporto Italia Sostenibile"

- *Earthquake risk*: The occurrence of seismic events is another component of physical danger. INGV defines seismic hazard as the likelihood that an earthquake of a specific strength or size may occur in a given place and time frame. *Cerved* has once again combined the INGV's seismic zone classification with other information on the business system in order to map our production system's earthquake risk exposure. Because of our country's natural morphological nature, earthquake danger is higher than landslide risk but lower than flood risk. There are about 600,000 production units in high seismic risk zones (9.3% of total), with potential consequences on around 1.3 million personnel (7.7%). In comparison to flood and landslide risk, earthquake risk has a greater incidence of production units (1.6 million, 25.6 percent) and personnel (4.3 million, 25.1%) in the medium risk class, while the percentages in the very low risk class are lower. On a geographical scale, the biggest instances are obviously observed on the Apennine slope, where seismic risk is significant. L'Aquila (97.3 percent), Vibo Valentia (94.5 percent), and Isernia (94.3 percent) are among the most susceptible regions, with a history of major earthquakes: the top 15 provinces also include Reggio Calabria (78.3 percent) and Campobasso (50,3%).

	SEDI LOCALI		ADDETTI	
Classe rischio terremoti	**Numero**	**%**	**Numero**	**%**
Molto basso	861.163	13,7%	2.530.153	14,7%
Basso	3.239.597	51,4%	9.046.885	52,6%
Medio	1.610.943	25,6%	4.312.288	25,1%
Alto	412.014	6,5%	974.327	5,7%
Molto alto	178.331	2,8%	337.215	2,0%
Totale	**6.302.048**		**17.200.868**	

Figure 18 Earthquake: local locations and employees by hazard class; Cerved: (2022); "Rapporto Italia Sostenibile"



Le 15 province più esposte al rischio

	% ADDETTI A RISCHIO ALTO/MOLTO ALTO
L'Aquila	97,3%
Vibo Valentia	94,5%
Isernia	94,3%
Catanzaro	90,6%
Siracusa	86,2%
Catania	81,7%
Benevento	79,8%
Reggio Calabria	78,3%
Cosenza	73,9%
Belluno	57,9%
Potenza	56,6%
Campobasso	54,7%
Perugia	51,4%
Udine	51,2%
Avellino	50,3%

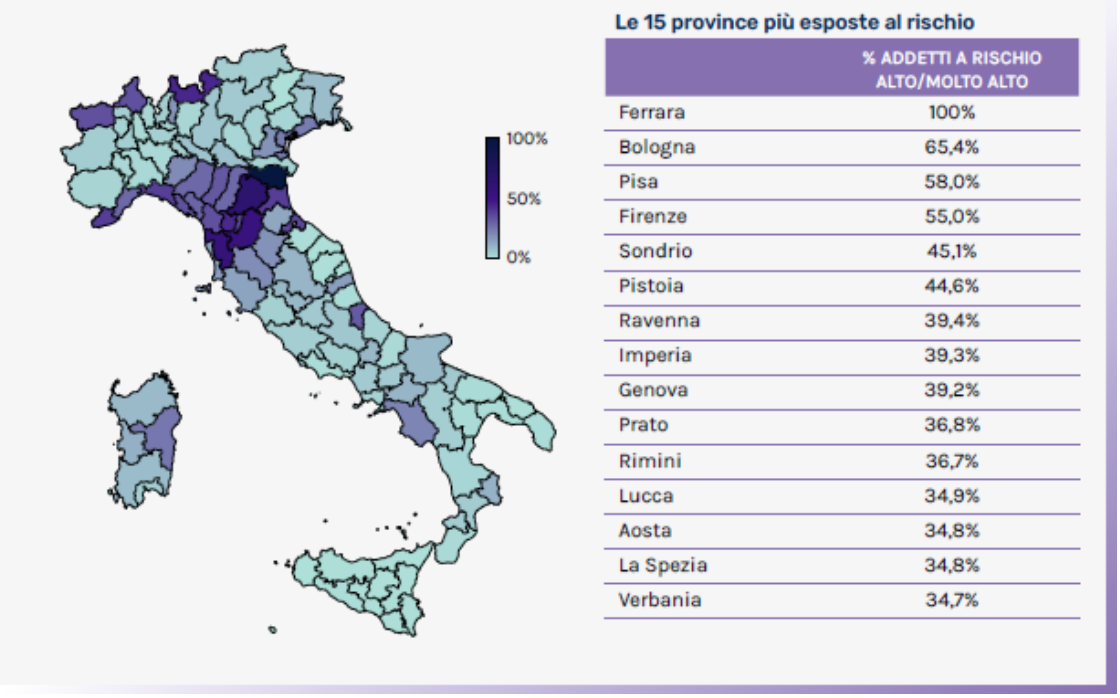
Figure 19 Earthquake Risk; Cerved: (2022); "Rapporto Italia Sostenibile"

- *Physical risks associated with climate change*: *Cerved* has developed a synthetic index restricted to just the two components of flood risk and risk landslides to intercept physical risk factors closely linked to climate change, obtaining a measure of the degree of exposure of businesses to the possible intensification of phenomena associated with climate change. According to the data from this index, 10.5 percent of businesses and 11.3 percent of our country's more than six million manufacturing establishments operate in areas characterized by physical risk due to high or very high climate change (710 thousand locations), employing 2.1 million workers, or about 12.1 percent of the total. While about 940 thousand (14.9 percent) units are located in medium-risk locations, more than 4.5 million (73.8 percent) are placed in low or very low-risk zones.

The map of regions most vulnerable to physical threats associated with climate change changes dramatically, with higher exposure in the Northeast and Liguria. Ferrara (100 percent of employees in areas of high or very high risk), Bologna (65.4 percent), Pisa (58.0 percent), and Florence (55.0 percent) are the provinces most exposed, followed by Sondrio (45.1 percent), Pistoia (44.6%), Ravenna (39.4%), Imperia (39.3%), and Genoa (39.2%).

	IMPRESE		SEDI LOCALI		ADDETTI	
Classe rischio climate change	Numero	%	Numero	%	Numero	%
Molto basso	3.127.299	59,1%	3.706.378	58,8%	10.010.955	58,2%
Basso	811.293	15,3%	944.688	15,0%	2.464.192	14,3%
Medio	795.926	15,0%	936.724	14,9%	2.632.321	15,3%
Alto	436.413	8,3%	560.511	8,9%	1.674.218	9,7%
Molto alto	117.767	2,2%	153.747	2,4%	419.182	2,4%
Totale	**5.288.698**		**6.302.048**		**17.200.868**	

Figure 20 Physical risks associated with climate change: local locations and employees by hazard class; Cerved: (2022); "Rapporto Italia Sostenibile"



Le 15 province più esposte al rischio

	% ADDETTI A RISCHIO ALTO/MOLTO ALTO
Ferrara	100%
Bologna	65,4%
Pisa	58,0%
Firenze	55,0%
Sondrio	45,1%
Pistoia	44,6%
Ravenna	39,4%
Imperia	39,3%
Genova	39,2%
Prato	36,8%
Rimini	36,7%
Lucca	34,9%
Aosta	34,8%
La Spezia	34,8%
Verbania	34,7%

Figure 21 Physical risks associated with climate change; Cerved: (2022); "Rapporto Italia Sostenibile"

- *Risk of transition in the Italian production system*: When the overall number of firms operating in our production system is taken into consideration, the companies that operate in high or very high transition risk activities amount 932,279, accounting for 17.6 percent of the total examined and employing nearly 2 million people (11.6 percent of the total). Sole proprietorships (76.6 percent) and farms (67.9%) are very common. In the moderate risk category, however, there are over 600,000 enterprises (11.2 percent), with a greater proportion of people involved (21.5 percent). The great majority of businesses and people are focused on activities with minor transition risk (70.9 percent of firms and 65.3 percent of employees), whereas green enterprises (16,354) constitute a still relatively small proportion of the Italian production system (0.3 percent of companies and 1.6 percent of employees).

	IMPRESE		ADDETTI	
Classe rischio transazione	**Numero**	**%**	**Numero**	**%**
Green	16.354	0,3%	267.024	1,6%
Trascurabile	3.747.854	70,9%	11.237.281	65,3%
Medio	592.211	11,2%	3.702.920	21,5%
Alto e Molto Alto	932.279	17,6%	1.993.643	11,6%
Totale	**5.288.698**		**17.200.868**	

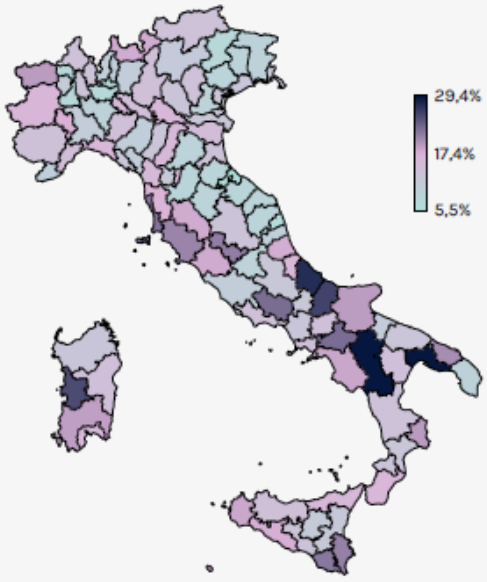
Figure 22 Transition risk: firms and employees by risk classes; Cerved: (2022); "Rapporto Italia Sostenibile"

Creved's analysis were undertaken on the 2020 financial statements of a sample of 682 thousand enterprises, which employ almost ten million people and are exposed to more than 924 billion euros with lending institutions, to examine in depth the susceptibility of companies to transition risk. A share of 8.4 percent (57,498 enterprises) of these companies engages in high-risk operations (high or very high), with almost 1.3 million people employed (12.5 percent of the total) and a *financial debt exposure* of more than 285 billion (30.8 percent of the total). The number of companies classified as medium risk is around 130 thousand (19.1%), with 2.6 million workers (26.1%) and 231 billion in financial debt (25.0%). The minimal risk class accounts for 71.7 percent, whereas firms green (4,955) account for just 0.7 percent of companies and 2% of workers, while having the greatest average debt and incidence on overall debt exposure (6.7%).

	IMPRESE		SEDI LOCALI		DEBITI FINANZIARI	
Classe rischio transizione	Numero	%	Numero	%	Numero	%
Green	4.955	0,7%	200.203	2,0%	61.487.754	6,7%
Trascurabile	489.858	71,7%	5.917.310	59,3%	346.845.584	37,5%
Medio	130.501	19,1%	2.604.484	26,1%	230.909.325	25,0%
Alto e Molto Alto	57.498	8,4%	1.253.498	12,6%	285.282.963	30,9%
Totale	**682.812**		**9.975.495**		**924.525.626**	

Figure 23 Transition risk: firms, employees, and financial debt of corporations by risk classes; Cerved: (2022); "Rapporto Italia Sostenibile"

Analyzing the employment incidence of transition risk activities at a more disaggregated level reveals a higher exposure in some provinces in the South-Central region characterized by low production diversification and a strong specialization in high-risk activities such as automotive, steel, and petrochemicals. Potenza (29.4 percent of employees in high-risk transition activities), where the automotive sector is concentrated, and Taranto (29.3 percent), where steel is processed, are anticipated to bear the highest expenses of production reconversion in the coming years. Chieti (27.7 percent), Campobasso (26 percent), Avellino (22.8 percent), and Frosinone (22.9 percent) are the provinces with the highest incidence of the automotive sector, while Livorno (22.2 percent), Terni (21.5 percent), and Aosta (19.3%) are the provinces with the lowest incidence. Syracuse (21.3 percent) suffers from the petrochemical employment weight, whilst Ragusa (22 percent) and Grosseto (21.1 percent) score high for the high incidence of transition-risk businesses in the agricultural and animal sectors.



Le 15 province più esposte al rischio

	% ADDETTI A RISCHIO ALTO/MOLTO ALTO
Potenza	29,4%
Taranto	29,3%
Chieti	27,7%
Campobasso	26,0%
Oristano	25,4%
Frosinone	22,9%
Avellino	22,8%
Livorno	22,2%
Ragusa	22,0%
Terni	21,5%
Siracusa	21,3%
Grosseto	21,1%
Brindisi	20,4%
Aosta	19,3%
Crotone	19,2%

Figure 24 Transition risk; Cerved: (2022); "Rapporto Italia Sostenibile"

3. CLIMATE CHANGE IMPACT ON THE PERFORMANCE OF THE ENERGY AND INFRASTRUCTURE SECTOR: THE SAIPEM CASE

3.1 Research question and overview of climate change negative externalities on the sector

The energy and infrastructure service sector is critical to the global economy, offering assistance and solutions to fulfil the expanding demands. However, climate change has had a substantial influence on this sector, as the consequences of extreme weather events such as floods, droughts, temperature fluctuations, and seasonal shifts have a direct impact on its performance. Extensive scientific study has increasingly concentrated on determining the influence of climate change on corporate performance. *The fundamental research subject addressed is the importance of climate change's impact on businesses and how it might affect their financial and operational success.* Climate change can have a particularly large impact on the energy and infrastructure service providing sectors.

