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Business Plan in the construction industry: Passive neighbourhood by Metathesis

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Master in Management

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September, 2023

Department of Marketing, Strategy and Operations

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Resumo

Este projeto insere-se no âmbito do mestrado em gestão, tendo como objetivo apresentar um plano de negócios focado na implementação e viabilidade de um empreendimento imobiliário passivo e sustentável, promovido por uma empresa imobiliária com 20 anos de experiência sediada em Almada, a Metathesis. O estudo explora as tendências de mercado e a forma como as características sustentáveis se alinham com as preferências dos clientes, em constante evolução.

Dado o tema, o presente trabalho irá concentrar-se na avaliação da viabilidade económica e financeira do projeto, tendo em conta o cliente-alvo da empresa - uma família de classe média de dimensão média - no que diz respeito ao financiamento do projeto, conhecimento técnico necessário para a sua implementação e a aquisição de parceiros e recursos.

Para a execução deste projeto, foi realizada uma análise da literatura sobre temas relacionados, bem como uma análise de mercado para estudar o ambiente contextual circundante que pode impactar o projeto. Foi também conduzida uma análise interna da empresa, juntamente com um estudo competitivo e estratégico. Em conjunto com os tópicos mencionados, foi conduzido um estudo de implementação, bem como a avaliação dos custos e regulamentações necessárias para concluir o projeto.

Após analisar todos os temas mencionados, posso concluir que o plano de negócios é economicamente viável, em qualquer um dos cenários de rentabilidade examinados.

Palavras-chave: Sustentabilidade, imobiliário, construção passiva.

Sistema de classificação JEL:

M - Business Administration and Business Economics; Marketing; Accounting

M1 – Business Administration

M10 – General

M19 - Other

Abstract

This project falls within the scope of the master's in management, and its object is to present a business plan focused on the implementation and feasibility of a passive and sustainable real estate development, by a 20-year-old real estate developer based in Almada, named Metathesis. The study explores the market trends and how sustainable features align with evolving customers preferences.

Given the theme, the present will focus on studying the economic and financial viability of the project, given the companies target client - a medium sized middle-class family – in what concerns funding of the project, technical knowledge needed to implement it, and procurement of partners and resources.

In order to execute the below project, a literature analysis of relating themes was executed, as well as a market analysis directed at studying the surrounding contextual environment that may impact the project. An internal analysis of the company was also conducted, as well as a competitive and strategic study of it. Pairing with the aforementioned topics, an implementation study was conducted, as well as the costs and regulations necessary in order to bring the project to completion.

After analysing all the previous themes, I can conclude that the business plan is economically viable, in any of the scenarios for profitability that were examined.

Keywords: Sustainability, real estate, passive building

JEL classification system:

M - Business Administration and Business Economics; Marketing; Accounting

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1. Literature review

In order to develop this business plan, some of the most important aspects and concepts of it must be properly understood. To define these concepts research was developed of the 3 most essential ones: entrepreneurship, business plan and strategy. This research was done in English, in the area of business, as well as study of passiveness in Portugal. The publication period taken into consideration was dates after 1970 up until 2023: given that these are general themes that do not suffer a lot of change through the years, the risk of them being obsolete would be very low.

1.1 Entrepreneurship

Entrepreneurship is a concept that, although very discussed, continues to be hard to define by scholars.

One of the most widely accepted definitions was designed by Professor Howard Stevenson in 1987, and it interprets entrepreneurship as “the pursuit of opportunity beyond the resources controlled”. The “entrepreneur” should be driven by the perception of opportunity, their task should be to manage the uncertainty and risk, while focusing on the result of profit. Ultimately Stevenson’s approach to entrepreneurship is on it being an approach to management, a behavioural phenomenon of going beyond the limits already established by a certain idea or company.

Gartner, 1990, discussed the lack of a common definition on, not only what entrepreneurship is, but also what it studies. Following this, he developed a questionnaire in order to understand how 44 different people viewed the concept and found out that their answer would vary on their own beliefs. Some focused-on innovation, others on value creation, and some on profit. Given this results the main conclusion of the author is that when talking about entrepreneurship, one must be clear about what the meaning of entrepreneurship for themselves.

Many authors will agree that while entrepreneurs always claim to search for innovation, few have ventures truly unique. One common misunderstanding of entrepreneurship is that for an idea to be successful it must be a completely new concept, and while some level of creativity

should exist, often the most successful new ventures are the ones focused on fulfilling a market gap more than coming up with something original.

Overall, there are many ways to divide the different types of entrepreneurs. One way could be as either opportunity based or as necessity based: the first one is derived from a good idea or a business gap that was perceived, and the second one is when the entrepreneur has no other option but to start a venture. It is not a choice, but a must. Another way to separate the different categories of entrepreneurship could be by innovation in order to serve a global opportunity or small medium enterprise, which serves a local market.

All these perspectives point towards a few common points: the role of an entrepreneur is a role with a lot of risk associated, and that is strongly related with taking advantage of opportunities. While innovation doesn't have to be the main lead of a business, a certain level of analysis in order to gain competitive advantage and tap into untapped markets should exist and is going to be one of the only ways to really achieve high profitability.

1.2 Business plan

According to Mason (2004), the business plan is the first step when deciding whether to invest in an idea or not. While not all business plans' final goal needs to be to gain funding (since the entrepreneur might not require it), the different aspects of a business plan are key in order to access viability of the project, and to develop it.

The first thing to remember when constructing a business plan is not to assume a "one size fits all" perspective. Different types of business, ideas and projects will need different types of support, financial or not, and should be adapted taking into consideration the specific audience for the plan.

Overall, following Haag's (2013) deconstruction of a business plan, the process should be initiated with a strong definition of a business concept and all that entails: services or products provided, target audience and the value proposition, or how these will differ from the services/products provided by the competitors.

Following that, one must gather data on the feasibility of the project and the specifics of the concept proposed. One way to do it could be by writing a list of questions that we have and researching them. After doing so, the information gathered will help decide whether it makes sense to pursue the idea, or if it needs to be reimaged (or scratched).

It is at this time that a statement of purposed can be designed, with one version of an early mission statement that explains what should be provided in the concept. According to Bangs (1995), this is a good exercise to check if the idea is well thought through: if we can't describe the idea clearly, in a simple, easy to understand way, then we must go back and rethink the project again. This clear explanation should appear on the first sentences of the business's plan executive summary.

As mentioned previously the business plan must be in a format adapted depending on its audience. Usually, the plan should have the following components:

1. Cover letter, which should entice the reader to be interested in the idea.
2. Executive summary, that captures the essence of the business plan.
3. Table of contents.
4. Business description and history, explaining how the business will succeed and how it will be managed.
5. Business structure with facts that might support any financing request.
6. Product or service description.
7. Market analysis and trends, which in a way is a plan within a plan, focusing on marketing strategy.
8. Operations explaining the day-to-day function of a company.
9. Technology plan with the functions that could benefit from technology.
10. Management and organization.
11. Social responsibility and sustainability and the "triple bottom line": people, planet and profile.
12. Development, milestones, and exit plan.
13. Financial data, income and expense statements.
14. Appendix.

It is vital to emphasize how important preparation is to a business plan, as one of the entrepreneur's most important documents in the entrepreneurship process. It should not be merely a report that is prepared and later forgotten, but an essential strategic tool for making daily decisions.

1.3 Strategy and competitive strategy

As per other concepts in the business world, strategy does not have one main definition that is accepted by all. One way of characterizing it is with its own nature: a mix of business perspective and competitive moments that are used by managers in order to unite their organizations.

In many ways, strategy can be translated into a game plan, whose objectives are to attract customers, achieve a good market share and position and be successful in its competitiveness.

