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SCENARIOS FOR THE FUTURE OF EUROPEAN UNION ENVIRONMENTAL DIRECTIVES AND REGULATIONS AND THEIR IMPLICATIONS FOR THE EUROPEAN REAL ESTATE SECTOR – EXPLORING RISKS, OPPORTUNITIES AND STRATEGIES FOR MOME – VOLTAGE REVOLUTION SCENARIO

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Abstract: This work project applies the Intuitive Logics School to explore the future of EU environmental policies and their impact on the European real estate sector until 2030. Through a combination of interviews with EU employees, foresight experts, and industry leaders, as well as a collaborative workshop with MOME, the study analyzes plausible developments and their implications for market dynamics and regulatory adaptation. By addressing uncertainties such as 'Supply Chain Stability' and 'Qualified Workforce Availability', four scenarios are developed to enhance the sector's preparedness for upcoming challenges. The work concludes with both scenario-specific and general strategic recommendations, providing MOME with actionable insights to ensure resilient operations through 2030.

Keywords: *Scenario Planning, Strategic Foresight, Strategic Implications, Real Estate Industry, Housing Cooperatives, Business Model Canvas, Porter's 5 Forces, TOWS Matrix*

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Table of Contents

List of Figures

List of Tables

Glossary

AI – Artificial Intelligence

approx. – approximately

BIM – Building Information Modeling

BTR – Build to Rent

CAGR – Compound Annual Growth Rate

CBAM – Carbon Border Adjustment Mechanism

CEAP – Circular Economy Action Plan

CO2 – Carbon Dioxide

CRMA – Critical Raw Materials Act

CRM(s) – Critical Raw Material(s)

CSDDD – Corporate Sustainability Due Diligence Directive

CSRD – Corporate Sustainability Reporting Directive

DNSH – Do No Significant Harm

DT – Digital Twins

EC – European Commission

ECI – Early Contractor Involvement

EED – Energy Efficiency Directive

EII(s) – Energy-intensive industries

EPC – Energy Performance Certificate

EPBD – Energy Performance of Buildings Directive

ETS – Emission Trading System Directive

EU – European Union

EuGB – EU Green Bond (Regulation)

GDP – Global Domestic Product

GHG – Greenhouse Gases

GRI - Geopolitical Risk Index

IoT – Internet of Things

JVR – Job Vacancy Rate

KU(s) – Key Uncertainty

LCA – Life Cycle Assessment

MEPS – Minimum Energy Performance Standards

MMC – Modern Methods of Construction

MNC – Multinational Corporations

MSR – Market Stability Reserve

NBS – Nature-based Solutions

PMT – Probabilistic Modified Trends

RED – Renewable Energy Directive

RRF – Recovery and Resilience Facility

SFDR – Sustainable Finance Disclosure Regulation

SMEs – Small & Medium-sized Enterprises

1 Introduction

"Scenarios are not predictions, they are stories about how the future might unfold", emphasizes Peter Schwartz (1991) in his fundamental work on scenario planning. The complexities of today's regulatory environment and sustainability challenges resonate deeply with this principle. Faced with the intersection of rapid climate change, geopolitical conflicts, and pandemic recovery, the European Union (EU) has introduced ambitious environmental initiatives such as the Fit for 55, which represents a key milestone of the European Green Deal by 2030. Such measures promise to have a severe impact on industries, particularly the real estate sector, which accounts for 37% of global greenhouse gas (GHG) emissions (UNEP 2023). This work project aims to address the uncertainties and strategic implications arising from the evolving EU regulatory landscape by focusing on MOME. The key challenge, identified in collaboration with MOME's leadership, can be formulated as follows: 'How can MOME adapt to the future development of the EU environment shaped by directives and regulations by 2030 in order to increase its competitive edge and achieve its objectives?'

Using the *Intuitive Logics School's* scenario planning methodology, this project explores plausible futures that highlight the critical uncertainties affecting the EU's environmental policies and their implications for the real estate sector. This qualitative approach facilitates the management of uncertainty while encouraging dynamic and adaptive thinking (Bradfield and Van Der Heijden 2005).

Therefore, the intent is to provide MOME with strategic tools and actionable insights that will help the organization thrive in an uncertain future. The ultimate goal of this work is to improve MOME's resilience and align its mission with the broader objectives of the EU's sustainability agenda by identifying risks, exploring opportunities, and developing responsive strategies.

1.1 Market Overview – European Real Estate Industry

The total value of the European real estate market will reach approximately (approx.) €106.8 trillion in 2024, representing an increase of 4.5% year-on-year. About 81% of the value relates to the dominant segment "residential real estate"[1] (19% to "commercial real estate"[2]). This valuation imbalance (Figure 13) is primarily due to the strong demand for housing in Europe's major cities, coupled with the low supply of housing as urbanization continues (Statista 2024c). The year 2023 has been associated with geopolitical challenges that have led to high inflation and subsequent interest rate hikes. Due to the level of uncertainty and the increased cost of capital, investors and private clients have adopted a "wait-and-see" approach (PwC 2023a), which has significantly weakened demand (Δ transaction volume 2023: -11% – Figure 14). Looking forward, the market is projected to stabilize and grow steadily at a Compound Annual Growth Rate (CAGR) of 3.2% to €125.1 trillion by 2029 as it recovers from the recent downfall (Statista 2024c).

As a result of rising house prices and the aforementioned surge in borrowing costs, affordable housing is in high demand, particularly in the EU's major cities. The associated decline in demand for home ownership favors investment in the build-to-rent (BTR) sector. Investors are looking for long-term, stable returns as long as current trends in urban living continue. Developers are focusing on urban, modern rental buildings with amenities such as onsite gyms and co-working spaces aimed at young professionals or city dwellers, adding to the BTR trend (Deloitte 2024b). In the commercial real estate sector, logistics is experiencing an upturn as a result of the ongoing shift towards e-commerce. On the other hand, demand for traditional office buildings is declining due to remote working and the wider adoption of hybrid working models. In general, environmental regulations are seen as the critical and defining factor for the future

[1] Residential real estate market covers houses and apartments
[2] Commercial real estate market covers office buildings, retail spaces, warehouses, industrial properties

development of the entire European real estate industry. Both the growing demand from buyers and investors for sustainability-compliant properties/projects and the tightening of standards are putting pressure on the industry and will result in additional costs (e.g., renovations, green tech). Assets that are already compliant are currently traded at a premium, whilst in the longer term the associated efficiency benefits and reduced environmental impact will lead to a further uplift in property values (PwC 2023a) (Figure 15 for detailed analysis).

1.2 Introduction of MOME

MOME is a Porto-based start-up company founded in 2023. It focuses on the development and management of housing cooperatives. The business model aims to address the growing problem of housing affordability in Portugal. MOME manages the entire lifecycle of a cooperative - from land identification and construction to ownership transfer (Figure 16).

MOME's housing cooperatives operate as non-profit entities, where individual ownership homes are sold at cost, covering only the actual development costs (Figure 17). This ensures transparent pricing with no extra profit margin. Upon completion, members can freely dispose of their homes without restrictions. MOME's main target group is the Portuguese middle class, with actual customers belonging to both the middle and upper classes.

The start-up follows strict principles to ensure the sustainability of its projects. The standards are set in line with the EU taxonomy to help reduce environmental impact. In practice, this means using modern methods of construction (MMC) and modular components to reduce material waste or integrating nature-based solutions (NBS), such as green roofs, to contribute to better air quality in the city. Currently, the company manages two housing cooperatives: PEDRAS.COOP in Vila Nova de Gaia (13 houses), and HERA.COOP in Porto (96 units). Until 2030, MOME aims to provide more than 1,500 homes at affordable and transparent prices in urban centers throughout Portugal (MOME 2024) (Figure 18 for Business Model Canvas).

2 EU Environmental Measures Overview

To critically examine the future of the EU's sustainability policies and their implications on the real estate sector, it is essential to have a comprehensive understanding of relevant environmental regulations and directives. The following subchapters provide an overview of these legal frameworks, discussing their purpose and objectives, as well as their current state.

EU directives set legally binding targets to be reached by all Member States. However, they grant national authorities flexibility in the form and manner of transposition into national law within a certain period (usually two years). Thus, directives may allow for differences in how countries intend to meet the targets (EU 2022a).

EU regulations, by contrast, are directly binding and applicable in all Member States without requiring national implementation. Hence, they are generally applicable and foster uniformity within the EU, with no room for national divergence or deviation (EU 2022b).

2.1 Green Deal 2050

The EU Green Deal, a concept to combat climate change, was first outlined in 2018 and was legally adopted in June 2021 as the European Climate Law. The main objective of the Green Deal is to create a climate neutral EU by 2050. This is to be achieved by having zero net domestic emissions by 2050, while decoupling economic growth from resource use and leaving "no person or place behind". The package of measures can be divided into several policy areas, such as Clean Energy, Sustainable Industry, Building and Renovation or Pollution Elimination (European Parliament & Council 2021).

2.2 Fit for 55

Following on from the Green Deal, the Fit for 55 package was adopted in July 2021, setting out initiatives to reduce GHG emissions by at least 55% by 2030 compared to 1990 levels (EU 2024c). It provides a specific plan of 19 directives and regulations with milestones up to 2030

(European Parliament 2024). It should be noted that any legislative proposal will have to go through the EU legislative process, requiring approval by the Parliament and the Council. A detailed overview of the Fit for 55 initiatives follows in this chapter.

The *EU Emission Trading System Directive* (ETS), introduced in 2005, is the EU's main emission-reducing tool and has led to a 41% decrease in emissions. The scheme operates on a cap-and-trade basis, with a decreasing cap over time on the total amount of emissions allowed in the energy-intensive industries (EIIs), commercial aviation, electricity and heat generation sectors. Around 10,000 companies are allocated[3] certificates or they acquire them (auction based), which confer the right to emit one ton of carbon dioxide (CO2). They are obliged to submit regular reports on their emissions and sufficient certificates without being fined for every surplus ton of CO2. Unless allowances are earmarked for a specific fund, most auction revenues will go to national budgets (around 75.7% in 2023), with 50% to be invested in climate or energy-related projects (EC 2024b). The ETS is being reformed as part of the Fit for 55 initiatives to bring it into line with the new targets. This involves increasing the emissions reduction target in selected sectors from the original -43% to -62% by 2030. The annual cap reduction of -2.2% will be accelerated to -4.3% (2024-2027) and -4.4% (2028-2030). The free allocation of certificates is to be gradually phased out by 2034. From 2024, the maritime sector will be included in the ETS, while the ETS2 system for the combustion of fuels in buildings, road transport and smaller sectors will be introduced as a complement in 2027. ETS2 will be based on an upstream cap-and-trade principle, which requires fuel suppliers to monitor and report their emissions. The cap is set at a level that will result in emissions being 42% lower in these areas than they were in 2005 by 2030.

[3] Allocation is based on factors such as product-related benchmarks (avg. emission of the 10% most efficient plants in the sector), historical production data (capacity, activity), carbon leakage risk (sectors at risk of relocating production to countries with fewer regulations receive more allowances to protect competitiveness) (EC 2024o).

To mitigate the risk of carbon leakage[4], the EU has devised the *Carbon Border Adjustment Mechanism* (CBAM) Regulation to ensure that a fair price is placed on the carbon emissions embedded in imported goods. It aims to align the carbon costs of imported goods with those of domestic production within the EU, in addition to adhering to the standards set by the World Trade Organization. The transitional phase, which will end in 2025, serves as a pilot for reporting considering cement, iron, steel, aluminum, fertilizers, electricity and hydrogen. Currently, importers operating in the EU must disclose the embedded emissions of goods covered by the CBAM Regulation without surrendering ETS allowances. From 2026, they will be required to register with the relevant national authorities and declare their annual number of imported emissions. From this date, importers will be obliged to acquire[5] and surrender allowances for the imported embedded emissions. Upon the conclusion of the transitional phase, a review of the system will be conducted, with the possibility of subsequent adaptations. Furthermore, the intention is to extend the scope of the program to include additional goods by 2030.

New climate targets required the EU to adapt its existing *Renewable Energy Directive* (RED). These adjustments include a mandatory target of 42.5% of renewable energies in the energy mix of 2030 (previously 32%). To counteract disparate developments in different economic sectors, respective targets for 2030 have been defined. The transportation sector must either reduce its GHG intensity by 14.5% or increase the share of renewable energies to at least 29%. In the context of buildings, a target of 49% renewable energy must be achieved, while the EU's industries in general must increase the annual share of green energy forms by 1.6%. With respect to the heating and cooling sector, the utilization of renewable energy must improve by 0.8% on an annual basis by 2026 and by 1.1% by 2030. Beyond this, the new directive is designed to expedite the approval process by categorizing projects as being of public interest,

[4] Risk of companies moving production sites to countries with laxer emission restrictions (EC 2024b)
[5] Price is based on the weekly average auction price of the ETS allowances (€/ton of CO2 emitted)

thereby accelerating the integration of renewables within the EU (EU 2023a). The RED was adopted in November 2023 and should be transposed into national law by May 2025 (EC 2024c).

According to the EU, saving energy and reducing its consumption will be as critical as the transition to renewable energies. Therefore, modifications to the existing *Energy Efficiency Directive* (EED) were conducted. Such amendments include the implementation of heightened energy efficiency standards, which have been designed to facilitate a reduction in final energy consumption of 11.7% on a EU level by 2030 (compared to 2020 forecasts). Member States are now required to establish indicative targets at national level, while the EU has identified key sectors for energy efficiency measures, including buildings, industry and transportation. Average annual energy savings of 1.49% are anticipated, reaching 1.9% by the end of 2030. Furthermore, the public sector is obliged to register annual energy savings of 1.9%, including a commitment to renovate 3% of the floor area of public buildings each year (EU 2023b). The official deadline for the national transposition of the EED is set for 11th October 2025 (EC 2024i).

The *Effort Sharing Regulation* (ESR) sets binding targets for each Member State to reduce GHG emissions in sectors not covered by the ETS. These include road transport, buildings, agriculture, small industry and waste, which together account for 60% of EU emissions. The regulation was adopted in 2018 with an initial target to reduce GHG emissions in these sectors by -29% by 2030 compared to 2005 levels. As part of Fit for 55, the ESR has been adapted to meet the ambitious Green Deal targets, hence the new target is a 40% reduction compared to 2005. Each Member State contributes to the achievement of the targets. However, the level of each reduction target is differentiated according to Global Domestic Product (GDP) per capita to ensure a fair distribution of the financial burden of the green transition. Economically strong countries such as Finland, Sweden or Germany must achieve -50%, while Bulgaria, for

instance, only has to reach -10%. Member States are given flexibility. If countries emit less than their annual limit, they can carry over the surplus to the following year. Likewise, allocations for the next year can be brought forward if the limit is exceeded. Countries can also trade allocations with other countries. The amendments were approved by the Council in March 2023 and have thus entered into force (EC 2024n).

A further cornerstone of the EU's sustainability agenda is the *Energy Performance of Buildings Directive* (EPBD), addressing their significant impact, which accounts for 40% of final energy consumption and 36% of energy-related GHG emissions. The revised directive establishes new standards and timelines for all building types, recognizing the potential for improvement of existing buildings (75% are energy inefficient): Starting in 2028, all new buildings owned by public bodies must be zero-emission, while all others must comply by 2030. With regard to existing non-residential buildings, Member States are required to define a minimum energy performance standard (MEPS) to target the 16% of worst-performing buildings by 2030 and 26% by 2033. In addition, existing residential buildings must reduce their primary energy consumption by 16% by 2030 and 20-22% by 2035. However, 55% of the anticipated energy savings will be achieved through renovations. Beyond that, the directive creates incentives for green energy solutions, including solar. These become binding in phases between 2027 and 2031, applying to various building types and sizes (e.g., new residential buildings from 2030) (EU 2023c). The revision was adopted in April 2024 and has to be transposed by all Member States until May 2026 (EC 2022).

2.3 Critical Raw Materials Act

The *Critical Raw Materials Act* (CRMA), which was introduced in 2023, represents an initiative designed to secure the EU's supply of critical raw materials (CRMs)[6], which are

[6] 34 materials raw materials of high economic importance for the EU, with a high risk of supply disruption due to their concentration of sources and lack of good, affordable substitutes (EC 2024g)

indispensable for the green and digital transition. In light of the accelerated growth in global demand for CRMs and the prevalence of geopolitical instability, the CRMA is designed to mitigate the reliance on third-party suppliers. The objective is to achieve a minimum extraction rate of 10%, a processing rate of 40%, a recycling rate of 25%, and a maximum source rate of 65% for the EU's annual consumption. Furthermore, the administrative burden associated with obtaining permits for extraction, processing, and mining is to be reduced, and national programs for exploring geological resources are to be established. The act empowers the Commission to regulate the environmental footprint, thereby increasing the circularity and sustainability of critical materials. In order to reduce dependence on third countries, a network of strategic partnerships is to be established, and soft and hard infrastructure projects along the entire raw materials value chain are to be created (EC 2024h).

2.4 Circular Economy

In 2020, the EU adopted a new *Circular Economy Action Plan* (CEAP), a key component of the Green Deal, which is primarily focused on reducing the environmental impact by introducing circular material use practices. These pertain to the design, production, consumption and disposal of products, thus establishing sustainable products as the norm within the EU. The plan comprises measures specifically targeting sectors with high resource consumption, such as electronics, packaging, buildings, and construction (EC 2020b). Additionally, waste prevention plays a central role in the CEAP. To this end, a uniform model for the separation and labeling of waste will be introduced in all Member States. Efforts will also be taken to reduce waste exports and illegal shipments in the EU (EC 2020a). By 2030, the use of circular materials is to be doubled, and the overall consumption footprint significantly reduced (EU 2020). To track the progress and effectiveness of policy measures in the Member States, the CEAP has now introduced a monitoring framework with new indicators, such as the material footprint or resource productivity (eurostat 2024a).

2.5 EU Taxonomy

The *EU Taxonomy* is the key framework for the EU's plan to channel investment towards sustainable economic activities as a further lever to achieve climate neutrality. The regulation sets out criteria for defining which economic activities are considered environmentally friendly and sustainable (EC 2024k). A distinction is drawn between "eligible" and "aligned" activities. The former are activities that potentially meet the taxonomy's technical screening criteria, while the latter are fully compliant (EC 2021e). These are centered on six climate targets (Figure 19). Large and listed companies are required to report on their percentage of aligned turnover / CapEx / OpEx[7] providing insight into their current sustainable state, but also their future direction (EY 2024). The aim is to enhance transparency and combat greenwashing (EC 2024k). As of November 2024, the taxonomy encompasses sectors such as energy, transportation, and real estate, with the intention to incorporate more in the future (EC 2021e). For taxonomy-aligned companies, this means improved access to green funding, increased investor confidence and a stronger market position (EC 2021e). From 2025, companies will have to disclose their compliance with the “Do no significant harm” (DNSH) principle[8]. One year later, credit institutions will have to publish their alignment of the trading books and fees with the taxonomy (EC 2024l).

2.6 Financing

In order to finance the Green Deal, the European Commission (EC) has pledged to mobilize a minimum of €1 trillion in sustainable investments over the next decade (EC 2024m). Consequently, 30% of the *EU's annual budget* (MFF 2021-2027) and the *Next Generation EU* instrument, devised to facilitate recovery from the COVID-19 crisis, will be allocated to green investments. A core component of this fund represents the *Recovery and Resilience Facility*

[7] Capital Expenditure, Operating Expenditure
[8] To not carry out economic activities that do significant harm to any environmental objective (EC 2021c).

(RRF), obtaining a budget of €672.5 billion. Member States are obliged to invest 37% of the allocated RRF funds in climate-related projects and reforms.

Moreover, the *EU Cohesion Policy* aids regions and municipalities in the implementation of large-scale investments aligned with the Green Deal with at least 30% of the *European Regional Development Fund* and 37% of the *Cohesion Fund* allocated towards climate neutrality (EC 2024m). Furthermore, the EC has devised the *Just Transition Mechanism*, which is anticipated to mobilize at least €55 billion of private and public investment from 2021 to 2027. The aim is to support the regions that are most affected by the green transition. The emphasis is on initiatives such as the reskilling of labor and combating energy poverty (EC 2024w).

The *InvestEU* program offers both funding and an EU budget guarantee to support investments in key areas such as sustainable infrastructure, innovation and social skills (EU 2024a). At least 30% of the investments must be climate related. Furthermore, an additional *Just Transition Scheme* within the program facilitates investments in regions affected by the change (EC 2024m).

Alternatively, the *EU Green Bond Regulation* (EuGB) represents a different way of financing the green transition and defines a voluntary framework for the issuance of bonds by EU / non-EU organizations (e.g., listed companies, government institutions, financial institutions). The aim is to facilitate the allocation of capital to environmentally sustainable projects that align with the EU taxonomy (Debevoise & Plimpton 2024). Consequently, green bonds are prominent in sectors such as energy or buildings (Climate Bonds Initiative 2024). According to the new regulation, a minimum of 85% of the bond proceeds must be allocated to activities that meet the criteria of the EU taxonomy. The remaining 15% may be utilized for activities that have not yet been defined in the taxonomy, if they do not violate the DNSH principle. This flexibility permits issuers in nascent green sectors to access green bonds as a funding option regardless (Debevoise & Plimpton 2024). However, it is bound to strict disclosure requirements

(e.g., pre-issuance fact sheets, impact reports), which must undergo external review (Ashurst 2023; BaFin 2024), offering issuers and investors an increased transparency with reduced greenwashing risks (EC 2021a). Driven by a high demand for green investments, green bonds can have lower interest rates than conventional funding, making them potentially more favorable (KPMG 2015). The EuGB entered into force in December 2023 and will be fully applicable one year later in December 2024 (Debevoise & Plimpton 2024).

2.7 Transparency

In order to track the progress of the green transition while providing investors, consumers and other stakeholders with transparency on the sustainability performance of companies, the EU has adopted three directives in the area of disclosure: the *Corporate Sustainability Reporting Directive* (CSRD), the *Sustainable Finance Disclosure Regulation* (SFDR) and the *Corporate Sustainability Due Diligence Directive* (CSDDD). The first (national transposition: July 2024 (EC 2024d)) requires selected EU companies[9] to disclose how they manage social and environmental risks and their impact on people and the environment. The aim is to harmonize sustainability reporting and reduce costs, with first reports expected in 2025 (EC 2024f). By setting out how financial market participants must disclose sustainability information, the SFDR helps investors allocate their capital in sustainable projects and companies. In this way, the regulation contributes to the EU's goal of attracting private funding for a shift towards climate neutrality (EC 2024u). The CSDDD (national transposition: July 2026) aims to ensure that all major EU companies[10] identify and mitigate the impact of their value chain on human

[9] Requirements (two out of three): Large companies (+€50m net turnover, +€25m assets, +250 FTE); listed SMEs (+€8m net turnover, +€4m assets, +50 FTE); Non-EU companies will also have to comply if they generate a +€150m net turnover in the EU (Normative 2024)

[10] EU Companies: +€450m Global net turnover, +1000 FTE; Non-EU Companies: +450€m net turnover (Deloitte 2024a)

rights and the environment by requiring due diligence and the submission of an action plan by 2027 (EC 2024e).