Floods may interrupt business, destroy infrastructure, and result in significant economic losses. Long-term droughts can restrict the supply of water required for corporate operations while also increasing energy expenses. Variations in temperature can have an impact on the performance and efficiency of equipment and systems, demanding additional expenditures in adaption measures. Seasonal fluctuations can disrupt demand and supply patterns, complicating resource planning and management. All of these challenges threaten the long-term viability and profitability of enterprises in the energy and infrastructure sectors. As a result, understanding the scope and impact of these climate risks on corporate performance is critical for developing effective risk management strategies and promoting industrial sustainability.

Addressing this study topic can give significant information for better climate risk management and the implementation of targeted steps to improve the resilience of enterprises in the energy and infrastructure service providing sector. This project seeks to contribute to the current body of information and help informed decision-making processes in the industry by investigating the impact of climate change on financial and operational indicators.

To achieve these objectives, a comprehensive study will be conducted that will include an examination of a company's historical business data, as well as an assessment of its financial

performance, operational indicators, and susceptibility to climate-related risks. The research will analyze the precise effects of extreme weather events such as floods, droughts, temperature fluctuations and seasonal changes on key performance indicators such as sales, operating expenses, profitability and other financial measures. The study will take a mixed-method approach, integrating quantitative analysis of financial data with qualitative insights gathered through articles and reports published by the company.

Finally, the results of this study will lead to a better understanding of the link between climate change and business performance in the energy and infrastructure service delivery sectors. The work seeks to provide significant insights to improve risk management techniques and promote sustainability in the sector by highlighting the problems and vulnerabilities encountered by these organizations.

3.2 Company overview

Saipem is a well-known global leader in the oil and gas industry's onshore and offshore engineering, construction, and drilling services. The firm has established itself as a prominent participant in the energy sector, with a strong presence in 72 countries and a diversified workforce of over 34,000 people from 122 different nationalities. Saipem's diverse portfolio comprises pipeline engineering, procurement, construction, and installation in both onshore and offshore locations.

The dedication to delivering outstanding projects via innovation is at the heart of Saipem's purpose, with the ambition of being the standard business for sustainable solutions. This vision is based on the company's principles, which stress creative intelligence, trust, caring for people and the environment, and enhancing cultural identities. The business strategy of Saipem is built on three fundamental pillars: maintaining a sustainable business founded on integrity, honesty, respect, inclusion, and transparency; prioritizing health and safety to ensure a safer and better future; and fostering innovation to meet global energy demand in a sustainable manner.

The firm is organized into four main sections, each of which serves a different area of the industry. The Engineering and Construction departments supervise all project phases, including engineering, procurement, construction, and installation, for both offshore and onshore projects. The Drilling divisions, on the other hand, are focused on delivering offshore and onshore

drilling services for oil and gas exploration and exploitation, as well as catering to deep-water and ultra-deep-water drilling requirements.

Recognizing the need for cost-effective and creative solutions, Saipem added a fifth division, Saipem Engineering High-Value Services, to its strategic strategy "Fit for the Future 2.0." This section is focused to satisfying the growing need for cutting-edge energy solutions.

Saipem continues to prosper, thanks to its remarkable results. Its sales in 2019 was 9.1 billion euros, while its investment in innovation was 79 million euros in the same year. In 2019, the corporation actively pursued patents and submitted 18 new patents. Furthermore, Saipem's backlog at the end of 2019 was 25 billion euros, showing a healthy pipeline of projects.

Saipem's persistent dedication to quality, innovation, and sustainability places it as an industry leader, with a focus on fulfilling ever-changing energy demands while honouring environmental and social obligations.

Saipem's presence in 72 countries, divided across continents and with multiple offices in many of these countries (34 in Europe, 25 in Africa, 2 in Oceania, 19 in the Americas, 13 in the Middle East, 10 in Asia, 19 in CIS), makes the company a very interesting case to study, as it is significantly vulnerable to the various extreme weather events that affect the various areas of the different continents. Furthermore, the diversity of Saipem's services, particularly those onshore and offshore, makes it vulnerable to a wide range of extreme weather events.

3.3 Methodology

The technique used in this research is a methodical strategy meant to untangle the subtle relationship between climate hazards and company performance during a four-year period, from 2017 to 2020. This analytical paradigm provides a thorough knowledge of the complex interaction between climate issues and financial results. The subsequent clarification outlines the essential procedural measures followed in the pursuit of this empirical inquiry.

First and foremost, the company's financial statements were meticulously curated, resulting in a comprehensive corpus of financial data ready for inspection. This temporal continuum,

spanning a quadrennial period, covers a crucial timeframe for successfully elucidating the dynamic evolution of financial performance and the gradual emergence of climatic variables.

Following that, the financial statements were reclassified in two stages, covering both the financial and economic sectors. The financial reclassification results in a recalibration of certain accounting entries, providing more clarity to the convoluted web of financial and investment interrelationships inherent in the company's activities. In tandem, the economic reclassification carefully categorizes accounting entries, allowing for a better understanding of the corporation's fundamental operational basis.

After careful reclassification, an elaborate tripartite study was conducted to methodically distinguish the multiple characteristics of solvency, liquidity and profitability. Solvency analysis, the very cornerstone of financial resilience, leads to a careful assessment of the company's long-term financial health, identifying potential capital structure adjustments as a result of emerging climate vulnerabilities. Liquidity analysis, the backbone of short-term fiscal resilience, examines the firm's inherent ability to meet immediate financial commitments, taking into account potential flows in cash management caused by climate fluctuations. Profitability analysis, arguably the pinnacle of financial accruals, tracks the company's profit potential relative to capital employed, taking into account the dense web of climatic factors that permeate operating expenses and revenue streams.

When these financial indicators are compared with the company's annual financial reports, an elaborate pattern emerges that articulates the increasing incorporation of climate risks into the company's mode of operation. The financial analysis that follows makes perceptible the company's growing strategies to incorporate climate risk factors into its fiscal and operational paradigm. This in-depth examination serves as a barometer, providing an empirical window into the extent to which these discussions have become increasingly integrated into the broader corporate strategy, potentially transforming performance metrics over the time horizon under consideration.

3.3.1 Balance Sheet and Income Statement: Financial and Economic Reclassification

BALANCE SHEET (Financial Reclassification)		31/12/2017
ASSET		
A - FIXED ASSETS		
I - TANGIBLE ASSETS		
	Fields	72
	Plants	196
	Machineries	4.165
	Industrial and commercial equipment	91
	Other goods	9
	Assets under costruction	48
	TOTAL I	**4.581**
II - INTANGIBLE ASSETS		
	Industrial and intellectual patents	18
	Concessions, licenses and trademarks	1
	Intangible assets under development	5
	Other intangible assets	2
	Goodwill	727
	TOTAL II	**753**
III - FINANCIAL ASSETS		
	Other financial assets	77
	Other financial activities	
	Government bonds	24
	Securities towards industrial firms	43
	Trade receivables	223
	Equity investments in subsidiaries, JVs and associated companies	142
	Other equity investments	1
	Tax credit	268
	Other assets	102
	TOTAL III	**880**
TOTAL FIXED ASSET		**6.190**
B - CURRENT ASSETS		
I - INVENTORY		
	Inventory	1.893
	TOTAL I	**1.893**
II - DEFERRED LIQUIDITY		
	Other financial negotiable or available assets:	
	Spain government bonds	2
	Trade receivables	1.785
	Financial receivables instrumental to operating activities	2
	Financial receivables not instrumental to operating activities	2
	Advances for services	233
	Other receivables	166
	IRES tax credit	213
	Tax credit	221
	Other activities	185
	TOTAL II	**2.809**
III - IMMEDIATE LIQUIDITY		
	Cash and equivalents	1.674
	TOTAL III	**1.674**
	TOTAL CURRENT ASSETS	6.376
TOTAL ASSET (A+B)		**12.590**

	LIABILITIES	
A - EQUITY		
	Equity and third parties reserve	41
	Share capital	2191
	Share premium reserve	1049
	Other reserve	-44
	Previous years profit	1786
	Profit (Loss)	-328
	Negative reserve for treasury shares in portfolio	-96
	TOTAL A	**4599**
B - NON CURRENT LIABILITIES		
	Long term financial liabilities	2929
	Provision for risk and charges	340
	Benefit provision for employees	199
	Non current tax liabilites	35
	Other tax liabilities	1
	TOTAL B	**3504**
C - CURRENT LIABILITIES		
	Short term financial liabilities	120
	Short term share of long term liabilities	69
	Trade and other payables	
	Trade payables	2179
	Payments on account and advances	1465
	Other liabilities	392
	IRES tax liabilities	47
	Tax liabilities	191
	Other current liabilities	24
	TOTAL C	**4487**
	TOTAL LIABILITIES (A+B+C)	**12590**

Figure 25 2017 Saipem Balance Sheet Financial Reclassification

BALANCE SHEET (Economic Reclassification)		31/12/2019
ASSET		
A - OPERATING ASSETS		
	Industrial and intellectual Patents (INT)	18
	Concessions, licenses and trademark (INT)	1
	Intangible assets under development (INT)	5
	Others intangible assets (INT)	2
	Goodwill (INT)	727
	Fields (TAN)	72
	Plants (TAN)	196
	Machineries (TAN)	4.138
	Industrial and commercial equipment (TAN)	91
	Others (TAN)	9
	Plants under construction (TAN)	48
	Inventory	1.893
	Trade receivables	2.409
	TOTALE A	**9.609**
B - EXTRAOPERATING ASSETS		
	Machineries	27
	Trade receivables	2
	Other financial assets	77
	Other securities toward industrial firms	43
	Equity investments in subsidiaries, joint ventures and associated	142
	Other equity investment	1
	Tax credit	268
	Other non current assets	102
	Government bonds	26
	Ires tax credit	213
	Other tax credit	221
	Other current activities	185
	TOTALE B	**1307**
C - LIQUIDITY STOCK		
	Cash & Equivalent	1.674
	TOTALE C	**1.674**
	TOTAL A+B+C	**12.590**

	LIABILITIES	
A - EQUITY		
	Equity and third parties reserve	41
	Share capital	2191
	Share premium reserve	1049
	Other reserve	-44
	Previous years profit	1786
	Profit (Loss)	-328
	Negative reserve for treasury shares in portfolio	-96
	TOTALE B	**4599**
B - FINANCIAL DEBT		
	Long term financial liabilities	2929
	Short term financial liabilities	69
	Other current liabilities	24
	Other non current liabilities	1
	Financial liabilities	120
	TOTALE B	**3143**
C - TRADE PAYABLES		
	Provision for risks & charges	340
	Benefit provision for employees	199
	Trade payables	4036
	Current IRES tax payables	47
	Non current IRES tax payables	35
	Current tax payables	191
	TOTALE C	**4848**
	TOTAL A+B+C	**12.590**

Figure 26 2017 Saipem Balance Sheet Economic Reclassification

INCOME STATEMENT (Financial Reclassification)	
Operating revenues:	
Revenues from sales and servi	9154
Change in work in progress co	-162
Change in advances	7
Indemnities	2
Contractual penalties	3
Operating costs:	
Purchases, services and other	-6558
Labours costs	-1618
Amortisation and depreciatio	-736
OPERATING INCOME	**92**
Ancillary revenues	34
EBIT	**126**
Net financial result	-223
Effect of valutation using equity method	-9
GROSS INCOME	**-106**
Tax charges	-201
NET INCOME	-307

Figure 27 2017 Saipem Income Statement Financial Reclassification

BALANCE SHEET (Financial Reclassification)			31/12/2018
ASSET			
A - FIXED ASSETS			
I - TANGIBLE ASSETS			
	Fields	67	
	Plants	182	
	Machineries	3.878	
	Industrial (and commercial) equipment	75	
	Others	7	
	Plants under construction	117	
	TOTAL I	**4.326**	
II - INTANGIBLE ASSETS			
	Industrial and intellectual Patents	23	
	Concessions, licenses and trademark	1	
	Intangible assets under development	9	
	Others intangible assets	2	
	Goodwill	667	
	TOTAL II	**702**	
III - FINANCIAL ASSETS			
	Other financial assets	76	
	Other securities toward industrial firms	64	
	Trade receivables	102	
	Equity investments in subsidiaries, joint ventures and associated com	119	
	Other equity investment	0	
	Tax credit	250	
	Other non current assets	67	
	Government bonds	22	
	TOTAL III	**700**	
TOTAL FIXED ASSET		**5.728**	
B - CURRENT ASSETS			
I - INVENTORY			
	Inventory	1.389	
	TOTAL I	**1.389**	
II - DEFERRED LIQUIDITY			
	Trade receivables	2.542	
	Ires tax credit	201	
	Other tax credit	117	
	Other current activities	100	
	TOTAL II	**2.960**	
III - IMMEDIATE LIQUIDITY			
	Cash & Equivalent	1.598	
	TOTAL III	**1.598**	
	TOTAL CURRENT ASSETS	5.947	
TOTAL ASSET (A+B)		**11.675**	

LIABILITIES		
A - EQUITY		
	Equity and third parties reserve	74
	Share capital	2191
	Share premium reserve	553
	Other reserve	-124
	Previous years profit	1907
	Profit (Loss)	-472
	Negative reserve for treasury shares in portfolio	-95
	TOTAL A	**4034**
B - NON CURRENT LIABILITIES		
	Long term financial liabilities	2646
	Provision for risks & charges	330
	Benefit provision for employees	208
	Non current IRES tax payables	18
	Other non current liabilities	9
	TOTAL B	**3211**
C - CURRENT LIABILITIES		
	Financial liabilities	80
	Short term financial liabilities	225
	Trade payables and others:	
	Trade payables	2674
	Prepayments and advances	1205
	Current IRES tax payables	46
	Current tax payables	108
	Other current liabilities	92
	TOTAL C	**4430**
	TOTAL LIABILITIES (A+B+C)	**11675**