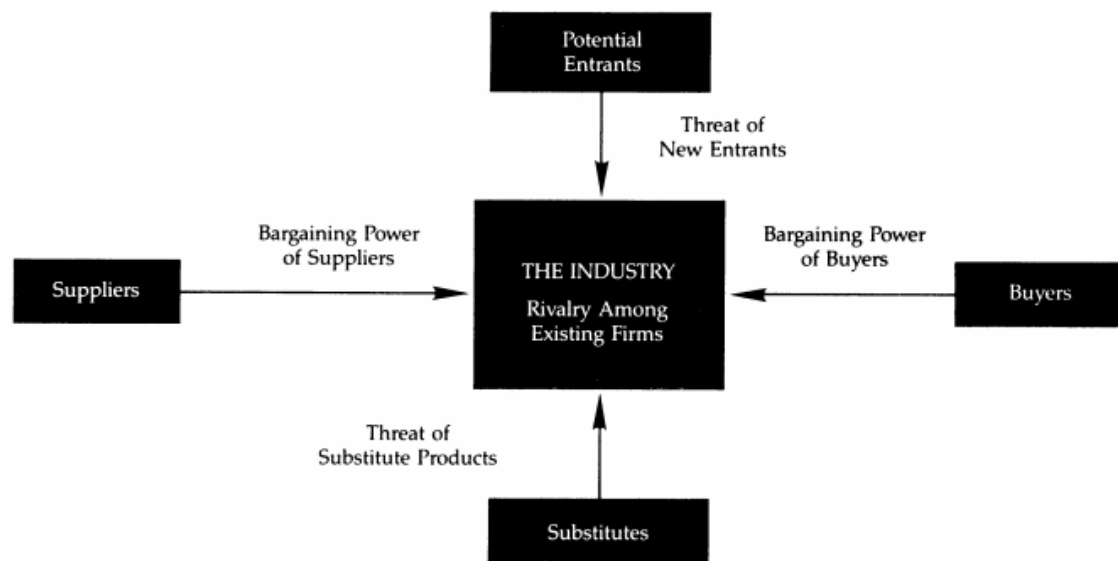
One of the most well know definitions of strategy was coined by Porter in 1996. After studying and analysing strategy in business he considered that in order for a company to succeed one must make the distinction between operational effectiveness and strategy. These 2 concepts, well executed, should let into a superior performance but, in his opinion, while the first was extremely important, it was not sufficient for a profitable enterprise. Very few companies are able to compete only with the use of operational effectiveness, due to the fact that this is a characteristic that is not hard to replicate, leading onto the loss of competitive advantage.

So, Porter defended the need of a company to establish a difference between its competitors that can be preserved: great value must be delivered or a comparable value, at a lower cost.

In order for a strategy to be well implemented and objective, it must be simple but consistent. As with any type of planning, there must be a profound understanding of the market, their customer base and of the competition. A thorough understanding of their resources and their capabilities is also essential to ensure a well thought out strategy. Strategy should be an interpretation of the company and its environment, and consistent with its goals, values, policies, and internal systems.

As do many authors, Porter defends that the success of a company is always dependent on external factors, impossible to control, such as political, economic or social. In order to be successful, the company must be able to adapt to these factors. As Porter defends (1980) these factors will always impact all companies in any given industry, so, in order to prepare the company must find its own place in the industry so that it can deal in the best way with the competitive forces presented by him in his model: Porter's 5 forces.

Figure 1.: Porter's 5 forces



Source: Porter (1980).

In this model, which requires an extremely detailed knowledge of the market, Porter focuses on the 5 most impactful “forces” that may affect how attractive a business is: the potential entrants, the bargaining power of buyers and of suppliers, substitute products and in general the rivalry among existing companies.

The best way to find that position and choosing how to best insert the company in the market is by using Porter’s generic strategies model.

Figure 2: Porter's generic strategies:



Source: Porter (1980)

This model differentiates 3 main “generic” strategies that the company can opt to choose when developing its strategy: a cost leadership strategy, a differentiation strategy, and a focus strategy, that can lean more low cost or more differentiation.

A cost leadership strategy means the company decided to sell the product at a lower level and usually at a lower quality level. It focusses on high production to lower the costs and on product standardization. A differentiation strategy focuses on offering the client a product that exists at a premium price point, but that is not comparable to the competitors. In order to choose between these two, we must have a good justification. Both these strategies exist on a total market.

A focus strategy exists on a segment of the market, with a smaller audience, and a niche product. This strategy can lean more towards a low-cost aim or a differentiation aim.

For Porter the middle point between all of these is “Stuck in the middle”, and it is a negative factor due to the lack of a clear strategy, a strategic error. One must have a strong strategy laid out. Instead, other models such as the Resource Based View find the middle point the best value point, the mix of a great different product and a great price.

1.4 Sustainable and passive construction in Portugal

There are no “main” single experts on passive building methods, as these methodologies have evolved over time, requiring the collaborative effort of various fields and entities, which includes engineering, environmental science as well as architects and other expertise in similar areas. Dr. Wolfgang Feist, however, is one of the co-founders of the *Passivhaus* Institute, the leading organization in the development and idealization of the certifications and building standards that are used worldwide. According to the studies conducted by the institute, Passive house is a building standard that focus on energy efficiency, comfort, and affordability practices. It’s a concept that allows for around a 75% higher energy savings level than regular building practices, making an intelligent usage of natural resources such as the sun in order to achieve better heat recovery and cooling techniques. Studies have been made on the performance gap of houses constructed using passive methodologies and found that their performance is 75% to 90% lower than ordinary buildings, as the original design intended in the ideation stage (Figueiredo et al, 2020).

Following the current measures of the European Energy Performance of Buildings Directive (EPBD) and other European organizations, on the goal of achieving close to zero energy

buildings, as well as the current Portuguese legislation focus on efficiency, there is a strong belief that this must become the main building standard in the ensuing years.

This method was initially developed for colder climates (where heating is the main concern), however, for south European countries such as Portugal, the main importance is to avoid overheating. For this reason, Portuguese homes tend to be unbearably cold in the winter, as they are made to lose heat. Schnieders et al studied how to apply the PH practice in different climate zones and concluded that we are able to apply passiveness into nearly every place on earth. According to a study performed by Figueiredo et al, the PH concept should be more incentivized in Southern European countries, as its implementation is possible in all Portuguese regions successfully (following correct adaptation of certain specificities natural to different region's climate).

One of the current issues with PH implementation in Portugal, as analysed in the studies conducted, is the lack of interaction of stakeholders, mostly legal and political. When comparing to other countries (mainly northern European), Portugal is missing a coherent framework and incentive system, that makes the necessary changes in order to achieve passiveness, accessible.

2. Introduction of proposal

The present project focuses on the expansion of a company to a new business area that is highly current and in great focus of the construction world – passive and smart houses. Metathesis is a real estate developer with over 20 years of experience in the field and that has been focusing since its early days on the rehabilitation of older buildings, both on an aesthetical level as well as structural, already using sustainable construction techniques and methods.

The current target client of Metathesis is divided by the company's different products and areas:

- The “Pateo das Maias” project encompasses small lofts, for either one person or two, well located and covers all expenses. This option is mostly directed at younger people, in their early 20's in beginning of their professional career or students, that have a lower income.
- For bigger one- or two-bedroom apartments, young couples or singles renting for a longer period of time, looking for well located, more modern houses.

For this proposal, Metathesis' focus should be people looking to purchase a "forever home", usually a house that is well located, with a garden and leisure space, and close enough to the capital while still maintaining a standard of quietness that only the outskirts of the city could offer.

Two main world events changed the house purchasing ways of this audience: the Covid-19 pandemic changed the way people purchased property and viewed staying at home, with a new focus on a bigger space and more rooms, more contact with nature as well as relaxation; and the energetic crisis that is affecting Europe due to the war between Ukraine and Russia, and that increases the cost of heating, cooking and general maintenance costs of a house.

In virtue of the current housing market, political state of the world and antiquated construction practices still developed in Portugal and the world, most people have gone used to having "uncomfortable", expensive to maintain, houses. Portuguese homes are too warm in the summer and too cold in the winter, and due to the increased inflation and energetic crisis, it has become harder to heat them up or make them cooler. Although there have been great advances in policies that focus on this issue, more often than not people are investing their life savings on property's that have an extremely high maintenance cost and that do not stand the test of time in terms of building practices. This means that in order to stay current they would require more work in a few years' time.

Given these, a focus on bringing characteristics that are usually only found in luxury construction, to the target, average patron by creating a neighbourhood of houses that are more efficient energetically, technologically advanced, and automated, that produce less waste and would increase both Metathesis visibility in the market as well as gather a new market slice. This methodology is called Passive building and is a practice that although has existed and been in place in northern countries for almost 30 years, is still wildly unknown in the Portuguese construction industry.

Metathesis has been working on the Lisbon South Bay area for over 20 years and has during this time finished rehabilitating over 50 properties, varying in size and shape, from simple 1 bedroom apartment rehabilitations to completely rebuilding historical properties with considerable fire damage.

Opposite of the trend among other promoters that open a different company for each project, the company develops all the buildings under the same company and offers real assistance over

the warranty period. Thus, the company has created a reputation among the clients and other stakeholders involved.

Metathesis' business model has always been focused mainly on trying to add value and transform already existing buildings, maintaining their authenticity, while modernizing them. In the past years, after understanding the trends in house purchasing and the tendencies of buyers to try to move to the outskirts of the Lisbon Metropolitan Area, the company has had a new focus on construction from scratch, mainly of single to two family houses, as there is a lack of offer in this segment.