3 Literature Review

3.1 Historical Context and Purpose of Scenario Planning

Scenario planning is a strategic method for exploring a range of plausible futures in the context of uncertainty. Its various methods are applicable to a set of entities, including companies and political institutions. The aim of this literature review is to provide a consolidation of the most important academic papers on the topic and review the key findings on the principal approaches, their limitations as well as the evolution of scenario planning.

According to Bradfield and Van Der Heijden (2005), the concept of scenario planning has its roots in military strategy, where it was first used by Herman Kahn from the RAND Corporation. He applied scenario planning to anticipate and prepare for possible future events in the context of national defense (Wack 1985). Thanks to Kahn's pioneering work on "thinking about the unthinkable" (1962), Pierre Wack was able to apply this knowledge to corporate strategy. His mission to navigate Royal Dutch Shell through the oil crises of the 1960s and 1970s and to anticipate the oil shocks remains the classic case of scenario planning and provides the first evidence that it can help organizations improve their strategic position.

Throughout the literature, most authors stress that scenario planning is not a tool that can predict the future. Rather, it is a tool that helps to simulate a number of potential scenarios in the future. Schoemaker (1995) highlights the value of scenario planning in facilitating the navigation of uncertainty, enabling managers to identify the key drivers of change. Consequently, scenario planning allows any organization to increase its strategic flexibility. As van der Heijden (1996) claims, it can also facilitate corporate learning by encouraging strategic conversations about the future. This encourages participants to consider possibilities beyond those typically addressed

in conventional problem-solving and thereby makes organizations more agile and resilient to future challenges in the long term.

The relevance of scenario planning nowadays extends beyond the realm of business and has notable applications in public policy, healthcare and environmental management (Ramírez and Wilkinson 2016). Peterson, Cumming, and Carpenter (2003), for example, examine the use of scenario planning in the context of climate change adaptation and show how it facilitates the formulation of adaptive strategies to cope with potential environmental change.

3.2 Principal Approaches of Scenario Planning

Based on Bradfield and Van Der Heijden (2005), three dominant methods of scenario planning have emerged over the years, each with its own characteristics: The *Intuitive Logics School*, *La Prospective* and the *Probabilistic Modified Trends School* (PMT).

The *Intuitive Logics School* approach, first articulated by Wack (1985) and later refined by Schwartz (1991), is the entirely qualitative of the three and has emerged as the most common in business settings. It is based on narrative scenarios and focuses on understanding and identifying the key drivers of change. Scenario building is achieved through structured workshops in which the identification of key uncertainties (KUs) and the formulation of plausible future narratives are critical steps. The principal objective is to challenge established mental models and expand strategic thinking. This technique is especially valued for its flexibility and adaptability in contexts where quantitative data is scarce or unreliable (Schwartz 1991).

La Prospective, which originated in France, was first developed by Michel Godet. This approach is more formal than Intuitive Logics and uses a combination of qualitative and quantitative data to construct potential scenarios. The main purpose of La Prospective is to help organizations formulate long-term visions through a systematic examination of trends, risks and potential disruptions (Godet 1991).

The *PMT* approach stands out from the range of scenario planning methodologies being the only purely quantitative technique. Its origin is rooted in statistical and probabilistic concepts, which is why it attempts to assign probabilities to potential future events. It uses historical data and trends as a basis and is known as the most analytical and data-driven of the three dominant schools.

3.3 Critiques and Evolution of Scenario Planning

Despite the many advantages, critics such as Goodwin and Wright (2001) have identified some limitations of the various approaches to scenario planning.

On the one hand, they point out that qualitative methods, such as the *Intuitive Logics School*, often lack the precision for which quantitative forecasting is known. As Bradfield and Van Der Heijden (2005) analyzed that the effectiveness of scenario planning depends on the quality of the scenarios, a potential limitation could be that scenarios based on narratives are too subjective. However, as the willingness of decision-makers to engage with scenarios is equally important, it is crucial that decision-makers do not disregard scenarios because they challenge deeply ingrained mental models or even power structures of the organization.

On the other hand, the *PMT's* quantitative approach is accused of being overly deterministic and relying too much on past trends to predict the future, thus failing to account for unforeseen or disruptive changes.

As most organizations' strategic environment is in a state of constant evolution and increasing complexity, it is inevitable that scenario planning methods also evolve in response. Krupp et al. (2014) specifically recommend the incorporation of new tools such as big data, artificial intelligence (AI) and computational modeling to increase the rigor and relevance of scenario planning. This approach could lead to the creation of more dynamic, data-driven scenarios that more accurately reflect the complexities of the modern world. In addition, Ramírez and

Wilkinson (2016) present a perspective on scenario planning as a way to help organizations prepare for the future, but also to challenge their understanding of the present.

In conclusion, scenario planning continues to be a central technique for strategic consideration in environments subject to uncertainty. It brings the ability to consider many plausible future scenarios, creating a useful tool in multiple sectors that can benefit from enhancing organizational resilience.

4 Methodology

The following section provides an overview of the scientific methods employed in the preparation of this report. It offers an outline of the principal stages of the scenario planning methodology and a comprehensive description of the procedures and other frameworks and instruments utilized. Additionally, it presents a summary of the data collection process and includes a detailed illustration of the client's involvement in this project.

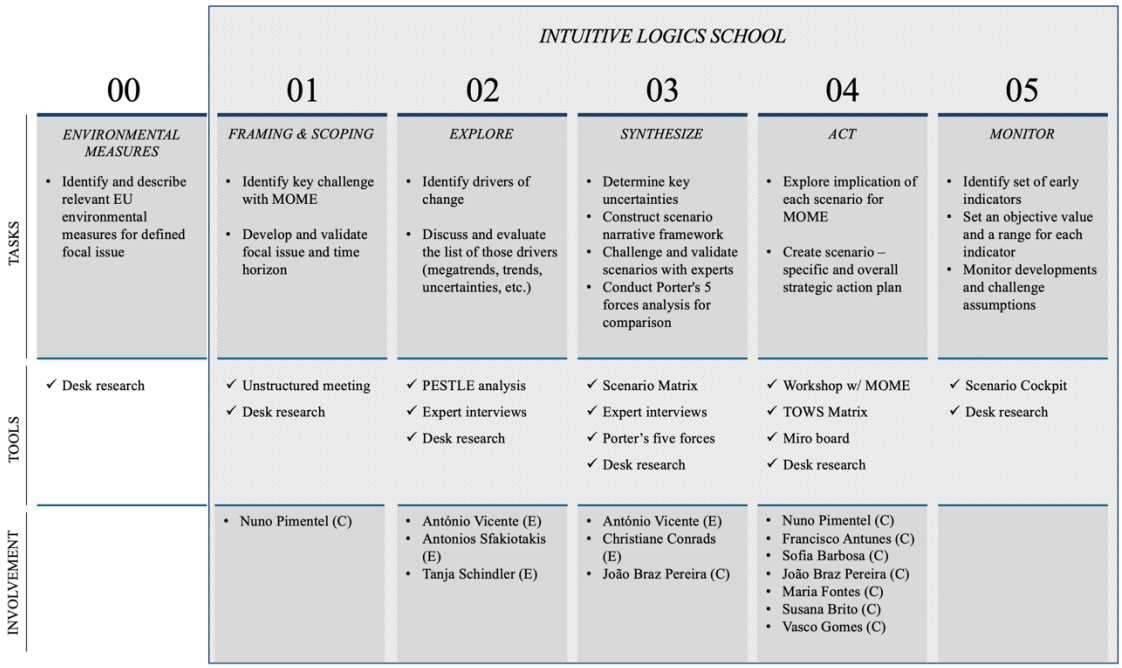

Figure 1 - Methodology Overview | (E): Expert, (C): Company | Source: Own Creation

4.1 Research Design and Implemented Tools

The real estate industry requires significant change to cope with the environmental challenges of the future (Walacik and Chmielewska 2024). Given the fact that MOME operates in this field, a significant part of this work project is dedicated to researching and identifying the key drivers of change that shape this industry and thereby enable the company to keep pace with changing trends and increasing uncertainties.

After analyzing the merits and drawbacks of the different scenario planning approaches outlined in the Literature Review chapter, the research team decided to adopt the *Intuitive Logics School* method to address the focal issue within the defined time horizon. The main reason for this choice revolves around the participatory nature of this approach that permits the incorporation of valuable insights from the partner company, thereby ensuring that the research is aligned with its perspective. Yet, the chosen method also allows for flexibility in handling uncertainty as it focuses on discussing multiple plausible futures while also fostering creativity by employing scenarios based on narratives (Bradfield and Van Der Heijden 2005). The input of the partner organization was complemented by the involvement of industry- and institutional experts through interviews at different stages of the process, which proved invaluable during the examination of the five phases of the *Intuitive Logics School*.

Phase 1 (Framing and Scoping): The first phase of the collaborative field lab was kicked off by an initial working meeting on September 6, 2024. The aim of this first discussion was to align MOME's current challenges and research interests with the student team's proposed hypotheses, supporting questions, and initial idea of the project design and implementation. As a result of previous desk research and this exchange of ideas, the focal issue and time horizon were determined and validated by the supervisor, the client's CEO Nuno Pimentel, and the project team. This set the stage for the following phases and enabled the project team to continue and narrow down its research.

Phase 2 (Explore): With the objective of identifying the industry's patterns of change and the factors that impact the implementation of the EU's sustainability measures, the second phase was initiated by individual, independent research on the focal issue. By scanning relevant literature, such as journal- and news articles as well as reports from political institutions, the first goal was to get an overview of the most influencing trends, megatrends and predetermined elements. Rather than treating predetermined elements as static constants, the research team decided to integrate these elements directly into the broader discussion of trends and megatrends. This allows their influence to be seamlessly reflected alongside dynamic changes, providing a more coherent and realistic understanding of the factors at play. Next to that, the PESTLE framework was applied to collect and organize the most important uncertainties in a structured manner. This tool proved particularly suitable as it comprehensively considers the main dimensions of the industry's external environment (Yüksel 2012). The individual members' findings were then discussed and consolidated during a team-internal workshop to conclude the phase.

Phase 3 (Synthesize): The selection of the above-mentioned uncertainties and especially their ranking from 1-10, based on their level of uncertainty and impact, were both discussed and validated with three different interview partners (Figure 1). As the initial classification of the uncertainties stemmed from desk research conducted by the project team, the discussions and interviews with renowned experts added an additional, valuable layer in terms of robustness. After validating the list of uncertainties and their respective classification, the next step consisted of determining the KUs for the subsequent scenario development. Considering that all upcoming phases depend on this decision, it was of utmost importance to ensure that the resulting scenarios comply with the following criteria: *Plausibility, Internal Coherence, Relevance, Divergence, Engagement and Actionability* (Wright and Cairns 2011).

Given these prerequisites, the area of interest within the upper right quadrant of the uncertainties matrix (Figure 3) resulted from applying a combined threshold of 8 between both the level of uncertainty and the impact on the focal issue. The uncertainties meeting this requirement were then subject to controls of interdependency among each other to ensure that they are suitable for becoming potential KUs.

Additionally, uncertainties with commonalities, intersections or supposed correlation were merged into clusters to avoid repetitiveness. Upon completion of these steps, the two KUs with the highest combined ranking served as the two axes of the scenario matrix. This matrix consists of four quadrants that are generated by assigning one KU to the horizontal- and one to the vertical axis. Thereby, each quadrant represents a distinct scenario with a unique narrative behind.

To ensure its practical relevance and internal consistence, the four scenarios were validated by an industry expert and the client organization. The project team's decision to apply a uniform approach to all narratives and conclude them by analyzing the real estate industry's attractiveness through a Porter's Five Forces framework is supposed to maintain comparability and enable the reader to differentiate between the scenarios. The outcomes were presented and discussed during the second official working meeting with the supervisor and the client's CEO Nuno Pimentel on November 13, 2024.

Phase 4 (Act): The fourth phase of the work project commenced with a collaborative workshop with the partner organization on November 27, 2024. Its aim was to present the finalized scenarios to MOME's core team and jointly derive strategic implications for each of the four narratives. For that purpose, the project team considered a TOWS matrix to be the most suitable tool for this exercise, provided that by comparing internal strengths and weaknesses with external opportunities and threats, the TOWS matrix enables specific strategies to be derived that are tailored to the company's particular situation. Hence, the TOWS matrix helps to make

strategic decisions that take both internal and external factors into account (Derr, Georg, and Heiler 2021).

To conceptualize the approach, the project team created a Miro board which served as a visual workspace to collectively brainstorm and gather ideas. The first step consisted in defining MOME's strengths and weaknesses together. Subsequently, the project team introduced each scenario's specific opportunities and threats that were prepared beforehand to guide the discussion. Based on the examined strengths and opportunities, as well as the opportunities and strengths identified, the aim was to commonly answer the following questions:

- *How can MOME leverage strengths to benefit from opportunities and overturn threats?*
- *How can MOME overcome weaknesses to benefit from opportunities and avoid threats?*

The drawn conclusions contributed substantially to the derivation of specific strategic implications for the distinctive scenarios, as well as an overall action plan for MOME. Given the time restriction of the workshop, the project team additionally conducted further desk research and made use of the information gathered through the expert interviews from previous phases to complete the analysis and provide additional strategic recommendations.

Phase 5 (Monitor): The final phase of the field lab focused on the identification and monitoring of early indicators. These indicators, identified by the research team, serve as critical signals to guide MOME in assessing which scenario is likely to unfold and ensure that the organization remains vigilant and adaptable to emerging changes in its evolving landscape. Constant monitoring is thus required to capture both gradual trends and sudden changes to anticipate future scenarios. The tool that proved to be the most suitable for this purpose is the Scenario Cockpit as its visual representations aid in communicating strategic actions to stakeholders, fostering a shared understanding and facilitating collaborative decision-making.

4.2 Strategic Collaboration: Client and Expert Involvement

Irrespective of the work project's phase, the input from both renowned experts and the client organization has been of great support for the research team and contributed significant additional value. To address MOME's research interests and the focal issue within the agreed time horizon, the insights received from third parties encouraged the team to challenge the status quo and take new perspectives.

During the initial stage, *Framing & Scoping*, no experts were involved in defining the cornerstones of the field lab, namely the focal issue and time horizon. The phase consisted of an unstructured meeting with the client organization's CEO Nuno Pimentel to understand MOME's strategic priorities and research interests for the upcoming years. This information exchange based on informal questions prepared beforehand by the project team culminated in the validation of the project scope.

In contrast, the next two phases of the project, i.e. *Explore* and *Synthesize*, included several expert interviews and validations of the project team's findings and main assumptions (Appendix 1). António Vicente (Deputy Head of Representation at the EC), Tanja Schindler (Foresight Advisor to the EC) and Antonios Sfakiotakis (Policy Coordinator at the Secretariat General – European Green Deal Unit) assisted the team in ranking the uncertainties according to their level of impact and uncertainty, as well as in the selection of the KUs and scenario matrix validation through semi-structured interviews. Likewise, Christiane Conrads (Partner and Global Real Estate Leader at PwC) participated in a semi-structured interview and approved the different scenarios and their implications on the real estate industry. João Braz Pereira (Head of Knowledge and ESG Initiatives at MOME) supported by sharing industry insights and valuable feedback during a semi-structured interview which was implemented to more accurately address MOME's research interest.

To examine MOME's strengths, weaknesses, opportunities and threats for each scenario and derive strategic recommendations in response, the *Act* phase consisted of a two-hour collaborative workshop with seven members of MOME's core team (Appendix 2). It served to answer the last part of the project's challenge set out in the title, namely *'Exploring risks, opportunities and strategies for MOME'*.

During the final *Monitor* stage of the project, no experts were consulted. However, all five phases highly benefited from the valuable insights received while conducting the work project.

5 Phase 1 – Framing & Scoping

The initial phase establishes the foundation for scenario planning by outlining the focal issue and the time frame of the project (Schwartz 1996). The focal issue defines the contextual and transactional scope of the project. It is important to ensure that the focal issue is specific enough to enable strategic decisions, yet broad enough to allow for exploration. A clearly stated focal issue enables a structured and comprehensive analysis of plausible futures, thereby enhancing clarity and focus in the decision-making process (Chermack 2011; Bradfield and Van Der Heijden 2005). The time horizon defines the temporal scope of the scenario planning process and ensures that it is aligned with the focal issue and the organization's objectives. An optimal time horizon should be long enough to allow for fundamental changes and distinctive scenarios, but short enough to ensure practical relevance for strategic decisions (Schwartz 1996; Ramírez and Wilkinson 2016). It therefore enables the organization to anticipate future opportunities and challenges and to strengthen its ability to adapt.

5.1 Focal Issue

With 40% of the EU's total energy consumption, the European real estate sector is the single largest energy consumer in Europe and is responsible for a significant carbon footprint with

36% of energy-related GHG emissions. It is therefore evident that the sector has a key role in reducing Europe's emissions (EC 2022).

Concurrently, the EU has declared itself to be a global leader in the creation of a sustainable world. With the Green Deal, a package of targets and measures to achieve climate neutrality by 2050 has been declared, which will significantly transform every sector and industry (EC 2024v). The huge emission impact of the real estate industry highlights the crucial role it will play. However, while many of the Green Deal measures have already been passed into law, the actual implementation faces major challenges and uncertainties (EC 2021b). The impact of climate change, technological disruption through AI, growing geopolitical tension, migration and demographic change are just a few of the factors that have the potential to significantly influence the EU and therefore the measures of the Green Deal (Eurofound 2024).

To explore the future development of the European real estate industry, it is essential to understand the dynamics of implementing EU sustainability measures. The interplay of these factors will not only determine the industry's ability to align with climate neutrality goals but also its capacity to remain competitive and resilient in an evolving environment. This necessity leads to the focal issue of this study: '*Future of EU environmental directives and regulations and their implications for the European real estate sector*'.

To investigate the focal issue in depth, a framework was constructed using the following supporting questions:

- What are the main obstacles faced by the EU in coordinating the green transition amid a rapidly evolving global landscape, shifting demographics, rising populism, and changing migration dynamics?
- How can real estate companies sustain their competitiveness while complying with the increasing regulatory measures imposed by the EU?

- How are EU environmental directives and regulations driving changes in construction methods, materials, and building technologies?
- What are the implications of the Green Deal on the availability and development of affordable housing across the EU?

5.2 Time Horizon

Upon first consideration, the 2050 target established by the Green Deal appears to offer a reasonable timeframe for addressing this focal issue. Nevertheless, an examination of the rapidly evolving circumstances within and surrounding the EU reveals that the initial timeframe is too expansive to provide a sufficient foundation for analyzing developments (EC 2024j; Schwartz 1996).

The Fit for 55 represents a pivotal initial milestone in the pursuit of the Green Deal, delineating tangible objectives and measures that must be implemented and achieved by 2030 in order to facilitate the realization of the 2050 objective (EU 2024c). Despite some of the measures already being codified into law, there remains significant uncertainty regarding the extent to which they will be implemented by 2030. This timeframe aligns with MOME's primary objective of providing 1,500 residential units by 2030. An objective that is directly aligned with the company's mission of providing affordable and sustainable housing and is thus significantly influenced by the implementation of EU measures until 2030.

The project team therefore determined that the time horizon until 2030 serves as an ideal reference point, as it accommodates sufficient uncertainties and changes in EU measures, as well as their impact on the real estate industry. Simultaneously, this timeframe facilitates the evaluation and scenario development through specific objectives, which ensure meaningful and reliable scenarios for MOME.

6 Phase 2 – Explore

Phase 2, *Explore*, aims to deepen the understanding of the research topic by systematically scanning the broader environment to identify external drivers of change that could directly or indirectly shape the future development of the EU environmental directives and regulations and their impact on the real estate industry. In the *Intuitive Logics School's* Phase 2, predetermined elements are also analyzed as events that are nearly certain to occur or have already taken place, but whose consequences have not yet fully unfolded (Wack 1985). These elements are often treated as static constants; however, this paper takes a different approach by embedding these elements within the discussion of trends to more seamlessly reflect the underlying dynamics. This captures the interconnected drivers influencing the future, providing a more comprehensive understanding of the forces at play and the pathways they may create.

Individual Part – Elena Cox

6.1 Megatrends & Trends

6.1.1 Megatrend 1: Climate Change

Trend I: Increased Societal Environmental Awareness

Trend II: Green cities

6.1.2 Megatrend 2: Global Realignment – Demographic and Political Shifts

Trend III: Migration & Political Shift

Trend IV: Increasing Fragmentation of Globalization

6.1.3 Megatrend 3: Digitalization

Trend V: Remote Work

Trend VI: PropTech (Property technology)

6.1.4 Megatrend 4: Urbanization

The megatrend *'Urbanization'* describes a transformation within societies. It can be observed on a global level and is marked by a rapid and accelerated shift of population to urban areas as well as a steady expansion of cities. More than 56% of the total world population currently lives in cities, a significant increase from one-third in 1950. By 2050, this figure is expected to reach about two-thirds (UN, n.d.) (Figure 20), with Asia and Africa being driven by migration from rural areas. Populations in these areas are primarily seeking better living conditions and economic opportunities in urban settings (PwC 2016). Meanwhile, in Europe 75% of the population already lives in cities (Figure 21) (Statista 2023), which is expected to increase to around 83.7% by 2050 (EC 2020e).

Well-structured urbanization has the potential to contribute positively to societal well-being (Correia et al. 2024). However, this trend also poses significant challenges. In more developed economies and older cities in the developing world, infrastructure will be stretched to its limits and beyond as populations grow. In the developing world, rapidly expanding cities will require significant (smart) infrastructure investment simply to accommodate the rate at which they are growing, and people are migrating. In addition, a large proportion of the population lacks access to basic infrastructure (Zhang 2015). Although cities occupy only 2% of the earth's land surface, their activities consume more than 75% of the world's material resources (WEF 2022). Moreover, poorly planned urbanization is a major contributor to rising CO2 emissions (Xiaomin and Chuanglin 2023). This suggests that unplanned urban growth can have serious consequences for both public health and the environment. In addition, loss of green space and fertile land, housing shortages, increased traffic and pollution are other related problems that are likely to occur (Evers, Katuric, and van der Wouden 2024).

Cities play an important role in developing smart, sustainable and inclusive economies through urban renewal projects (UN-habitat 2021). To fully realize their benefits, the focus must shift

to accommodating rapid population growth and creating vibrant urban environments that contribute positively to society and the planet. Investing in efficient infrastructure, strengthening urban resilience and promoting inclusive urban policies can transform growing cities into engines of sustainable development.

