SELINUS UNIVERSITY
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Strategic management and leadership for global energy transition: obstacles, incentives, and motivating factors.

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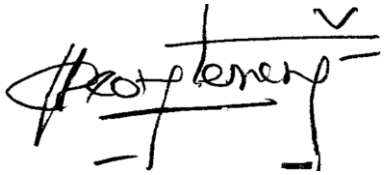
Declaration:

I confirm that, this dissertation is my own research work, and that all sources of information are acknowledged. I declare that a Harvard style citation is systematically used for acknowledging all academic, professional publications, and other support information. I confirm that a comprehensive Harvard style referencing and associated citations elements are included at the end of the work. ☒



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I hope multitudes will contribute and promote schools like University of Selinus; and to position similar schools at the fore of educational systems.

For several decades, or even centuries, exceptionally qualified professionals have painstakingly been pillars and support-step-stones for millions of workers, and especially students, worldwide. Such individuals need to be recognized for their Skill, painstaking coaching, and guidance to countless students; permitting them to gain professional experience. We are therefore indebted and grateful for the intelligence and the far sightedness of schools like Selinus University. This academic orientation system of Selinus, for professionals, constitutes a quantify means; permitting to duly recognize the long-standing, and quality contribution of all such global professionals.

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ABSTRACT

Purpose-: This dissertation critically analyses the “causes” and “effects” of decisions of some leaders and executives, operating in global energy transition market. These companies’ executives are accomplished leaders, possessing varied and proven, long experience in several aspect of business strategic management. Surprisingly, some of them were involved in few cases of Loss, use of premature market withdrawal plan, repeated errors, “missed successes”; and especially apparently unnecessary internal stockholders’ disputes. It appears then, that, evaluating their vast areas of success, may permit to explore insightfully, in the few sectors, where these leaders missed the mark; and eventually learn from how they corrected the situation, for business stability or market growth. The results of the research sections, that explored areas where the leaders amended previous strategic actions, - cases of “missed-steps” -; constitute precious lessons for future leaders or executives. And these could direct attention to how to treat similar future cases, and thus, serve as “support” or guidance. The research findings emphasize why and where it is required that; top leaders possess exceptional agility and intrinsic success determinants. These will serve as extra aid for new leaders in their quest to observe and imitate applied business management.

The research study concentrated on the practical aspects of global business ventures, strategies, managerial principles, and results they obtained. The report highlights the importance of linking leadership intuitive capabilities and experiences, with business models and frameworks. Several practical case studies were use for the research. These were taken from past business ventures, focused on deployment, operation, and associated companies’ infrastructures. These companies operate in mixed global energy business sectors, therefore, the environments permitted to observe the consequences of actions in a larger scale: a global market enterprising.

On the other hand, whilst evaluating the importance of applying proven business models and frameworks, the research confirmed the necessity for more top leaders to enroll in course like the executive DBA, as proposed by schools like University of Selinus. This will incite guided self-assessment, lead to unimagined thrust to acquiring complementary knowledge and skills. The investigation examined what could be the outcome, if relevant business analytic techniques were employed, and the subsequent effects on decisions and success.

About Methods-: The actions and resultant impacts, of leaders from eight among leading global energy companies were investigated. The investigation included the biographies of these leaders and executives.

Quantitative, qualitative, and observational research methods were used to explore performances, business decisions, and impact of these leaders on their respective organization; as well as their interaction with internal and external stakeholders. The study involves both primary and secondary data review methods. It was therefore easier to observe the corroboration of two methods, complemented with observational approaches. The observational research was ethnographic, and this were painstakingly acquired, during about 22 years in the field of energy business and market. Some of the data and information were one-to-one exchange with managers, leaders, engineering team, and diverse managing team. Resourceful and important input was gained from project post-mortem meetings, close-out briefing, own company, and client's analysis; reviews of reports on comparative projects' post-mortem. Therefore, few of comparative information is of qualitative data as well.

The observational research, added to the quantitative methods included: observation methods of naturalistic, direct, indirect, participant, non-participant, structured, unstructured, and covert observation. The insight gained in these leaders' action; were by means of the large spectrum of strategic management, direction, and leadership. These spheres of leadership, served as "gauges" for the investigations.

The sectors of strategic management practices in the research scope included:

1) Awareness of the key external influences on business strategy: Roles of energy transition leaders.

2) Using change for strategic advantage: Lessons from "conventional" companies - for energy transition business.

3) Leaders' ability to gain insight in research on business ventures: a critical step for shaping business success, during energy transition mission.

4) Why peering into research methodologies; could be a vantage point for leaders in defining strategic visions and missions.

5) Corporate governance for global energy transition business: role of top-leaders or executives.

Observation on Results. Our results showed that, despite their deep involvements and years of varied professional experiences, some of the strategic leaders investigated, are comparatively new in the renewable energies sectors. This seemed to necessitate continuous personal development for gaining “the-needed” extra skill in; quantified, methodical, and proven guidance of business modelling techniques.

The biographies of 125 leaders, from 10 different companies were investigated. It was observed that, only 5% among them have followed a continuous professional development to the executive DBA, or PhD level. Obviously not everyone could attain such a degree before starting a professional carrier. However, could companies create such possibilities for progress, for internal stakeholders; for employees whose circumstances did not allow such academic level prior to professional carrier.

On the other hand, it was observed that some top leaders, or executives were exceptionally successful in most of their sectors of action. However, some were involved in certain strategic” inaccuracies”; perhaps considered as minor at outset, but costly errors, at the long run. It seemed that, these mistakes could have been detected, well in advance through acquired skills in business models. If the companies had custom of systematic professional development for all leaders and employees; to as higher level as possible. The investigations also revealed that, the companies of the same leaders possessed a noteworthy leadership strength, in vertical and horizontal integrations, along with consistent new business developments. In few cases however, some of these leaders made mistakes as if a “action-lapsus”, or perhaps flaws in applying paramount business models or frameworks, especially in conflictual situations. Such “seemingly” deficiency, or scarcity, of knowledge of models; whether it was deliberate or, ‘unawareness’; led to important financial losses; that could have been avoided. And these impacted brand name, led to lawsuits, repeated costly strikes, and accidents. One of the cases in the investigation, showed that some internal stakeholders were not involved, not consulted at the outset; about an important change plan. A case in 2018, showed that; it was only after ten months of repeated strikes and turbulences, -which cost the company about 350 million euros-, that leaders and executives decided to meet with some stakeholders,

representatives, and employees. Each side presented their views and position, and thereafter, it was possible to move ahead. Costly actions and strikes were then halted.

Implications-: This finding emphasizes that, for leaders, deep knowledge in business models, frameworks, and the various research methodologies, can help to ascertain a clear set of determinants for successful leadership approaches. Whether for globalization business ventures, global sustainability approaches or company social responsibility. Such models, of course are complements, as the “extra” support for success. Leaders could as such, be able to perceive in advance, what could contribute to realistic approaches in the spheres of difficult business environments.

The observations compiled through this research study is that; acquiring knowledge like a DBA for Adults and professionals, could significantly complement leaders personal “composite knowhow”, for the awareness of business principles and strategies in leadership and direction. The study’s humble recommendation is that organizations make it their company culture, to systematically attribute time, resources, and planning; and provide such curriculum to their employees. These include: current leaders, or those considered for leadership succession planning.

Titles of Chapters

Chapter 1: Awareness of Global Key External Influences on Business Strategy: Role of Energy Transition Leaders.

Chapter 2: Using change for Strategic Advantage: Lessons from "Conventional" Companies – for Energy Transition Business.

Chapter 3: Insight in Research for Business Venture: Critical for Shaping, Developing, And Planning Energy Transition Mission.

Chapter 4: Peering into Research Methodologies: A Vantage Point for Leaders in Defining Strategic Visions & Missions

Chapter 5: Corporate Governance for Global Energy Transition Business: Role of Top-Leaders.

Chapter 6: Compounded Conclusion, Findings and Recommendation.

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Abbreviations and Definitions

ADEME	“ Agence de la transition écologique “ - French environnement and Energy Management
ADKAR	Awareness, Desire, Knowledge, Ability, & Reinforcement.
AEMO	Australian Energy Market Operator
AFEP	“Association française des entreprises privées” - French Association of Private Enterprises
AGEL	Adani Green Energy Limited
ANOVA	Analysis of Variance
ATEX	Explosive atmospheres
BCG	Boston Consulting Group
CAPEX	Capital Expenditure
CEC	Clean Energy Council (Australia)
CEO	Chief Executive Officer
COSHH	Control of Substances Hazardous to Health
CSF	Critical Success Factors
CSR	Corporate Social Responsibility
DSEAR	Dangerous Substances and Explosive Atmospheres Regulations
EDF	Électricité de France. - Electricity of France),

EIF	Enhanced Integrated Framework
ERM	Enterprise Resource Planning
ESG	Environment Social Governance
FPSO	Floating Production Storage and Offloading - offshore oil and gas system
FTC	Federal Trade Commission
GATT	General Agreement on Tariffs and Trade
GBS	Gravity Based Structure - Consist of thick concrete steel reinforced structure for offshore oil and gas storage means, with anchoring system
IMF	International Monetary Fund
KLM	Koninklijke Luchtvaart Maatschappij - Dutch: "Royal Aviation Company"
LNG	Liquefied Natural Gas
MEDEF	“ Mouvement des Entreprises de France’’ - French Business Confederations
MOSCOW	Must Have, Should Have, Should Have, Don’t Have this time
NHTSA	National Highway Traffic Safety Administration
OECD	Organization for economic Co-operation and Development

OHADA	Organization for the Harmonization of Business Law in Africa
OMS	Outcomes Measurement Systems
PESTEL	Political, Economic, Social, Technological, Legal
PMI	Project Management Institute
R & D	Research and Development
Renewable Energy	Energy derived from natural sources that are replenished at a higher rate than they are consumed.
ROI	Return On Investments
S.M.A.R.T.	Specific Measurable, Achievable, Realistic, Time-bound
STP	Segmentation, Target, and Positioning (STP) Analysis
SWOT	Strengths, Weaknesses, Threats, & Weaknesses
TSO	Transmission System Operators
VRIO	Valuable, Rare, Inimitable, Organized
WTO	World Trade Organization

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1. Chapter 1. Awareness of Global Key External Influences on Business Strategy: Role of Energy Transition Leaders

1.1. Introduction

Global businesses are influenced by several determinants, with subsequent ramifications, traversing market environments. Consequently, leaders' understanding of strategic management, in a globalized world, and how their leadership informs and influences strategic change is crucial. Because these have bearing on their ability to develop and evaluate strategic position, choices, and actions. This chapter is a research report on 'the how', the methods, some leaders, executives, and associated teams, have deployed to evaluate their external business environments. It subsequently points out the effects of their decision on internal and external stockholders. The aim is by means of these "observed" business organizations: a new leader may learn, be informed, and develop how to access, or ascertain best practices. These could help in identifying business key drivers and industry critical success factors. The research followed the observational style of some leaders; when these wish to identify a source of inspiration and realistic guidance. Often these employ the technique of "neutral cases", or case study, by observing other companies. Such typical, and discrete "examination" with quantitative data, provides insight, "torchlight-example", that permit to identify similar situation within their own company. This permits them to identify, by comparison, their own organization's weak and strong sectors, and can therefore proceed for the necessary corrective actions.

Interestingly, such an approach makes it easier for leaders to detach themselves from any emotional impediment; or any hidden determinants linked to resistance. Knowing that, if a leader is personally involved, insidious factors may crop in, due to human emotion. It is very well documented that, leaders or executives' emotional state, or feelings may easily conflict their leadership role. Leaders need to use effective methods, or else, need to develop and build personal emotional intelligence; strengthening their capacity to control hidden resistive determinants. (hbr.org, 2023).

On the other hand, business evaluation may be done by means of a practical "Case study of chosen company". These could be performed by means of proven strategic management business models, such as PESTEL, Porter's 5-forces, Value Chain, SWOT, VRIO analysis, BCG Matrix, CSR literatures, theories, and other relevant tools. The analysis: as is the case for this research work; incorporates a critical evaluation of the

dynamic capabilities and resources of the organization. These models, combined with practical past cases and experiences, may help leaders to identify the company's core competencies, their source of competitive advantage, and tactical responses required, to move into a global market.

This report is based on combination of observation in the business field and applied business frameworks. It wished that, it provides at least, support to new leaders; offering slight ideas on how to improve their organization's responses to complex changes, in global markets. On the other hand, it highlights the impact, and evolutions of global market corporate social responsibility (CSR) and sustainability.

In harmony with the above, a "familiar" and typical global energy organizations are chosen as case studies. These are critically evaluated, to highlight their state of affairs pertaining to the company's:

- Business: Sectors of Operation or Activities.
- External Business Environment
- Dynamic Capabilities, with V.R.I.O.
- Dynamic Capabilities, with S.W.O.T.
- Competition Advantage and Responses
- Segmentation, Target, and Positioning (STP) Analysis.
- Analysis of the Overall Strategies.
- Current Business Scenario, through:
    - Value Chain Analysis;
    - Porter's Five Forces Analysis.
- Environmental Analysis through
    - PESTEL.
- BCG Matrix Analysis.

The research report subsequently shows the exploration done in evaluating the company's:

- Possible Strategic Options.
- International Drivers and Strategies.
- Applied Ansoff Matrix Analysis.
- Corporate Social Responsibility (CSR) and Sustainability;

    - Emphasizing ‘Stakeholder Theory.
- Link between Strategy and CSR/Sustainability.
- Shared Value Concept.

Finally, the research reports how some of the necessary leadership styles are utilized in the energy transition context; especially, when the companies are managing “Change”. The case studies permitted to:

- Identify and assess leadership styles related to strategy change.
- Evaluate the organizational context and how it affects strategic change.
- Appraise the influence and impact of leaders in strategic change.

1.2. Case Study – Company’s Chosen

1.2.1. Introduction Chapter 1

For this section: “awareness of global key external influences on business strategy: role of energy transition leaders”; the study case organization is the French Multi-National Oil and Gas company, TotalEnergies. The report critically evaluates external and internal business environment of TotalEnergies, as well as the company’s strategic position, choices, and actions in this fast-changing global business.

1.3. Company Background

TotalEnergies, a French and Global integrated Oil & Gas, energy company, now operating as well in renewables. Extending beyond its original sectors of 1924, Totalenergies now operates in power production and variety of renewable energy sectors including: wind, solar, batteries, and fuel cells. The company’s expansion includes vertical and horizontal integration, and it now employs more than 100,000 employees in more than 130 countries. (TotalEnergies, 2022). The company recently made brand and image change, with a new logo. (totalenergies, 2021). See Totalenergies overview in the figure below. (TotalEnergies, 2021).

Name : From 28 May 2021	TotalEnergies - (Formerly Total SE)
Origin/Changes	Omnium Français des Pétroles. Elf Aquitaine ; Petrofina
Traded as:	Euronext Paris : TTE - NYSE : TTE - CAC 40 component
Founded	28 March 1924
Business/Market	A multi-energy company
Headquarters	Tour Total. (Tower of Total). 2, place Jean Millier La Défense 6 - 92400 Courbevoie, France. (About 5 km from Arc de Triomphe)
Chairman & CEO	Patrick Pouyanné
Number of employees	105,476 (2022)
Revenue	US$ 190 billion (2021) ↑ 58.7% US$ 119.704 billion (2020)
Net income	US$ 30.5 billion (2021) ↑ 321% US$ 7.242 billion (2020)
Total assets	US$ 320.5 billion (2021) ↑ 20.4% US$ 266.3 billion (2020)
Net investments	US $13.0 billion
Main competitors	Royal Dutch Shell ; BP ; ExxonMobil ; Chevron ; Eni ; Conoco-Phillips.

Figure 1. TotalEnergies Company Overview.

1.4. Business Environment Presentation

1.4.1. Global Company Overview

TotalEnergies, is one of the six major Oil & Gas and energy companies in the world. The company operates in exploration, production, trading, transportation of the Oil & Gas Industry, refinery, and chemicals. The company has in the past decades, entered the sector of large-scale renewable energy transition, biofuels, green gases, and electrical power generation, at a global level. (TotalEnergies, 2022). See brief summary in figure below.

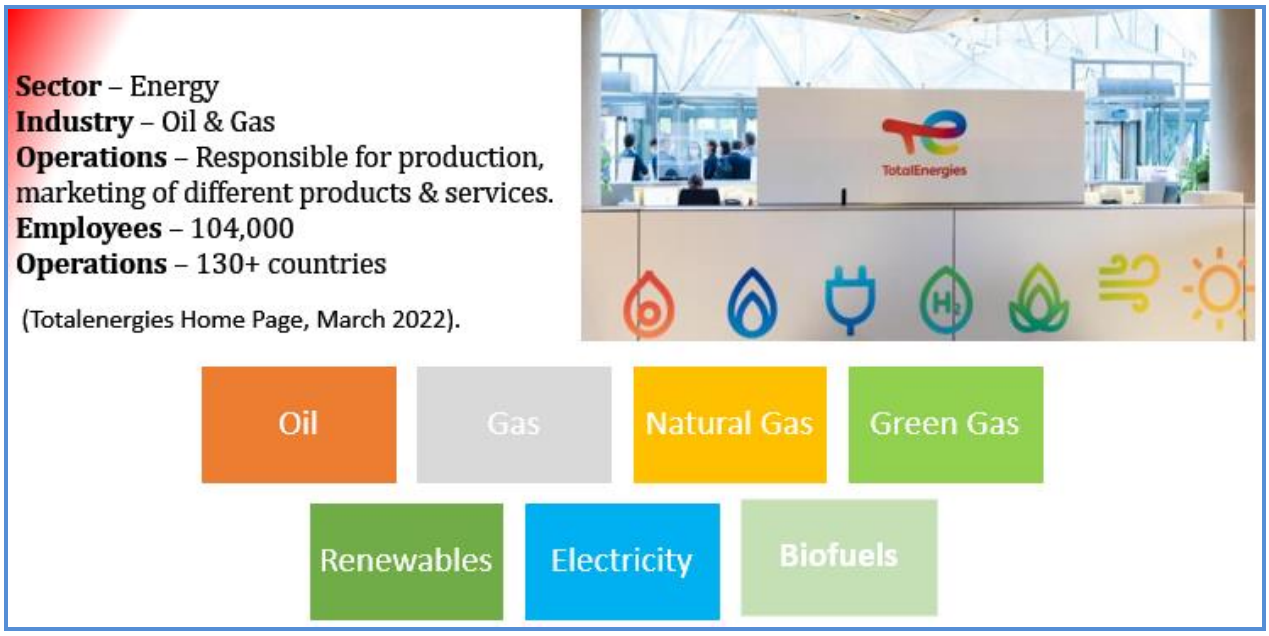


Figure 2. Business Environment and Value Chain

1.5. Evaluating Dynamic Capabilities With VRIO Framework: Support for Leaders

Since the original business of the company was principally Oil and Gas, this means that the value chain involves three stages of operations, with huge complexities and serious competition. Entering into renewable energies requires that, leaders scrutinize the company's operational structure, actively and dynamically to identify areas where improvement is needed. This is a sort of "house cleaning" before checking outside the company; to compare competitors. VRIO framework is the tool used to analyze firm's internal resources and capabilities to find out if they can be a source of sustained competitive advantage.

VRIO is an anachronym that stands for:

- Valuable?
- Rare?
- Inimitable (costly to imitate)?
- Organized to capture the value"?

If a company's resources or capability meets all four requirements, it means a sustained competitive advantage". (Jurevicius, 2023). Otherwise, executives need to take strategic actions. Review of fifteen (15) years of 'TotalEnergies' online data, intended for stakeholders, provides the information on the dynamic capabilities- presented within figure below.

Resource	Value	Rare	Imitation	Organization	Competitive Advantages
Alignment to Corporate Strategy	Yes	No	Unique Strategies by each firm	Optimization present across value chain	Areas of improvement
Leadership Vision	Yes	No	Can be imitated (Atinternet.com, 2021).	Somewhat using	Can be a good competitive advantage
Pricing	Yes	Yes	Unique Strategies	Using	High
Supply Chain Resiliency	Yes	Yes	Competitors have same	Using	Areas of improvement
E-Commerce	Yes	Many competitors	Competitors have same	Just Starting (Atinternet.com, 2021).	Holds potential
Investments	Yes	Yes and Unique	Can be imitated	Optimization	High
Financial	Yes	No	Competitors have same	Sustainable position	Holds potential
Talent	Yes	Yes	Unique and non imitable	Yes	High
Project Execution	Yes	Yes	Competitors have same	Yes (Totalenergies.com, 2021).	Holds potential
Brand Awareness	Yes	No	Yes	Sustainable position	Can be High
		Competitive	Not competitive		Least competitive

Figure 3 Dynamic Capabilities - VRIO Analysis. TotalEnergies.

Careful investigation, presented in the table above reveals some of the core competencies of the organization. (TotalEnergies, 2023). (Totalenergies, 2021). The VRIO analysis highlights competitive advantages of TotalEnergies, whilst highlighting areas of opportunities. There is need of further improvements in some areas, like e-commerce and leadership styles; the later to be deeply investigated, in this study. Some of the company's core competences are not easy to imitate. TotalEnergies holds potential in terms of leadership vision, brand awareness, financial resources management, local e-commerce, and "restricted" project execution. (Atinternet.com, 2021). The company used a lot of contractors and is now developing, in house project execution. Time and investigation will permit to know how far management are able to go, to be more self-sufficient in critical areas. Shortage on external content can, in emergency situation, block or even reverse the company's financial status. From the embargoes tied to the Ukrainian war, several companies decided to quit Russia. On December 9, 2022, TotalEnergies declared that it" will no longer account for its 19.4% stake in Novatek, Russia, leading to a $3.7 billion

write-down in its fourth quarter accounts". (lemonde.fr, 2022). "The French company said it cannot sell its stake in the Russian firm as "it is forbidden for TotalEnergies to sell any asset to one of Novatek's main shareholders who is under sanction". (lemonde.fr, 2022). This is a complex situation. But did the other energy Giants in Russia perform better in this? This is a serious case study for business financial and investment aspects, and requires deep investigation, that could be added to the VRIO framework we just considered.

On the other hand, from the VRIO Analysis, the competitive advantages of the company appear High. As evident from the analysis, the competitive advantages of the company lie in its pricing strategies, unique and efficient, attracting varieties of customers. In addition, Totalenergies has unique investment strategies, disciplined innovative values, and all these attract more investors. Additionally, talents acquisition and retention remain one of the core advantages for the company (TotalEnergies, 2022). There are potential areas of improvement, especially a speedy increase in sponsoring on global level. And then, better alignment with leadership vision: e.g., extending globally e-commerce strategy, enhancing financial resources, expanding diverse project executions; adding more to its new brand awareness. A review of this part of the report on this energy giant company may provide an insight for a beginner leader in the field.

1.6. Dynamic Capabilities: SWOT framework for Leadership

1.6.1. SWOT – Analysis

The SWOT analysis of the company highlights some of the potential capabilities of the company, as well as areas where strategic attention and actions are required on the leaders and executives. SWOT framework complements the evaluation performed above by means of VRIO analysis. The acronym SWOT signifies: Strengths, Weaknesses, Opportunities, and Threats. The figure below presents, briefly, the evaluation of the SWOT dynamic capabilities of TotalEnergies.

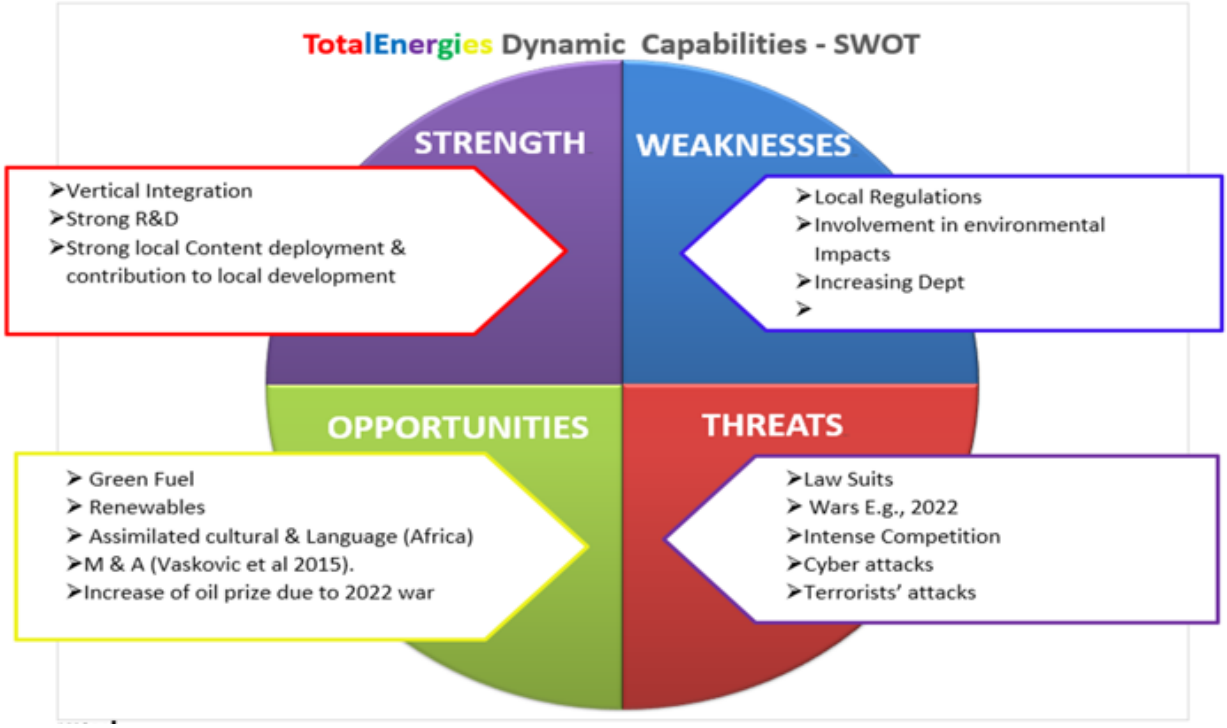


Figure 4. Dynamic Capabilities- TotalEnergies.

From the above figure, based on quantitative and secondary data, the strengths of TotalEnergy comes mainly from vertical and horizontal integration, and this is backed by consistent research and development program. However, it was found that weaknesses lie in regulations, environmental impacts, increasing debts, Lawsuits, and repeated strikes; inherent to the French culture. It was found that, the last section, -strikes and management of such conflicts-: appear to be the weak point; the "Achilles' heel" of the leaders of TotalEnergies. The investigations indicate that, for decades, the leaders find it difficult to deploy the "measurable" means to manage the strikes. This has been the case, even when the company declares to have achieved very high benefits, as it was in 2022. And more often, there had been an external intervention; by the French state, before actions were taken, and to arrive at mutual accord. (theguardian.com, 2022). However, the company has several opportunities to expand its services; particularly in the global energy program, comprising of green fuels/gas, organic and inorganic fuels. (Vasković, et al., 2015), (totalenergies, 2022).

1.6.2. Other Business Implications - SWOT for TotalEnergy

Below is a step-by-step evaluation of each constituent of SWOT framework as applied to TotalEnergies.

1.6.2.1. Strengths

- Vertically integrated for expansion;
- Operating across 130+ countries;
- A strong Research and Development;
- Structured rewards system: to support focus towards sustainability, green fuel, and energy transition (Totalenergies, 2022);
- Partnership with several universities;
- Attracting partners and inventors through public competitions.

1.6.2.2. Weaknesses

- A strong environmental focus has also called for stringent regulations;
- Increasing debts, affecting its balance sheet and financial stability;
- Involvement in oil spills and chemical explosion. (Collet, 2019), (Rachida, 2009), (Collet, 2011).

1.6.2.3. Opportunities

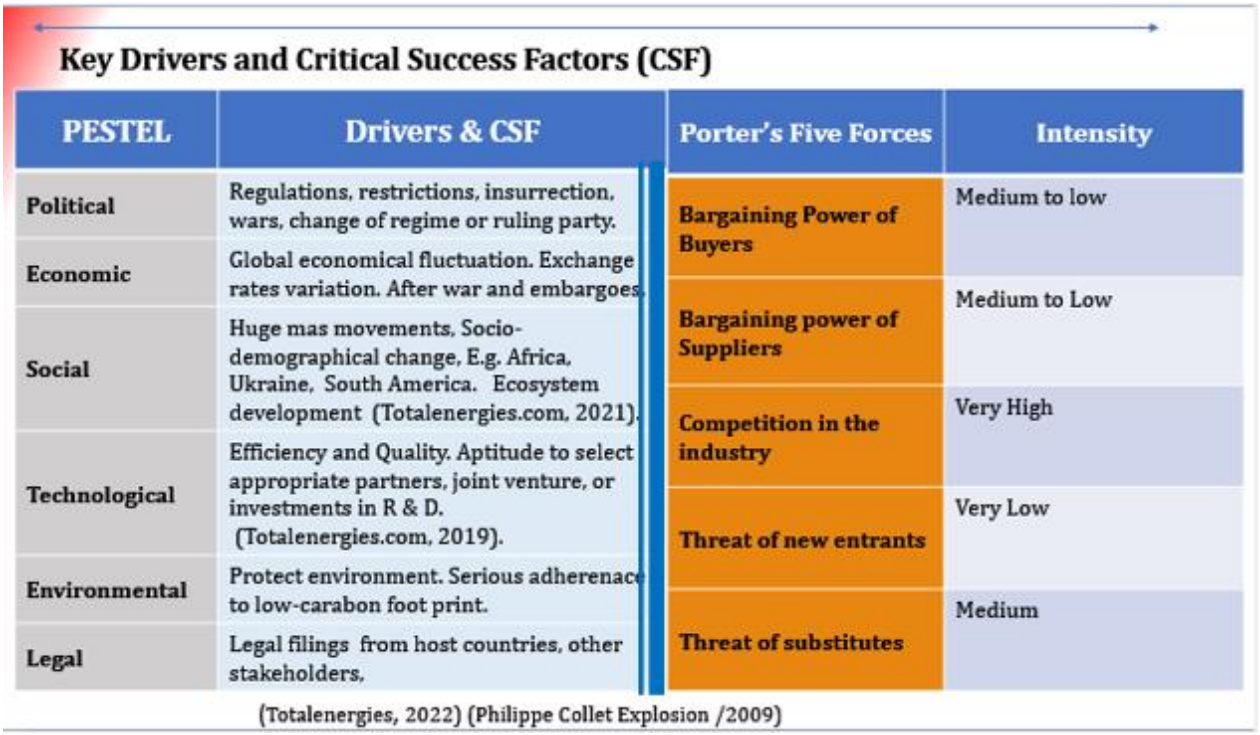
- Expansion in green fuel;
- High oil cost advantages /accelerates green energy;
- Constant Merges & Acquisition to complement its services and products; (Vasković, et al., 2015).
- Barrel of Oil cost raise, due to war;
- Huge Investments in renewables. (totalenergies, 2022).

1.6.2.4. Threats

- Possible lawsuits and protests from stakeholders in their ecosystem. (Jessop, et al., 2022).
- Intense competition from existing players across regions.
  Threats from Eastern Europe war and embargo on Russia.
- Highly investment in Russia. (White, 2022).
  - Possible Loss due to high percent overtake by independent gas provider, Novatek;
    - Novatek's shareholders include the Volga Group,
    - The investment vehicle of Gennady Timchenko, (financialtimes.com, 2022).
  - Possible depreciation of 3.7 billion on the Yamal plant-due to war. (lesechos.fr, 2022);
  - Recorded a first-quarter impairment of about $4.1 billion partly related to Arctic LNG 2 project. (reuters.com, 2022).
- Strong competitors, because of sponsorship for renewable projects.
- Aftermath of Covid-19 and War in Europe. An area needing a separate and complete investigation for itself.

1.7. TotalEnergies External Business Environment – Aligning PESTEL with Porter's 5 Forces

These aspects of key drivers and critical success factors for TotalEnergies, were evaluated through PESTEL and Porter's 5 Forces. The results are first shown in the figure below.



Key Drivers and Critical Success Factors (CSF)

PESTEL	Drivers & CSF	Porter's Five Forces	Intensity
Political	Regulations, restrictions, insurrection, wars, change of regime or ruling party.	Bargaining Power of Buyers	Medium to low
Economic	Global economical fluctuation. Exchange rates variation. After war and embargoes.	Bargaining power of Suppliers	Medium to Low
Social	Huge mas movements. Socio-demographical change, E.g. Africa, Ukraine, South America. Ecosystem development (Totalenergies.com, 2021).	Competition in the industry	Very High
Technological	Efficiency and Quality. Aptitude to select appropriate partners, joint venture, or investments in R & D. (Totalenergies.com, 2019).	Threat of new entrants	Very Low
Environmental	Protect environment. Serious adherenace to low-carabon foot print.	Threat of substitutes	Medium
Legal	Legal filings from host countries, other stakeholders.		

(Totalenergies, 2022) (Philippe Collet Explosion /2009)

Figure 5. TotalEnergies- Resume: PESTEL and Porter's 5 Forces.

From the above analysis, here are some findings. For political aspects (current war in Ukraine), embargo, regulations, restrictions are some of the key drivers. This aspect was emphasized within the SWOT analysis above. Economic outlook is highly dependent on these. What of social perspectives after Covid-19, at long term, say five years from now. It was noted that Covid 19 had socio-economic impact on the whole globe. However, as above noted with the SWOT analysis, outwardly, the company appears to be losing huge parts; billions of euros in investments in Russia. (totalenergies.com, 2022) Future evaluations could confirm or infirm such apparent losses. Adding to this, are the international regulations on environments and ecosystem that are currently of high importance, and needs to be addressed without err; by learning from the past and avoiding inopportune cases mentioned above.

Technology through R&D has helped the company in the past decades; especially in deep sea/subsea developments; and therefore, improving quality and efficiency. The company can learn from such experiences and apply it in the energy transition projects. However, strict adherence to environment requirements is indispensable to avoid diverse violations and subsequent legal filing. (Rachida, 2009) Bargaining power of buyers is somewhat medium to low. Materials required by buyers, like refineries, oil companies, traders, distribution companies are specific, and buyers have limited choices. This is because

direct buyers and supplies constitute significant players and have strong bargaining power; but within specific limit; and therefore, do not constitute serious threat to the company. Competition in the new energy sectors and industry is very high due to many global competitors. Threat of new entrants in “Pure oil & Gas” is very low, since this requires a huge capital, along with high restrictions. Threat of substitutes in energy sources is medium, as company works in increasing and varied sectors. (TotalEnergies, 2022).

1.8. Competitiveness and Responses. (TotalEnergies, 2022).

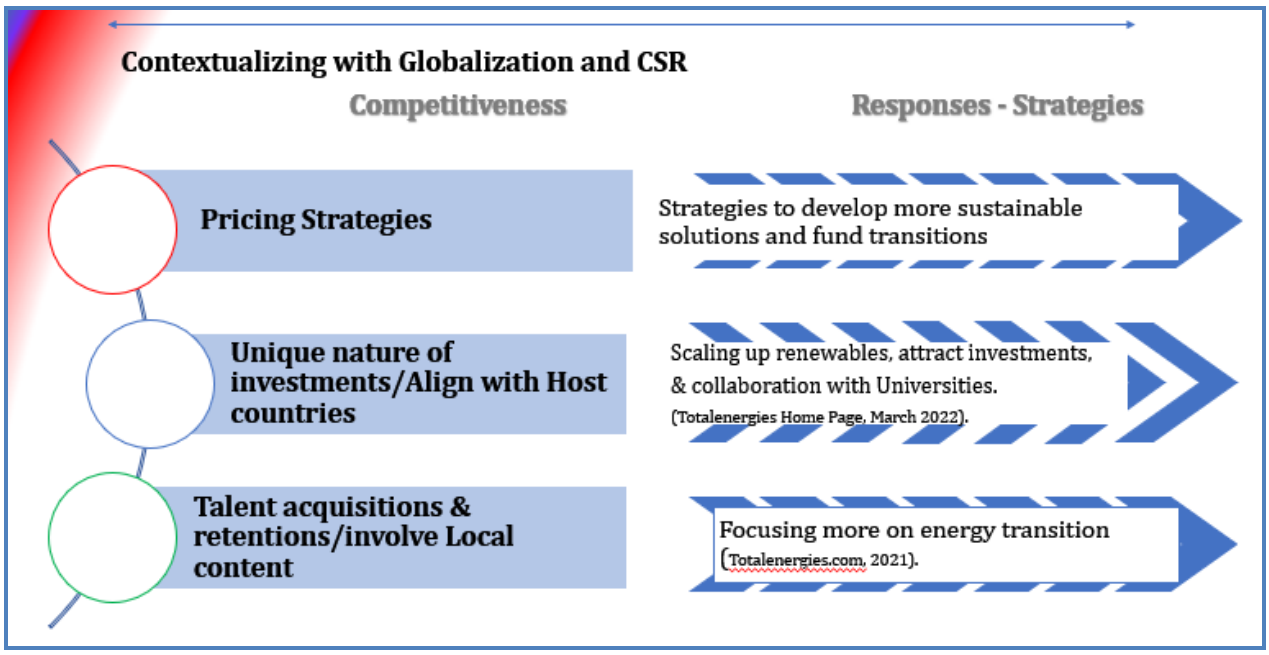


Figure 6. Competitiveness and Responses-Totalenergies

Investigation through 10 years of activities of the company in such aspects give evidence of the company’s varied ‘value chain’ of activities; and thus, ascertains strong competitive advantages. It was observed that, the company has well-established research, development procedures, and exceptional talent acquisition strategies. The pricing strategies and investments; which is peculiar to TotalEnergies, is an advantage. Efforts for staff retention is on the way. Response strategies outlined by Total Energies 2021 strategy outlook, seems to confirm this. The company’s leaders intend to develop more sustainable solutions and fund transitions, to “catch-up” in renewables and energy transition and attract investments, (Totalenergies.com, 2021).

1.9. Segmentation, Target, and Positioning (STP) Analysis

To deeply analyze the company, it was very important to understand its status by means of the operation segmentations, targets, and the company's positioning. Through this, it became easier to evaluate its current positioning, as well as operational complexities within the varied energy sectors. With the STP analysis we grasp how Totalenergies is moving towards its targets and positioning. Evaluation of the company's market context, permitted to define/ understand their strategic moves and platforms of operations. Below are the findings for each part of the STP.

1.9.1. Segmentation

The segmentation of TotalEnergies is very diversified and comprises of about 215 subsidiaries and affiliates. (TotalEnergies, 2021). These include corporates, industries, large organizations requiring energy sources and power production. Even countries, or regions, as well as individuals retail stations, belong to segmentation categories of the company. Hence, for the organization, the segmentation is mostly demographic and geographic in nature, depending on the type of products, supplies; and as per global particularities, organizations, regions, even individuals, it was observed.

1.9.2. Target

The target market of the company as per the segmentation strategy remains either the corporates, countries, or regions. All these were in accordance with the needs, either oil, gas, green gas, fuel, renewable energy, electricity etc. An example is the aim of manufacturing raw materials from petroleum. Included are also, power production, or involvement in daily operations of individuals who need diesel, fuel cells, car charging station, or electricity for the daily activities or needs. However, the current world situation puts the company in front of extra challenges, as compared to its defined outlook on the energy transition. (TotalEnergies, 2021) The figure below depicts the company's objects on energy projects.

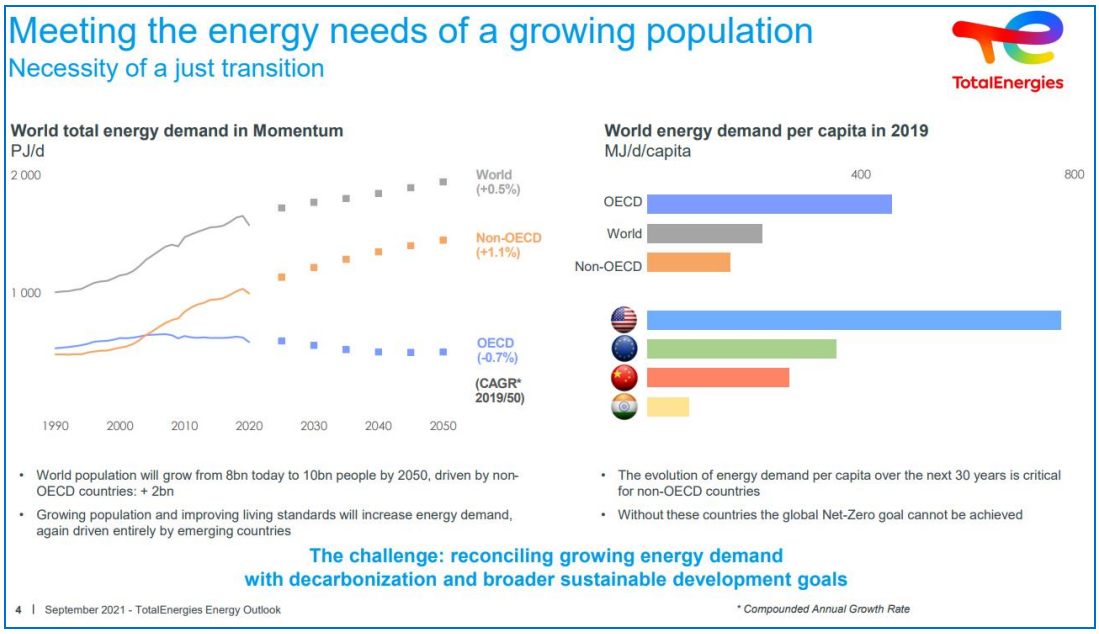


Figure 7. Energy Outlook. - TotalEnergies

1.9.3. Positioning

The company has, in the past decade, made drastic positioning change, to “stay in the course” for renewables. Knowing that most of major Oil and Gas competitors have likewise embraced seriously the energy transition objectives. Along with the change of the company’s logo, they have been in recent times focusing largely on the renewable energy. TotalEnergy has invested huge amount and resources, for developing, and even production of renewable energy; by means of natural and/or artificial sources.

However, perhaps learning from past mistakes, - all along sustainability, quality, and efficiency- have become one of the most prioritized positioning statements for the company. Could Totalenergies progress at the same “pace” as it did in Oil and Gas sectors, in the past? This could be another area of further and deep investigation; with comparative actions of several competitors. The current trends seem to be positive, nevertheless, the aftermath of Ukraine war’s impact may generate an increase in business scenarios, as did Covid-19. It is noteworthy that, from 2002 to 2012 the current Chairman, and CEO, Patrick Pouyanné, was director of Strategy, Growth, R&D, and Economy in Exploration-Production Branch. (TotalEnergies, 2022). (Brébion_itforbusiness.fr, 2021). And his experience had served the company a great deal in the programs for research and development.

1.10. Analysis of the Strategies of Leaders

1.10.1. Relationship between Corporate, Business and Operational Strategies

The analysis of the company's strategies was tied to fast and vast changes in demographical factors in the areas of operations. The analysis included current business scenario and environmental analysis. These permitted to understand the company's present status, the impacts of various drivers, and other factors that affect Totalenergies's Critical Success Factors (CSF). (TotalEnergies, 2023). The next sectors will present the findings.

1.10.2. Current Business Scenario

1.10.2.1. Value Chain Analysis

Oil and Gas value chain of TotalEnergies is composed of three parts; upstream activities, midstream, and downstream activities. See figure 3 below. However, the primary activities involve exploration, production, transportation, trading, and then comes downstream refining and marketing. However, support activities include processing, selling, value discovery, supplying materials to ancillary industries and much more, (Shqairat & Sundarakani, 2018). (TotalEnergies, 2023), (Vasković, et al., 2016), (Vasković, et al., 2016), (TotalEnergies, 2022). The figure below shows the Value chains: Upstream, Midstream and Downstream.

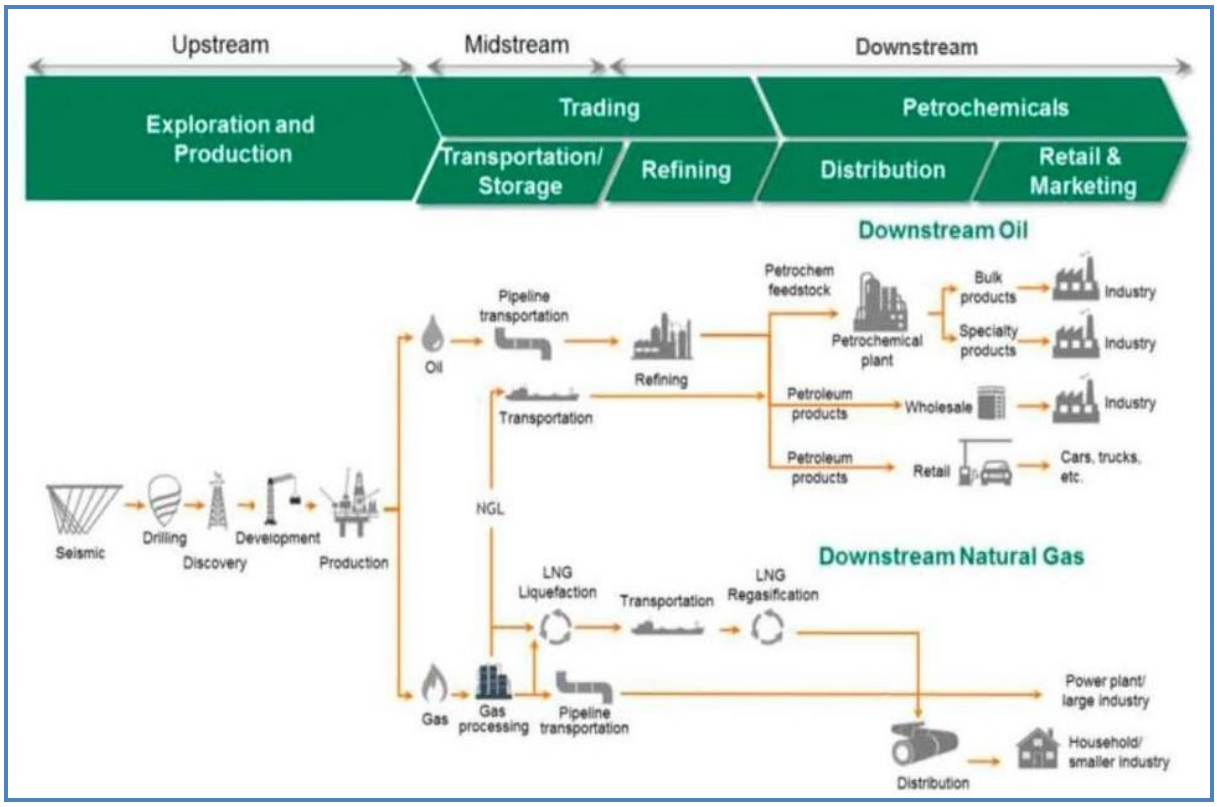


Figure 8. Value Chain of TotalEnergies

The figure above shows the company's original Value chains. These gave the company a "master's control" of all the chain values stages. Presently, TotalEnergies intends to leverage the company's "know-how" and resources inherent to its original business model. These include a global branding and presence; deploying the previous energy business' technical expertise in this "new" energy sectors. The model of value creation is now extending to electrical energy production, storage, transportation, and distribution, to end customer. TotalEnergies expects that this integrated business model will enable the company to capitalize on synergies. Using this within the various business segments, it intends respond to volatility in feedstock prices that were not under the control of original fossil fuel business. The company's future energy transition policy depends on these. The next diagram below shows the company's integrated value chain model: where the new energies are incorporated to form a composite one. Oil and gas associated to carbon reduction energies business targets. (TotalEnergies, 2022), (TotalEnergy, 2021).

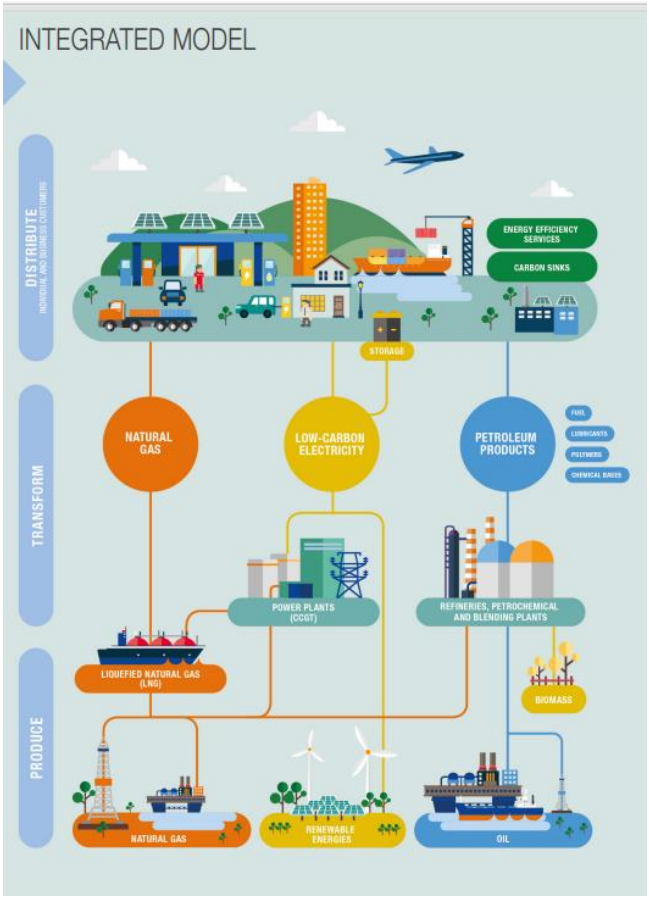


Figure 9 Value Chain of TotalEnergies.