Following past years trends in writing about construction practices and people's concerns, the project's aim is to build in an eco-friendlier way, with solar panels and materials that are efficient. Passive building methods also take into consideration aspects such as sun orientation, natural ventilation, quality of insulation, solar gain and thermal bridges (when heat or freshness is able to bypass isolation and therefore energy is necessary to maintain inside temperature) and have general lower ecological footprints. The intention of this project is also to incorporate a "smart" focus on these passive houses: a property that is not only better for the environment but also technologically advanced, with automatized abilities that make living in them more comfortable for the owner, and that mean that the proprietary is able to control the entire house from afar using their smartphone, saving energy and ultimately helping the end goal of building an eco-friendlier home. Even though these are already a reality, they are extremely unattainable for an average citizen, due to their high price point and the lack of offer in this field.

As EU and Portuguese regulations in construction also become stricter and more focused on reducing energetic usage, following global trends, this project would be ahead of policies, and hopefully serve as a reference point for setting restrictions and requirements on both rehabilitation and building from the ground up.

Another reasoning for the investigation on the feasibility of the current project is the answer to the rising demands of consumers for sustainable products, on every level. While passive construction may not be a concept known to people outside of the business, as will be analysed further into this project there is a trend in consumption of sustainable products, on every major area. As it happens in other industries such as automobile, food, or cosmetic, companies in the construction industry should respond to these expectations that have been set, following consumer demands, fostering consumer trust, and influencing innovation in the industry.

Thus, the research aim of my thesis is to develop this business plan, which must answer a few main questions:

- Are rehabilitation and passive house builds feasible options for this price range?
- Is the project viable based on a market analysis and financial projections?

3. External analysis

In order to develop any new business or project, as we per the literature analysis, it is essential not only to examine the company's own abilities and the competitors', but also to focus on any external factors, that will impact its ability to survive and long-term success.

In line with Porter's studies (1980), external factors are impossible to control and will always impact a company's strategy, which is why it essential to produce a thorough analysis, of any information sources, resources, of the threats and opportunities, and any other aspects where we may find necessary answers for the project (Carvalho, Filipe, 2006).

3.1 Pestel Analysis

The PEST or PESTEL (the last one adds the Legal and Environmental context to the analysed dimensions of the model) is a wildy used framework to understand all the macro factors that can impact an organization such as Metathesis and the industry in which this organization is inserted.

Many experts such as Michael Porter, primarily known for his work on competitive strategy, have made contributions to the field of macro-environmental analysis and how it impacts the strategic model to be followed.

Given the high focus of the project in sustainability, and this field's relationship with state organizations, when studying the contextual analysis, it is beneficial to add the Legal and Environmental factors to the PESTEL analysis. This method will be useful to help understand the current and potential factors that may impact and influence Metathesis as an organization, and the viability of the Passive-smart house project.

3.1.1 Political context

Portugal has a parliamentary democracy, which is ruled by whichever party has more seats, currently held by the socialist party. Since late 2015 (currently on its third term) the prime

minister is António Costa. Politically this has been an unstable government, due to its minority share of assembly seats, which in 2021 led to the 2022's budget rejection and new elections being appointed by the president of the Portuguese Republic, Marcelo Rebelo de Sousa (in office since 2016).

Portugal is a member of the European union, which sets as one of its goals “sustainable development” and offers financing to projects and proposals that focus on this objective.

The economic hardship felt after the COVID-19 pandemic and worsened by inflation and the energetic crisis has increased poverty risk. The PRR¹ climate transition model follows the acceptance of Portugal for the climate goals set by the EU, mainly its goal of achieving carbon neutrality by 2050. It was resubmitted in May of 2023, and predicts that 70 000 energetic efficiency projects should receive financial, both for residential as well as service buildings. Support. Portugal has an ongoing housing crisis, for which the government has put in place several social aids and laws such as “*Mais Habitação*” (law 38/2023), that has the same implementation timeline of the PRR program.

Portugal's minimal wage was raised in the beginning of 2023, following measures set in place to combat inflation, and the average salary (as well as meal card allowance) of state workers increased, which in turn leads to the increase of these benefits for the private employers as well.

Currently, in new construction and rehabilitation, it is compulsory by law to reach a certain level of energetic efficiency, but there are no guidelines on how to do it.

There are presently incentives to construction, more specifically aiming at financing energy efficiency. These are included in the PRR version in place:

- The Residential Condominium Support Program aims to finance energy efficiency measures that promote the improvement of thermal comfort in residential buildings.
- Upon deliberation of each municipality, for which Almada has in place a 15% reduction (proposal 06/XIII-1º, present in notice 12/XIII-1º/2021-25), the municipality property tax rate (IMI) can be reduced up to 25%.

¹ The PRR (Recovery and Resilience Plan) is a nationwide program, first approved by the European Commission in 2021, and a new updated version resubmitted in May of 2023. It has an implementation period until 2026, including a set of reforms and investment funds that are aimed at setting sustainable growth and convergence with the United Nations Sustainable Development Goals. Its main pillars are resilience, climate transition and digital transition.

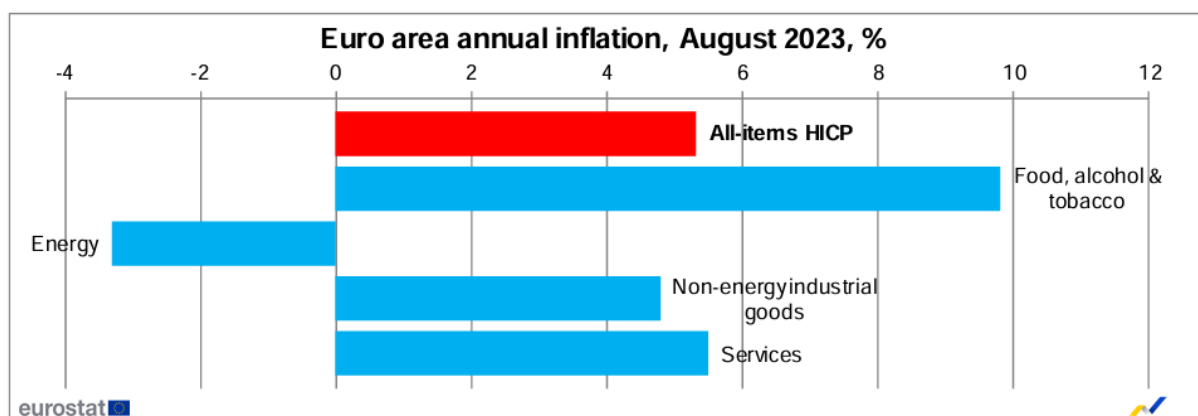
- The IMT tax (for Real estate transfers) of urban buildings that were completed over 30 years ago or that are located in urban rehabilitation areas benefit from exemption, when resulting from building rehabilitation interventions following legal regime and follow the set requirements for energy efficiency and thermal quality.
- The expenses with energy certifications can be deducted from the party's IRS (personal income tax).

3.1.2 Economical context

With the rise of the inflation rate, the cost of products and services has also increased, as well as interest rates for bank loans, which has affected highly Portuguese people, mostly due to the now bigger cost of their home monthly payments.

Following forecasts for the increase in interest rates, on July 2023 the directorial rates set by the European Central Bank (ECB) increased 25 points, reaching the highest value since 2008 of 4.25%. This will and has impacted EURIBOR² and therefore, monthly mortgage payments made by buyers. Interest rates are expected to continue increasing, as long as inflation remains above the 2% goal set by the Euro Zone. In the euro area consumer price inflation is measured by the “Harmonized Index of Consumer Prices, or HICP. According to Eurostat estimates, the statistical office of the European Union, by August 2023 inflation was 5.3%.

Graph 1: Inflation in the Euro zone in August 2023



Source: Eurostat

² EURIBOR is short for Euro Interbank Offered Rate and is the rates at which European Banks are allowed to borrow funds from each other. There are currently 5 types of Euribor rates: weekly, monthly, quarterly, half-yearly and annually.

While most economies in the world are still reporting growth as per the first quarter of 2023, economists believe there may be a recession coming, following increase in unemployment levels (7.1% in January 2023).

Data from INE (The national institute of statistics in Portugal) has set the unemployment rate for the first quarter of 2023 at 7.2%, an increase from the same homologous period of 2022 of nearly 1.3%.

Generally, Portugal has one of the lowest average salaries in the EU, which given the higher cost of living recorded in the past years has increased the risk of poverty and energetic poverty in the country.

There are many financial incentive programs that were created in order to push and finance projects that promote building energy optimization. Some examples of these are:

- *Edifícios mais sustentáveis* Program, that is dedicated to individuals, who may want to invest in improving energy efficiency of their properties in Portugal. These are regulated by the government and limited to 15 000€ per owner and 7500€ per unit.
- The energy efficiency fund (FEE) aims to finance the measure that are identified in the Nacional Action Plan for Energy Efficiency, and is directed at the construction sector in particular. Both individuals and companies are able to submit applications to the fund.
- *Casa Eficiente* 2020 Portugal Program provides loans for projects of any type whose aim is to improve the environmental performance of private homes. For this particular support, the interventions may only be carried out by the authorized companies that are identified and registered in the database present on the program's website.
- The IFFRU 2020 Program is a financing channel that offers loans with better terms than those currently available on the market, when investing on the renovation and rehabilitation of buildings, as well as the improvement of energy performance of structures.