Trend VII: Gentrification

'Gentrification' is the process of renovating and refurbishing working-class or low-income neighborhoods to make them more appealing to wealthier residents or businesses (Tulier and Allen 2019). This typically results in elevated property prices, rental rates, and cost of living, which displaces long-term residents who can no longer afford to stay. Although it can result in enhanced facilities and economic revival, there are concerns about how it might affect social cohesiveness as well as the neighborhoods' cultural identities. This duality has sparked ongoing debates among policymakers, who remain divided over its implications for social justice and urban development (Smith 2023).

The drivers of gentrification involve a combination of political, social, and economic factors. People with higher incomes get drawn to urban areas due to economic shifts like the growth of high-tech industries or the inflow of capital into urban real estate markets (Zuk et al. 2017). The phenomenon is further fueled by social changes, including a growing preference for inner-city, cosmopolitan lifestyles (Florida 2017). Moreover, the implementation of gentrification projects in aging neighborhoods is further encouraged by government policies such as tax breaks for real estate developers (Hwang and Sampson 2014).

To address these challenges, cities must promote economic inclusion. They must adopt equitable urban development strategies that both prioritize affordability and mitigate the risk of displacement. The implementation of targeted policy tools can ensure that gentrification contributes to long-term urban success while preserving social equity and inclusion.

Trend VIII: Collaborative Living Models

'Collaborative living models', including co-living and co-housing, are becoming increasingly popular as an innovative approach to changing urban lifestyles and housing needs. They are particularly appealing to professionals, students and individuals looking for an affordable, convenient and socially connected housing option (Jarvis et al. 2016).

The rise of co-living highlights a shift in real estate trends, with developers increasingly adapting their projects to meet these preferences. Co-living spaces offer flexible lease terms, affordability and shared amenities, making them especially attractive to those seeking convenience and community (Corfe 2019). This trend highlights the importance of housing innovation in addressing challenges such as population density and social isolation (Hacke, Muller, and Dutschke 2019). In contrast to traditional models, co-living spaces encourage interaction and support networks through the direct integration of shared kitchens, lounges, co-working spaces and community-building events (Steding 2019). They address urban housing needs by offering fully furnished private rooms or studios alongside shared amenities such as co-working spaces, gyms and terraces (Bergan and Power 2024). At the same time, co-housing offers a more suburban or rural alternative by clustering privately owned units around shared spaces, where residents can often manage their own communities (Beck 2019).

As interest in collaborative housing options continues to grow, it is foreseeable that they will play an important role in the future of urban development. Their long-term success will depend on their ability to scale in different urban contexts, while remaining affordable, inclusive and adaptable to changing societal needs.

6.2 Uncertainties

In the final stage of the *Explore* phase, the uncertainties regarding '*the future of EU environmental regulations and directives*' were systematically analyzed. Uncertainties are unpredictable factors that have a significant influence on the focal issue, often by shaping a

range of different possible future scenarios (van der Heijden 1996). Through a combination of desk research and an internal team workshop, 12 uncertainty factors were identified and defined (Appendix 3). These uncertainties were filtered into the categories of the PESTLE framework (Figure 2) which suggests a structured approach to identifying and understanding relevant external factors (Buye 2021).

Institutional Stability & Unity of the EU: The EU is a dynamic institution, constantly adapting to changing circumstances both inside and outside the EU. As a result, there is uncertainty about the future institutional stability and cohesion of Member States. While a stable and united EU enables coherent development and implementation of environmental policies, instability and disagreement can lead to delays or even blockages. Cohesion also influences consistency of implementation, which is a key factor in efficiency and the emergence of internal conflict (EC 2024j).

Political Right Shift of Member States: Right-wing populist parties tend to prioritize sovereignty and economic concerns over EU energy and climate policies (Huber et al. 2021). In power, they could counteract national and EU policies with political instruments that can reduce the overall impact of policies and make it more challenging to achieve environmental goals. In particular, the election years of 2025 and 2026, when influential countries such as Germany, Sweden, Spain, Italy and Poland vote, will provide insight into the extent to which right-wing populist parties influence the implementation of environmental measures (Bundestag 2024).

Geopolitical Stability: Countries with stable political environments, where terrorism and political violence are minimal, often demonstrate a stronger commitment to social and environmental causes (Costantiello and Leogrande 2023). However, geopolitical risks, such as military conflicts, sanctions or blockades can disrupt the focus on environmental initiatives across the EU. Such events can create uncertainty over resources and cause governments to

shift focus and funding away from sustainability efforts, making it harder for them to achieve their environmental goals (Khan, Khurshid, and Cifuentes-Faura 2023).

Economic Situation: Economic fluctuations can create uncertainty and shape how regulations are prioritized and carried out. There is generally increased support for improving environmental practices and advancing sustainability initiatives during periods of economic growth, when more financial resources are available, and investor confidence is high (Delova-Jolevska et al. 2024). However, during economic downturns or financial crises, the focus can shift away from long-term environmental goals as other political priorities take over, and investor confidence drops, which can hinder or delay sustainability efforts (Geels 2012).

Financing Conditions and Inflation: Financial conditions and inflation can affect the investment flows into environmental measures. When financing conditions are favorable, characterized by low interest rates and a stable and controlled inflation, there's a low borrowing cost which expands the willingness to invest in sustainable initiatives. Conversely, an increase of the interest rates and inflation raises the cost of borrowing and therefore decreases investment in ambitious sustainable projects due to the reduced availability of funds (Busch, Bauer, and Orlitzky 2015).

Supply Chain Stability: The EU's green transition is critically reliant on specific components and raw materials[11] essential for sustainable technologies (Christou and Carrara 2024). As the EU mainly imports these resources from abroad, disruptions in these supply chains can delay the timely implementation of environmental measures and significantly increase the cost of the transition. In addition, they could lead to a loss of transparency in supply chains, jeopardizing the assurance of sustainable standards (Nobletz, Svartzman, and Dikau 2024).

Societal Acceptance: Surveys show large regional and social differences in the acceptance and support for more sustainable and environmentally responsible practices. Further discrepancies

[11] Such as Lithium, Cobalt, Nickel, Copper, Manganese and Rare Earth Elements (RRE).

arise in the degree to which citizens are willing to adapt their lifestyles. These are accompanied by a growing mistrust of national and EU institutions (PwC 2024a; Jon Henley 2023). A lack of social acceptance can cause politicians to counteract environmental measures and can deter companies from investing in sustainable practices (EC 2021b).

Qualified Workforce Availability: To cope with the challenges associated with the green transition, companies need to ensure large-scale recruitment and sufficient investment in reskilling and upskilling of their employees (EC Directorate General for Economic and Financial Affairs 2022). The main challenges include increased reporting requirements such as CSRD, a structural lack of construction, roofing and electrical workers as well as bureaucratic hurdles to employing foreign manpower (Brucker Juricic, Galic, and Marenjak 2021). Therefore, EU Member States are tasked to identify gaps in their workforce and respective skillsets within the frame of the RED. This is because qualified professionals can significantly impact the implementation of environmental initiatives and either expedite or slow the achievement of EU targets (Bezerra, Martins, and Macedo 2024).

Mass Migration Patterns: Recent data (eurostat 2024c) show a steady increase in first-time asylum applications in the EU. However, it is uncertain whether this trend will continue or be mitigated by measures such as the EU Migration Pact (EC 2024q). According to the Eurobarometer, immigration is the second biggest concern of the EU population at 8%, ahead of the environment and climate change (EC 2024r). A heightened public attention can put pressure on policy makers and influence the setting of government priorities (Bundesinnenministerium 2024), potentially reducing the importance of the green agenda.

Technological Innovation: The EU's capacity and the development for innovation will influence both the effectiveness and the long-term viability of environmental policies. Incorporating new technological paradigms is increasingly seen as a driver of resource efficiency. The incorporation of innovative technologies acts as a driver that enhances resource

efficiency (Chatzistamoulou and Koundouri 2024) and can facilitate the transition to a decarbonized economy (Fleiter 2019). However, the definition of innovation implies uncertainty, as its potential value may or may not be realized in the future (Jalonen 2011).

Climate Change Intensity: In recent decades, Europe has been affected by a series of extreme weather events, including droughts, forest fires, and floodings, which are expected to increase in the future. An increase is likely to drive greater public awareness and an elevated focus on the environment, potentially prompting substantial policy shifts (Davidsson 2020). The catastrophes do not only pose risks to human health, but they also result in substantial economic losses (approx. €740 billion from 1980 – 2022 in the EU) (EEA 2024a). Moreover, enormous costs may also lead to a reallocation of EU financial resources towards warning systems, protection measures and reconstruction funds (Davidsson 2020; EC 2021d).

Project Backlog: Given that renewable energy licensing is a lengthy process and usually takes years, the EC tasked the EU Member States to identify, evaluate, and denominate suitable *go–to areas* that are available for renewable energy projects to accelerate the expansion. Despite the commission's effort, the current levels are not consistent with the aspired plan (EC Directorate General for Communication 2022). To date, projects are still evaluated on a first-come, first-served basis, which means that the most mature projects - i.e. those that are most likely to be realized, cannot be prioritized by public administration (WindEurope 2024). This causes delays, which can be significantly reduced by streamlined administrative processes, less bureaucratic hurdles and effective stakeholder engagement (Silva, Sánchez-Hernández, and Carvalho 2023; Marques et al. 2021).

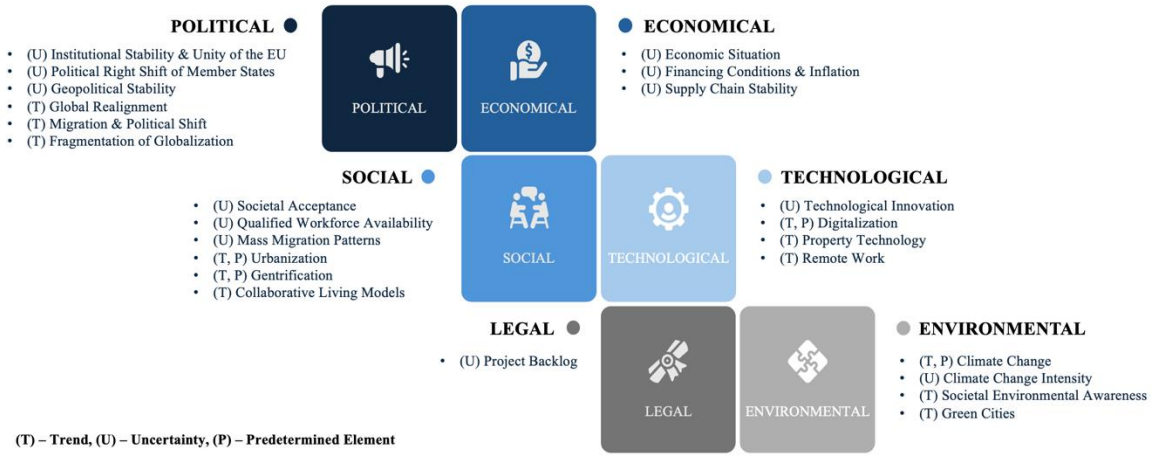

Figure 2 - PESTLE | Source: Own Creation

7 Phase 3 – Synthesize

The purpose of the *Synthesize* phase is to identify the two KUs, which are defined by the events or forces whose outcomes are the most uncertain and that could have the highest impact on the focal issue within the time horizon. These two critical uncertainties are then mapped in a matrix and will serve as the basis for the scenario planning exercise (Schoemaker 1995). For the exact procedures of the uncertainty mapping and the scenario matrix development please refer to the Methodology (s. Chapter 4.1), for the ranking of all uncertainties, refer to Appendix 3.

7.1 Grouping & Identification of Key Uncertainties

The critical uncertainties resulting from the defined area of interest were *Supply Chain Stability*, *Geopolitical Stability*, and *Qualified Workforce Availability*. By grouping uncertainties with chronological and causal relationships, one can ensure that each cluster remains sufficiently independent of the others (Wright and Cairns 2011). In this way, the distinctive impact on the focal issue can be clarified. The critical uncertainty of *Supply Chain Stability* is increasingly driven by *Geopolitical Stability*. In an interconnected, globalized world, rising tensions between nations can lead to supply chain disruptions that restrict access to goods and resources. These disruptions often take the form of trade restrictions, sanctions or regulatory barriers, which can also be described as the weaponization of the supply chain to achieve political objectives

(Aronow 2024). Recent international conflicts underscore the direct link between geopolitical dynamics and supply chain vulnerabilities (KPMG 2022).

Conversely, *Qualified Workforce Availability* represents an independent critical uncertainty. Factors such as the reskilling of existing personnel or the bureaucratic hurdles related to labor mobility in terms of the green transition are not influenced by potential supply chain disruptions or geopolitical stability, since they are mainly restricting the availability of goods and materials. Thus, the analysis identified two distinct clusters. The first cluster encompasses *Geopolitical Stability* and *Supply Chain Stability* (named after the chronologically last), while the second cluster consists solely of *Qualified Workforce Availability* (Figure 3).

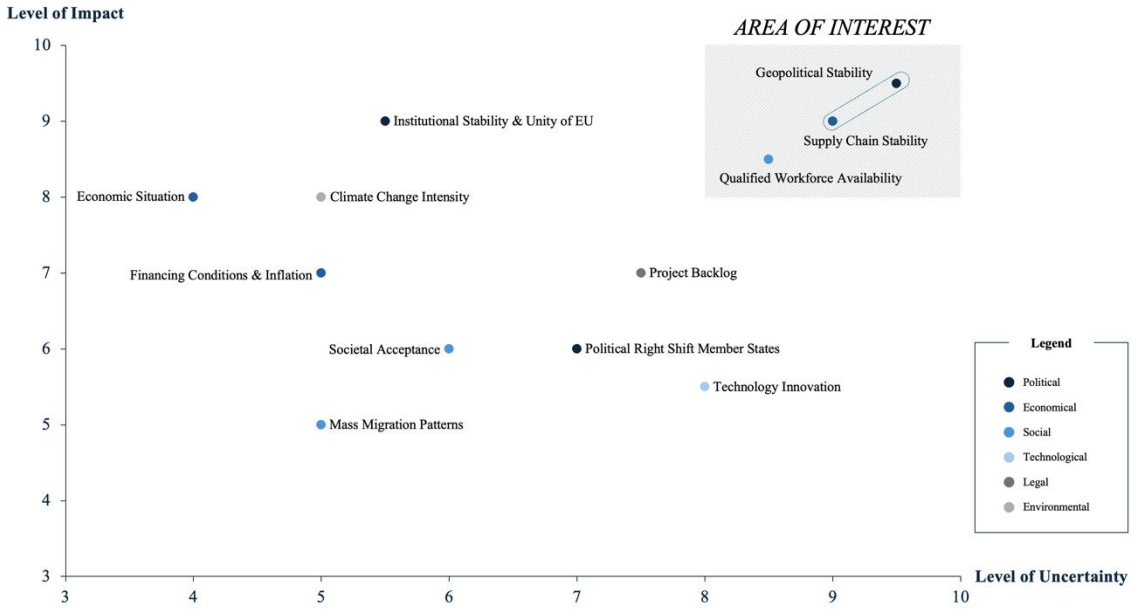

Figure 3 - Uncertainties Mapping | Source: Own Creation

7.1.1 Key Uncertainties

Key Uncertainty 1: Supply Chain Stability

High Impact: The EU's green transition is inextricably linked to increasing the share of renewable energies in the energy mix. However, the introduction of renewable technologies for energy production is strongly linked to imports, as the EU relies heavily on external suppliers for solar panels, lithium batteries, wind turbine components, and the CRMs necessary for its production (EC 2023c). Given the limitations of the EU's own procurement and production

capabilities, there is a risk of significant gaps in the supply of renewable energy (IEEP 2024). The reduction of the share of fossil fuels in the energy mix would not be possible, with serious consequences for the environment, society and the economy. Consequently, a decelerated and less stable inflow would result in a significant delay to the green transition and in a substantial increase in cost (IEA 2023). Serious disruptions would even make it impossible to implement the measures as currently planned.

High Uncertainty: The significant uncertainty surrounding the stability of the supply chain originates from the EU's reliance on imports and refining of CRMs and technologies from only a few countries with which there has been a history of repeated geopolitical tension in recent times. China is the dominant producer of six of the ten most production-concentrated CRMs, while Russia is the second largest producer in three of them (Kowalski and Legendre 2023). With regard to heavy rare earths, which are essential for the development of renewable energy technologies and especially electric vehicles, the EU currently relies on China for 100% of its supply (EC 2024g). Other key suppliers of CRMs are the Democratic Republic of Congo, Peru, South Africa, Indonesia and Australia. In all ten of the most important CRMs, production is concentrated in a maximum of two countries, which account for at least 70% of global production (Kowalski and Legendre 2023). Geopolitical tensions, especially with China, have in the past led to artificial disruptions in supply chains. The export ban on magnet production technologies announced in 2023 as a means of exerting pressure on the US, the export restrictions on gallium and germanium announced in July and the most recent export ban on three critical raw materials to the US in December 2024, serve to illustrate this point (Pickles 2023; Seaman 2024; GLOBSEC 2024). The current extremely tense geopolitical situation, as well as specific EU conflicts with China, such as its close cooperation with Russia and an ever-escalating trade war, has led to heightened political tensions between the EU and China. These

tensions are reaching levels not seen in decades and pose significant risks to global supply chains (Xiatong 2024; CB 2024) (Figure 23).

Key Uncertainty 2: Qualified Workforce Availability

High Impact: To realize the full potential of the green transition, the EU needs to close the skills gap as the availability of a sufficiently qualified workforce significantly impacts the achievement of climate targets. An insufficient number of skilled labor force could hamper the EU's transition to a green economy and lead to delays in the implementation of the European Green Deal, especially in high-demand sectors such as renewable energy and construction. This skills gap could lead to economic disruption and job displacement, especially in carbon-intensive industries, while exacerbating regional and demographic inequalities. In addition, a lack of readiness in workforce development could drive up economic costs as labor markets struggle to keep pace with the demands of the green transition (EC Directorate General for Economic and Financial Affairs 2022). Thus, the existence of skilled workers exerts influence on two crucial dimensions of the measures' implementation, i.e. time and costs, and is hence to be classified as highly impactful.

High Uncertainty: The degree of uncertainty surrounding the *Qualified Workforce Availability* is highly affected by the EU's acute shortage of technical workers and other skilled professionals. The mentioned transition could require over 1 million new jobs by 2030, with jobs in the renewable energy sector and other clean energy technologies growing faster than in other sectors (European Labour Authority and Fondazione Giacomo Brodolini 2024; CEDEFOP 2021). Yet, it remains unclear to what degree the EU will tackle the bureaucracy regarding effectively employing workers from abroad. Time loss in this respect results from ongoing difficulties in recognizing foreign diplomas. Although the EU has a framework for the mutual acknowledgement of professional qualifications, it does not cover all professions or countries outside the EU (EC Directorate General for Employment, Social Affairs and Inclusion

and ECORYS 2016). This is complemented by complex work permit and visa procedures. Each Member State has its own requirements, leading to inconsistencies and making it difficult for employers to recruit workers from outside the EU in a timely manner (European Court of Auditors 2024). Thus, both the bureaucracy associated with hiring foreign workers and the time needed to diligently train workers adds a considerable level of uncertainty to the implementation of the EU's sustainability measures.

7.1.2 Scenario Matrix

The scenario matrix was built by combining the two KUs: *Supply Chain Stability* and *Qualified Workforce Availability*. The integration of both uncertainties – and the definition of the two opposing and extreme spectrums of each axis – allows for the emergence of four distinct scenarios. Each scenario results as a unique combination of factors that impact the future of the EU environmental regulations and directives.

The first axis represents the *Supply Chain Stability* and is defined by the following spectrums: Spectrum 1, which addresses an '**Unstable Supply Chain'** and is characterized by an environment of geopolitical tensions, resulting in CRMs shortages and increased prices due to tariffs. Contrarily, spectrum 2 consists of a **'Stable Supply Chain'**, where the EU maintains healthy relationships with key trade partners, thus ensuring a secure and stable supply of CRMs without shortages or imposed tariffs. The second axis, *Qualified Workforce Availability*, encompasses the subsequent spectrums. Firstly, spectrum 1 embodies a '**Scarcity of Qualified Workforce**' mainly caused by a lack of talent in the EU and strict immigration policies. In contrast, spectrum 2 is classified as an **'Availability of Qualified Workforce'**, foreseeing the EU has been able to address the skilled workforce gap.

As a result, the four scenarios that arise from the combination of two different spectrums of each axis are the following: **'Voltage Revolution', 'Digital Backbone', 'Efficiency Gambit' and 'Broken Foundations'**. The scenario matrix helps guarantee that all scenarios are distinct

enough while covering all possible future factors and combinations of the KUs that could impact the focal issue (Figure 4). Moreover, each scenario provides a descriptive narrative that envisions the possible real-life challenges and opportunities by the specified time horizon.

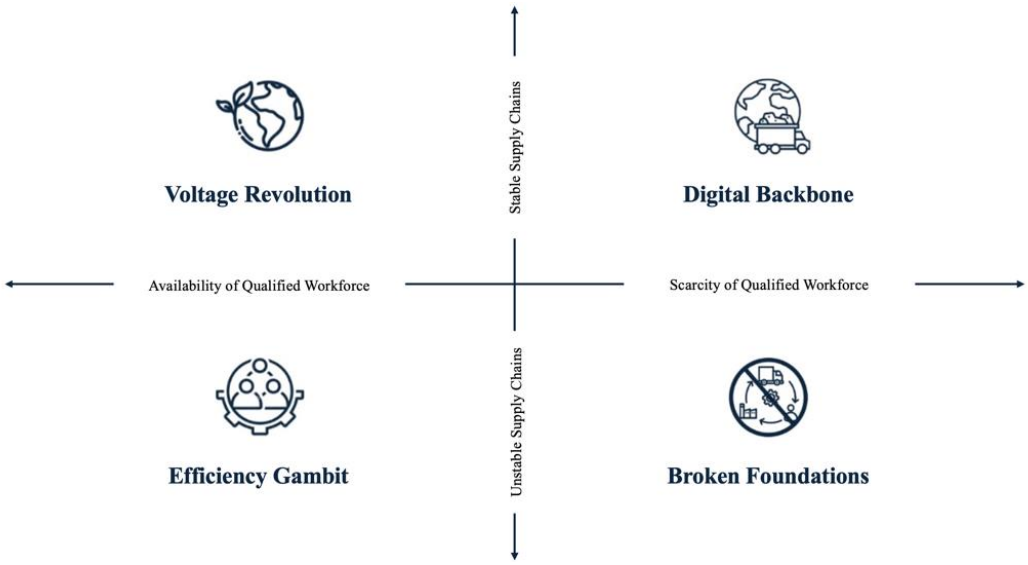

Figure 4 - Scenario Matrix | Source: Own Creation

7.1.3 Cross-validation of the Scenario Matrix

To ensure the robustness of the scenario matrix, a cross-validation was carried out with further expert input. To this end, the project team held a semi-structured meeting with Christiane Conrads, Global Leader for Real Estate and ESG at PwC (Appendix 1). Her dual expertise in EU environmental policy and the real estate sector provided an additional critical perspective to validate the approach adopted. During the discussion, Conrads highlighted the strong link between the stable supply of CRMs/green technology with geopolitical tensions and their impact on the European real estate industry, particularly given that a stable supply of these materials is crucial to achieving the sector's sustainability goals. At the same time, her insights into workforce dynamics confirmed that targeted reskilling to meet the demands of new technologies, as well as labor mobility and migration, are key to implementing these policies, thus confirming the second KU. The feedback not only validated the approach taken, but also enriched the scenario development with nuanced perspectives on its potential logical evolution.