1.11. Isolating Porter's Five Forces Analysis – for TotalEnergies

After briefly considering the value chain of TotalEnergies, it was extremely important to understand the competitive environments; forces competitors can exert on its market, and how this affects the company's long-term success. Hence, the Porter's Five forces model is briefly considered in analyzing the competitive intensity. The figure below highlights the effect of business environments and the company's competitive position in the industry. As can be seen in the figure below, the firm's strategies revealed how powerful each of the Five Key Forces, are impacting the competitive position of TotalEnergies. (totalenergies, 2021), (totalenergies, 2023).

Porter's Five Forces	Intensity
Bargaining Power of Buyers	Medium to low
Bargaining power of Suppliers	Medium to Low
Competition in the industry	Very High
Threat of new entrants	Very Low
Threat of substitutes	Medium

Figure 10 Porter's Five Forces Analysis of TotalEnergies

The above figure highlights the interplay of the Porter's Five Forces, and the corresponding intensity of such forces. It was observed that, for bargaining power, buyers appear to be between medium to low. This is because buyers, traders, distribution companies, oil companies, refineries, or the individuals, are all having varied and specific needs. Thus, because of the large scope of the company value chain, it can spread it supplies as per “distinct” need accordingly, using related end products as well. The strategies of the company seem proven and permits an easy “juggling” with competitors. The suppliers, feeding the large organizations like TotalEnergies, are likewise huge integrated players, with high bargaining power. Hence, the bargaining power of the suppliers also swings, from medium to low. There are lots of renowned, and established competitors, who work either across same integrated value chain, or in different parts. The competitors involved, are worldwide; like Shell, ExxonMobil BP, Conoco, Chevron, OMV Group, Engie, EDF, Cheniere Energy and many others. (Shastri, 2022). These have operated in same sectors, even if most of them have, sometimes, been joint actors, for decades. Therefore, competitive rivalry is very high. However, threats of the new entrants into sectors of “pure” Oil & Gas industry are very low, because this requires huge capital investments, in addition to intensifying restrictions, and carbon reduction regulations. For renewables sectors, the threat is high; because of the governmental incentives associated with the sponsorships, that are accorded to new entrants in the business.

For substitutes, the threat is medium, because market share of renewables is very diversified, and technology is quickly emerging globally. TotalEnergies’ competitive position is considered as not yet stable and comfortable. Personal experience and observation in the field, show that, it requires a lot of training, wise joint-venture, qualified engineers, and managers, in order to gain maturity, and really progress in the renewable fields. A case in mind is Edf, electrical power company known worldwide as one of the best in power and energy. However, it took them more than 10 years to attain maturity in large scale wind Farm projects. They needed to “accelerate” investments and developments, in this new sector to attain the same “position”, as it had been in nuclear or classical power sector. It is noted that, even horizontal or vertical integration is not always, automatically, the solution; for compensation. One may acquire or integrate vertically, a known and well performing company in new energies. However, frequently, the quality of such company may depend on about 5 to 10% of its staff. And the “buying” company may lose such elements few months after purchase. These aspects of vertical and horizontal

acquisition/integration; - in energy transitions business -, require deeper research, to understand the operational risks, besides the financial impacts.

1.12. Environmental Analysis and Need For Change.

1.12.1. Isolating PESTEL Framework– for TotalEnergies

The acronym PESTEL framework, covers Political Economic, Social, Technological Environmental and Legal issues related to business entreprises. Therefore, the skills required to take into account these factors are essential for leaders, when deploying a business endeavor in a global energy transition. Understanding the key external factors, macroeconomic level, requires understanding such forces that can create both threats and opportunities. The PESTEL Analysis is therefore one of the best tools or frameworks for this.

The research areas for Totalenergies are:

- The current external factors affecting the company;
- How TotalEnergies is exploiting or using these changes for Opportunities;
- And what was the tactics they have been using to defend against business threats, accentuated by current situation of the world.

The Figure below presents the results of combined data reviewed; helped by previous observations in the energy sectors. (totalenergies, 2022) (Reichel & Schifrin, 2013). (TotalEnergy, 2021). (TotalEnergies, 2023).

PESTEL	Drivers & CSF
Political	• Regulations, • restrictions, • governmental change, • instability. • New trade regulation or control. • Other new laws.
Economic	Effects: • after war & after Covid-19, • After Embargo, • Demographics: movement of populations/ • Possible immigration, • Inflation, Employment trends. (Economies factors are interdepended).
Social	• Shorter working time or through Internet • Ecosystem development, decarbonization • Green Vehicles • Domestic buying • New attitude toward use of energy • (totalenergies.com-press-strategy-outlook, 2021)
Technological	• How efficient? • Quality. • Spending: innovations, R&D, investments, • Incentive and rewards?
Environmental	• Laws to protect environment. • Waste management. • Recycling.
Legal	• Legal filings, • Discrimination law to emerge aftermath of current war. • New data protection laws due uprising of cyber-attack. • Actions from other stakeholders

Figure 11 Extensive *PESTEL Analysis of TotalEnergies.*

As evident from the PESTEL analysis in the figure above, the current world conditions requires that Totalenergies adjusts or increases certain aspect of its strategies; to adapt to new environments. Regulations and restrictions have been major factor for operating in some areas like in Russia. Environmental requirements and stakeholders' expectation plays on the balance. The present conflicts in Europe have affected world. For the case of Totalenergies in particular, if it were not the possible losses in Russia, mentioned above, the company could have obtained huge benefits. It is to be noted that, arrangements made between Totalenergies and the Russian partners are not known; therefore, it is difficult to qualify the situation as a loss for the company. This situation requires further or future investigation and as case-study for strategic management approaches and lessons. Leaders in the company still will need to steer strategies, complementing them to respond

to these extra factors. (totalenergies, 2021). TotalEnergies past instrumental actions has permitted to adopt best technologies, focusing on increasing efficiency and thereby improving quality. (Knott, 2015). However, like all other Oil and Gas companies, that regulations requires that they modify and/ or improve their chain value. The company also faces, several threats. The “known” aspects may be the modification of their “strategic attitudes” towards energy transition. This may include significant acquisition of qualified employees in the sector, and avoiding legal suits. Leaders may need to delve deeply-in or be trained to understand the processes of advance research methodologies. Presently, it appears that the company will continue to operate within the current tough world conditions, sometimes to their advantage; when tied with fossil fuel. However, to progress in the energy transition endeavour, the leaders need to align the operational methodologies of all branches, subsidiaries across the world. The overview of Totalenergies’s published Outlook of 2021, demonstrates tactical coherence with all the factors of PESTEL. If the company could apply such strategies in relation with PESTEL factors and determinants, the leaders may attain fruitful business and its target.

1.12.2. Situational PESTEL Effect on TotalEnergy

In the Strategy and Outlook presented by TotalEnergies’ on the September 28th, 2022, they highlighted the state of the energy market due to the war in Ukraine. The report showed how the new energy market transition is sustained, despites current global, political, economic, social, and legal issues linked with the war. All data, governmental or international, news, etc; confirms that despite problems caused by the absence of the Russia gas, as well as the war; these have nevertheless boosted actions and the investments in renewable energies. This is “true-life” experiences that could serve as practical and real-time experience for new leaders. Basing on the present Political, Economic, Social, Legal, and Environmental, TotalEnergy has stipulated its actions from now onwards, as follows.:

- Economic recovery, related to the war and aftermath. (TotalEnergies, 2022). See figure below.

Figure 12. Economic recovery previsions: TotalEnergies.

ii How prevision on the oil market is tightened. See figure below.

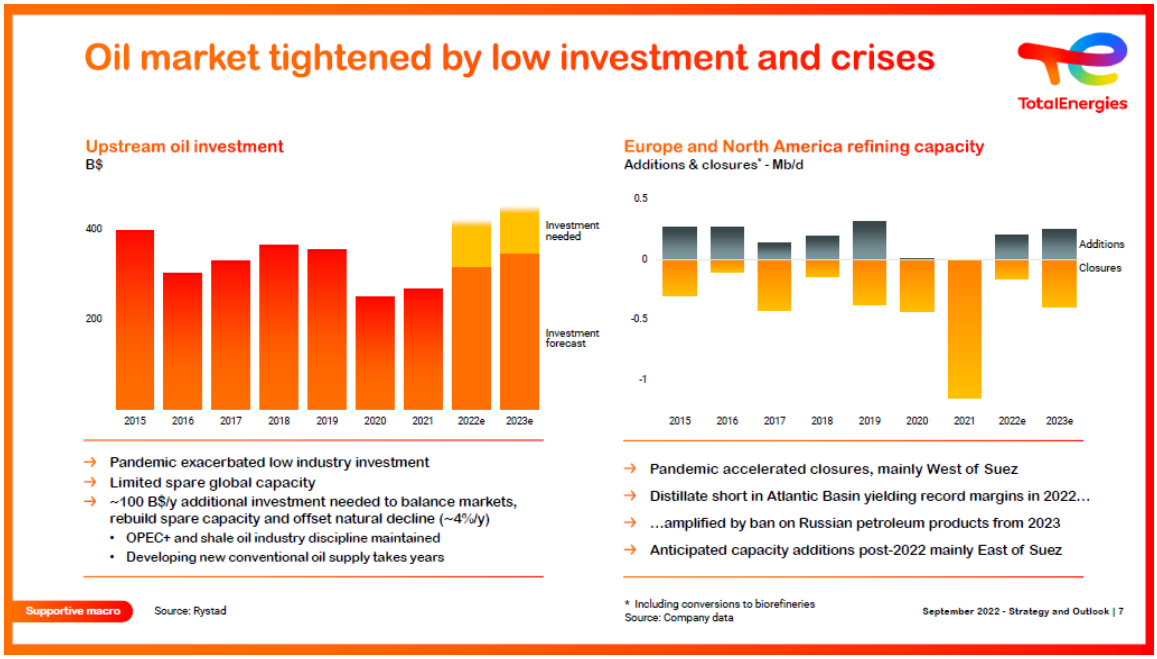


Figure 13. Investments and the Oil Crises

As shown above, there are differences between forecasted investments and what was actually realized. We observed therefore the second variant of P**E**STEL bearing on ECONOMICAL; which subsequently affects TotalEnergy's core competence and operation systems, and will likewise impact the other companies within the energy sectors.

iii With figure below, it is observed, how the European dependency on Russian gas, observably, created tension in the market for TotalEnergies; other competitors as well. See graph below.

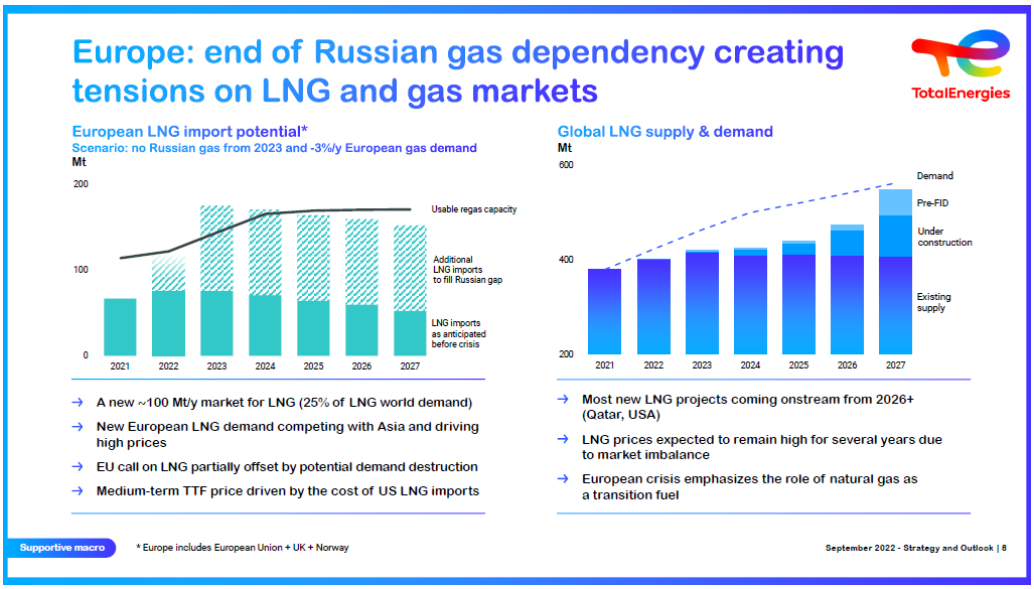


Figure 14. External Gas Sources dependency

From the above the European LNG import potential will be stabilized only by 2027; back to the level of 2021. Of course, the results depend on the strategies or sub-tactics that each affected company will deploy.

iv Nevertheless, to emphasize what was said above, it appears that the situation has boosted the Green Energy and Low Carbon power investments; an incentive; or as a positive side of the “coins”. See figure below, that shows the previewed growth steps in renewal energy transition, by Totalenergies.

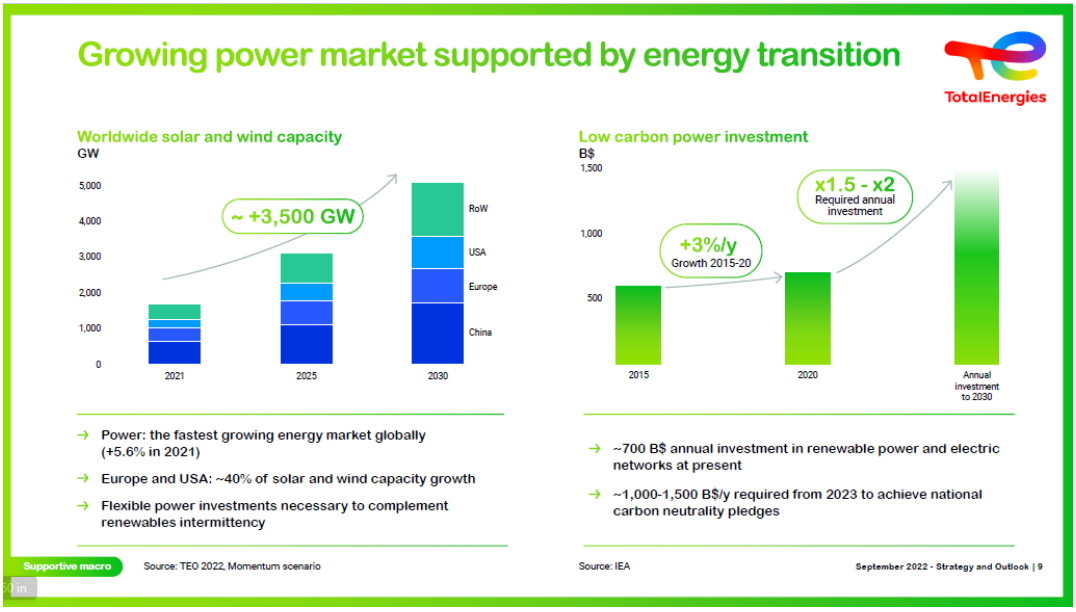


Figure 15. Interesting Growth in Renewal Power and energy transition

Thus, according to this graph, probably, the global market in Wind, Solar and Low carbon Energies transition will almost be doubled, by 2025. The next couple of years will show how the results of strategic actions previewed by the TotalEnergies have impacted, growth in the market, their brand image, and economically.

1.13. BCG Matrix Analysis: Applying to TotalEnergies Leaders

To explore the strategic choices of TotalEnergies, a look into the company's product portfolio permitted to understand their market potential, products, and services. BCG Matrix analysis helps in understanding product portfolio opportunities. Because it critically evaluates strategic position of business and also brand portfolio, and their related potentials.

BCG matrix business tool created by Boston Consulting Group, helps to understand where to proceed in company's investment, and the appropriate diversification.

The classification of business portfolio of BCG into four categories, permits to see the market attractiveness of TotalEnergy's rate of growth in the market. At same time, we see the competitive advantage they have already gained, or the market share. Because TotalEnergy is investing into new energy sectors as opposed to it original oil and gas sectors; BCG analysis reveals a strong probable profitability of their business portfolio in respect to cash. The cash values required to achieve their goal; as compared to possible cash benefit the business venture will generate. The analysis helped to understand, that the investments the firm had made in green energies could be fruitful. The Figure below

presents the company's analysis through the BCG framework: based on the company's business information. (TotalEnergy, 2021). (TotalEnergies, 2023).

BCG Matrix	<--Relative Market Share->	
Market Growth Rate	**Star** Oil & Gas. Renewables, Refining & Chemicals	**Question Mark** Exploration & Production
	Cash Cow Marketing Services. LNG Green Gas. Integrated Gas.	**Dog** Energy & Power production.

Figure 16. BCG Matrix of TotalEnergies,

From figure above, there are wide ranges of products and services, hence company's business segments convers a broad category of products and services as represented in the BCG matrix.

TotalEnergies' business segments include:

i) Exploration & Production;
ii) Integrated Gas, Renewables & Power, (Blue and green energy systems);
iii) Refining & Chemicals;
iv) Industrial Marketing & Services;
v) Domestic Marketing & Services;
vi) Investment in Classical Power Generation (TotalEnergy, 2021).

At this turning point of energies, Totalenergies' strategic choices should continuously incorporate vertical and horizontal integration, market penetration, market development, product development, to permit renewables to become Cash Cow. Because some sectors are "new for them", there may be cash requirement for start-up. However, with technological acquisition in previous activities, it appears much easier for the company. For example, working in the offshore Wind Farm energy will be much easier because TotalEnergy has worked for decades in large scale deep sea/ subsea ventures. In January 2021, TotalEnergy announced the acquisition from the Adani group of a 20% minority stake in Adani Green Energy Limited (AGEL). A leader of world's leading solar developers, contributing to gross power generation capacity in renewables to 35 Gigawatts, by 2025.

(Totalenergies, 2021). Added to their previous acquisition, this horizontal integration fortifies the company's "star" core competence.

1.14. Exploring Strategic Options of TotalEnergies Leaders

1.14.1. Visioned Strategy

TotalEnergies being one of the major energy industry players, is aware of the varied consequences and the unconditional effect of the environment as a part of their strategy. Hence, our investigation shows that the organization has learned from the past, and is now actively being instrumental in avoiding, or minimizing the risks. Current reports from the company's shows how leaders are now focusing on incorporating major environmental issues as a part of their strategic activities "marking". We observed that report to stakeholders indicates that, the strategic activities of the company are based on:

- Research;
- Prevention;
- Stakeholder Dialogue;
- Lessons learnt.

The recent publications to stakeholder show focus on improving environmental performance. *(*TotalEnergies, 2021), (TotalEnergies, 2022). See figure below.

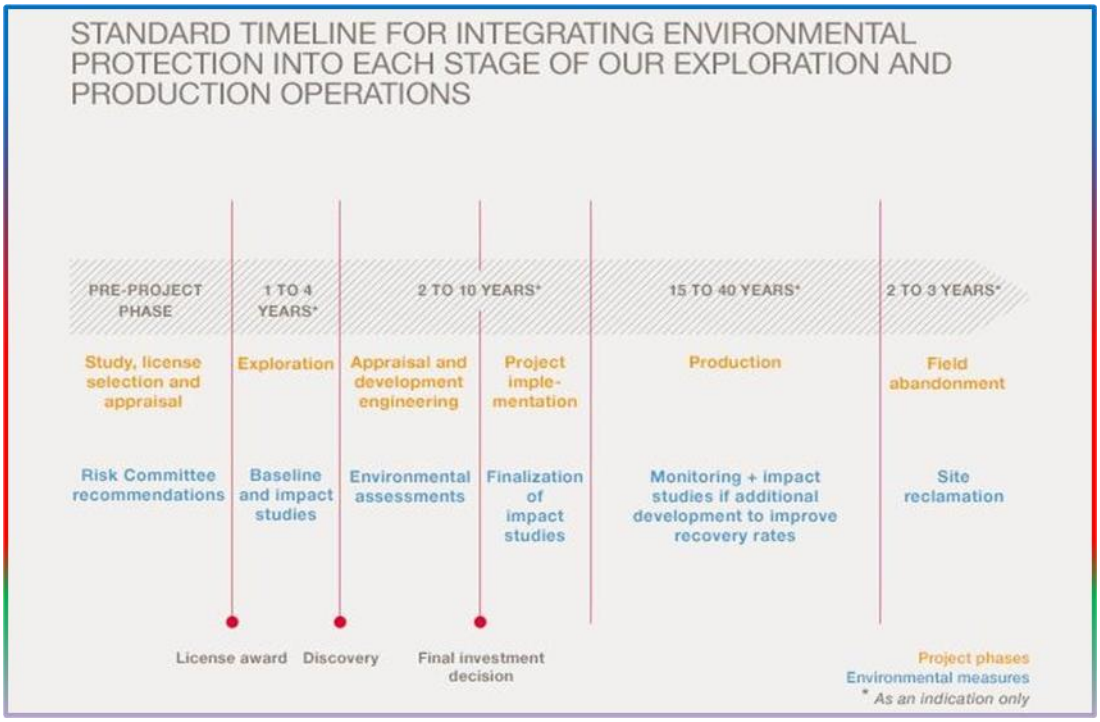


Figure 17. TotalEnergies imbibing environment into its strategy- options

1.14.2. Exploring Options

Analyzing of the market “survival” strategies, with environment related influencing factors of the company, the data used is from research consultants and analysists. And it highlights strategic options of TotalEnergies, as stated bellow:

a. Formulating strategy with more stakeholder engagements;
b. Understanding the totality of the ecosystem to identify opportunities of growth;
c. Playbooks of return of investments (ROI), creating of means for boosting. (Johnston & Uro, 2021);
d. Imbibing Agility into actions – With Ecosystem view to move with all;
e. Aligning digital strategy to support the energy transition – Environmental, Social and Profit;
f. Redesigning the process of financial resources allocation – Identifying unique areas;
g. Innovation to reduce costs, increase quality and improve efficiency;
h. Suitability Analysis which fits the framework of energy transition and growth through Mergers & Acquisitions (M&A) Valuation model. (prnewswire.com, 2023), (Ati, et al., 2021),

1.14.3. Evaluating Strategic Options for the Organization

Strategic importance matrix in the figure below helps in highlighting the importance of the approach mentioned above; setting priorities and timelines for the company. (TotalEnergies, 2023). See below.

Strategies	Incumbent (Rating Out of 5)	Future need (Rating out of 5)	Timeline
3	3	5	Short-Term
3	3	5	Mid-Term
2	2	4	Short-Term
2	2	4	Long-Term
3	3	5	Mid-Term
2	2	4	Mid-Term
2	2	5	Short-Term
3	3	5	Short-Term

Figure 18. Strategic Importance Matrix.

Note: In rating; 1 being lowest, and 5 highest.

Because of the relative newness of TotalEnergies in this sector, the company appears to be within the average, and even lower in some part of the matrix. Incumbent is the same as strategies. Futures needs are more Short-term dominated. And these, in practical terms, are related to need of qualified employers in all sectors of the green energy business; as well as a serious staff retention programs. It is observed in global energies companies, that; there a lot of turn-over in respect to qualified employees, with the aim of salaries and position increase. TotalEnergy should continue or even improve in their rewards system.

1.14.4. Evaluating International Drivers and Strategies

As mentioned above, TotalEnergies is already present across more than 130 countries with over 100,000 employees. (totalenergiespress, 2021).

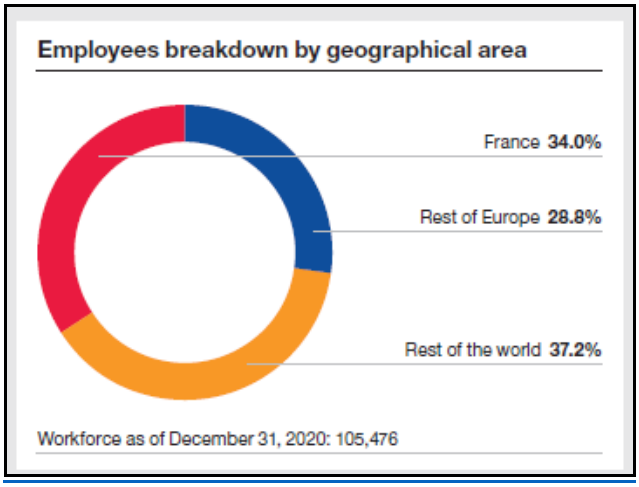


Figure 19. Employees Breakdown.

The figure above shows the employees breakdown as per global zones. The rest of the world incorporates 37%. From renewable energies experience, TotalEnergies need to expand globally- for energy transition-, because green energies are abundant globally. Yet there appears a disequilibrium, basing on its part of operation in European being almost 63%; this requires a progressive, strong, and persistent action for expansion.

1.15. Ansoff Matrix Analysis – Applying to Leaders Growth Actions.

Ansoff Matrix model in the figure below depicts the risks levels associated to business possibilities and development of Totalenergies' strategy for the past eleven years. The Ansoff Matrix is one of the popular business and market growth models in strategic management. It is used for planning market penetration, development of products and diversification. As seen from the diagram below, Ansoff's Matrix the strategy of vertical and horizontal integrations made by the company, with associated risks, seems to have paid off, with a measurable success.

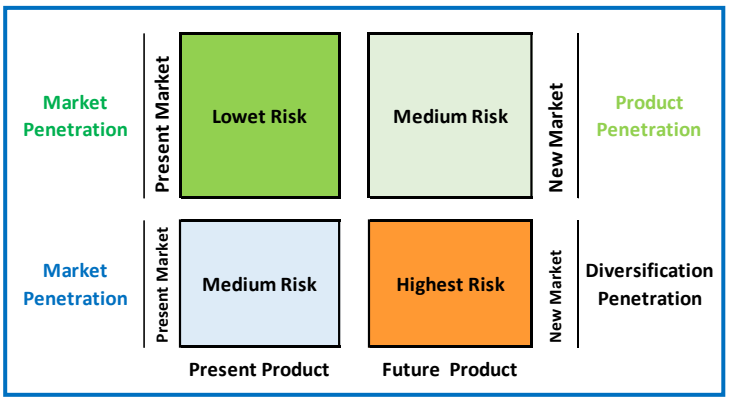


Figure 20 Ansoff's Matrix for TotalEnergies.

Company needs to ascertain key human assets before performing acquisition, to avoid empty integration: e.g., quickly loosing of qualified personal within the acquired company, right after the integration.

Information depicted with two figures below, capture the process of the company's growth, since it was founded. And then, developments since 2011; showing the diversifications, entrance in new markets, compared to its original business activities. (TotalEnergies, 2023). (Totalenergies, 2021).

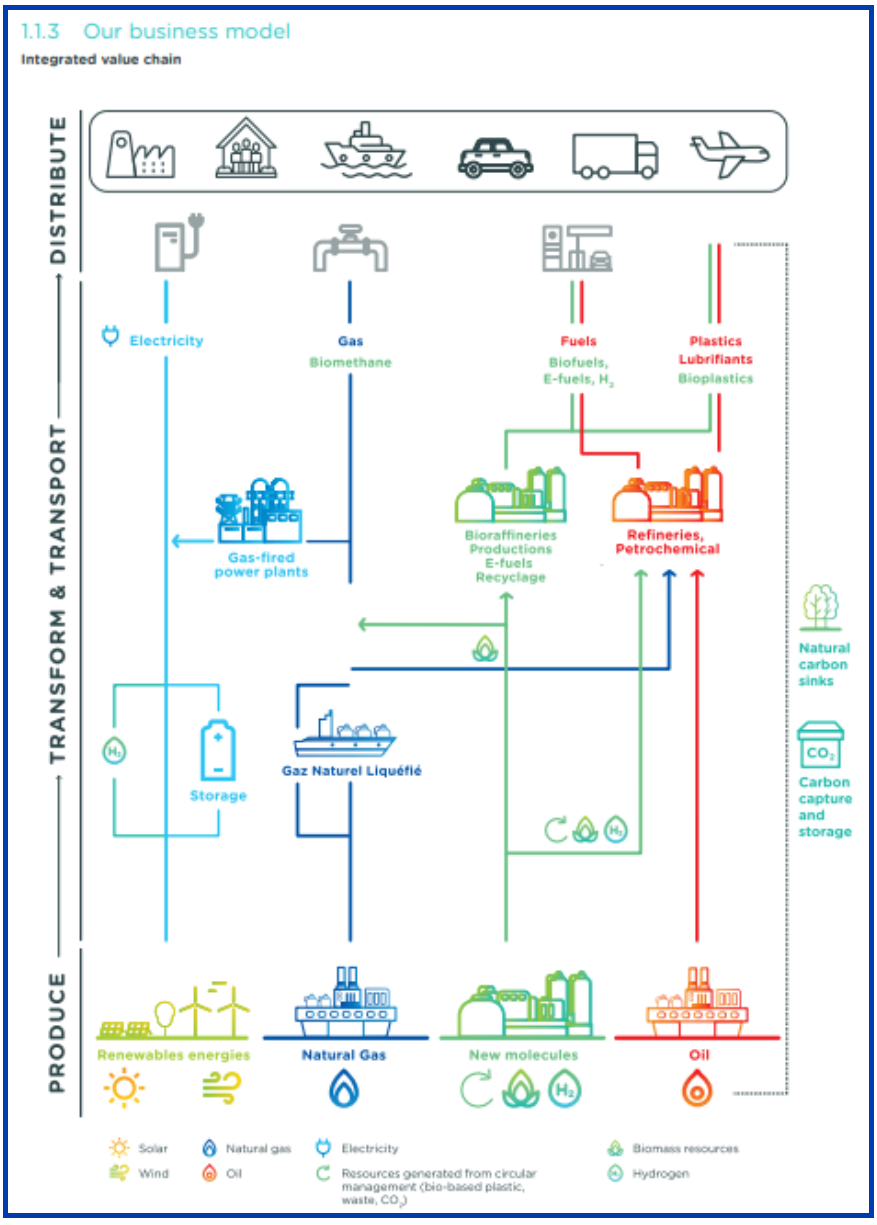


Figure 21. Business Model TotalEnergies.

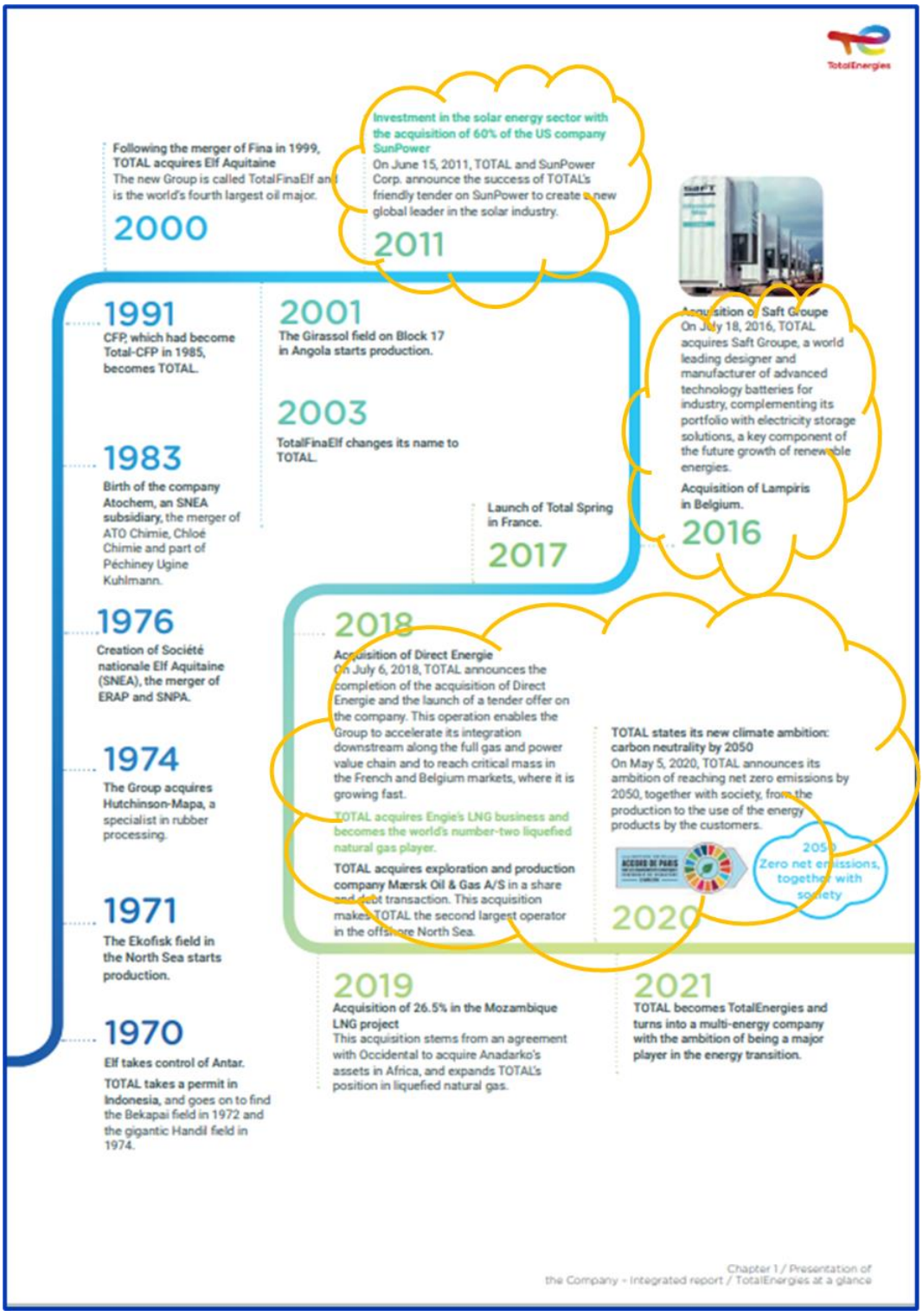


Figure 22. Company History and Progression.

1.16. Corporate Social Responsibility (CSR) and Sustainability

1.16.1. TotalEnergies CSR strategies and ‘Stakeholder Theory’

From a stakeholder theory perspective, Corporate Social Responsibility (CSR); plays an important role to understand the different stakeholders’ function within the value chain of the company. Leaders may use these factors, along with influencing strategic options social responsibility (CSR), and sustainability, for uplifting overall activities of the company. As per ‘Stakeholder Theory’ of CSR engagement, an organization needs to have a wide range of internal, external, primary, and secondary stakeholders. And should work towards the mutual development and growth of all. The company has long history in working within the fossil fuel energies; added to their deep understanding of infrastructural resources and R&D constitute an advantage for them. Their past experience therefore seems to helping them to come out with unique and innovative solutions, arrangements, and engagements with the stakeholders. In 2000-2002, TotalEnergies had the opportunity to cooperate in a joint-Venture; with Shell and few others, in this direction. Interestingly this was the first global gas gathering project with intention to stop Flaring gas (“non-torching” of gas into the atmosphere; the Odidi-AGG project in Nigeria. This was a significant step into company social responsibility (CSR) and sustainability process in this respect. Having participated in this project; personal observations, meetings and quantitative data found at Totalenergies website, helped to understand the leaders’ stakeholder engagement; their leanings to sustainability. (TotalEnergies, 2023), (TotalEnergies, 2022). The snapshots in the next two figures below illustrate the leaders’ recent visions.

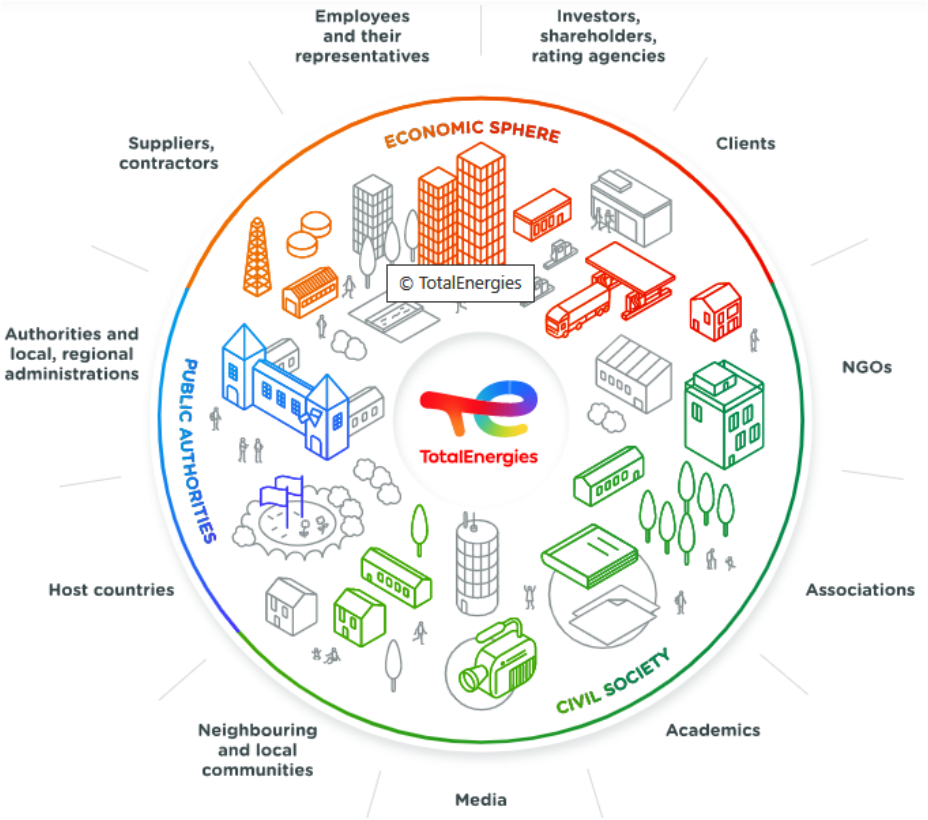


Figure 23. stakeholder engagement and roots in sustainability.

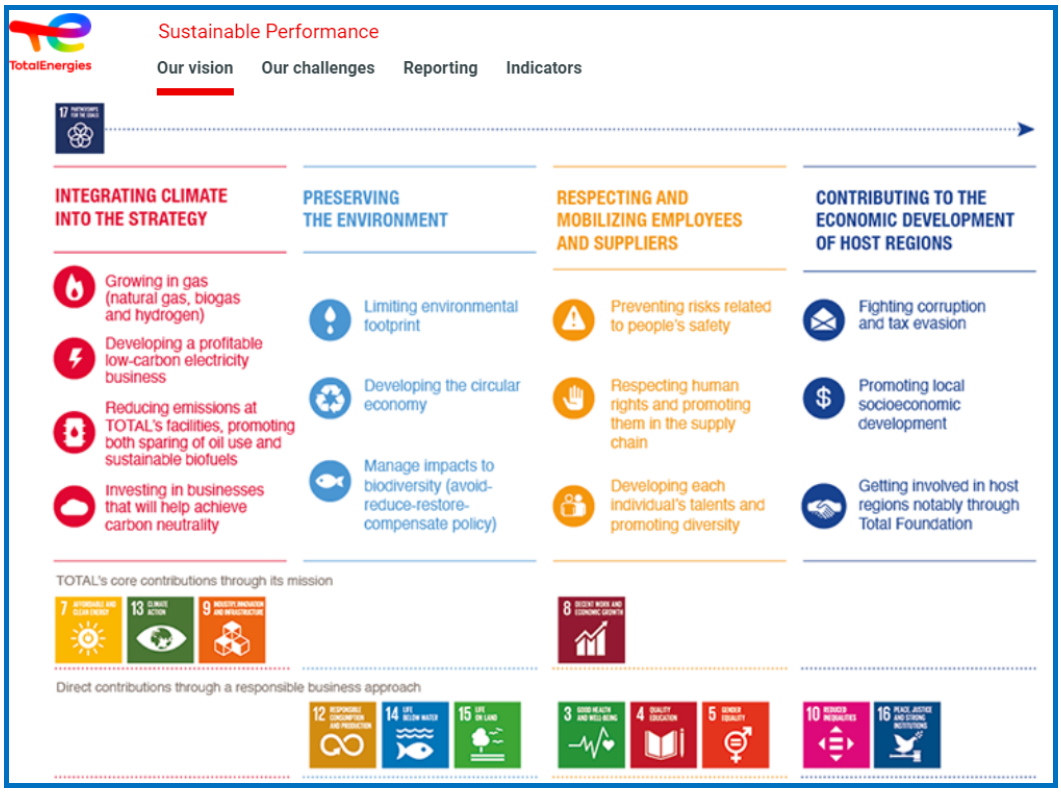


Figure 24. Sustainability Performances. TotalEnergies.

It is evident from company's data, above, and other world reports, that, global regulations as well as other circumstances have encouraged or coerce the company to organizing CSR at different levels of business operation. For example, at the economic level, the suppliers, contractors, employees, investors, and clients are of primary concerns. Actions are being taken to prevent negative perception by local stakeholders or communities, e.g., in west Africa Delta area. Nowadays, at public authorities' level or host countries, local, regional, or national authorities, CSR is of serious concerned, and the leaders seem to be very well aware. At the civil or society level, communities in the neighborhood, media, academics, and associations, are actively engaged to implement all aspects of CSR. Hence, TotalEnergies enrolls stakeholders when formulating their strategy for Corporate Social Responsibility (CSR) and Environment Social Governance (ESG) metrics. To some extent, thereby, this represents a classic example of following the 'Stakeholder Theory' of CSR. Interestingly, the "perspective of stakeholder is an alternative way of understanding how companies and people create value and trade with each other" (Cambridge, 2018).

1.16.2. Relationship Between Strategy, CSR, and Sustainability

When it comes to defining the CSR strategy of the organization, TotalEnergies has learnt from past incidents. Accidents lean (Boughriet, 2009), and all along the value chain, the company is now being instrumental in absorbed sustainability best practices. The group participates or incites several actors across different organizations of the industry; promoting CSR at different levels, as shown in the figure below. (Totalenergies, 2023).

Figure 25. TotalEnergies CSR participation or initiatives.

TotalEnergies declares to pursue these praiseworthy efforts, despite fluctuating global business conditions, and at the long run, maintain permanently within its company culture a CSR position. This strategic attitude could be, by itself, a fringe benefit to success, as well as an incentive for being "accepted" by the global market; as sustainable company. As of the current situation, TotalEnergies have a major aim; “heavy” shifting towards a complete model of energy transition while keeping into mind the importance of the CSR perspective. This is evident from the last published annual reports, where some senior leadership "discoursed" that, their key target, or outstanding pointers, comprise of:

- Stakeholder – Community and ecosystem development remains one of the major aims and dimensions of the strategy of the company, as it moves actively towards becoming a great sustainable power and energy group. The leaders went as far as company rebranding; changing its’ logo, and positioning themselves accordingly (totalenergies, 2022).

- Climate – Climate focused is one of its primary objectives and has been a major thrust. This is evident from integration of enhanced portfolio for green gas and green fuel, as well as other renewable energy sources. The company has also been instrumental in including the climate related actions into its varied expansion and extension plans. (totalenergies, 2022)**.** See the two diagrams below. They depict the company's levers for performing decarbonization, through increase in percentage of renewable energy mix; production and integration. And the graphs show as well the climate related action; in course, or as projected by the leaders.

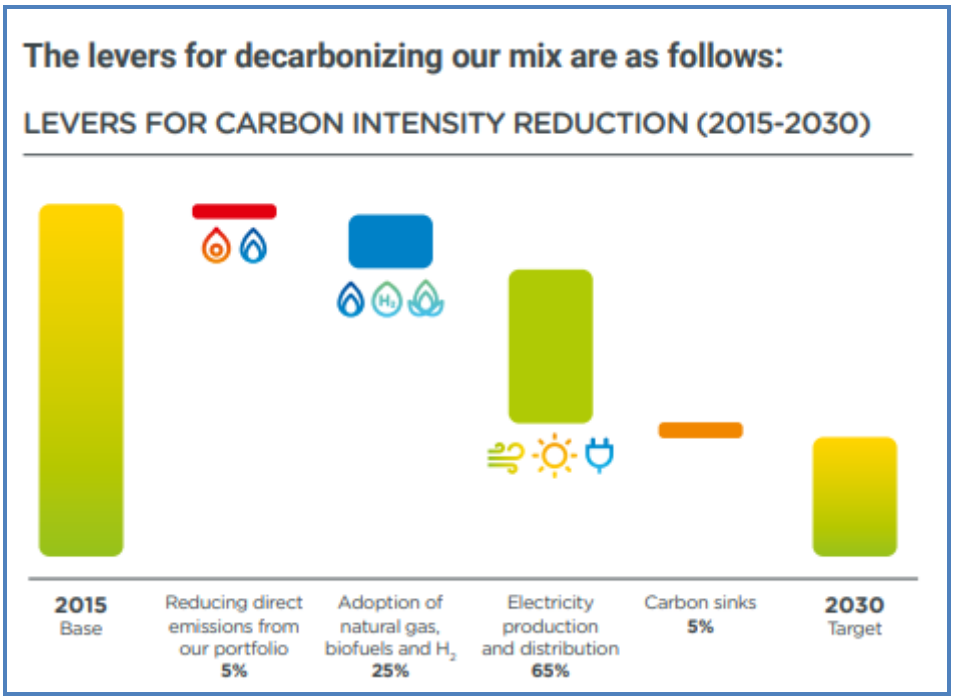


Figure 26. Climate related actions.

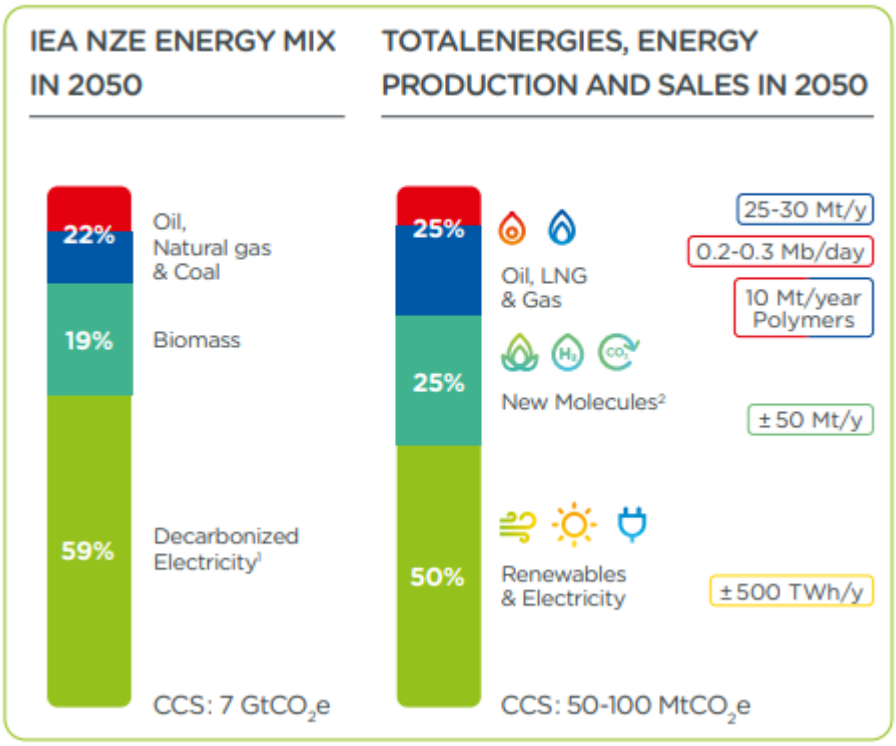


Figure 27. Energy Report. TotalEnergy.

- Diversity – In the diagram above, the company provides metrics of its' involvement, in diversity strategy. Inclusive are: products, host localities, employees, mixity, gender equality, and top management and nationality equality. The group presentation shows involvement of global local contents, within the activities of the company: whether in delivering products, or services to the end users. The company has thrusted forward to sustainability across its value chain. This has helped in developing a strong 'narrative' for stakeholder engagement. (Totalenergies, 2022). The Company's target for environmental, diversity, and mixity; is shown with the three figures below. (totalenergies.com, 2021).