The European Union has increased the amount of public funds aimed at energetic efficiency, in order to meet the objectives, set by 2030. It also launched the Smart Finance for Smart Buildings initiative in 2018, aimed at private investors in residential buildings projects.

3.1.3 Sociological context

As per the Census 2021, in Portugal 19.8% of people in Portugal had any higher education. The Portuguese population is aged, and decreasing in number, which could create issues such as shrinking of the workforce and stress on both healthcare and social security capabilities of the state.

Graph 2: Aging Index from 1961 to 2021

Source: INE, Pordata

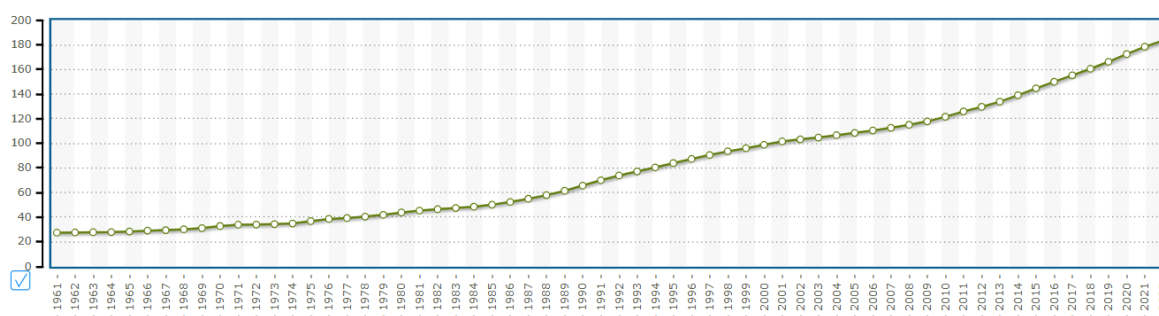


Table 1: Evolution in Portugal over 6 decades, accounting for population, old people for every 100 young, families, households, illiteracy rate, population with higher education, unemployment rate, % of population receiving support from social security and PIB per capita.

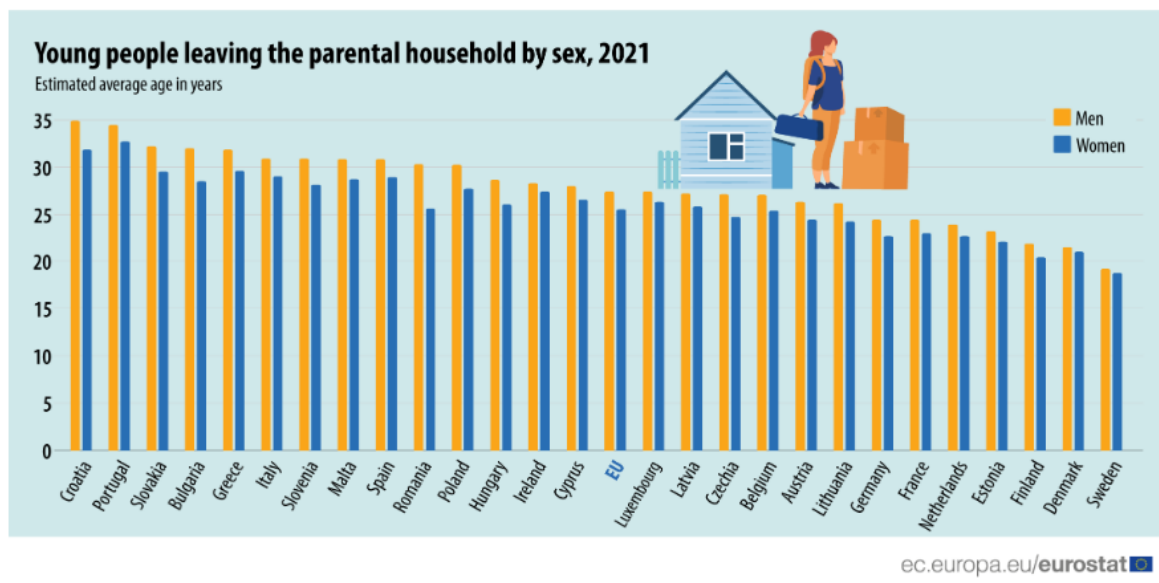
	1960	1981	2001	2011	2021
Population (thousands)	8.865,0	9.851,3	10.362,7	10.565,8	10.407,7
Elderly per 100 youngsters	-	45,4	101,6	125,9	178,4
Families	2.356.982	2.924.443	3.650.757	4.043.726	4.149.096
Households	-	-	5.357.900	Pre 5.879.333	Pre 6.002.874
Illiteracy rate (%)	33,1	18,6	9,0	5,2	3,1
% of population with higher degrees	-	-	6,8	13,4	24,1
Unemployment rate (%)	-	-	4,0	13,4	6,6
Social security and CGA pensions per % of population	1,9	25,1	34,0	39,4	40,0
PIB per capita (constant prices 2016)	4.664,2	10.179,5	17.442,2	17.739,5	Pro 18.949,5

Source: INE, Pordata

The average salary in Portugal is 1539 euros, according to INE, which puts most of the population in the middle class.

In terms of the housing crisis, according to Eurostat young people in Portugal are the oldest to leave parental houses, at an average 33.6 old, which has been accredited by political economists to be caused not only by cultural norm, but also due to low wages, job instability and cost of housing. This impacts the average age at which the Portuguese population purchases their first home, at 37 years old, according to a 2021 study of “ComparaJá”.

Graph 3: Age in Europe of when people leave parental home in 2021



Source: Eurostat

As per other European countries, there is a tendency for the population to concentrate on urban areas.

Graph 4: How the population in distributed in Europe per degree of urbanization, in 2021



Source: Eurostat

A Kantar study found that 25% of consumers are what is called “eco-actives”, which means they are extremely focused on the sustainability of the choices made when purchasing products.

Analysis of the housing market in the beginning of 2023 records 3% less purchases than the previous quarter. Specialists point to the decrease of confidence in sellers after the development

of the “Mais Habitação” government package, higher cost of build as well as generalized less offer.

According to the Portuguese Construction Union (SCP), there is a deficit of 90 000 workers needed to execute both public and private constructions, which threatens the industry. This is mostly given due to low salaries, ageing of the sector and well as lack of inspection that leads to work accidents and increased risks associated with the profession.

3.1.4 Technological context

Impacted by the covid-19 pandemic, there is a new trend in office work of a hybrid model: about 30% of the population works at home at least a day of the week, which has increased the needs for office materials for an average Portuguese.

Appliances and other technologies such as televisions have followed the trend of smart-machines and are now controllable from afar using smartphones and apps. Big data and analytics have also had an impact in the average home, by analysing the day-to-day life of the users and adapting to their personal needs. This is now a normal need and expectation that consumers have on technology. Iot (Internet of Things), is a technology that links several decices and gathers data and can be used both on the production stage of the construction projects, as well as later on, to connect technologies in the buildings for the users.

Artificial intelligence had also had an increase in the day to day of regular people, in e-commerce, entertainment and voice assistance. AI is also being used in the production aspect of construction, in planning, operations and cost reduction, as it provides more information and simplifies workflows.

There has been an insurgence of the BIM methodology (Building Information Modelling), which is a process for creating and managing information on a construction project across all of its stages. In this regard BIM software's are now used by some in the industry, such as Revit and Archicad. These software's are helpful not only for control, but also to make calculations and to create 3D models. In Portugal this is still not widely used, mostly due to the lack of modernization of smaller constructors, which make up for most of the sector.

As per other industries, there has been many advances in construction solutions. In many places 3D printing as enabled more affordable construction, allowing as well faster construction. Laser

technology has helped precise measurements and reduce errors, and robotization of repetitive tasks is also being adapted, which can also help to reduce the impact of the labour shortages that have been noted, as well as devices that reduce the impact of physical strain and help create more safety for workers.

The increased demand for integration of efficiency and greener practices has led to innovations in more sustainable materials and methodologies in construction. Materials such as cigarette but bricks and pollution absorbing bricks have been developed, following the emerging concern with finding ways to counteract the effects of pollution and other types of contamination. There is a strong trend in discovering ways to use materials and outputs from other industries to reduce the garbage that is created by society and give it another use.