7.2 Scenario Narratives

The structure of the following scenarios is based on the respective attributes of the two KUs. The consequences resulting from these effects are examined in two interlinked layers: the contextual environment from an EU perspective and the transactional layer specific to the European real estate sector. The contextual layer examines the broad systemic influence of the uncertainties on the implementation of the relevant EU measures and their interlinking in a logical chain. Whether or not the measures can be successfully implemented is influenced by factors such as the energy mix, energy prices or carbon prices. These factors shape the wider environment in which EU industry and society act. The transactional layer thus describes market developments, pursued by both the KUs and the contextual environment. Finally, the attractiveness of the industry is evaluated with the Porter's 5 forces framework, creating comparability (Figure 5).

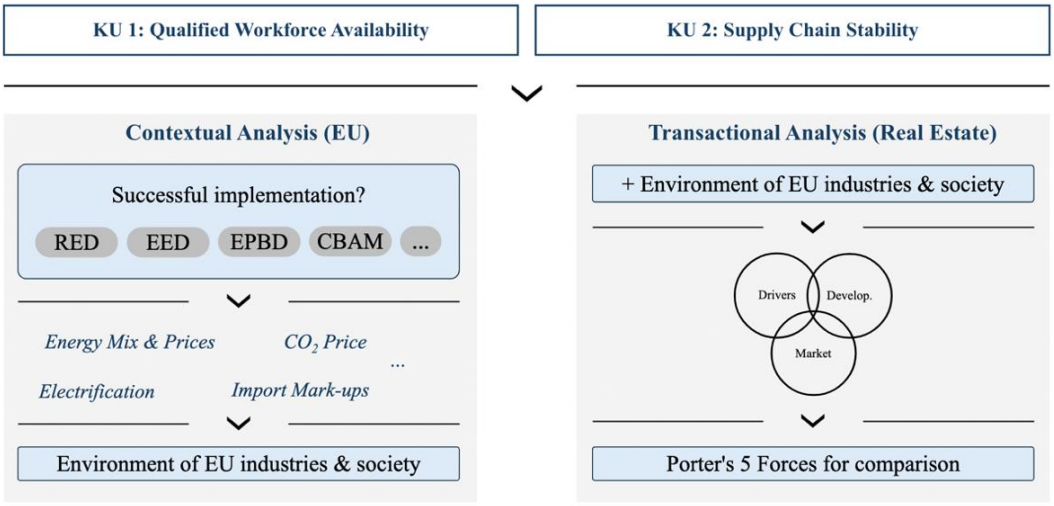

Figure 5 - Scenario Structure | Source: Own Creation

Individual Part – Moritz Fischer

7.2.1 Scenario 1 – Voltage Revolution

The geopolitical tensions of the 2020s, such as in the South Chinese Sea, remain, but have not escalated further. Potential conflict parties are prioritizing their own economic growth over ideological disputes (Kohlmann 2022). This pragmatic approach ensures a stable supply chain

with a steady flow of both CRMs and cost-effective renewable technologies and components into the EU. Consequently, the objectives of the **CRMA**, including the reduction of supply dependency or the expansion of local mining or processing facilities, are not pursued with the greatest urgency, given the absence of any significant threat of these dependencies being weaponized. Concurrently, the EU has a sufficient workforce with the requisite skills to facilitate and implement the green transition by 2030. Notable achievements include targeted investments in up- and reskilling programs, along with streamlined qualification recognition processes and simplified work visa agreements. This has resulted in the formation of an EU-wide talent pool that effectively offsets potential labor shortages.

Contextual Analysis (EU Perspective)

In 2030, the EU has not pursued its plans to mine and process CRMs itself, as set out in the **CRMA**. On the one hand, the bloc continues to have robust supply chains and CRMs due to the stable geopolitical situation and the fact that relevant supplier countries prioritize their own economic growth and trade relations over ideology. On the other hand, mining and processing are associated with significant environmental impacts. These can be visible, such as the destruction of hydrology or the loss of landscape and biodiversity in these areas, but also invisible, such as the emission of immense additional GHGs, chemical emissions or water stress (EEA 2023; EU 2022c). Based on the specifications of the **RED**, the EU has been pushing for a rapid roll-out of its renewable energies. In order to accelerate the expansion, the Member States have designated pre-defined go-to-areas, which are particularly suitable for the implementation of renewable energy projects due to their favorable location. These areas benefit from significantly shortened authorization procedures (EC 2024a), which makes it easier to implement large-scale projects. Key developments in the workforce area have been targeted training programs, such as the introduction of EU-wide solar certificates, which have simplified training in the renewable energy sector (Cooper 2023). The combination of a secure

supply of raw materials[12] and human capital with cheap green technologies, such as solar panels from China, allows projects to be implemented in an economically efficient way. As a result, large-scale projects such as solar farms in Andalusia (Ridao et al. 2007) and offshore wind farms in the North Sea (NDR 2023) have moved forward rapidly.

In addition, the EU is driving the modernization of its electricity grid into so-called smart grids to create a flexible and stable energy infrastructure (EC 2023b). Technologies like smart meters now record energy consumption in real time, thus enabling dynamic control of supply and demand throughout the grid to avoid overloading. As a result, renewable energy can be optimally integrated into the grid in order to cover a larger share of the EU's electricity needs (EC 2024s). Modernization, coupled with expanded storage options such as pumped storage, will increasingly ensure lower volatility of electricity supply (Staude 2024), reducing the need for fossil fuel back-up power generation.

The gradual phasing out of free allowances under the **ETS** from 2026 and the associated rise in the price of CO2 increased the pressure on industry to decarbonize. At the same time, the introduction of the **ETS2** from 2027 made fossil fuels for heating and transport more expensive, providing additional financial incentives for businesses and society to go green.

As a result of the developments described above, electricity prices in the EU have fallen steadily (Antweiler and Muesgens 2021), while fossil fuels have become more expensive. This discrepancy has led to increasing electrification of industry, buildings and transport (Luderer et al. 2021). Electric furnaces and boilers as well as green technologies such as heat pumps, and lithium batteries are implemented more widespread. On the other hand, EII sectors that often rely on high-temperature processes, such as steel or cement production, face technological barriers to electrification (Roelofsen et al. 2020). However, the general increase in electricity consumption has led to concerns about whether the grid can continue to meet demand with a

[12] e.g., rare earths to produce permanent magnets in wind turbines (EC 2020d)

predominantly renewable generation system, or whether more fossil fuel power plants will continue to be needed to stabilize supply at peak times. This can lead to periodic price spikes due to higher marginal costs and carbon surcharges in the EU's merit order system, which determines electricity prices (Gasparella, Koolen, and Zucker 2023). Keeping electricity prices low to maintain the financial incentive to switch is critical to sustain the momentum of electrification (Roelofsen et al. 2020). The EU's energy efficiency measures are therefore becoming increasingly important to reduce electricity consumption. On the other hand, end consumers still based on fossil fuels are driving efficiency initiatives to keep their energy operating costs as low as possible.

Under the **EED**, industries and companies are encouraged to carry out mandatory energy audits to identify and correct inefficiencies. Due to the high availability of auditors, these actions can be extended to SMEs (CORDIS 2022). In addition, advanced energy management systems are being introduced (Siemens 2024), while the EII in particular is investing in waste heat recovery systems, which are essential for increasing CO2 cost-efficiency in production (Hajlasz et al. 2023). In accordance with the **EPBD**, new buildings will be required to meet the zero-energy standard, whereas existing buildings will receive an energy performance certificate (EPC) and a renovation passport. The issuance of these documents is conducted through certified energy consultants and should identify weaknesses for improvement. Refinements such as insulation, double glazed doors/windows or high-efficiency heating and cooling systems are getting widely integrated (EC 2022). In addition, decentralized renewable energy systems, such as rooftop solar panels, may be used for a building's own energy needs or transmitted to the market via the modernized electricity grid (EC 2023b). EIIs are increasingly taking advantage of the measures set out in the **CEAP** to improve resource efficiency and lower their carbon burden. The focus is mainly on the recycling of primary and secondary materials (e.g., clinker) or energy recovery through waste-to-energy systems (Edmond 2023; Umweltbundesamt 2018).

In general, the increasing electrification and widespread implementation of efficiency measures have led to an acceleration of the EU's decarbonization efforts beyond initial **ETS** trajectories. This development could have potentially led to lower carbon prices due to a surplus of allowances. As a countermeasure, the EU's Market Stability Reserve (MSR) mechanism has been in place to withdraw allowances from the market in order to maintain a stable carbon price and monetarily encourage further emission reductions (EC 2024p). The **CBAM** will continue to phase in as planned until 2034 and represents the key tool to ensure the competitiveness of European EIIs, which bear the highest emissions costs due to the lack of electrification options. In order not to lose access to the European market, most countries will refrain from retaliatory measures and focus on reducing their emissions. They are adapting their national climate policies, expanding or introducing national emissions trading schemes or their own carbon border mechanisms (Schneider 2024). Furthermore, European EIIs benefit from fair competition and a modernized infrastructure that provides optimal conditions for the integration of green hydrogen in the future (EC 2023a), further minimizing the risk of carbon leakage for this industries.

Green bonds have emerged as a significant additional financing instrument for enabling the transition towards a sustainable energy infrastructure in Europe. Although the EU offers considerable financial assistance, the importance of private investments is becoming more apparent as a complement to this support (EEA 2023). The EU, alongside national governments and grid operators, issue green bonds to channel additional capital into the grid modernization and renewable energy sources. Since December 2024, large and/or listed companies have also been permitted to issue their own EU green bonds, which has been particularly prevalent among EIIs for the partial financing of efficiency measures (Pirgaip, Karan, and Kutluca 2024). Financial investors are keen to invest in companies that comply with the sustainability principles set out in the **EU taxonomy**. Public demand for sustainable financial products and

enhanced transparency introduced by the **SFDR** act as driver for this development (J.P. Morgan 2023). As a result, the **CSRD** is playing a critical role in helping companies obtain financing for their transition plans. Companies benefit from the availability of trained staff to prepare reports that give potential investors a comprehensive and detailed understanding of their sustainability initiatives (PwC 2024b). The convergence of social demand and transparency has resulted in an influx of capital into companies that align their operations and strategies with the EU's sustainability standards.

Furthermore, companies are proactively implementing measures to guarantee sustainable supply chains in accordance with the **CSDDD**. One approach taken by mainly multinational corporations (MNC) is the formation of partnerships, particularly in the domain of CRMs procurement (BMW 2022). This approach allows for direct influence on the processes, thereby preventing human rights and environmental violations at an early stage. Comprehensive supplier codes of conduct represent another prevalent strategy, defining clear requirements for environmental and social standards on which cooperation must be based on (Cyber Risk GmbH 2024). Regular audits conducted in collaboration with certification bodies ensure compliance with these standards along the supply chain (FTI Consulting 2024).

Transactional Analysis (European Real Estate Industry):

The European real estate industry is in the midst of the green transition by 2030. While the sector benefits from a high availability of skilled workforce (e.g., construction workers, electricians) and stable access to required technology, it also faces the challenge of meeting the demand for sustainable housing.

The rise in CO2 prices is prompting property owners to undertake renovations with the objective of enhancing the energy efficiency of their buildings. The issuance of renovation passports and EPC are of importance, as they act as a tailored roadmap, providing clear guidance on necessary upgrades and their expected benefits, thereby streamlining the

renovation and retrofitting process while increasing transparency for stakeholders (EC 2022). Properties that fail to comply with the requisite standards face the risk of a loss in value, providing an additional incentive for change (RICS 2024). Investments in materials and tech including insulation, heat pumps and solar panels have become economically viable as a result of improvements in production processes and the increasing electrification of industry.

The cost of energy-intensive building materials, such as steel and cement, has grown due to technological challenges within the EII related to electrification and the rising carbon price. However, domestically sourced materials remain more cost-efficient than imported goods due to efficiency gains (i.e., lower emissions through enhanced production processes). The markup on imports has risen further, as the **CBAM** continues to gradually phase in, reinforcing the reliance on EU materials (Statista 2024a). Therefore, recycling concrete and other materials is becoming an important strategy to reduce emissions, thereby mitigate inflating construction costs and supply dependencies (mpa, n.d.).

The relocation of skilled workers to the EU is accompanied by an increased demand for new housing. Consequently, multi-family houses and large BTR projects are becoming increasingly significant. These approaches facilitate the expeditious and sustainable creation of housing while leveraging economies of scale on the aforementioned EII materials. BTR models are particularly relevant for attracting private investors, as they offer long-term and stable returns (BNP Paribas 2022; CBRE 2024a). Additionally, niche markets such as modular construction and prefabricated houses are experiencing growth. These methods often provide even more affordable and time-efficient housing solutions by reducing the use of emission-intensive materials (Ashton 2024; Santander 2022).

A comprehensive rethink of the use and expansion of existing building complexes, known as vertical densification, is occurring within cities. To meet the increasing demand for housing, unused or underutilized office buildings are being converted, and multi-family houses or public

buildings are being vertically extended (PwC 2023b). To reduce commuting times and relieve the pressure on urban infrastructure, there is a rise in demand towards areas close to go-to-areas, where many new jobs in the renewables sector have been created (Hanna, Heptonstall, and Gross 2024).

Aligning business activities with the **EU taxonomy** provides a competitive advantage within the industry. Compliance with sustainability criteria and the DNSH principle facilitates access to green financing. Listed companies issue green bonds to finance their aligned renovation and construction projects with additional private capital flows. The bonds are either linked to individual large projects (e.g. new buildings) or to a pool of smaller green projects (e.g. renovations) (Segal 2024). The required reporting, such as the factsheet and annual updates, as well as third-party certification, can be implemented efficiently and promptly with the help of specialists. In general, both corporations and SMEs can benefit from green loans with favorable terms. These are provided by national financial institutions and specifically promote sustainable construction practices (Pallardy 2024). In addition, SMEs can apply directly to the EU's local and national implementing partners for additional funding, backed by guarantees from the InvestEU program. This funding not only enables SMEs to undertake ambitious projects, but also reduces the risks associated for financial institutions (EU 2024a). For both green loans and funding, applicants must provide comprehensive information on the sustainability of their activities (EC 2024t). An increasing number of SMEs that are not covered by the **CSRD** are therefore preparing simplified or voluntary reporting in order to disclose their compliance in a standardized way (EFRAG 2024).

Porter's 5 Forces:

Competitive rivalry within the industry is high as players adopt different strategies in response to market changes. Companies with energy inefficient/fossil fuel dependent portfolios focus on retrofitting existing portfolios to avoid depreciation, while others are targeting new buildings

to meet the latest standards (Seveke 2023). In addition, new market potential is opening up in rural areas as a result of the economic upturn experienced in these places due to the expansion of renewable energy, easing some of the competition in urban areas. However, the pressure within cities remains high due to urbanization. The competition here is mainly about finding suitable buildings for expansion or conversion to housing. The BTR sector is becoming an additional growth area, especially for larger players, due to economies of scale and potential attraction of investors (BNP Paribas 2022). The availability of labor, favorable technology and lower material costs (except EII materials) further increase efficiency, resulting in greater supply and competitive pricing in residential construction (Investopedia 2023). Sustainability criteria have become standard for access to green finance in this scenario, making other differentiators such as location and design more important.

The ***threat of new entrants*** is moderate to high. Affordable and stable access to technology along sufficient human capital are lowering market barriers (Alliance Experts 2023). At the same time, capital flows in the form of green finance are channeled to the existing players, which are partly able to make optimal use of economies of scale in EII materials as well. This makes market entry in the traditional segment more difficult (Hayes 2024). Niche markets such as prefabricated housing, on the other hand, offer easier entry opportunities, as high initial costs can often be avoided, for example by outsourcing production (Fuchs et al. 2019).

In contrast, the ***bargaining power of suppliers*** is low to moderate. For instance, construction service providers are losing bargaining power as more alternatives with lower personnel costs enter the market, reducing the dependency from a buyer's perspective due to low switching costs (CFI, n.d.). The local sourcing of traditional building materials is favored by the **CBAM** mark-up and production efficiencies, thus strengthening the power of national EIIs relative to international suppliers (O'Herron 2024). Conversely, technological advances in recycling and modular construction mitigate this effect.

The ***bargaining power of buyers*** is moderate to high, as they increasingly benefit from information through renovation passports and certificates as well as standardized sustainability reporting. This strengthens the position of buyers, who are increasingly able to make informed decisions (Sreenivasalu 2024). High sustainability standards can be achieved more cost-efficiently, hence buyers are increasingly demanding energy-efficient properties with lower running costs. At the same time, more remote working is driving independence from the place of residence, which increases the pressure on landlords to create attractive conditions to avoid a tenant churn (Chazanas 2022). Despite these factors, bargaining power is dampened by the increased demand for housing, particularly in cities.

The ***threat of substitutes*** remains at a moderate level. Modular construction and prefabrication offer an even more affordable and sustainable alternative to traditional construction methods and are gaining traction (Zonta 2024). As housing in general becomes more affordable and factors such as individuality through design are seen as differentiators, these advantages will have limited impact on the competitiveness of traditional players (Independence 2023). Accordingly, in this scenario modular and prefabricated alternatives are increasingly in demand from buyers with fewer financial resources. At the same time, traditional real estate is competing with alternative asset classes, such as infrastructure projects or renewable energy development, which also offer returns and sustainability benefits for investors (PwC 2023a).

Individual Part – Theofanis Orfanidis

7.2.2 Scenario 2 – Digital Backbone

Individual Part – Joshua Peter Jungblut

7.2.3 Scenario 3 – Efficiency Gambit

Individual Part – Andrei Razvan Fratila

7.2.4 Scenario 4 – Broken Foundations

7.2.5 Scenario Comparison

The EU, its industries and its society are differently impacted by the four distinctive scenarios. To facilitate their comparison, this section offers a consolidated view on the most important contextual/transactional factors (Figure 6) and illustrates the attractiveness of the real estate industry per narrative based on the Porter's 5 forces framework (Figure 7).

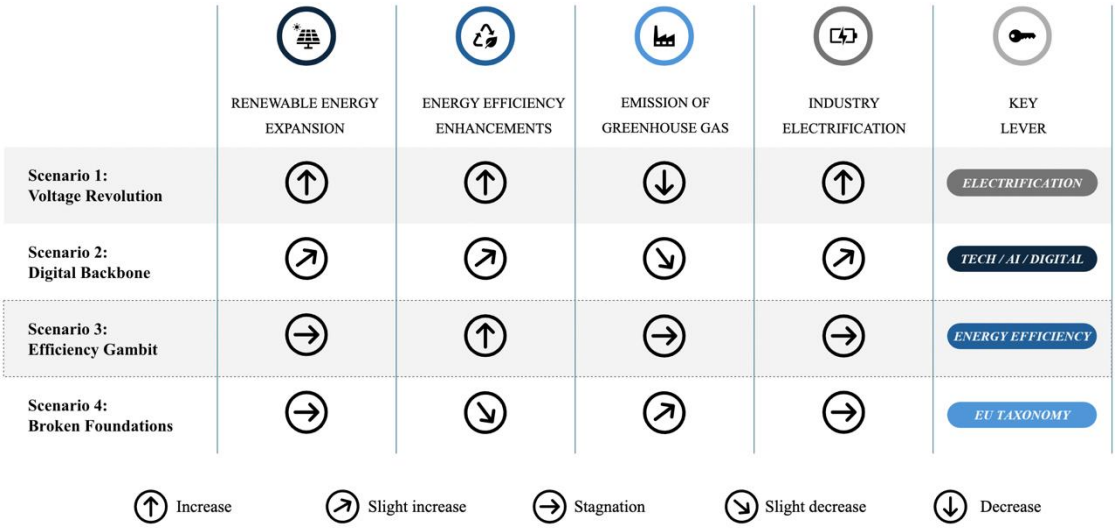

Figure 6 - Scenario Comparison | Source: Own Creation

In *Scenario 1*, significant progress is made in all areas. Renewable energies and energy efficiency are greatly expanded, industrial electrification progresses, and GHG emissions fall significantly. This scenario is therefore the most ambitious and reflects a comprehensive transformation in which electrification serves as a key lever.

In contrast, *Scenario 4* shows only minimal progress. Renewable energies are stagnating, as is the electrification of industry. There is also no improvement in the reduction of GHG emissions. This scenario emphasizes the importance of regulatory framework conditions such as the EU taxonomy criteria, which need to be adapted to the industry needs.

Scenario 2 focuses on technological and digital innovations, in particular AI and automation. Although there are slight improvements in energy efficiency and a smaller reduction in

emissions in this scenario than in *Scenario 1*, progress in renewable energies and electrification remains rather moderate given the scarcity of skilled workers.

In *Scenario 3*, energy efficiency is increased, but other areas largely stagnated, particularly the expansion of renewable energies and electrification. Nevertheless, a moderate reduction in emissions is achieved.

Overall, *Scenario 1* stands out as the most optimistic vision of a sustainable energy transition, while *Scenario 4* paints a conservative picture. *Scenarios 2 and 3* move between these extremes and each focus on specific approaches. The scenarios therefore not only show different development paths, but also the areas of tension between technological, regulatory and infrastructural measures to achieve climate targets.

	INDUSTRY RIVALRY	BARGAINING POWER OF SUPPLIERS	BARGAINING POWER OF BUYERS	THREAT OF NEW ENTRANTS	THREAT OF SUBSTITUTES
Scenario 1: Voltage Revolution	HIGH	LOW – MODERATE	MODERATE - HIGH	MODERATE - HIGH	MODERATE
Scenario 2: Digital Backbone	HIGH	HIGH	LOW – MODERATE	LOW – MODERATE	MODERATE
Scenario 3: Efficiency Gambit	MODERATE	MODERATE	MODERATE	LOW – MODERATE	MODERATE - HIGH
Scenario 4: Broken Foundations	HIGH	HIGH	LOW	MODERATE - HIGH	MODERATE - HIGH

Figure 7 - Porter's 5 Forces Scenario Comparison | Source: Own Creation

Operating in an environment characterized by a stable supply chain and a sufficient number of skilled workers, the *'Voltage Revolution'* scenario offers the best conditions for buyers to leverage their bargaining power and new players to enter the market.