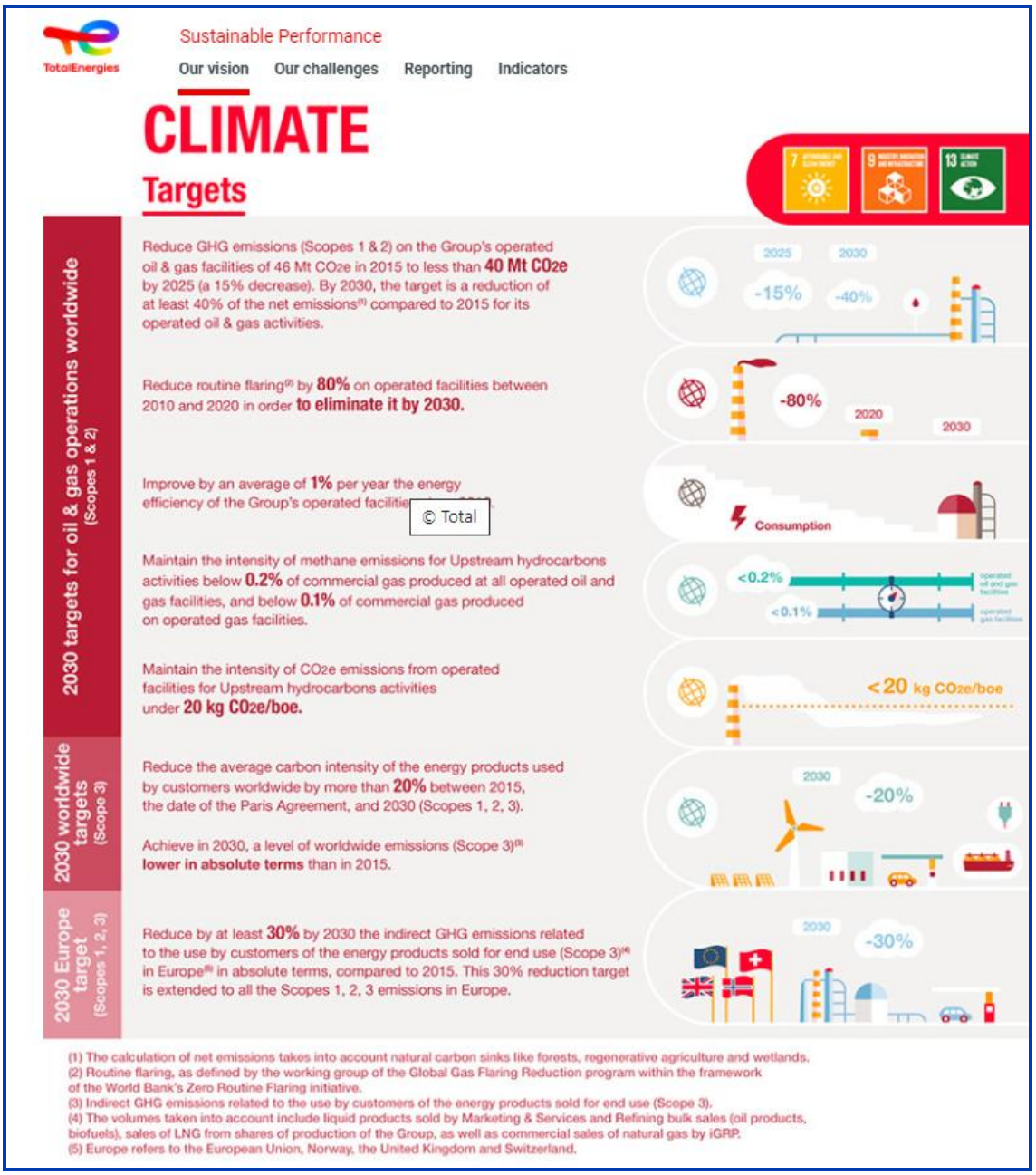


Figure 28. TotalEnergies Climate target.

Figure 29. Health safety/Diversity in Global Business.

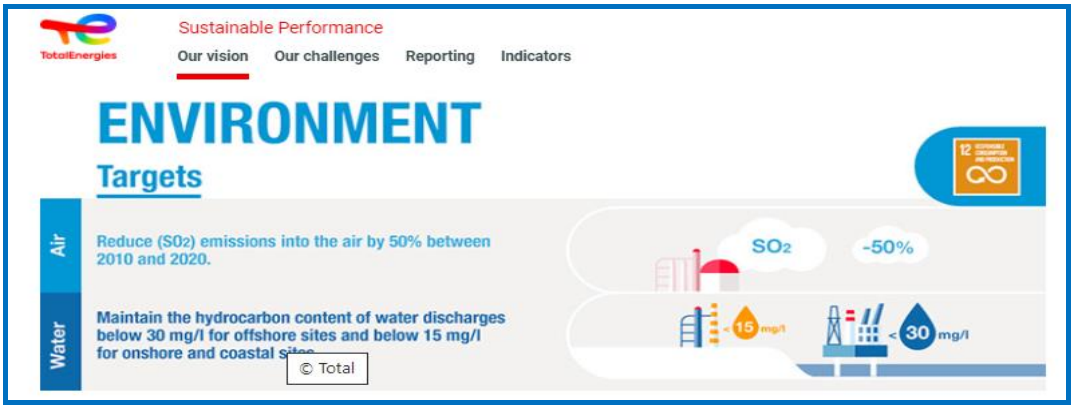


Figure 30. Environmental Inclusion. TotalEnergy.

From the above three figures, the leaders stipulate as well their target on climate related actions, health, safety, diversity, and personnel mixity. As time goes by, the evaluations, investigations and further critical assessments will permit to ascertain how far the company has adhered to their statement and published CSR/sustainability strategy.

1.17. Evaluating the Shared Value Concept of Leaders

The shared value concept speaks about the policies and the principles of operations of the company. This not only contributes to the development and growth of the organizations under consideration. It also helps in the development of the socio-economic conditions, community conditions and stakeholder conditions of the organization under consideration. (Menghwar & Daood, 2021), (totalenergies.com, 2022).

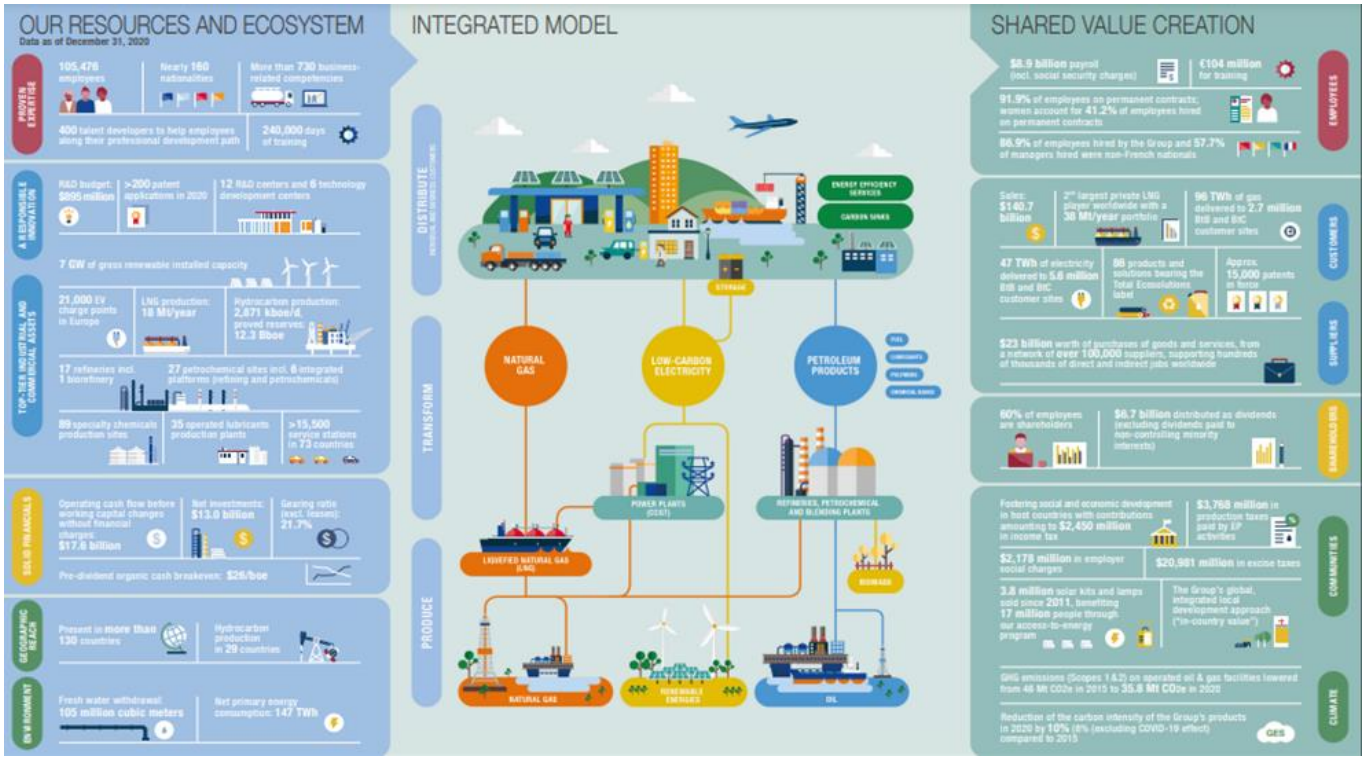


Figure 31. Intergraded Model &Shared Values. TotalEnergies.

As per the figure above, TotalEnergies has been instrumental across its value chain to properly utilize the ecosystem in which it has been working. Across its value chain the company has been working very closely with all type of its stakeholders. For example, it has been instrumental in giving $8.9 BN payroll for its employees with 91.9% of the

employees being at permanent contracts. It has been instrumental in purchasing $23 billion diversified supplies from suppliers and making 60% of employees as shareholders. With $2.45 billion tax payment, the company has also contributed to socio-economic development of the regions it operates.

In countries where TotalEnergies operates; e.g., Nigeria, Congo, Gabon, we had the opportunity with (Bouygues offshore/Saipem) to be involved in providing material supporting locality. These included, free training, free provisions for electrical energy distribution for locals, and water supply system. The company has participated in projects with global carbon foot-print reduction. Hence, the company has been proactive to optimally utilize its products and services to provide value not only for itself, but also for its stakeholders across the value chain (totalenergies.com, 2022). In figure below, consensus ESG ratings: attributed to TotalEnergies a rating on “Corporate Social Responsibility (CSR) and Environment, Social, Governance (ESG) Metrics; with a net positive appraisal- as shown with the graph just below. (csrhub.com, 2021).

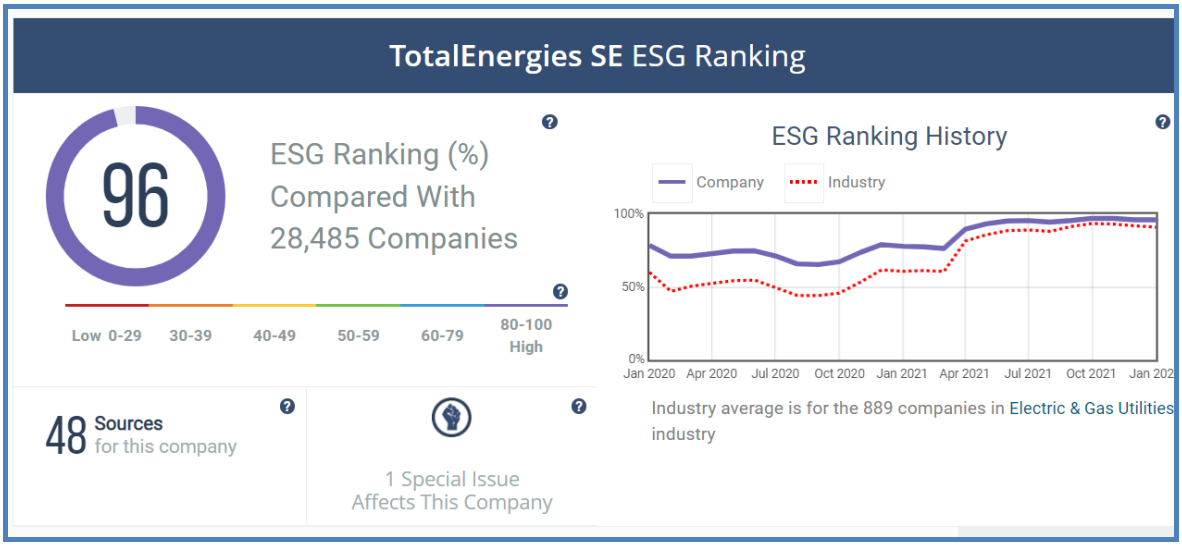


Figure 32. Corporate Social Responsibility (CSR) & Environment, Social, Governance (ESG) Metrics.

1.18. Leadership Styles in Managing Strategic Change

1.18.1. Leadership Styles Per Say

Leadership styles are the ways by which people expected leaders to run the organizations successfully, whilst satisfying stakeholders/shareholders through organizational growth. Five of the major types of leadership styles are authoritarian, participative, delegative, transactional and transformational. All the five styles have their intrinsic advantages and

disadvantages. Totalenergies' present-day global and environmental strategy appeared to be steered toward sectors of greener energy transition; and is based on innovative future performance.

Consequently, the company needs a leadership style that would not only empower its employees, but will also create an atmosphere of collaboration, creativity, and innovation. (Yahaya, 2016). It is often said that; Leadership is not telling others what to do, but rather inspiring and influencing to do their best, because they have come to like doing it. And positive influence is subtle, yet incredibly powerful.

TotalEnergies already have a strong patent portfolio, but as it is moving towards a greener and more sustainable future, it needs to have innovation leadership style as main driving engine. Hence, it should be careful in choosing the correct path in leadership. (Algahtani, 2014). This will help, as the company moves on with innovative and varied energy transition strategies in these new business environments.

1.19. The organizational Context and Strategic Change

TotalEnergies is having almost 100 years of history of operation in energy sectors. There have been different types of leaders at different points of time with different objectives, aims, contexts and challenges. Patrick Pouyanné is the current chairman and Chief Executive Officer (CEO) of the organization, successor of Christophe de Margerie, following his tragic death. Under his responsibility, the executive committee is the decision-making body, while the second body of performance management committee is responsible for examining, analyzing, and monitoring the varied financial, HSE and business performance. However, at the outset of his chairmanship of the company's new Executive committee from 2015, the CEO was under criticism. This was mainly due to his highly centralized style of management, considered then as authoritarian style. His leadership style resulted in some complaints from the employees and has also resulted in dissatisfaction leading to early departures from among the different executives (Morissard, 2021).

Talent management was one of the important aspects and core competency of the company for a long time, yet the group appeared then to be less competitive. The board needed to adjust. This resulted in somehow mixt of transactional and transformational leadership. The organization is now excelling in the business performance, along with managing the brand change. Meaning that the present leadership and the corresponding

styles have been good enough. However, there is need to pursue this transformation to attain the intended organizational growth. Especially due to aftereffects of Covid-19 and wars. (TotalEnergies, 2022). Currently, TotalEnergies has 14 Board of directors; with several ramifications permitting to be in touch of all levels of operation. Thus, it seems the desire to enter into new energy sectors has been an incentive, for a shift in leadership style. If pursued, this may help satisfying the shareholder/stakeholders across the organization, and help growth and development. At the same time this mixt system may curtail turnover of critical staffs. (totalenergies.com, 2022).

1.20. Leaders and Their Influences on Strategic Change

Does the actual leadership styles of Patrick Pouyanné constitute the leader required for the company's business strategy and direction? In 2021, he received a reward as Manager of the year by the French magazine "Itforbusiness". (Brébion_itforbusiness.fr, 2021). It remains to see globally, and time and effects may provide the answer. The combination of the two types of leadership style spoken would help consolidate an environment of collaboration and creativity. These in turn would help in putting forward robustness into their innovation quotient**.** (Ejimabo, 2015). TotalEnergies has a huge ecosystem-oriented stakeholders, attached to the company for different purposes. This type of leadership would help in reducing the attrition rate of the company, as it has been the case for many other companies in this global context, filled with major challenges. On the other hand, the company would be able to stand out in its new sectors; as it continues to retain talents. And at the same time being innovate on its new products, and services in greener future. (Sheard & Kakabadse, 2012).

The two types of suggested leadership styles would also be instrumental in encouraging learning at different level of management and staff. This in turn would indirectly help in stimulating creativity, to some extent, and thereby bring in more enthusiasm or motivation into the employees' pool. (Garland, et al., 2018). The transformational style serves as an ideal platform for creating influence across the stakeholder groups, through 'Lead with Example' style alignment. Hence, employees will feel the new motivation and new urge to work towards their own development and thereby contributing towards the company's aims of greener future and sustainability. As Sun Tzu said: "A leader leads by example not by force".

1.21. Conclusion Chapter 1

TotalEnergies is one of the major energy companies across the world. The company has a huge employee 'base", and a wide range of operations through varied services and products. This company has been able to establish a strong foothold across both emerging, advanced business technologies, and economies. The company's competitiveness lies in its R&D, pricing strategy, talent management, and in unique investments opportunities. In recent times, TotalEnergies has undergone a brand and logo change, as a strategy of aligning itself to global energy transition.

While the strategy has been working to some extent, the authoritarian leadership style, created discontentment among the employees, leading to a lot of employee attrition. However, from the current analysis, the company is apparently adjusting, that which would lead to an exponential growth in greener energy. The social-cultural, economic, and environmental agendas are on the company's priority list. The transformative style of leadership coupled with participative style may help in achieving a strong collaborative atmosphere.

Also, there are possibilities in terms of expanding its products and solutions to newer markets along with exploring organic and inorganic growth. Hence, a host of opportunities wait for the company to explore under their leadership style with focus towards a greener future. This constitutes a real motivation factor for the company. We note however that, mistake leading to unnecessary, financial loss, brand name depreciation, lawsuits, strikes and accidents could have been avoided. If the applicable business models, frameworks, and theories discussed above were fully applied at the very beginning; the disturbances mentioned above could have been averted. It is instructive to note that, the business analysis related solutions, deployed by these leaders later-on, confirmed the usefulness of these frameworks.

From the above, It would be informative to explore in detail the actions of these leaders, and those of similar companies; starting from Covid-19 pandemic time, through to the war in Ukraine, and afterwards.

2. Chapter 2. Using Change For Strategic Advantage: Lessons from Conventional Energy Companies

Introduction to Chapter 2

Change is a fundamental feature in the universe. In all realms, things evolve from one stage or conditions to another; even in non-organic realm. In business sectors, changes are triggered by competition, stockholders' constraints, volatile behaviours of consumers, social and environmental factors. Successful leadership, therefore, entails a deep knowledge, and skillful maneuvering of change processes. The importance of change management is accentuated by the fact that, humans are an important part of business changes. And human nature, and future actions, are not always easily predictable. This research report is based on actions of leaders in the 'classical' energy companies, and the effects of methods deployed to implement changes within their organization. The report consists of the Why change management strategies, that are specifically "tailored" are indispensable for success. It implies that a leader accommodates in actions; market variations, and become comfortable: and then the company can thrive in the new business sector of energy transition. The research section presents findings on the consequences of leaders' change methodologies. These demonstrate that, in relation with internal and external stakeholders, the relevance of change management models and theories hold: and can therefore provide precious guidelines for practical applications.

2.1. Sequences in Organisational Change and Components of Influence.

2.1.1. Choice of Case Study Organisation.

AIRFRANCE

Air-France Group

Business' environmental factors described within the introduction above, are relevant to the Air-France KLM airline holding company. The group's Legal, and financial status depended on two different making entities: France & Holland. And this could be

challenging, especially in periods of change. The figure below shows the legal composition of main stakeholders. (planespotters.net, 2022).

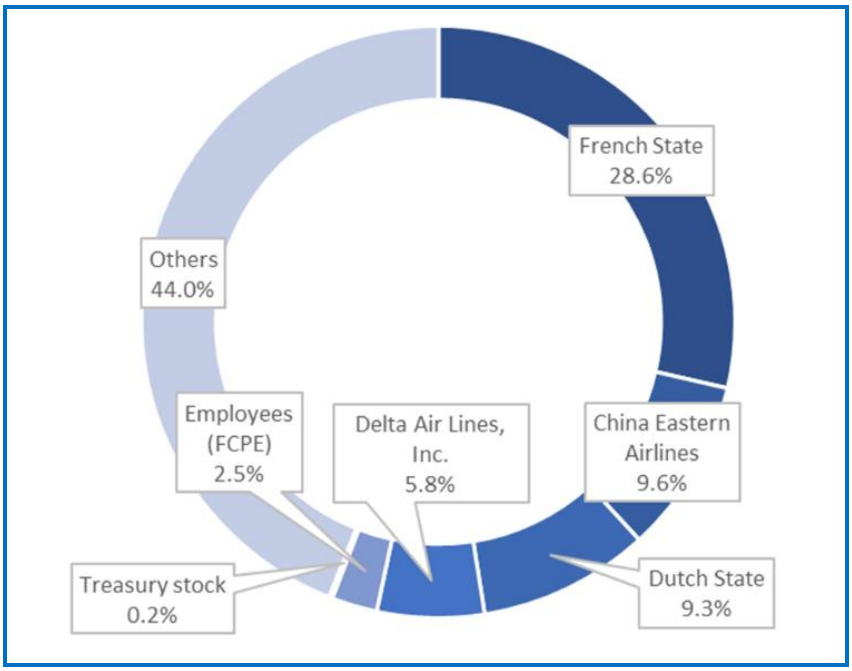


Figure 33. Air France stakeholders.

The company experienced significant changes since its creation in 1933, in France. In 2004, the merger Air France and KLM become a dual airline, members of the SkyTeam airline alliance. The Franco-Dutch group is however incorporated under French law. It is estimated that, in 2019, the group transported about 104,205 million passengers; that is before the Covid-19 pandemic. (Corporateairfrance, 2021), (airfranceklm, 2019). (air-journalfr, 2020). The next three figures provide information on Airfrance and on the group.

Air France Fleet Details and History

Air France		
IATA **AF**	ICAO **AFR**	Callsign **AIR FRANS**
Airline Full Name		Air France-KLM
Country		France
Airline Founded		7 Oct 1933
Group / Part of		Air France-KLM
Subsidiaries / Group Airlines		Air France Air Inter Express Air France Asie Air France Express
Headquarters		Paris Charles De Gaulle (CDG / LFPG)
Bases		Paris Orly (ORY / LFPO) Pointe-a-Pitre Le Raizet (PTP / TFFR)
Focus Cities		Lyon Saint Exupery (LYS / LFLL) Marseille Provence (MRS / LFML)
Fleet Size		213 Aircraft (+ 4 On Order/Planned)
Average Fleet Age [1]		14.2 Years
Official Site		airfrance.com

Last updated on Jun 09, 2022

Figure 34. Air France history.

Air France-KLM Fleet Details and History

Air France-KLM	
Airline Full Name	Air France–KLM S.A.
Country	France
Airline Founded	5 May 2004
Subsidiaries / Group Airlines	Air Antwerp Air France (213 aircraft) Air France Hop (44 aircraft) Brit Air HOP! JOON KLM Asia (9 aircraft) KLM Cityhopper (58 aircraft) KLM Royal Dutch Airlines (109 aircraft) KLM UK Engineering MRO Martinair Holland (1 aircraft) Régional Transavia (39 aircraft) Transavia France (60 aircraft)
Headquarters	Paris Charles De Gaulle (CDG / LFPG)
Fleet Size	524 Aircraft (+ 10 On Order/Planned)
Average Fleet Age [1]	12.2 Years
Official Site	airfranceklm.com

Last updated on Jun 09, 2022

Figure 35. Air France-KLM history.

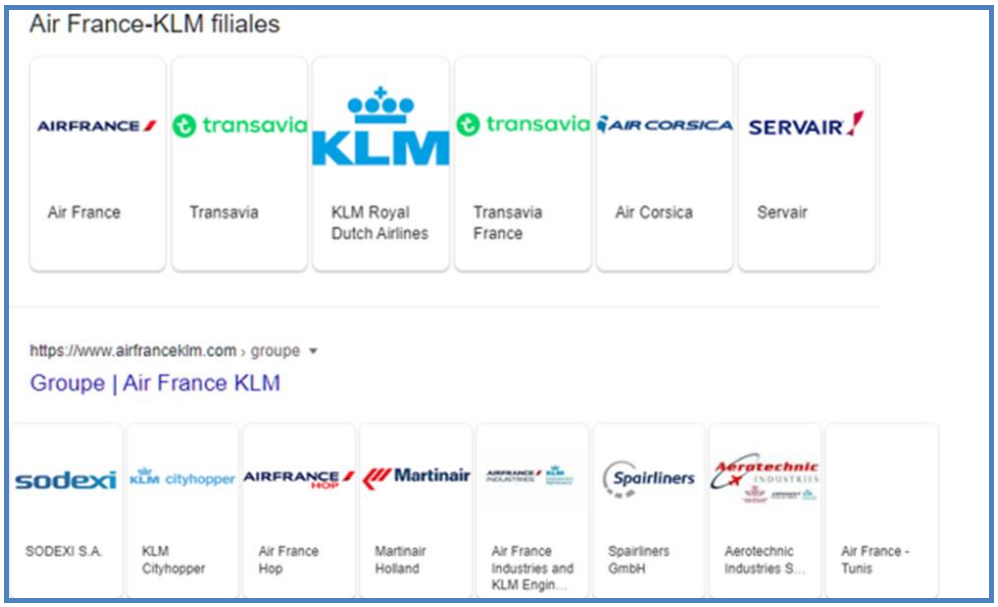


Figure 36. Air-France group & branches.

The figures above show that groups activities; including subsidiaries and other group members, globally. Most of the members were a result of horizontal or vertical acquisition.

2.2. Change Theories and Analysis of the Relationship Between Leadership and Change Agents.

Change management at Air-France's sometimes faced mixed reactions due to interferences of the two governments. (TourMaG.com, 2018). In moments of change, frequently, Air-France's leadership had to systematically persuaded agents, employees, state stakeholders and especially, French labour unions. The later are more difficult to handle, and could easily vote for a strike; or on the other hand, convince overall agents to support and enroll in leaders change strategies. (Bohineust, 2014) (Golla, 2014). For decades, because of opposition to change; several conflicts in Air-France have paralyzed operation; and in each case, causing losses in millions of Euros to the company. (Gliszczynski 2018), (Duclos, 2019). Appropriate knowledge of company's "environments", viewed through change management models and theories is therefore indispensable for the company to positively impact on employees' acceptance. One of the effective change theories is that of Kurt Lewin's 3 stages change management model.

2.3. Lewin's 3 Stage Change Management Model

A key impeding factor on change process is human's natural inclination to dread the unknown. The Kurt Lewin model highlights the fact that, correct actions are required to break-down existing "state of affairs", the status quo: neutralizing the perception of change as being a threat. Several past change processes in Air-France provoked repeated social upheavals, and lessons learnt afterwards, confirm the appropriateness of applying models like Kurt Lewin model. This implies implementing changes in sequential way, so that the overall process of a change, would follow the three major steps; a more manageable way. The steps, depicted in the figure below, are:

- Unfreeze;
- Change;
- Refreezing threshold; to final 'Refreeze'.

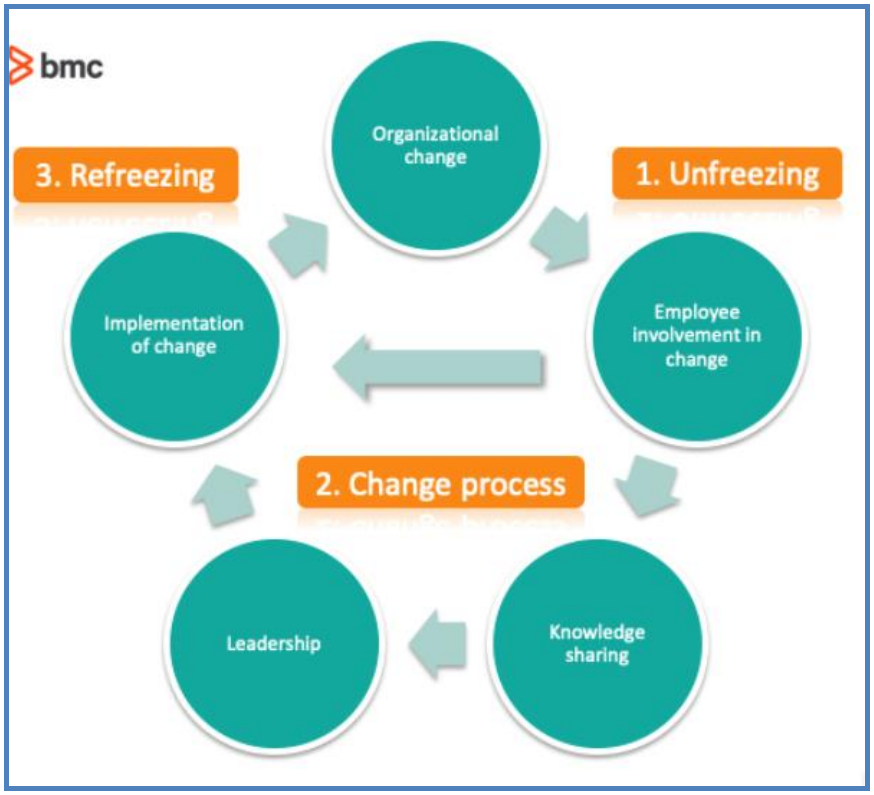


Figure 37. Lewin's Model of Change. (bmc-Raza, 2019).

From above principles in the diagram, a collective approach is needed to prepare organization change. It goes with supporting individuals, teams, as well as the labour organizations, as in the case of Air-France. All stakeholders or shareholders, and employees should be involved in change processes; permitting them to grasp the

necessity, or how crucial is the change for success. With this understanding, it should be normally easier for anyone to let go; “unfreeze” status quo. Simply because they understand Why, How and Where, and even what; what they gain, as consequent of the change.

A look into company’s changes’ history, - (through quantitative data)-; it appears that, often, after concerting with labour organizations, solutions/agreements were found, and all agreed to “unfreeze” from the “*as it has been*”. Cooperation and support were received from most of employees. Unfortunately, in some cases, company lost millions of euros before all accepted to let go; unfreeze. This was, mostly due to non-application, or partial application of the sequences imbricated within the Lewin's Model of Change.

Thus, employing the sequences of this mode will be:

- From “acceptance”, e.g., in mode ‘’en-route’’;
    - When those involved have “**Unfreeze”.**
- The change is then deployed;
- The next step will be to “solidify” the “acquisition’’, e.g.;
    - **Refreeze** the new state.

Another aspect of Lewin’s model is to spread change phases over a reasonable period to dissipate any residual resistance from employees. This model will be extremely useful for leadership at Air-France and their relationship with when stakeholders and employees. The quantitative data examined, for a period of about three decades, shows that; changes were frequently accepted by employees, only after several information meetings were held. Having their say and knowing what is involved for them appears to have helped to accept change environments.

An example is what happened in 2018. After ten months of turbulences, which cost company about 350 million euros, top Management then met with labour union representatives. Each side made a move, and, about 74% of employees accepted the terms, halted the strike. (Gliszczynski, 2018). What prevented leaders to consider this possibility at outset? Especially knowing the reaction of the labour Union? Why would they allow such a heavy loss before negotiating for both parties? This aspect could be qualitative research that would involve the leaders. In Air-France, the change agents could be both internal and external. Change leadership vision and ability to management through conflictual situations is frequently put to test. Therefore, Leaders face a strong and resistant factor in the company, and perhaps applying past experiences in change plans

may help for a smooth process in future change management. Thus, it can be said that, a strong relationship and mutual “respect”; between change agents and leadership is required, so that resistance can be minimized, thus smoothen change implementation.

As noted above, Lewin's Model enables change in three steps consisting of: unfreezing, change, and refreezing. In the unfreezing stage, Air-France change leaders must decide on what aspects to apply. The company’s history shows that, earlier communication on projected change is crucial.

If the change concerns software systems, it will be appropriate prepare the team through information and training process. Starting with ‘’coalition’’ until change becomes inculcated in these staff. Encourage through rewards and regular assurance from leadership, whilst emphasizing the “differentiation”, or gain obtained from the change. It is important to record appropriate feedbacks, personal success stories and then broadcast them. The metrics on the three steps of Lewis Model for the company, should be carefully considered for the change process and be recorded as well. (Suk & Kim, 2021).

2.4. Air-France’ Organizational Structure and Leaders: How These Influence the Characteristics and Attributes Of Change Agents

At Air-France, as in many other companies, individuals, and teams influence attitudes at pre, and-post change moments. Within the organizational structure of Air-France, another factor that influences changes, even more powerfully, is the relationship ‘’State’’ and Board of Directors. (Air-Journal, 2019). The Board of Directors determines the direction of the Group's activities and ensures their implementation. However, because sometimes the state “inject “cash’ for the company’s financial stability, governments frequently intervene and impose sometimes their point of view.

The board of directors’ composition reflects this fact. The board comprises of 19 members;

- 16 of them were appointed during shareholders’ meeting, including:
  - **2 directors proposed by the French State and,**
  - 2 directors representing the employee shareholders.
- **1 representative of the employees appointed by the “Comité de Groupe Français” /French.**
- 1 representative of the employees appointed by the European Works Council.
- **1 representative of the French State appointed by ministerial order- in place.**

The board is presented in the figure below.

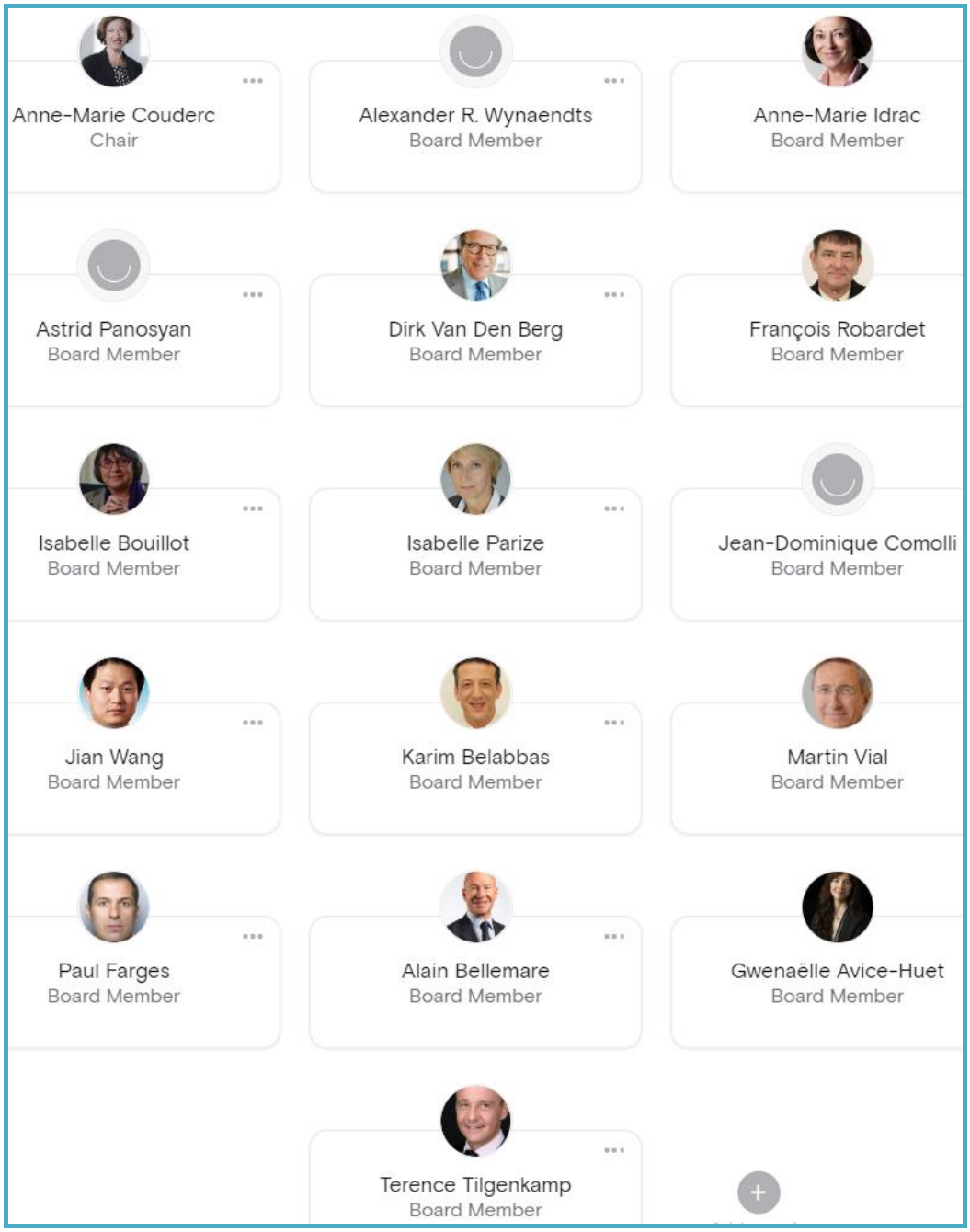


Figure 38. Directors' Board – At end of Pandemic (airfranceklm, 2021).

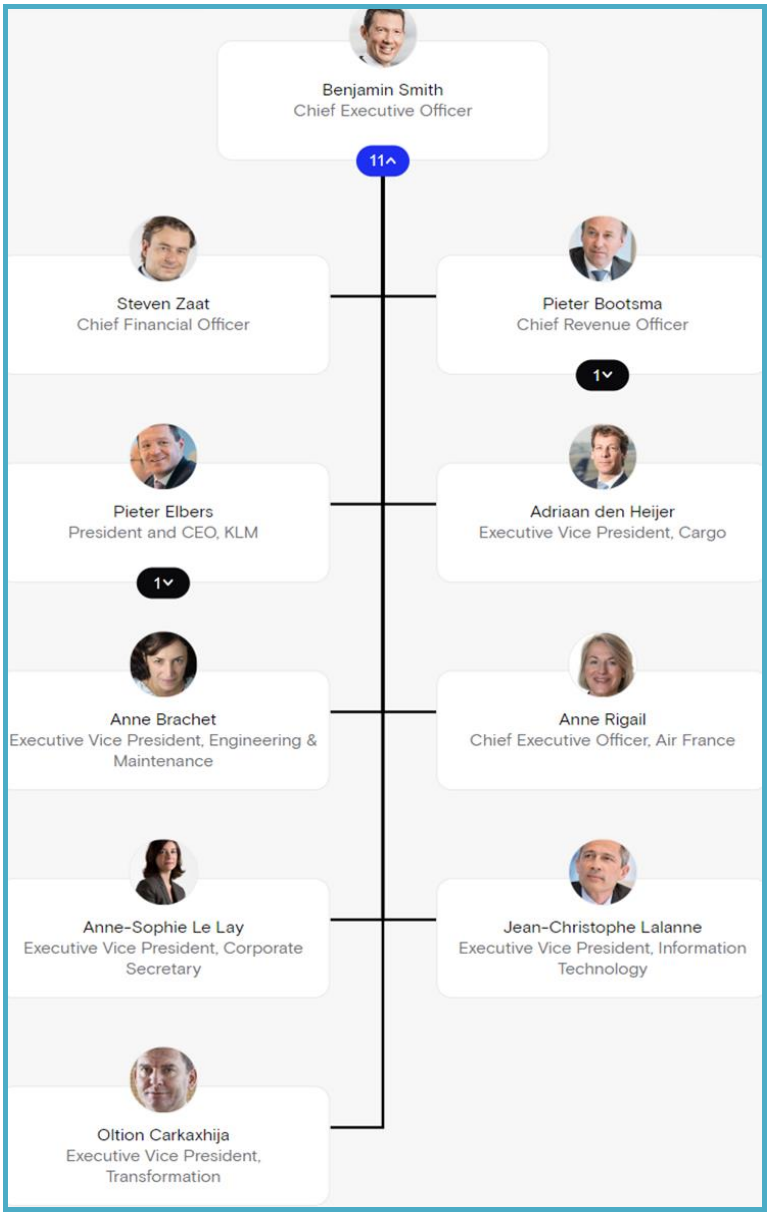


Figure 39. Executive Committee. At end of Pandemic (airfranceklm, 2021)

The Board operates in accordance with the France legal code for corporate governance system called, AFEP-MEDEF. Additionally, change management at times becomes complex; due to cross-cultural sensibility peculiar to the group's dual-state structure: Air-France-French; KLM-Dutch. (Pelletier B, 2020). Nonetheless, both states have contributed enormously to the economic stability of the group. (Financial-times, 2021), (airfranceklm, 2021).

Air-France-Klm considers this structure of Board of Directors' system and Executive Committee as critical, in order to obtain smooth coordination in change, and managerial aspects at the overall levels of Company. (Corporate.Airfrance, 2021). The group's 2020 Governance brochure made an interesting statement, quote:

“By virtue of …. Air-France KLM … these principles ……To lead by example. …Living our principles requires consistent and clear communication at all levels … promote awareness …. encourage open discussions …”. (France-KLM, 2020) With such objectives, Air-France-KLM may efficiently inspire change and encourage employees’ support. The change agents supported by leadership and adaptive structure appears to enforce frequently, smooth change process in all areas of the company. (Yan, et al., 2019).

2.5. Challenges and Effectiveness Of Change Agents

There may be multiple challenges, but some factors could facilitate the process of organizational change. These include:

- **Planning challenges:**
  - Leaders and change agents must investigate before planning and therefore develop a supportive change environment.
- **Degree of change:**
  - Going by phases, with researched and fine-tuned sequences, permitting to consider behaviours and attitudes.
- **Learning lessons to retain could be:**
  - Intrinsic characteristic of resistance of labour unions,
  - Error or unsatisfactory communication process of leaders
  - Possible wrong timing in disclosing critical information.
  - Perceived betrayal by employees.
- **Subjective perception of lack of executive support:**
  - It appeared that, the executives were not giving needed support. However, they themselves are as well subjected to states’ authority. These challenges, due particularly to mixed cultures of two states, rendered some procedures very complex to maneuver. Nonetheless, both states supported the company with enormous finances. Covid-19 and war in Europe impacts-, being situations of changes processes-; the company’s business operation became, extremely difficult with negative result. The states’ financial supports provided financial stability until better periods of 2022. (Rfi-France, 2020). (Financial-times, 2021).

(Airfranceklm, 2022). The figure below shows, the aforementioned difficult periods -2020 to 2021-, when support from the states was appreciable.

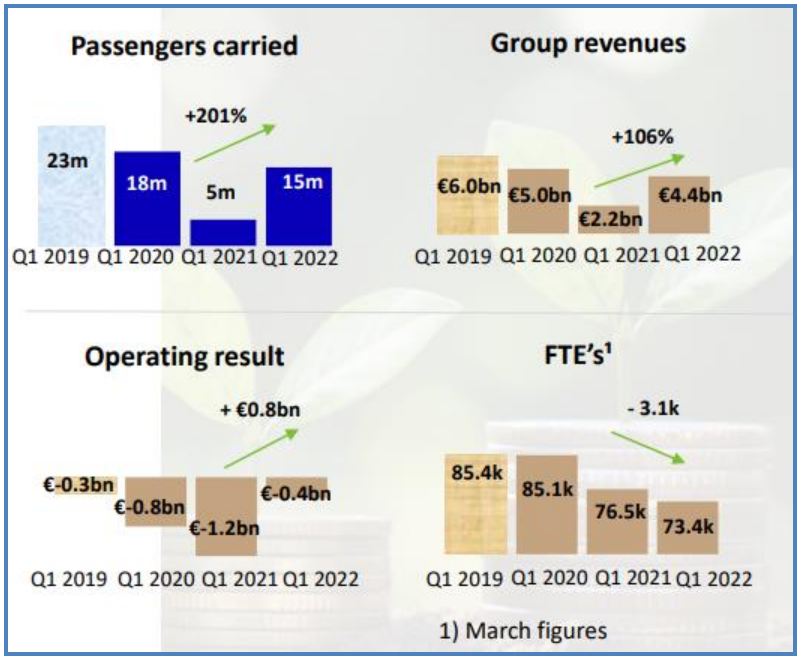


Figure 40. Comparative Quarter- results - 2019 to 2022.

As shown on figure above, the operation results were negative during periods of 2019 to 2021; and support from the States were at the right time; for stability.

- **Communication misalignment:**
  - Importance of honesty from leaders whilst negotiating, to avoid strikes and confusion.

- **Resistance to change:**
  - France is known for its labour organizations intrinsic culture of resistance to change. Any leadership engaging in energy transition business in similar culture, must take this into account.; and to device means for neutralizing this; avoiding unnecessary and prolonged resistance to change. (news@thelocal.fr, 2020).

  - Leaders must deploy means to systematically include employees, somehow, at the outset to endline, during any change plans. (Service-infographie, 2014)

Change agents could be employees, managers, labour organizations; and their contribution could make a change smooth or otherwise. It could be re-emphasized, that,

for overall success, leaders should, imperatively learn to align appropriate methodologies and skills, and thus reap supportive participations. (Tiron udor, et al., 2021). Additionally, cultivating effective change agents in an organization through diversified training will help to develop:

- **Flexibility:**
  - Accommodating feedbacks and viewpoints.

- **Diverse knowledge:**
  - Provides broad and beneficial industrial practices.

- **Prioritization:**
  - Internal priorities are espoused through cooperative identification of disruptors and positive drivers.

- **Accountability:**
  - Create accountability as well as rewards system.

2.6. Developing and Implementing Strategic Organisational Change

A successful business organization needs reshaping in accordance with its vision, mission, and business environments. This is so important for the new energies' companies. Because of uncertainties in new and global zones of activities. What seems like resistance to change, may simply be as a result of confused, unsuitable, or inflexible directives. This where relevant change theories, tools and techniques can provide guidelines to dissipate fear of change. Air-France's example case was used for this sector because it operates worldwide. Renewables business developments requires that a company moves to far and remotes zones of the globe. The information retrieved from the analysis of a classical company - like Air France group-, can be a source of substantial help. These have highlighted some steps to consider in advance, before deploying, and/or, even announcing changes. Especially changes that will impact the overall operating systems of a company.

2.7. Assessment of Selected Relevant Theories and Tools - Techniques for Implementing Change.

2.7.1. Assessment with Kotter's Change Management Steps

For a global energy company, desiring to expand, the relevance of Air-France's analysis above, as well as management theories like that of Kotter's change management model could be an invaluable help. When combined these may facilitate the sequences of changes. A company of energy development business requires several operation entities within the same company. Some of the operation departments of a company may, operates far away, e.g., at offshore activities for several weeks. Therefore, for stability's sake, changes should be implemented in a sequence that could be easily accepted and adopted. (Kotter, JP 1995), (Tang, 2019). (Kotter, JP, 1999). Leaders could, well in advance, consult Kotter's change management framework's steps. (Kotter, 1996). These include:

a. Determining needed change;
    - and then create urgent awareness;

b. Building the means, team, and coalition;

c. Develop vision and strategy applicable;

d. Induce acceptance through honest, powerful, and persuasive communication;

e. Empower proactive actions and remove barriers;

f. Generate short-term wins, through/with milestones;
    - early successes boost adherence.

g. Be alert. Sustain change process through acceleration, proactive actions, steering of roadmap;

h. Anchor changes, transform into company culture;
    - make it a VRIO- Valuable-Rare-Inimitable-Organized.

Figure 41. Kotter's change management theory.

(Kotter, JP 1995), (Kotter, JP, (1996), (Kotter, JP, 1999).

This diagram above; showing Kotter's 8 steps model is appropriate for Air-France. (managementstudyguide, Prachi Juneja, 2023). This model is likewise essential for companies entering into the renewable energies business sectors. For an adequate stance, when entering into the renewables energy business a company needs to ascertain operating capacities and related infrastructure. These include, to name few:

- Operating software's architecture updates;
- Inter-global Managerial software;
- Joint venture partners managing software;
- TSO- Transmission System Operators' interfacing management systems;
    - for Structures;
- Sea condition analysis;
- Structure capabilities analysis;
- Plannings for projects that will take several years for execution;

- Plannings for:
    i. pre-commissioning,
    ii. commissioning,
    iii. and de-commissioning.
- Integrating new power system analysis software;
- Incorporating dynamic systems analysis software;
- Sea operating equipment planning and equipment overhaul;
- Planning for Sea operation with Ships;
    - Installation.
- Etc.

These project projection sequences, if not appropriately deployed, will negatively impact the whole organization and personnel. Sequencing the change, it could be useful to start with departments with least resistance to the change, - and then spread the gains across others. (Talwar & Mehta, 2019).

2.7.2. Developing Plan to Implement a Change

An example for possible change at Air-France, -- or a renewable energy sector company-, could be Enterprise Resource Planning (ERP) software. The change management may succeed with guidance from Kotter's change management theory in the following steps:

a) Alignment of leaders and communication About Change

This would include informing on the change process. If the company has a size of Air-France structure, then, leadership must communicate the scope and detailed in the schedule as early as possible. And then implementing strategy for about 10-12 months duration, by means of scheduled sequences or steps. The size of Air-France, and its related change management experience is invaluable for global organizations. This provides specific lessons and guidelines for a new global energy company.

b) Management of Opportunities and Risks

An international energy company, will need to seriously consider it is Enterprise Resource Planning (ERP). Covid-19 and War in Ukraine have thought leaders a great lesson in strategic business change management: What is required to support change, detect opportunities, and the associated risks management. One of the opportunities lies in the

shift from legacy Enterprise Resource Planning (ERP) to Cloud based ERP, due to globalization and the associated uncertainties. It will be an error for the organization to allow its change sequences be negatively impacted by inadequate functionality of manufacturing and distribution companies. A “Cloud” Enterprise Resource Planning would make the processes more efficient, with variable sources. They then gain strength through the undisturbed growth the company is attaining. The current global market situation appears advantageous for a renewable energy company. However, risk tied with wide-range of global materials origin, make resources planning critical. Risk management requires upstream check of reliability of the system, resources impact, as well as employees’ readiness. The risks identified can be appropriately mitigate or aligned. (Suk & Kim, 2021). The best practices from other large global and long times energy companies and their change management processes can serve as examples and guidance.

Research through quantitative data, have provides feedbacks; permitting to ascertain the facts about energy organizations. For those who entered the market during past 10 years, the analyse covers:

- State of their activities
- Business property;
- What is their operating equipment?
- Are they outsourcing?
- Do they possess a local join venture?
- Did they make a local vertical or horizontal acquisition?
- How many expatriates do they have?

In the case of those who made exit process:

- Why did they exit?
- In what sector are they operating presently?
- How long did they stay?
- What prompted the exit?
- Etc.

c) Stakeholder Communication Process

Air-France-Klm cases confirms the importance of detailed and planned exchange of informing between leaders/executive's and stakeholders. This could consist of the communication on topics of utmost importance; with appropriate timing, medium of information, and sequence of communication. It will be more effective to start by getting "all" involved at draft stage, and then progress, incorporating the feedbacks received. In most cases, it was found that, the company regularly informed "composite" stakeholders, informing technology vendors, regulators, and employees. Through channels like three quarterly and annual meetings- these made change moves "smooth". All this information is on a cloud base technology that permits easy access. (Air-France-Klm, 2022). The cases mentioned above, where there had been serious disturbances, were those, when leaders did not inform employees at the right time, and with the appropriate means. This aspect should be taken seriously, because as, it could constitute a serious bottleneck for a new entrance in the energy transition endeavour. We saw the same case with Totalenergies, also in France.