Figure 28 2018 Saipem Balance Sheet Financial Reclassification

BALANCE SHEET (Financial Reclassification)			31/12/2018
ASSET			
A - OPERATING ASSETS			
	Industrial and intellectual Patents (INT)	23	
	Concessions, licenses and trademark (INT)	1	
	Intangible assets under development (INT)	9	
	Others intangible assets (INT)	2	
	Goodwill (INT)	667	
	Fields (TAN)	67	
	Plants (TAN)	182	
	Machineries (TAN)	3.878	
	Industrial and commercial equipment (TAN)	75	
	Others (TAN)	7	
	Plants under construction (TAN)	117	
	Inventory	1.389	
	Trade receivables	2.612	
	TOTALE A	**9.029**	
B - EXTRAOPERATING ASSETS			
	Machineries	0	
	Trade receivables	32	
	Other financial assets	76	
	Other securities toward industrial firms	64	
	Equity investments in subsidiaries, joint ventures and associated con	119	
	Other equity investment	0	
	Tax credit	250	
	Other non current assets	67	
	Government bonds	22	
	Ires tax credit	201	
	Other tax credit	117	
	Other current activities	100	
	TOTALE B	**1048**	
C - LIQUIDITY STOCK			
	Cash & Equivalent	1.598	
	TOTALE C	**1.598**	
	TOTAL A+B+C	**11.675**	

LIABILITIES			
A - EQUITY			
	Equity and third parties reserve	74	
	Share capital	2191	
	Share premium reserve	553	
	Other reserve	-124	
	Previous years profit	1907	
	Profit (Loss)	-472	
	Negative reserve for treasury shares in portfolio	-95	
	TOTAL	**4034**	
B - FINANCIAL DEBT			
	Long term financial liabilities	2646	
	Short term financial liabilities	225	
	Other current liabilities	92	
	Other non current liabilities	9	
	Financial liabilities	80	
	TOTAL	**3052**	
C - TRADE PAYABLES			
	Provision for risks & charges	330	
	Benefit provision for employees	208	
	Trade payables	3879	
	Current IRES tax payables	46	
	Non current IRES tax payables	18	
	Current tax payables	108	
	TOTAL	**4589**	
	TOTAL LIABILITIES (A+B+C)	**11.675**	

Figure 29 2018 Saipem Balance Sheet Economic Reclassification

INCOME STATEMENT (Financial Reclassification)	
Operating revenues:	
Revenues from sales and services	8526
Indemnities	1
Contranctual penalties	0
Operating costs:	
Purchases, services and other costs	-6110
Labour cost	-1522
Amortisation and depreciation	-811
OPERATING INCOME	**84**
Ancillary revenues	11
EBIT	**95**
Net financial result	-165
Effect of valuating using equity method	-87
Other income (expenses) from equity investment	-1
GROSS INCOME	**-158**
Tax charges	-194
NET INCOME	-352

Figure 30 2018 Saipem Income Statement Financial Reclassification

BALANCE SHEET (Financial Reclassification)		31/12/2019
ASSET		
A - FIXED ASSETS		
I - TANGIBLE ASSETS		
	Fields	67
	Plants	1.104
	Machineries	11.750
	Industrial (and commercial) equipment	545
	Other goods	108
	Plants under construction	187
	Plants accomulated depreciation	-942
	Machineries accumulated depreciation	-8.097
	Industrial (and commercial) equipment accumulated depreciation	-474
	Other goods accumulated depreciation	-99
	Plants under construction provision	-20
	TOTAL I	**4.129**
II - INTANGIBLE ASSETS		
	Development cost	8
	Industrial and intellectual patents	213
	Concessions, licenses and trademarks	17
	Intangible immobilization under development	5
	Others intangible assets	11
	Goodwill	667
	Development cost accumulated depreciation	-8
	Industrial and intellectual patents accumulated depreciation	-190
	Concessions, licenses e marchi accumulated depreciation	-16
	Others intangible assets accumulated depreciation	-9
	Leasing right of use	584
	TOTAL II	**1.282**
III - FINANCIAL ASSETS		
	Equity investments in subsidiaries, JVs and associated companies	133
	Other financial assets	69
	Financial assets on Right of use	8
	Tax credit	297
	Ires tax credit	24
	Other assets	54
	Investment in subsidiaries	1
	Other securities towards industrial firms	68
	Governments securities	7
	Trade receivables	63
	TOTAL III	**724**
TOTAL FIXED ASSET		**6.135**
B - CURRENT ASSETS		
I - INVENTORY		
	Inventory	303
	Contractual assets (and inventories)	1.028
	TOTAL I	**1.331**
II - DEFERRED LIQUIDITY		
	Other financial activities	180
	Financial assets on Right of use	8
	Trade receivables	2.181
	Advances for services	220
	Other receivables	137
	Ires tax credit	251
	other tax credit	167
	other activities	115
	Governments securities	12
	TOTAL II	**3.271**
III - IMMEDIATE LIQUIDITY		
	Cash & equivalent	2.272
	TOTAL III	**2.272**
	TOTAL CURRENT ASSETS	**6.874**
TOTAL ASSET (A+B)		**13.009**

LIABILITIES		
A - EQUITY		
	Equity and third parties reserve	93
	Share capital	2191
	Share premium reserve	553
	Other reserve	-24
	Previous years profit	1395
	Profit (Loss)	12
	Negative reserve for treasury shares in portfolio	-95
	TOTAL A	**4125**
B - NON CURRENT LIABILITIES		
	Long term financial liabilities	2670
	Long term leasing liabilities	477
	Provision for risks & charges	253
	Benefit provision for employees	246
	Non current IRES tax payables	27
	Non current tax payables	6
	Other non current liabilities	1
	TOTAL B	**3680**
C - CURRENT LIABILITIES		
	Short term financial liabilities	164
	Short term share of long term liabilities	244
	Short term leasing liabilities	149
	Trade payables	2528
	Current contractual payables	1848
	Current IRES tax payables	87
	Other current tax payables	139
	Other current liabilities	45
	TOTAL C	**5204**
	TOTAL LIABILITIES (A+B+C)	**13009**

Figure 31 2019 Saipem Balance Sheet Financial Reclassification

BALANCE SHEET (Economic Reclassification)		31/12/2019
ASSET		
A - OPERATING ASSETS		
	Industrial and intellectual Patents (INT)	23
	Concessions, licenses and trademark (INT)	1
	Intangible assets under development (INT)	5
	Others intangible assets (INT)	2
	Goodwill (INT)	667
	Fields (TAN)	67
	Plants (TAN)	162
	Machineries (TAN)	3.653
	Industrial and commercial equipment (TAN)	71
	Others (TAN)	9
	Plants under construction (TAN)	167
	Inventory	303
	Prepayments	1028
	Trade receivables	2.244
	Advances for services	220
	Other receivables	137
	Leasing of Right of Use	584
	Financial assets on Right of use	16
	TOTALE A	**9.359**
B - EXTRAOPERATING ASSETS		
	Equity investments in subsidiaries, joint ventures and associated com	133
	Other financial assets	69
	Tax credit	297
	Ires tax credit	24
	Other assets	54
	Investment in subsidiaries	1
	Other securities towards industrial firms	68
	Other financial activities	180
	Ires tax credit	251
	other tax credit	167
	other activities	115
	Governments securities	19
	TOTALE B	**1.378**
C - LIQUIDITY STOCK		
	Cash & Equivalent	2.272
	TOTALE C	**2.272**
	TOTAL A+B+C	**13.009**

	LIABILITIES	
A - EQUITY		
	Equity and third parties reserve	93
	Share capital	2191
	Share premium reserve	553
	Other reserve	-24
	Previous years profit	1395
	Profit (Loss)	12
	Negative reserve for treasury shares in portfolio	-95
	TOTALE	**4125**
B - FINANCIAL DEBT		
	Long term financial liabilities	2670
	Long term leasing liabilities	477
	Short term financial liabilities	244
	Short term leasing liabilities	149
	Other non current liabilities	1
	Financial liabilities	164
	TOTALE	**3705**
C - TRADE PAYABLES		
	Provision for risks & charges	253
	Benefit provision for employees	246
	Trade payables	2528
	Current IRES tax payables	87
	Non current IRES tax payables	27
	Current tax payables	139
	Non current tax payables	6
	Current contractual payables	1848
	Other current tax payables	45
	TOTALE	**5179**
	TOTAL A+B+C	**13.009**

Figure 32 2019 Saipem Balance Sheet Economic Reclassification

INCOME STATEMENT (Financial Reclassification)	
Operating revenues:	
Revenues for E&C and Drilling	9099
Operating costs:	
Purchases, services and other	-6240
Labour costs	-1670
Amortisation and depreciatior	-752
OPERATING INCOME	437
Ancillary revenues	19
EBIT	456
Net financial result	-210
Effect of valuation using the equity method	-18
GROSS INCOME	228
Tax charges	-130
NET INCOME	98

Figure 33 2019 Saipem Income Statement Financial Reclassification

BALANCE SHEET (Financial Reclassification)			31/12/2020
ASSET			
A - FIXED ASSETS			
I - TANGIBLE ASSETS			
	Fields	51	
	Plants	124	
	Machineries	2.889	
	Industrial and commercial equipment	68	
	Other goods	9	
	Assets under costruction	143	
	TOTAL I	**3.284**	
II - INTANGIBLE ASSETS			
	Industrial and intellectual patents	25	
	Intangible assets under development	8	
	Other intangible assets	2	
	Goodwill	666	
	Leasing right of use	288	
	TOTAL II	**989**	
III - FINANCIAL ASSETS			
	Cash and equivalents (blocked bank accounts)	3	
	Government bonds	7	
	Securities towards industrial firms	61	
	Financial assets for leasing	51	
	Equity-accounted investments:		
	Equity investements in Joint Ventures	89	
	Equity investements in associated firms	77	
	Tax credit	240	
	IRES tax credit	20	
	Other financial assets	66	
	Other financial assets	35	
	TOTAL III	**649**	
TOTAL FIXED ASSET (A)		**4.922**	
B - CURRENT ASSETS			
I - INVENTORY			
	Inventory	280	
	Contractual assets (and inventories)	1.295	
	TOTAL I	**1.575**	
II - DEFERRED LIQUIDITY			
	Financial assets for leasing	16	
	Trade and other receivables		
	Trade receivables	1.663	
	Advances for services	199	
	Other credits	129	
	IRES tax credit	243	
	Tax credit	189	
	Other current assets	298	
	Other current financial assets	344	
	TOTAL II	**3.081**	
III - IMMEDIATE LIQUIDITY			
	Cash and equivalents	1.684	
	TOTAL III	**1.684**	
	TOTAL CURRENT ASSETS (B)	6.340	
TOTAL ASSET (A+B)		**11.262**	

	LIABILITIES	
A - EQUITY		
	Equity and third parties reserve	25
	Share capital	2191
	Share premium reserve	553
	Other reserve	14
	Previous years profit	1387
	Profit (Loss)	-1136
	Negative reserve for treasury shares in portfolio	-86
	TOTAL A	**2948**
B - NON CURRENT LIABILITIES		
	Long term financial liabilities	2577
	Long term financial liabilities for leasing	270
	Provision for risk and charges	295
	Benefit provision for employees	237
	Tax payables	6
	IRES tax payables	24
	Other liabilities	2
	TOTAL B	**3411**
C - CURRENT LIABILITIES		
	Short term financial liabilities	257
	Short term share of long term financial liabilitie	201
	Short term share of long term liabilities for leas	151
	Trade and other payables	
	Trade payables	2193
	Other payables	270
	Contractual liabilities	1616
	IRES tax payables	44
	Tax payables	136
	Other current liabilities	35
	TOTAL C	**4903**
	TOTAL LIABILITIES (A+B+C)	**11262**

Figure 34 2020 Saipem Balance Sheet Financial Reclassification

BALANCE SHEET (Economic Reclassification)			31/12/2020
ASSET			
A - OPERATING ASSETS			
	Industrial patents and intellectual property rights	25	
	Assets under construction and advances	8	
	Other intangible assets	2	
	Goodwill	666	
	Fields	51	
	Plants	124	
	Machineries	2.889	
	Industrial and commercial equipment	68	
	Other assets	9	
	Assets under construction and advances	143	
	Inventory	1.575	
	Trade and other receivables	1.991	
	other assets (long + short term)	333	
	right to use leased assets	288	
	Financial assets for leasing (long term + short term)	67	
		TOTALE A	**8.239**
B - EXTRAOPERATING ASSETS			
	securities issued by industrial companies	61	
	Other current income tax assets + Other current tax assets	432	
	Other non-current financial assets	66	
	Quota securities issued by sovereign states	7	
	Other current financial assets	344	
	investments accounted for using the equity method	166	
	deferred tax assets	240	
	income tax assets	20	
		TOTALE B	**1.336**
C - LIQUIDITY STOCK			
	Cash & Equivalent	1.687	
		TOTALE C	**1.687**
	TOTAL A+B+C		**11.262**