Focusing on efficiency and sustainability, materials such as isolation made of wool, or paint with low emissions are a must in passive construction and are continuously developed. Different technologies and methodologies are constantly being developed, tested and certified by the concerning authorities to identify the best materials for passive construction.

3.1.5 Environmental context

Climate change has led to hotter, drier summers in Portugal, increasing the risk of drought in Portugal. According to OMS inadequate housing conditions lead to 100k deaths in the European union, and the organization puts Portugal the 4th lowest level at an increased risk of energetic poverty.

In Portugal, about 70% of the energy generated comes from renewable sources, however its use only makes up for around 28% of all energetic usage in the country. According to Eurostat data, in 2020 Portugal was the 11th country with more energetic dependence on other countries, 2 spots ahead of the European average. This is due to the fact that 100% of the petrol and gas needed is imported, both for fuel as well as industry, electrical production and homes. As Galp's Sines production is not enough to support the entire country's needs, some gasoline, gasoil and cylinder gas is imported from Spain, the United Kingdom and the United States. In 2020 and 2021 coal was also imported (although it is no longer a source of energetic production in the country).

According to the Sustainable governance indicators Portugal ranks as 22nd in sustainability policies put in practice and 17th in environmental policies.

Strict environmental regulations in Portugal (law 102-D/2020) require that all residue from construction and demolition must be treated, disposed, and recycled by certified company's, following the European directive 2008/98/EC as well, that imposes a rate of 70% for the non-dangerous residue from construction.

Several laws have been put in place to reduce carbon emissions by companies and instruments such as green IRS have been created to support the population that implements sustainable products in its day to day.

3.1.6 Legal context

In order to initiate construction, following regulations from the government, it is necessary to make an authorization request to the local government. When involving an architecture project this is firstly submitted, to make sure that it follows zoning regulations and construction policies. After its approval a specialities project (the projection all the different technical spheres that make up the project, such as water, thermal, electrical or gas) is proposed, and only after its acceptance, the construction permit is requested and approved. This bureaucracy necessary to build often discourages construction.

There are also several strict labour laws specific to health and safety of construction sites that must be followed, in order to ensure protection of workers in sites. These are:

- 273/2003, establishes general rules for planning, organization, and coordination to promote safety, hygiene and health in construction work.
- 101/1996, naming minimum safety and health requirements in places and workplaces on temporary or mobile construction sites.
- 46427/1965, that identifies the Provisional Social Facilities regulation intended for personnel employed in sites.
- 41821/58, which approves the safety regulations at work in construction.

Regarding passive methodologies, there is currently no legislation in place for the construction of passive homes, however the EU has 2 directives, one focused on energetic performance (EPBD) and one on energetic efficiency (ELPRE). The EPBD's goal was to have the member states add it passive measures to their laws and regulations. These standardize the efforts that need to be made in order to reach the objectives stated by 2050.

Some examples of laws that affect construction on efficiency levels are law 11/2023, stating that from February 2023 there is no longer a need to add a gas network to building projects. In new construction and rehabilitation, there is also obligatoriness by law to reach a certain level of energetic efficiency, although there are no guidelines on how to do it.

Specific laws regarding construction can also be found on the SILUC³ platform.

4. Competitive analysis

4.1 Porter's generic strategies

Porter's generic strategies (1980) differentiates the main ways a company pursues and achieves competitive strategy over its competitors in its chosen field of action. According to Porter, strategies either target a leadership through cost, differentiation, or focus (that can then fall either in focus and cost or focus and differentiation). According to him, choosing one of these 3 main action ways will reduce risk of waste of the company's resources.

These 3 generic strategies are defined by the segment at which the company chooses to insert itself, and how the company then copes with the Porter's forces after choosing where to insert itself, versus how its competitors copes with them.

If a company chooses to target the customers of a certain market by offering a product at a lower price, it is offering a cost leadership strategy. If the target is on certain characteristics of a product, no matter the extra price, it is following a differentiation strategy. If its strategy is to focus on one or two segments of a chosen market, it is a focus strategy, that can either be more cost focused or differentiation focused.

In the case of Metathesis, when taking into consideration Porter's beliefs, it follows a differentiation strategy. By having a different product than its competitors, focusing on the characteristic of energetic efficiency and passive building, Metathesis is standing out from its competitors. The reason why a buyer would make the choice of purchasing a passive house instead of a normal house that follows regular methods of construction is not due to lower prices (since it is actually more expensive than other offers in the market) but due to the features

³ SILUC is an electronic platform, on a national level, that presents all the current legislation and regulations regarding the current laws for construction and urbanism. It was created to contribute to the fulfillment of the Legal Regime of Urbanization and Building and is managed by the National Lab of Civil Engineering (LNEC), the General Directorate of Territory (DGT) and The Institute of Housing and Urban Rehabilitation (IHRU). It currently contains all legislation in force since the 1st of January of 2007 for these industries.

that that house has when compared to other products in the market, and the benefits that it may offer to its buyers. It attracts a different target audience than the one looking for the immediate cheaper alternative.

When aiming for the long-term benefits of the product the company is “giving a reason” for buyers to make the choice. In the housing market apart from aesthetics nothing really differentiates different properties. For the project, the qualities and benefits that set apart Metathesis’ offer overpower the downsides (immediate price) by highlighting them.

- A- Health benefits
- B- Long term savings
- C- Sustainable living

4.2 Porter’s 5 forces

As in the previous literature analysis, Porter’s 5 forces aim is to analyse the attractiveness and future profitability of a certain industry by the way they impact it, as they don’t always have the same influence.

4.2.1 Competitive rivalry

There are currently no known projects similar to the one presented in Almada. In Portugal there are 4 certified homes, and 50 waiting to be certified. These are located in different and varied parts of the country.

Generally, although any house for sale is an indirect competitor of the project, the aim is to reach a target audience that is directly looking for this type of project.

In terms of competitors in the construction field in general, there are many different types of investors in the area, both bigger and smaller in size, private citizens, and companies, that focus on the development of buildings, neighbourhoods, and private homes. Some examples of more well-known competitors in real estate development are Vanguard Properties, Stone Capital, Saraiva + Associados, Habitat Invest, SOLYD Property Developers and VIC Properties.

Overall, industry rivalry can significantly impact the project, as it can lead to reduced profitability. One way to counter this is to focus on differentiation, which it already is. As this

project focuses on a quite unexplored segment of the market, there are no real established players that could devolve into aggressive strategies. Beyond the more common pricing strategies, due to the differentiation, the variation in design, quality and overall featured of passive building serve as a buffer against rivals.

4.2.2 Power of suppliers

The power of suppliers is the force that most impact has on Metathesis and the viability of the project. Due to inflation cost of materials and services already increased, and it is expected that this trend continues. Therefore, the risk is extremely elevated, as a big increase in prices can make the project too expensive to both be profitable and to make sense for buyers.

Another power that suppliers have in relation to the company and the production stage of the project is the availability of said supplies, necessary to move forward in the project. The most impactful and project-ending factor in the industry is the time it takes from the ideation stage to the purchase of the area, project approval, construction, and sale, which sometimes can take up to 5 years. As passive construction can take more time to conclude, due to the added complexity of said methods, this creates costs that make the price per square meter completely unbearable. Any delays in the construction alters the production and impacts the profitability of the company and final sale price.

The focus of building passively is to decrease costs and to make the houses more comfortable: if the added price of a passive house in the long term is much larger than the cost to mitigate the negative aspects of regular building practices, consumers won't make this choice, and therefore Metathesis interest in the project will decrease.

One way to try to mitigate this is to find several suppliers options, ask for several budgets in order to find the best price, create contracts with said suppliers that protect the company in case of delays in delivery or even explore vertical integration methods or partnerships, overall taking reducing power to the suppliers in favour to Metathesis.

4.2.3 Threat of new entrants

The smart aspect of the project is already extremely explored and by itself. Nowadays even making a regular house smarter can be achieved through investment in equipment, and time to set it up. As mentioned in the previous analysis, while it is not simple to build a passive house

and not common for companies in Portugal to participate in this market, starting this would be a matter of interest and investment in the study and certification of this method. The only deterrent would be the added complexity of the method and the added cost of a passive house build, that could decrease ROI (return on investment) of the investors. The fields barriers such as necessary expertise and certification needed are helpful to “block” new entrants or make it more difficult.

4.2.4 Threat of substitute products and Bargaining power of buyers

In the construction business, and given the current project, the threat of substitute products and the bargaining power of buyers aren't as impactful as other forces.

In the real estate business, any property can be a substitute of other options, more so if their purchase is being looked at from an investment perspective. However, given the target audience for this project, and the unique advantages that are marketed and its focus as a “forever home”, the choice is being made more from an emotional side, while adding the sustainability and passiveness of the project.