2.8. Transition Process Planning – Learning From the Past

In the last stage, Air-France deployed efforts towards creating the future, ''in advance''; with dexterous, flexible organization system, based on computer aided system. For energy transition plan, this process could completely transform data system into global level. Starting with the head office's resources planning implementation, to its success. Change in the form of transition management process will therefore involve implementation of process in sequences, by means of a systematic planning. As the case of Air-France demonstrate. (airfranceklm.com, 2021), (airfranceklm, 2021) (inform-software.com, 2023). This will "go "with specific desirable future state, without disturbing current activities of business during the change process. (Juneja, 2022). Since the energy transition may be a new venture for the company, it will be disastrous if the change stifles the current sources of income. Especially that such new business sectors require enormous investments.

2.9. Workforce Enablement for Change

Workforce enablement principles acted as support for Airfrance. This step ensures that the workforce is trained on the new system until autonomy. Employees receive, progressively,

available information, realistic assessments are made, and thus create an effective personal involvement. Exhaustive training on new technology included an overall job sector; and the new change skills were applied within the composite organization. It was observed, that communicating extensively, ensured that everyone understood the new direction, and how their work and activities were to be impacted, and the expected results. (airfranceklm.com, 2021), (airfranceklm, 2021) (inform-software.com, 2023).

2.10. Developing Measures to Monitor and Evaluate Progress of "Change Plan"

To achieve targeted change, all employees involved should receive information on the metrics of achievements; in form of feedback through progressive mentoring. There can be multiple measures to monitor the change in a huge global company like Air-France, due to the vast departments and the involvement of the group partners. Measurements would include reports, surveys, observations, and work group assessments. It is also important to track impact on business outcome through monitoring and evaluation. (Ciliberto, et al., 2019). The measures usually include qualitative as well as quantitative metrics. Quantitative measurements would include time taken for the employees to adapt to changes; "high" "low" moments.

The *qualitative measures* would include performing surveys, interviews and reviews of employees and managers. Qualitative measurement will shed light on how employees were affected by the change. As well as the level of information provided to them; to have insight on their personal perception of the change process. (Chen & Gayle, 2019).

2.10.1. Evaluation of Change Progress

A modern company's life evolves within internal, and external global factors: be it technological or economic trends. Several business models on change in organizational structure permit to identify, and then proceed for "regulating" the influences affecting all the process of change. One of these models is the ADKAR Analysis; an acronym that stands for: Awareness, Desire, Knowledge, Ability, And Reinforcement. (A.L. Wilkins & W.G. Dyer Jr., 1988).

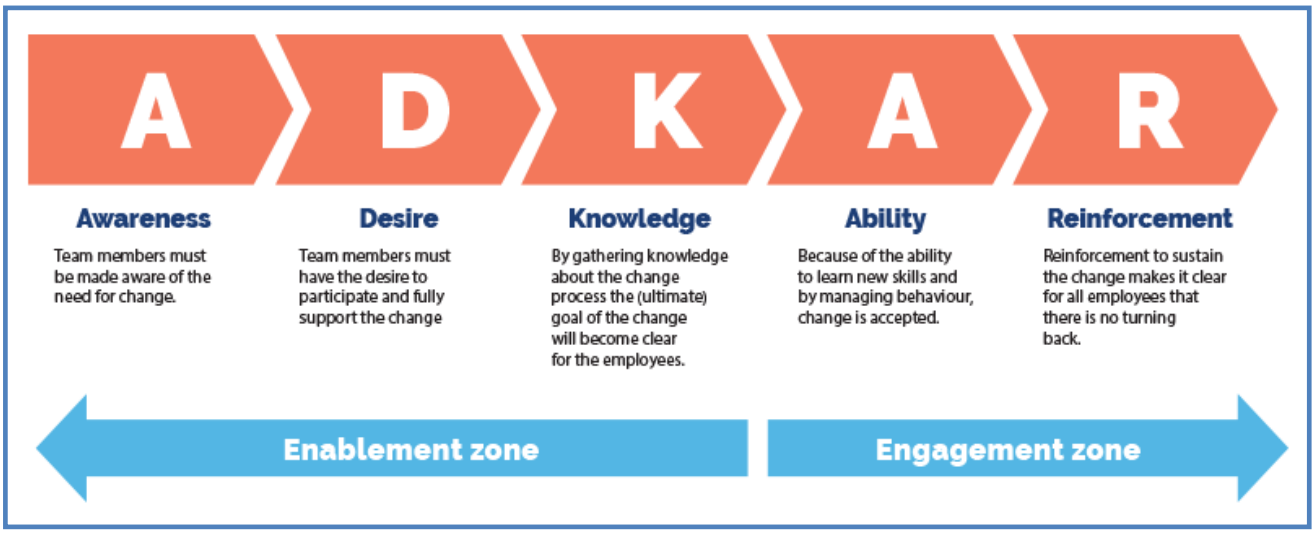


Figure 42. ADKAR Model

As per ADKAR figure above, the model identifies clearly the necessary steps required for a successful change, as well as the qualities needed by leaders for successful strategic change management. These are based on ADKAR model:

- **Awareness:** Know employees' perception of the change required.

- **Desire:** Leader should **Long** for the positive change and transmit this desire to employees, without coercing.

- **Knowledge:** training, communication, documentation, and analysis.

- **Ability**: feedback on employees' capability in incorporating new ventures and emphasizing positive results.

- **Reinforcement:** rewards and incentives to sustain change efforts made by All employees. This may involve modifying objectives, consulting labour organization or pay incentives, and bonus schemes and incentives for new behaviours.

2.10.2. Analysis of Stakeholder Responses to Organizational Change

Stakeholders are people or entities that:

- Have allotted interest in such activities.

- Are affected by the entity's endeavours.

- Are concerned or affected by results.

The figure below describes the "types" and "attitudes" of Stakeholder. (Heath Chip; Heath Dan, 2015).

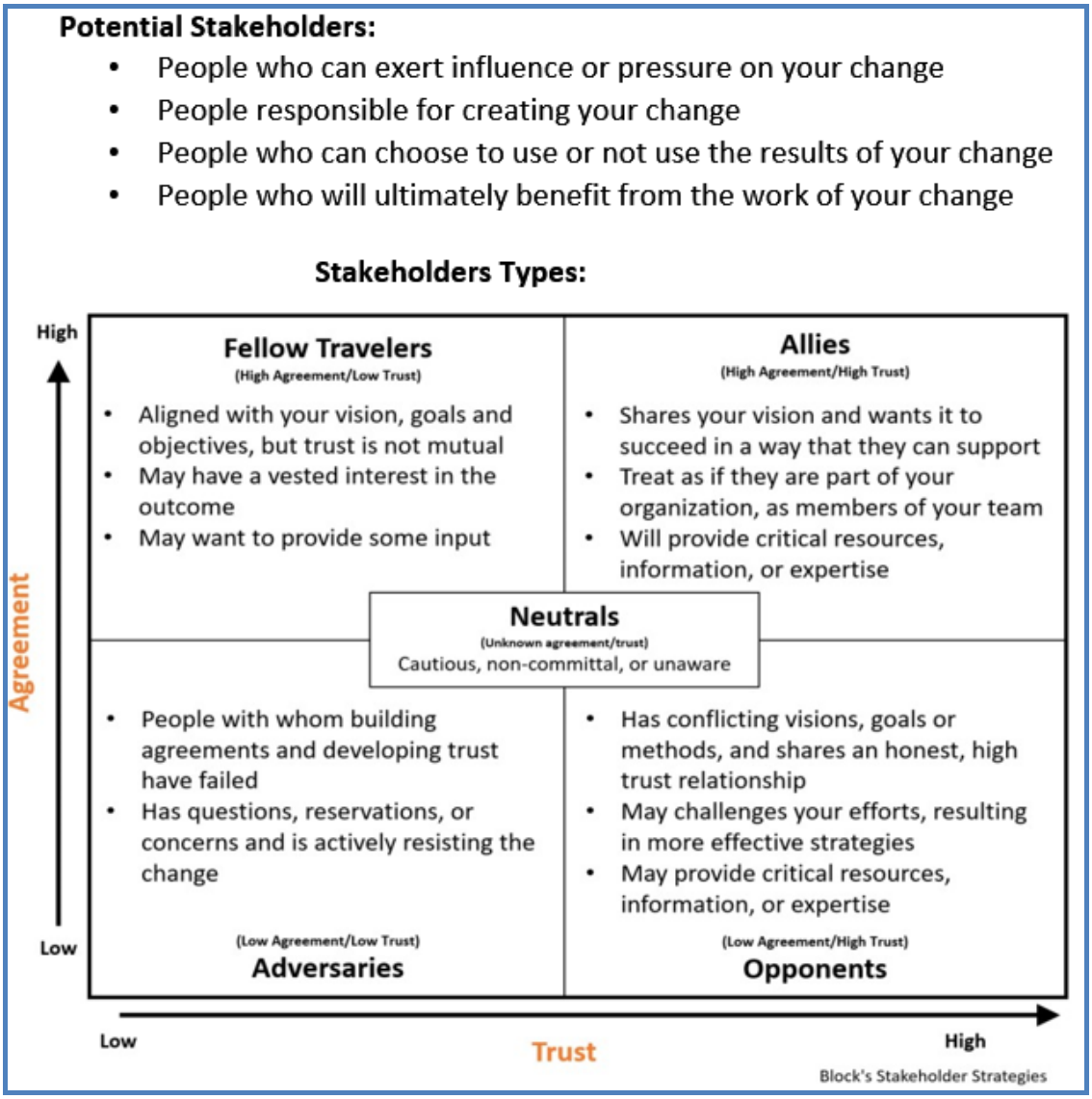


Figure 43. Types and Attitudes of Stakeholders

2.11. Transformation of Conventional Energy Organization: EDF Case Study

A global conventional energy organization, that has great impact on power production is Edf, "Électricité de France S.A". (French for: Electricity of France), This is a French multinational Energy Business structure, largely owned by the French state, its Headquarter at 22-30 avenue de Wagram in Paris 8th district.

Analysis of the company's stakeholder responses to organizational change, could serve as a stepping-stone for any energy transition organization.

Edf operates globally in electricity energy values chains, from generation, distribution, energy transmission, and trading activities. (Edf, 2021). See Figure below.

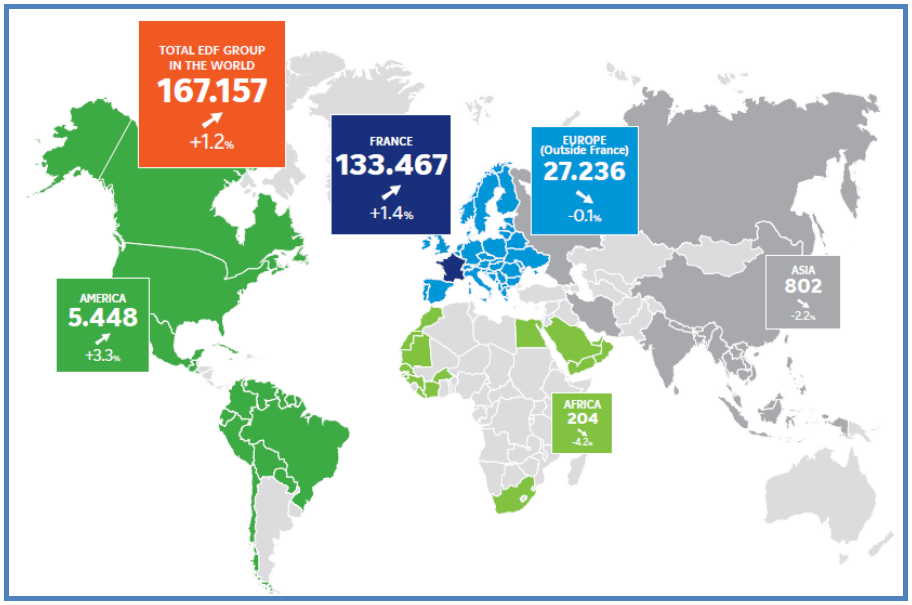


Figure 44. Edf global value chains.

After encountering difficulties in 2017, due to changing business environments, the group boosted its shareholders' equity by over €8 billion at mid- 2018", rising to power transaction of 580.8 TWh electricity generation. (edf.fr, 2018). Note: One whole year Electricity consumption in Great Britain in 2012 is just 274.8 GWh. Yet Edf's one-year power transactions are 2000 times. (Energy & Climate, 2013). (edf.fr/finance, 2021). See figure below.

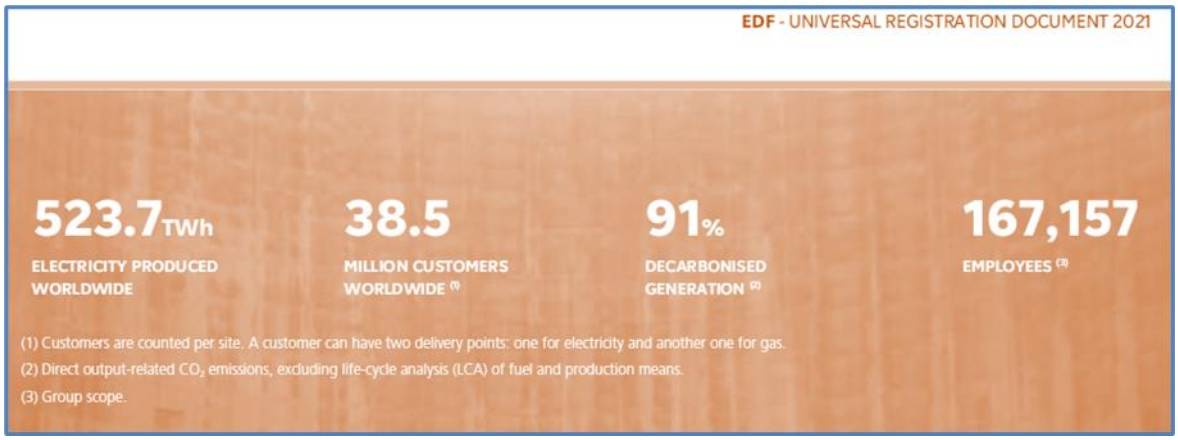


Figure 45. Edf's transactions and decarbonization process.

Electricity affects the “life” of millions, every second. Organizational change management will therefore need to use a structured approach, and smooth application to ensure that changes do not generate unnecessary disturbances in activities- both within shareholders but overall stakeholders. (edf.fr, 2018), (edf.publispeak.co, 2020), (edf.fr, 2018); (edf, 2017). Interesting business operation figures of Edf are provided within the figure below.

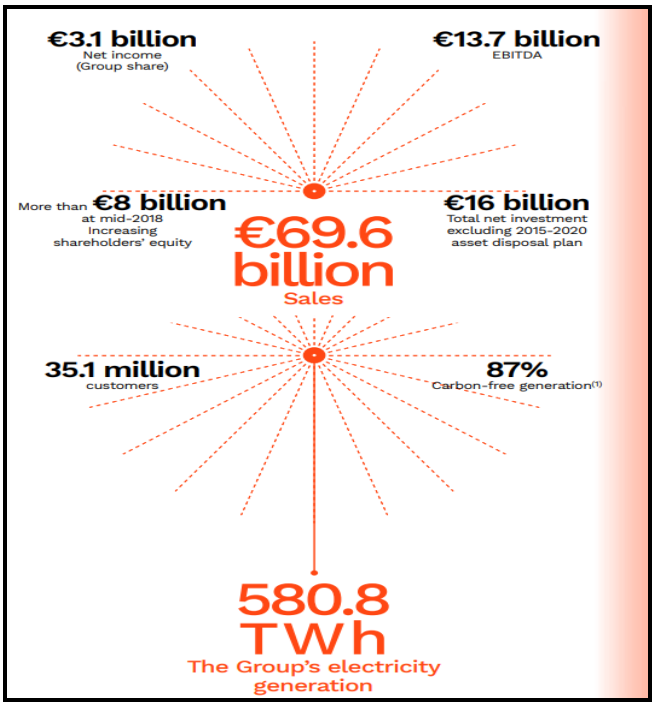


Figure 46. Edf’s Sales and power generation.

2.11.1. Organization’s Changes and History of EDF

The post-war France had almost all the power grid system destroyed. The French state therefore created a state-owned utility, Edf. A year later, Edf begins working to re-build the transmission grid, for “energizing the future”. (edfpublispeak, 2020), (Edf-Press-Release, 2022), See the next two figures; depicting the development of the company from 1946.

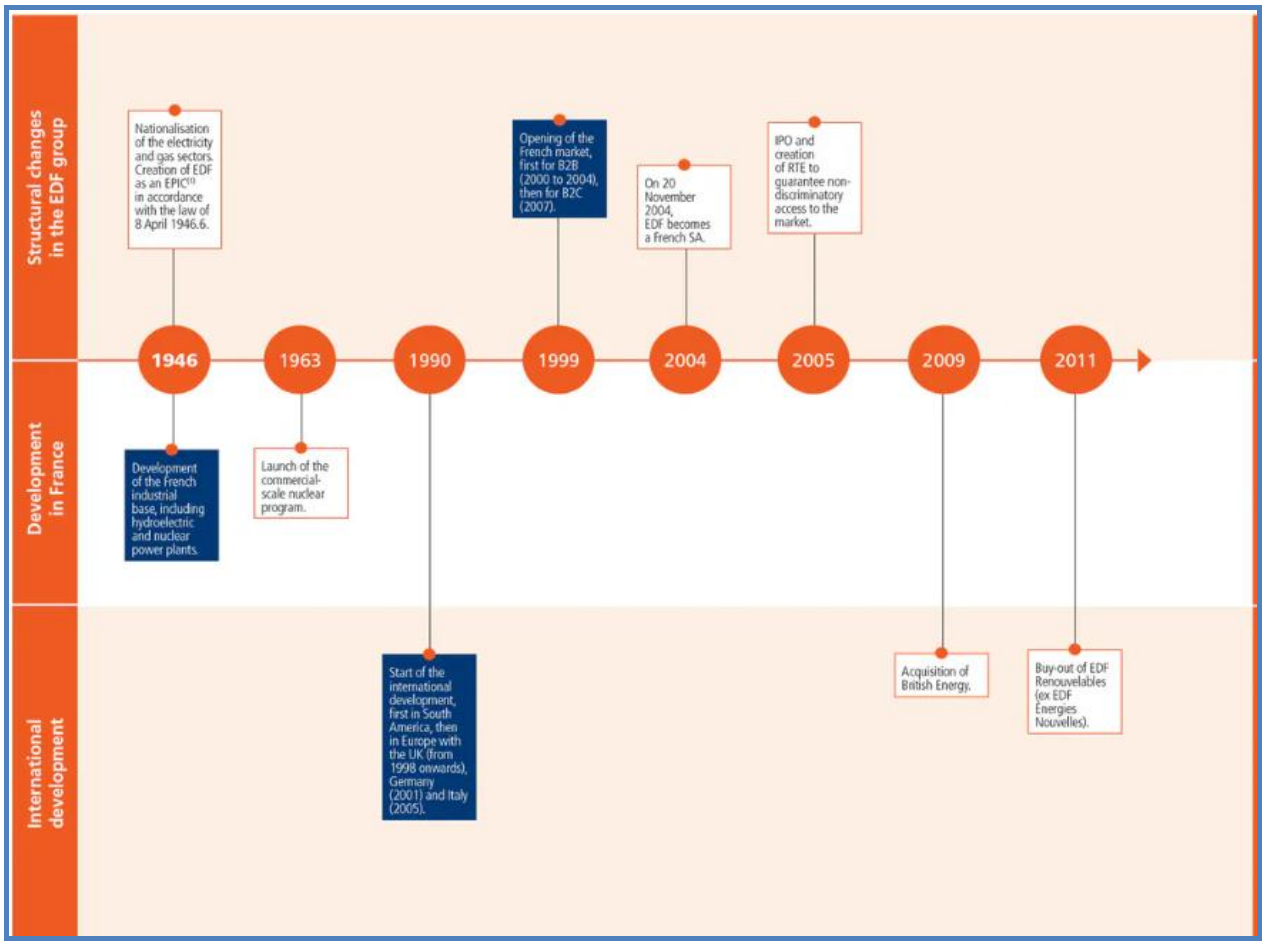


Figure 47. Edf: Changes in timeline - (i).

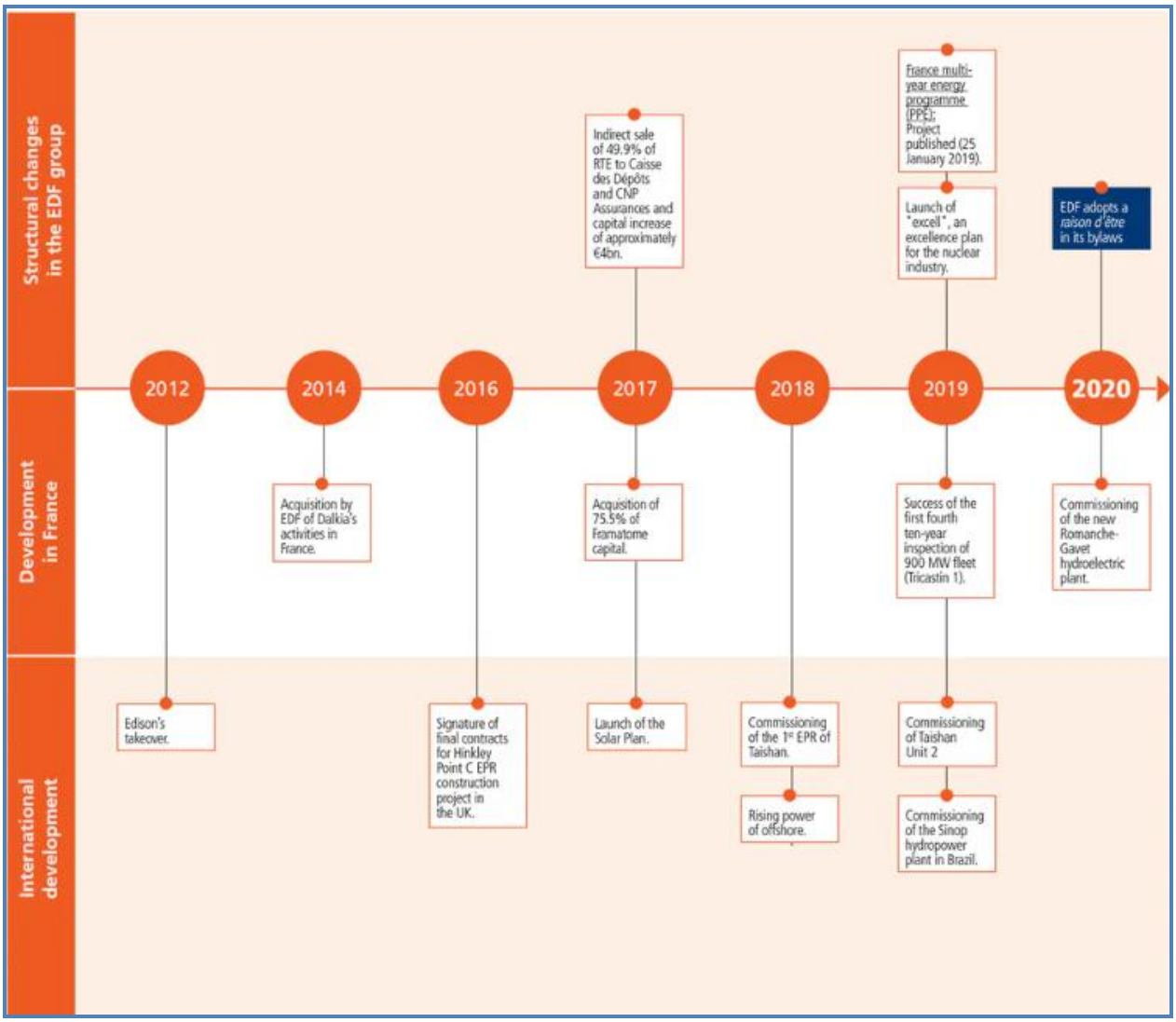


Figure 48. Edf: Changes in timeline - (ii).

2.12. Assessment of Risks and Benefits Associated with Change Process

2.12.1. Risk Tied With the "Structure" of Stakeholders

The stakeholders involved in Edf change management process includes, France state, employees, labour organization, and other value creators. (Edf, 2021). The structure of the stakeholders requires diligent risk analysis in moment of change to minimize misunderstanding and complications in the new situations. The next two snapshots below, depicts the description of ambition of the company; as well the relationship with the variety of stakeholders.

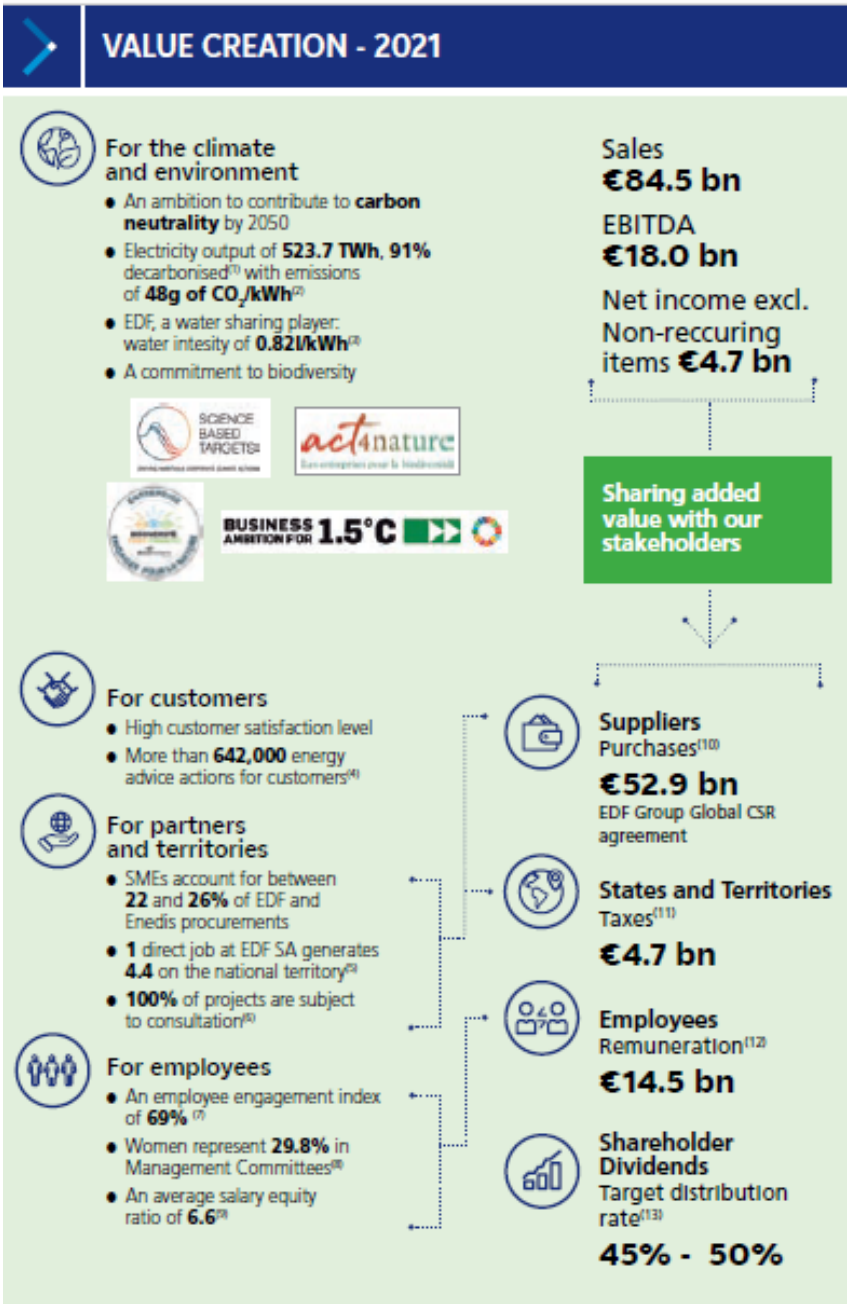


Figure 49. Edf: Values & Benefits - created with Change.

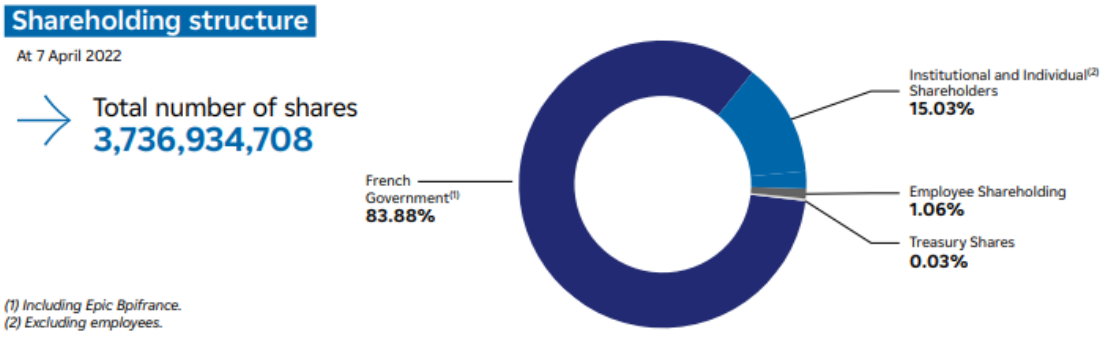


Figure 50. Edf: shares.

2.12.2. Leaders and Issues Related To Stakeholders' Responses

Leadership and change management experiences in Edf have confirmed that, efficient business process and "moves" requires a meticulous analysis of stakeholders' possible responses or reactions. In Edf, stakeholder responses and perspectives are frequently modified, mainly due to governmental interferences, which sometimes diverge with that of the company and other stakeholder's vision. (edf.org Foster, 2020), (latribune.fr, 2022). (latribune.fr & Platiau, 2022), (edf-shareholders, 2022). The two figures below, depict the governance of Edf; demonstrating the complexity of managing change; within the board and the other stakeholders.

It will be notices that some the members the governance comprises of those:

- Appointed by shareholders;
- Recommended by the state;
- From the labour union elected by employees;
- State representatives.

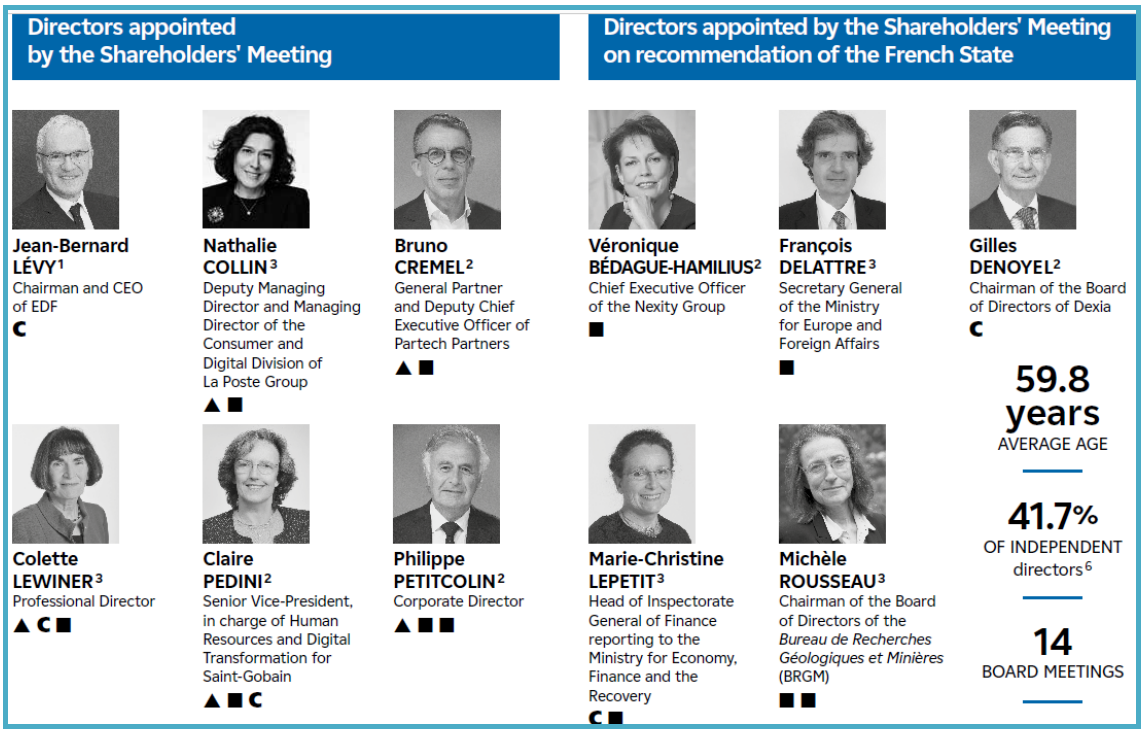


Figure 51. Edf: Shareholders appointed Leaders -Till end of Covid-19

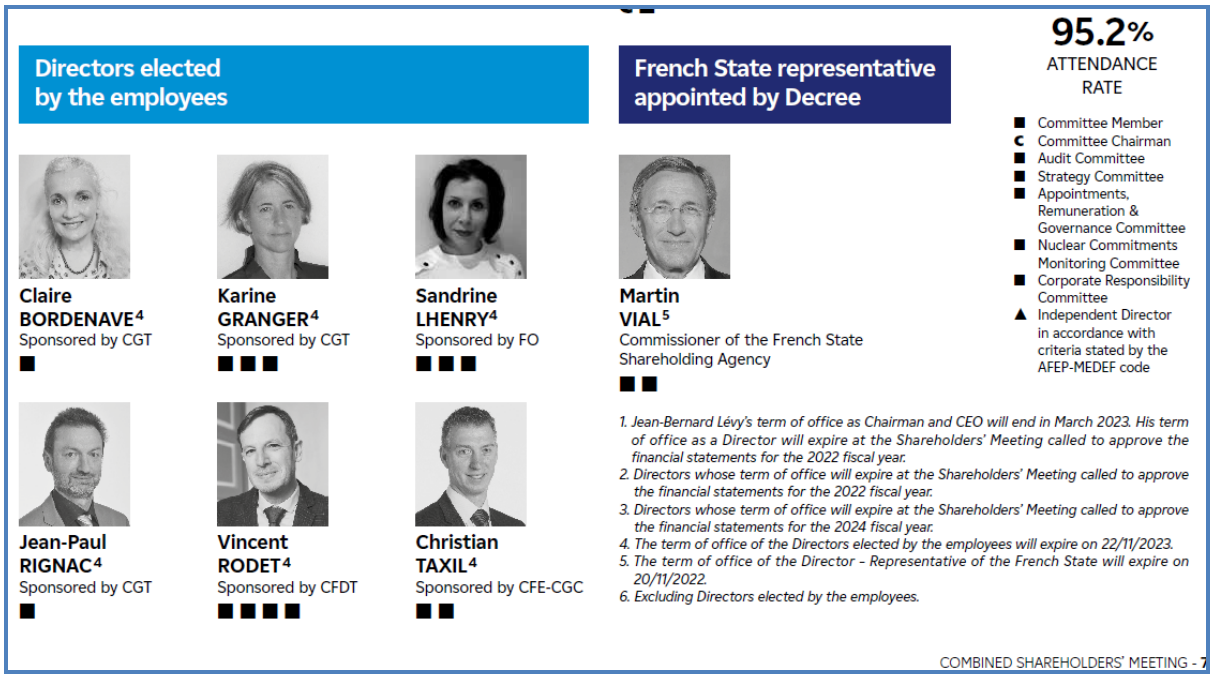


Figure 52. Edf: Leaders appointed by employees & state -Till end of Covid-19

It goes without saying, why the governance, and leadership actions for change processes; are more complex in such organizational structure. And this confirms the importance of using well established business frameworks and analyzing tools to deploy change, in such situations.

The planning and implementing of changes involve assessing the new process, comparing to past, and figuring out how it can be improved upon. Therefore, analysis of stakeholder responses, will enable company similar to Edf, to strategically determine stakeholders' viewpoints and concerns, on any envisaged change process. (Al-Ali, et al., 2017). As it was the case of Airfrance-KLM (French origin company); whenever an organization change is attempted at Edf without total concertation, there had been risk of disruption; strikes instigated by labour organizations, sometimes by state's intervention. (edf.org Foster, 2020) (latribune.fr & Platiau, 2022). Obviously, change process can be a delicate endeavour; and therefore, higher level of errors, or poor management due to limited skills, will obstruct success. The envisioned change can hardly happen. (Hayes, 2018).

2.12.3. Risks' Levels During Change Project

The individual change project levels of risks, as cited above, may include:

- Employee resistance;
- Project on hold;
- Unavailable resources;
- Unexpected obstacles;
- Project abandonment.

2.12.4. Risks At Organizational Level

When the project level risks are mitigated it improves overall organization risk level. Organization level risk would include wide spectrum of challenges to the company's operation systems and project feasibility. **(**Lehmann, 2017).

The organization level risks for a company similar to Edf would include the following:

- State involvement-, according to ruling government's ideology;
- Corporate organization level resistance;
- Turnover in resources, instrumental in change management;
- Changes related to fruitfulness of market;

The organization level risks can have an impact on partners, customers and may subsequently affect the general morale of workers, creating confusion and stress. (Maina, 2017). These have led to frequent strikes that paralysis the company's activities and causes more financial losses. (latribune.fr & Platiau, 2022).

2.13. Stakeholder Analysis: Understanding Possible Resistance to Change

In present energy business, the increase in number of new entrants makes stakeholder assessment critical. It is also fundamental to continuously map company's stakeholders' responses to the changes and implement resultant. For example, stakeholder analysis and feedbacks, show good past result for Edf; depicting how the leaders' strategic adjustments have positively impacted employees. (latribune.fr, 2022); (Nyamwange, 2018). Edf's past stakeholder analysis had already helped to immensely mitigate resistance to change through "correct" communication These permitted to stop strike actions. (Reuters.com, 2018). Besides, with such improvements, the state representatives were then sufficiently informed of change process; they therefore cooperated. These emphasizes the importance of identifying and assessing possible reaction of stakeholders, especially those

forming the company's strategy change management core. (N'Cho, 2017), (Edf, 2021). The figure below shows how a company with complex attributes, particularities, and characteristics like Edf; may deploy mapping steps of the stakeholders. The mapping steps, shown below, show the interdependencies and sector to sector mapping of stakeholders, with definite sequential steps.

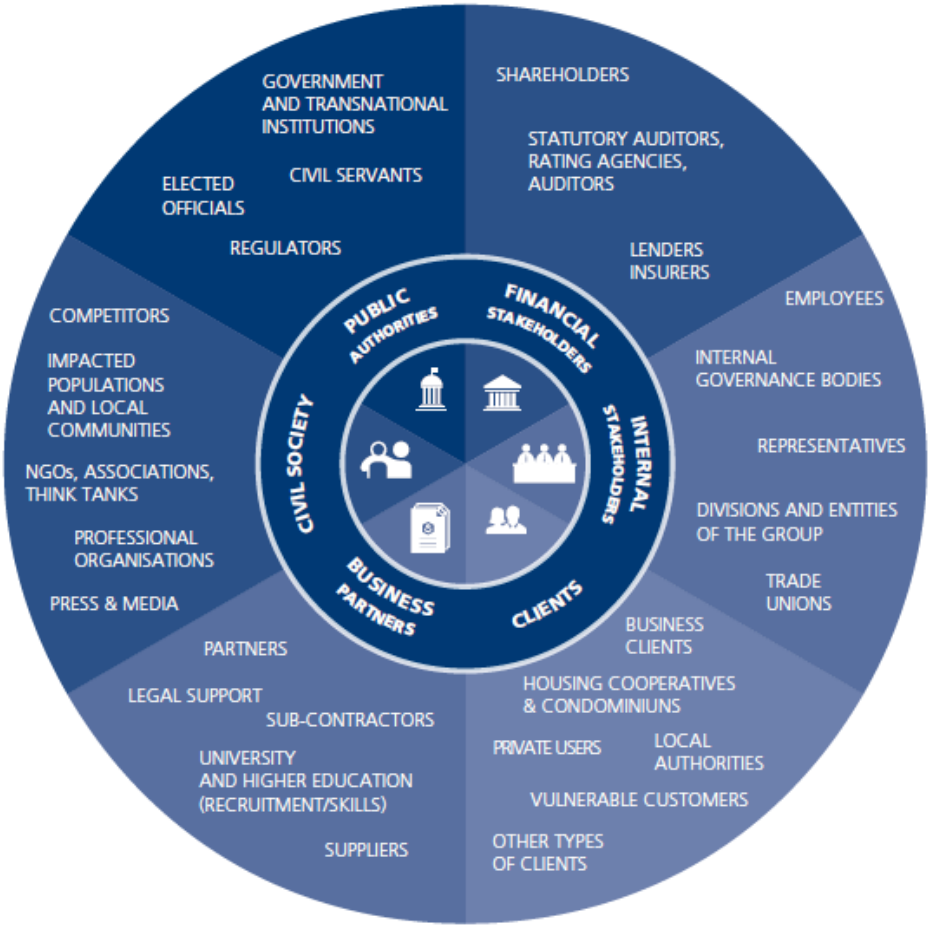


Figure 53. Mapping of stakeholders- Edf or similar company.

We see from this map that each sector has its specificities; and nevertheless, impacts the whole entity. The sectors include subcontractors, suppliers, local authorities, final clients, government, and elected representatives, and more. When well mapped, mismanagement in change process will be reduced to the minimum.

2.14. Understanding and Managing Resistance to Change in Organizations

Carol O'Connor's model depicts "modes" of resistance to change. (skillsyouneed, 2017). Each section of the organization should be studied and apply specific models that help to enroll people to change. The figure below, depicts the resistance "type of people involved in change process. (skillsyouneed, 2017).

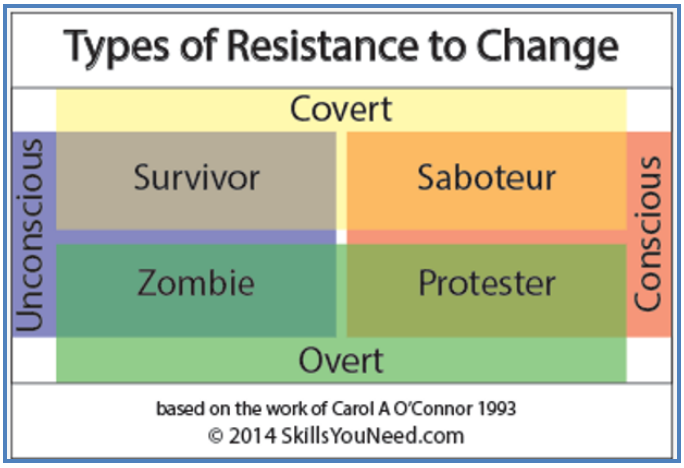


Figure 54. Changes resistance forces Mapping.

Leaders and executives should expect to encounter some resistance in almost all change process. (hbr.org, 2023). The four main types of resistance should be carefully analyzed, to find the corresponding mitigating action. This will permit to enroll each "type" of change character, in harmony with the identified temperament.

It is true that, without changes, no progress will happen. This is especially true in our case here; for global energy transition. No matter the incentives or motivating factors; no one will dare delve into these new energy market, if dominated by fear. However, when resistance to change is well "evaluated", these so-called barriers, could rather "sprout" useful or innovative developments. And surprisingly, this will permit to "gear" the change; or re-route strategic visions, and adjust appropriately timelines of expected changes.

The is what Carol O'Connor's work depicted above emphasizes. Leaders need to identify the types of change resistance, learning and adapting, transforming, positively influencing, and rewarding, for the good of all. Interestingly, resistance could be conscious or unconscious, covert, or overt-; the four (4) types of people intertwined, could be evaluated; and helped accordingly. The skills to understand of all these types and their respective subtle characteristic could enhance change methodologies.

2.14.1. Force Field Analysis

One of the important tools to overcome resistance to change is Force Field Analysis. Through this tool, an analysis can help an organization's structure to overcome resistance. As depicted in the diagram below, the forces in action could be; against or in favour of the change. For an energy transition company, with extreme complexity in characteristics; like Edf, the steps may include:

i. Accurate definition of current state;
   - For Edf: Position of State governance,
   - For Edf: Data on labour Organization.

ii. List supportive or resisting forces;

iii. Ranking forces by their strength of influence;

iv. Pictorial representation force field diagram;

v. Analysis forces' potential to increase or decrease;
   (i) For Edf: change of government.

vi. Agreement with leadership to mitigate resisting forces. (Skillsyouneed, 2017).

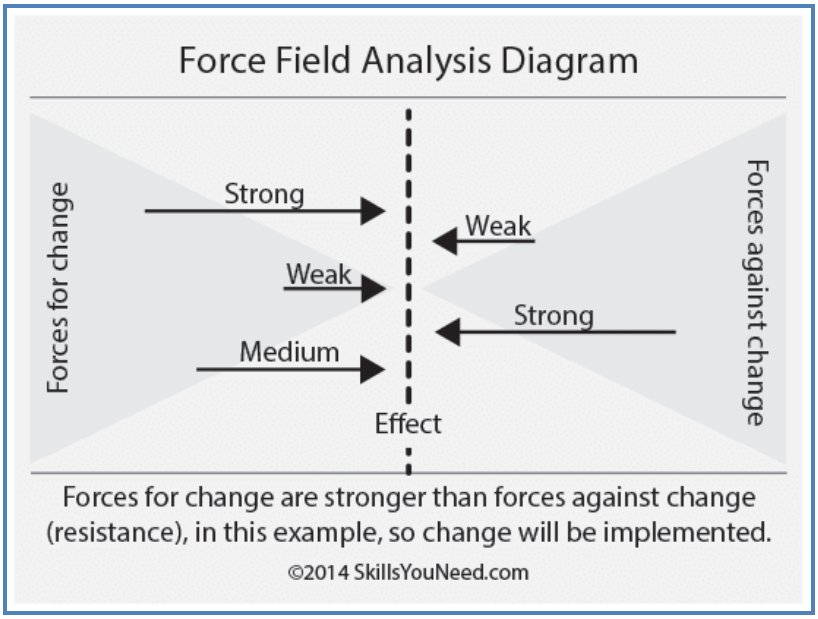


Figure 55. Force field analysis diagram

Deducing from the diagram above on field forces, six strategies below could help to mitigate or overcoming resistance:

- ✓ **Communication and education**: Stakeholders to understand why change is needed.
- ✓ **Participation:** Involvement of all, along with regular feedback.
- ✓ **Support and facilitation**: Company France to provide support and appropriate rewards for accomplishments.
- ✓ **Negotiation:** Careful analysis, acceptable and realistic agreement. (Paro, 2017).
- ✓ This especially true in France; with labour organizations. Gliszczynski, 2018), (lefigaro, 2014).
- ✓ **Positive m**anipulation and co-opting: this step ensure that everyone is acquainted with changes and have their say.
- ✓ **Guided Coercion-:** this includes both implicit and explicit coercion, used as a last resort, only, if advisable- perhaps in agreement with labour force: for those who are incisive.

2.15. Role of Organizational Cultures in Managing Change

2.15.1. Organizational cultures: influence on communications and power relations

Organizational culture is the set of underlying beliefs, values, principles, and ways of interacting within a company. Organizational culture defines and creates a distinctive work environment. The company's brand, productivity and results are directly related to its culture.

2.15.2. Types of Organizational Culture - Study Case Edf

Some of organizational culture in France that affect Edf, includes; Clan, Adhocracy, Hierarchy, and Market. These operates within Edf workforce, ranging from environment of stability, control, flexibility, and discretion. A diagram of the four types of culture is shown below. (bt-editorsbusiness, 2018).

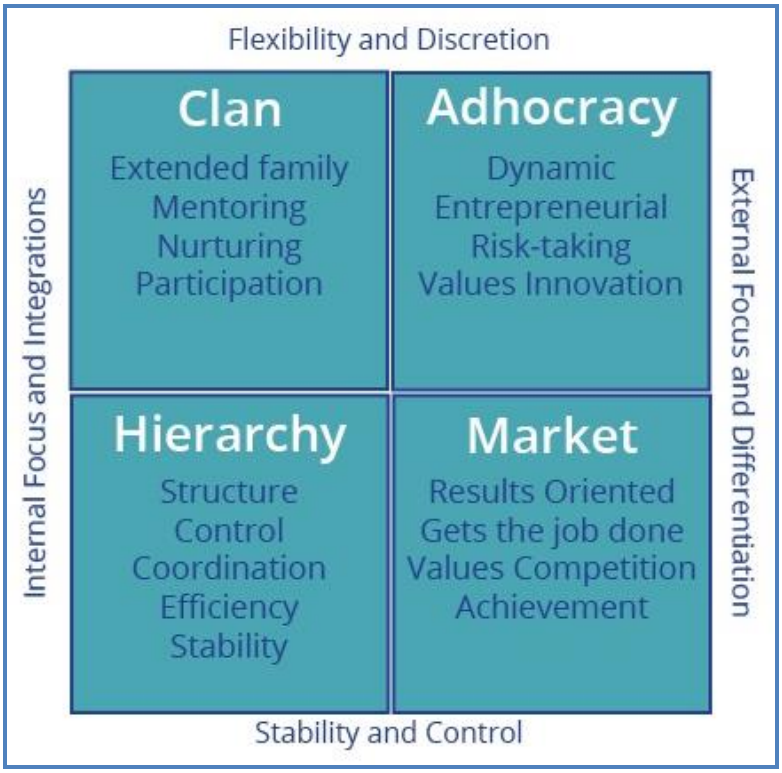


Figure 56. Types of Organization Culture.