LIABILITIES			
A - EQUITY			
	Equity and third parties reserve	25	
	Share capital	2191	
	Share premium reserve	553	
	Other reserve	14	
	Previous years profit	1387	
	Profit (Loss)	-1136	
	Negative reserve for treasury shares in portfolio	-86	
		TOTALE B	**2948**
B - FINANCIAL DEBT			
	Long term financial liabilities	2577	
	Short term financial liabilities	257	
	Other current liabilities	35	
	Other non current liabilities	2	
	quote a breve della passività a lungo + quota a breve passività	352	
	contractual liabilities	1616	
	financial liabilities for long-term leases	270	
		TOTALE B	**5109**
TRADE PAYABLES			
	Provision for risks & charges	295	
	Benefit provision for employees	237	
	Trade payables	2463	
	Current IRES tax payables	44	
	Non current IRES tax payables	24	
	Current tax payables	136	
	deferred tax liabilities	6	
		TOTALE C	**3205**
	TOTAL A+B+C		**11.262**

Figure 35 2020 Saipem Balance Sheet Economic Reclassification

INCOME STATEMENT (Financial Reclassification)	
Revenues from ordinary activities	7351
Other revenues and income	
Operating costs:	
Purchases, services and other costs	-5347
Reversal of net impairment losses (write-downs) on trade and other re	-7
labour costs	-1625
depreciation and amortisation	-1273
other operating income (expenses)	-1
OPERATING INCOME	-902
Ancillary revenues	57
EBIT	-845
Financial income	465
Financial expenses	**-691**
derivative instruments	60
Extraordinary income	37
GROSS INCOME	-974
Tax charges	-143
NET INCOME	-1117

Figure 36 2020 Saipem Income Statement Financial Reclassification

3.3.2 Solvency Analysis

Solvency analysis is an important lens for assessing the influence of climate change on a company's overall performance. It gives a comprehensive picture of a company's long-term financial resilience and ability to tackle the challenges posed by climate change. This research is especially pertinent in the context of climate change since it examines a company's ability to absorb possible shocks and adapt to a changing environment over a long time horizon.

When examining the impact of climate change on a company's performance, several indices under the Solvency Analysis framework merit careful attention. These indexes provide information on a company's financial structure, leverage, and sustainability, all of which are important in the face of climate-related uncertainty.

Looking at Figure 39, we may examine the solvency analysis for the whole time horizon in question, thinking considerations that potentially link these statistics to the impact of climate change:

❖ ***2017:***

- *Primary Structure Index (0.74):* Indicates a reasonable equity basis compared to long-term debt, implying a reasonably sound financial foundation, albeit the value may rise if the latter is less than unity. Climate change may result in unforeseen costs, and a strong equity foundation may assist the corporation overcome these obstacles.

- *Secondary Structure Index (1.30):* The ratio of equity to long-term debt demonstrates adaptability. As the effects of climate change grow more obvious, financial flexibility becomes crucial in order to respond to unanticipated expenditures.

- *Degree of Asset rigidity (49%):* A substantial share of fixed assets may suggest stability. However, determining their resilience to climate-related disturbances is crucial. Climate change has the potential to disrupt infrastructure and operational stability.

- *Liquidity Indicators (0.36 and 0.13)* demonstrate the company's ability to satisfy short-term obligations. Unpredictable expenditures due to weather disasters necessitate readily available finances for swift actions.

- *Inventory Indicator (0.15),* which indicates an acceptable inventory turnover rate. Weather-related supply chain disruptions might have an impact on inventory management.

- *Debt Ratio: The overall debt ratio (1.74) and financial debt ratio* (*68%)* represent the financial leverage of the organization. A low degree of debt can give flexibility in dealing with unanticipated climate-related expenditures.

❖ ***2018 - 2020:***

- *Decline in Primary Structure Ratio:* A decrease over time (*from 0.70 in 2018 to 0.60 in 2020*) might imply that the company's long-term debt relative to equity has grown. This might be attributed to a number of things, including greater investment in climate adaption methods.

- *Secondary Structure Ratio stability:* Despite minor oscillations, the secondary structure ratio stays *steady*. Maintaining this equilibrium is critical in order to tackle the financial difficulties provided by climate disasters.

As we have seen throughout the paper, a crucial indicator for analyzing the impact of climate change is that of the company's assets, which is why it is important to investigate the performance of this ratio through time and try to understand the causes behind it:

- *Degree of Asset rigidity (47% - 44%):* The degree of asset rigidity continually declines in successive years. This indicates a trend toward a more adaptable asset structure. Although a drop may appear concerning, it may indicate a purposeful decision to have a greater share of liquid assets, which might be essential for responding rapidly to unforeseen weather occurrences. The reduction in asset stiffness might be symptomatic of the company's attempts to strengthen its capacity to react to changing conditions, such as those caused by climate change. The firm may be better positioned to satisfy urgent financial demands originating from climate-related disruptions if it has a more balanced asset structure that includes a larger share of liquid assets. This trend is consistent with businesses' larger realization of the need to be agile and responsive in the face of uncertain and potentially

disruptive occurrences like extreme weather, which can be worsened by climate change. Increased liquidity and a more adaptable capital structure may assist the organization in mitigating the financial effect of climate-related difficulties. Finally, the consistent decrease in the "degree of asset rigidity" over time implies that the organization is making a concerted effort to retain financial flexibility, which is crucial for properly managing the effects of climatic disasters.

- *Total Liquidity Indicator rises:* The total liquidity indicator rises with time (*from 0.390 in 2018 to 0.423 in 2020*). The increase in liquidity may point to a more proactive strategy to dealing with climate-related disruptions.

- *Debt Ratio rises:* The overall debt ratio rises considerably (*from 1.89 in 2018 to 2.82 in 2020*), possibly as a result of financial efforts to boost climate resilience. The financial debt ratio rises as well (*from 73% in 2018 to 103% in 2020*), indicating a higher reliance on debt, maybe for climate adaption measures.

- *Financial Dependency* has increased (*from 65 percent in 2018 to 74 percent in 2020*), indicating a higher need for external finance to manage climate threats. Looking at *Figure 37*, it is possible to understand how, from 2017 to 2020, the financial dependence (which can be computed as a ratio between the Current Liabilities and Non-Current Liabilities out of Invested Capital) grows year by year: by breaking down the same index, moreover, it is possible to show that while the *non-current financial dependence* grows by only *2%*, the *current financial dependence* grows by *12%*. Considering the mentioned growth and comparing it with the constant trend of the *total liquidity indicator*, a perpetual deterioration of the solvency of short-term bonds can be expected. The situation is even worse when considering the *immediate liquidity indicator* which purifies the previous index from the inventory. *Figure 38* explains why it is important to understand whether Saipem is able to satisfy its short-term creditors throughout the liquidity analysis, that will be computed during the next paragraph.

These shifts over time may represent the company's growing awareness of climate consequences. Rising debt, liquidity, and dependency ratios indicate efforts to address the financial consequences of climate change. Long-term debt may signify investments in sustainable solutions, but increased liquidity may suggest stronger reactivity to climatic disasters.

To summarize, these indices demonstrate the evolution of financial strategies in response to the difficulties and possibilities given by climate change.

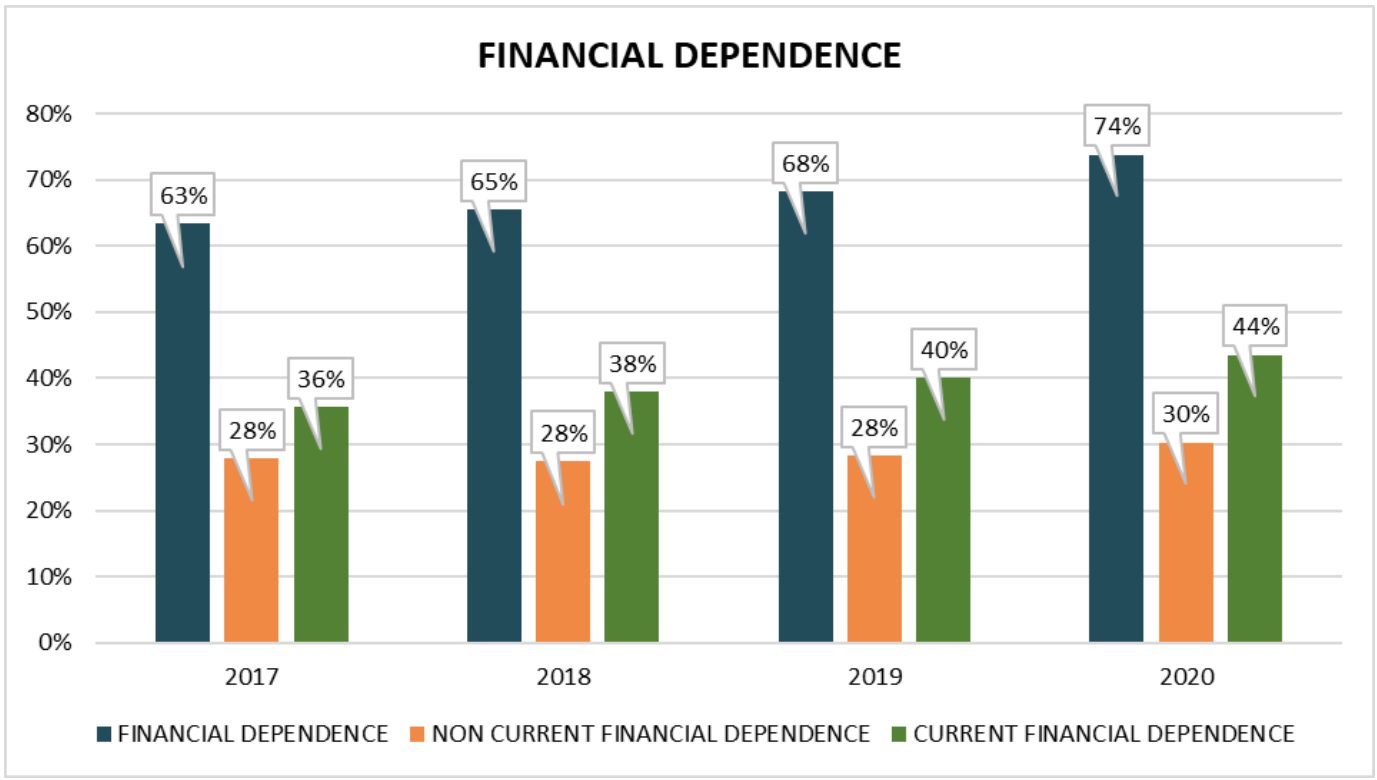


Figure 37 Saipem Financial Dependence

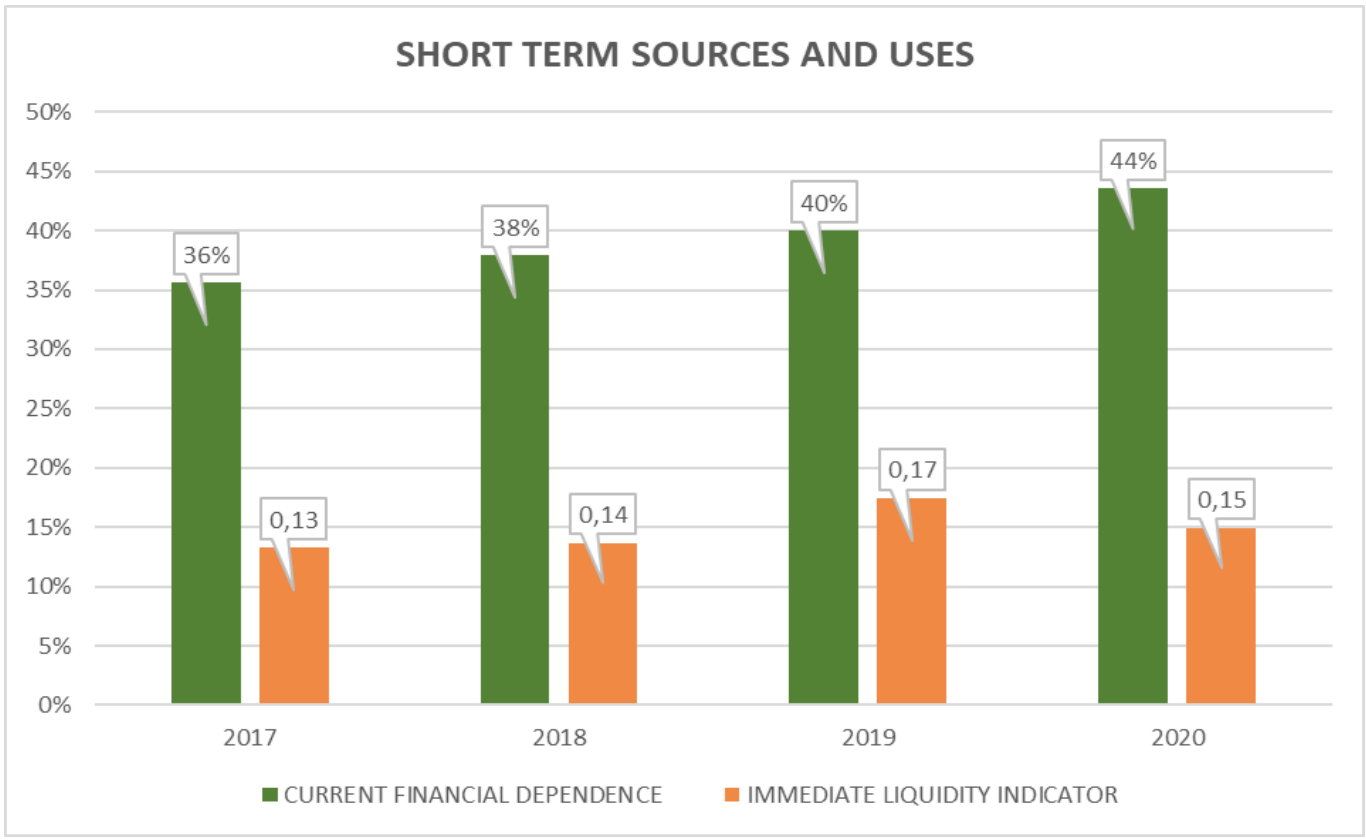


Figure 38 Saipem Short Term Sources and Uses

2017	
Primary structure ratio	0,74
Secondary structure ratio	1,30
degree of rigidity of assets	49%
tot liquidity indicator	0,36
Immediate liquidity indicator	0,13
inventory indicator	0,15
tot debt ratio	1,74
medium-long term	0,76
short-term debt	0,98
financial debt ratio	68%
financial dependence	63%
non curr. financial dependence	28%
curr. financial dependence	36%