Just as consumer perceptions can be impacted through careful marketing and trends, so can consumer's bargaining power suffer changes. Understanding the diversity within the target audience is essential in this, as some can be more focused on the sustainability and green aspects, and others prioritize the reduction in costs that are associated with passive construction, or even the smart applications of the house. For this reason, marketing and customization are ways to mitigate the impact of these forces.

5. Internal analysis

In order to define a good strategy, it is essential to research and assess not only the external factors that impact the company, but also its own capabilities, both tangible and intangible, such as its resources, assets and define accurately the areas for growth.

5.1 VRIO Analysis

The VRIO analysis is a tool that helps identify how the resources of a company can be used in order to create competitive advantage over its competitors. When developing a competitive

strategy, the target is to reach a sustainable competitive advantage, by analysing it with the true critical factors of success: Value, rareness, imperfect imitability, and organization.

Metathesis has 3 main resources (or capabilities) that differentiate the company from its competitors. Those are its certification by the Passiv Haus Organization, its human resources, and its brand image.

When it comes to the certification from the PHO and general focus in passive house building, we note both high value and rarity: as mentioned the company is the only certified in the target area, and in order for the builds to be considered true passive houses they need to follow very specific guidelines. However, while rare this resource is not inimitable, as any organization with time and money can get the same certification.

The same is noted in its Human Resources, they hold value to the company, are rare, as in order to achieve this level of expertise many years of work and study has to exist, but not inimitable: once again, work, money and focus can achieve it.

When it comes to its brand image, Metathesis while very well connected in the field and with good relations with previous clients, which makes it valuable, does not have exactly a rare type of brand image.

This set of resources means that there is currently a temporary competitive advantage, which means that it could be limited for however long it would take other companies to catch up to this.

5.2 Strategic options

Following the analysis conducted, it is possible to highlight the following possible points of action:

1. Because one of the main weaknesses of the company is its size and investment capability, we can highlight the current legislation and fiscal benefits that are associated with sustainable building to attract investors and buyers. The expertise that Metathesis has on the construction field and its reputation already offers credibility, however a strong communication is important to gather strength and reduce the impact of the previously found points.
2. The company's expertise is important, as well as the partnerships it has with outside agents that have worked with the company for many years and created strong

relationships with. By collaborating and innovating with these smaller partners, Metathesis can find unique and cost-effective ways to reduce the overall cost of production. By outsourcing some activities that do not need to be done by the direct construction company, we can reduce the stress of the main workers, and therefore try to limit the impact that the reduced manpower may have on timelines.

3. When analysing the financial aspect of the project it is always necessary to try to account for the expected increase in prices and the impact that the economic impact that the delay might have on the price of the end price of the project. While in many occasions the company tries to sell the project prior to construction, increasing this effort in order to mitigate the impact of the investment capabilities that the company is missing.

6. SWOT Analysis

The SWOT analysis, created in the 60's by Albert Humphrey is one of the most used methodologies, and observes 4 main factors to access the full range of the company's abilities: Strengths, Weaknesses, Opportunities and Threats.

6.1 Application of SWOT analysis

Strengths:

1. Focus on passive houses and sustainability in building is still not very common, Metathesis has 20 years' experience in building rehabilitation,
2. Metathesis is the only certified company in the area by the passive house association.
3. APPII member, meaning it has good relations and reputation in the field.
4. Metathesis has a sister company, Meca, a construction company with over 32 years of experience, meaning that instead of needing an outside constructor the company can build at a lower cost level.
5. Metathesis has many human resources with a lot of expertise in the field, both in terms of construction as well as energetic efficiency.

Weaknesses:

1. Compared to other, bigger, property developers, Metathesis does not have the same capital capabilities. The project would require a loan.

2. Shortage of manpower and construction workers needed in order to both work on the project and maintaining the outside work that the company offers.
3. Given its size, although it does have good relations, market awareness is still not very big.

Opportunities:

1. New EU legislation focus on energetic efficiency, and practices + Requirement of EU for countries to establish renovation strategies to decarbonize building stock by 2050.
2. There are fiscal benefits for passive homes, as well as a general lower cost of living associated that can motivate buyers.
3. 94% of Portuguese people are willing to have a more sustainable way of life according to the “*Barómetro Europeu das Melhores Práticas de Compra*”.
4. Energetic crisis and housing crisis, higher cost of living leads people to find new ways to spend less money. General unexplored business
5. The evolution of IA would mean better capabilities in the “smart” aspect of the project.

Threats:

1. Less houses being purchased due to higher interest rates and inflation.
2. Less credit access by the clients due to higher restrictions from the banking sector.
3. Complete project approvals take anywhere from 12 months to 18, or more, months.
4. Higher cost of production when compared to normal practices (about extra 4% to 6%), meaning also a higher final purchase price.
5. Bigger competitors have more capabilities.

Table 2: Swot Analysis

Strengths	Weaknesses
S1: 20 years of experience, focus on a new unexplored field. S2: Only certified company in the area. S3: Good relations and reputation. S4: Sister company in construction. S5: HR with high expertise.	W1: Investment capability. W2: Not enough manpower. W3: Missing market awareness.
Opportunities	Threats

O1: Legislation focused on sustainability and energetic efficiency.	T1: Due to interest rates and inflation less houses are being purchased, and credits are also harder to acquire.
O2: Fiscal benefits.	
O3: Target audience focused on sustainability.	T2: Project approvals could take up to 18 months.
O4: Crisis that leads to people trying to invest in saving money.	T3: Higher cost of production and purchase price.
O5: Evolution of AI.	T4: Capabilities of competitors.

Source: Self made

6.2 Systemic SWOT Analysis

By focusing on the most important factors, and comparing and creating relationships between strengths, weaknesses, opportunities, and threats we can now achieve a dynamic SWOT, that we use to identify challenges, warnings, risks and any restrictions in the activity.

Table 3: Systemic Swot Analysis

Systemic SWOT analysis	S1: Unexplored field S2: Passive house certification S3: Direct builder S4: High expertise in construction and in the field of property investment.	W1: Investment capability. W2: Not enough manpower. W3: Missing market awareness.
	Strengths	Weaknesses
	Opportunities	Constraints
O1: Legislation focused on sustainability and energetic efficiency as well as fiscal benefits. O2: Target audience focused on sustainability.	Because this is a largely unexplored field, and Metathesis has both expertise and a direct builder, it can be ahead of the curve of sustainable	The current legislation and fiscal benefits associated with sustainable building will help make the project more appealing for investors and buyers. As

O3: Crisis that leads to people trying to invest in ways to save money. O5: Evolution of AI.	building and target the audience of people that are interested in living a more sustainable life before other investors do the same.	one of the only companies in the area the focus on a specific target audience can increase market awareness for the company.
Threats	Alertness	Danger
T1: Due to interest rates and inflation less houses are being purchased, and credits are also harder to acquire. T2: Project approvals could take up to 18 months. T3: Higher cost of production and purchase price. T4: Capabilities of competitors.	Having a direct builder working for Metathesis helps mitigate the added cost that project approvals have on the project, as well as reduce the cost of production to the company. Apart from that this might not be enough to counter the threat of increased competition with bigger capabilities.	If the slow approvals coincide with the rise of production cost, as well as delays due to lacking manpower, the projects efficiency and profitability could be hindered. As the sale price is already higher this could also deter buyers.

Source: Self made

7. Purchasing motivators of real estate

Purchasing motivators of real estate differ from other types of products. More so than when renting, buying a house is more often than not an emotional decision. As mentioned previously the target audience of this project is usually looking for what is called a forever home. Unlike starter houses, a forever home has everything buyers might be looking for. It's usually a bigger investment, where people feel an emotional connection, and where they can imagine themselves living for a very long time. According to psychological studies, the emotional connection individuals have towards their homes is comparable to the ones felt with pets as close friends.

Traditionally, when buying a house, common motivators include the location and accessibility – proximity to work and good schools, as well as amenities; asset building, as real estate is

usually the biggest investment of a person's life; factors such as family size and lifestyle needs; and affordability.

Choosing to invest in a sustainable house adds different motivators to the choices made by buyers. Buyers may be influenced by the possibility of energy savings and the long-term reductions in household expenses related with energetic usage, as well as a reduction of a carbon footprint, which is related to the increase in eco-active consumers across all industries. Health and comfort are also a big moving factor for passive houses, as thermal comfort is still not present in most buildings in Portugal, and the improved air quality that comes with the methodologies used in passive construction.

Following government incentives associated with energetic efficiency in buildings in Portugal, tax relief and funds, buyers may as well find that passiveness can impact significantly their budget.

Another important factor that could motivate clients is the longer-term effectiveness of passive construction. As analysed by the Passiv haus Institute in Germany, following a 20 year period, it was found that the success of the techniques used in the structures is maintained almost to its full capacity, meaning that these are homes that age well and might not need as much repairs and work as traditional homes.