Strong competitive market culture is highly deployed in Edf, through R&D, in association with institutions and research companies. Edf has developed strong and aggressive competition market culture due to current business environments. Thus, influences of power relations from top level have considerably affected past changes in the organizational functioning. (Roberts, 2017).

The values and beliefs that exist in the Edf organizational structure is long known to be of global nature. Nonetheless, the French origin and influence of the French state have considerable influence on organizational culture, on finance, operation governance and on employees. The positive aspects of these have permitted Edf to deploy its culture of expansion in strategic renewal energies business development; through, internal training, R&D and decarbonization. The company has quickly “adapted” to the green culture to

reduce carbon footprint; noteworthily, most of the employees were happy to participate, willingly. The next three figures provide statistics on the strategic axes, resources, and stakeholders' interface. (Edf, 2021).

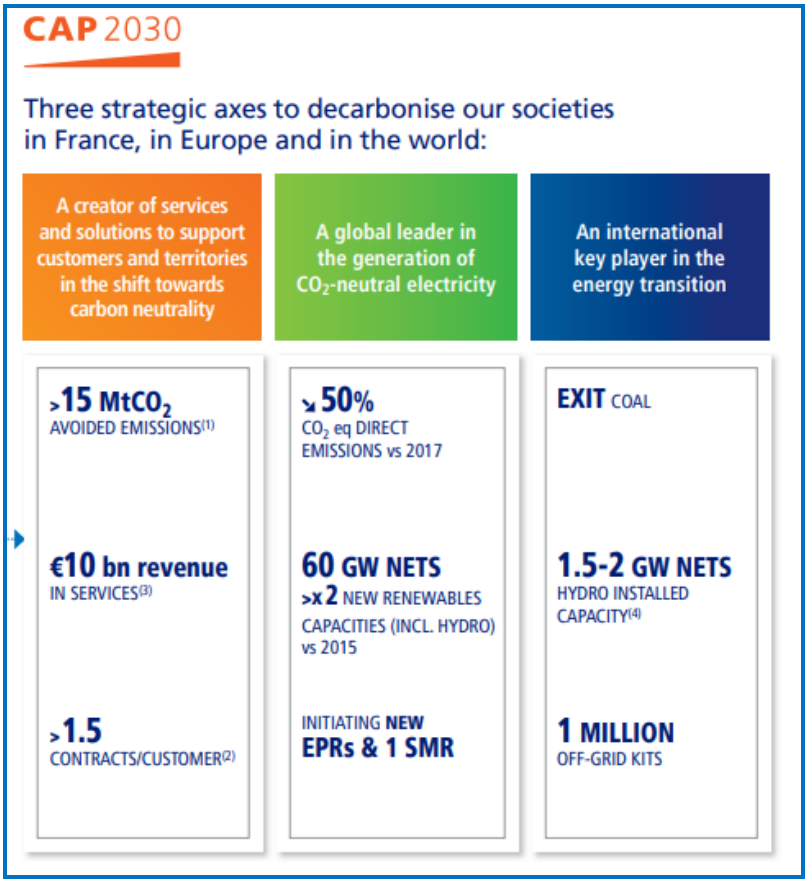


Figure 57. Edf. Axes of decarbonization strategies

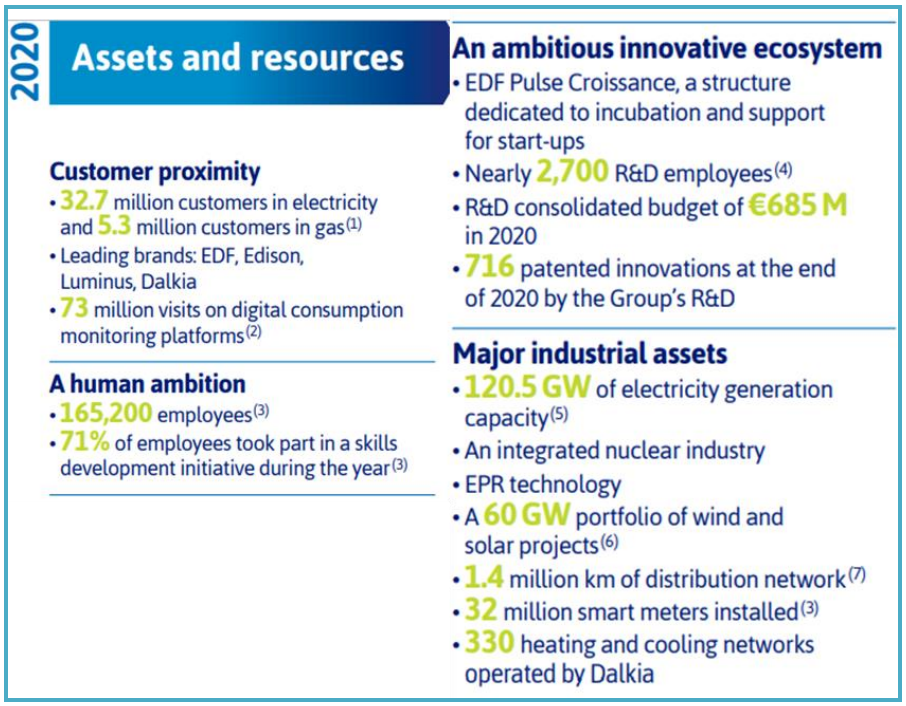


Figure 58. Edf Assets and resources for change.)

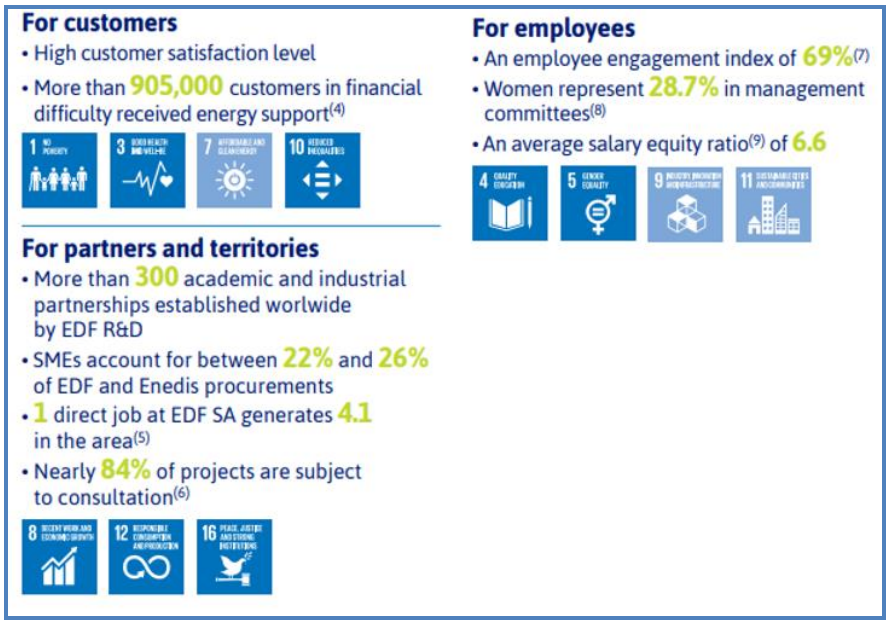


Figure 59. Edf Humans factors for change.

As depicted by the diagrams above, the organization's intrinsic culture has facilitated the various change processes in the company. Beliefs held by Edf's employees about company and the values they are "trained" to acquire constitute real influences on behaviours and attitudes. These enable easy achievement of company mission and goals, directly influencing power dynamics within the organization (Roberts, 2017). If the culture

of EDF continues to improve in open and transparent interchange, these will have more positive effects on working environment. Such culture enables smooth relations at all levels, enhancing team collaboration, leading to achievement of organizational missions/visions. The group is currently known to be as the leader in classical power production, (nuclear, classical-thermal, hydro, etc); and now in renewables energy in Europe and globally. (edf.fr/finance, 2022).

2.16. Influence of Cultures on Strategies: for Change Management

Organizational culture is a critical component of business success according to various research and analysis. Like “branding”, organizational culture defines or creates a unique market differentiation and work environment. EDF organizational culture has influence on its global change management strategy. With the France state having a big share, the organization’s culture is somehow complex and cannot be changed through simple or random change management mechanism, **(**Talwar & Mehta, 2019).

However, because at the outset group’s creation, the company was composed of different competing electrical companies, this brought in an important human asset. (edf-publispeak, 2020). They have kept in addition, the core values, consisting of; deep development and research culture. This has kept the company in the forefront of electrical energy in group members. In past moments of change management, this culture appeared to be the “cementing” factor of the staff, employees; and permitted to reduce friction and clashes. Thus, resulting in mutual goal of maintaining company’s position as leader in electrical energy developments. **(**Their-Passion, 2022). This culture has somehow protected the company from being “dismantled” by the state. With no “power-struggles” in leadership and staffs, as well as fighting against the state, these permit to keep the original company culture. (humanite.fr, 2016).

Contrary to many companies in France, employees in Edf, wishing to keep their “energy leadership culture” have more often been “fighting” by the side of the management and leaders, against some past governmental planned actions. This has had a positive and direct bearing on planning and execution of organization change strategies- to maintain the strategic position of the organization’s culture. As above mentioned, Edf has now, seriously, is embarked on a mission to reduce the CO2 emission and become carbon neutral by 2050. This can be achieved through technological innovations and business process changes supported by organizational culture, **(**Tang, 2019). Because we work

with/for Edf on large scale wind energy project, we have seen how the company has progressed dramatically since 2013; in renewable energy transition.

2.17. Strategies to Manage Resistance to Change

Strike is a “norm” in France, therefor, change management must seriously take overall employees into account. This will reduce to minimum resistance actions, including repeated strikes that cost several companies financially and in brand reputation; in this country. Efficient change management requires that managers, or externally hired consultants, analyse all “known” or “expected” attitudes, to enable smooth change. Change resistance could be managed in a global energy organization, like Edf Group through the following steps:

i. **Formal management:** managing resistance should not be a reactive or authoritative steps but rather be focused on insight and prevention of resistance.

ii. **Labour organizations** should be involved upstream to avoid resistance to change and obtain adhesion. (news@thelocal.fr, 2020). These should be a systematic process, at early stage to mitigate resistance to change. (Service-Infographie, 2014).

iii. **Prepare approach:** creation of strategy, planning and change prevention approaches.

iv. **Identification and anticipating** of resistance points, a risk assessment, consultation of experience from company data.

v. **Resistance prevention** through training activities and actions. This could be based on the ADKAR framework.

vi. **Sustaining outcomes:** Assessment of activities that helped manage resistance, as well as documenting lessons for the future. (Tiron-Tudor et al., 2021).

vii. **Identification of root cause:** Go beyond reactions, rather find out the root cause of employees' resistance. The root causes may be a lack of awareness of why change, fear of impact jobs, or "registered" fear because of past failures in change attempts. Were there lack of leadership support, or lack of overall employee consultation.

viii. **Engaging resistance managers:** this step ensures that the senior leaders, people's managers, and labour organizations are engaged to manage employees' perception of the change.

ix. **Through insightful communication** with employees, change managers could permit to deal successfully with any resistance.

x. **A Toolbox to Manage Oneself**. When involved in complex change projects

2.18. Individuals' Role in the Change Management Process

Since the 2001, the French authorities decided to gradually open energy market to competition. Companies with public sector culture, like Edf, had to manage change; through such transition to the market mix of: Public - Private. This cultural split affected individuals at all levels of company (Michel Guénaire et al, 2022). For Edf, past data suggests that individuals are engaged, the more they are willing to participate, and adopt to change requirements. Despite Covid-19, Edf reported only 1% reduction in revenue in the first quarter (Wajsbrot, 2020). Employees' fondness and job satisfaction contributed to the achievement, with positive resultant at several the levels. (Their-Passion, 2022). Since of EDF France have a high job satisfaction, they sometimes made a 180° turn to support, change leadership. Engaged employees are one of the primary requisites of a successful change management process. When this is combined with a stable channel for communication, as well as an insightful management team, these becomes a solid backbone for successful change**. (**Vermeeren & Voet, 2017).

2.19. Application of change management in EDF France

EDF has already started to move for another deep change-; into global digital transformation, with intent of including its global staff. Martine Gouriet, Director of Digital utilities, addressed 3 crucial points during her conference in 2020. She raised a point that goes with the core element of digital change, saying: "*It is a mistake to focus solely on the tool and not the purpose or benefit of this tool*. She added: "this *mistake has occurred at all levels of the company*" (visionarymarketing.fr, 2020). Therefore, further success required digital training of employees on transformation, including the resource planning, sales planning, human capital management, and other specificities related to energy and power production complex systems' management, functionalities, and applications. Since several "testers" staff at EDF have started on the path, the positive momentum must be sustained through "supportive change training" and follow-up individuals to make the process easier. EDF hired consultant to follow-up the steps highlighted during the evaluations, as shown in the diagram below. (visionarymarketing.com/fr, 2020).

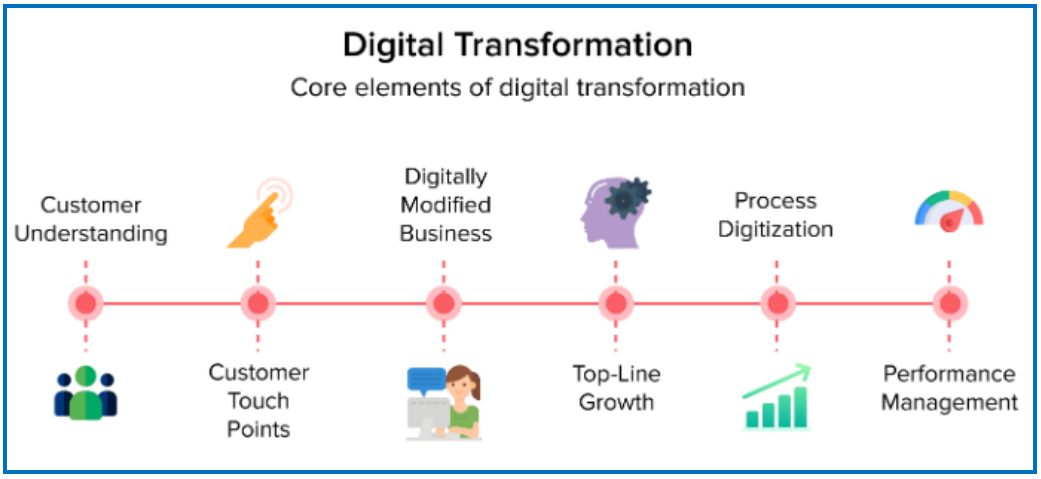


Figure 60. Typical digital transformation sequences.

An organization operating in the new energy sector, can take EDF as a "Tutor"; in deploying its large-scale change with larger scope. This therefore implies "ongoing" change management related to digital transformation. And requires starting with gradual, and yet dynamic, at some points; thus, permitting to overcome the inertia of change motion, and modify the status quo. (visionarymarketing.com/fr, 2020).

Therefore, change plan for an organization similar to EDF could include:

I. **Preparation:** Logistically and culturally. Also, managers to communicate importance of change to raise the awareness of employees at all levels.

II. **Vision and plan:** Get agreement on a realistic, time bound plan. The process at whole EDF may take 18 months or more, as was in past, (visionarymarketing.com/fr, 2020). The key performance indicators, (KPI), should include increase in customers satisfaction, lesser costs of operations and so on. (Vrontis, et al., 2018). Timing to be inserted in the ERP system. This should incorporate charting strategic goals, KPI's, and project team's scope.

III. **Applying of the Change:** Empower employees', giving them means mitigate roadblocks. Help them to tie their work to company's vision. To perceive their personal contribution to near future profitability and sustainability.

IV. **Embed in culture:** Every Success in change needs to sink into company's culture - emphasizing employees already acquired adeptness.

V. **Analysis for Review:** Analyzing and reviewing change - whether success or failure metric. The insights gained to be used for enhancement.

2.20. Monitoring Effects of Change Management Process

To be aware its present position in respect to change, and at every instant of strategic timeline, an organization needs to deploy metrics; system of measurement that monitor then motions of changes. Change effects' metrics can be obtained through Quantitative and Qualitative data.

2.20.1. Quantitative data

Leaders must measure the impact of change through tangible and numerical values.

- Were customers/ employees satisfied?
  - In what areas?
- Employees adopting;
  - "Refusal" or,
  - Unable to follow change.
- Financial gained – values; revenue, cost, etc;
- Overall People impacted – number;

- Impact on performance/operational- rework;

- Performance of suppliers; (e.g., reliability, durability);
  - Quality gained on: productor Service (e.g., occurrence, flaws eradicated, volume).

2.20.2. Qualitative measurements

Qualitative measurements could entail creation of a questionnaire, and actively surveying the employees, interviewing stakeholders on their perception of the change process,

- ongoing and
- at completion.

The comfort level of the employees with the new systems could be understood through these metrics. As well as the proficiency achieved. From these metrics collecting could proceed through:

- Meetings: employee/stakeholders;
- Teams(projects) Meetings;
- Planned focus groups;
- General/specific surveys meetings;
- Open comment boxes;
- Feedbacks electronic/ in person;

Figure below, shows typical monitoring system procedures. (Heath & Heath, 2015).

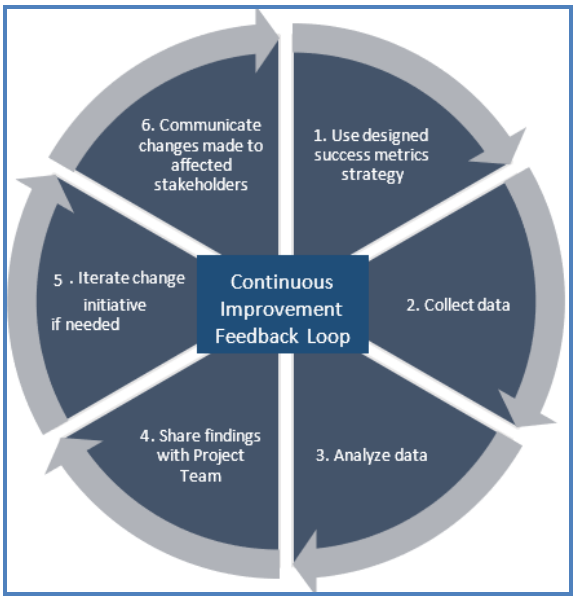


Figure 61. Monitoring change - chart

In this figure above, these six steps method metrics are for gauging stakeholders' engagement and will help to obtain an overall reaction to the change. The change managing team members needs to collaborate to create communications system that disseminates both the quantitative and qualitative data obtained. All impacted employees should receive information on the outcome and feedback that are shared with leadership.

2.21. Conclusion: Chapter 2.

This study has highlighted the main aspects of managing change successfully. When done incrementally, change is deployed much easier. Challenges appeared because change starts with unfreezing the status quo, to abandon the present and go for a future state, - and stakeholders/shareholders should not be taken by surprise. Changes implies basically new ways of doing things, and perhaps abandoning the old ways. Usually, this comprises significant modifications that affect culture, behaviour; and could affects a large number of employees. The complexity involved in culture change is often so strong that it impedes changes. This was the case with EDF, Air-France and Total Energies. The models and tools considered above, constitute real support to accomplish or manage a strategic change successfully. The solution used by these companies, to unfreeze, change/modify and refreeze demonstrate that: the models are useful and even indispensable in most cases. New organizations wishing to engage in new energy sector, will help themselves by being skilled and prompt to use these proven business framework and models. New

energies sectors of themselves present insidious or serious challenges. Because it imbricates, in reality with the classical energy system, and the energy produced with new energies. Transiting from existing or classical power systems to renewables requires that, leaders gain skills not only in technical sectors, but the business strategic principles, to avoid cumulating obstacles. Therefore, such analysis can help prevent cascading of multiple challenges. Additionally, global energy businesses, being as it is; involving multi-cultural zones. This will almost always require some changes, and adaptation, in accordance with the global zone of operation. Consequently, success is strictly depended on appropriate change management skills and methodologies; in all areas of the company's infrastructure and operational systems.

3. Chapter 3: Insight in Research for Business Venture: Critical for Shaping, Developing, and Planning Energy Transition Mission

3.1. Organization Management and Business Research

Effective planning and supervision are essential factors for the success in business, as well as general project management. On the other hand, the success in new business activities is highly depended on the critical information acquired beforehand; by means of adequate research.

The similitude between managing a company's project and managing a business research activity, is a factor that will help to eliminate any reluctance or fear of leading/overseeing a business research project.

According to the Project Management Institute (PMI), a project is a temporary endeavour undertaken to create a unique product, service, or result. PMI adds: "Project management is the use of specific knowledge, skills, tools, and techniques to deliver something of value to people". (PMI, 2022). This quotation implies that, project management is critical, whether for classical business activities, or research for business endeavour.

Renewable or classical energies developments costs are in hundreds of millions of dollars, for just a single project. For example, a Floating, Production, Storage and Offloading (FPSO) system for gas, the cost is around three billion dollars. Four billion dollars for a Concrete Gravity Based Liquid Gas Storage system. Two to three billons dollars for an offshore wind power production project. Totaling about 650 Megawatts; a recent project we participated, for EDF France, - Saint Nazaire, Courcelles, and Fécamp in course of execution. The cost of Euro-Russian Arctic LNG-2 projects, comprising three LNG trains with concrete gravity-based structures cost the sum of 21 billion dollars. (Bajic A, 2020).

Additionally, these kinds of projects involve arrays of stakeholders, numerous engineering, and construction disciplines. It will include as well diverse companies of engineering and management disciplines, joint venture systems, horizontal and vertical subcontractors, as well as third-party tests and approval institutions.

All these show the complexity involved. As such, it requires; specific advance analysis, and well-structured management system. Actions from very starting phase could include:

- Request for governmental permission;
- Request for finance and approval;
- Systematic coordination and control;

- Project roadmap;
- Execution plan;
- Detailed schedule;
- Outlined timescales and deadlines;
- Specific start and finish dates;
- Demarcated millstones;
- Projected actions,
    - specifically, and rigorously delineated.
- Risk Assessment,
    - Associated with mitigation strategies.
- Expected responses to specific situations,
    - clearly expressed.
- Provisions for uncertainty;
- Contingencies and external variables;
    - catered for at planning stage;
- Dynamic corporation,
    - with disciplines synergy;
    - Subcontracting management;
    - Institutions,
        - Private and States.
    - Consultants;
    - Laboratories;
    - Manufacturers;
    - Etc.
- Multi-tasks job process distinctly elaborated.

The above facts emphasize the fact that, the complexity of such projects, is similar to a research project for new business ventures. Planning these projects of such intricate interface requires a “perfectly” structured management system. It goes the same way for business entrance research activities, e.g., when a company is transiting to activities in renewable energies.

Research at outset, is planned by means of a detailed scope of activities and responsibilities, as well as risk assessment. The two figures below show the organization

chart of Top Management for a classical energy (Gas). It could be an international or national energy project. This will comprise for long distances, extra high voltage power grid transmission- costing about 2 billion dollars. The complexity of the management structure of such projects shows that, there is a high risk for companies working in these sectors.

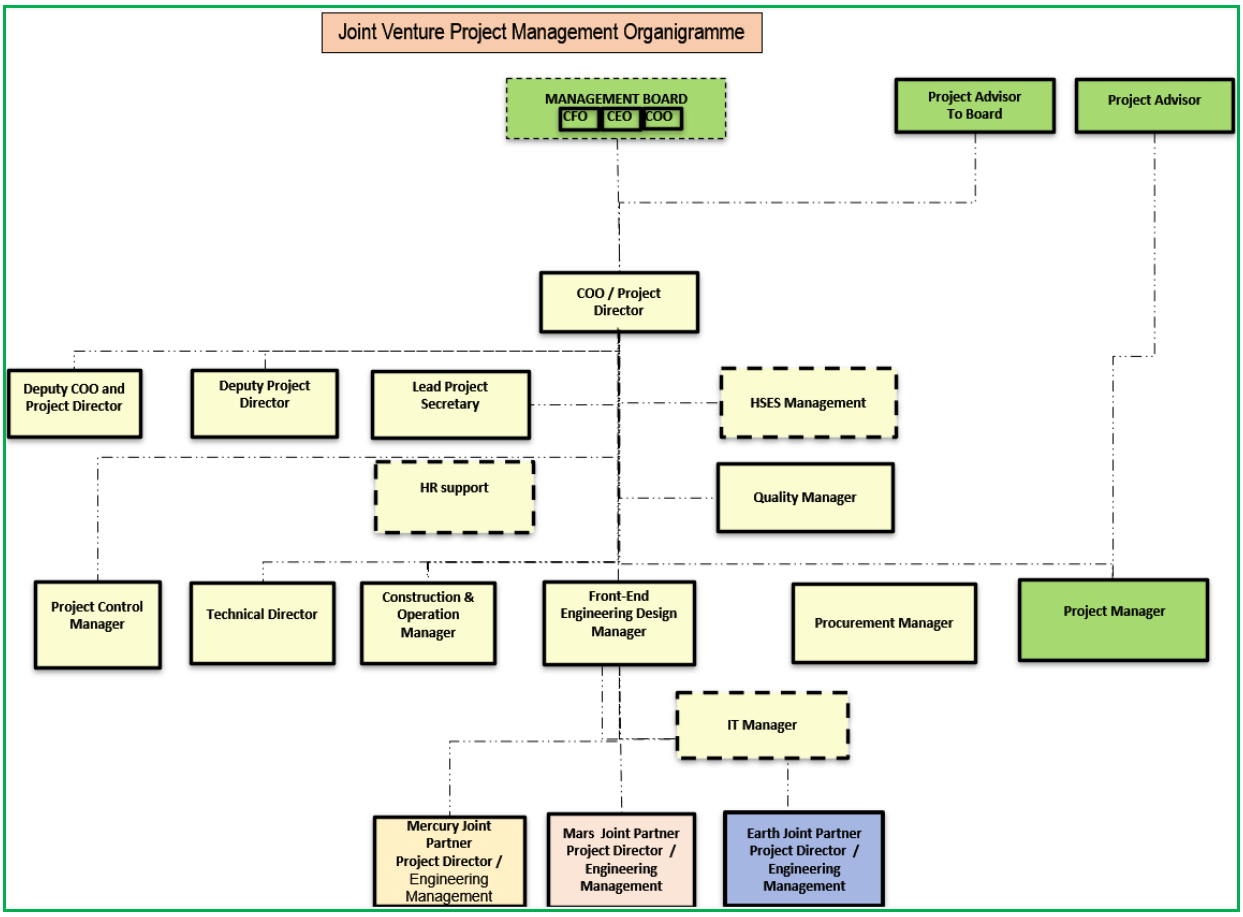


Figure 62.Typical Multibillion energy project management chart

The two charts above; show that because of its complexity, business execution management should be strictly structured. Activities of responsible managers and directors are carefully planned for intricate interface; permitting to have an effective operational flexibility, reliability, and for smooth project “running".

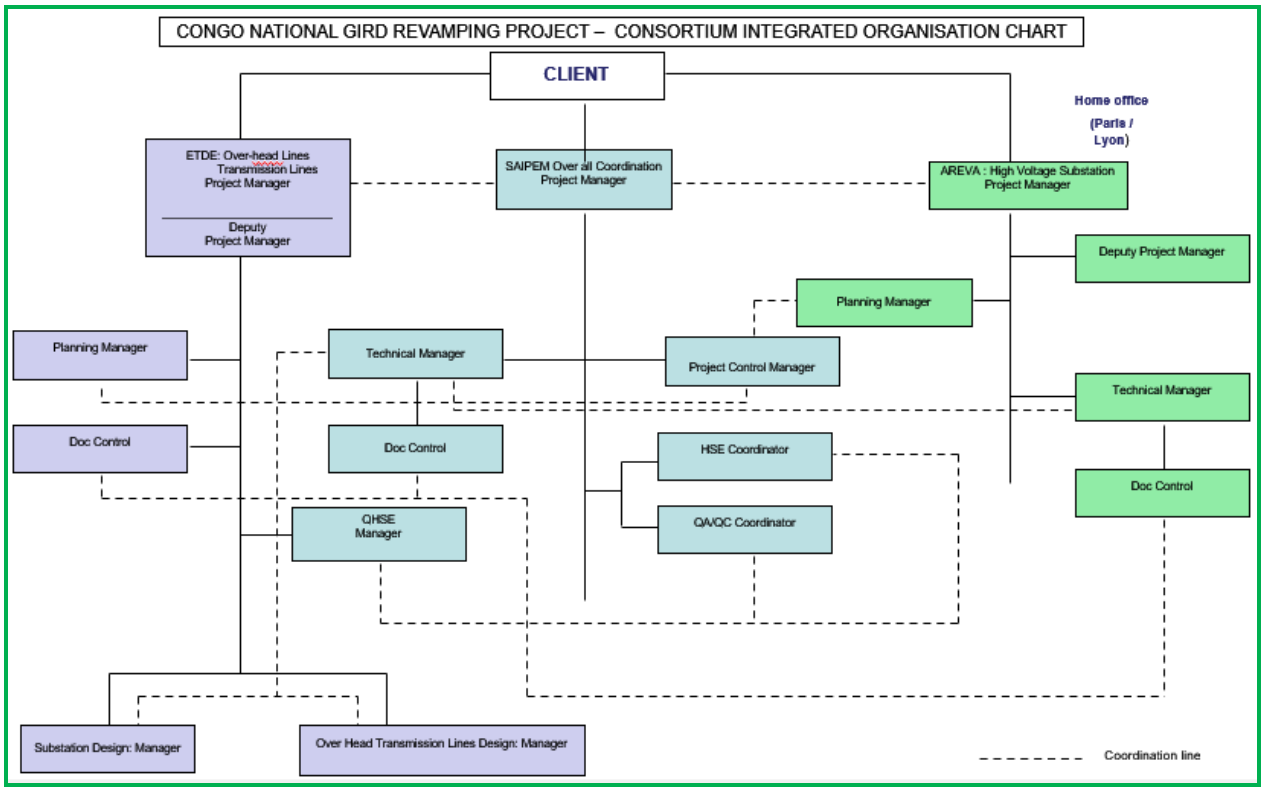


Figure 63. A national electrical grid project management chart.

It is important for executives venturing into the sector to ascertain all the "contour" of such business market. Consequently, insight in business research is Critical for Shaping, Developing, and Planning an Energy Transition Mission. A leader will, evidently, need to possess an appropriate research methodology and capabilities; at least to be able to oversee and understand the processes involved. Such skill will help unclutter all unknowns related to the vision.

Oil and gas companies are encountering several challenges and restriction related to climate change. These are somehow "forced" to be "switching" from fossil fuel energy to renewable energy, to make green energy a big section of their energy business. Pressures from "green" institutions or organizations, incentives from governments, international decrees, etc., somehow obliged or encouraged such ventures. Reports show that many of the top global Oil & Gas company are engaged in the renewable energy sectors; trying to play a leading role in renewables. (IEA, 2020).

From the above factors, a business in energy transition, requires strategy based on deep and methodical research; to ascertain the present global trends, bottlenecks, and all the pros and cons tied to this sector.

Renewable energy technology is improving year after year in quality, price, and accessibility. Energy options and related emission data below shows the current progress. However, renewable energy sources are used by less than a quarter of the world's total population. (Charles et al, 2021), (enerdata.net, 2020). The data below shows energy options; confirming the energy type and related emission.

Table A.III.2 | Emissions of selected electricity supply technologies (gCO_2eq/kWh)[i]

Options	Direct emissions	Infrastructure & supply chain emissions	Biogenic CO_2 emissions and albedo effect	Methane emissions	Lifecycle emissions (incl. albedo effect)
	Min/Median/Max	Typical values			Min/Median/Max
Currently Commercially Available Technologies					
Coal—PC	670/760/870	*9.6*	*0*	*47*	740/820/910
Gas—Combined Cycle	350/370/490	*1.6*	*0*	*91*	410/490/650
Biomass—cofiring	n.a.[ii]	–	–	–	620/740/890[iii]
Biomass—dedicated	n.a.[ii]	*210*	*27*	*0*	130/230/420[iv]
Geothermal	0	*45*	*0*	*0*	6.0/38/79
Hydropower	0	*19*	*0*	*88*	1.0/24/2200
Nuclear	0	*18*	*0*	*0*	3.7/12/110
Concentrated Solar Power	0	*29*	*0*	*0*	8.8/27/63
Solar PV—rooftop	0	*42*	*0*	*0*	26/41/60
Solar PV—utility	0	*66*	*0*	*0*	18/48/180
Wind onshore	0	*15*	*0*	*0*	7.0/11/56
Wind offshore	0	*17*	*0*	*0*	8.0/12/35

Figure 64. Energy options and related emission

"Successful transitions must be "secured", otherwise these will not happen fast enough to ward off catastrophic climate change". Researchers are saying that the world is not investing enough to meet its future renewable energy needs. (iea, 2021). Therefore, managing successfully such projects, requires alignment with factors like cost/ finance, time and research endeavours, The figure below shows that such factors are always ascertained at outset, of an energy project. (iea, 2021).

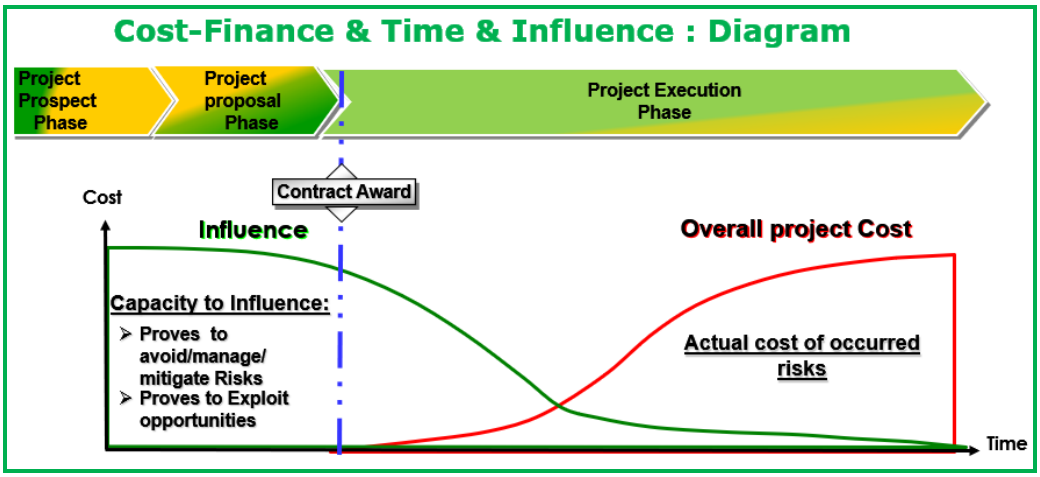


Figure 65. Project life.

3.2. Purpose of the Research Proposal - For Energy Transitions

3.2.1. Specificity and Area of the Research

Executives should aim research program to investigate the challenges faced by global energy organizations, especially companies of classical energies, who are transiting to greener Energy Production and Transmission. Renewable energy-based technologies are becoming increasingly commonplace, and this could create more entrants into the business sector. Due to the radical swing to new concepts, R&D, and technologies; the green energy sector seems able to rapidly alter the world's energy supply systems (Charles et al., 2020). Some of the leading classical energy companies have “declared” strategies of models, and value creation, based on “integration across the energy value chain”. (Shell-Energy-Transition, 2022), (totalenergies.com, 2021). The areas include exploration, production, and transmission of the final chain in form of electrical power. The intention then, is energy distribution to end customers, by means of energy transportation, transmission, and storage; whilst reducing progressively petrochemical trading.

3.2.2. Current Trends in Research in Energy Sectors

According to International Energy Agency, “Transition-related spending” is gradually picking up but remains far short of what is required to meet rising demand for energy services in a sustainable way. The deficit is visible across all sectors and regions. At the same time, the amount being spent on oil and natural gas, dragged down by two price collapses in 2014-15 and in 2020.

This is geared towards a world of stagnant or even falling demand for these fuels. Oil and gas spending today is one of the very few areas that it is reasonably well aligned with the levels expected in 2030*”.* (iea, 2021). Current 2022 conflict in Europe is taking its toll. IEA adds the “the pace and scale of the global clean energy transition is not in line with climate targets. Energy related carbon dioxide (CO2) emissions rose again in 2018 by 1.7%. (iea, 2019).

3.2.3. Enquiries for research proposal

Before entering in the new energies, a company should therefore have the capacity to investigate on what is happening. Leaders could then detect any game changer, where they will generate a market competitive edge. The above crucial actions, place a huge

responsibility on executives; and their skill or insight in business research activities will be very helpful. Executive leaders should therefore be:

- Capable to initiate **specific topics of investigative** business research;
- Capable to instruct appropriate business **research methodologies;**
- Capable to **understanding results** and interpretation transmitted by;
    - Own company research department or,
    - Consultant.
- Capable to link research results with “in market” application.

The research will additionally, (for a general case) permit to expose:

- “Blockages” in satisfying the rising demand for energy services in a sustainable way.
- Transition strategies insufficiencies of other energy companies, in order to take advantages.
- What the other organizations are really accomplishing?
- Are these publicly proposing renewal strategies, whilst neglecting or drastically reducing all “efforts” in reducing the carbon footprint. This could serve as an advantage.
- What are the developments, investments, R&D capabilities the energy companies are deploying?
- What is behind the curtain, from a lay man’s point of view?
- What could be extra gain to “customer, if the company gain access to energy sectors?

Answers to these questions could be a game changer. Because IEA confirms enormous energy alternatives, and due to current available technological possibilities. Besides, the infrastructural cost, and components prices were falling before the Ukrainian/Russian conflict. (iea-gas, 2019). The figure below, provides a graph on the changing, or diminishing capital cost of energy alternatives and related technologies.

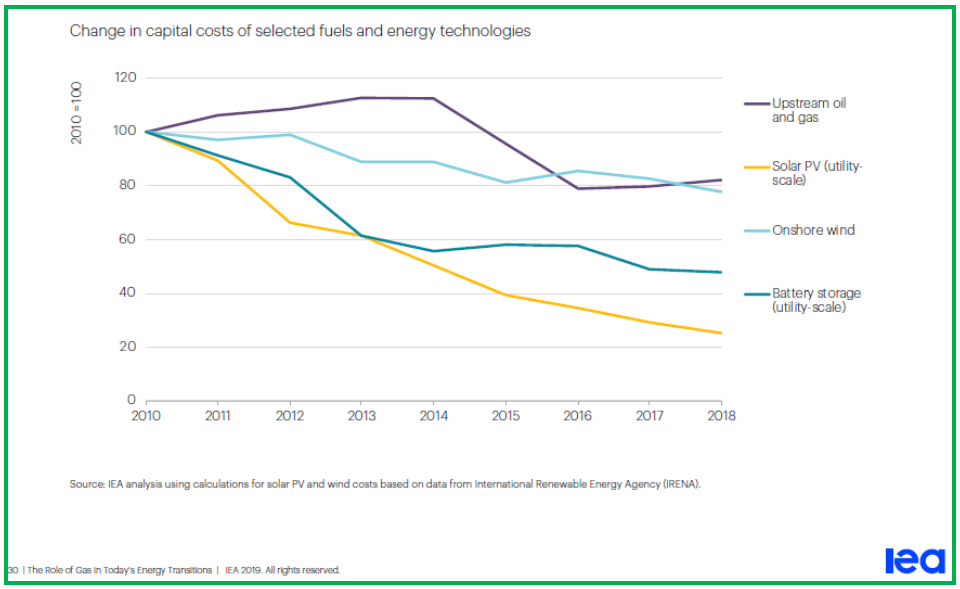


Figure 66. Energy alternatives.

An incentive to energy transition is the reluctances of some organizations. In effect, reports pinpoint large corporations and governments that are not willing, or not as swift as necessary in carbon reducing actions. (Charles et al., 2021). Those going ahead can therefore improve therefore their brand image and positioning; by capitalizing on sustainability and social responsibility.

3.3. The rationale for the Choice of the Research

Renewal energies developments and projects are a prerequisite to adhering to the global carbon footprint reduction. Additionally, fossil fuel energies are “apparently” depleting; or else, will deplete at a long run. The incentives for global new energy development for carbon reduction, is sustainability and company’s social responsibility. Global Vice President of the Oil & Gas, and Energy Business Unit Benjamin Beberness said. “There are a number of ways companies can do transition” (Judith Magyar, 2021). “Some companies buy into utilities; others acquire renewable energy companies”. “Whichever path a company decides to pursue, technology and talent will be determining factors in a successful transition”, said Mr. Beberness. “Everything will be different”. (Judith Magyar, 2021). Energy requirement and appropriate strategy to cleaner transition is therefore a crucial, a major global challenge.

In this particular case, a leader who understands research methodologies, could easily instruct a research rationale leading to an appropriate and cleaner energy transition. This will inevitably affect positively, the business “prosperity” of the company entering

renewable energy business sector. Besides, presently, a company's social responsibility and sustainability are a determining factor for business success, as above mentioned. However, leaders and executives, can proceed in this way only if they are aware of what is really happening in the market, and the business actvities of their direct competitors. This stresses as stated in chapter 1; why companies need to establish and sponsor knowledge development systems to "upgrade" employees through schools like Selinus University. The intention is to spark in them, a deep knowledge acquisition and leadership capabilities. Because not everyone can afford classical academic studying system, to attain a level of, say, a DBA or similar degree. Employers can sponsor employees, and will result with positive returns for the organization.

Gaining such skills in their mist, energies companies will therefore be able develop, internally, research methods and capability in renewal energy, and provide appropriate impetus and "sail" to the right direction. (Mengpin Ge, 2020).

Research capabilities will permit to observe, compare, and contrast data sources or publications about the business outlook or strategies of energy business organizations. And then analyse the reports from international energy institutions. It will be helpful to investigate the directions the energy businesses are going. With such knowledge, a company can capitalize on its strategy of positive organization company social responsibility. Combined with business framework and models considered in previous two chapters, the organization can gain a vantage position.

3.4. Research Aims and Goals

In sum, the goal of the research mentioned above is:

- To understand the trends in major energy organization;
- To understand the cost implications of shifting to renewable energy sources;
- To comprehended how far they are investing for transition;
- If they have really started to "swing" to the green direction;
- What are the challenges in shifting to renewable energy sources?
- Investigating with the "business eye" of a competing organization;

- “Will permit to gain competition advantage, whilst flawlessly “being in green” energy transiting?”

- Discover what are competitors lacking, loopholes, or what should be done to accelerate to gain advantages;

- To understand what governments can do or are doing to ensure an upward direction in renewable energy.

3.5. S.M.A.R.T. Objectives

The research questions mentioned above, are categorized for investigations; and will help to obtain” essential facts. The research questions will help to perceive what the other competing companies are really about. Are they making a tangible advancement; a substantial shift towards green energy? The research project is performed with the model of the acronym S.M.A.R.T. objectives.

Therefore, the project is expected to be:

- **Specific**: information, proves, find out actions, proves;

- **Measurable:**
  - With business actions;
  - Values;
  - Reports;

- **Achievable:**
  - Data are available;
  - Use of onsite companies;
  - Or international energy institutions’ requirement.

- **Realistic:**
  - Obtainable through reports of key performance indicators;
  - Transmitted to stakeholders and approved. (which is a specificity in energy business).

- **Time-bound:**
    - Could be accomplished within few months.

As an example, information available indicates that “most oil and gas majors have either purchased renewable electricity for sale, installed renewable systems, acquired renewable energy companies, or built their own renewable energy business ventures. (Chetna Kumar, 2021). More could be found, if leaders themselves are conscious or have some “potentialities” in research work on energies business strategies and deployments.

3.6. Past Studies and Relevant Literature

According to numerous research work available, having access to energy is vital for creating resilience, and fostering socio-economic progress. (enerdata.net, 2020). Energy poverty may get some populace stuck to the old polluting fossil fuel; as observed in a lot of developing countries. (eia-international, 2020), (Charles et al., 2021). Consequently, access to “accepted” energy creates people's ability to adapt to climate change. (Charles et al., 2021). A Company can capitalize on this important factor; during its entrance in the new energy in different zones in the globe. The figure below, shows the current efforts made by several companies, towards zero Co^2 emission. (enerdata.net, 2020).

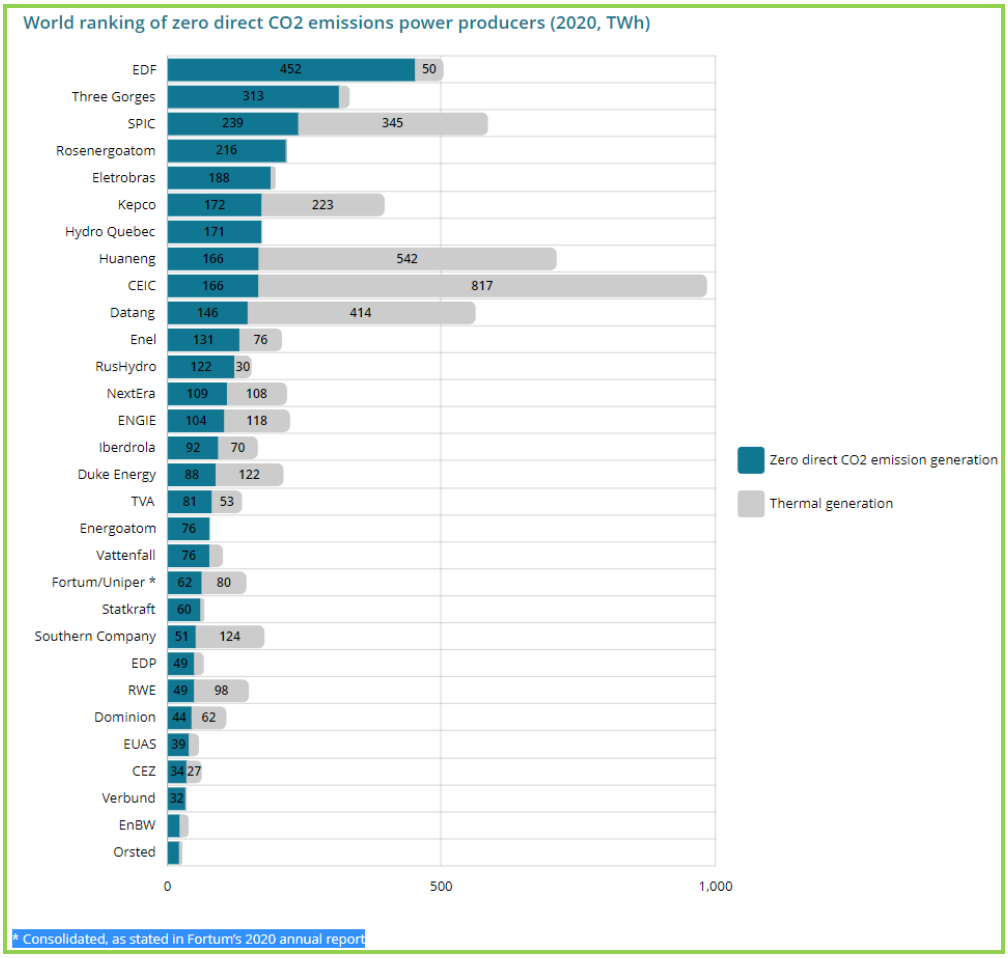


Figure 67. World ratings of low carbon emission

The information within this figure above, is about the "renewable moves" made by several global energy giants. Based on this, or similar, it becomes much easier to identify where to concentrate: to obtain motivating factors and incentives in development the energy transition business. And then, comparing the emission level of the different energy sources: through related technologies, would be helpful to define business strategies or tactics. This will help to identify which area to invest in the renewable sectors.

The industrial sector, which is primarily responsible for developing steel, and petrochemical, manufacturing is estimated to account for about half of the increase in natural gas consumption. (Charles et al., 2020). Studies about energy developments sectors, indicate that between 2018 and 2030, natural gas production is predicted to rise by 20%. Until the European war of 2022 natural gas usage decreased at a slower rate, as compared to oil use throughout the globe. (Charles et al., 2021). Lantz and Doris also concluded that renewable energy tax credits had played a critical role in certain areas.

These; in achieving some of the energy objectives, expanding the economy, and ensuring adequate energy for several social levels. Both Boghossian and Heshmat stressed that tax incentives are essential to reducing conventional energy use. (Charles et al., 2020). These tax advantages aim to encourage transition to renewable energy. If tax advantages provided to encourage renewable energy, - particularly in areas where conventional energy sources have little competition -, it might positively impact the progression. (Charles et al., 2021). The three diagrams below show the situation of renewable generation until 2021.