Contrariwise, the *'Broken Foundations'* narrative represents a unique opportunity for suppliers to take advantage of their high negotiating power given the scarcity of qualified labor and the unstable supply chain which results in an ever-increasing reliance on few providers in the market.

The *'Digital Backbone'* and *'Efficiency Gambit'* scenarios present opposing challenges to the industry. While the first one forces the industry to find solutions to compensate for the labor market shortages, the latter is affected by an unstable supply chain and insufficient supply of CRMs. More precisely, the *'Digital Backbone'* scenario offers more favorable conditions for suppliers in terms of bargaining power while the *'Efficiency Gambit'* scenario is more advantageous for buyers provided that they can choose from a wider range of substitutes than in the *'Digital Backbone'* scenario.

Common to all narratives is the intensity of competition, i.e. industry rivalry, which is at least moderate across all four. Apart from that, the threat exerted by substitute firms or products is at least moderate in all scenarios as well.

8 Phase 4 – Act

The Act phase is of central importance for translating scenario findings into strategic action. To this end, MOME's strengths and weaknesses were jointly examined in a collaborative workshop and a TOWS matrix served as the basis for deriving implications for each of the four narratives (Phadnis, Sheffi, and Caplice 2022). Additionally, an overarching action plan was developed to guide the client organization effectively under various plausible future circumstances.

Individual Part – Moritz Fischer

8.1 Scenario 1 – Voltage Revolution

As mentioned above, the *'Voltage Revolution'* is based on stable geopolitical conditions with robust supply chains for CRMs and sufficient skilled workforce available to the EU industries. Within the scenario narrative various implications have emerged for the European real estate industry. In the following, four strategies tailored specifically to MOME are developed in order to align and navigate the company efficiently in the future.

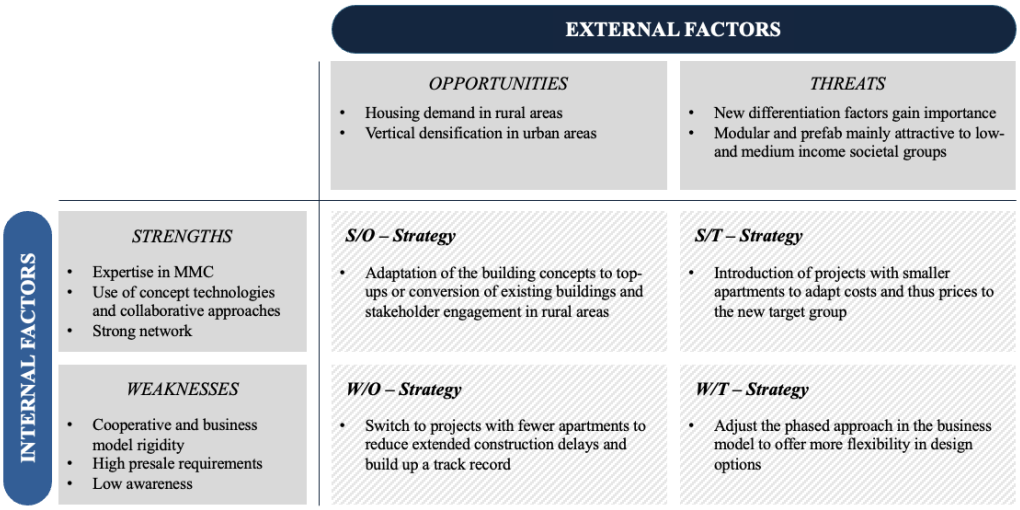

Figure 8 - Scenario 1: TOWS-Analysis | Source: Own Creation

S/O – Strategy: MOME's network of contacts with other players in the Portuguese real estate sector is strengthened, for example, by the active involvement of the company's management in the executive committee of the national Urban Land Institute (ULI Portugal 2024). These relationships can be strategically leveraged to capitalize on opportunities related to the growing demand for housing. By engaging with local stakeholders and authorities in areas of increased demand, MOME can position itself to identify potential project opportunities at an early stage. In particular, Portuguese regions such as Alentejo may become attractive through the expansion of renewable energy. Due to the high solar radiation capacity and the fact that a large part of the region is not designated as a Natura 2000 or biodiversity area (Global Solar Atlas 2023; EIGL 2024), there is a possibility that it will be designated as a go-to-area, creating new jobs and attracting immigration (Figure 24 & Figure 25). In addition, MOME's expertise in MMC and modular construction allows it to take advantage of rural areas. Housing components can be manufactured off-site and efficiently transported and assembled in these areas. In urban settings, MOME can also benefit from vertical densification through modular construction, technologies such as BIM, and the approach of involving the contractors early (ECI). These tools and practices enable the company to streamline required design adaptations for conducting modular top-ups to existing buildings (Cantrell 2023), or the conversion of underutilized non-

residential buildings (Hubspot 2024) that are potentially at risk of loss of value due to non-compliance with sustainability criteria into functional housing cooperatives in desirable locations.

W/O – Strategy: MOME's housing cooperative model offers a sustainable and affordable approach to meeting the growing demand for housing. However, the low level of awareness of the chosen approach among the Portuguese population and the rigidity of the model pose a risk to meeting the needs of potential interested parties in an optimal timeframe. MOME's project development process consists of four distinct phases, from the identification of an opportunity to its handover to the buyer. The construction phase follows the admission phase, during which potential members of the cooperative can register for the available units on a first-come, first-served basis. Construction of the buildings will not begin until all units have been allocated. The reason for this is that construction financing is only available once 30% of each unit has been paid for (MOME 2024). While this phased approach provides financial and commercial security, the low level of public awareness of housing cooperatives may result in long admission periods. These delays may prevent MOME from responding quickly to demand by 2030. To address this issue, MOME should implement smaller projects. This will reduce the time needed to complete the admission phase and thus speed up the transition to construction. In addition, faster completion of projects can help build a track record, thereby increasing public recognition of the MOME model as an alternative to traditional construction.

S/T – Strategy: MOME should strategically use its expertise in modular and prefabricated construction methods, as well as conceptual design technologies such as BIM, to adapt to the changing customer base, which by 2030 will increasingly consist of low to middle income groups. While traditional construction methods will become more cost effective in this scenario, modular construction methods offer further cost reductions through the reduced use of energy-intensive materials. This makes it particularly attractive to the aforementioned social groups,

who prefer affordable and energy-efficient solutions to keep running costs as low as possible. At present, MOME's housing cooperative offering is particularly attractive to middle to high income customer groups due to its cost structure and scale (MOME 2024). To be able to maintain its competitiveness and broad market reach in the future, MOME needs to focus on reducing the sales price per unit. Since the housing cooperative model is based on selling units at cost, the biggest lever here is to reduce the cost of building materials per square meter and per unit. This can be done in two ways. First, by introducing modular housing coops with smaller unit sizes, such as studios and compact apartments. Secondly, BIM enables the creation of DT of building concepts, ensuring precise material optimization and cost management to keep housing prices affordable without compromising on quality.

W/T – Strategy: To address the rigidity of its housing cooperative model, MOME can adapt its approach to mitigate the risks posed by emerging differentiators such as design customization. Currently, MOME's project development process relies on defining a precise, standardized building plan during the setup phase. These predetermined designs allow MOME to accurately calculate costs, which are transparently communicated to potential members during the admission phase. They can then decide if the design meet their preferences and proceed with the application (MOME 2024). The approach ensures on the one side transparency and cost efficiency. On the other side it leaves no room for individual customization, which is increasingly valued by consumers, particularly in the middle-income segment. Although affordability remains a key factor for MOME's target demographic, the lack of customization options may be a disadvantage, especially as alternative prefabricated housing providers often offer more flexibility. In order to enhance its competitiveness within the low- to middle-income segments, MOME could introduce a more flexible design process that incorporates limited customization. This approach should begin with a base building design and a standard configuration, which enables MOME to maintain transparency and provide an estimated base

cost price. Potential buyers can participate in the design process during a subsequent conceptualization phase. It allows them to personalize certain aspects, such as room layouts. This additional phase preserves the financial and operational efficiencies of the housing cooperative model. Moreover, it addresses the growing will for greater individuality which emerges in this scenario. By incorporating these limited customization options, MOME can mitigate competitive differentiation advantages from its prefabricated housing provider competitors and appeal to a broader customer base.

Individual Part – Theofanis Orfanidis

8.2 Scenario 2 – Digital Backbone

Individual Part – Joshua Peter Jungblut

8.3 Scenario 3 – Efficiency Gambit

Individual Part – Andrei Razvan Fratila

8.4 Scenario 4 – Broken Foundations

Group Part

8.5 Cross – Scenario Strategic Recommendations

The preceding strategies have been elaborated based on the scenario-specific configurations of the selected KUs. Given that there are plausible events for which the company should prepare independently of the scenario to navigate the future successfully, the following section presents an overarching action plan that aims to provide concrete guidance. This involves identifying actions that can be effective under multiple future conditions, thereby enhancing organizational adaptability (Phadnis, Sheffi, and Caplice 2022).

Marketing and Awareness: A first, important point that MOME must capitalize on is the use of marketing strategies to raise general awareness of the cooperative housing model in Portugal, while increasing its visibility as an emerging player in this market. To achieve this, MOME should resort to different marketing strategies. To build brand recognition and establish

credibility, MOME must focus on leveraging its unique strengths in sustainability and innovative construction practices. The company can highlight its expertise in MMC and NBS through targeted marketing campaigns. By demonstrating the environmental benefits and cost efficiencies of these methods, MOME can position itself as a leader in sustainable and affordable housing. MOME's digital presence should be optimized to engage potential customers and stakeholders. The company's website must feature comprehensible explanations of its cooperative housing model, along with educational blogs, videos, and testimonials. Social media platforms can amplify this content and run targeted campaigns to reach younger, environmentally conscious audiences. Emphasizing affordability and transparency will resonate strongly with those struggling with the current housing crisis. Establishing thought leadership is another critical step. MOME should publish whitepapers and articles on the advantages of cooperative housing and innovative building practices. Participating in real estate expos, delivering presentations, and collaborating with sustainable housing forums can further enhance credibility. Additionally, highlighting partnerships with well-known organizations in press releases and marketing materials will help offset concerns about MOME's lack of a track record and establish the company as a trustworthy entity.

Customer and Product Focus: To reach audiences that may not have access to social digital platforms, MOME should use traditional marketing which entail collaborations with TV channels, local newspapers, and community radios, particularly in urban centers like Lisbon and Porto. Moreover, MOME should bet on physical advertising strategically placed in high-traffic urban areas such as crowded train- and metro stations in city centers. These locations are perfect for reaching the attention of daily commuters who may be searching for affordable housing options. According to diverse studies, these physical ads create instantaneous awareness and increase brand recognition and recall (Roux 2016). To increase the conversion rate, MOME should consider hosting workshops and webinars to explain the process, benefits,

and financial commitments required and meet potential cooperators in person. Simultaneously, to engage with the younger demographics, it is recommended that MOME takes into consideration strategic collaborations with influencers who tour cooperative housing projects and discuss their potential. This represents a great way to resonate with younger audiences and attract their attention in an authentic and trustworthy way.

Community-centric approach: Fostering engagement by creating lasting value for the communities MOME serves, has the potential to become central to the company's mission of providing affordable, sustainable living. Therefore, several actions can be taken to encourage collaboration and build trust. To begin with, MOME's projects should include shared, community-oriented spaces such as co-working areas, recreational facilities or common gardens. This can help to create interaction and develop a sense of involvement and ownership. Apart from that, the company could assist in the organization of events such as charity runs or community cleanups which can help to strengthen local connections. The cooperatives managed by MOME can, for instance, initiate partnerships with schools and NGOs, thereby making sure that they gain publicity from people who share the same values. Finally, MOME can significantly contribute to promoting equity and inclusivity in the Portuguese society. Through policies that welcome individuals from different socioeconomic, cultural, and generational backgrounds while keeping housing costs accessible to a diverse demographic, MOME's housing cooperatives can create communities where members not only live but thrive together, fostering both individual well-being and collective progress.

Risk Mitigation: The scarce availability of workforce and the rising cost of materials present a significant risk for MOME, given the company's reliance on suppliers and construction service providers. The guarantees provided to the cooperative's members in the *Preliminary Contract of Sales* could potentially become a significant financial burden for MOME in the event of delays or price increases. This could have a detrimental impact on the company's early-stage

success, particularly if it lacks sufficient capital reserves. It is therefore of the utmost importance to be able to rely on an existing network of suppliers and partners. To mitigate this risk, it is recommended that MOME transparently report these clauses to the supplier side within the ECI Model. Furthermore, a risk analysis should be conducted, and if feasible, a contractual clause for a maximum price and project duration should be implemented. It is therefore recommended to engage in collaboration with local, sustainable partners whose reliability has been demonstrated in previous projects and whose business risk is more readily assessable. This approach facilitates transparency while mitigating dependence on volatile global supply chains. Additionally, it would be advisable to explore the possibility of concluding long-term, cross-project framework agreements with fixed price ranges to ensure long-term planning security.

Financing: MOME's access to EU funding is constrained as a purely private sector entity, with funding limited to small-scale projects due to restricted resources. However, in addition to accessing national funding opportunities, MOME is eligible for funding under the InvestEU program. The InvestEU Fund offers direct and intermediate financing options for sustainable and inclusive investments. InvestEU can be particularly relevant, as it explicitly provides funds for subsidized loans and guarantees for small businesses (EU 2024a) and as MOME has already demonstrated compliance with the requisite criteria for funding, it is highly recommended to apply for InvestEU (Appendix 4). To access InvestEU, MOME must first verify and document its own eligibility. This includes classic business documents that demonstrate the economic viability of MOME, as well as project specific information. These include a description of the project, detailed funding requirements and evidence of the project's impact on EU objectives (EU 2024d). As the InvestEU Fund works through selected financial intermediaries, applications must be submitted directly to them. In Portugal, the main partner is Banco Português de Fomento, with many other smaller, private and regional financial service

providers awarding smaller contracts (EU 2024b). Once the financial partner has been selected, a project proposal is submitted outlining the project and its conformity with the objectives of InvestEU. If the proposal is successful, the financing terms are negotiated.

Figure 9 - General Strategic Roadmap MOME | Source: Own Creation

9 Phase 5 – Monitor

The *Monitor* phase is the final phase of the *Intuitive Logics School* approach. It aims to keep track of each scenario's evolution by comparing it with the progress of the real-world environment. As a result, it enables identifying which possible scenario is most likely to unfold, and therefore which strategy is best employed (van der Heijden 1996).

For this purpose, the *'Scenario Cockpit'* approach is used, which consists of the following two main steps. First, the early indicators must be clearly defined, and threshold values are attributed to each indicator. The second and final step involves constantly monitoring the value ranges of each indicator (Wulf, Brands, and Meissner 2010). This approach allows MOME to understand which scenario is likely to emerge and thus quickly adapt its strategy.

Early Indicators and Threshold Values

The selection of early indicators must be carried out carefully, based on the following specific criteria: *measurable* and *quantifiable*; *relevant to the development of the scenarios*; *specific to*

a certain aspect of the scenarios; *timely to provide information early enough*; and *actionable to provide insights into strategic changes*. Using these criteria, six early indicators were selected. Moreover, thresholds were introduced in two different ways. First, for those indicators for which it was feasible and appropriate to do so, a trend line was established, and the corresponding thresholds were set by considering the trend values for the years 2026, 2028 and 2030. Then, for the remaining metrics, fixed thresholds were set by analyzing historical trends while ensuring there is sufficient time to act strategically before they escalate.

Geopolitical Risk Index: The Geopolitical Risk Index (GRI) serves as an effective instrument for the early recognition of emerging tensions. The intensifying trade conflict between the USA, the EU and China illustrates how geopolitical crises can directly impact the supply chains of entire sectors. When the index value is situated within a range of 150 – 200, geopolitical tensions have emerged and are bound to escalate (Figure 26). In all previous instances, values for the GRI exceeding 200 have signified global crises that have exerted a substantial influence on the global economy and supply chains (Statista 2024b). Considering this, the threshold value of 150 provides accurate and precise insights on geopolitical developments while also serving as an early warning system that allows for a timely strategy adaptation before outcomes escalate. Contrarily, values below 150 represent a stable geopolitical environment and low conflict risk, fostering economic growth.

Supply Chain Stability Index: The Supply Chain Stability Index represents the reliability of the supply chain over time. It provides a quantifiable way to monitor disruptions and other dependency risks that affect the operational efficiency of the supply chain. This enables the identification of instabilities that are not merely geopolitical in nature, such as the COVID-19 pandemic, which caused a sharp increase in the index between 2020 and 2022 (KPMG 2024). In recent years, the index has fluctuated between -1.5 and 3, with -1.5 representing a low level of supply chain stress and 3 indicating a fragmented supply chain (Figure 27). Given that critical

disruptions in the past have been caused primarily by geopolitical developments that are impossible to predict and trend, the threshold value of 0 should be considered when assessing supply chain robustness. This baseline level encompasses normal supply chain stability in the absence of disruptions. Values below this threshold may represent a stable supply chain with respect to CRMs, while values above indicate a stressed supply chain environment where affected materials should be promptly identified, and appropriate measures taken to mitigate potential supply chain dependency risks.

Job Vacancy Rate & Employment Rate: The EU job vacancy rate (JVR) is a key indicator for assessing the state of the labor market. Job vacancies are defined as paid positions that employers advertise and actively seek to fill immediately or in the short term. Over the past decade, the rate in the EU has risen from 1.3% to 2.4%, signaling challenges in filling advertised positions (eurostat 2024e) (Figure 28). Future values exceeding the trend line may indicate a growing shortage of skilled workers, while lower values could either suggest an influx of additional workers into the bloc or targeted retraining of existing workers to match labor market demands. However, it should be noted that a downturn in the EU's economic situation may result in fewer job vacancies being advertised, potentially distorting the information provided by the JVR alone. Therefore, the employment rate represents a vital complementary indicator. The EU tracks the seasonally adjusted rate quarterly, considering all persons aged 20 – 64 who are employed or have an unmet need for employment. As of Q2 2024 the rate stands at around 75% and has increased by 8% within one decade (eurostat 2024b) (Figure 29). When combined with the JVR, the employment rate provides insights into the labor market's health. If the JVR falls, for instance, below its trend line and the employment rate's values also stagnate or decline below its threshold, this indicates fewer job advertisements rather than an increasing number of vacancies being filled, as was the case during the COVID-19 pandemic. Conversely, if the JVR falls below the threshold and the employment rate rises above, it can be assumed that workers'

access to vacancies has improved, for example through a larger workforce and skills adapted to the transition.

Labor Migration: This indicator assesses the inflow of foreign labor into the EU by tracking the issuance of first-time residence permits for employment. In 2014, the number of issuances amounted to approx. 457,000, while in 2024 it had already reached 1.26 million (eurostat 2024f), corresponding to a CAGR of 10.7%, thus illustrating the increasing trend of labor migration in the European labor market (Figure 30). An inflow of first-time residence permits for employment above the trend line slope may indicate a harmonization of EU labor migration policies or agreements between different Member States and third countries to facilitate the issuance of work visas. Values below the threshold may signal a less relevant and attractive European market for foreign workers, potentially causing labor shortages.

Personnel Cost Index of Construction Industry: The index tracks the costs of gross wages and salaries for employers in the construction industry. Accordingly, it uses Q1 2015 as the base value of 100. The indicator shows stable and steady growth through Q4 2019, with a CAGR of approx. 4.6%. During the COVID-19 pandemic, the index fell by about eleven points, but quickly recovered and continued its previous upward trend to 149.7 points in Q3 2023 (eurostat 2024d) (Figure 31). Future movements above the trend line may indicate that the industry will continue to experience labor shortages with increased wage levels. Conversely, should the index drop below the trend line, it can be associated with lower construction activity or indicate that there is sufficient labor available in the bloc and the industry, leading to non-competitive wage structures.

Renewables Share in Energy Mix: The share of renewable energies in the EU's total energy production is an important indicator that quickly helps to identify which scenario is most likely to unfold. A target line has been established by the EU, which demonstrates a threshold for the period up to 2030. It illustrates the requisite increase in the share of renewable energy to achieve

the 2030 target of 42.5% (EEA 2024b) (Figure 32). Values that fall below this target line may represent either CRMs shortages or a lack of skilled workforce that stagnate the development of renewable energy technologies. Alternatively, values that are on par or above the planned line could indicate stable and reliable access to CRMs, as well as the availability of skilled workers which are crucial to the growth of renewable energy share.