8. Strategy implementation

8.1 STP – Segmentation, Targeting and Positioning

Marketing management is a process that involves the analysis, planning and coordination process to achieve the objectives set at organizational level. The concept of STP has evolved overtime as an essential framework for strategic marketing, and as such, it is a critical step in the planning of the project. Segmentation should identify the different customer segments based on their preferences and needs when it comes to the product offered – in this case sustainable housing. Targeting evaluates how attractive each segment is based on a multitude of factors and how they align with the project capabilities that we've set previously and selects the ones that are better fit. Finally, positioning works in developing the product for the selected segments and identifies the value proposition for each.

The segmentation for the current project differs in some aspects from others used in different products that the company offers. Metathesis uses mostly demographic and life-stage criteria in order to segment each of its project's target audiences. The company currently focuses on the development of real estate, and later its sale or rental. The first segment is comprised of a younger generation, in the beginning of their professional career, with a lower income and interested in shorter-term rentals that are easily maintained and are of low-effort management. Secondly, young couples renting for a longer period of time, looking for well located, more modern houses. Lastly the third segment includes people purchasing homes, with a higher income and more focus on the different characteristics of the house. The target audience for the present proposal is included in this segment.

When it comes to the target audience for passive houses, as mentioned previously in the project, the demographic we are aiming for is green enthusiasts, who show a deep commitment and concern with sustainability and finding eco-friendly alternatives for their day-to-day purchases. This is found mostly in the younger generations, and taking into consideration the typology of houses that are projected, it would comprise of young families, with ages comprising between late 20's and early 40's, looking for what is known as the "forever home" in the real estate industry. These buyers are also conscious of energy costs and efficiency in appliances and green technologies. These families would have an average income of between 35 000 to 50 000 euros annually, or 2500 to 3500 per month, being part of the middle class, as per Pordata's analysis of the INE's study. In terms of education level any type of superior education is more common. Usually, these families work in the Metropolitan Lisbon Area, and have 1 to 2 children.

This group is the most suitable target audience due to its financial capabilities, and the value that they can give the project with the characteristics of the one being developed. As the most marketable characteristic of the project is the passiveness and efficiency of the project, we can focus our efforts on the "green enthusiasts" that are included in the mentioned group. When doing so the concentration of our statements should follow the communication of the sustainability aspect, harmonious living, green technologies, and cutting-edge construction practices followed by the company.

8.2 Marketing-Mix

When developing an effective Marketing strategy, we should analyse the 4 P's of classification, and how they interact with each other. This method was first developed by McCarthy in 1960 and is used to understand how to position the project in order to satisfy the target audience and market that Metathesis is focused on. Currently this method has evolved to 7 P's of classification, adding people, physical evidence and process. These added dimensions are mostly used for service-based businesses, while the previous is used to product-based businesses. While in this situation the product Metathesis offers does have some aspects of customization that can be offered to the clients, it is not the goal, as the production of the houses should follow a more standardize creation in order to reduce costs and construction time.

8.2.1 Product

The “product” refers to the goods or services that one offers to the customer, and that satisfy a customer's needs or wants. Following Kotler's 1988 interpretation, there are elements associated with a product, apart from itself, that attract a customer, both tangible (such as size) or intangible (such as aesthetics).

The product the Metathesis offers, a house, is more than the physical elements associated with it. The characteristics it has, both on an aesthetic level as well as the more important “passive” element separate it from other product that exists, and it is what makes it desirable to any potential buyers. More than the house itself, the success of previous projects of the company is based on the contact with the customer and the relationship between the company and its construction/design process, and the buyers. The purchase of a home, more specifically in the price and characteristics of the projected ones is a highly personal process. As these are usually “forever homes”, it's the attention to detail and the ability for customers to be involved in the process and choice of the final details that really set apart the company and the offer that is made. As mentioned previously, many of the customers find the company through recommendation, so the relationship between the company and the customer is essential.

8.2.2 Price

“Price” refers to what is charged for a product or service and is a fundamental part of the viability of a product. The real estate market differs highly from other markets on the way a transaction is made and the psychological process a customer goes through in order to make a

choice. Pricing is one of the most important elements and is dependent on a great number of components such as the market demand, economical state, absorption rate and even trends.

The pricing process of a house, when it comes to new construction, is determined by many factors, such as construction cost, labour cost, average cost per square in the chosen geographical area, as well as the added percentage of profit (minimum 5%) and also the “time/money” cost since the promoter already bought the land prior to the submission of the projects.

Plus, due to the long timeframe of the projects, major political, health or natural catastrophe may occur during the project planning process adding extra risks to the sector.

When determining the sale price of a project, prior to the start of the planning itself, a market analysis is conducted to determine how much are similar houses being sold for in the area, in different brackets. An average lower price is found, as well as the maximum price per m² and we decide whether we are targeting a luxury audience, or an average audience, and therefore the price range we are aiming for. After that an estimation is made following trends analysis on the future sale price of a property. For a company such as Metathesis this is the most critical part of the project: before even purchasing the land where construction will be made, the expected price must be studied and selected in order to decide financial viability.

Given that a house purchase is conducted in a different way than other purchases made in one's lifetime, more than the price being selected by Metathesis (according to the market) and the added value that a passive house has, the company must in a way prove why this immediate bigger investment is a good idea. The company already has the practice of giving a “manual” to the buyers that highlights the services in proximity, transportation and any other information that adds value to the house. With the passive project, a more comprehensive manual must be presented answering some of the most common questions asked: Why is this a better option than regular building? What are the added benefits? How does this impact the value of the house? What are the economical and health advantages?

8.2.3 Placement

Placement in the Marketing Mix follows the idea of assuring that one is above any competitors, due to the way we market ourselves and how a sale is acquired. This is achieved through finding the better way to distribute the company's product, and how to better push our product to a client. Most studies around placement and distribution mix follow the idea that understanding

the role of different distribution channels is essential to build good relations with customers and achieve competitive advantage over competitors. (David A. Aaker, 1984).

Due to the nature of the field in question, distribution works mainly with partners (such as realtors), recommendation from previous clients, promotion in real estate websites as well as following from social media.

Given the target audience for the project and the characteristics that align with its principles, the selection of the location is essential: the focus on reducing expenses as well as increasing general well-being equals to the need of proximity to good public transportation and nature, while maintaining closeness to the capital. Since the company focuses its activities mainly in the Almada area, construction around Charneca da Caparica, Sobreda, Caparica and Trafaria would be preferential. It is also important to find a site that allows for correct solar orientation and ventilation, and general integration of the passive design layout and regulations needed.

These areas are also preferential to construction due to the fact that in the past years there has been a strong effort from the local government to build bike lanes, green spaces with exercise equipment among other facilities that enhance the sustainability profile of such project.

8.2.4 Promotion

It is essential, after careful pricing and product creation, to develop a good product promotion tactic to reach and persuade the target customers (Kotler, 1988).

Following the need to achieve competitive strategy, as developed by Michael Porter, and specifically due to the differences that the project has comparing to other similar area/look homes, a promotion strategy that focuses on evidencing and granting value to those differences could be beneficial for the company.

The company works on having a strong social media presence, focused on sharing not only the company's values and workers, as well as the characteristics of the previous and current projects: how the work of Metathesis is good, and how it adds value to the area it surrounds and the city.

Given that most people, while they might want a passive house, may not quite understand what it entails, explaining in its social media accounts what passive building is, what benefits it has, sharing 3D images of the project and its characteristics would be a good what of creating a relationship with the customers while also promotion and creating awareness. The educational

content also opens the page to a new type of audience and followers, that might not know the company.

As mentioned previously many Metathesis projects are sold still in development/project stage, which offers benefits to the company. Therefore, there must exist a strong communication in order to try to find early on investors. A good way of doing that would be by creating a virtual tour of the houses, (that would also create traction to the website), and update pictures from the construction site. Another way of creating traffic in Metathesis' social media could be by comparing normal construction methods and passive ones, energetic savings, and real benefits versus the current houses.

In terms of more physical promotion tactics, posting a banner in the future site, with the developer's name and contacts, and images of the project are a way of perhaps finding passerby's that might take interest in the project. Posting the project on websites such as Imovirtual, OLX, Facebook and CASA SAPO should also create awareness for early offers. Partnerships with local realtors that can introduce the project to customers will also create business.

The company also has a website, that is used both to advertise its services and products, as well as to educate on the industry. Using a more aggressive approach on the project's promotion would be beneficial, as well as employing this resource to communicate the advantages and characteristics of the project. This can be achieved both with 3D imaging, as well as videos with updates on the current stages of the project.

Via the publication of Google Ads and SEO (Search Engine Optimization) tools Metathesis can achieve another audience, and by doing so, maintaining its advantage over competitors in the industry.