2018	
Primary structure ratio	*0,70*
secondary structure ratio	*1,265*
degree of rigidity of assets	*49%*
tot liquidity indicator	*0,390*
Immediate liquidity indicator	*0,14*
inventory indicator	*0,119*
tot debt ratio	*1,89*
medium-long term	*0,80*
short-term debt	*1,10*
financial debt ratio	*73%*
financial dependence	*65%*
non curr. financial dependence	*28%*
curr. financial dependence	*38%*

2019	
Primary structure ratio	*0,67*
secondary structure ratio	*1,272*
degree of rigidity of assets	*47%*
tot liquidity indicator	*0,430*
Immediate liquidity indicator	*0,17*
inventory indicator	*0,102*
tot debt ratio	*2,15*
medium-long term	*0,89*
short-term debt	*1,26*
financial debt ratio	*75%*
financial dependence	*68%*
non curr. financial dependence	*28%*
curr. financial dependence	*40%*

2020	
Primary structure ratio	0,60
secondary structure ratio	1,292
degree of rigidity of assets	44%
tot liquidity indicator	0,423
Immediate liquidity indicator	0,15
inventory indicator	0,140
tot debt ratio	2,82
medium-long term	1,16
short-term debt	1,66
financial debt ratio	103%
financial dependence	74%
non curr. financial dependence	30%
curr. financial dependence	44%

Figure 39 Saipem Solvency Analysis

3.3.3 Liquidity Analysis

Liquidity Analysis is critical in determining an organization's capacity to satisfy short-term financial obligations. Liquidity Analysis gives insights into a company's financial resilience and capacity to resist and recover from climate-related disruptions while analyzing the influence of climate change on its performance. Connecting Liquidity Analysis indices to the influence of climate change on a company's performance entails understanding how these ratios represent the company's capacity to manage financial issues caused by climate-related disruptions.

Looking at Figure 40, we may examine the liquidity analysis for the whole-time horizon in question, thinking considerations that potentially link these statistics to the impact of climate change:

❖ ***2017***

- *Current Ratio (1.42):* The corporation had 1.42 times greater current assets than current liabilities. This suggests a strong liquidity position to meet short-term financial obligations, which might be critical during climate-related disruptions that influence cash flows or operating expenses.

- *Quick Ratio (1.00):* A quick ratio of 1.00 indicates that the company's most liquid assets might be used to satisfy its short-term commitments. This means a balanced approach to dealing with possible climate-related financial difficulties.

- *Cash Ratio (37%):* With a cash ratio of 37%, the corporation covered a significant chunk of its current liabilities with cash. This demonstrates a good financial position, which is useful for addressing unplanned costs caused by weather disasters.

❖ ***2018***

- *Current Ratio (1.34)*: A minor drop in the current ratio might reflect changes in asset-liability mix, such as investments in climate-resilient infrastructure or dealing with climate-related difficulties.

- *Quick Ratio (1.03):* An increase in the quick ratio indicates an improved capacity to meet urgent commitments, maybe as a result of effective cash management in the face of climate-related concerns.

- *Cash Ratio (36% of total assets):* A stable cash ratio demonstrates the company's continuous good liquidity position, which is critical for responding to climatic events that may result in increased expenses or revenue interruptions.

❖ ***2019***

- *Current Ratio (1.32):* The current ratio's decline might be attributable to changes in asset composition or strategy adjustments, which could be impacted by the company's reaction to climate change.

- *Quick Ratio (1.07):* An increase in the quick ratio indicates increased short-term liquidity. This might be attributed to preventive actions made to mitigate anticipated operational issues caused by climate change.

- *Cash Ratio (44%):* The greater cash ratio represents a larger cash buffer, which may be advantageous during periods of financial instability caused by weather catastrophes.

❖ ***2020***

- *Current Ratio (1.29):* The falling current ratio may suggest changes in the asset-liability structure, which may be impacted by variables such as climate adaptation or mitigation initiatives.

- *Quick Ratio (0.97):* A reduction in the quick ratio indicates a considerably reduced liquidity position for urgent commitments, which might be ascribed to changes in cash management practices, potentially influenced by climate concerns.

- *Cash Ratio (34%):* A fall in the cash ratio may indicate a decline in cash liquidity, which may be the outcome of capital allocation to climate-resilient initiatives.

In conclusion, changes in these liquidity ratios over time may be indicative of the company's dynamic reaction to climate-related difficulties. Liquidity ratio adjustments might represent the company's attempts to preserve financial resilience, manage operational risks, and handle uncertainties provided by changing weather circumstances. Moreover, on top of that, we

illustrate that the *current ratio*, which is greater than one but less than two, indicates that it is critical to look at the *quick ratio* to completely evaluate the company's capacity to satisfy short-term liabilities. The mentioned ratio of *1.07* can be regarded as adequate. At the same time, it is critical to evaluate if current liabilities are appropriately financed and balanced between Immediate Liquidity and Deferred Liquidity: the *cash ratio* indicates that Current Liabilities are funded with Deferred Liquidity more than Immediate Liquidity, indicating a liquidity structure mismatch. All of this increases the likelihood of being unable to fulfil the negative externalities generated by climate risk.

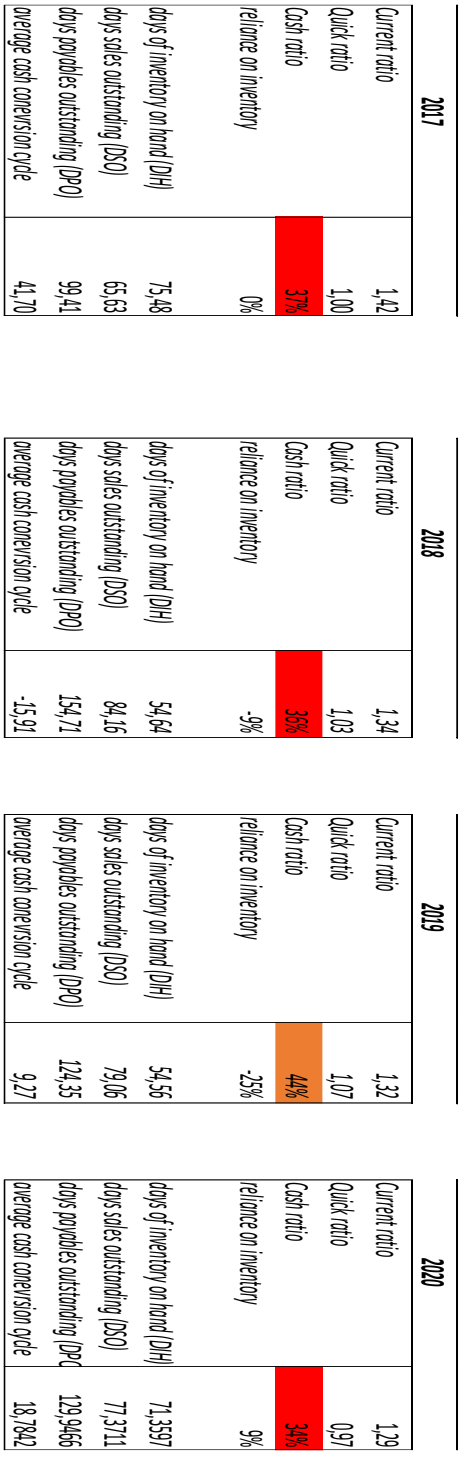


Figure 40 Saipem Liquidity Analysis

3.3.4 Profitability Analysis

Profitability analysis is critical in determining the impact of climate change on a company's performance because it offers a complete picture of the impact of extreme weather occurrences on operational and financial operations. Profitability analysis indices assess a firm's efficiency and profitability by demonstrating how climate change may effect expenses, revenues, and the capacity of the company to make profits.

Furthermore, profitability analysis indices can assist in identifying how a firm is responding to climate threats through adaptation and mitigation efforts. A rise in adaptation-related expenditures, for example, might result in a loss in profit margins. Furthermore, the capacity of the organization to make revenues amid catastrophic weather events may represent its operational and strategic resilience.

Overall, profitability analysis may offer a detailed picture of how the organization is handling the financial consequences of climate change, highlighting the problems and possibilities associated with sustainability.

The profitability analysis data for the specified years gives useful insights into how extreme weather occurrences may have affected the company's financial performance and management initiatives (*Figure 45)*. Examine the important indicators and their fluctuations throughout time:

- ***ROE: (Figure 41)***

  Saipem's ROE averaged -12,73% over fiscal years 2017 and 2020.

  Looking back four years, the graph shows that it peaked in December 2019 at 2.4%, while the most recent twelve-month return on equity is -38%; the business environment for 2020 has been impacted by the Covid-19 outbreak and the resulting drop in energy prices. Indeed, the corporation reported a net loss of €1,14 million, compared to a net profit in 2019.

  According to the research done over four years (2017-2020), Saipem's ROE has fallen by 31,2 percentage points (going from -6,7% to -38%) beginning in 2019.

  Changes in the ratio throughout time:

  - ***2018***

  In 2018, equity (including minority interests) amounted to €4,036 million, compared to €4,599 million in 2017. Additionally, operating income decreased from €92 million to €84

million, resulting in an overall decrease of the ratio; the reduction reflected the negative effect of the period's net result. In 2018, the net income was €-354.

- ***2019 - 2020***

In 2020, equity (including non-controlling interests) was $2,948 million, down from $4,125 million in 2019 (a decrease of €1177 million), with a -306% decrease in operating income (from 437 to -902). This decrease reflects the period's loss (€117 million), dividend payments (€94 million), treasury share purchases (€16 million), and the negative effect of translating financial statements denominated in foreign currencies and other changes (€71 million), as offset by a change in the fair value of derivatives that hedge exchange-rate and commodity-price risks (€121 million).

The shifting energy environment as a result of climate concerns complicates Saipem's financial performance. The firm works in the energy industry, which is undergoing a revolution as a result of the need to address climate change. Energy price fluctuations, as shown in 2020, can be impacted by moves toward renewable energy sources, more regulation, and the potential consequences of catastrophic weather events on supply systems. Furthermore, the consequences of the pandemic on global energy consumption and supply chains highlight the interconnection of climate-related risks and economic concerns. Given these considerations, it is clear that Saipem's ROE changes over time are driven by a variety of external events such as the Covid-19 epidemic, energy market dynamics, and climate-related issues. The company's financial success reflects its capacity to adapt to these changing difficulties while attempting to chart a course toward a more sustainable and resilient future.