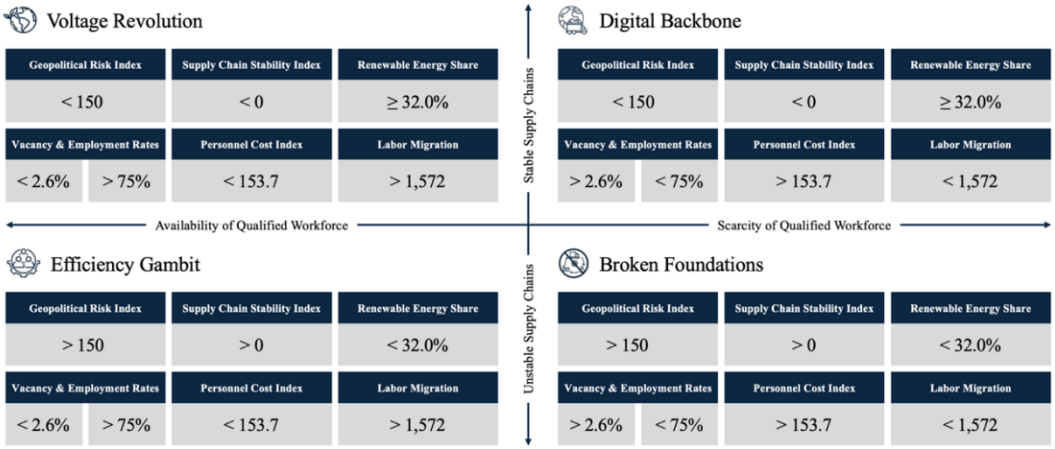

Figure 10 - Monitoring Thresholds 2026 | Source: Own Creation

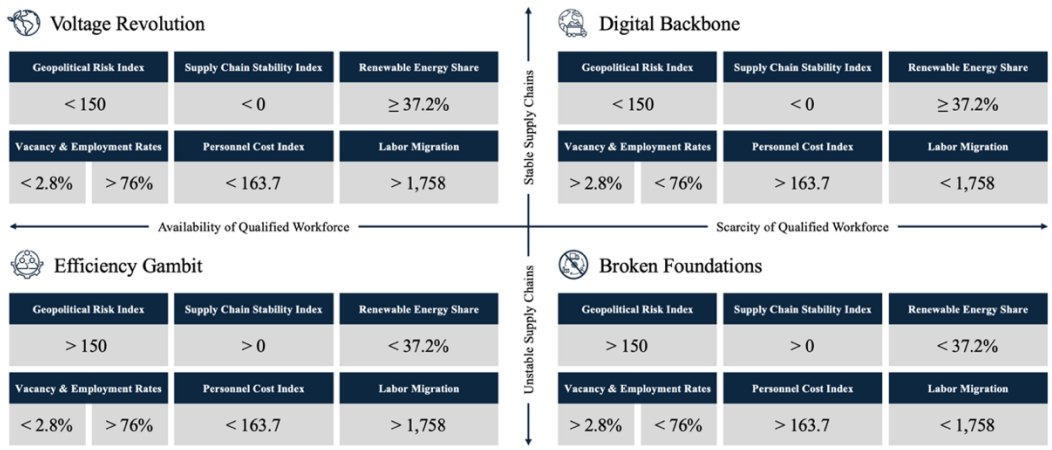

Figure 11 - Monitoring Thresholds 2028 | Source: Own Creation

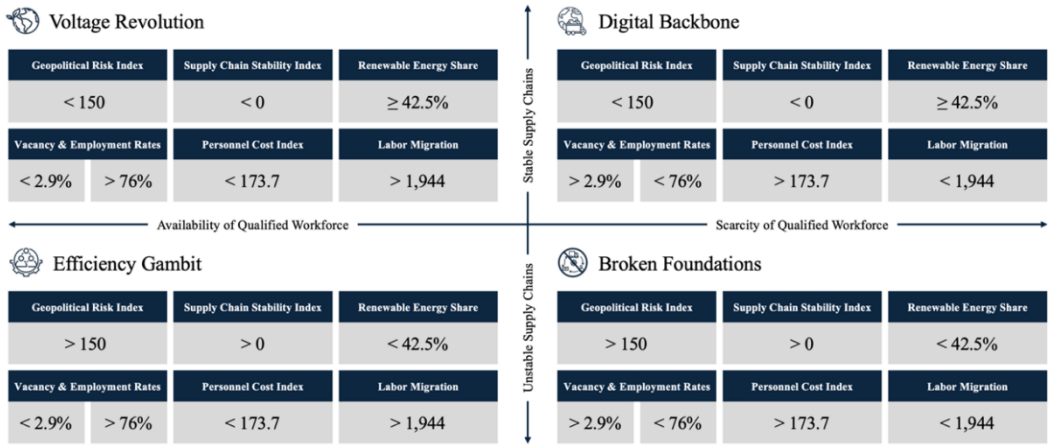

Figure 12 - Monitoring Thresholds 2030 | Source: Own Creation

Constant monitoring

The last and most important step of the Scenario Cockpit framework is to constantly monitor the development of the early indicators. Accordingly, threshold values have been provided for the years 2026, 2028 and 2030, therefore allowing for continual monitoring, which is adapted over the years to ensure alignment with the evolving environment of each scenario. The selection of these years as key monitoring points is closely aligned with the nature of the real estate industry and the slow pace of the EU environmental regulatory landscape. Adhering to this approach enables companies to be agile and proactive in their decision-making processes, allowing them to quickly adapt to the most appropriate strategy.

10 Conclusion

This work project focused on exploring the future of the European real estate sector, particularly in light of evolving environmental regulations and their implications for MOME. Employing the *Intuitive Logics School's* scenario planning methodology, and leveraging insights from industry experts, four plausible scenarios for 2030 were developed, along with strategic recommendations to enhance MOME's competitive edge while aligning with sustainability goals.

To better understand how the sector will evolve, key trends and patterns of change were identified. They include the rising importance of sustainable building practices and digitalization, as well as the ongoing demographic and urbanization shifts shaping housing demand. Further, common to all scenarios is the critical role of regulatory frameworks such as the Fit for 55 package and the EU taxonomy, which drive the need for innovation in construction methods, energy efficiency, and sustainable materials. However, the industry also faces critical uncertainties, particularly regarding *Supply Chain Stability* and *Qualified Workforce Availability*, which have a significant impact on its future trajectory.

To respond to the external environment's evolution, MOME should adopt general strategies independently of which scenario unfolds. These entail focusing on modular and energy-efficient construction, deepening long-term collaborations with innovative and sustainability-focused stakeholders, and investing in cutting-edge technologies. For instance, in the *'Voltage Revolution'* scenario, where regulatory alignment is strong, MOME should position itself as a leader in the lower-income segment and offer smaller projects and units to meet the new target group's needs. Conversely, in the *'Broken Foundations'* scenario, where sustainability and regulatory progress stagnates, MOME would need to emphasize cost efficiency and adaptive resilience to survive in a highly competitive and low-growth market. The remaining scenarios, i.e. *'Digital Backbone'* and *'Efficiency Gambit'*, call for tailored strategies focusing on digital integration and optimized resource management to thrive in varying regulatory and technological landscapes.

Finally, several indicators have been identified to help MOME monitor and adapt its strategy as these trends and uncertainties evolve. This ensures that MOME remains resilient and competitive. The indicators include advancements in green technologies, shifts in societal and regulatory attitudes, and disruptions in global supply chains.

In conclusion, this research highlights the complexity of the EU regulatory landscape and the critical role of strategic foresight for companies like MOME. By understanding potential directions of change and preparing to evolve accordingly, MOME can position itself as a sustainable and innovative leader in the European real estate sector.

11 Limitations & Further Research

This report utilizes the *Intuitive Logics School* approach for scenario planning to analyze the potential development of the EU environmental directives and regulations and their impact on the real estate industry by 2030. This qualitative approach served as the primary methodology for constructing the scenarios; however, the lack of quantitative data limits the ability to measure specific impacts that could otherwise make the findings more robust and actionable. Additionally, while the methodology captured a range of potential developments, it does not adequately prepare for 'black swan' events, which are unexpected, high-impact disruptions that although unlikely, can have significant effects on the EU environment as well as the European real estate sector and merit consideration for future scenario planning. Moreover, the analysis in this report is carried out at EU level, which may overlook significant country-specific differences, such as those for Portugal. This work primarily considered the most relevant environmental policies and their interactions, while future research could include additional EU measures to develop even more detailed scenarios at EU and industry level. The real estate industry is also large and multifaceted, encompassing a range of activities such as construction, property development, facility management and investment across residential, commercial and industrial segments. This diversity makes it inherently difficult to capture the full complexity of the industry in a single report. Furthermore, the workshop was conducted exclusively with the partner company, which is primarily specialized on the housing cooperative sector. Future research would benefit from the involvement of a wider range of stakeholders, such as commercial property developers and investors.

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13 Appendix

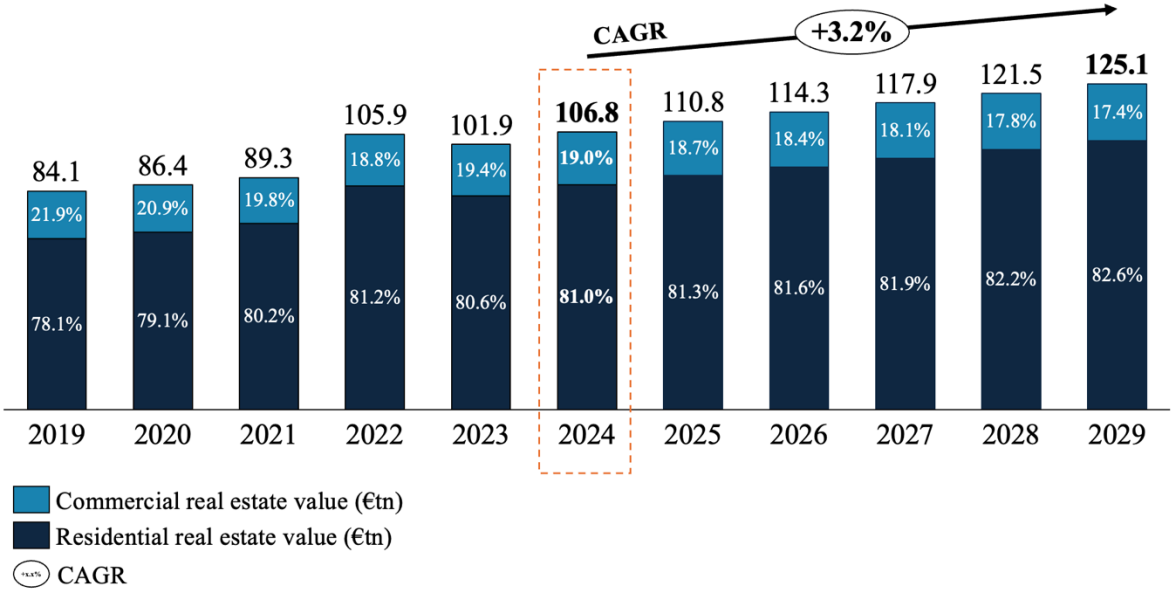


Figure 13 - European Real Estate Valuation Balance | Source: Own Creation based on Statista 2024c

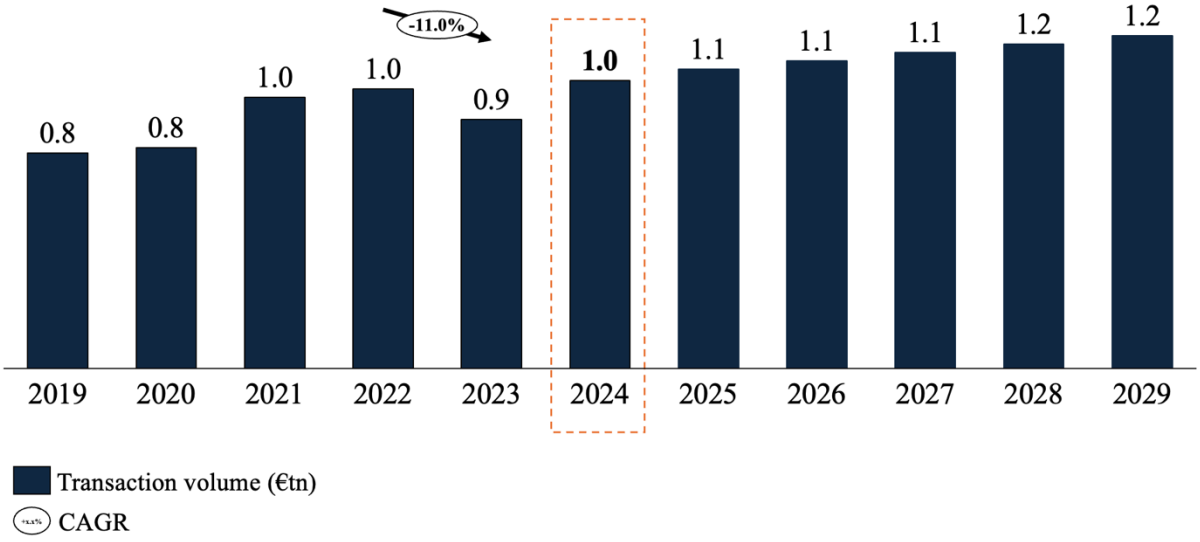
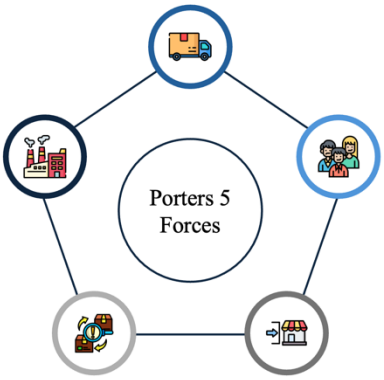


Figure 14 - European Real Estate Transaction Volume | Source: Own Creation based on Statista 2024c



INDUSTRY RIVALRY – *HIGH*

Competition for prime assets (well located / ESG compliant / stable demand) in capital cities and central markets remains fierce between developers and investors: Safe investments with high demand to better meet their ESG requirements (good location, ESG-compliant). Rivalry is also increasing in niche segments such as student apartments or co-living. The conversion of old buildings to ESG conformity is also having an impact on competition.

BARGAINING POWER OF SUPPLIERS – *HIGH*

Currently, suppliers have a strong bargaining position due to shortages of building materials and skilled labor. This shortage increases construction costs and gives suppliers more power over developers due to a one-sided dependency. Further pressure on developers to utilize sustainable building materials and technologies strengthens the position of suppliers, since such materials are often more expensive and scarcer.

BARGAINING POWER OF CUSTOMERS – *MODERATE*

Tenants' negotiating power is limited in urban areas, as the supply of affordable housing is scarce and rents continue to rise. Investors waiting for favorable opportunities (especially in "wait and see" mode) typically have a stronger position as they have capital and can wait for favorable market conditions. Private buyers have a mixed negotiating position. On the one hand, high interest rates limit the access to financing, reducing demand. However, this is outbalanced by high demand for residential property in many cities.

THREAT OF NEW ENTRANTS – *LOW to MODERATE*

Development of real estate in attractive locations or for ESG-compliant projects requires significant investment. New market entrants face difficulties in gaining access to sufficient capital, which represents a significant barrier. Local market knowledge and existing networks create additional challenges for newcomers who have to compete with established players. ESG compliance is increasingly becoming mandatory, which increases complexity for new market participants. Within the niche markets, entry barriers are lower than in the traditional real estate segments.

THREAT OF SUBSTITUES – *LOW to MODERATE*

Forms of housing like co-living, serviced apartments and specialized housing solutions such as student residences or senior housing offer customers alternatives to conventional rental apartments and are becoming increasingly popular. Futhermore, investors are also seeing alternative forms of investment such as infrastructure projects and sustainable energy solutions as a substitute for traditional real estate assets.

Figure 15 - European Real Estate Industry 2024 Porters 5 Forces | Source: Own Creation based on Deloitte 2024b; PwC 2023a; CBRE 2024b

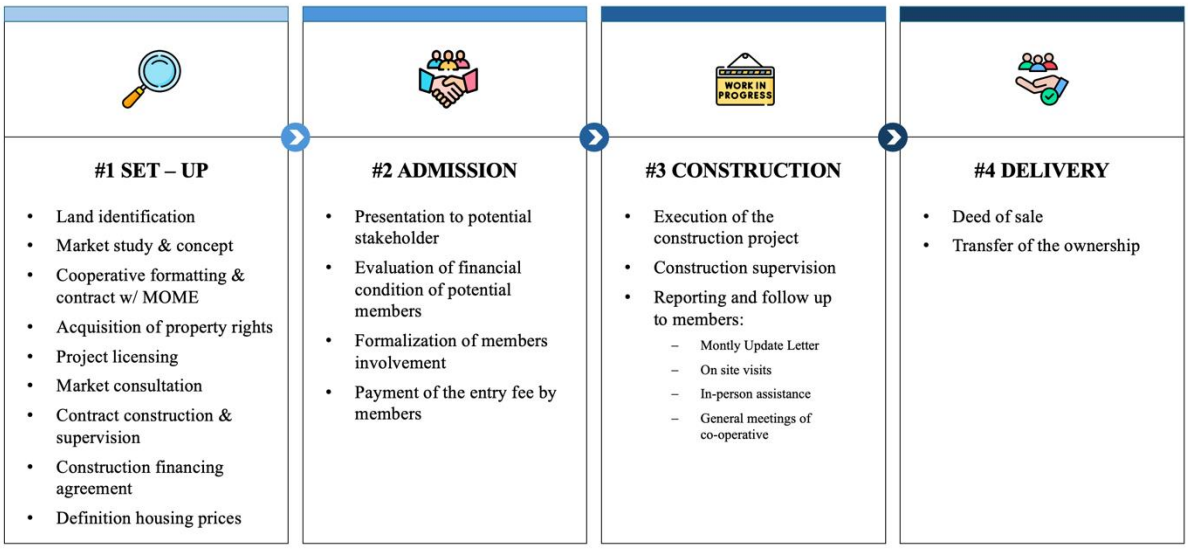


Figure 16 - Lifecycle Cooperatives MOME | Source: Own Creation based on MOME 2024c

Components of acquisition costs – *Article 17 of Decree – Law No. 502/99*

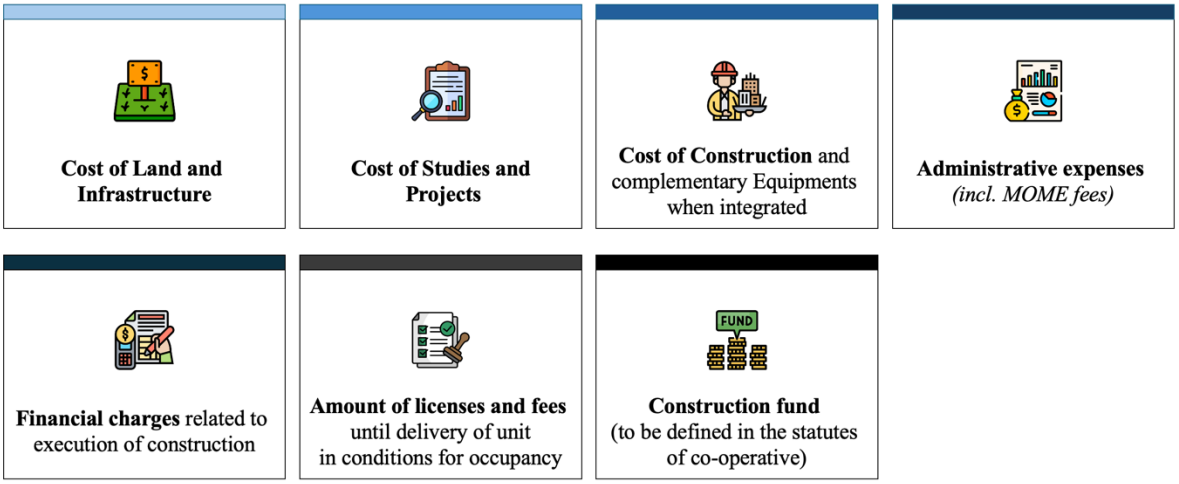


Figure 17 - Costs Housing Cooperatives Portugal | Source: Own Creation based on MOME 2024c