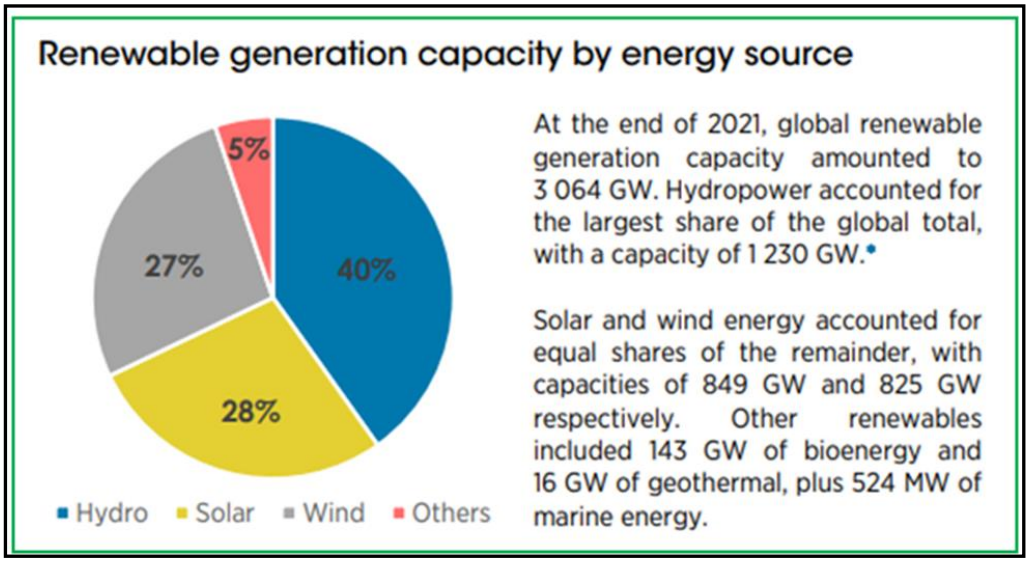


Figure 68.Renewable generation capacity

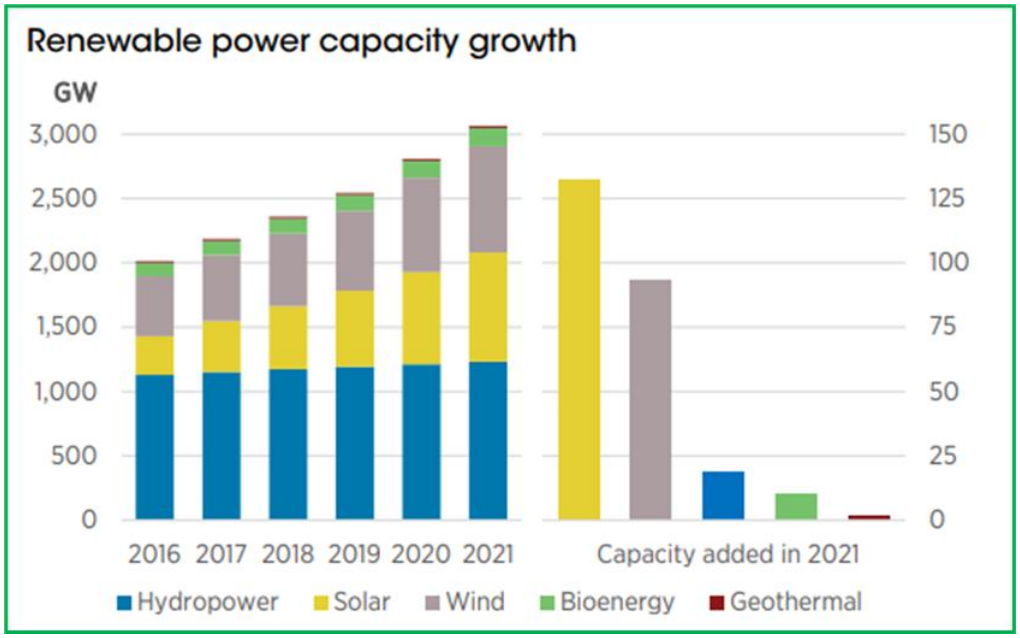


Figure 69. Renewable generation capacity (Irena.org, 2022)

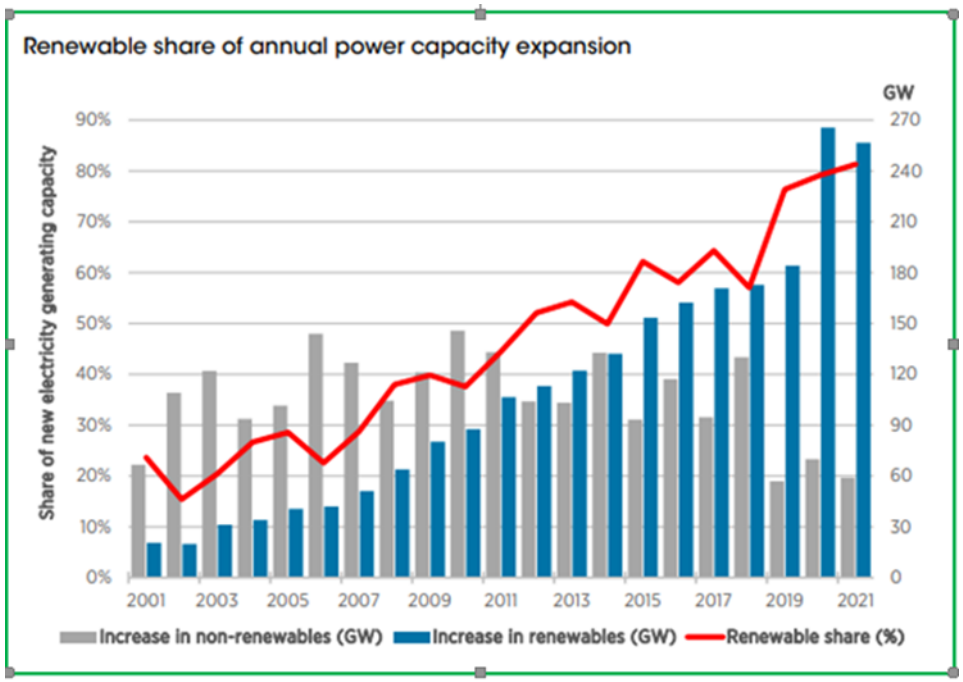


Figure 70 Figure. Renewable Energy share. (Irena.org, 2022).

The information above about the progress in renewable energies are invaluable for company's executives, who desire to enter into the new energy sectors. However, this requires exhaustive evaluations or analysis; and to compared with the company's own core competences and business culture.

3.7. Data Requirements to Accomplish the Project

3.7.1. Comparatives in Data Requirements

As above mentioned, data collecting is important for the research and analysis. Appropriate research data in this area may permits to measure, analyse, to ascertain facts, and thus gain accurate insights.

In business research project, data obtention is a means to evaluate a particular case. Nevertheless, it is essential to obtain consistent and productive research data for analysis. The frequent ways for collection data could be in person, or electronic; (Mail, Phone, and Online). The electronic method usually being faster and cost-advantage. This may imply

the collection and using of appropriate data from renewable energy institutions, governmental policies data base, and surveys.

Success in such business research project depends on planning, specificity of data collection, and exchange, for successful project objective This is in fact somehow similar to oil & gas and energy business project execution. The figure below shows typical data collection and data exchange for multibillion energy project.

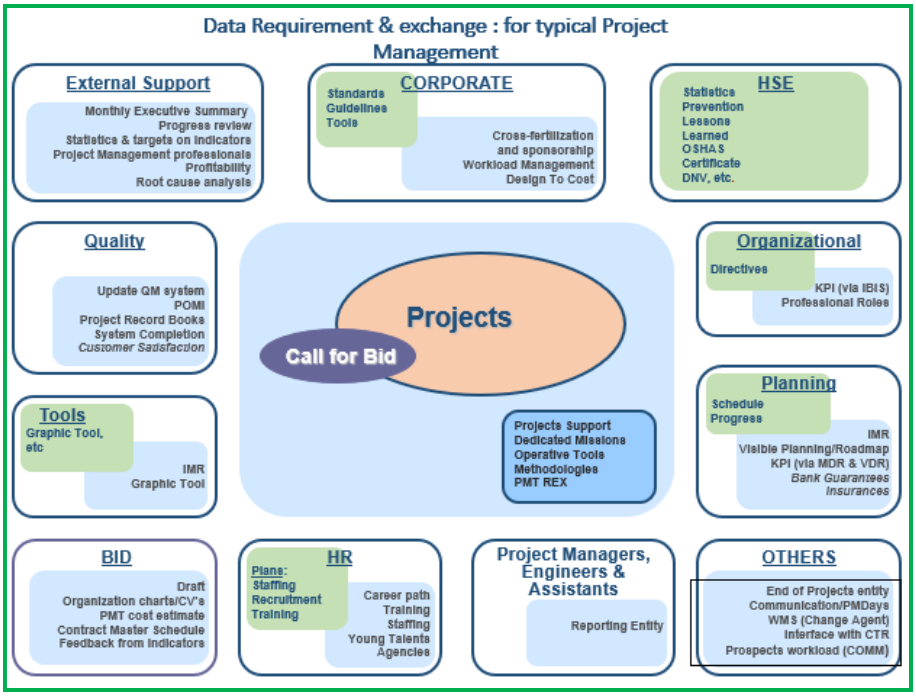


Figure 71. Typical Data requirements. Energy projects

Such project organization, permit coherent interface with all involved. It becomes a “self-correcting” system, where errors or “missing-links” are easily identified. Market entrance with similar structure will enable exhaustive screening and provide and excellent risk analysis and business potentialities identification.

3.7.2. Classification of Data Usage

Data classification is broadly defined as the process of organizing data by relevant categories, so that it may be used, and protected more efficiently. On a basic level, the classification process makes data easier to locate and retrieve. Data classification is of particular importance when it comes to risk management, compliance, and data security.

Data classification involves tagging data to make it easily searchable and trackable. It also eliminates multiple duplications of data, which can reduce storage and backup costs while

speeding up the search process. Though the classification process may sound highly technical, it is a topic that should be understood by all. (De Groot & digitalguardian, 2023) Therefore, for energy project research, there is the need to classify data, depending on importance, usage and impact on project or research work. The MOSCOW model or method, among others, is of significant importance for “structuring” project actions and sequences. (Hevia-Koch & al, 2019).

The acronym, letters **Moscow** stands for:

- Must Have.
- Should Have.
- Could Have.
- Won’t Have this time.

This approach is helpful on project projection, or forecast, to overcomes bottlenecks associated with ordinary approaches which are based on relative priorities. And will as well be very efficient of business entrance research and analysis. Actions are divided into any of the four categories as mentioned above. Must Have provides the minimum usable subset; the (MUST) are requirements for business research and analysis, that guarantees the delivery. Whilst the Should Have requirements are defined as important but not vital. And ‘could have’ are defined as the “Wanted” or “desirable” but less important, have less impact. Therefore, the primary focus initially is to create Moscow priorities for the project. (agilebusiness, 2022). Because “should-have” efforts may be planned for the future without compromising the current schedule, they are distinct from “must-have” initiatives. (Charles et al., 2021). Thus, if consequences of not implementing “Must Have” task would imply project failure, then it really is a Must Have. If not, then classification could become “should have or a Could Have (or even a Won’t Have this time).

Any team's success relies heavily on establishing and adhering to clear priorities, whether at project start, ongoing project: actions in business development, or market entrance. Tasks accomplishments could “apparently” require simultaneous actions for research, or for company project. However, because of the “competition” on limited resources from multi tasks, these "competing occupations" need to be prioritized. An example in our sector, for projects of 3 billion dollars (within our company), it is critical to determine which tasks must be completed first in sequence, to avoid bottlenecks that could result in disastrous consequences. Besides, due to the complexities of projects and deadlines, an in-depth preparation is indispensable. Project participants are more likely to work

collaboratively if they clearly understand the project's priorities. It goes the same way for business research. An example is research with goal to determine tactical business steps, to gain competition advantage, move, or business transition. After determining goals and objectives, working toward them based on planned to-do list can help prepare, keep track, and help tie-in with oncoming weeks and months. (Chaurasiya, et al., 2017). (Charles et al., 2021). Project managing process should delineate tasks' importance and sequence of work. In business project execution methodology, companies begin with:

- In-house project data usage;
- Client or contract related data;
- Ethics related, or regulations;
- Standards (International & Local);
- Consortium or Joint venture;
- Overall planning;
- Etc.

Therefore, since data collection and usage vary, this effective methodology can help to know how to "acquired needed data", whether administrative, business data, or other statistical surveys.

For our type of research, data from public institutions, international energy organizations, private or governmental registries, and other surveys that has previously been conducted could be sufficient. The technique of data "collection" or " modelling" may help in finding reliable and necessary information. For example, sample surveys and censuses are often linked to statistical surveys. (Chaurasiya, et al., 2017). The in-situ energy data, having been obtained from measurement of production and consumption; at different points will be useful; to start with. The most crucial aim is to get trustful information efficiently. Most recent trade data collection may also provide information on energy imports and exports. (Charles et al., 2021). Researching on organizations through data acquisition is quite easy. This is because recent business organizations are storing data on online systems or company site; to inform stakeholders, or for the public. Data used or required should cover all the "Flow" of the project workload Management. This knowledge can help in researching on a similar energy organization. Data for business workload management permit to compare company's needs and demands; based on workforce available to complete the projects. Data could provide workload management based on the resources staffing activities, matching this with project needs; and in terms of roles required to

complete the scope of work. Data on resources available are characterized by the required professional role, either through internal active employees, or could be integrated with external capacity, composed of:

- Intercompany resources (e.g., company belonging to the Group);
- Or Extra Group resources engaged by company, subcontractors, or; vendors.

To certain degree, this specificity could be used for business research activity with associated workload and interface. As an example, the diagram below shows a typical business workload management.

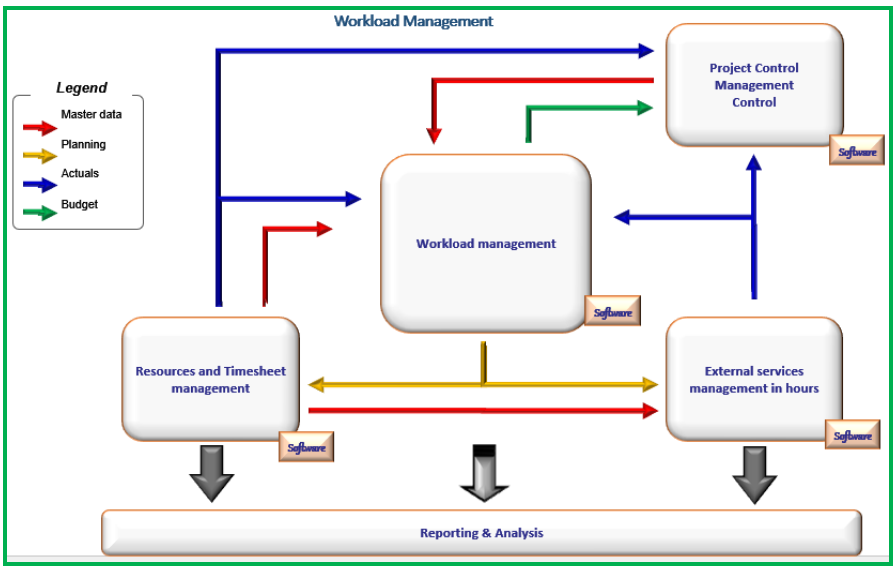


Figure 72. Typical workload data management.

A simple look at the legend, in this figure; gives us an idea of this type of data management. We see the master data, and those for planning, current or actuals; and budget related etc. The interfaces, or interconnecting data distribution, permit to arrive at reporting and analytic conclusions.

3.7.3. Using Business Execution Plan as Support

Adding a new strategic business portfolio requires specific skills in planning and execution. Strategic execution or implementation plan should be well structured and tied-in with the core operational systems of company. (hbs, 2020). Research from Bridges Consultancy indicates that “48 percent of organizations fail to reach at least half of their strategic targets, and just seven percent of business leaders believe their organizations are excellent at strategy implementation”. (bridgesconsultancy, 2016). In most cases, implementation could be wrongly perceived as marginal. The principles behind successful

business project implementation should be as well be applied in strategic execution process.

In effect, for business execution or developments plannings, companies usually add a traditional timescale, a linear model to present in chronological order or sequence of the project activities. These make it easy for monitoring, or task evaluation, at identified milestones and deadlines.

The figure below shows a typical sequence of project realization in a typical, multibillion dollar energy project. This is a typical 40% accelerated; or project execution time reduction, with work breakdown, time scales, and are based on task starting dates.

Project Schedule - Main steps	
Work Starting Date (WSD)	**WSD**
Preparation Phase	**WSD + 2 Month**
Conceptual Design Frozen Date	**WSD + 6 Months**
Overall Structure Lay-out Design Review	**WSD + 7 Months**
PIDs Initial Resease for Feed-Back/Comments	**WSD + 9 Months**
Hazard and Operability Analysis - Review	**WSD + 10 Months**
Offshore Model Test Campaign	**WSD + 12 Months**
Materials Take Off, Cost Spread Sheets + etc	**WSD + 16 Months**
Front End Engineering Final Resease	**WSD + 18 Months**

Figure 73. Multibillion energy project timescales.

Business project sequences, especially in energy sectors could takes years to complete; e.g., Offshore Gas projects, nuclear energy, hydro energy as well as offshore wind farm energy projects. The underlying principles of the factors described above, may serve as guidelines; and helpful indications for a leader in supervising research project.

3.8. Research Data Types

In general research cases, either quantitative or qualitative data collection methods may be used. In some cases, the two are complementary, especially when we wish to ascertain clients, or peoples' feelings, perception, etc.

3.8.1. Qualitative Data Based Research

Qualitative methods seek to observe or/and get opinions, views, and attributes through interviews or researcher's focus on groups, etc. in addition to reports from international organizations. (Denzin and Lincoln, 1994). For a business venture of transition to global energy market, quantitative data research will be appropriate.

Comparative graph below shows that, when it comes to in person focus, in-depth interview discussion, etc; qualitative methods being then the most appropriate type. (Bouchrika, 2021)

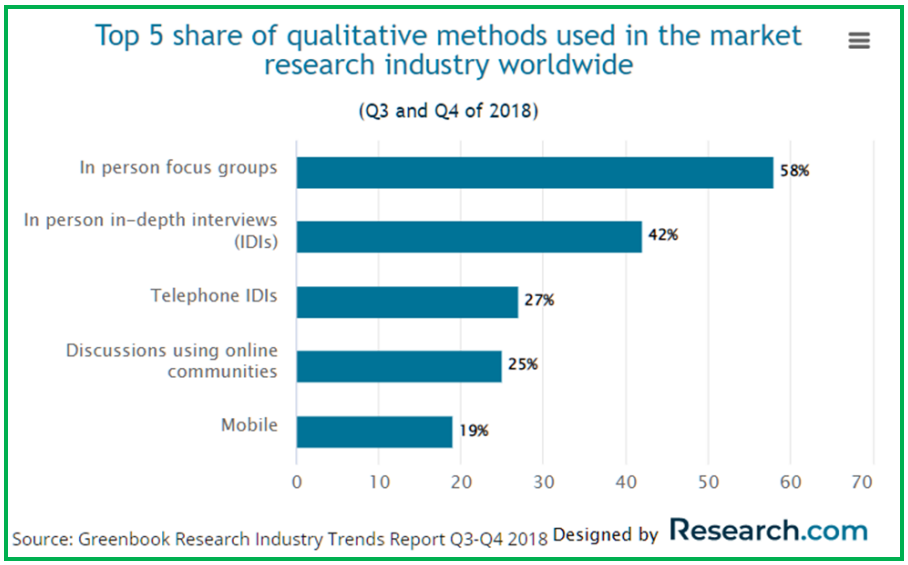


Figure 74. Global Market Research- Where Qualitative used.

3.8.2. Quantitative Data Based Research

On the other hand, quantitative methods collect statistical data, to quantify variables. Quantitative methodology will permit to draw conclusions and answer a question like: "What "market" data or records demonstrate that, "XY" energy company, impulsively made strategic exist from energy sector? Was it due to local content technological deficiency? Records/ data collected may permit establish the causes, with figures, and thus learn from the situation. Therefore, the fundamental difference with qualitative data, is that quantitative research involves "objective" collecting and analyzing numerical data to describe, predict, or control variables of interest". (McLeod, S. A., 2019). Whilst he intent of quantitative research is to test/or perceive relationships between variables, make predictions, and apply results to wider cases.

In global energy venture context, "quantitative researchers aim to establish general laws of behavior, phenomenon; all across several business settings/ and contexts". (Denzin and

Lincoln, 1994). The quantitative research data will permit analyzing of the market and then, to decision making. Such statistics can be used to summarize data, permitting to describe patterns, relationships, and interconnecting factors. (McLeod, S. A., 2019).

The Outcomes Measurement Systems, OMS, questionnaires in surveys; are a significant source of collecting numerical data for quantitative approach. This is often used by researchers who follow the scientific paradigm. (Haq, 2014, p. 1). This method seeks to quantify data and generalize results from a sample of a target population (Macdonald et al., 2008, p. 9). It follows a structured data collection process with data output in the form of numbers. Quantitative research also observes objective analysis using statistical means. (Macdonald et al., 2008, p. 9). According to some reports, quantitative research took the biggest portion of the global market research spend in 2018/19. (Esomar, 2019, page 27). See graph below, (Bouchrika, 2021).

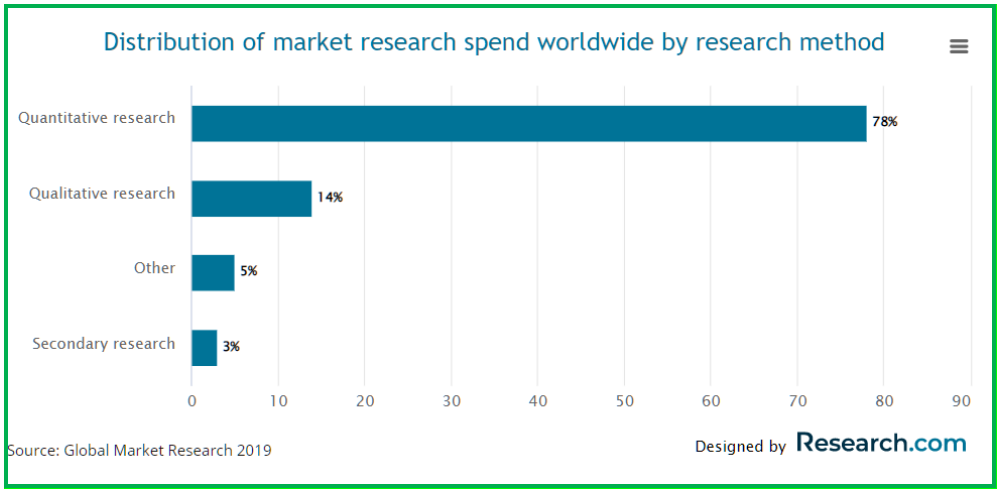


Figure 75. Research methods for global market- Quantitative bias; 2019.

For our energy transition business, quantitative data research will be appropriate, especially that there is a need to statistically compare or contrast, data sources.
Additionally, there is possibility to negotiate ethical data access from different organisations and institutions. Majority of such data access are permanent and free; and yet well controlled for quality. It is particularly so, on the sites of global Energy Institutions and organizations. For competitors, most of needed data are stored on-line for stakeholders, public; as well as to attract future stakeholders; in addition to reports from international organizations.

3.9. Present Energy Transition Ambitions - Gap or Loopholes

Understanding the pace of progress made in energy transition ambitions clarifies questions related to the motives and real intent of the organization engaged in this endeavour. Therefore, comprehensive, and explicit consideration of existing data evidence will be useful for a new entrant in this business sector. Through consistent research, the new player can identify possible gaps or loopholes and specify steps to take. The intention will be to fill-in the market Gap my means of its organizational strategic mission and ambition. (ncbi, 2013). Appropriate research methodologies and “reviews of existing evidence” will likely highlight “areas of deficiencies” requiring compensation, or business development. (ncbi, 2013). The several studies have been made concerning the top global energies companies, mentioned above. The studies concern operational means that these companies are deploying, in response to carbon reduction and transition to green energy. The energy companies themselves provide data that could serve for investigation; e.g., their annual reports intended for stakeholders, as well as the public information. (Chetna Kumar, 2021). From the Global Status studies, it was shown that; the share of fossil fuels in global energy consumption has barely changed in the past decade. The figure below shows the renewable share. (Chetna Kumar, 2021,) (GSR 2021.

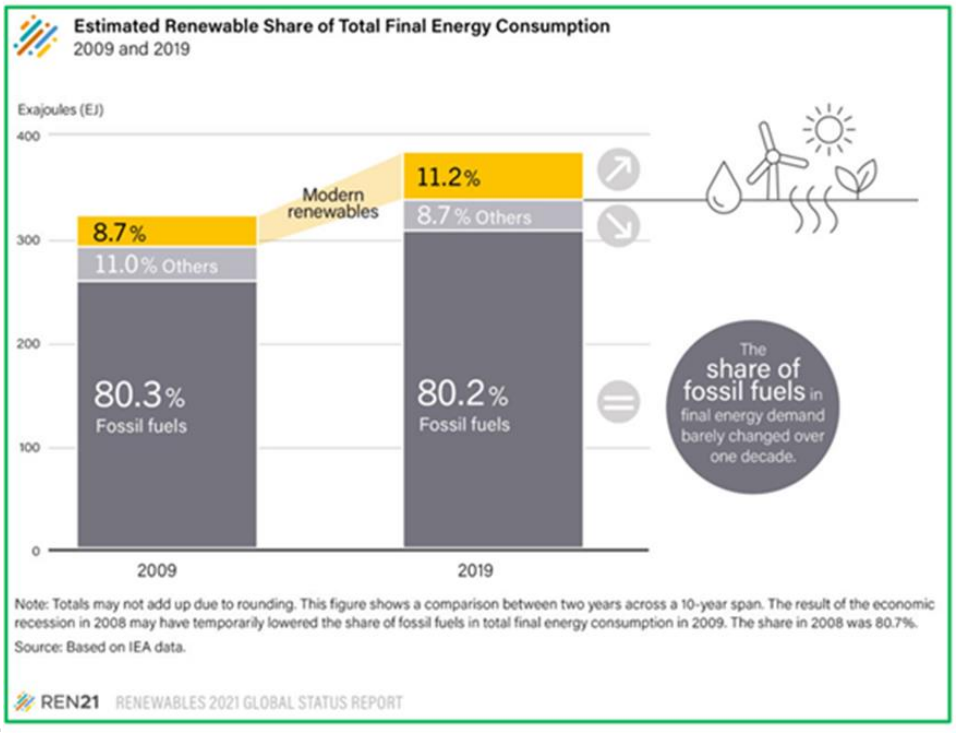


Figure 76. Total share & consumption.

Comparison of these reports to that of international energy organizations or institutions, may provide insight for business venture; to detect where a new entrant needs to “put business emphasis”, to gain competitive advantage. Consulting these “public” documents of energy companies and assessing them with technical managers may provide precious information. This could be used to reassure stakeholders and attract new ones. At the same time, it will help the company to identify what is lacking; and see what/where to develop or invest, in order to differentiate.

3.10. Past Efforts in Energy Sources Endeavors

Since 1881, efforts were deployed in quest of mass production of cars, propelled by electrical energy; in fact, a carbon reduction energy. These endeavours demonstrate that, possibilities of mass usage of electric cars existed more than a hundred years ago. The technologies used were developments of those days, and not an invention of modern times.

A different and specific research work could be assigned to this case, and” travelling back in time”, specifically identify what were the game stoppers in the electric vehicles mass production. What were then the Gaps or loopholes? The four pictures below, show electric cars since 1881. (wikipedia.org, 2022).

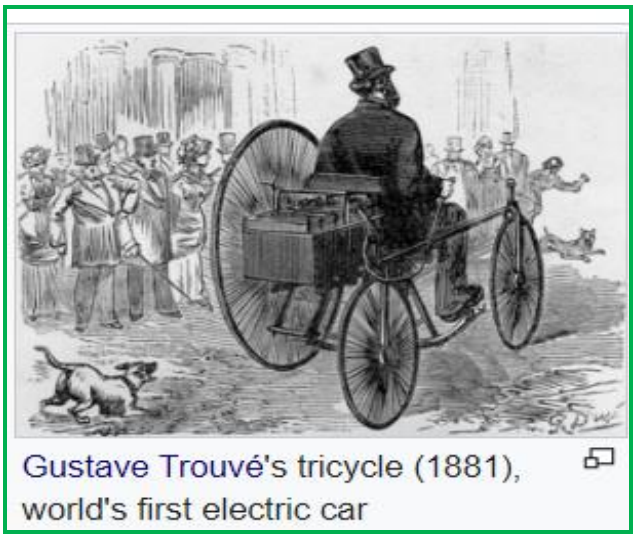
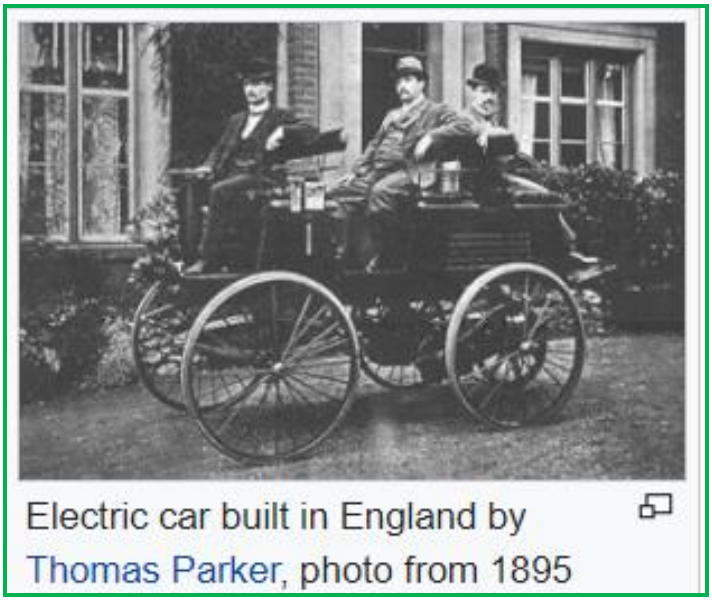
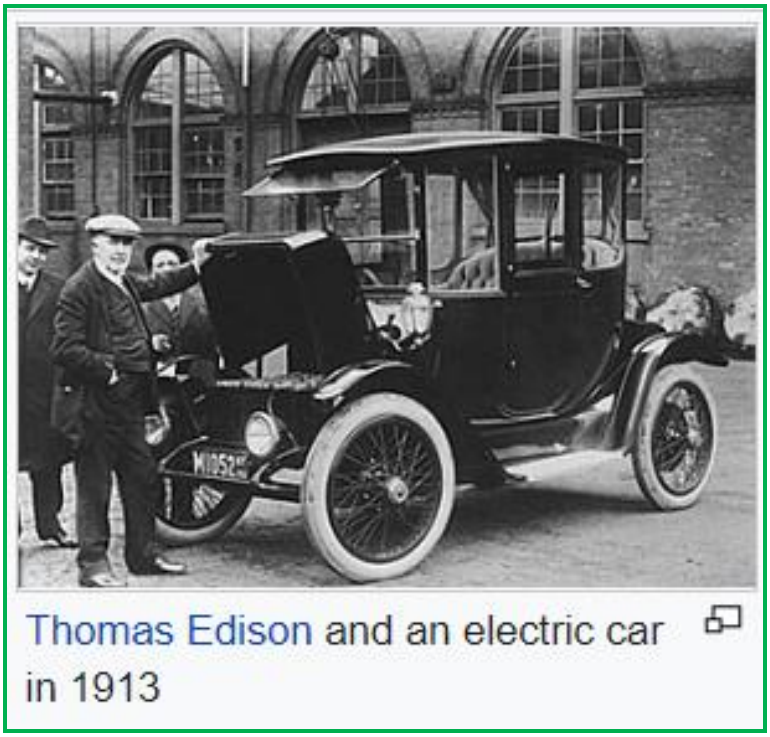


Figure 77. World first Car



Electric car built in England by Thomas Parker, photo from 1895

Figure 78. Electric Car 1895. (web.archive.org, 2014)



Thomas Edison and an electric car in 1913

Figure 79. Edison and electric Car 1913. (web.archive.org, 2014)

Figure 80. Henney electric Car 1961. (web.archive.org, 2022)

Another interesting point is about energy storage for renewable energy. The is a critical, if not the most crucial aspect of renewable energy. Simply because, the energy, or power produce with renewables, (same as classical energy); are not always consumed by end user. When produce from a distance location, solar, or hydrogen originated energy need to be stored, somehow and somewhere. Technically, in power system, energy storage is one of the delicate scheme or functionalities. battery system constitutes one of the major keys to energy storage. Interestingly, batteries, (electro-chemical storage system); have been used with high functionality and capabilities since more than a century. The figure below shows the Edison's Storage battery company of 1903. (wikipedia.org, 2022).

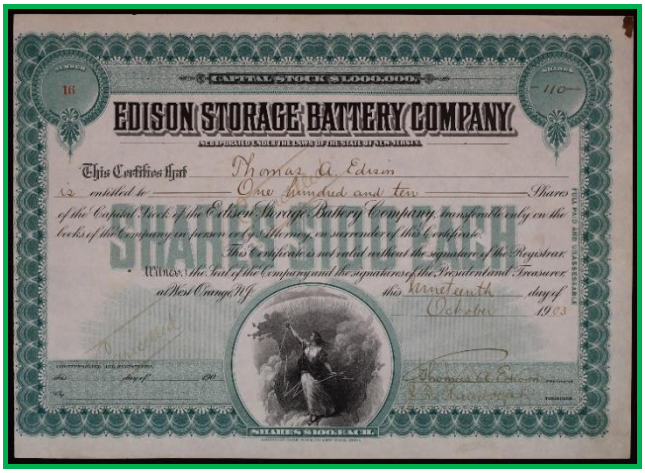


Figure 81. Edison battery storage company.

It implies that storage systems are more than hundred and twenty years old. And that, with the present development of high-performance batteries, - efforts and investments are

deployed -; the Gap in storage system could be bridged. This case can also serve as a reference in tackling a business project in the green energy today. A research project could permit to unveil all the environments or domains related to this transition in order to ascertain what is really happening. As mentioned above, non-renewable energy still accounts for most of the energy industry's current output, and this serves to exacerbate the situation. Fossil fuels compete with renewable energy sources like solar, wind, and hydropower. (Seyr & Muskulus, 2016). Extra and specific investigations could unveil if corporate lobbying, political pressure. And if so, these are strengthening dependency on fossil fuels and therefore making it a big challenge. Or, are these preventing development components like bulk energy storage batteries, for easier transition to renewable energy. (Bouman et al.,2016).

3.11. Current Situation in the Field - Electric Vehicles Example

Business possibilities are abundant globally. By means of precise research methodologies, strategic leaders, and executives of a global energy transition organization, can easily perceive:

- Obstacles;
- Incentives;
- and Motivating Factors for their business visions in these sectors.

Questions lingering on the mind, could be answered with reasonable precisions. The figure below depicts an example of progress in electric vehicles. Especially, accomplishments made from 2010 are spectacular, with higher potential in the sector. (IEA, 2020). This comforts the venture in the green energy transition projects or business.

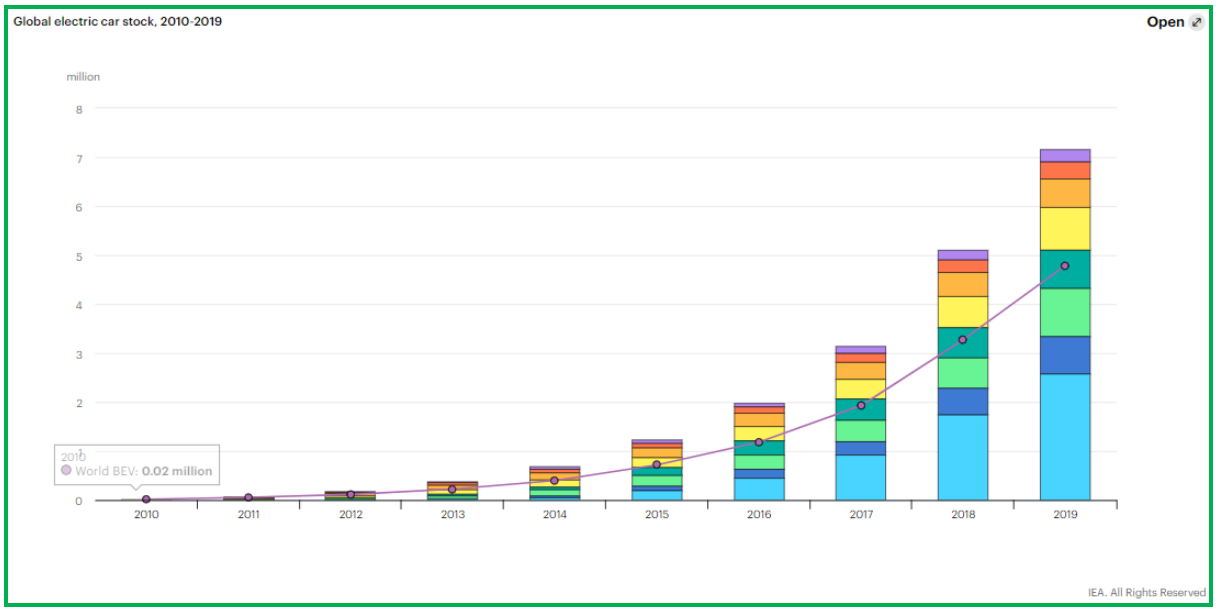


Figure 82. energy and electric vehicles

3.12. Researching With Competitors' "Eyes"

Another factor in entering this business is to see things as if with competitors' "Eyes". This will help to be prepared. What insight do we gain when we compare and contrast competitors in global energy companies? To enter this market, a new entrant would need to research/analyse the existing business modus operandi to gain insight in what is actually happening. (eia-international, 2020). Could a competitor use "results" to re-evaluate its steps/position in the market and gain a competition advantage. For such research, a deeper marketing comparative investigation may help to define exact business strategies. This could be based on exhaustive business marketing measurement guidelines; some presented here below. (Proctor, 2002).

These may include:

- How to create,
  - Competitive advantage,
  - Marketing channels.

- Markets strategic windows,
  - Opening or closing of strategic windows – as per Area Accessibility.

- Nature of competitive strategy – depending on direct competitors.
- Market drivers – tying research information to strategic move.

- Strategies for hostile markets areas.

- Markets: actual and potential size – game play basis
    - Market growth,
    - Forecasting methods,
        - Long-term forecasting.
        - Short-term forecasting.

Then proceed for:

- Market profitability analysis.
- Key success factors.
- Benchmarking and identifying competitors.
    - Competitor attack methods,
    - Understanding competitors' strategies.

Informed and precise research knowledge on competitors and the market will boost stakeholders' participation and adherence to such energy business. All the above facts show why it is worthwhile for business organizations to investigate on all the "conners".

3.13. Risk Management Plan

3.13.1. Principles Involved in Assessing Risk During Research Activity

Risk assessment plan and deployment for research activity is not so different from that of any other Job, or project accomplishment. Exhaustive risk appraisal and mitigation solutions need to be organized for each case – similar to business projects. Risk assessment and mitigation encompass "people", materials, methods, and all means for the project realization. A certified risk assessor is essential to ensure proper training and equipment needed for the task. In several cases Health and Safety Advisory Service (HSAS) links adviser and safety experts (for health-and-safety concerns), as well as members of research governance team; ready to assist in risks identification. This will help the leader and the team to conduct meaningful risk assessments and understand what is involved in the circumstance. (Preisser et al., 2019). Typical research line management structure in a college, university or for organisation is presented in figure below, (iosc, 2012).

Figure 83. Typical research line management.

The research type and "location" for a business venture, will delineate the areas of assessment. These may include working with fire, visiting, or working in participants' homes, working in rural or high-crime regions, travelling abroad, working in or near water, pressure equipment, flammables substances, very hot or cold weather and laboratories.

3.14. Assessment of Risk in Quantitative Data Based Research

The main risk with quantitative research, is more related to **ethics and quality** of sources of data collected. (hks.harvard.edu, 2020), (Singer, et al., 2003)

These are related to:

- Confidentiality
    - Least-sensitive data;
    - Restricted data;
    - Etc.
- Anonymity
- Protection of the participants
- Privacy of organization, companies, or individuals

- Data storing security- to avoid infringement or manipulations,
- Personal information
- Deliberate deception - intentional concealment, manipulation, or modification of information
- Misrepresentation or biased information. (AJ., 2007).

All these risks necessitate that sources are assessed of quality and ethical qualification before consulting such data for research.

3.15. Regulations On Risks in Research Activity

Offshore energy platforms, structures, construction sites, high/medium voltage power system sites, heights: all these constitute a “Hight Risk” workplaces.
And risk mitigation governances and regulations are specified within international standards such as:

- DNV - Det Norske Veritas; international accredited registrar/ and classification society headquartered in Høvik, Norway.

- IEC - The International Electrotechnical. international standards organization. Especially related to Electrical Energy.

- IEEE - Institute of Electrical and Electronics Engineers. Professional association for electronics and electrical engineering, and several other related disciplines.

- Lloyds - Germanischer Lloyd SE Classification Society & Consultancy- Merged with DNV.

- Bureau Veritas - Bureau Veritas. A French Institute specialized in testing, inspection, and certification.

- OSHA - Occupational Safety and Health Administration; United States federal agency that regulates workplace safety and health.

- etc.

These standards and any other specific national or local regulations should be taken into account.

3.16. Health Safety Rules: Assessment of Risk in Research Activity

In some research activities, risk may be related to the following factors:

- Health and safety
- Standards for foreign countries,
- Travel health guidelines,
- And emergency procedures;

All these need to be studied to obtain segregated information. (Seyr & Muskulus, 2016). The hazardous materials could include allergens, biological agents, blood and blood products, flammable, poisonous, explosive chemicals, corrosive gases, and asphyxiating gases. (Seyr & Muskulus, 2016). Research planning, hazardous evaluation, standards, and process could permit to determine risk levels.

As part of control system regulation sources could incorporate:

COSHH - Control of Substances Hazardous to Health Regulations 2002 is a United Kingdom Statutory Instrument

or **DSEAR** - Dangerous Substances and Explosive Atmospheres Regulations. The United Kingdom's implementation of the European ATEX directives (Explosive atmospheres tied with hazardous areas and Items).

Early risk assessments are indispensable to ascertain whether the project facilities must be adjusted as part of the planning process. Besides, risk assessment must be updated, especially when activities, places, equipment, or chemicals involved change significantly. Advance preparations for decommissioning of research equipment and restricted locations, must be included in risk assessments. This will be similar to what is done for high voltage power system and offshore construction projects. (Preisser et al., 2019);

3.17. Assessment of Risks Associated With Data Collection Procedures

Research through collection of data comprises the following risks:

- Mitigating privacy risks;
- Reviewing process;
- Sensitivity of data;
- Usage: if permission is required;
- Storage: risk of data loss;
- Accesses: permission duration;
- Sharing;
- Potentially identifiable data: if redistributed.

The two figures below present some of the data privacy, collection challenges, and risk factors. (Polonetsky. et al, 2014), (Matthew S. & al, 2019).

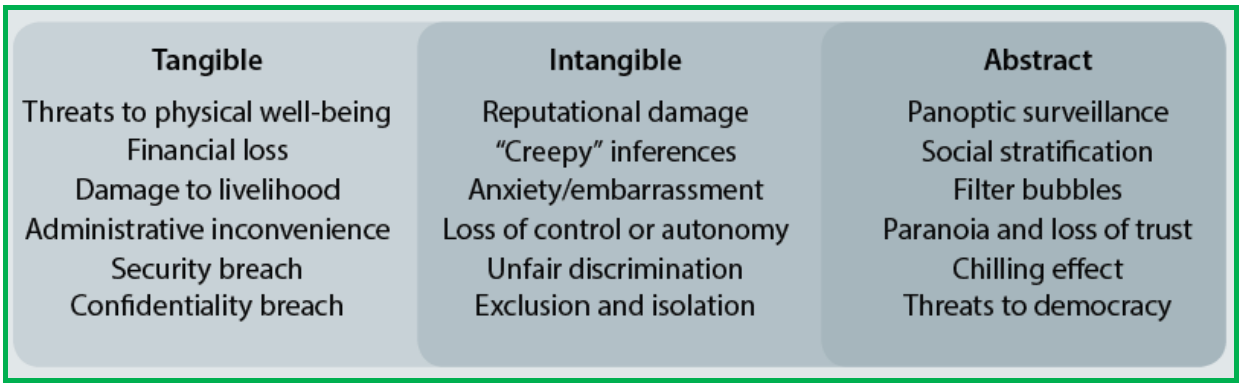


Figure 84. Data privacy challenges

Data based Research Project - Risk	
Risk Factor	**Description**
Lack of use	Data are rarely accessed and dubbed 'unwanted', thus getting thrown away
Loss of funding for archive	The whole archive loses its funding source
Loss of funding for specific datasets	Lack of funding to monitor, maintain, and otherwise work with specific data
Loss of knowledge around context or access	The loss of individuals who know how to access the data or know the metadata associated with these data that make the data useable to others, e.g. due to retirement or death
Lack of documentation & metadata	Data cannot be interpreted due to lack of contextual knowledge
Data mislabeling	Data are lost because they are poorly identified (either physically or digitally)
Catastrophes	Fires, floods, wars/human conflicts, etc
Poor data governance	Uncertain or unknown decision making processes impede effective data management
Legal status for ownership and use	Uncertain, unknown, or restrictive legal status limits the possible uses of data
Media deterioration	Physical media deterioration prevents data from being accessed (paper, tape, or digital media)
Missing files	Data files are lost without any known reason
Dependence on service provider	Risks due to potential single point of failure problems if a particular service provider goes out of business
Accidental deletion	Data are accidentally deleted by a staff error
Lack of planning	Lack of planning puts data collections at risk of being susceptible to unexpected events
Cybersecurity breach	Data are intentionally deleted or corrupted via a security breach, e.g. malware
Over-abundance	Difficulty dealing with too much data results in reduction in value or quality of whole collections
Political interference	Data deleted or made inaccessible due to political decisions
Lack of provenance information	Data cannot be trusted or understood because of a lack of information about data processing steps, or about data stewardship chains of trust
File format obsolescence	Data cannot be accessed due to lack of knowledge, equipment, or software for reading a specific file format
Storage hardware breakdown	Sudden & catastrophic malfunction of storage hardware
Bit rot and data corruption	Gradual corruption of digital data due to an accumulation of non-critical failures (bits flipping) in a data storage device

Figure 85. Data collection risk factors.

From the facts elaborated within the two tables above, we observe that, obtaining research data, necessary for entrance into energy transition business; could be complex, with several obstacles. However, if well classified, the research activities will go on smoothly.

Precision in of types of data identification, tagging, as well as classification of the relevance to business target, or market quest, is indispensable. (Bradley & digitalguardian, 2017). Also, appropriate sorting, as shown in the table above, will permit easy future retrieval, as per data categories, and criteria. If correctly implemented, this will provide the team a well assembled information. Review with leaders, executives, employees, and technical managers involved, can as well allow easy comprehension of the research work. Thus, finally permitting leaders to understand risks, and correspondingly, define its objectives, roles, technical protocols, and execution responsibilities. A sage roadmap for the business enquiry will ensue.

3.18. Conclusion: Chapter 3

The research report confirms that, success requires that, leaders assimilate available proven tools and techniques, in managing market entry. Business research project should therefore not be taken lightly. Because this constitutes the “veins” for success in new business-sector development. As emphasized above, many global energy “giants” are apparently deploying huge means in the form of upstream research. Research and development are directly intertwined for gaining market edge in energy sectors. The research may help to understand the challenges, hindrances, or obstacles on the way to expansion or new developments in renewable energies sector. Besides, the research may “hint”, or highlight tangible and intangible incentives. This would unveil motivating factors for the endeavour and provide direction on how to gain competition advantage.

Such business projects, comprising of intricate interfaces; require a “perfectly” structured management system, with detailed scope and planning. Besides, composite data collection is critical; a crucial means to “ascertain” the “status”. It is therefore essential to obtain ethical, consistent, and productive data for analysis. Project procedures, planning, with specific methodology, incorporating data acquisition sequences will help to accomplish the objectives successfully. These need to be aligned with factors like; cost, obtention of finance support, risks assessments, and appropriate time scaling. All the above factors are to be ascertained at outset of the project; for successful accomplishment. And the skills and understanding of leaders or executives in research methodologies, procedures, and capabilities; are prerequisites steps for success.

4. Section 4. Peering Into Advanced Research Capabilities: A Vantage Point for Leaders in Defining Strategies

4.3. Research on Biographies of Leaders and Executives: Insight to Acquired Skills and Academic Developments.

As complements to previous chapter, on research capabilities, extra quantitative research was performed; by the evaluation of the biographies, of several business top leaders, and executives. The intent was to evaluate these leaders' skills, trainings, or courses they have received; either through earlier academic or continuous professional development education and schooling. The biographies considered were those of some leaders and executives of the following Global companies:

- ExxonMobil
- Esso
- Uber
- Shell Global
- Air France
- Unilever
- KLM
- EDF
- Bp
- Totalenergies

The quantitative research data were collected from official website of these companies, cited above. These public reports data were intended for the stakeholders and partners. The biographies analyzed, included about 130 top leaders and executives. The business positions and ranks of those evaluated included:

- Corporate governance members;
- Board of Directors;
- Executive Committee;
- Chef executives;
- Board Committees;
- Audit Committee;
- Governance Committee;

- Finance Committee;
- Environment, Safety and Public Policy Committee.

The findings are that, less than 5% among them attained an academic or professional doctorate. Additionally, - from these same available data/information of the companies -, less than 30% possess a master's degree, academic or professional. The underlying qualities of almost all of them, were that they have gained an extensive experience; whilst occupying different positions. They served within several companies, and at diverse operation entities. (corporate.exxonmobil.com, 2023), (corporate.airfrance.com, 2023), (shell.com, 2023), (edf.fr, 2023), (uber.com, 2023), (bp.com, 2023), (klm.fr, 2023), (unilever.com, 2023), (Unilever.com, 2023), (totalenergies.com, 2023). Seeing that the professional doctorate was so few amongst these top leaders, a different and future investigation, or research, could permit to ascertain the unknow determinant.