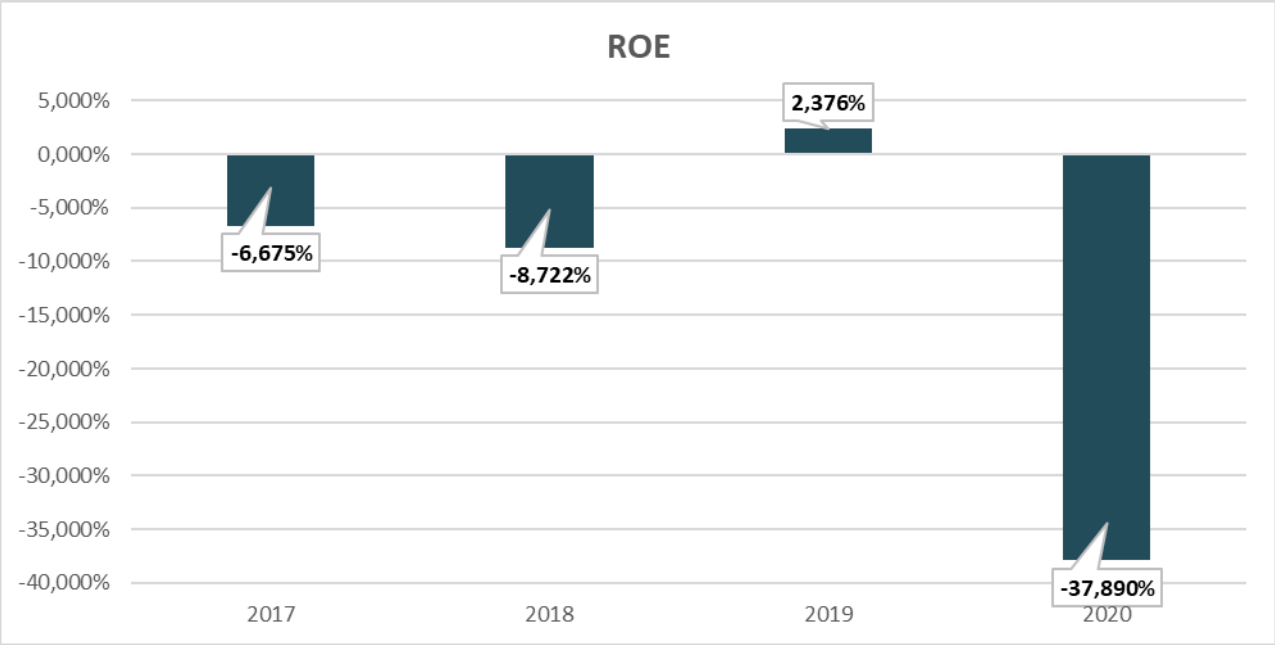


Figure 41 Saipem ROE

- ***ROI & RONAn: (Figure 42)***

  The Return on Investment (ROI) measure is a useful tool for determining how well a firm uses both its own capital and external finance. In the instance of Saipem, the average ROI between 2017 and 2020 was -0.91%. According to the graph, the ROI hit its peak in 2019, reaching at an amazing 10.45%. This notable accomplishment occurred during a year of strong success across all four divisions of the corporation. Surprisingly, 2019 was the only year in which Saipem not only had a positive result but also provided dividends to its stockholders. This increase in performance in 2019 was related to improved cost-of-sales efficiency, as seen by lower cost of sales for the Offshore E&C, Onshore E&C, and Offshore D divisions. In comparison to the baseline year 2017, the ROI decreased by 19.8 percentage points throughout the four-year period, reaching -17.92% in 2020. The ROI statistic measures a company's capacity to create profits from its primary business operations. ROI and another important indicator, Return on Net Assets (RONAn), may be compared convincingly. The latter gives information on the influence of non-recurring revenue on the overall performance of the firm. Surprisingly, RONAn outperformed ROI statistics in 2017, 2018, and 2019. This implies that Saipem's additional operational areas produced greater returns than its core business operations. In contrast, the year 2020 saw a transition in which RONAn fell below ROI. This change suggests that the core operational area achieved substantially better profits this year.

Several insights arise when analyzing the impact of climate change on various financial variables.

The good increase in ROI in 2019 can be ascribed in part to the year's generally improved business climate. However, climate change and the energy shift are likely to have played an influence. Saipem's commitment to sustainable practices, such as renewable energy and technology advancements, may have contributed to its better performance. In contrast, the significant fall in ROI in 2020, caused by pandemic and energy market shocks, demonstrates the energy industry's intrinsic sensitivity to external shocks, particularly climate-driven shifts in energy demand.

Finally, Saipem's ROI and RONAn indicators reflect its financial health and operational efficiency. The swings seen over time are driven by a number of variables, including overall company performance, external market dynamics, and the developing energy landscape shaped by climate change concerns. The company's capacity to adjust to these complicated dynamics

will almost certainly play a crucial role in determining its financial resilience and sustainability in the coming years.

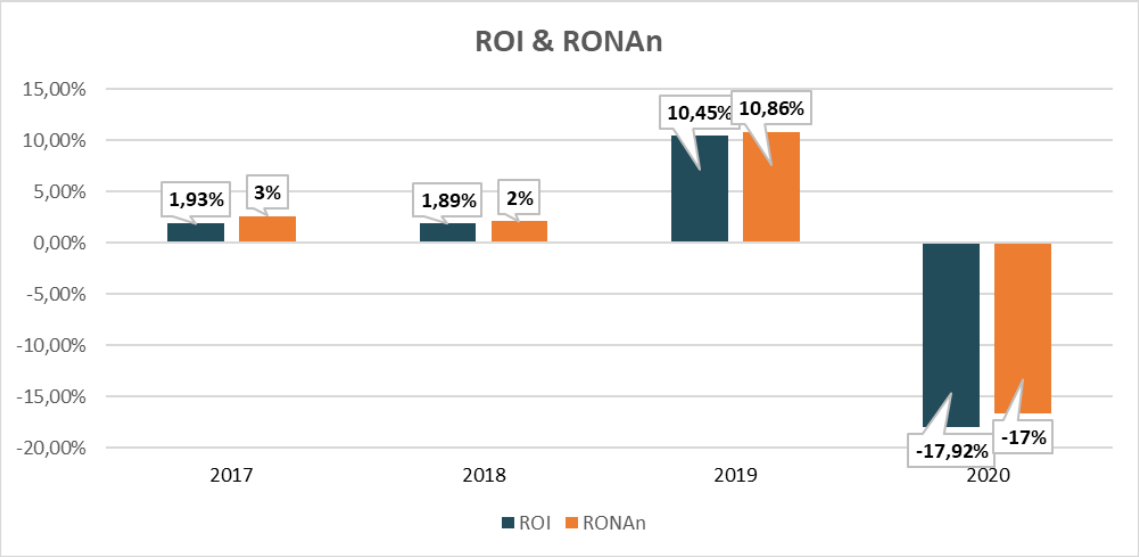


Figure 42 Saipem ROI & RONAn

- ***ROS: (Figure 43)***

  The Return on revenues (ROS) measure is an important indicator of how well a firm converts its revenues into profit. Examining Saipem's ROS over time reveals interesting facts. The ROS stayed generally steady at approximately 1% in 2017 and 2018. This consistency shows that the revenue's ability to pay operating expenditures was restricted (*look at Figure 44*), leaving little room for profit development. In 2019, Saipem had a large increase in ROS, which was a noteworthy shift. This was the only fiscal year throughout the examined period in which the corporation not only covered operational expenditures, but also additional charges and shareholder pay. This improvement is mostly due to a significant rise in operational revenues, which increased by 6.72% over the previous year. This rise in revenue resulted in better operating income and, as a result, a 5% ROS in 2019. However, the following year, 2020, saw a considerable decline in ROS of 12%. The firm encountered difficulties since its operating revenues were insufficient to meet not just operational expenditures but also financial, unusual, and non-recurring expenses. Furthermore, it fell short of providing stockholders with adequate pay. The negative consequence was caused by a significant decrease in turnover, as indicated by a significant decrease in both revenues and purchasing costs. This drop can be linked to the widespread impact of the COVID-19 pandemic, which caused a significant drop in global demand and consumption.

When these data are placed in the context of climate change, they reveal a complicated interaction. Climate change frequently adds to supply chain disruptions, altering production, demand patterns, and overall business operations. Climate change-related irregular weather patterns can cause logistical issues and operational disruptions. Storms, floods, and droughts may all have a direct influence on a company's capacity to run efficiently, influencing revenue creation and expense management. In Saipem's case, the increase in ROS in 2019 might be attributed to the company's efforts to align its operations with sustainable practices and renewable energy solutions. The company's initiatives to diversify its energy portfolio may have contributed to the revenue increase. The drop in ROS in 2020, on the other hand, underlines the susceptibility of enterprises, particularly those in the energy industry, to global shocks caused by climate-related disturbances.

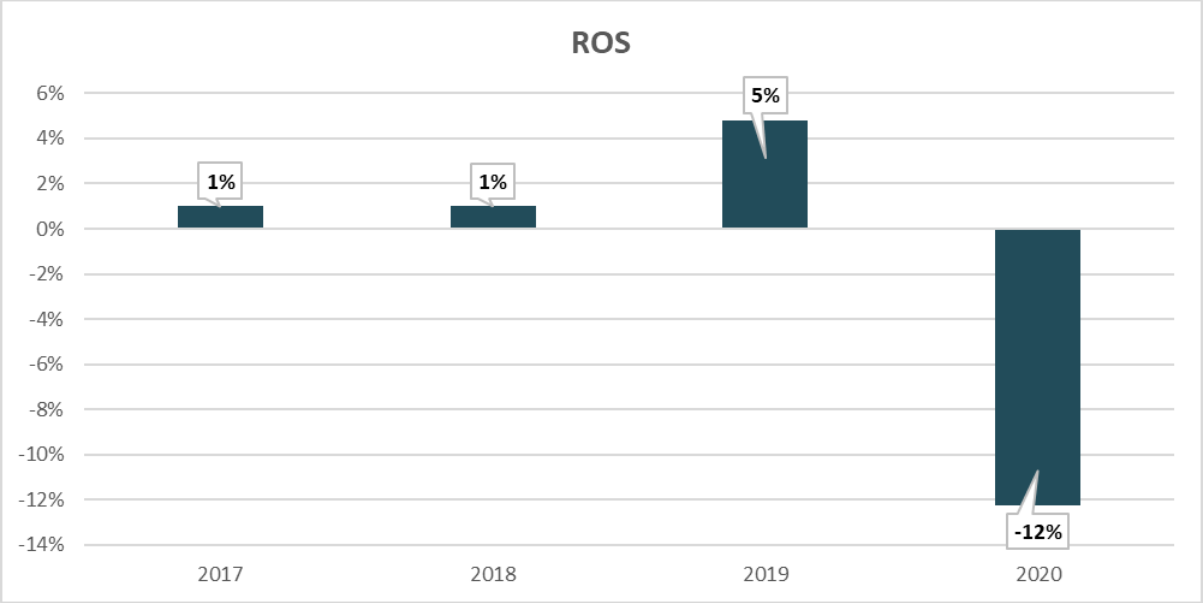


Figure 43 Saipem ROS

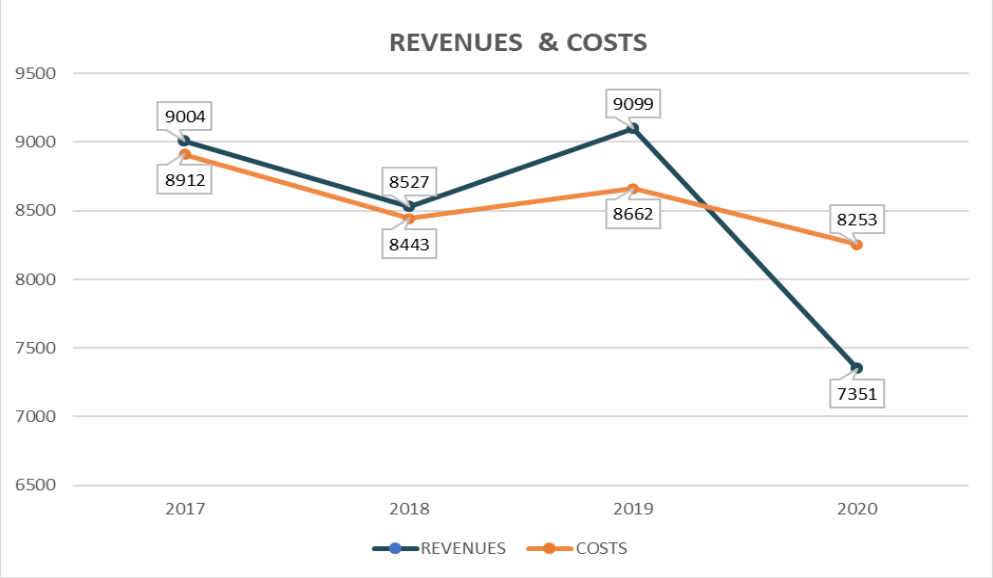


Figure 44 Saipem Revenues & Costs

analysed with ROI

2017	
ROI	1,93%
ROI*	1%
ROS	1,01%
CT	1,92
RONAn	3%
RONAi	2%
ROE	-6,68%
NET INVESTED CAPITAL	4761

2018	
ROI	1,89%
ROI*	1%
ROS	0,99%
CT	1,92
RONAn	2%
RONAi	0%
ROE	-8,72%
NET INVESTED CAPITAL	4440

2019	
ROI	10,45%
ROI*	5%
ROS	4,80%
CT	2,18
RONAn	10,86%
RONAi	10,43%
ROE	2,38%
NET INVESTED CAPITAL	4180,000

2020	
ROI	-17,92%
ROI*	-11%
ROS	-12,3%
CT	1,46
RONAn	-17%
RONAi	-19%
ROE	-38%
NET INVESTED CAPITAL	5034

Figure 45 Saipem Profitability Analysis

3.4 Evidence: relationship between financial analysis and climate information in Saipem Annual Financial Reports and Sustainability Reports

The extensive studies of solvency, liquidity, and profitability done give a multifaceted perspective of Saipem's financial performance from 2017 to 2020. When these financial measurements are compared to the climate-related data given in the company's annual reports over the same time period, they reveal deep interdependencies between financial success and the problems faced by climate change.

Beginning with the solvency study, which assesses the company's capacity to satisfy long-term obligations, we see a trend in some critical ratios. From 2017 through 2020, the primary and secondary structural ratios show consistent improvement. This indicates at Saipem's efforts to strengthen its financial structure and minimize its reliance on debt, which may have been driven by the need to negotiate climate-related concerns that might undermine the company's long-term viability. The rising rigidity of assets may also represent the company's caution in maintaining a strong financial position in the face of future climate-related disruptions.