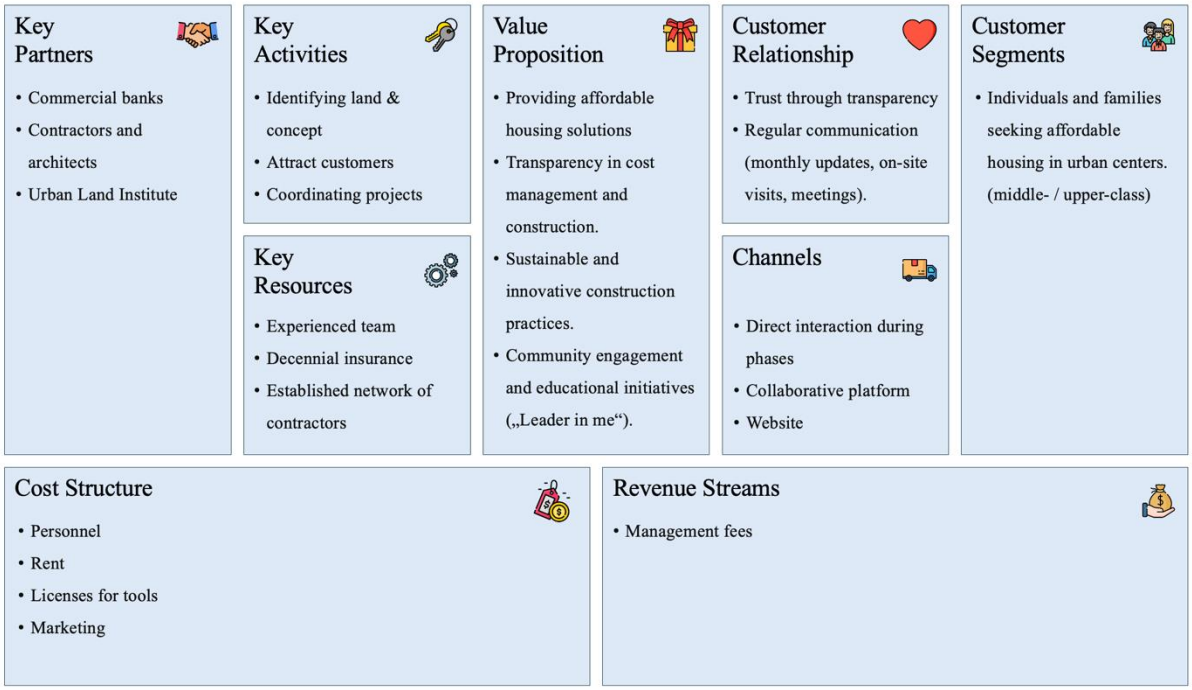


Figure 18 - Business Model Canvas | Source: Own Creation based on MOME 2024c

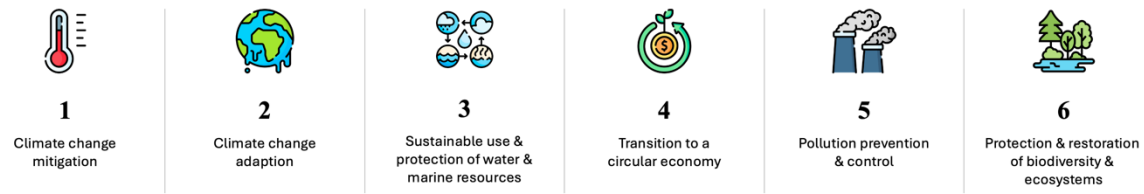


Figure 19 - Defined Climate Goals EU | Source: Own Creation based on EC 2024s

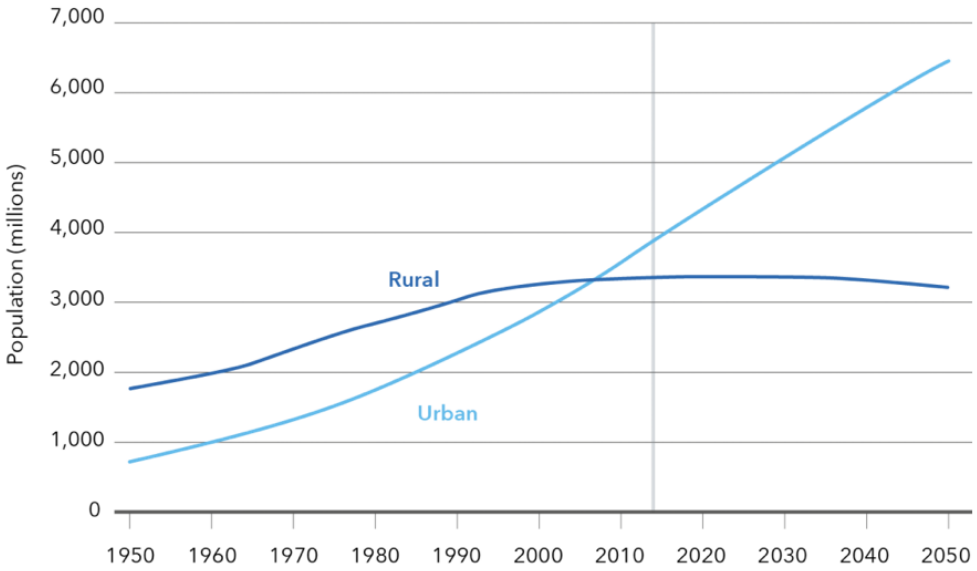


Figure 20 - Urban and Rural Population of the World, 1950-2050 | Source: UN 2014

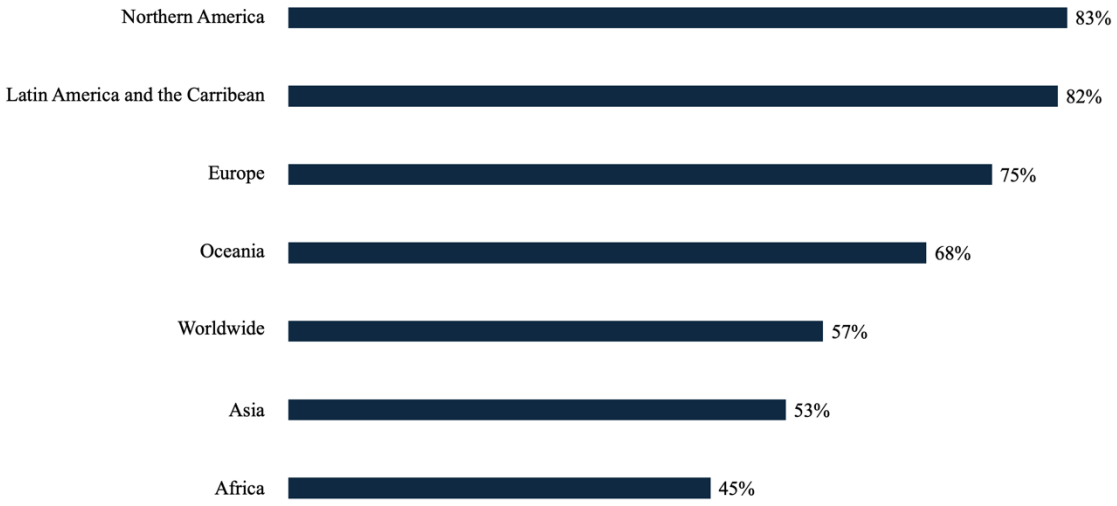


Figure 21 - Urban Population in 2023 | Source: Own Creation based on EC 2024s

PESTLE	Uncertainty	Level of impact (1-10)	Level of uncertainty (1-10)	Configuration 1	Configuration 2
Political	Institutional Stability & Unity of the EU	9	5,5	Strong and cohesive EU	Fragmented EU with national interests diverging
	Political Right Shift of Member States	6	7	Moderate right influence	Dominant right-wing influence
	Geopolitical Situation	9,5	9,5	Stable international relations	High geopolitical instability
Economical	Economic Situation	8	4	Upturn with economic growth	Economic downturn
	Financing Conditions & Inflation	6	5	Favorable with low interest rates and stable inflation	Unfavorable with high inflation and interest rates
	Supply Chain Stability	9	9	Resilient supply chains	Vulnerable supply chains disrupted by crises
Social	Societal Acceptance	6	6	Widespread public support for sustainability	Public skepticism and opposition
	Qualified Workforce Availability	8,5	8,5	Sufficient supply of skilled workers	Shortages of qualified workers
	Mass Migration Patterns	5	5	Uncontrolled migration	Managed and stagnated migration
Technological	Technological Innovation	5,5	8	Rapid innovation in sustainable technologies	Slow pace of technological innovation
Legal	Project Backlog	7	7,5	Highly bureaucratic procedures with excessive compliance costs	Streamlined regulatory frameworks with reduced bureaucracy
Environmental	Climate Change Intensity	8	5	Severe climate disruptions	Moderate climate impacts

Figure 22 – Uncertainty Ranking | Source: Own Creation

Raw Material	Phase	Import Dependency	Supplying Countries	Usage in Renewable Tech.
Magnesium	Refining	100%	China (93%)	Lightweight Structures Electric Vehicles Batteries
Heavy Rare Earths	Refining	100%	China (98%)	Permanent Magnets Electric Vehicles Energy Efficient Lighting
Light Rare Earths	Refining	100%	China (99%)	Permanent Magnets Alloys Catalysts
Platinum Group Metals	Refining	100%	South Africa (N/A) Russia (N/A)	Hydrogen Fuel Cells Energy Storage Catalysts
Lithium	Refining	100%	Chile (78%)	Electric Vehicles Energy Storage Energy Grids
Niobium	Refining	100%	Brazil (85%) Canada (13%)	High-Strength Steels Photovoltaics Supercapacitors
Tantalum	Extraction	99%	Congo DR. (36%) Rwanda (30%) Brazil (13%)	Capacitors Thin-Film Photovoltaics Turbine Electronics
Natural Graphite	Extraction	95%	China (47%) Brazil (12%) Norway (8%)	Electric Vehicles Energy Storage Fuel Cells
Cobalt	Extraction	86%	Congo DR. (68%)	Electric Vehicles Stationary Energy Storage Hydrogen Production

Figure 23 - Selected CRMs with Highest Import Dependency | Source: Own Creation based on Blengini et al. 2020; EC 2020c

Figure 24 - Photovoltaic Power Potential Portugal | Source: Global Solar Atlas 2023

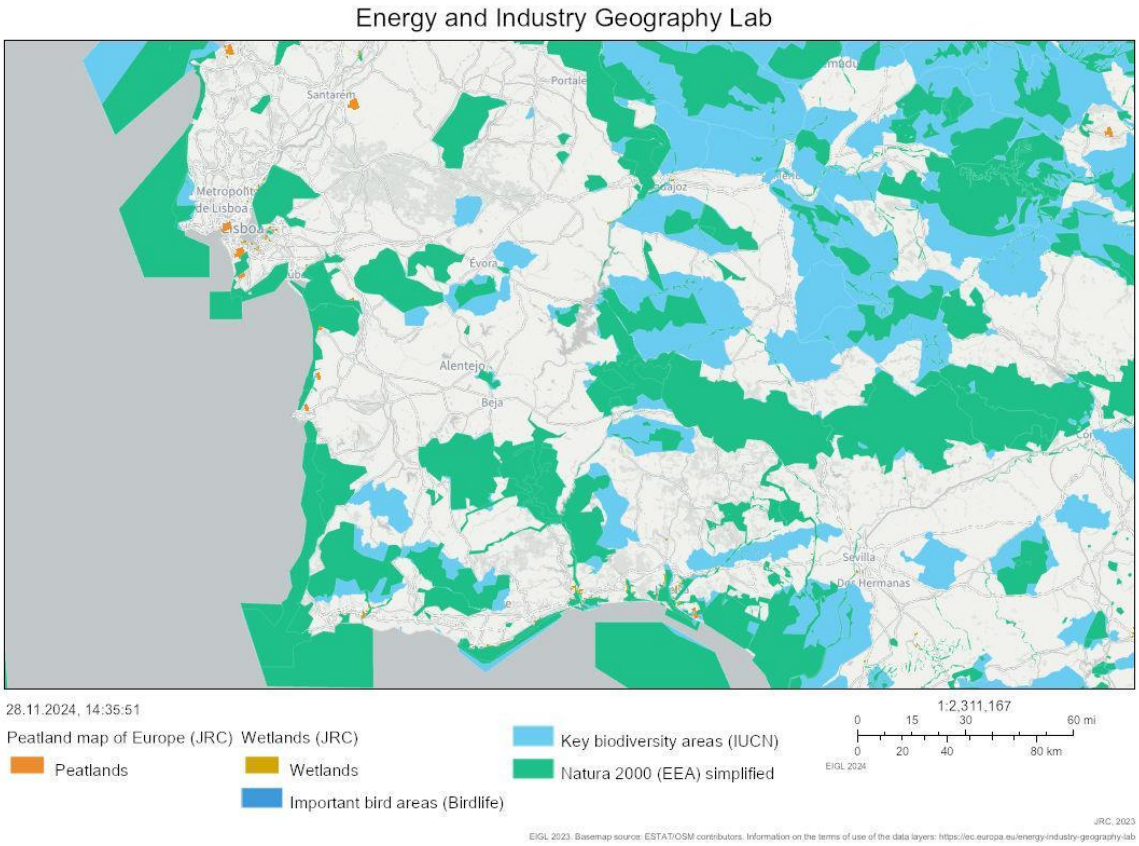


Figure 25 - Natura 2000 & Biodiversity Areas Alentejo Region | Source: EIGL 2024

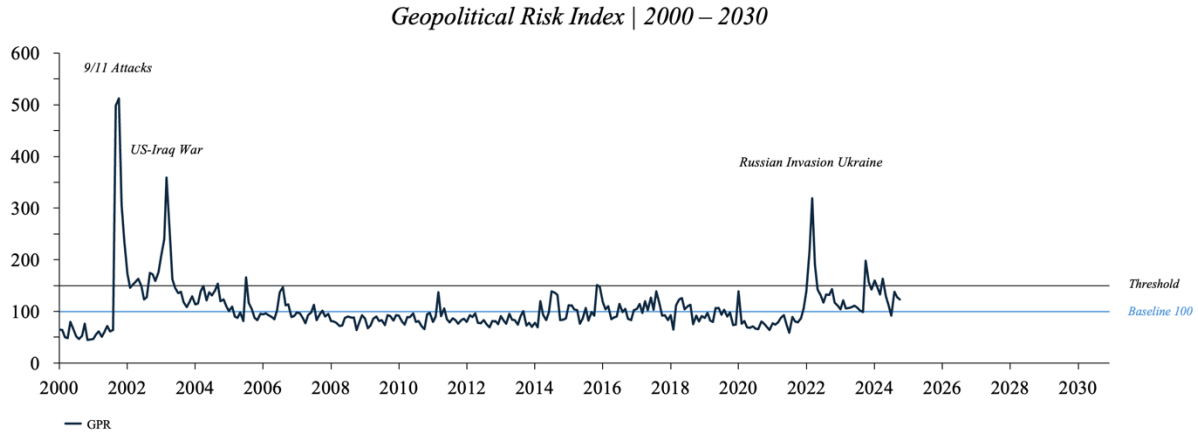


Figure 26 - Geopolitical Risk Index | Source: Own Creation based on Statista 2024b

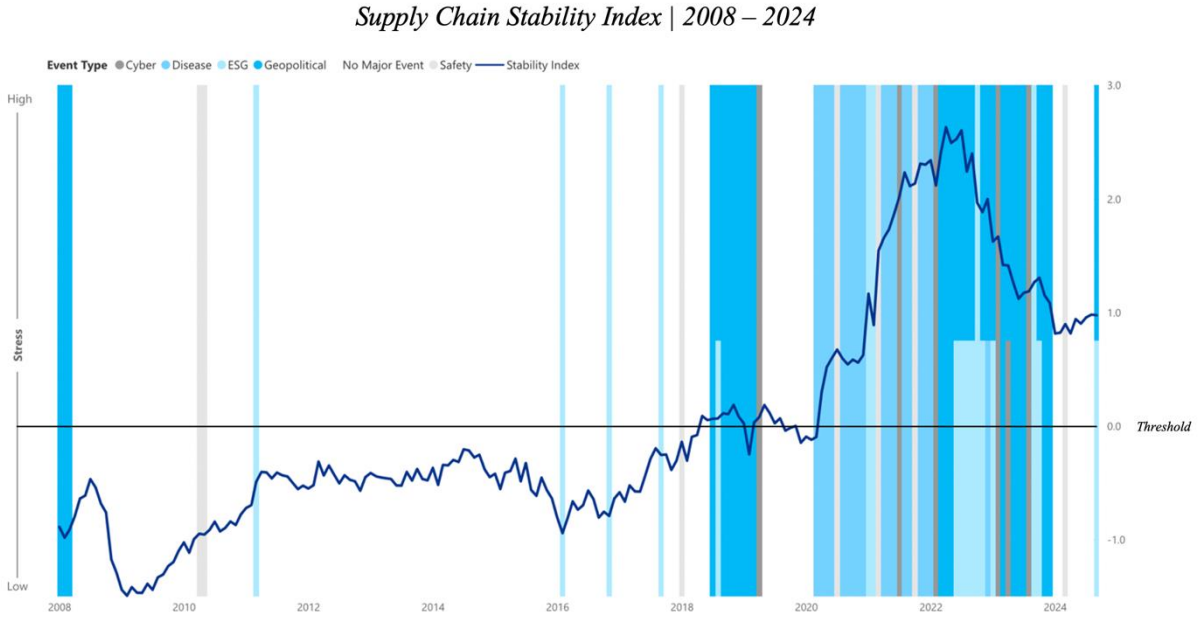


Figure 27 - Supply Chain Stability Index | Source: Own Creation based on KPMG 2024

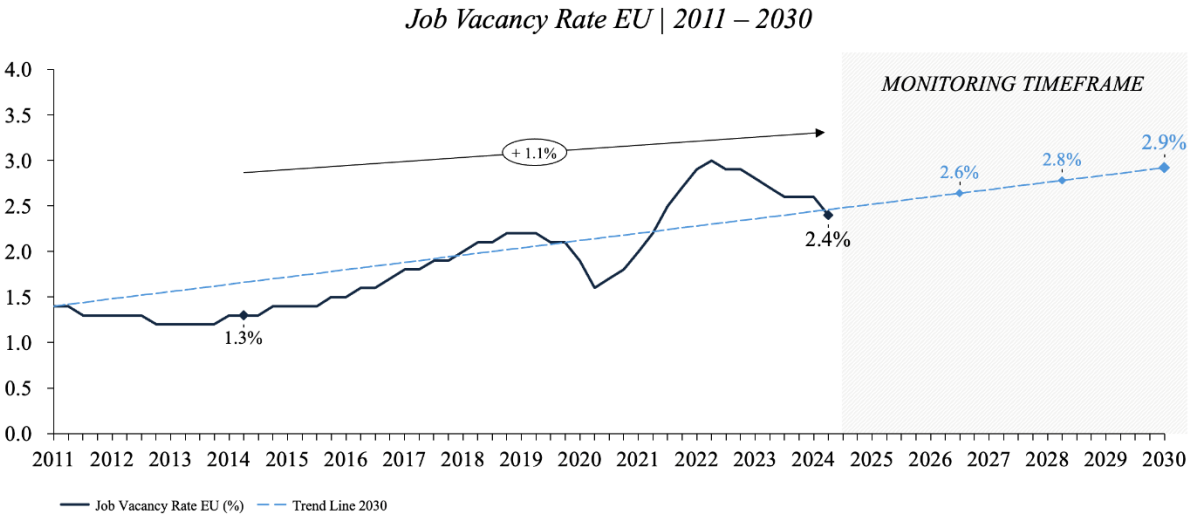


Figure 28 - JVR EU | Source: Own Creation based on eurostat 2024e

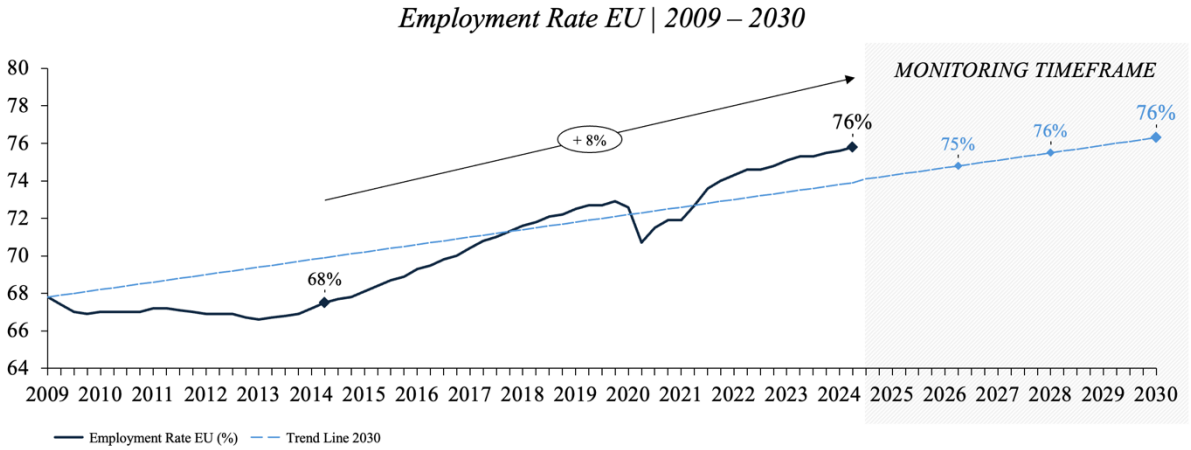


Figure 29 - Employment EU | Source: Own Creation based on eurostat 2024b

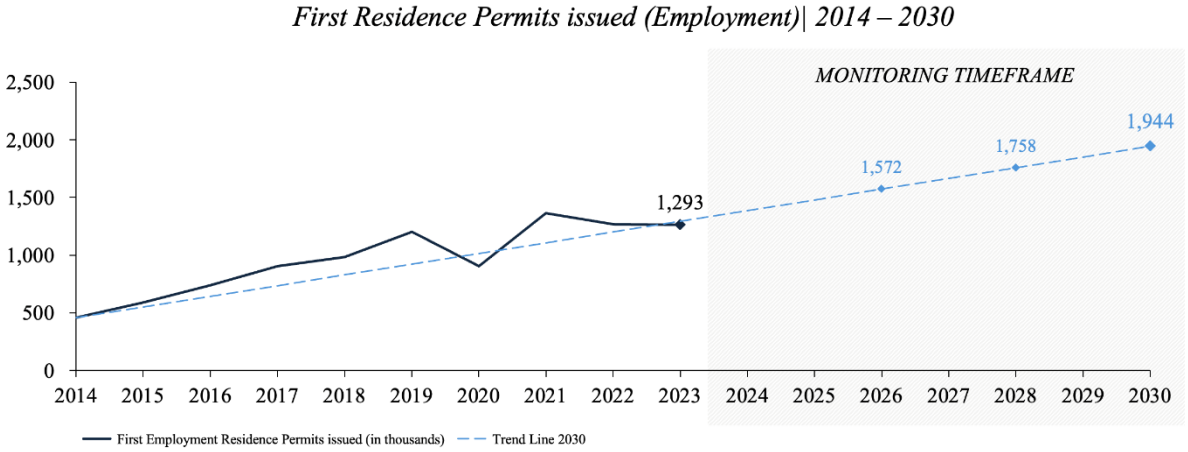


Figure 30 - Permits (Employment) EU | Source: Own Creation based on eurostat 2024g

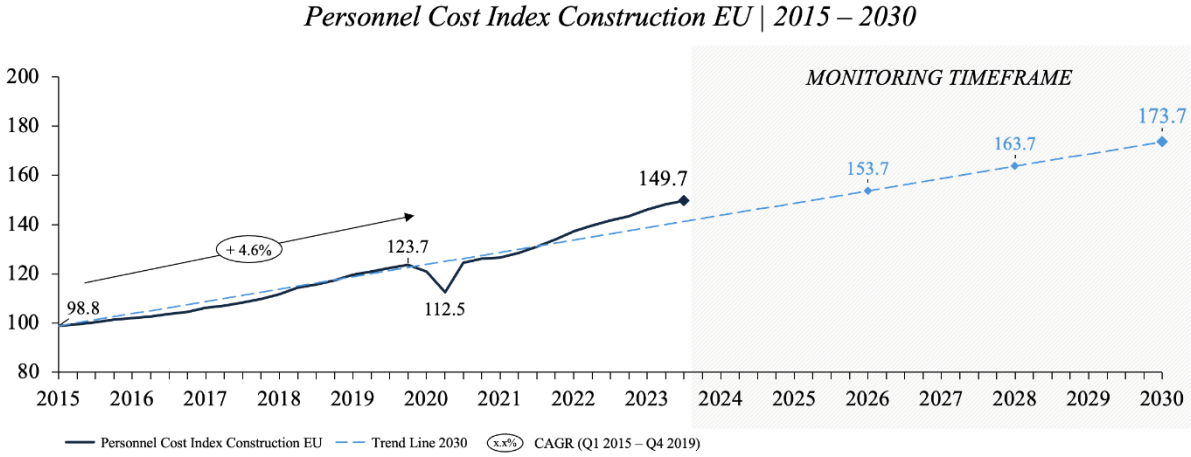


Figure 31 - Personnel Cost Index Construction EU | Source: Own Creation based on eurostat 2024d

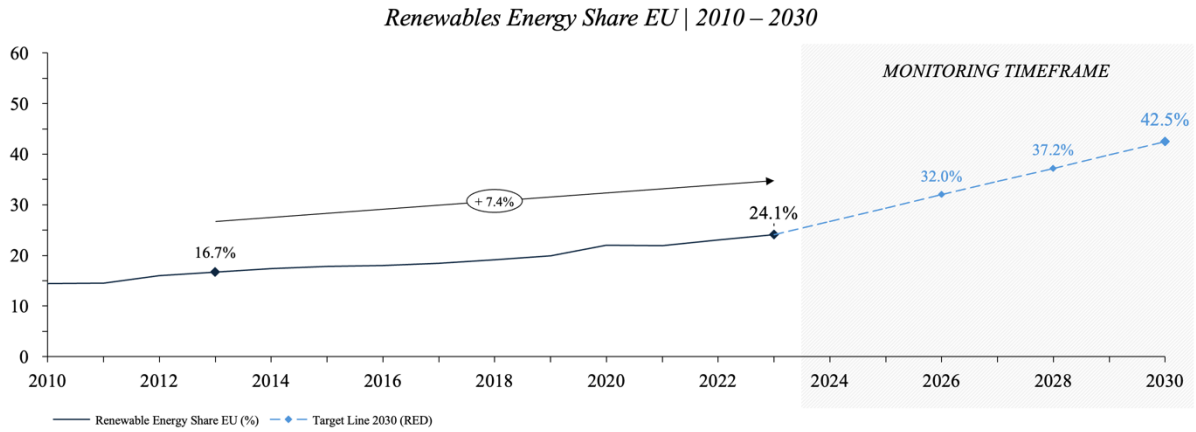


Figure 32 - Renewables Energy Share EU | Source: Own Creation based on EEA 2024b

Appendix 1

Interview Summaries

Interview 1: Assessing and Validating Uncertainties

Date: 09.10.2024

Participants: Professor Antonio Vicente, Joshua Jungblut, Moritz Fischer

Disclaimer: The interview with Prof. Antonio Vicente was held in English and was kicked off by a short introduction round of all participants, which is not part of this summarized transcript. Prof. Vicente accepted the proposal to record the meeting. Direct quotations were only inserted after his permission had been obtained.