The research finding incites questions on why, those major companies rarely decide to enroll their leaders, for this highest professional training, education, or development. This could be a pertinent inquiry, because the business researchers emphasize that, to gain a "vantage point" of view on new market strategies, special and specific insight are prerequisite. This will not simply be an academic training, - a pre-employment education-, but rather, a continuous development, a post-employment education. The next section develops this aspect in detail.

4.3.1. On-Job Development for Top Leaders: Academic and Professional Determinants

Fundamentally, career improvement process is sourced from training, coaching and specific individual development; business sector is of no exception. And after decades of training of executives and top leaders, training consultants have thus observed that; leadership-development is a characteristic of innovative companies. The researchers have arrived at the conclusion that; "long-term success requires a pipeline of visionary leaders who can help build and secure a competitive edge". (hbs, 2023). The associated skills are based on programs for leadership development. This in turn, "prepares emerging executives to become more effective influencers, and who can contribute to corporate success on a higher level". Such "highly personalized program" will render leaders "more confident, more capable, and better equipped to take on new challenges". (hbs, 2023). As

leaders acquired “broader business knowledge, global perspectives, and leadership insights”; they are thus equipped to instruct an “agile culture that embraces digital transformation”. They can then implement strategies that drive through innovation, and “gain of knowledge edge”; and deploy business advancements in the renewable energies. (hbs, 2023), (ceric.ca, 2023).

Therefore, it could be emphasized that, a top leader’s exceptional, or higher capability to instruct and interpret research, for energies business endeavour is a prerequisite. Because it will certainly be rewarded with competitive advantage for the company. On the other hand, it will foster “personal growth, resilience of individuals”; and produce the required progressive agility in the evolving global energy markets. (ceric.ca, 2023).

4.4. Twenty Years’ Research Findings: Strategic Implementation Capabilities of leaders and Executives

The above information, was complemented with data from institutions, research consultants, by means of their respective research proceedings and reports. These highlighted the critical success factors required of top leaders. (Bridgesconsultancy, 2020). From their research observations and report, quote; “only exceptional talent makes a real difference”. And that, there is a “high correlation, between executives with “excellent” capabilities…., in leadership and performance”. (Bridgesconsultancy, 2020), (Dotiwala et al, 2013). (Bridgesconsultancy, 2016). Examples of their research results, (from Bridges Consultancy) are depicted within the four figures below.

Principally, for 20 years, Bridge consultancy made exhaustive research on the business activities of top leaders of several companies. The report presents their findings in strategy implementation of vision, mission, and values. It was found that, these three; as always being the most important top three. However, in each case, only one out of five leaders, -20%- does performs reviews on implementation; once a month. The survey shows that, leaders habitually underestimate the process of implementing of strategies; once defined. (Bridgesconsultancy, 2020). Apparently, this was due to factors tied to underestimation, or unacquaintance with the importance of strategic implementation in business. And consequently, it could be said, that, this was linked to the “knowledge threshold”, within business models related specific domain in the market.

The four figures below present snapshots of the research results. (Bridgesconsultancy, 2016), (bridgesconsultancy, 2020).

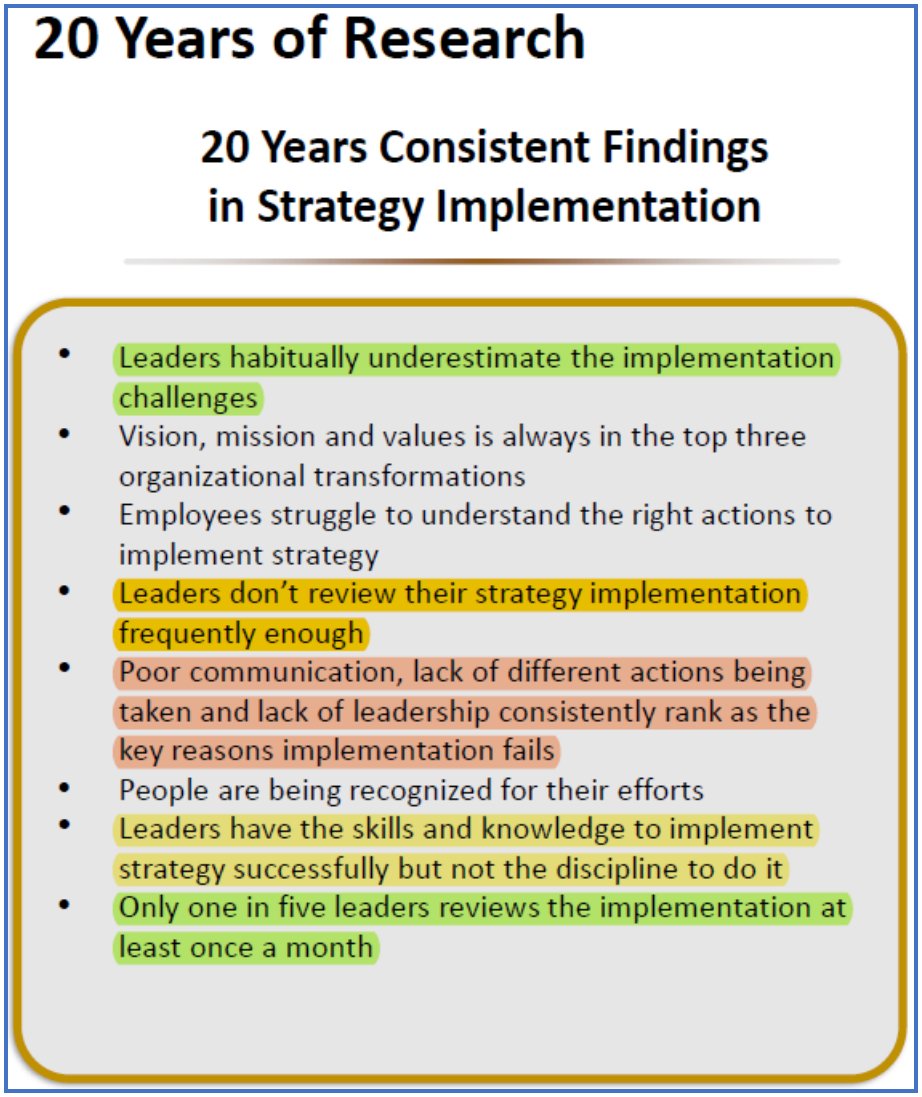


Figure 86 . Summary bridgesconsultancy 20 years Research.

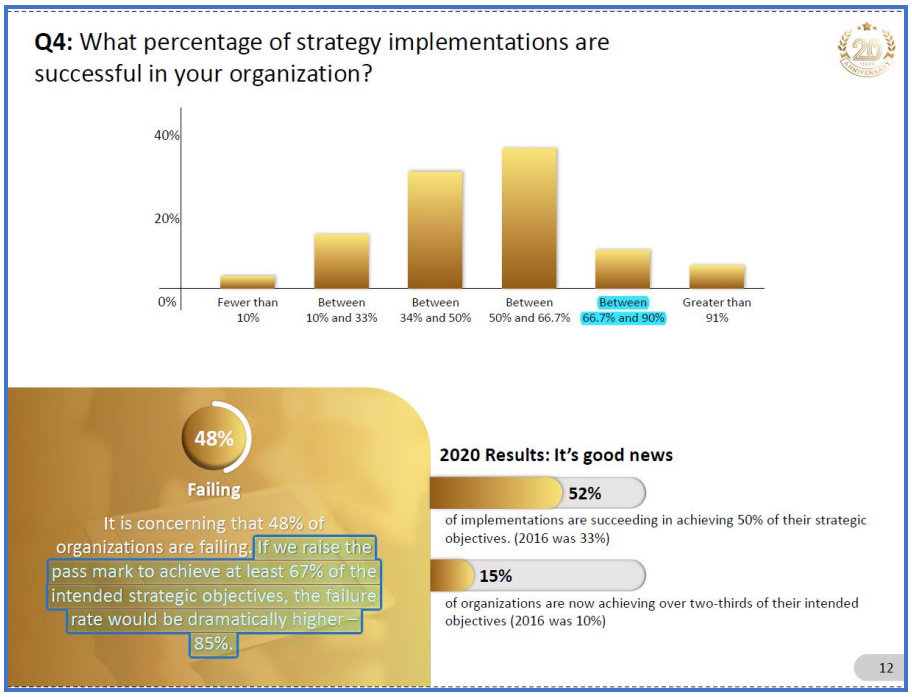


Figure 87. Executives' Implementations Success.

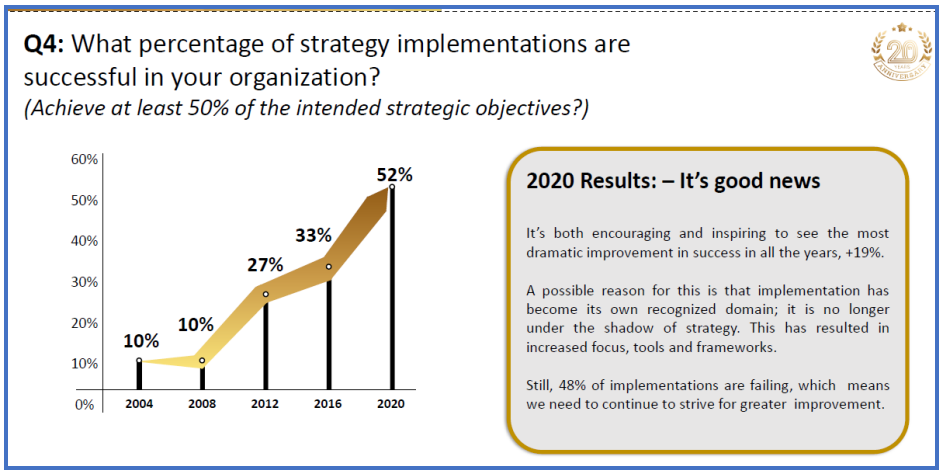


Figure 88. Executives' strategies success rate.

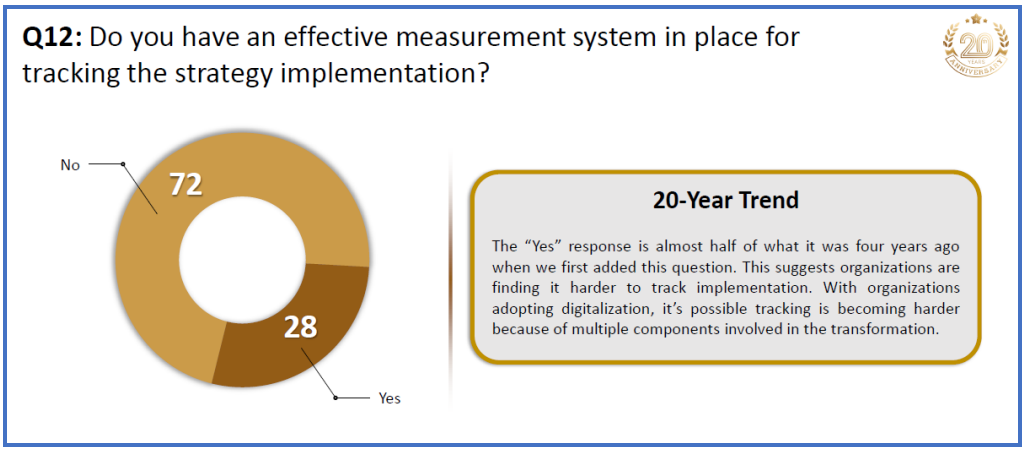


Figure 89. Leaders' lack of monitoring in strategy implementation.

This research result, above; is evidently alarming, because this qualitative research shows that, for 20 years, only 28% of respondents confirmed they have an effective measurement system. It seems startling because; "we know that; what gets measured, gets done". (Bridgesconsultancy, 2020). The result found as well that, some leaders possessed some skills, however, they lacked the knowledge disciplined, or guided means to implement strategy successfully. They surprisingly "continue to repeat past mistakes". (Bridgesconsultancy, 2020). Evidently, without the right measurement, the ability to instruct correct research plan, evaluate, interpret, or comprehend research; leaders will remain in the status quo.

The section below, present a typical and simple research project, for energy transition. This example could serve as research methodologies sequence, when specifically oriented with advance methodologies. The new leader could use such means of research capability, and peer into energy market by means of acquired strategic advantage; through appropriate research.

4.5. A Case Study: Investigating Strategies Deployed by Leaders

4.5.1. Case Research Design and Methodologies

This section assesses the extent to which major energy companies are transitioning from a fossil fuel-based model to renewable energies with the integrated model. This is a case study, that could serve as beginners' guidelines. The purpose is to evaluate how far companies have transited to clean energies; by their involvement in tangible and continuous processes over the years. Based on their declarations, their mission ought to have boosted the endeavour, or get them "enthused" to move from the oil and gas businesses to renewable energies sectors. Thus, it was expected to see how they have:

- Deployed tangible and intangible assets;
- Supported ways to preserve value for stakeholders;
- Been investing and expanding significantly, large renewables projects;
- Progressed enough, - as per the years -; towards eventual replacement of the extraction and sale of fossil fuel.

The global energy transition objective is a "promised, to be net-zero", meaning, green energy business will progressively replace fossil fuel energy.; at least to a very high percentage.

In measuring and comparing the company's transition activities, this study employs a triple analysis, of three factors; that include: discourse, investments, and strategies. The three factors act as "measurable variables", to determine the company' transition "steps" to clean energies. Data on these variables are captured within 12 years periods of activities, between 2009 and 2020.

4.6. Discourse: Shell PLC, BP, ExxonMobil, and Chevron

Discourse as a variable, involved an examination of the number of times specific keywords appear within strategical outlook data published in the annual reports of these companies:

- Shell plc;
- BP;
- ExxonMobil;
- Chevron;

A survey was conducted to identify any mismatch between discourse, actions, and investment for these major oil companies (BP, Shell plc, and ExxonMobil.) (Shell-Energy-Transition, 2022), (bp-strategic-progress, 2022).

Information collected the International Energy Association shows that all the energy companies are having the same discourses similar as the four mentioned above. Individual evaluation permits to stipulate where each company is. But for the study case we concentrate on the four. (IEA, 2020), (Breetz et al, 2018). The survey was performed by national and international institutions, consultants, energy watch institutions, governmental media, and public media who gave insight on the companies' commitment in carbon reduction, concern on climate changes and overall steps undertaken in transition to clean energies and ecosystem. (IEA, 2021), (Jessop, et al., 2022), (Collet, 2019); (Rachida, 2009). (Vasković, et al., 2015). (Yahaya, 2016).

The frequency of terms and variants counted on stakeholders' perceptions. The discourse or wording translates perceptions impression on fossil fuel company's "normalization" into green energy.

There were four terms identified which included:

- Climate - a clue on climate-related awareness concepts;
- Repair - expecting company to compensate/repair heavily, any damage it causes to environments and individuals;
- Emissions - acknowledging the need to actively reduce its greenhouse gas emissions;
- Transition - which examines the discourse is on resolving/ reducing greenhouse gas emissions;
- Clean energy - which reflected peoples' watch on statements related to investment on decarbonized energies/non-fossil fuel;
- Appreciation – Views on investments makes in green energy value chain developments, activities, and/or strategies;

- Empowering employees - Creating atmosphere that encourages and leads to creativity, and innovation in green energy.

These seven categories represent major essential perspective, deemed necessary for a transition to clean energy by the oil industry. An assumption in the selection of this approach for this variable in this study is that of the frequency of the application of the keywords. It provides a rough proxy for the level of awareness and the degree of importance that these variables bear. However, the study was also mindful of tangible or palpable facts, like accidents against “green environment”, which the companies could also be involved in. (Shell, 2017), (Jessop, et al., 2022), (Rachida, 2009).

Discourse, as one of the variables in this study, is considered a precursor to concrete moves by the company. These include investments and organizational transformation as part of core competencies. We observe these discourses with all the fossil fuel companies. (bp-strategic-progress, 2022), (Shell-Energy-Transition, 2022), (embapro.com, 2021), (totalenergies.com, 2022).

The figure below, shows results of research, analyzing discourses ExxonMobil, Shell plc, and BP, on declaration for energy transition, and the associated keywords. (Mei Li. et al, 2022). It is the same for TotalEnergies, and several other oil and gas giants.

Climate change		Transition		Emissions		Clean energy	
Main terms	**Variants**	**Main terms**	**Variants**	**Main terms**	**Variants**	**Main terms**	**Variants**
1.5 degree*	1.5˚C	carbon + variant	activit*;business*; credit*; cost*; offset*; polic*; pric*; project*; tax*	carbon + variant	abatement; dioxide*; CO2; emission*; footprint; intensity; neutral*; zero-, sink*	alga*	
2 degree*	2˚C; two degree*	decarbon*		ccs/ccus	carbon capture; carbon storage; carbon removal	alternative + variant	fuel, energ*
climate		transition*		energy efficiency	energy efficient	batter*	
dual challenge		sustainab*		flar*		biofuel*	biopower, bioenerg*, biomass
OGCI	Oil and Gas Climate Initiative			fluorinat*		clean* + variant	fuel, energ*
IPCC	Intergovernmental Panel on Climate Change			greenhouse	GHG	electric vehicle	electric mobility; electric transport; EV, charging; charger*
Kyoto				Hydrofluorocarbon*	perfluorocarbon*	electricit*	power*
Paris				sulfur hexafluoride		ethanol	methanol
UNFCCC	United Nations Framework Convention on Climate Change			methane	CH4	geothermal	
warming				net zero	zero net	hydropower	
				N2O	nitrous oxide	hydrogen	
						low* carbon	
						renewable*	
						solar	
						wind	

Note: More comprehensive information on the omitted keywords appears in S1 File.

https://doi.org/10.1371/journal.pone.0263596.t001

Figure 90. Analyzing discourse: Using keywords

The study has used comparative and various data from the Companies' annual reports; from their websites. These are official data and represent main documents delivered to stakeholders and shareholders. At the same time, these are ethical means of data collection. The choice is also related the format which is consistent from year to year and hence is quite suitable for the comparison.

The comparative conclusion shows below, total keyword frequency in annual reports, between 2009 and 2020 is shown below.

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
0.000694	0.0007	0.0006	0.00098	0.00088	0.00077	0.00074869	0.00049	0.00081	0.00131016	0.00141	0.00218

Figure 91. Count of discourses keyword: the Variables

4.6.1. Strategies: Comparing and Contrasting Pledges and Actions

Strategies represent is another important variable in this study. It will be compared from annual strategies deployed by the company for a move to a clean-energy business model. This also involved a survey conducted among the company's employees to understand the strategies that the company has put for a change to clean energy.

In addition to the report from the survey, the study also identified other twenty-five (25) indicators. These are from academic literature that captured the presence of pledges and disclosure. They were therefore labelled as "P&D" and concrete actions labelled "A". Some of the commitments and activities that were identified in this study included:

- Climate-change cognition (CC),
- Business model (BM),
- Emissions reduction (ER), and
- Clean energy investment (CE).

The data relating to this variable was also sourced from the company's annual reports, energy transition reports, and sustainability reports published by the company during the period of study. The figure below, represents indicator of descriptions, pledges of declarants, and real action towards carbon reduction strategies. (Mei Li. et al, 2022).

Category	Sub-category	Indicator	Type	Basis in literature
Climate change cognition	Awareness of climate change	CC1. Does the major acknowledge the scientific evidence of anthropogenic climate change (e.g. the link between human activities or fossil fuels and climate change, and potential risks or dangers of climate change etc.)?	P&D	[50, 52]
		CC2. Does the major affirm the need for itself or society to shift away from or reduce dependence on all types of non-sequestered fossil fuels to mitigate climate change?	A	
	Participation in international framework	CC3. Has the major joined the Oil and Gas Climate Initiative (OGCI)?	A	[31, 43]
	Disclosing climate risk	CC4. Does the major disclose regulatory risks related to climate change on their business or products?	P&D	[23]
		CC5. Does the major disclose market and other indirect risks and opportunities due to increasing climate concerns (e.g. reduction of market returns, shifts in consumer preferences, competition from renewables and transport electrification etc.)?	P&D	
Business model	Transition strategy	BM1. Has the major pledged to shift their assets and product portfolio to carbon-free energy in the long-term (in the next few decades)?	P&D	[19, 54, 59, 65]
		BM2. Has a step-by-step strategy been formulated to achieve this?	A	
	Fossil fuel production	BM3. Does the major pledge to reduce the production of all non-sequestered fossil fuels annually due to climate concerns?	P&D	[57, 58, 66]
		BM4. Has the major reduced the production volume of all non-sequestered fossil fuels in a given single or multi-year period due to climate concerns?	A	
	Fossil fuel exploration	BM5. Does the major pledge to reduce their exploration of fossil fuels due to climate concerns?	P&D	[41, 46, 55]
		BM6. Has the major reduced the exploration or estimates of fossil fuel reserves under holding because of climate concerns?	A	
	Workforce reallocation	BM7. Does the major pledge to reallocate the labor force to low-carbon businesses?	P&D	[51]
		BM8. Has a step-by-step strategy been formulated to achieve this?	A	
	Carbon price	BM9. Does the major state support for carbon pricing policies by governments (e.g., taxes or emissions trading, etc.) to mitigate climate change and promote clean energy?	P&D	[56, 64, 67, 68]
		BM10. Has the major employed a carbon price or tax into their internal investment decisions?	A	
Emissions reduction	Carbon emissions	ER1. Does the major pledge a long-term goal to reach net-zero carbon or GHG emissions on an absolute basis by the year 2050 or sooner, at least for scope 1 and scope 2 emissions?	P&D	[4, 21, 38, 40, 42, 46, 60, 67, 69]
		ER2. Has a concrete strategy been formulated to achieve this (e.g. an integrated series of steps or more specific targets)?	A	
	Scope 3 emissions	ER3. Does the major pledge to reduce scope 3 emissions?	P&D	[4, 21, 62, 63]
		ER4. Has a concrete strategy been formulated to achieve this (e.g. an integrated series of steps or more specific targets)?	A	
	Methane emissions	ER5. Does the major pledge to reduce methane emissions, on an absolute or intensity basis, for the following years?	P&D	[4, 48]
		ER6. Has a concrete strategy been formulated to achieve this (e.g. an integrated series of steps or more specific targets)?	A	
	Emissions disclosure	ER7. Does the major disclose all three scope GHG emissions annually?	P&D	[23, 41]
Clean Energy	Clean energy investment	CE1. Does the major publicly disclose the total annual investment volume in clean energy (e.g. clean fuels or electricity production, R&D, etc.)?	A	[31, 39, 70]
		CE2. Does the major pledge to allocate a specific portion (at least 1%) of their annual capex or investments to clean energy technologies (e.g. clean energy production, carbon capture and storage etc.)?	P&D	[4, 46, 60]
		CE3. Has the major allocated at least 1% of their annual capex or investments to clean energy technologies (e.g. clean energy production, carbon capture and storage etc.)?	A	

Note: P&D indicates pledges and disclosure; A indicates actions.

https://doi.org/10.1371/journal.pone.0263596.t002

Figure 92. Pledges and real actions for carbon reduction.

The actions of respective companies were evaluated through a quantitative research data that was based on numerical scoring; and as follows;

i. "+1" represents the pledges and actions focused on implementing and reinforcing a strategy in that year.
ii. "-1" represents the company's pledges and actions which are an impediment or a contradiction to the company's commitment that year.

iii. “0” represented the lack of evidence on the pledges and actions taken by the company in either direction.

The actions of ALL the companies’ yearly metrics were tallied; covering 12 years. And an average of scores is shown in the Figure below. (Mei Li. et al, 2022).

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
-4	-4	-2	-2	-1	-2	0	-1	1	4	0	4

Figure 93. actions based scores.

4.6.2. Investment: Link with Earnings, Productions and Expenditure

Investment is the third variable, and it involves an analysis of data collected on the company's financial performance over the period of study.

This analysis tracks annual economic activity changes in the company in the following six areas:

i) CAPEX for fossil fuel upstream related businesses such as oil and gas.
   - Activities at this level include exploration, production, storage, processing, and midstream transportation, as well as oil and gas marketing and trading. Offshore and onshore. And volumes of Fossil Fuel Production.

ii) Associated Financial Gains/Earnings.

iii) Downstream Sales.

iv) Estimates of Fossil Fuel Reserve.

v) CAPEX in the Production/Development in Technologies IN Clean Energy.

Setting 2009 as the baseline, the combined annual oil and gas production has been converted to an incremental percentage to minimize the influence of price fluctuation in fossil fuels. Figure below depicts the results. (Mei Li. et al, 2022).

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
104.28%	92.92%	92.16%	90.87%	97.13%	87.80%	-42.75%	510.46%	88.64%	89.83%	88.10%	43.89%

Figure 94. Investment, as the third variable

4.6.3. The Multiple Linear Regression Model

This study employed a multiple linear regression model to check on the effect of discourse, strategies, and investments on the transition to green energies by these companies. Transition is hence the dependent variable, while discourse, strategies and investments are the independent variables. The formula below is simply to give an idea of model's calculation process. (Mei Li. et al, 2022). Thus:

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \epsilon$$

Where;

$y_i = dependent\ variable\ (Transition)$

$x_i = explanatory\ variables\ (discourse, strategies\ and\ investment)$

$\beta_0 = y - intercept\ (constant\ term)$

$\beta_i = slope\ coefficients\ for\ each\ explanatory\ variable$

$\epsilon = the\ error\ term\ in\ the\ model(residual);$

$normally\ distributed\ with\ mean\ of\ 0\ and\ variance\ \sigma^2 (\sim N(0, \sigma^2)$

4.6.4. Hypothesis Testing

H_0 $discourse,\ \ strategies\ and\ investement\ predict\ the\ transition,$ to cleaner energies.

$H_{a=}$ $discourse, strategies\ and\ investement$ do not$predict\ the\ transition,$ to cleaner energies.

Quantitative data on the three variables were extracted, transformed, and loaded for analysis, using (The Base) SPSS and; the results presented in the Figure below.

	Discourse	Strategies	Investment
2009	0.0006938	-4	1.0428
2010	0.0007083	-4	0.9292
2011	0.0005666	-2	0.9216
2012	0.0009746	-2	0.9087
2013	0.0008839	-1	0.9713
2014	0.0007735	-2	0.878
2015	0.0007487	0	-0.4275
2016	0.000493	-1	5.1046
2017	0.000493	1	0.8864
2018	0.0013102	4	0.8983
2019	0.0014055	0	0.881
2020	0.0021823	4	0.4389

Figure 95. Discourse Strategies & investments.

4.6.5. Insight on Variables for Research

The figure below, is simple for information; a screen on computer aided analysis values; entering variables into models' processing. (Mei Li. et al, 2022).

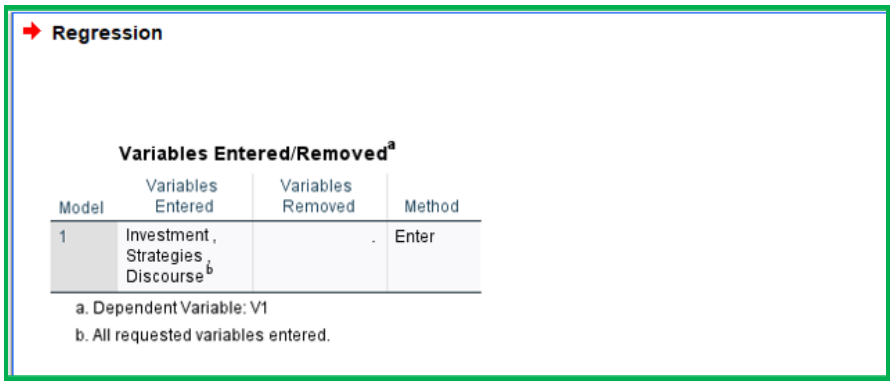


Figure 96. For information: entering variables.

4.6.6. The Model Summary

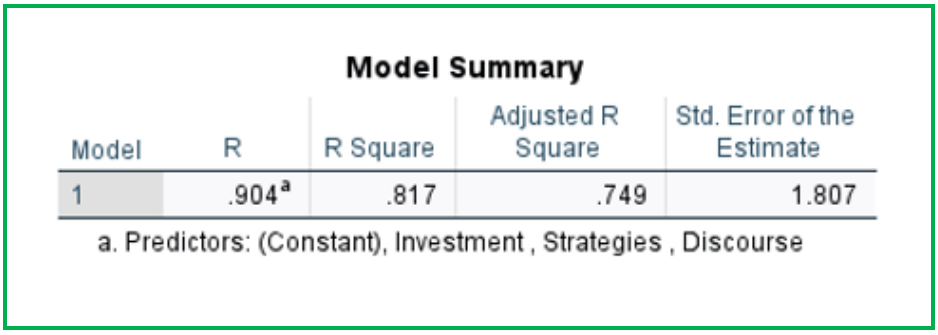


Figure 97. Model summary.

The model summary in the figure above, helps us determine how well the regression model fits the data. The multiple correlation coefficient R = 0.904 indicates a good prediction level. The coefficient of determination gives the proportion of variance in the dependent variable. Transition to cleaner energies, tied to discourses, strategies, and investment covers the independent variables. (Mei Li. et al, 2022).

From above, 81.7% of the variability in transition to cleaner energies is collectively explained by discourse, strategy, and investment.

4.6.7. Statistical Significance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	116.866	3	38.955	11.925	.003[b]
	Residual	26.134	8	3.267		
	Total	143.000	11			

a. Dependent Variable: V1

b. Predictors: (Constant), Investment , Strategies , Discourse

Figure 98. Anova & statistical significance

Using the F-ratio in the ANOVA as in figure above, to test whether the overall regression model is a good fit for the data. From the results above, we can see that discourse, strategies, and investment as the independent variables, are statistically significant in predicting the transition to cleaner energies of the companies: e.g., $F(3, 95) = 11.925, p < 0.05$. Meaning that the regression model is a good fit of the data coefficient chart presented below. (Mei Li. et al, 2022).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2013.599	1.875		1074.054	<.001	2009.276	2017.923
	Discourse	1029.073	1581.121	.139	.651	.533	-2617.000	4675.145
	Strategies	1.130	.283	.818	3.990	.004	.477	1.783
	Investment	.533	.438	.195	1.215	.259	-.478	1.544

a. Dependent Variable: V1

Figure 99. coefficient chart

4.6.8. Estimated Model Coefficients

From the coefficient results in the figure above, the general form of the equation to predict the transition to cleaner energies in the company is as given below:

$$y_i(Transition = 2013.599 + 1029.073x_1(discourse) + 1.130x_2(strategies) + 0.533x_3 + \epsilon$$

From the results in the equation above, we get to see that discourse = 1029.073 meaning that for an increase in discourse every year, there is an increase in transition. The same is true for strategies and investment. We also check for the statistical significance of each of the independent variables which tests whether the coefficients in the population are equal to 0. From the Figure above in the "Sig." column with a $p < 0.05$ we can see that strategies and investment are statistically significantly different to 0 as per discourse variable. (Mei Li. et al, 2022). From the above results, we can conclude that discourse, strategies, and investment statistically significantly predicted the transition by, the three European energies majors to cleaner energies:

$(F(3, 95) = 11.925, p < 0.05, R^2 = 0.817.$

4.6.9. Qualitative Research: Complementary to Quantitative

The reason for using qualitative research is that it helps reveal the potential problems and challenges experienced when executing a task. (Janis et al., 2020). Besides, it was possible to review more than 15 years annual reports; covering about eight giants in energy, oil and gas organizations: for this research report. For instance, complementary ethnographic approach used in this study involved distributing open-ended surveys to TotalEnergies employees across France in all their offices. The in-depth interviews helped to gather in detail, their experiences, and perspectives about the transition to cleaner energies. This helped each to company to ascertain the point of view of their respective employees. (Janis et al., 2020). Ethical aspect is crucial in qualitative research; when research is conducted with the participants who desire to be anonymous.

4.6.10. Associated Qualitative Research

A complementary qualitative approach with wide public will make it possible to reach other people concerned in the areas where these companies operate. They could include shareholders, subcontractors, and equipment manufacturers, etc. When these people are involved in gathering data, they will share their attitudes, observations, experiences, and perspectives about the company's transition to cleaner energies. Such method provides a variety of sources and complementary responses for the research. (IEA, 2020), (Mei Li. et al, 2022).

4.7. Choice and Types of Respondents in Data Collection

The choice of the type of respondents in this study was a critical factor to consider considering the need for the safety of the employees in the company. Since the study involved a specific issue relating to the company's steps in addressing carbon emissions, there was a need to identify the right kind of staff that would provide relevant information to the company. Specific members of the companies are able to provide the best information about some issues, or incidents. (Miller, 2019). These involved managers, departmental heads, and other employees willing and ready to share their views about the sensitive subjects.

Societal leaders and other institutional leaders, such as those concerned with environmental safety, also gave their opinions. This helped to get an overall picture of the commitment of the company for transition to cleaner energy. A target of 100 respondents were involved in this study, and 50 respondents who shared their knowledge about the moves taken by the company in recent years are presented. The data "captured", included therefore company reports and several energies related articles reported through the international energy association-; and these permitted to analyze the case over twelve years period. (IEA, 2020), (Mei Li. et al, 2022).

4.8. Ethical Issues During Research Data Gathering

First of all, before conducting the survey, participants needed to be informed of their personal decision; their own choice of consent. To make sure that they willingly agree to participate in the study; and knew what would happen to the responses.

Secondly, there was a need to ensure that the participants were promised/guaranteed of confidentiality, and these were respected; during and after the study (Fisher, 2020). This was especially in respect to personal data; to ensure they were safely handled and stored without any breach.

Some employees needed assurance of anonymity while sharing their views about the company. A leader instructing researching through qualitative methods, needs to ensure that "personally identifiable" information about any employees is properly segregated from survey answers; to ensure anonymity. On the other hand, qualitative data are ethical obtained from documents published by the companies themselves. This has been "transmitted", deposited online, on company's website for consultation, by stakeholders and public.

The principle involved in research data collection methods and ethical requirements, is as described by Cooper and Schindler, depicted in the figure below (Cooper & Schindler, 2014).

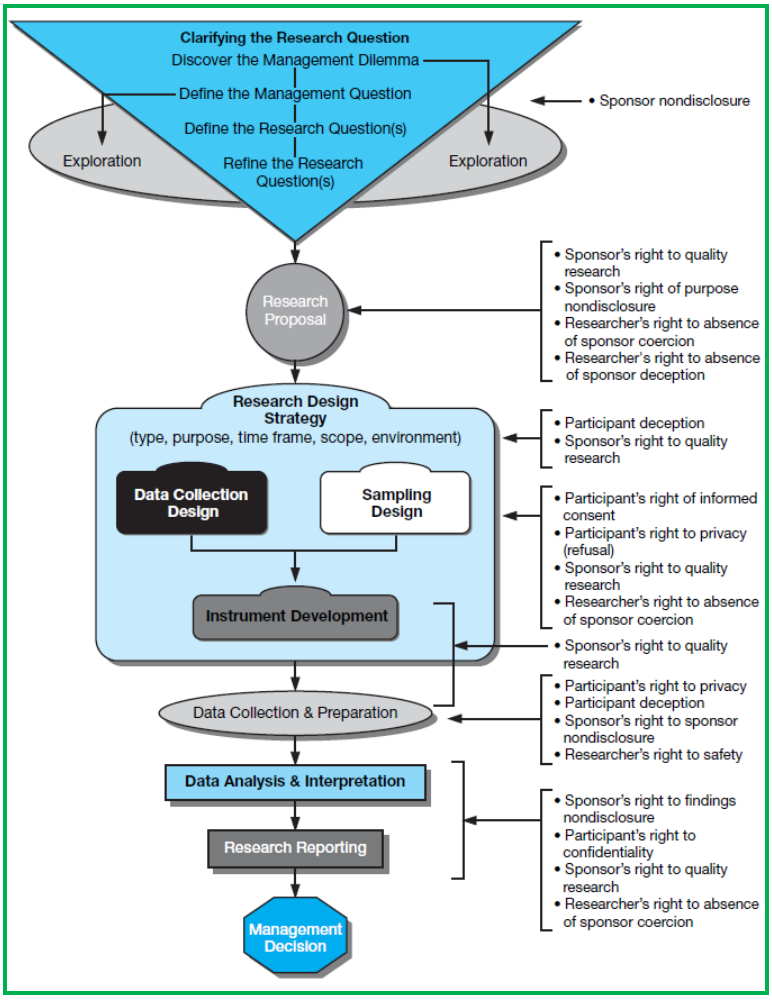


Figure 100. Ethics in research process.

As per figure above, data sourcing for research; either through qualitative, or quantitative methods, poses several constraints. The principal being the ethical requirement. “Ethics is generally defined as “norms” or standards of behavior that guide moral choices about our behavior and our relationships with others. Ethics are delicate because it is somehow different from established rules and constraints. The latter is generally an accepted standards have defined penalties that are universally enforced. For business endeavour leaders in research work need to consider this aspect: as very critical.
Coopers and Schindler delineate the goal of ethics in research; as to ensure that no one is harmed, or suffers adverse consequences from research activities.

The conclusion is as follows:
“As research should be with several and balanced ethical considerations to:

- Protect the rights of the participant or subject;
- Ensure the sponsor receives ethically conducted and reported research;
- Follow ethical standards when designing research;
- Protect the safety of the researcher and team;
- Ensure the research team adhere to ethical principles.

Coopers and Schindler stated: “In general, research must be designed so that a participant does not suffer physical harm, discomfort, pain, embarrassment, or loss of privacy”. There are also the ethical concerns in sourcing, storing, and analyzing of data in research.

4.9. Collecting Information: Analyzing and Coding.

As shown in the figure above, from Cooper & Schindler; specific ethical and sequential steps are required when sourcing from companies’ data. This includes company’s reports on cleaner energy transition. (Cooper & Schindler, 2014). And this reflects transition efforts that each company is making towards a business model based on green-energy business.

4.9.1. An Explanation of the Findings and the Insights Gained from the Analyses

Graph representing the number of Discourses since 2009-2020

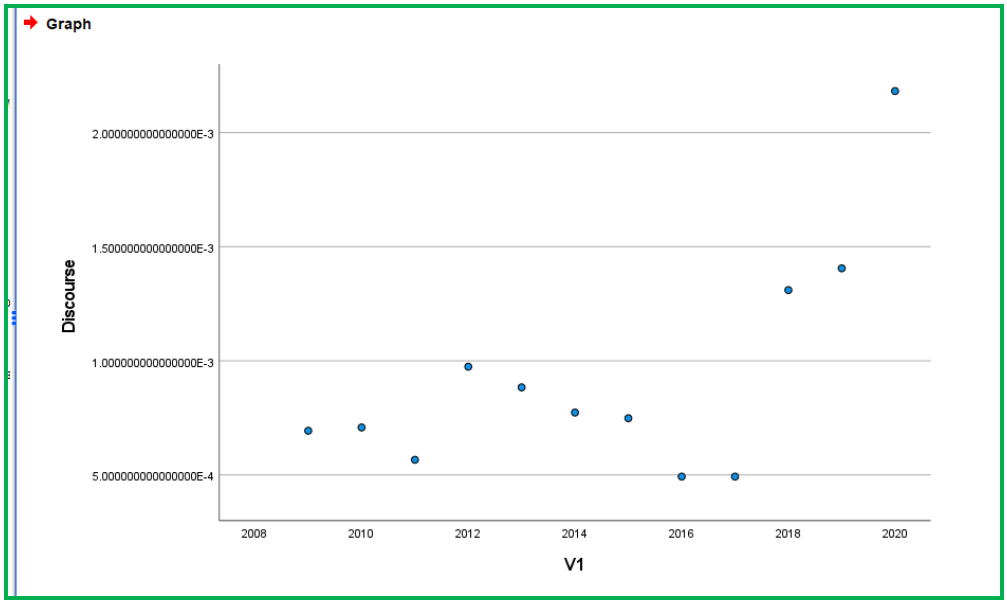


Figure 101. Insights on declarations

The graph above shows that the number of discourses pronounced since 2018. The variations, higher in (2012, 2018-2020), constitute indications that the companies are aware of the need to reduce carbon emissions; by transitioning to cleaner energy. The discrete increase in discourse analysis is based on the keywords related to clean energy and climate change found in the companies' annual reports. The graph below represents the number of strategies the companies have employed since 2009-2020

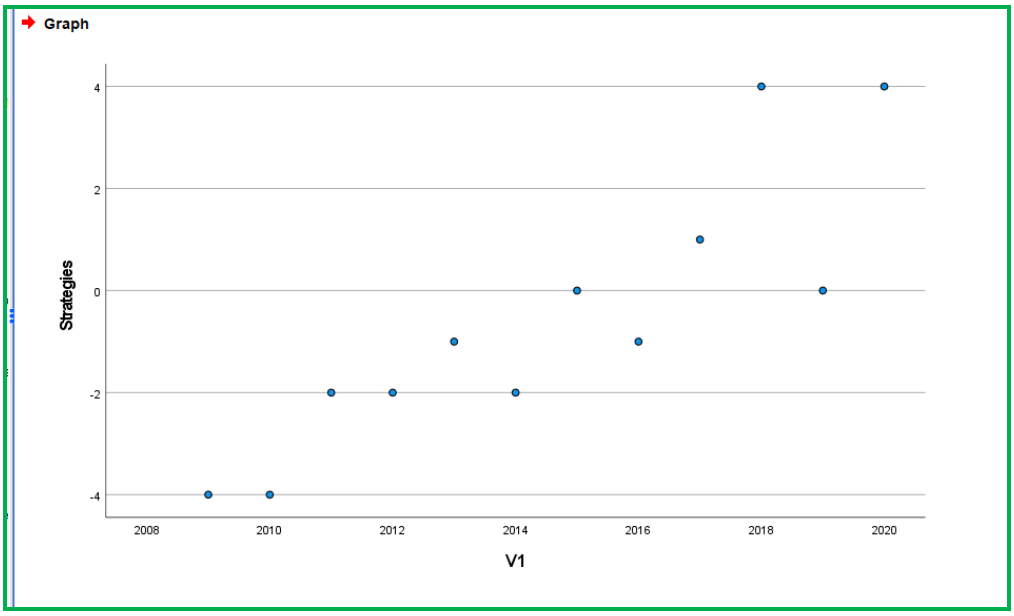


Figure 102. How many strategies used?

The graph above demonstrates that the companies have been employing various strategies for transitioning to a cleaner-energy model. The number has also been upward, as seen in the graph above.

The graph below, represents the number of investments the companies have been deploying, from 2009-2020

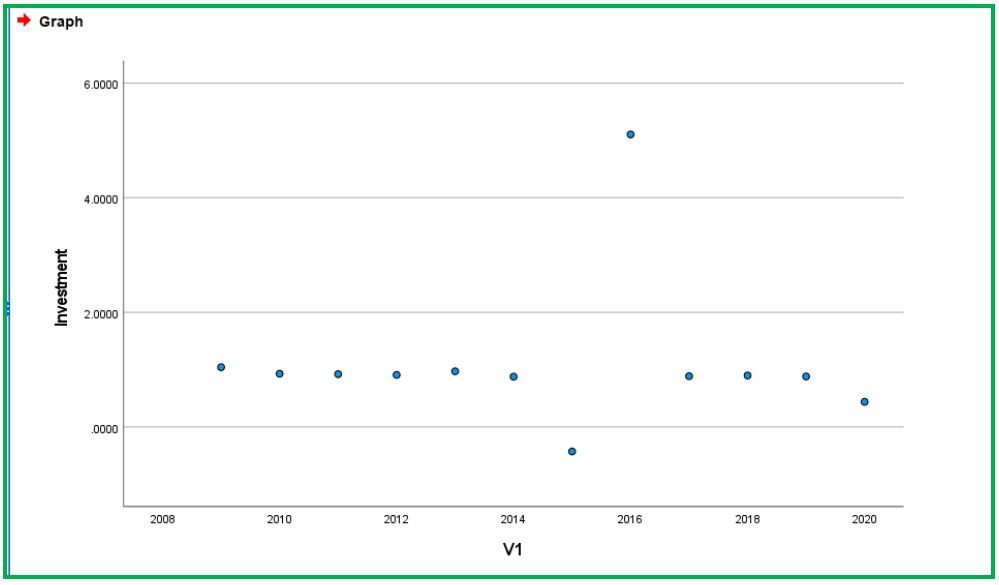


Figure 103. investments trends

As shown in this graph, the number of investments by the companies during the period studied; exhibits a downtrend, especially since 2018. This reflects the real intention of the company as far as transitioning to cleaner energies is concerned. The graph, however,

indicates that the company invested highly in 2016, which could be attributed to the impact of the Paris agreement signed on December 12, 2015 (Seo, 2017). The agreement set long-term goals for all nations to reduce greenhouse gas emissions and limit gas temperatures to below 2 or 1.5 degrees.

The upward move in investment by the companies in 2016 and then a sudden drop in subsequent years. This indicated the level of the companies' disinterest in pursuing cleaner-energy models. However, from 2019/20, several of these companies have proposed, invested, made vertical acquisition in the green energy; as seen in the graph as sudden uptrend: and these trend needs further and deep investigations.

The impact of war in Ukraine and the embargoes, will certainly change the curve for the next two to five years. Future studies and analysis will permit to identify what progress was made, and who accomplished that. A leader aware of the situation may take this as an incentive, and therefore investigate the trend for possible business venture, at the right time.

The above energy market context provides important opportunities to performed future research. The reassessment of the situation will help to re-define, or re-assess what investments are made towards infrastructures for “clean energy”. Such research may help to refine the indicators mentioned above about energy transition activity and developments. These will also be done through an updated quantitative data, as well as a well-spread “timeline” qualitative data.

4.10. Limitations of the Data Sourcing and Associated Methods.

One of the limitations of the qualitative methodology used by the energy institution for their study is the number of samples used. Data captured represents yearly information, providing data for twelve entries from 2009 to 2020. The second limitation concerns the complementary and associated respondents. To be noted that; those who were required to participate in the study, voluntarily accepted to participate. However, there is always a possible factor of data being biased.

Business investigation instructed by a leader, for the organization’s entrance into energy transition, should take all these factors into account. These will include planning, supervising, and monitoring of the research activities. in planning and/or supervising the

research activities. Evidently, qualitative aspect of a research is time-consuming; therefore, leaders' strategic investigations should be well structured and spread through timeline in accordance with business strategic or tactical moves. Unlike the quantitative aspects, this will be geared toward creating a complete and detailed description of observation of the market, competitor actions, and "peoples" perceptions. (Macdonald et al., 2008, p. 9).

4.11. Theoretical Solution – Comparing to "Real Market" Situations

Changes in technology are likely to cause people to experience both worrying and hopeful situations, due to uncertainties. Therefore, such situations require systematic management, which has to be incorporated within the life process of individuals affected by the program. Theoretical solution could be per the Engagement and Technology Integration Framework. Therefore, technological integration has to be discussed at the micro level of the company. (Yilmaz, 2021). During technology integration, it is crucial for the organisations to manage the phases of integration systematically, while focusing on how the integration procedure and sequences will impact the life of the individual. "Science and technology are essential ingredients of modern life. They transcend local boundaries and touches lives of everyone.

Thus, change related to this, is usually in the material environment and the adjustment that we make with these changes is often in relation to local customs and social institutions. And the research takes his into consideration. (Sociologyguide, 2022). The process of integration is implemented at the basic and intermediate levels, in line with "allocated budget" for the integration scheme. This is crucial, because as Andrea Loubier puts it: "Though technological advancements are generally seen as a positive change, some people perceive them in a negative light. And this could affect the result of a research work. (Loubier, 2021). In the context of energy "related" technological integration, the process "imposes" a change in people's habits, secular work choices preferences, transportation, communication, place of dwelling, ideas, values, recreational activities, displacements of land for farm owners, and residences allotments, etc. In a culture like that of France, this can create local/social upheavals, even though same people claim to adhere to renewable energy position. (financialtimes, 2021).

4.12. Literature Review as a Watchdog: Associated Benefits

Another aspect of business research enquiry is using literatures review, as a guide, a sort of “watchdog”, same as in digital technology functionalities. The principle behind is that, through observation, it is possible to obtain detailed records and information. The review will as such provide an alarm; as if a signal to inform of any misalignment from trajectory; or perhaps indication, any possible loop holes. This aspect is very important; when it concerns a company that has been operating within the fossil fuel energies for decades. Because the tendency is usually to dwell in the comfort zone, or the status quo system of thinking and operating.

4.12.1. Epistemological and Ontological Assumption and Its Impact

The concept of epistemology and ontology are the research paradigm, which suggests that the research enquiry is based on the truth; and goes with the reality that some investigators may discover later on. (Antwi and Hamza, 2015). Ontology and epistemology are two major ways of thinking about research philosophy. They contain important differences which will influence the way in which we proceed or “think” about the research process. (Saunders, et al., 2009).

Leaders need to be aware of the impacts of such theories related to market “real life”; as compared to previous experience, in classical energy sectors. The “happenings”, or changing aspects of the market, impacts the reliability and validity of data/information to conduct the research. In business strategies, data accuracy and reports on factual occurrences are mostly reported publicly. This shows why leaders need to understand how accurate and how real the information is: before proceeding to publish; or before using such published data.

4.13. Practical Aspects of Epistemological and Ontological Axiology

Interestingly, it said that, in research:

- "**Epistemology:**
  - focus is on knowledge and certainty; concerns are about what constitutes acceptable knowledge in a field of study".