Moving on to the liquidity analysis, the measures demonstrate Saipem's ability to adapt to changing conditions. The current and quick ratios show a steady tendency of retaining a liquidity buffer, which might be attributed to the recognition of climate-related operating risks. The need to navigate supply chain disruptions caused by extreme weather events or other climate-related factors could influence the company's attention to efficient working capital management, as evidenced by changes in days of inventory on hand, days sales outstanding, and days payables outstanding.

The profitability study reveals the influence of external variables on Saipem's earnings capacity, such as climate change and the COVID-19 pandemic. Changes in measurements like Return on Investment (ROI) and Return on Sales (ROS) are strongly related to changes in market dynamics. The positive ROI in 2019 coincides with the company's focus on sustainability and innovation and may reflect its attempts to move to more environmentally friendly methods. The negative trend in ROI in 2020, on the other hand, mimics the financial setbacks suffered during the pandemic, underscoring firms' susceptibility to global crises, which might be compounded by climate-related disasters.

Saipem's annual reports routinely highlight the company's dedication to sustainability, climate adaption, and innovation. These pledges may explain the company's attempts to improve liquidity and solvency ratios, assuring financial resilience in the event of climate-related

disruptions. The company's investments in renewable energy solutions, as shown through its renewable sector activities, might explain variations in profitability indicators like ROS.
Overall, the relationship between financial indicators and climate-related information implies that the need to manage climate-related risks is increasingly influencing Saipem's financial decisions and tactics. As the firm grows, a better understanding of how these financial measures change in concert with its commitment to sustainability will offer insight on how well Saipem navigates the shifting climatic scenario while maintaining financial stability.

Now it may be useful to go back and look specifically at how the company's attention to the issue of climate risk has varied, and how the variation in the financial data highlighted above reflects a growing interest on the part of the company in climate change, expressed in an increasingly frequent trend as the years pass over the time horizon we considered in the published reports.

3.4.1 2017: Annual Financial Report and Sustainability Report

In 2017, Saipem highlights in some places in its reports (financial and sustainability), its interest in climate risk, which, however, is also perceived to be very immature. Below is some evidence from the reports mentioned above:

Climate change has the potential to have an influence on Saipem's financial stability and project performance. Revenue recognition from multi-year projects is dependent on work progress and cost appraisal. This method, however, is subject to change as a result of climate-related conditions, market dynamics, and changes in project execution timetables. Such uncertainties may cause major changes in cost forecasts, affecting project profitability.
Saipem has created a thorough project financial data monitoring methodology in response to these concerns. This includes evaluating cost and value projections, as well as conducting extensive risk assessments to meet the uncertainties that each project entails. Furthermore, in accordance with financial rules, Saipem's Internal Control System for Financial Reporting assures continual monitoring of these assessments. This strategy reflects Saipem's attention to controlling the potential financial volatility posed by climate-related concerns, as well as its commitment to financial stability and transparency.

Saipem is also aware that its strategic assets, such as specialized military boats, fabrication yards, and logistical depots, are vulnerable to operational and catastrophic risks associated with climate-related events and natural catastrophes.

Saipem invests much in asset maintenance in order to avoid and reduce hazards. Increased labour and material prices, technological improvements, or regulatory changes in safety and environmental protection can all cause maintenance costs to rise.

Although Saipem's proactive risk management methods help to reduce risk, the inherent unpredictability of weather occurrences remains an issue that might jeopardize the safety and dependability of its assets. The company's dedication to preventative tactics reflects its understanding of climate-related risks as well as its attempts to strengthen the resilience of its important assets. (*Saipem; (2017); "Relazione Finanziaria Annuale"*)

As evidenced by the World Bank's decision to cease financial assistance for upstream oil and gas owing to climate concerns, Saipem recognizes the substantial impact of climate change on its business. This shift emphasizes the changing energy mix and the need for responsiveness to socioeconomic developments. Climate-related hazards are caused by a variety of circumstances that may impair company operations. However, Saipem is aggressively addressing both the threats and possibilities posed by climate change.

The risk management procedure at the corporate and project levels is implemented. Regular workshops ensure that risk assessments are up to date, guiding choices. Climate change dangers and possibilities are a major focus:

Risk: Extreme natural events.

Opportunity: Diversification of client and project portfolios, such as venturing into wind farm projects.

Risk: Changes in environmental regulations.

Opportunity: Emergence of new markets for low emission services, carbon pricing, and green technologies like renewables and carbon capture.

The governing system of Saipem is dedicated to climate change mitigation. Climate problems are integrated into the corporate plan by the Board of Directors, which meets in committees such as Corporate Governance, Audit and Risk, and Sustainability. This dedication was highlighted during a workshop that resulted in a refreshed vision and goal for the organization.

Saipem's reaction to climate change is a focus on environmentally friendly business operations. The company's goal is to provide energy-efficient solutions, cutting-edge technology, and programs to minimize CO2 emissions and promote renewable energy. This technique assures

long-term viability while also contributing to global climate mitigation initiatives. (*Saipem; (2017); "Sustainability Report"*)

3.4.2 2018: Annual Financial Report and Sustainability Report

Saipem's assets include specialist boats, drilling rigs, and production/storage/transloading vessels, all of which are susceptible to operational and climatic hazards. Execution and maintenance faults are examples of operational hazards. Despite the company's precautionary precautions, unforeseeable incidents are still a possibility.

Saipem has a health, safety, and environment (HSE) management system that is compliant with ISO 14001 and OHSAS 18001. To maintain employee well-being and environmental safety, the system stresses prevention, protection, awareness, promotion, and engagement. Efforts are being made to reduce health and safety hazards.

Saipem has mechanisms in place to avoid, manage, and respond to environmental threats. Initiatives include reducing spill hazards and preventing fluid loss through asset-specific maintenance programs. Heavy maintenance investments and efforts such as the Asset Integrity Management System mitigate asset management risks.

Saipem's dedication to all stakeholders in its operations is a key pillar of its long-term business strategy. The organization develops shared value via continual communication and collaboration in executing common goals with stakeholders. Saipem's strategy is to build open and honest partnerships with all stakeholders, fostering good and mutually beneficial interactions.

The primary challenges that developed from stakeholder engagement over the year are related to material issues. Climate change mitigation and greenhouse gas emissions are among the goals. Saipem gives additional information on these concerns in both this statement and the publication "Sustainable Saipem 2018." (*Saipem; (2018); "Relazione Finanziaria Annuale"*)

In this study, it is possible to see how Saipem's emphasis on climate risk, as a major aspect to consider in terms of even financial performance, is becoming increasingly significant and decisive in the company's strategic decisions. To understand the progression of the underlying issue, it is sufficient to emphasize a few crucial paragraphs in this report.

Regardless of the complexities of the relationships between climate-related indicators and financial repercussions, it is evident that climate-related risks and opportunities have an impact on the future strategy and prospects of an international and multinational technological

solutions provider like Saipem. Indeed, Saipem has a significant role to play in assisting and supporting its clients in addressing the demands of a fast-changing world.

In accordance with the Task Force on Climate-related Financial Disclosures (TCFD) guidelines, Saipem issued the first disclosure on "Addressing Climate Change," which was authorized by Saipem's Board of Directors on January 15, 2019. The document highlights our commitment to providing effective transparency to stakeholders on concerns that may impact company operations, as well as how we are prepared to manage our business in the long term. The possible impacts of climate change on business and operations are assessed and monitored, as well as other medium- to long-term challenges, and this consideration is included into the company's strategic plans.

The climate strategy of Saipem is based on the examination of numerous climate-related scenarios, which are developed using a variety of internal and external inputs and studies to capture important energy sector drivers, as well as developing trends in technology, regulations, laws, socio-political elements, and so on. This scenario study applies to the entire firm and covers macro and energy factors that will affect Saipem's primary business drivers up to 2050. The outcomes of these scenarios are reported to the Board of Directors and Top Management at least once a year. One of the components addressed by the divisions in formulating the Strategic Plan is scenario analysis. (*Saipem; (2018); "Sustainability Report"*)

For the first time, Saipem alludes to the hazards stated multiple times throughout this article, demonstrating the company's increasing attention:

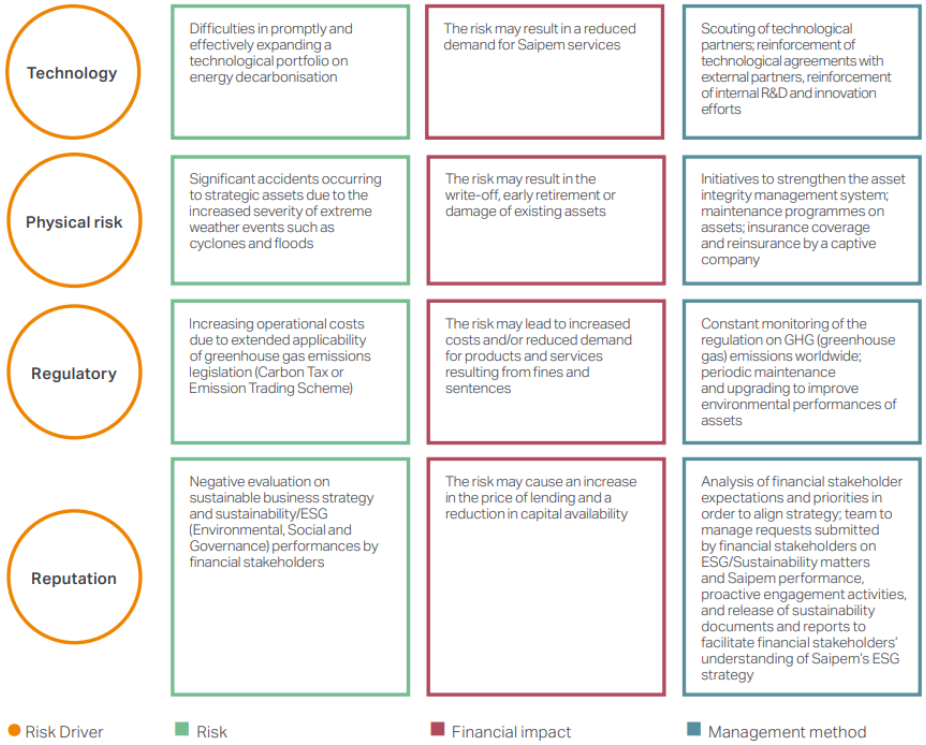


Figure 46 Climate change risks and opportunities; (Saipem; (2018); "Sustainability Report")

3.4.3 2019: Annual Financial Report and Sustainability Report

In 2019, Saipem will undoubtedly make its interest in climate risk real and a priority. In fact, it addresses this issue not just in its financial and sustainability report, but also in a completely other document titled "Climate: from strategy to action."

This document demonstrates how previous years' efforts and progress, particularly in 2018, demonstrated to all stakeholders and company management how focusing attention on this issue, and thus all reasoning in terms of costs, budgets, and strategies, leads to a performance advantage for the company itself.

The booklet provides a complete outline of Saipem's climate change strategy. It starts with governance, establishing the Board's and management's roles in resolving the issue. Subsequent sections cover climate-related risks and opportunities, highlighting the need of detecting and managing climate-related risks and opportunities. The following part shows Saipem's climate change strategy, stressing the fundamental pillars that influence the company's efforts. Scenarios emerge as a critical tool for adjusting to changing problems. The need of business resilience in providing continuity in a changing environment is then discussed. The section "Metrics and Targets" describes the indicators used to track success, such as particular emission reduction targets and internal carbon pricing efforts. Overall, the score illustrates Saipem's comprehensive and strategic approach to tackling climate change through solid governance, risk identification, opportunity identification, and implementation of a resilient plan.

Saipem, which has historically focused on oil and gas, realizes that climate change poses major direct and indirect threats to its business activities. These dangers include both temporary difficulties and the physical consequences of climate change. Climate-related hazards are incorporated into Saipem's enterprise-wide Enterprise Risk Management methodology. However, Saipem sees itself as playing an active part in the shifting scene. The organization can help clients fulfill the demands of a low-carbon future by providing creative and sustainable solutions. Business growth, business activities, tenders, and operations are all part of the opportunity management process. Recognizing development prospects, studying rivals, reviewing Saipem's competitive position, anticipating future industry difficulties, and researching strategies for expanding the company portfolio are all part of this. These elements influence the development of the company's Strategic Plan as well as the appraisal of investments.

So, we can see how the corporation identifies the many sorts of hazards caused by climate risk in this paper as well.

Climate-related risks:

- *Technology Risk*: This risk pertains to the task of swiftly and successfully developing Saipem's energy decarbonization technology portfolio. This includes options like renewable energy, reduced greenhouse gas emissions, and carbon dioxide control.

    - *Financial Impact*: This risk may reduce demand for Saipem's services.
    - *Assessment:* This risk is expected to occur in the long run and will have a medium to high financial effect.
    - *Management Strategy:* Technology intelligence efforts, scouting for energy decarbonization, concluding partnerships with technology suppliers, and securing licenses on renewables, circular economy, and CO2 management are all strategies to reduce this risk. Furthermore, Saipem intends to use dedicated resources to internally invent renewable energy and CO2 management solutions.

- *Physical Risk:* This risk is associated with large occurrences harming critical assets as a result of extreme weather events caused by climate change.