Summary: The initial meeting with Professor Vicente was conducted with the objective of assessing and validating the initial uncertainties identified as being of particular importance. In response to the uncertainty surrounding the National Implementation, Professor Vicente asserted that it was less uncertain than the project team had initially estimated. He clarified that the Fit for 55 measures have already been legislated, and that there is a minimal theoretical and even more limited practical possibility of stopping or reversing them. The only exceptions would be in the adaptation of these measures using technical standards and delaying specific dates. Subsequently, Prof. Vicente guided the team to the central issue, namely, the

implementation of measures. He proceeded to emphasize the pivotal role of accessibility to technologies and the availability of labor in influencing the implementation process. When questioned about access to technology, he used the example of Europe's dependence on renewable technologies, especially from China, to highlight its impact. In cases of complete dependency, failure would have a detrimental impact on the EU's green transition. With regard to geopolitical stability, Professor Vicente recommended an increased uncertainty, given that recent developments have shown that these dependencies have become an effective means of exerting pressure and have become part of sanctions.

Main Conclusions:

- The role of political influence is relatively limited, given that the measures in question are already incorporated into legislation and there is no evidence of significant political decision-makers seeking to halt or even reverse them.
- It is possible to adapt some individual measures by adding or removing technical standards, and to slow down the process by pressuring delays.
- The primary source of uncertainty is the implementation process.
- The most significant influencing factor is access to these technologies, which can be affected by geopolitical conflicts.
- The availability of labor is another crucial factor (discussed in detail in second session)

Interview 2 – Assessing and Validating Uncertainties

Date: 24.10.2024

Participants: Tanja Schindler, Joshua Jungblut, Moritz Fischer, Theofanis Orfanidis

Disclaimer: The unstructured interview with Tanja Schindler was conducted by the project team in German. It began with a short round of introductions, a reiteration of the topic of the

paper, and the motivation of the project team to write a paper in the area of strategic foresight, which is not included in the summary. Tanja Schindler agreed to record the meeting.

Summary: The interview began with the project team asking her for her assessment of the biggest drivers of change in relation to our focal issue by 2030. Ms. Schindler highlighted the bureaucratic hurdles within the EU and between Member States. She gave an example from her own experience to illustrate her point: she recently wanted to hire a person from the Netherlands for her company in Germany, but it was not easy for her to do so. If the person is not willing to move to the company's country, a branch has to be opened in the person's home country. In a broader sense, she believes that there needs to be a united Europe that allows for cooperation to manage the green transition. The project team then presented Ms. Schindler with a list of uncertainties based on desk research and previous expert input. Ms. Schindler was asked to give her assessment of the list and to provide input on points where she disagreed with or wanted to highlight. Thus, she mitigated the uncertainty of the political shift to the right in Europe, which the team considered to be very significant, in terms of the chosen focus and time horizon. She attributed the polarization of society primarily to populism and poor communication by current politicians. The impact of new right-wing governments by 2030 would be limited primarily due to the lengthy decision-making processes in Brussels. In addition, she said, social engagement and awareness among younger generations is at an all-time high, reducing the level of uncertainty associated with it. The project team would have initially identified this as a potential KU. Ms. Schindler also highlighted the importance of knowledge transfer within the EU, which she linked to her initial assessment of labor mobility in Europe. The high youth unemployment rates in the south can be an important lever if cross-border mobility could be facilitated. Equally important is the recognition of professional qualifications and diplomas, both for EU Member States and for third-country nationals seeking work in the EU. Finally, she considered access to technologies such as solar panels to be more important than technological innovation,

especially with the chosen time horizon. In her view, innovations will not be scalable and therefore not market-ready enough to have a high impact on achieving the goals.

Main Conclusions:

- The mobility of workers within and into the EU is an important success factor for the green transition, but bureaucratic hurdles pose an obstacle.
- Polarization of society and a shift to the right have only a limited impact on the Fit for 55 goals by 2030 due to the inertia of processes and populism.
- Young generations are showing great willingness and commitment to green change.
- Access to key technologies is more important than new innovations by 2030.

Interview 3 – Assessing and Validating Uncertainties

Date: 28.10.2024

Participants: Antonios Sfakiotakis, Joshua Jungblut, Moritz Fischer, Theofanis Orfanidis

Disclaimer: The unstructured interview was conducted by the project team in English. The conversation began with an introduction to the topic of the paper and a brief round of introductions, which are not included in the summary. Mr. Sfakiotakis agreed to the recording of the interview, but it was also made clear that his statements were his personal expert opinion and not the official position of his employer, the EU.

Summary: The project team has shared the selection of uncertainties and the associated rating (level of impact/uncertainty) with Mr. Sfakiotakis and asked him to provide his opinion on selected points where he does not agree with the rating or would like to highlight his opinion. The first topic addressed was the institutional stability of the EU and the potential shift to the right in the Member States. The interviewee elaborated that the long-term orientation of EU policies such as the Fit for 55 is very unlikely to be derailed by political changes among the members. Even potential leadership changes such as Marine Le Pen in France or the rising

influence of the AfD in Germany are very unlikely to result in significant deviations by 2030 due to institutional inertia at the country and EU level and long-term commitments by European industries in the area of sustainability. Industries have already made substantial investments in a low-carbon future, which makes abrupt policy reversals economically infeasible. Another key issue was global competition. The EU is heavily dependent on other global powers such as the US and China for energy and raw materials. The interviewee emphasized that decoupling from China should be avoided and instead a de-risking of dependencies should be undertaken in order to strengthen the global competitiveness of European industries as much as possible. He also highlighted the potential supply chain risks in the future for CRMs in the EU, which could escalate due to potential upcoming crises such as the one in Taiwan. It was emphasized that this is particularly concerning due to the importance of these materials for the green transition. The expert considered social acceptance of climate policies to be higher than ever, which has been further strengthened by the increasing frequency of extreme weather events. He also identified the shortage of skilled workers as a serious factor in achieving the climate goals by 2030. He linked this to broader education challenges, as reflected in declining PISA scores, and the urgent need to re-skill the existing workforce. Finally, he sees factors such as the economic situation or financing conditions as predictable with robust forecasting tools and therefore with low uncertainty.

Main Conclusions:

- EU climate policy remains resilient to political changes in the Member States due to long-term industrial commitments.
- Global supply dependencies exist and need to be de-risked to ensure raw material security.
- Social acceptance is very high today and contributes to support for climate targets.

- A shortage of skilled workforce is coming into focus by 2030 and requires both changes in education and reskilling.
- Economic factors are easy to predict and are therefore less uncertain.

Interview 4: Assessing and Validating Uncertainties 2nd Session

Date: 30.10.2024

Participants: Professor Antonio Vicente, Moritz Fischer, Theofanis Orfanidis

Disclaimer: Prof. Vicente accepted the proposal to record the meeting. Direct quotations were only inserted after his permission had been obtained.

Summary: The second meeting with Professor Vicente served the purpose of validating the final KUs. Accordingly, the project team presented the idea of merging supply chain stability, related to renewable technologies and critical raw materials, with geopolitical stability. Professor Vicente approved this concept and advised that we consider increasing the impact and uncertainty of this factor in comparison to other uncertainties. Simultaneously, he underscored the significance of accurate framing. For instance, the conflict in Sudan had a negligible impact on global supply chains, whereas the war in Ukraine resulted in a complete transformation of the European energy landscape. He agreed with the idea of framing the uncertainty very specifically to China and other important suppliers due to the dependencies on renewable energy technologies and CRM. Professor Vicente expressed reservations about the concept of a potential social acceptance KU. He justified this by noting that public acceptance of such changes occurs over many years and is therefore not especially uncertain. Furthermore, he observed that acceptance of climate-friendly policies remains high, as evidenced by the Eurobarometer survey. In addition, social acceptance could not be viewed in binary terms, which would have made mapping on the scenario matrix more difficult. Conversely, he advocated the prioritization of workforce availability as the second KU. Professor Vicente

highlighted that, despite the EU's advancement in renewable technology, the existing workforce may not be sufficient to implement these technologies on a wide scale. In response to a question regarding the uncertainty associated with this factor, he highlighted the potential for the skills gap to widen further, but also for it to narrow again if the planned visa and recognition programs are implemented successfully and promptly. Furthermore, he underscored the education protectionism that persists within EU countries, emphasizing the necessity of addressing this barrier to successfully admit qualified and specialized workers across the EU.

Main Conclusions:

- Validation of the first KU: Supply Chain Stability.
- Supply Chain Stability must be specifically framed to ensure high impact and uncertainty.
- Rejection of the KU social acceptance due to insufficient uncertainty.
- Validation of the second KU: Skilled Workforce Availability.
- Confirmation of sufficient uncertainty, as skills gap can be both increased and reduced through the right measures.
- Highlighted educational protectionism as a key barrier in workforce availability.

Interview 5: Challenge and validation of the four developed scenarios

Date: 04.11.2024

Participants: Christiane Conrads, Moritz Fischer, Theofanis Orfanidis & Joshua Jungblut

Disclaimer: The interview with Christiane Conrads was held in German and was kicked off by an extensive introduction round of all participants, which is not part of this summarized transcript. She accepted the proposal to record the interview, orally agreed on the students' wish to cite her statements and asked for the final version of the work project to be sent to her.

Conrads was taking notes on the scenarios and shared her comprehensive feedback after hearing the four scenarios.

Summary: The project team started off explaining the purpose of the work project, its focal issue, time horizon and the main ideas and concepts behind strategic foresight, scenario planning and the *Intuitive Logics School* approach that will be applied for the scenario exercise. Subsequently, the scenario matrix was shown to Christiane Conrads while explaining the framing and the implications of the two KUs to better understand the four underlying scenarios. The project team also added that all scenarios follow the same structure: They begin with an analysis of the contextual factors, where the implementation of the EU's sustainability directives and regulations is analyzed and end with an analysis of the transactional factors, where the impact of these measures is concretely applied to the real estate sector.

Then, Joshua Jungblut started off presenting the *'Efficiency Gambit'* (formerly: *'Disruptive Efficiency'*) scenario. Moritz Fischer continued presenting the *'Voltage Revolution'* (formerly: *'Green Symphony'*) scenario and Theofanis Orfanidis concluded presenting the *'Digital Backbone'* (formerly: *'Green Gridlock'*) and *'Fading Horizon'* (formerly: *'Green Struggle'*) scenarios.

Christiane Conrads thanked the team members for sharing their insights, ideas and assumptions with her and expressed her deep interest in knowing more about the European Commission's go-to areas, which she had not heard of beforehand. Thus, the team shared an article published by the official website of the EC in the chat. She stated that she very much liked the approach of splitting the analysis into contextual and transactional factors, which helps to break down the topic and add value by reducing complexity. She agreed with selection of the KUs, highlighting the dependence and interplay between CRMs (necessary for green technology) and geopolitical risks. She also reinforced the importance of reskilling the existing workforce for the transition, for instance from brown industries to green industries. Finally, she got back to the logic chains

presented in the different scenarios, highlighting the importance of this exercise for the future of the Real Estate sector, yet recommended the team to consider the following topics and ideas.

Main conclusions:

- Energy monitoring, facility management, the use of digital devices such as smart meters, building management, etc. are also very important pillars of the transition, yet oftentimes neglected in the discussion. However, the number of workers who can install, operate and maintain it is still too small.
- When talking about using alternative/transition fuels in response to the lack of skilled workers for expanding renewables (sources of energy), one must keep in mind that also in these areas many people are close to retirement. Therefore, countries such as Germany are considering recalling recently retired pensioners to stabilize energy supply. However, this will only happen at a high price.
- Reducing energy consumption and decarbonizing buildings dominate debates and regulation. As positive as this development is in view of climate change and the industry's contribution to it, it ignores many other relevant aspects of sustainability. One of these issues is the loss of biodiversity and the critical situation of many ecosystems. Depending on the scope of your work project, this is something to think about as well.

Appendix 2

Workshop Summary (27.11.2024)

Participants:

Last name:	First name:	Institution:	Role:
Antunes	Francisco	MOME	Executive President
Barbosa	Sofia	MOME	Production Manager
Braz	João	MOME	Head of Knowledge & ESG Initiatives
Brito	Susana	MOME	Financial Manager
Cox	Elena	Nova SBE	Project Team
Fischer	Moritz	Nova SBE	Project Team
Fontes	Maria	MOME	Marketing & Design Manager
Fratila	Andrei	Nova SBE	Project Team
Jungblut	Joshua	Nova SBE	Project Team
Orfanidis	Theo	Nova SBE	Project Team
Pimentel	Nuno	MOME	General Manager

Table 1 - Workshop Participants | Source: Own Creation

Summary: On November 27, a joint workshop was held with partner company MOME to examine the four scenarios developed and their implications for the company. The goal of the workshop was to examine both external and internal factors for each scenario and to develop strategies using the TOWS framework (Threats, Opportunities, Weaknesses, Strengths) as a central analysis tool.

The session began with an introduction to scenario planning, outlining its purpose and methodology. Each scenario was then discussed individually, focusing on potential developments at the EU level related to the implementation of specific environmental policies, driven by the two KUs that could affect the future of the industry.

Participants were actively involved in applying the TOWS framework to each scenario in an engaging, collaborative format. First, key strengths and weaknesses within each scenario were identified, and then the discussion moved on to analyzing the threats and opportunities arising

from wider environmental changes. To facilitate collaboration and capture all participant inputs effectively, a Miro board was used throughout the session.

This structured approach provided a clear understanding of how each scenario differed and highlighted the unique challenges, opportunities and strategic considerations inherent in each possible future.

Miro Board:

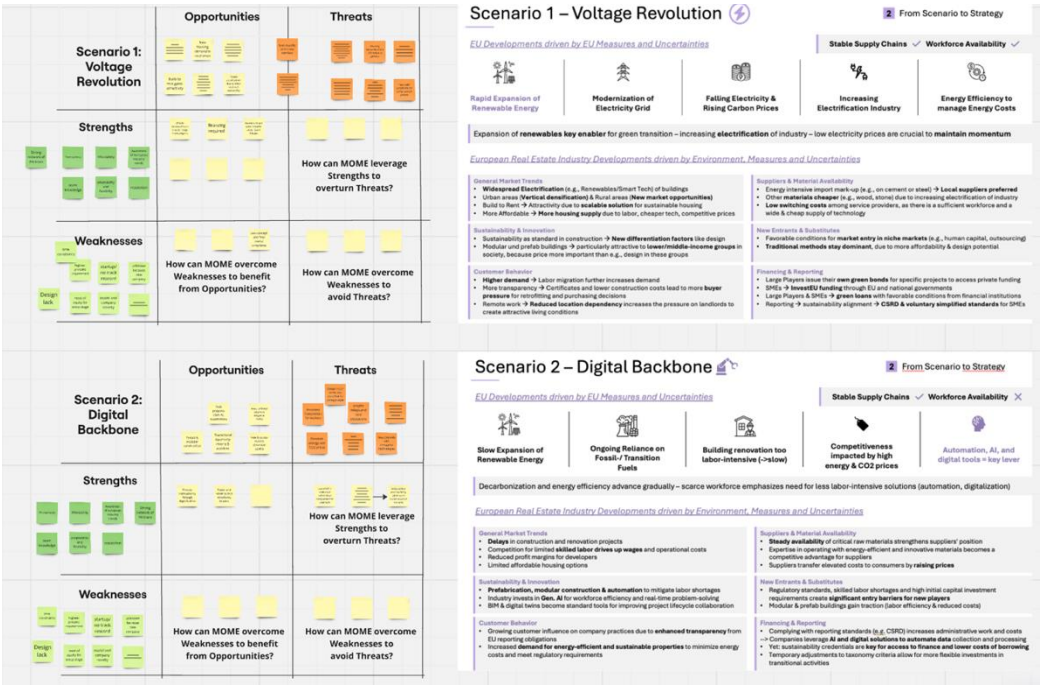


Figure 33 - Workshop Miro Board 1/2 | Source: Own Creation

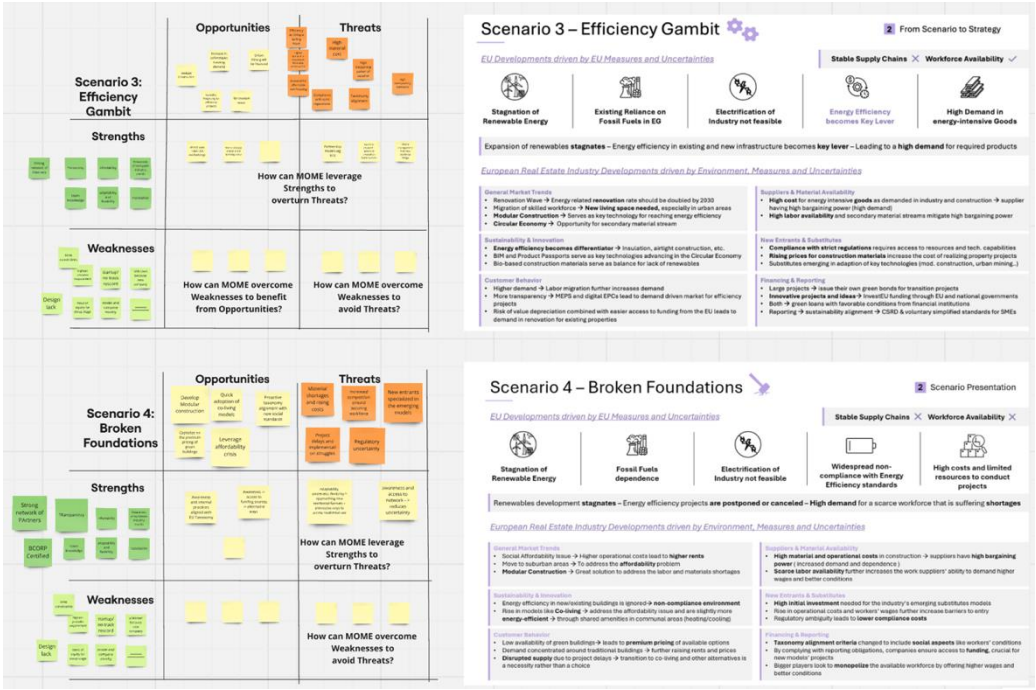


Figure 34 - Workshop Miro Board 2/2 | Source: Own Creation

Appendix 3

Uncertainties Description

Uncertainty	Level of Impact (1-10)	Level of Uncertainty (1-10)	Justification
Institutional Stability & Unity of the EU	**Score: 9** *Acute impact*	**Score: 5.5** *Neither likely nor unlikely to predict*	Critical for the enforcement of sustainability measures, as cohesion ensures consistent & unified policy application across Member States **(acute impact)**. Yet, growing political & economic pressures (e.g., Brexit, internal divides) create **moderate uncertainty** regarding long-term unity and its role in addressing climate & sustainability goals.
Political Right Shift of Member States	**Score: 6** *Moderate impact*	**Score: 7** *Uncertain to predict*	A shift towards right-wing parties can reduce the prioritization of sustainability in policy agendas. However, for the selected time horizon (2030), most measures are already being transposed & implemented and thus too costly to overturn **(moderate impact)**. The variability in electoral

			outcomes across the EU introduces **significant uncertainty** about the long-term prioritization of sustainability.
Geopolitical Situation	**Score: 9.5** *Acute impact*	**Score: 9.5** *Extremely uncertain to predict*	Global conflicts, trade tensions, and energy dependency (e.g., reliance on non-EU fossil fuels) directly affect the EU's ability to implement the green transition **(high impact)**. High geopolitical volatility, such as outbreaking wars or sanctions, exacerbate the unpredictability **(high uncertainty)**.
Economic Situation	**Score: 8** *High impact*	**Score: 4** *Somewhat likely to predict*	Economic growth or recession influences the funding available for sustainability projects and the political will to enforce them (**high impact)**. Given that economists regularly publish forecasts on GDP and other metrics, **uncertainty** is **moderate**.
Financing Conditions & Inflation	**Score: 6** *Moderate impact*	**Score: 5** *Neither likely nor unlikely to predict*	Inflation and rising interest rates affect the affordability of green technologies and the financial feasibility of large-scale sustainability initiatives **(high impact)**. The uncertainty stems from fluctuating global economic conditions and monetary policies, however, can also be roughly forecasted by economists **(moderate uncertainty).**
Supply Chain Stability	**Score: 9** *Acute impact*	**Score: 9** *Extremely uncertain to predict*	The implementation of sustainability measures relies on stable supply chains for renewable energy technologies and materials that are also needed for automation **(acute impact)**. Disruptions from geopolitical tensions, disputes, pandemics, or trade wars introduce **high uncertainty**.
Societal Acceptance	**Score: 6** *Moderate impact*	**Score: 6** *Uncertain to predict*	Public engagement and support for sustainability measures can accelerate their implementation and increase their success **(moderate impact)**. However, societal acceptance for trade-offs is increasing according to the latest Eurobarometer, leading to **moderate uncertainty**.
Qualified Workforce Availability	**Score: 8.5** *Acute impact*	**Score: 8.5** *Extremely uncertain to predict*	A skilled workforce is crucial for executing technological and challenging infrastructural transformations required by sustainability goals **(acute impact)**.

			The **high uncertainty** reflects the mismatch between current workforce qualifications and the rapidly evolving demands of green industries, as well as the gap to fill between increasing number of jobs while the working age population is steadily decreasing.
Mass Migration Patterns	**Score: 5** *Moderate impact*	**Score: 5** *Neither likely nor unlikely to predict*	Mass migration influences infrastructure and resource allocation, but its direct influence on the implementation of sustainability measures is relatively lower **(moderate impact)**. **Uncertainty** is **moderate**, as migration patterns depend on unpredictable factors. However, migration is certainly going to increase by 2030 given the geopolitical and climatic circumstances.
Technological Innovation	**Score: 5.5** *Moderate impact*	**Score: 8** *Uncertain to predict*	Breakthroughs in technology can accelerate sustainability projects, but the required technology for the achievement of the EU's goals for 2030 does already exist and solely needs to be comprehensively implemented **(moderate impact).** Reliance on innovation for the future, coupled with high investments in R&D introduce **high uncertainty** due to the unpredictability of the progress made until 2030.
Project Backlog	**Score: 7** *High impact*	**Score: 7.5** *Uncertain to predict*	Delays in infrastructure- and energy transition projects hinder progress towards sustainability goals **(high impact)**. **High uncertainty** arises from the unsolved problem how to tackle bureaucratic inefficiencies and labor shortages.
Climate Change Intensity	**Score: 8** *High impact*	**Score: 5** *Neither likely nor unlikely to predict*	Climate change poses significant risks to ecosystems and economies, which is why the EU will need to allocate significant funds to the consequences of potential climate catastrophes **(high impact)**. **Uncertainty** is **moderate** as the long-term trends are well-established, though specific regional effects remain variable.

Table 2 - Uncertainties | Source: Own Creation

Appendix 4

InvestEU Criteria:

Elimination of potential market failures or investment gaps: The project to be financed must solve an existing problem for which funding is required. MOME fulfils this requirement, as affordable and sustainable housing has been identified as a clear gap in Portugal.

Contribution to EU policy objectives: With its focus on energy-efficient construction, MOME corresponds to one of the classified priorities.

Economic viability: MOME must be able to demonstrate that the project is financially sustainable through transparent cost structures.

Transparency and reporting: MOME must transparently document and disclose the use of funds. Detailed project reporting is also required.

Taxonomy compliance: MOME is already taxonomy compliant.