- "**Ontology:**
  - focus is on relation to the human factor".

Both of these are to be connected with:

- "**Axiology**:
  - Concerns the study of values, and it applies especially to ethics", quality factors required in research". (Saunders, et al., 2009):

In a business research strategy for expansion, innovation, or global deployment, understanding these factors can help reduce potential risks and errors. Leaders, no matter their perspectives or involvement in strategic business research, can gain a vantage point, with these understanding; as they scrutinize the market.

To quote Paula Leach; Leaders need to investigate:

i) **<u>From "high above"</u> –**
   - A typical vantage point of a leader, having information such as data or attending meetings, where information is shared, about how teams and activities are delivering together. (Leach, 2021).

ii) From **"high out and beyond** "–
   - "Where they take a vantage point that ensures they are gathering observations, learning and obtaining information from wider teams, competitors, industry etc".
   - Gaining an external view, gathering new innovative thinking, testing the market.
   - "Therefore, able to maintain professional curiosity", (Leach, 2021).

iii) Lastly **“Inside- “**

- This is associated with discerning intrinsic danger that tends to “undervalue intuition and experience, in favor of hard facts and data”. (Leach, 2021).

Consequently, there is a relationship between ontology, epistemology, methodology, and sources of information for research activities. Epistemology, and ontology represent then the spectrum covered by the research. The research foundation and steps, once chosen by the researchers, will go with a methodology that permits to harmonize, or adhere to the planned sequences. Unless for reasons of an important circumstantial adjustment, or justified improvement, the original planned sequences will be carried through. Therefore, ontological, and epistemological positions are interrelated, they simply denote how “extensive” and how “good” a research activity is performed.

4.14. Understanding The Impact and Importance of Research

Understanding the process and results of research is crucial. It is the way gain insight or knowledge about a general or specific cause and the resultant effects. In the case here, it relates to events pertaining to chosen market of investigation. This is indispensable if a leader “desires” to enter a new sector of energy transition. Especially if is only from the traditional business sector. Our experience confirms this; when we entered into the energy business of large-Scale offshore wind Farm Power System development, innovation, and Tendering projects. It took more than a decade for French National Department of Renewable Energy, l’ADEME. The national agency, decided to be “factually” aware of the determinants involved in this new area of operation. And later on, the globally recognized Electrical power and energy company, EDF (Electricity of France Global), deployed huge investments. It took about 10 years; before EDF engaged significantly in their first campaign in a large-scale offshore Wind Energy, and even more time, before engaging in installation in the offshore wind Energy campaign.

With understanding, a leader may instruct research to discern the major problems faced by the organisation within this new energy sector; in terms of technology integration and other factors. Understanding the problems will “arm” the leader and the organization, to come up with mitigation strategies and innovative ideas. Thus, within this new sector of energy transition, an organization will be able to tackle or identified well in advance obstacles and

problems, encountered by the pioneers in the sector- simply through well guided quantitative research. It is considered that, the above assessment on research has illustrated how leaders; an executive, experienced or a novice, can help themselves, “sail” reasonably safe through the new energy business problems. These concern technological integration, led by the combination of research and proven theoretical solutions. Such composite leadership tools will help to identify problems, and also fill the knowledge gap for business in the renewable energy. In turn, such skills will provide benefits or market gain for the organization.

4.15. Research Philosophies: Their Influence On Data Collection Process

Research philosophies are crucial because these permit to see all assumptions about the research and choices applied to the research purpose, methodology, and research design. It becomes easier to get “balanced” in philosophical stance plus the potential challenges during the process of data collection methodology”: and will provide clear comprehension of findings about any lacking. (Bashir, 2017). In addition to this, the choice of research methodology is often susceptible to the philosophical assumptions of the investigators. This is because the perspective of research philosophy describes company’s culture, leaders, experience, and maturity. This on the other hand reveals, or unveils the nature of applied science required, while producing new knowledge into the organization’s core competence.

In accordance with target objective energy sector, a single or a mixed methods of research methodologies could be used; combining both qualitative and quantitative data collection techniques and analysis procedures. The research methods and objectives with all its variable, could employ the “Onion” model, described here below. In accordance with complexity, the metaphoric “Research Onion” proposed by Sander and others, is an ultimate guide to attain a higher quality research sequence. The figure below shows the Onion slice methods. (Saunders, et al., 2009).

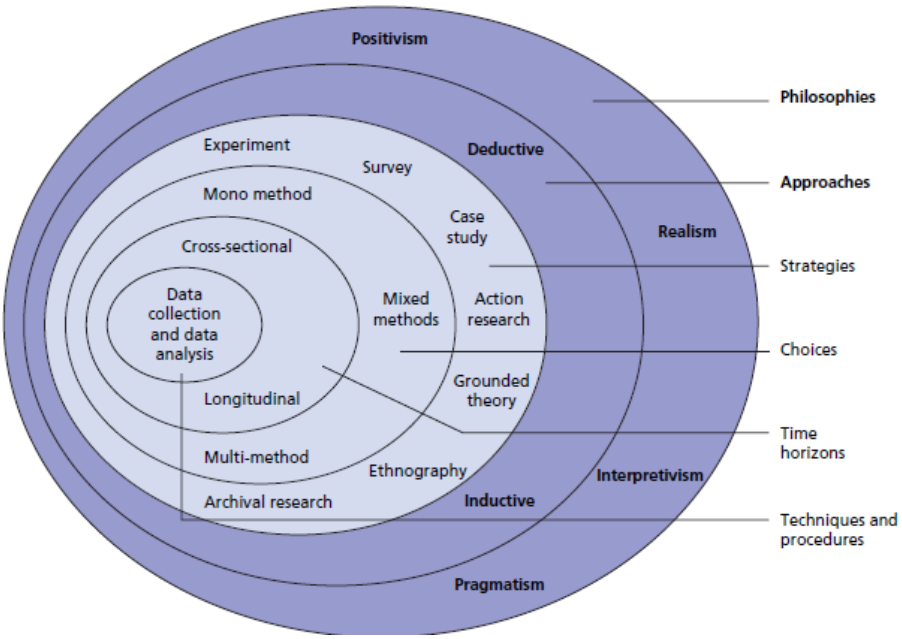


Figure 104. Research "onion".

We see qualities required at outside section of the onion slice. These covers: philosophies, strategies, choices, time horizons, and techniques associated with procedures. Passing through deductive to inductive process, one is guided through the different methods to arrive at a substantial and superior process of data collection for analysis. Any leader, who is aware of the principles enumerated in this research model; and the relation with business strategy, may gain insight to deploy successful business enquiries.

4.16. Scaling of the Obstacles (or Problems), Inherent to Energy Transition – with Typical Case

Technology integration is one of the significant challenges faced by the energy transition business. This obstacle could be mitigated by means of appropriate investments, research, and development. The primary concerns with the integration of innovative technologies for the production of renewable energy, is the level of "dispersed" existing energy "sources"; as compared to current operational infrastructures of the different organisations. In order to match the power demand, exiting structures for power system interconnection need a complete overhaul. This is a major challenge faced by organisations in Australia; as an example, due to the country's enormous size, and the widely dispersed renewable energies sources. Several countries are facing similar renewable energies sources dispersion; combined with inadequate electrical power

transmissions interconnection structures. This is a major obstacle; difficult to scale and solve; frequently encountered during a global energy transition project. However, determined strategic leadership, with well-defined management and resources could overcome this obstacle. It is to be noted that, in such dispersed areas; the foremost incentive, or a strong motivating factor, is the gaining of a definite market competitive edge.

New entrances to such area for business development will be limited, by the “repulsive” market environment. Therefore, this may worth, a calculated risk. These challenges can be allayed through sector to sector “scanning” to permit a “tailored” innovation developments in technologies. Then, to consider various factors; such as the range of applications, costs, maturity, expertise, and explicit technologies preferences of the organisations. (Sinsel, et al., 2020) Australia's energy transformation is “ramping up”, but there are major challenges ahead. (ABC-News, 2022). Only business related strategically “brave” procedures and actions” can succeed! The “100% Renewables” an Australian national consultancy, specialist in net zero carbon neutral and climate positive strategies; presented some facts about the situation on the continent. In the article; “the Barriers for the uptake of renewables in Australia: They listed the following points, as a global obstacle.” (Albert, 2020).

1) Major barriers for renewables at the Electrical Grid-level
    - Investment;
    - Uncertainty;
    - Connection and transmission issues;
    - Lack of transmission infrastructure.

2) Major barriers for renewables at a community level
    - Capital cost;
    - Pricing signals;
    - Priorities;
    - Renters versus owners.

These are among the obstacles, which comparing to global “situations” and cases may require a deep analysis: financially and technically. The goal is to elucidate possible solutions for easier advancement in energy transition objectives.

Therefore, the investment in integrating renewable energy technologies, has been one of the major problems faced by the organisations within the power industry. Then follows the challenge of transmission stability in terms of the power system supply. The obstacle resulting from the huge distances in Australia, concerns power generation, transmission, distributions, down to utilization or consumers' level. These constitute an exceptionally complex mesh of power systems operation. Such a network requires strict coordination of dispatching methods, between the different Transmission System Operators (TSO); as it is currently done in western Europe. Another aspect is the difficulties in integration(interconnection) of the green energies generated into the power Grid. Australian energy site "reneweconomy" reports that: "Australia's complex mesh of electricity grid connection, congestion and system strength issues is quickly becoming a major barrier to the next big wave of renewable energy investment, a panel of industry insiders has warned". (Vorrath, 2020).

4.17. Depth of Obstacle In Energy Transition

The above-mentioned obstacles require a planned or definite solution, if any organization wish to benefit from the abundant energy resource in a global area like Australia. The incentives include abundant renewable energies that could be produced in this area alone: in thousands of Gigawatts. Nevertheless, there is a structural requirement in the form of power transmission means to transport the huge power to end users. Therefore, the success of all programs for carbon reduction, renewable energy programs and objectives, depends on this. This will be viable, if only, the energy produced is conveyed to the populations or industries for utilizations. Globally, power system expert and researchers will corroborate on the major issues in the energy sector, as being:

- Designing of infrastructures for a strong and reliable electricity system
- Market "terminal" that will support/" evacuate" the energy transition,
- Along with sustained or consistent investment (Rainey and Sise, 2018).

According to Australian Clean Energy council (CEC): in early 2020, the CEC and the Australian Energy Market Operator (AEMO) brought together CEC members. These network service providers and other industry stakeholders formed ''the Connections Reform''; with the initiative to address concerns on the following:

- The delays on connection procedures, and

- Increasing complexity in connections.

The roadmap provides 11 recommendations to improve the grid connection process. These covers: across access standards, information and modelling, batching, and investment constraints. All of which will help to speed up the connection process is expected to:

- Lower the cost of connection,
- Improve hosting capacity and system strength,
    - Allow for firmer connection process within “specified time limits”, (clean energy, 2022).

However, this same problem existed in 2011, when the concern was still considered as; “The barriers to renewable energy in Australia”. (Courtice, 2011). The progress Australia is making these days, could be study case for a new entrant, - going into a similar global zone of similar concern. It will be worthwhile to scan the results data of the energy contingency analysis. And isolate all the factors; -the “energy process and system gap” that were discovered-, for Australia. This could be used as a reference, for international business positionings in renewable energy sector; thus, providing insight for future research.

4.18. Conclusion on the Benefit of Further Survey

The survey performed above revealed that, the companies have repeatedly asserted to be committed to carbon reducing, by gradually transitioning to cleaner energies. Most (not all), of their actions are coherent with the declarations. Figures from public or international institutions like IEA are published in reports. These are about the present and future programs of these companies; as above mentioned. The findings in this research support the company's claim to be involved in transitioning to cleaner energies, - to some extent. Generally, their statement on this is not merely empty words. It is noted, however that, although huge investments have been made by the companies, a lot of the discourses, and declarations are related to “future realization”. “Not yet accomplished”. This area of mismatch between words, actions and investments incites “caution. It therefore, suggests extra evaluation to discern the factors that are inciting these companies to discourse so much about the energy transition. And why the gap.

Extra research studies are required to ascertain the percentage of “already realized”, operational energy transition projects globally; and the obstacles such organizations had overcome, and how they managed these. This will, as well permit to alleviate the fear that the green energy discourses and pledges; made the energy giants, are simply means to diverge pressure from society and regulating institutions.

5. Chapter 5. Role of Corporate Governance for Energy Transition: of Top-Leaders

5.1 Global Natural Resources: Incentive and Obstacles

A renewable energy source is sustainable, because it does not deplete quickly, but last for billions of years; as is the case of the sun, geothermal, and wind. These energy sources are spread throughout the globe. In some areas, these sources are abundant; whilst very scare in other zones of the globe. However, several leaders and their companies that are now in the energy market, operated within sectors with little or no renewables activities. Therefore, these companies will need to venture to global sites for the energy business. Thus, transiting into the use of these sources, for sustainable and enhanced diversify energy supply, implies moving to such worldwide localities. And each area, countries, and rural areas, have their inherent particularities. As such, in order to create new business opportunities in these places, company leaders need to learn to adroitly adapt themselves to local characteristics. This implies that, from a company's original operating methodologies or strategies, leaders will adjust to:

- Methods of trade,
- Infrastructures,
- Services,
- Governance,
- Processes,
- Investments tactics,
- Marketing procedures, and
- Intellectual properties deployment.

The above points are the basic requirements for accommodating or adapting to the specific or individual global sector. The leaders will tactically deploy their assets, through an established subsidiaries in different localities and cultures. Consequently, their business activities will be legislated by varied market laws and regulations. Therefore, it is crucial that leaders make all the necessary efforts to educate themselves of each particularity, or peculiarities of the areas, of intended for business operation.

5.2 Impacts Of Globalization on Business Organizations.

5.2.1 Assessment of Factors Related to Globalized Business

Globalization has been defined as the free movement of goods, services, and capital; a process which integrates world economies, culture, technology, and governance. (Almadani, 2014). Business globalizations consist of also adapting to:

- Local technology and equipment,
- Working process,
- Local social guidance,
- Culture, and religious influences,
- And environmental considerations.

When entering a global market, a company will develop strategic plans for assessing "safe" and fruitful business tactics. Additionally, there should be means to defuse any negative impressions and take full advantage of opportunities from the new business milieu. However, in globalization, each new entrant needs to analyze the other side of the coin. The impact on their business entity, as well as local entities. Especially in energy transition, local governmental authorities nowadays have a "wide eye" on all new entrants. The legislators are conscious of the effect and impact a foreign company may have on the locals. Areas concerned may be: economy, business structures, the society, market responses and business developments of native populace. (Almadani, 2014). These factors therefore may engender:

- Increased competition;

- Possible disadvantages in technological development for locals;

- Knowledge/Information transfer;
    - Could have positively or negatively effects on local business entities.

- Portfolio in investment - effects may be that;
    - Locals may be left behind; due to limited financial possibilities;
    - Or this may generate extra jobs opportunities.

- Regulation or deregulation

- Fear that a major international entity may lobby authorities to modify laws;
- And this may be difficult for local companies adjust or adapt.

- Market integration
  - The market may become saturated or;
  - Local entities may find their products and services outdated;
  - Or their products may not be able to satisfy the new expectation of the market.

- Intellectual capital mobility;
  - Depending on the “wealth “of the locality, native business may not be able to compete financially with the international arrival.

5.2.2 Impact of Globalization on Local Businesses: Uber Study Case

The above-mentioned, globalization contingencies and peculiarities had already become an issue in several countries. A case study is that of Uber Technologies Inc; when the company entered global local markets, starting from 2009. The case presented here below, could be an instructive study case for leaders venturing into a global energy transition business. The case is developed in this section, with qualitative research to perceive any possible lessons; whether Do’s or Don’ts. These will help to refine strategies on development; or at least, to refine tactics related to renewable business sectors.

Uber being a global organization, provides variety of amenities and innovative business, at different level of the society in the world. These services are very well assorted to technological trends and way of modern living.

The services include:

- Mobile application for services;
- Drivers and transportation services;
- Delivering;
- Postal related system;
- Merchandise conveyance;
- Home delivery of food;
- Home delivery of package;

- Taxi hiring system;
- Internet sites;
- Vehicles for rent;

The company's exceptional rate of expansion, business presence, sector coverage and financial status has been exceptionally fast. (InvestorUber, 2022). The next six figures, depict business figures of Uber, as published in its 2022 annual report during meeting with stockholders.

The six figures below, are related to:

1) Uber's mobility platform 2022- (i);
2) Uber's mobility platform 2022- (ii);
3) Uber cities' presence;
4) Uber's delivery progress;
5) Uber's market spotlight - France 2022-(i);
6) Uber's market spotlight - France 2022-(ii);

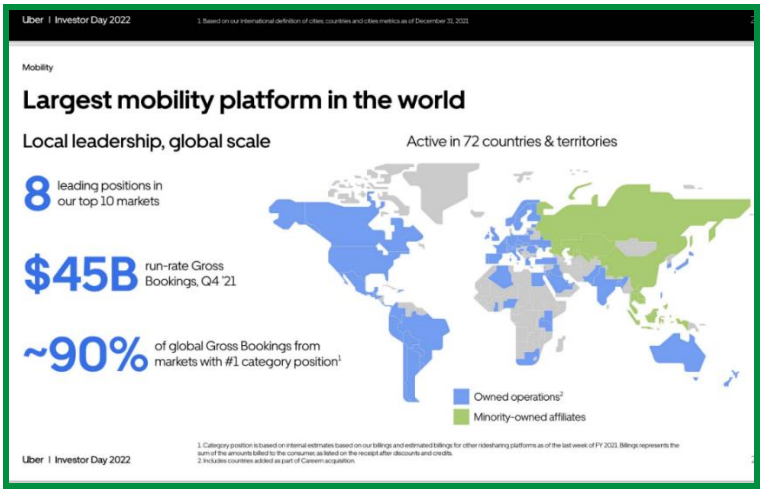


Figure 105. Uber's mobility platform 2022- (i).

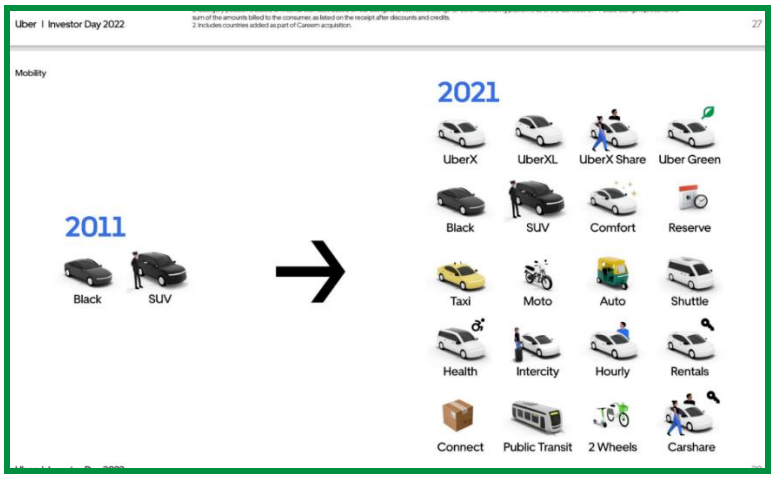


Figure 106. Uber's mobility platform 2022- (ii).

Figure 107. Uber cities' presence.

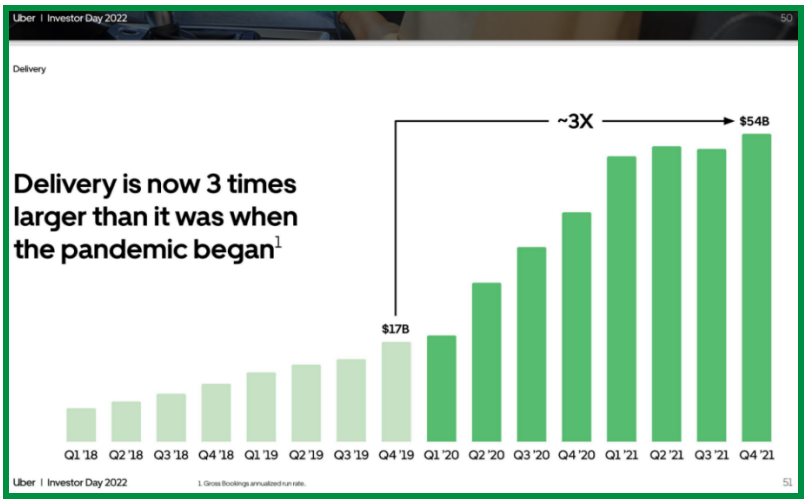


Figure 108. Uber's delivery progress.

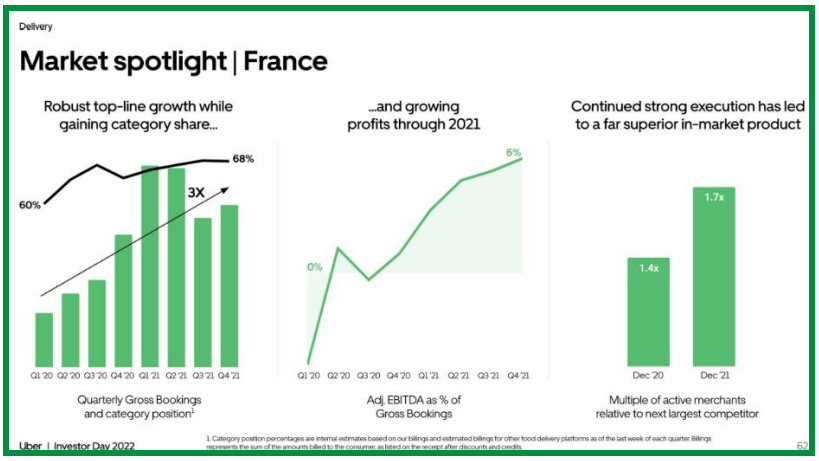


Figure 109. Uber's market spotlight - France 2022-(i).

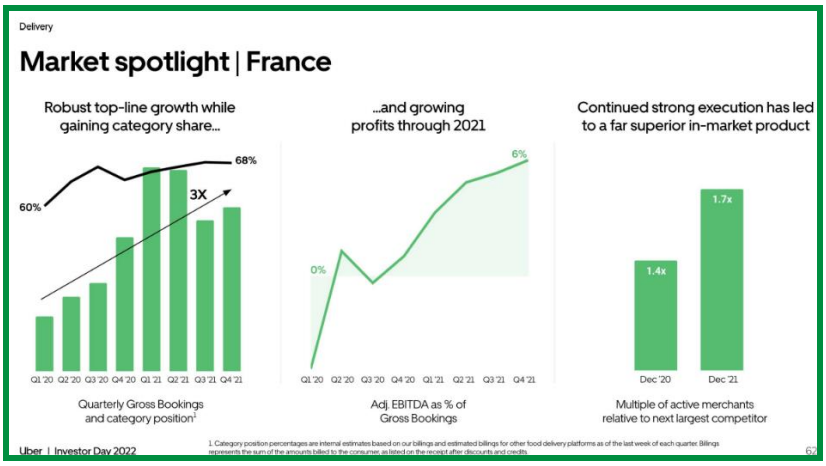


Figure 110. Uber's market spotlight - France 2022-(ii).

The above reports shows that Uber Inc. is a well-established global entity; and is dominating several business sectors. In entering those market, Uber concentrated on developing and introducing novelty in various business market. Their financial report figures permit to see that Uber drastically captured big market shares; above the "norm". However, some of the company's methods were perceived as inequitable by the exiting national companies or entities. In several countries, such local business sectors demonstrated their hostility towards Uber's arrival. The figure below, shows Uber's competitors' resistance to its presence and the violence involved here, during a strike in France; especially the taxi drivers' actions in Paris. (Chrisafis, 2016).

Figure 111. Protests across France. Uber.

During these protests or strikes:

- About 2,000 taxi drivers were involved;
- Main traffics were disrupted all over France;
    - especially airports around Paris;
    - railway stations were affected national wide.
- Two people were injured at Orly airport;
- 20 people were arrested amongst the taxi drivers.

The reasons for these protests; as it was reported, was the perception of Uber's business process and competing as being unequal, and non-ethical (Chrisafis, 2016).

This typical case demonstrates the caution required in entering global market. And the importance of assessing the impact of globalization business on local businesses and adapt smoothly to the area. In this sample cases, local companies reacted strongly and aggressively in the face of what they perceived as illegal and aggressive global business competitor.

Consequently, when entering business sectors globally, it behooves leaders to ascertain all the ethical behaviours, cultures, and regulations. And then, research the means that permit to adhere to them, from the outset. Otherwise, this could mean the collapse of several existing local business entities. And on the other hand, the business entrepreneur will eventually face a fierce resistance from the locals-; perhaps to its detriment. (Levin & CNN, 2017). Therefore, global business-related factors, are to be treated as a composite determinant, which demands as well searchful consideration before venture the global market.

5.2.3 Effects of Globalization on Local, or National Economy

On the other hand, economically, global business is complex, sometimes possessing opposing factors. These are associated with:

- Risk tied to finances, for the venturing entity;
- And on the other hand, direct and indirect economic losses for the locals, as a result of the new market arrival.

Depending on how the entering company deploys its strategies, these factors, could positively or negatively impact on sources of living of the locals and existing companies. Strategies should be developed upstream, with mitigation "additives" so that there will be a win-win variables for both parties; locals and new company.

We can therefore say that, both venturing company and local economies are impacted by these forces; creating both opportunities and threats. (Rothaermel, 2012). For the national companies, the local economies, and the community, the impact could be:

- A gain or loss of business/economic opportunities;
- Disadvantaged economic position because of **technological** leading position of the arriving company; as well as other factors within "Pestel" framework.
- If arrival's activities pollute local environments; the nation ecosystem may be viewed worldwide as "unhealthy"- with consequence of perhaps loosing tourist.

When research is made upstream, to ascertain appropriate strategies or ethical tactics, the recorded facts will surely contribute to positive outcome.

A positive early stage "research example" for global business, is the arrival of McDonald in Russia. Having advanced knowledge, the company devised strategies to accommodate the local market. McDonald adapted to diversity of the country, based on consumer demographics, and local economic factors; presented later, below. (Racoma, 2019). The case of McDonald, is a positive contrast to that of Uber's. The negative effects of Uber early days, could be associated with of deficiency in knowledge, or lack of preparation in respect to global socio-cultural effects.

In effect, even though Uber created significant jobs for the localities, because of legal loopholes in Uber's social responsibility governance, this generated a big upheaval. Some of the "workers" for the company, caused a serious harm to the company's brand reputation, because of repeated unethical issues. Added to this, modern media technology made news spread quickly, globally. (Chrisafis, 2016).

Thus, when “arriving” in new markets; executives need to take the lead and stipulate an applicable ethical procedure related to local socio-cultural, and economy stances. If such factors are considered at the outset, this can positively impact on the view of the nationals, who may consider the arriving company as a benefactor.

The contrasting case is McDonald’s arriving at Russian market in Russia in 1990, when Soviet Union was dismantled. Through investigation; McDonald noticed a local deficiency in resources. McDonald leaders converted this local "deficiency" into a positive brand image, a sort of brand ‘polishing’. The leaders arranged to work with local economy, social, and cultural factors, and acted to compensate this scarcity.

In reality, local suppliers lacked food products like potatoes, needed for the French fries when McDonald was opened in Russia. Rather than abandoning the Russian market entry, the leaders adapted their business model; and modified the habitual outsourcing supply chain. McDonald’s leaders worked with a joint-venture and partners, in order to fill the lack. They brought in agricultural specialists from Canada and Europe to improve Russian farmers’ farming management practices. The leaders devised a means to lent money to locals, so that, these can invest in better agricultural practices and equipment. (Reuters, 2018). As a result, McDonald gained 80 percent of the Russian fast-food market by 2010. (Racoma, 2019).

We can conclude that, for global business endeavor, leaders need to be “informed” of the local particularities, at the very outset. They can then adapt their strategies or tactics to the socio-economic characteristics. The contrasting cases of Uber and McDonald, demonstrate that, success depends on specific business strategies. This emphasizes the importance of informed strategies through research on possible obstacles, incentives, and the hidden motivating factors. The positive effects or negative impact will depend on how much efforts, and insightful skills that are deployed during the business entrance process.

5.2.4 The Regulations from European and International Institutions.

Modern technology, communication, and transportation have prompted international trade into dimension and scale unknown in the past. These have generated huge benefits to international enterprises, to states, and opened access to foreign produce and services for worldwide populations. However, the most obvious gain for companies is economic advantage. Global market permits free trade flows. It generates technical and economic

resources for business growth. It ‘invites’ infrastructures, research and development openings, jobs opportunities, labour expansion, and social stature improvements. These implies that local laws and regulations of individual states are interconnected in the global trade. However, this may pose legal confusion and general loopholes.

However, no single state holds universal control the over activities of international companies. Besides, individual countries’ trade laws and policies may be completely different from each other, or even be opposing. The consequence may be the creation of business conflicts; due to the principle of state sovereignty.

Without an agreement on international guidelines, standards, model laws, conventions, as well as treaties; it will be practically impossible to manage, govern or monitor international trading globally. These facts emphasize the role of the different international organisations and institutions, like:

- European Union [EU],
- International Monetary Fund [IMF],
- World Trade Organization [WTO] etc. (Auboin, 2007).

Their goals include ensuring that trade is ethical, as fair as possible, and as open as is practical. And thus, benefiting not only business entities but also individual consumers, localities, and environments. However, such standards of governance are negotiated with binding rules, between committed states. Such internationally devised laws, intend to improve global business potential, facilitating borders access and exchange frontiers.

Global market rules on trade and business provide assurance and market stability, not for only companies, but also for foreign exporters, consumers, and producers. These are assured of secure supplies, variety of good choices products, raw materials, quality components and trustworthy services. Only a mutually agreed on global legislator, representing lawmakers of individual states can guarantee such a delicate task, responsibility, and stability. (Auboin, 2007), (Rockwell, 2013).

These are role of the EU, and international institutions on business organisations. Leaders desiring to enter into the energy transition business, should be aware of the international, and local laws. In addition to the new regulations on energy transition. An exhaustive research methodology should be prescribed by the leaders, well in advance. The three figures below, recapitulate some of the objectives of the major international institutions.

EU & International Institutions: Business_ Market Regulation	Declared Objectives
WTO: Since 1995- from GATT Regulates: o Intellectual property o Dispute settlement o Trade monitoring o Technical assistance and training o Fare trade	The only international organization dealing with the global rules of trade. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible. Decisions in the WTO are typically taken by consensus among all members and they are ratified by members' parliaments. Trade frictions are channelled into the WTO's dispute settlement process, where the focus is on interpreting agreements and commitments and how to ensure that members' trade policies conform with them. 2013, WTO members struck the Agreement on Trade Facilitation, which aims to reduce border delays by slashing red tape. Each member receives guarantees that its exports are treated fairly and consistently in other members' markets. Provide developing economies flexibility in implementing their commitments. Aim to reduce risk of disputes spilling over into political or military conflict. Agreements are the legal foundations for global trade; Are contracts, guaranteeing WTO members important trade rights. Binding on governments to keep their trade policies transparent and predictable, to everybody's benefit. https://www.wto.org/english/thewto_e/whatis_e/inbrief_e/inbr_e.htm
EU	Established in 1993, the European Union (EU) is a political community in which 28 member states comprise a single economical market that has reduced the barriers and obstacles when moving goods, services and investments within the community. Through a standardized system of laws and a single currency (the Euro), citizens of the EU can freely live, work, study and do business throughout the EU as well as enjoy a wide choice of competitively priced goods and services.https://european-union.europa.eu/live-work-study/doing-business-eu_en. https://op.europa.eu/webpub/com/eu-what-it-is/en/

Figure 112. Regulations: EU International Institutions -(i)

EU & International Institutions: Business_ Market Regulation	Declared Objectives
IMF ○ **deals with the rules of trade between nations** ○ **sound international financial system** ○ **sound international financial system**	The International Monetary Fund (IMF) works to ensure the stability of the international monetary and financial system. Its mandate includes facilitating the expansion and balanced growth of international trade, promoting exchange stability, and providing the opportunity for the orderly correction of countries' balance of payments problems. It works together with WTO to ensure a sound system for global trade and payments. IMF, the WTO, and other international organizations and donors often work together to help countries improve their ability to trade. The Enhanced Integrated Framework (EIF) for trade-related technical assistance to Least Developed Countries (LDCs) gives supports to LDCs to be more active players in the global trading system by helping them tackle supply-side constraints to trade. https://www.imf.org/en/About/Factsheets/The-IMF-and-the-World-Trade-Organization ; https://european-union.europa.eu/live-work-study/doing-business-eu_en
OECD	**Risk awareness Tools for Multinational Enterprises in Weak Governance Zones. Aim to help companies that invest in countries where governments are unwilling or unable to assume their responsibilities. Addresses risk and ethical dilemmas that companies may face in such weak zones.** https://read.oecd-ilibrary.org/governance/annual-report-on-the-oecd-guidelines-for-multinational-enterprises-2006/oecd-risk-awareness-tool-for-multinational-enterprises-in-weak-governance-zones_mne-2006-4-en#page39
OHADA	Established in 1993, the Organization for the Harmonization of Business Law in Africa, known by its French acronym OHADA, is working toward instituting more secure legal and judicial measures and establishing a modern and uniform business law in order to attract investors to African states. https://www.tradeready.ca/2017/topics/researchdevelopment/role-international-organizations-international-business-law/

Figure 113. Regulations: EU International Institutions -(ii)

5.2.5 Incorporating Global Consumer Protection Laws for Business

Various international legal frameworks cover consumer protection laws, and leaders in energy transition business do well to be informed about these.

To establish relationship of these laws and study case of Uber, let consider USA federal laws for consumers' protection.

In the United States, 'Federal-Trade-Commission' (FTC) is one of the legal agencies that administer consumer protection laws (Waller et al., 2011, p.10). The legal framework of FTC is to allow consumers to have a genuine marketplace, free of deception, or fraud, and obtain quality services at competitive prices. FTC Act prohibits deceptive business practices and includes consumer protection laws. Some e-business organizations practice deception by deliberately omitting information or misleading material representation. FTC's rule requires advertisements to disclose conspicuously and clearly, all information about material the terms related to it; to protect consumers against unfair practices. (ftc-gov, 2022) Another significance aspect of FTC as a legal body, is its legal framework used to investigate and detect deception, or unfair organizational practices. Globally, each country stipulates similar laws for consumers' protection and fair-trading practices

Moreover, the Division of Advertising Practices in the Bureau-of-Consumer-Protection acts as vital shield for consumers. These legislations "fight" against false or deceptive advertisements, particularly concerning health and safety. (ftc.gov, 2022). This division monitors the marketing of unreputable electronic games or violent movies to children.

There is also the National-Highway-Traffic-Safety-Administration (NHTSA), another national/international framework that is pivotal in protecting consumer laws. Its activities involve online related or in presence purchasing; and inform customers. (nhtsa.gov, 2022). This federal agency facilitates automobile safety to prevent injuries and deaths of consumers. (Waller et al., 2011, p.12). The stated goal or mission is to save lives and prevent injuries, whilst at the same time reducing economic impact. These are done through safety standards, research procedures, education, and related law enforcement. (nhtsa.gov, 2022).

A related case, that of Uber, operating in the United States, was bounded to unified standards for automobile safety. Additionally, the Bureau-of-Consumer-Financial-Protection is another framework for consumers protective laws.

It conducts financial protection, provide education supplies, and receives complaints. Significantly, It regulates banks, moneylenders, and large non-bank-entities, like credit-reporting organisations and debt-collection companies. (usa.gov, 2022) This agency activity in defining consumer financial products, loans-servicing, and credit-increasing, is noteworthy. Leaders are to acquire knowledge of similar laws globally, especially where they intend to operate.

In addition to the case mentioned above, Uber's international operations likewise have been subjected to various international consumer protection laws. These regulations obliged Uber to adapt, and modify ethically its businesses operation. (Danish, et al., 2021), (Geoff, et al., 2017).

Organizations that violate these state laws may face lawsuits or financial penalties. The Division-of-Privacy-and-Identity-Protection is one of the consumer protections laws. It ensures that customers' data are safe, preventing companies' misuse or abuse. (Waller et al., 2011, p.13). As per these legislations, any organization that could access confidential information, like credit cards, are to provide 'watchdogs' to keep it secure, to prevent 'code' or identity theft.

In reference to such regulation, Uber was requested to summit the "comprehensive-privacy-program", to settle with US Federal Trade Commission; regarding data-handling problems. (Hawkins, 2017). The Company was requested to report and notify clients if their personal information is in danger of exposure. Uber had to make correction by implementing appropriate security measures, and submit consistent privacy procedures for audits. Thus, consumer data privacy laws serve to compel organizations; to maintain an irreproachable security system for customers' data.

The Division-of-Advertising-Practices (working under FTC) is another consumer protection system that protects consumers from deceptive advertisements in businesses. (ftc.dap, 2022). FTC, and other authorities work together to determine the deception intentions of organizations by analyzing the overall impression advertisements.

For instance, it was reported against Uber; that the company violated advertisement principles; by misleading applicant drivers about their financial income. (Bartz & reuter, 2017). FTC has since then been probing Uber to eliminate, or prevent unethical business practices within the organization's business activities. All these confirm the

unpreparedness of Uber when it started the global business; in respect to legislations and consumers' protection laws.

These authorities cited above, were mostly from Federal law of United States. However, they were used to illustrate the positive impact; and the protection these regulations are providing. From the study case of Uber Inc.; it becomes evident that, any leader in international business, is expected to get acquainted with these laws. And at the same time, instruct and inform his organization.

There are however corresponding regulation authorities in Europe, and globally. In Europe these include:

- Unfair Commercial Practices, (commission.europa.eu, 2023);
- The single voice on advertising self-regulation issues in Europe, (easa-alliance.org, 2023);
- Road Rules And Safety, (europa.eu, 2023);
- Road Traffic And Safety Provisions, (europarl.europa.eu, 2023);
- Consumer Protection Law, (commission.europa.eu, 2023);
- Policy Areas - Consumer Protection, (efta.int, 2023).

The global authorities have implemented measures to protect or shield consumers' interests. And principles involved have safeguard consumers from greedy service providers through legal procedures. A leader, venturing in global energy business, will consider these laws closely, making sure that the company as a whole, is aware of the regulation.

The UK, General Data Protection Regulation (GDPR), is significant authority that provides guidelines for online trading; supplemented by DPA-2018 after Brexit. It provides protection for customers' 'Personal-Identifiable-Information' (PII); and defines principles on data use and retention by business organisations. (UKGDPR, 2022). (Greenley-Giudici, 2022).

5.3 Corporate Social Responsibility For Global Business

The world economic environment is greatly impacted by the fast-moving global business. The concerned is the How competitors control the market, how well they are doing it, as well as the strategy employed. The changes are constant and everywhere; and it is crucial that companies understand what is happening. In this way, they can devise the appropriate means to stand-up, and prosper, amid aggressive global competitors.

With globalization and associated technology, incidents in a remote sector becomes public, worldwide; and could affect entire economies, multinational corporations, and small businesses. (csrhub.com, 2021), (Ejimabo, N. O., 2015).

Such incidents could have an adverse, or even destructive effects on a business. In addition, leaders should seriously consider the following crucial factors:

- Ethical consideration;
- Moral issues;
- Socio-Cultural issues;
- Workforce Diversity;
- Employees versus Employers' Responsibilities. (Johnston & Uro, 2021) (Leach, P., 2021).

5.4 Corporate Governance: Crucial Factor for Global Business

When appropriate corporate governance is implemented; this will permit acceptance of local populace of the new business entrance. Therefore, leaders of such entities must act to develop good brand-image, through insightful knowledge of the local culture. (Betz, & Pond, 2019). (Johnston & Uro, 2021) This will include:

- Actively and continuously promoting diversity;
- Making decisive efforts to prevent all sort of discrimination;
- Adhering to principles of zero human abuse, especially child labour;
- Actively preventing discrimination because of personal beliefs and religion in new areas;
- Including all culture, age, gender;
- Encouraging dialogue in work environment;
- Encouraging 'diversity-mix' at work by means of work environment set up;

- Accepting diverse educational and cultural background among employees; (Almadani, A. A., 2014), (Johnston & Uro, 2021).

All these aspects go deeper into the human factor, and will surely impact business success.

Additionally, acceptance of a new entrant in an energy transition business requires as well using:

- Appropriate technology based on green energy, and reduce carbon footprint;
- Taking Health and safety seriously;
- Encourage ecological friendliness;
- Actively discourage corruption through recognition or disciplinary actions.
- Make work environment attractive;
    - Emotionally;
    - Psychologically;
    - Appealing.
- Continuously sustaining solid business strategies that affect employees, at all levels;
- Share benefits with all;
- Being aware local ethically appropriate or inappropriate courses of actions/ situations. (csrhub.com, 2021), (Ejimabo, N. O., 2015).

5.5 Conclusion Chapter 5

Effective corporate governance requires a sound, legal, institutional, and regulatory framework. These facilitate the understanding of market contributors. They create a reliable and trustworthy business processes, especially when engaging in contractual relations with new sectors in global energy transition business (OECD 2015). The case study in this part of research report has shown that. The basis of corporate governance should be established with a view to impact on overall economic performance and market integrity. Additionally, leaders can learn from examples and create incentives for market participants. This will promote well-functioning and transparent markets tactics. Governance has become indispensable in these days of global business ventures. The research study cases of Uber and McDonalds have demonstrated these facts. Well-structured corporate regulation will serve in regulating the actions of all business partners.

This will in turn, provide a fair or equitable energy transition; from fossil fuels to renewable energy sources. As above mentioned, sustainable energy system is interwoven with regulating, controlling, and monitoring of business actions. Therefore, company or corporate governance-, (with all its complex and composite components)-, is a means to promote sustainable and progressive energy transition. (resourcegovernance.org, 2022). New leaders can note that, good corporate governance for global organizations, provides a signal that: the organization has effective and efficient management. The mode of operations and communication for global companies is diverse and technology based. However, technology alone could be a weakness; if leaders do not acquire skills, knowledge, and early-stage information pertaining to the people, and sector of envisioned global area of business development.

6 Chapter 6: Compounded - Conclusion, Findings and Recommendation

The five successive chapters above, have presented research on sampled experiences, companies' strategies; the applied methodology of business processes and results. Where corrective actions were taken, to aligned strategies to realities in the fields; positive results were obtained. It is hoped, - as mentioned in the abstracts-, that, this research report would serve as part and parcel of beginners' guide, for new executives or leaders; for a global energy transition business.

The research incorporated case studies of energies' business strategies in real time applications. And the lessons learnt, provides practical feedback as a research report data. The research incorporated primary and secondary research data. The primary researched were "in situation" company, and client interactions, years of one-to-one probing, inquiries, notes, and meetings.

It can therefore be emphasized that, research for deploying new energies strategic marketing plans is crucial to success. Research is indispensable before entering a new market, especially in the current energy transition business. Competition, intricacies, or specificities of global energy market, is increasingly complex. This particularly, is due to

the fact that; energies transition business compels operating in vast areas of the globe, where renewable energies are available. Therefore, special efforts are required: to ascertain the conditions, people's culture, regulations, and governmental specificities, that are indispensable.

Structured research can reveal tangible incentives and strong motivation factors; and therefore, enroll internal and external stakeholders onto the leaders' ambition and goals. The result will be that; having a "peaceful" full support, and personal deep insight of business case, a leader, - even new- can deploy strategic actions to success.

The diverse case studies emphasized as well, that, monitoring, evaluation, and constant adjustments to the market environment are crucial to success. In this way, plans can be deployed with confidence and correct perception. These will give assurance to internal and external stakeholders. Executives will demonstrate that they are aware of they areas where they are deploying financially heavy infrastructures, for anergy transition business. Progressive monitoring will shed light on the efficiency and effectiveness of strategies. Leaders will be informed of the market context, previewed timeline of achievements, and therefore go ahead with confidence.

The research demonstrated that: leaders' assessment of business market, needs to be near as possible to "exact science". Because current business strategies evolve within dynamic market. Also, fluctuating political context, uncertain socio-economic-technological areas, and legal constraints are frequent. The appropriateness of performing strategic analysis before a transition to renewable energy is of great importance. For this reason, two chapters were used to evaluate; why leaders need to acquaint themselves with research methodologies and advance research skills. They can with such capabilities, instruct the phases of strategic business moves. The results will permit them to evaluate all acceptable risks, and act insightfully to success.

The research cases studies showed the significance of the skills, required for a strategy leader, in energy transition. That, these skills constitute the ability or capacity to perceive "what is", "what's not", even in moment of change. A leader can then be able to co-ordinate tasks and operation process; being able to adjust in global environments. On the other hand, the research demonstrated that, executives need to be intrinsically "global", understand global "characteristics" and "moods". This is because energies sources are spread worldwide, within remote areas of the globe. As such, to be successful, leaders need to be a "social-strategic chameleon". The research showed that, for true and lasting

success, adroitly adapting, and merging into the culture of areas operation; is a prerequisite.

The research showed, on the hand that, the errors some leaders made that cost the companies financially and brand image depreciation. However, as soon as corrective measures were taken, the strategic change permitted internal stakeholder to enroll with the leaders' goals and ambitions. This was confirmed by research on some French energy companies; Totalenergies, Airfrance, and EDF.

The research, analysis, and conclusion on cases of these companies' actions were confirmed by governmental research instructed by French authorities.

In reality, on the 30th of March 2023, the French Authority National Assembly; received the results from a committee of inquiry on energy system. The authorities have assigned the committee to identify the reasons for France's loss of energy sovereignty and independence. The results highlighted several strategic mismatches. Even the country's international electricity Transmission Service Operator/manager (RTE-TSO) was affected. Although having been an energy exporter for 40 years, RTE became an energy importer in 2022. And this was due to cumulated poor energy strategies.

Evidently, in 2022, European countries, (including France), were confronted by the consequences of the war in Ukraine and related energy crises.

However, France has for decades be a leader in energy, because of its nuclear Fleet. The National Assembly constituted committee found out that, the country's overall and national energy strategies were; miscalculated, late, or wrongly evaluated. And that, the maintenance operations were not well sequenced. These included the country's nuclear fleet. This national error case, of a leading energy country, summarizes the fact that: a successful Strategic Management and Leadership for Global Energy Transition: requires an advance the identification of:

- Obstacles;
- Incentives;
- Motivating Factors.

This research report intents to provide a basic "ruler" and typical examples; that could signal to a new executive or leader, the presence of hidden determinants. Factors to be aware of, as well as the possible consequences, if these are neglected. The research report could be a beginner's guideline. It expected that, at least, the report incites curiosity

that triggers a quest, or inclination for deep investigation and evaluation, about the step to take. And be as a business guardrail for beginners.

Since the Paris accord on carbon dioxide reduction agreement was adopted in December 2015, several countries, organizations, and energy companies pledged to adapt renewable energy projects strategies.

This research found that; after years of renewable energy business development strategies, several energy companies have been under limelight. Despite obstacles, some have realized significant progress. It was found that, strategies in energies are intrinsically linked to their global sustainable brand image. And that, business development ambition, and success is affected by global image. The report shows that, Transition to Global Energy involves “detecting” quantifiable obstacles. The companies that deployed tangible research approaches, despite difficulties at the beginning; have acquired sources of tangible incentives. These has become strong motivating factors for them. Such positive factors have prompt them to strong commitments, and diversified investments strategy.

It was noticed as well that, efficiently structuring an integrated portfolio for multi-energy business infrastructure, is not as simple as some imagined; despite heavy investments.

The research demonstrates that; for a Global Energy Transition, Leaders and Executives need to deploy specific strategic plans, for each global sector. That, awareness of global key external influences on energy business strategy is indispensable. That these depend on their skills or of the market area and knowledge in applying appropriate business frameworks and models, in the appropriates sequences. That change could be used as an advantage for energy transition business strategic; by researching through lessons learnt from “conventional” energy companies.

Change could be an exceptional opportunity for company’s growth. However, when change is wrongly aligned, it could degenerate and heavily cost the organisation; financially, and of brand image. It was understood, that, leaders should gain insightful skills in research processes related business ventures. These include for: critical re-shaping, developing, investing, and planning energy transition mission.

That the saying:” Knowledge is power”, has its full power here. Even a new leader, who may have less experience, would however navigate through difficult sectors. But it requires that, efforts are made to obtain full knowledge of business environment. Initiating appropriate business-related research will provide a certain level of insight. A leader may

progressively advance to success, with surprise, because of having advance perception, or knowledge, of the global sector they desire to operate.

Lastly, the research demonstrated that, corporate governance for global energy transition business, is the role of top-leaders or executives. This will permit to establish or impact the organization's overall economic status and brand image. That the way executives and leaders handle a corporate governance, could be the rise, or the fall of a global company. Especially in energy transition activity; since this market is global. Knowing the implications of this, implies applying structured and sequenced, social responsibility company core attitudes. Misalignment with global employee variety, socio-cultural differences could prevent the entrance of an organization into several sectors of the globe. Such incidents could have an adverse, or even destructive effects on a business. If in addition a company's executives disregard crucial requirement like; ethical consideration, moral issues, and workforce diversity.

Like all the other area considered in this research report, specific actions are definitely required for success. Cautions related to globalization energies transition could be obtained, if the necessary steps are taken to acquires the skill and insight for the venture.

The means to be successful in managing strategic global energy transition are available. Leaders therefore, need to identify, prior to any business: the Obstacles, Incentives, and Motivating factors. It will then be possible to enroll overall internal and external stakeholders to achieve a global energy transition business goal; for success

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