    - *Financial Impact*: Risks may result in asset cancellation, early retirement, or reimbursement for damages.
    - *Assessment*: Although improbable in the long run, this risk might have a significant financial impact.
    - *Management Strategy*: Saipem manages this risk by providing staff with specific training programs on technical and HSE matters, developing a feeling of responsibility and awareness. The organization runs maintenance plans for critical facilities, ships, and components and employs an asset integrity methodology. Risk management also includes insurance coverage and reinsurance through a captive firm.

- *Reputation risk:* This risk involves financial stakeholders negatively assessing Saipem's sustainable business strategy and ESG (environmental, social, and governance) performance.

- *Financial Impact:* These risks may result in higher borrowing costs and lower capital availability.
- *Assessment:* This risk is short-term, more likely to occur, and has a medium to high financial effect.
- *Management Strategy:* Strategies for managing this risk include analyzing financial stakeholder expectations, aligning strategies, managing financial stakeholder requests on ESG/Sustainability, proactively engaging, and publishing sustainability documents to improve financial stakeholders' understanding of Saipem's ESG strategy.

- *Regulatory Risk:* This risk is associated with rising operational expenses as a result of the expansion of greenhouse gas emission regulations (Carbon Tax or Emission Trading Scheme).

  - *Financial Impact:* Due to convictions or penalties, this risk may result in greater expenses and decreased demand for Saipem's services.
  - *Assessment:* This is a long-term risk that is more likely to occur and might have a medium to high financial effect.
  - *Management Strategy:* Saipem manages this risk by continuously monitoring global greenhouse gas emission regulations, developing a four-year plan with quantitative emission reduction and energy efficiency targets, implementing energy efficiency initiatives, and maintaining and upgrading assets on a regular basis to improve environmental performance.

To summarize, Saipem is aware of the different climate-related dangers it faces and is proactively implementing mitigation solutions. The company's creative solutions, risk assessment, and management practices help to position it as a responsible player in solving climate concerns.

However, there is also a part devoted to the opportunities that result (*see figures 47 and 48*):

CLIMATE-RELATED OPPORTUNITIES

PRODUCTS AND SERVICES

OPPORTUNITY 1	ASSESSMENT	FINANCIAL IMPACT	MANAGEMENT METHOD
Increase of revenues in consolidated business segments aimed at reducing climate-related impacts (e.g. Infrastructures, renewables, water projects, etc.)	Time horizon > Current Likelihood > More likely than not Magnitude of fin impact > High	Market opportunity in terms of revenues for infrastructure projects for ongoing tenders or projects that may be awarded within next 3 years	Innovation efforts, both incremental and disruptive. Strengthening of commercial efforts in these market segments. Scouting to identify strategic technological partners

OPPORTUNITY 2	ASSESSMENT	FINANCIAL IMPACT	MANAGEMENT METHOD
Development of new business segment in the framework of infrastructure aimed to reduce climate-related impacts (e.g. Smart city, Smart Infrastructure)	Time horizon > Medium-term Likelihood > More likely than not Magnitude of fin impact > Medium	Market opportunity in terms of revenues for smart city and smart infrastructure projects associated with future tenders that may be awarded within next 4 years.	Strengthening of commercial efforts in these market segments. Scouting to identify strategic partners and or acquisition.

OPPORTUNITY 3	ASSESSMENT	FINANCIAL IMPACT	MANAGEMENT METHOD
Increase in revenues from renewable business segment aimed at reducing climate-related impacts (offshore wind farm)	Time horizon > Short-term Likelihood > Likely Magnitude of fin impact > High	Revenues from offshore wind farm project awards	R&D investment and innovation efforts. Strengthening of commercial efforts in these market segments. Scouting activities to identify strategic partners

OPPORTUNITY 4	ASSESSMENT	FINANCIAL IMPACT	MANAGEMENT METHOD
Access to new CCUS (Carbon Capture Utilisation and Storage) market to support client requests	Time horizon > Medium-term Likelihood > More likely than not Magnitude of fin impact > Medium - High	Revenues for potential CCS projects on new investments for oil extraction, engineering feasibility study to verify cost and opportunities	R&D investment, potential technology acquisition and partnership. Strengthening of commercial efforts in these market segments

Figure 47 Saipem Climate-Related Opportunities; (Saipem; (2019); "Climate: form strategy to action")

OPPORTUNITY 5	ASSESSMENT	FINANCIAL IMPACT	MANAGEMENT METHOD
Access to new additional renewable markets and satisfaction of customers' requests (floating wind farm, ocean energy, tropospheric wind etc)	Time horizon > Long-term Likelihood > Likely Magnitude of fin impact > High	Revenue due to the award of these kind of project at 2024	R&D investment and innovation efforts in renewables; new partnership agreement; strengthening of commercial efforts in these market segments

RESOURCE EFFICIENCY ON OUR ASSETS

OPPORTUNITY 6	ASSESSMENT	FINANCIAL IMPACT	MANAGEMENT METHOD
Offer more efficient and cost-optimized solutions through energy efficient solutions in vessels and yards	Time horizon > Current Likelihood > Very likely Magnitude of fin impact > Low	Cost saving related to reduced fuel and electricity consumption costs due to initiatives already implemented	Implementation of energy assessment to identify adequate solution and maximise savings Design and realisation of measures and interventions aimed at energy and GHG emissions reduction

OPPORTUNITY 7	ASSESSMENT	FINANCIAL IMPACT	MANAGEMENT METHOD
Fuel consumption optimisation through predictive analytics in offshore drilling fleet	Time horizon > Medium-term Likelihood > Very likely Magnitude of fin impact > Low	Cost savings from fuel cost reduction and reduction in carbon tax (where applicable)	Plan to install a predictive maintenance tool for drilling fleet, starting with a Pilot vessel in 2019

Figure 48 Saipem Climate-Related Opportunities; (Saipem; (2019); "Climate: form strategy to action")

3.4.4 2020: Annual Financial Report and Sustainability Report

"A risk analysis of Saipem's strategic positioning reveals a number of climate-related challenges and opportunities." The examination of macroeconomic situations, technical advances, and changes in energy markets is used to define corporate strategies. However, climate change and the move to renewable energy sources can have a significant impact on the operational environment. Reduced demand for oil, along with emission reduction objectives, has an influence on both traditional oil and gas services and novel energy transition options. climatic change poses physical climatic and energy transition risks, which might have an impact on the company's capacity to adjust its portfolio and strategic positioning to changing market needs. Saipem tries to maintain its competitiveness through a divisional structure, with a growing emphasis on sustainability and decarbonization. The policy is based on an examination of energy possibilities through 2050, with a commitment to low-carbon solutions and renewable energy investment. Through innovation, digitization, and development in sectors such as renewable energy and gas, the corporation hopes to react to market needs. This strategic strategy allows Saipem to not only face the difficulties of climate change, but also to capitalize on the possibilities given by the transition to a more sustainable economy." (*Saipem; (2020); "Relazione Finanziaria Annuale"*)

Once again, Saipem underlines the importance of climate risk and all it entails in both its financial and non-financial reports.

In 2020, it may place a greater emphasis on transition risk, with a strong emphasis on decarbonization and the aim of net zero emissions, than on physical risk, as evidenced by the study *"2020 LEADING THE PATH TO ENERGY TRANSITION."* As in the 2019 report (see section 3.4.3 and Figures 47 and 48), there is usually a part devoted to risks and possibilities stemming from climate risk in the latter, but there is a clear focus on energy transition in this case.

3.5 Analysis Conclusion

Given the important financial analysis data, a strong relationship can be formed between Saipem's financial structure, and the physical risks posed by climate change, emphasizing the need of examining these issues in a holistic manner. The asset rigidity study indicates the company's vulnerability to harsh weather occurrences. Increased asset rigidity may make it more difficult to swiftly adjust to changes in the operating environment, raising financial risk in the case of infrastructure damage.

Another key feature identified by the financial study is financial reliance, which might magnify the effect of climate concerns. Increased expenditures connected to climate effects might weaken the need for external finance to maintain operations, with possible repercussions for solvency and debt management. The cash ratio, which represents the immediate availability of money to pay unanticipated costs connected to climate change, demonstrates the relationship between financing and climate risk.

ROE, ROI, and RONAn are financial returns that represent a company's profitability and how it is influenced by climate risk management. Extreme weather occurrences might incur unanticipated expenditures, lowering ROE and ROI. Investments targeted at reducing such risks, such as switching to renewable energy sources, on the other hand, can assist enhance long-term profitability, as evidenced by the study of renewable energy potential.
Simultaneously, the cost and income analysis highlight the possibility of additional expenses due to climate risks, such as maintenance and repair costs induced by unfavourable weather occurrences. These expenses can have a direct impact on the company's operating margin, which in turn affects the ROS indicator.

In a nutshell, the financial analysis data offer a picture of the company's financial health and the physical hazards posed by climate change. Saipem's financial health, as measured by asset rigidity, financial dependency, cash ratio, and returns, is inextricably tied to its capacity to handle and mitigate the effects of climate hazards. The company's long-term approach to sustainability and innovation, as evidenced in its financial predictions and renewable energy sector potential analysis, displays a concrete commitment to responding to climate issues and capitalizing on emerging possibilities. The financial analysis, on the other hand, emphasizes the significance of smart climate risk management to maintain Saipem's financial resilience and sustained performance in a context where climate and financial dynamics are more interwoven.

CONCLUSIONS

The primary objective of this study was to provide a comprehensive analysis of the influence of climate risk on company financial performance. This was achieved by addressing the fundamental research inquiry: "To what extent and in what manner does climate risk affect corporate financial performance?" This study aims to examine the correlation between climate change and the financial performance of Saipem, a corporation active in the energy and infrastructure sector, by conducting a comprehensive examination of its financial data.

The initial chapter of this thesis establishes a foundational macroeconomic framework that serves as a basis for the ensuing study. The analysis focused on the progression of global policy, commencing with the Kyoto Protocol and culminating with the Paris Agreement, with an emphasis on the role played in enhancing recognition of climate-related issues. The present study focused on examining the prevailing condition of the climate, with particular emphasis on the escalating global temperatures, elevating sea levels, and intensifying occurrences of extreme weather phenomena. Furthermore, we conducted an analysis of several prospective scenarios, taking into account the potential ramifications for the natural environment and global economic systems. We extensively deliberated the implications of climate threats on business balance sheets, with a specific emphasis on pertinent financial metrics.

In the subsequent chapter, emphasis was placed on the pivotal significance of corporate governance in effectively addressing climate-related risks. The present study investigates the approaches employed by corporations in tackling these difficulties by formulating sustainability plans and engaging in transparent communication with stakeholders. Within the Italian context, an analysis was conducted to explore the many obstacles and possibilities that enterprises in the nation are encountering in regard to the complex issue of climate change. Our primary attention was directed towards comprehending the disparities within industrial sectors and the associated dangers, with an emphasis on elucidating the effective incorporation of the climate agenda into the business strategy of certain firms.

The focal point of our inquiry was the third chapter, whereby a comprehensive examination of the Saipem case was conducted. By conducting a comprehensive financial study, we have scrutinised essential metrics pertaining to solvency, liquidity, and profitability in order to

evaluate the influence of climate risks on the financial performance of the organisation. The findings unequivocally demonstrated that Saipem, owing to its involvement in the energy and infrastructure sector, faces a substantial obstacle in the form of climate change. Nevertheless, the organisation has exhibited exceptional adaptability via deliberate corporate governance and open communication with investors and other pertinent financial players.

Based on the outcomes derived from the performed financial study, it can be posited that climate risk exerts a quantifiable influence on the financial well-being of corporations. Specifically, the escalation in both the occurrence and severity of extreme weather phenomena can lead to substantial financial burdens for corporations, including disruptions in operations as well as damage to physical assets and infrastructure. The aforementioned effects are manifested in the financial statements of corporations, leading to a decrease in profits and an increase in operating expenses. Consequently, this has an influence on crucial performance metrics such as Return on Equity (ROE), Return on Investment (ROI), Return on Sales (ROS), and several other indicators.

The solvency of corporations is also influenced by the rise in investor knowledge and the need for increased openness. Companies that neglect to incorporate climate concerns into their financial reporting may face repercussions from financial markets and have heightened costs of funding. Liquidity is a significant aspect, given that unforeseen rapid expenses for asset repairs or replacements may arise due to extreme weather occurrences.

Nevertheless, the findings of Saipem's financial study indicate that effective management of climate risks can lead to successful mitigation. The organisation has implemented measures to enhance its capacity to withstand the impacts of climate change through the strategic diversification of its activities and the allocation of resources towards the development and use of environmentally sustainable technology. Furthermore, Saipem has implemented a corporate governance framework that is cognizant of climate risks and has effectively communicated its objectives and initiatives to its financial stakeholders in a transparent manner.

Notwithstanding the favourable outcomes exhibited by Saipem, it is imperative to acknowledge the existence of several constraints inside this study. Initially, our study centred on a particular firm operating within the energy sector, hence limiting the direct generalizability of our findings to other companies in this industry. Furthermore, the investigation predominantly focused on

financial data and business reports, neglecting the inclusion of interviews or field research that may offer a more comprehensive comprehension of firm strategy pertaining to climate change.

In conclusion, it is indisputable that climate risk has a significant influence on the financial performance of corporations. Nevertheless, Saipem's research of financial data revealed that organisations may effectively confront these issues and safeguard their long-term financial viability through appropriate corporate governance and adaption strategies. The imperative for enterprises to secure their competitiveness and resilience in an increasingly climate change-affected world necessitates a shift towards a more sustainable economy.

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