By having both a more rational communication (the benefits) as well as emotional communication (the visualization of the house, imagining themselves there), there is a strong message being shared with customers, that will be able to persuade a purchase in an easier way.

8.3 Resources

One of the most important aspects of the success of any company or project is the management ability of said company, and how well its resources are used in order to achieve the best possible end result.

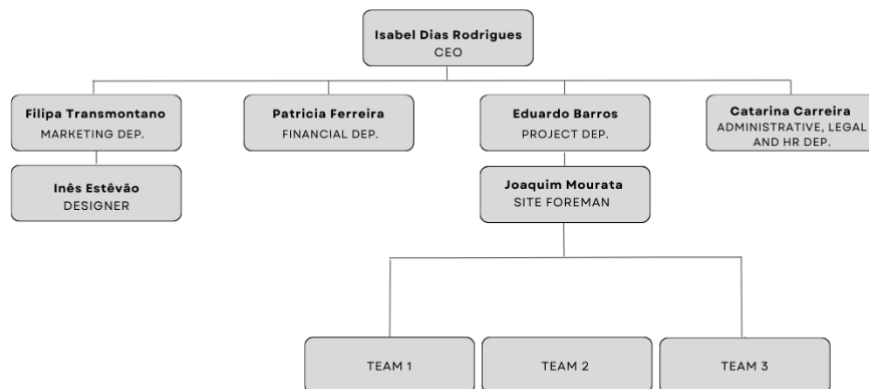
8.3.1 Organizational structure

According to Mintzberg's 1992 suggestions on organizational structures, their implementation depends on 3 basic dimensions: the key part of the organization, that plays the major role on its success, the choose method of activity coordination and how involved subordinates are in the decision-making process.

There are 5 main organizational structures: the entrepreneurial organization, also known as simple structure; the machine organization (or machine bureaucracy); the professional organization; the divisional organization; and the innovative organization.

Metathesis uses a mostly functional organizational structure, in order to better define the company's key functions and its different products and services. For this particular case, and since the current CEO of Metathesis is also the CEO of its partner construction company, Meca, (that will handle the production aspect of the project) the chart joins company's resources, as per the below:

Figure 2: Organizational chart of Metathesis



Source: Self made

It is important to mention that, due to its smaller size, the way the different departments work also aligns with the simple or flat structure, as the CEO works closely with every single department and is the final decision maker in bigger issues. All departments also act as one, as there is a strong cross-functional aspect between all. As with many organizational types, there is variation, and the reality of the current structure doesn't quite match any single type.

In result, the role of each department is separated by the following functions and tasks:

- CEO: The CEO oversees all departments and focuses mainly on the procurement of new investment opportunities that pertains. It is also the one who works with partners on

sales and ensures that all departments work cohesively towards achieving the company's goals.

- The marketing department, which includes a specialist whose job is to align both sales and the marketing strategies; and a designer that works on the maintenance of the image of both Metathesis and Meca. It develops and executes the strategies to promote the company's activities, upcoming projects, and its image. For this project it is essential to ensure that there is a clear communication and that the objectives and expectations set previously are being followed. A more comprehensive marketing strategy should be idealized by the team, mock-ups created and as time progresses, an analysis of the result of the campaigns and whether these are successfully engaging customers and turning possible leads into sales.
- The financial department includes a controller that works closely with an outsourced accounting firm and whose task when it comes to the project is to assess projected costs, the impact of the aforementioned timing and financial risks on the potential return on investment and profitability. To do so it is necessary to work closely with the production team, be on top of expenses and budgets from suppliers, expenses with HR and necessary machinery and tools, while maintaining other tasks with different projects and products offered by Metathesis.
- The production department is the biggest department of the company and is led by a project manager tasked with a more technical and overseeing role. His job is to arrange the project, working with outsourced architects and designers to understand the specifications of each part of the project, and develop the plan of action, including timelines, resource allocation, supplier's budgets, and project milestones. On the field the site foreman directly manages 3 teams of 2 people each. The foreman has the most knowledge and oversees all current projects. It is important to note that, while Meca is owned by the same CEO and will be the main player in the production of the project, it still has other ongoing sites and developments for external clients.
- The administrative, Legal and Human Resources department serves as a bridge between all the departments and outside consultants such as the company's lawyer, insurance brokers and various service vendors. It is the department that oversees the billing for rental clients and handling issues with the day-to-day management of these clients, that can be transferred to other departments if necessary. This department is essential to the

day-to-day management of the company and its activities, in order to reduce tasks that would otherwise be performed by the CEO.

8.3.2 Human resources

When it comes to the construction of one 2 story house, on average it takes around 10 to 12 months, from start to finish with one 2-person team, not taking into consideration the prior planning stage. For this project encompassing 6 houses with those characteristics, with the project standardization that is planned and designed by the architect and the project manager, it should take about 18 months to conclude the entire construction phase. To do so, on the first 6 months, according to experts, 4 to 6 people need to be working on the project on a semi-permanent basis, and in the 12 following months, only one team must be fully allocated to the job site.

It's important to take into consideration the construction company's capabilities, financing needs as well as the aforementioned external projects. In order to be able to cover all of the company's current costs the 3 teams need to be working at all times. Currently with the expected growth projections of Meca there is no immediate requirement to increase the permanent staff of the company, but, due to the complexity of the passive house project, there may be a need to either employ on a temporary level, or outsource, some more aspects of both internal and external projects to freelance agents – comparing to those that are presently needed.

Given the technicalities of the passive project, which requires a lot of expertise and more training than usual, from both the site foreman, Joaquim Mourata, and our passive building expert partner, the Engineer Joaquim Neto Teixeira, the construction phase and implementation of the methodologies required will only be executed by the company's internal personnel. This will ensure that some level of know-how is not passed to competitors and that Metathesis can hold on to its competitive advantage for longer, as mentioned in the previous strategic analysis chapters.

The current specialities that are always outsourced to partners by Metathesis in bigger projects are:

- Formwork (is used to create the structure, such as beams and other foundations necessary).
- Electrical wiring
- Plumbing and sewer system

- Aluminium (for windows and doors)
- Dry walls or laminated plasters
- Kitchen cabinets, doors, closets, and fixtures
- Air conditioning, heating, and other critical ventilation systems
- Gardening

For the above, Meca and Metathesis have trustworthy partners that have worked with the companies in previous projects.

The planning of how the human resources mentioned are used is made by the project manager, Eduardo Barros (civil engineer), to ensure that every single one is used in the most efficient way, reducing time waste. Having standard homes with little to no differences, apart from design choices that may be requested by the clients, means that while one team is working on house A, others can be doing their tasks in house B, and switch when this is concluded. This method follows what is usually referred to as “parallel production”, very commonly used in construction. It allows for the work to progress in a steadily manner and reduces unnecessary delays.

While not part of the permanent team of Metathesis and Meca, civil engineer Joaquim Neto Teixeira is a Certified Passive House Designer and has a long-term partnership with both companies. His role will be essential in ensuring that all the methodologies for sustainability and passiveness are being followed.

8.3.3 Material resources

Construction is an industry that requires a large number of components and material resources in order to produce the final product that will be delivered. Commonly these are:

- Concrete: Used for foundations, slabs, walls, and more.
- Steel: Structural steel for framing and reinforcing concrete.
- Lumber: For framing, sheathing, and finishing.
- Bricks: Used in masonry construction.
- Cement: Used with sand to make mortar for masonry work.
- Roofing Materials: Includes shingles, tiles, metal roofing, etc.
- Insulation: Materials like fiberglass, foam board, and spray foam.

- Drywall: For interior walls and ceilings.
- Windows and Doors: Made from various materials such as wood, vinyl, or aluminium.
- Siding: Materials like vinyl, wood, or fibre cement for exterior cladding.
- Pipes and Plumbing Fixtures: For water supply and drainage.
- Electrical Wiring and Components: Includes wires, outlets, switches, and more.
- HVAC Systems: Heating, ventilation, and air conditioning equipment.
- Flooring: Options include hardwood, tile, carpet, and laminate.
- Paints and Finishes: Interior and exterior paints, stains, and coatings.
- Fasteners: Nails, screws, bolts, anchors, and other hardware.
- Adhesives and Sealants: Used for bonding and sealing various materials.
- Rebar: Reinforcement bars used in concrete structures.
- Glass: For windows, doors, and architectural features.
- Asphalt: Used in road construction and some roofing applications.
- Plaster: For interior wall finishing.
- Aggregate: Gravel, sand, and crushed stone used in concrete and road construction.
- Wood Preservatives: Chemicals to protect wood from decay and insects.
- Gypsum Board: Used for drywall and ceiling applications.
- Roof Underlayment: Provides water and weather resistance under roofing materials.
- Plywood: Used in various construction applications.
- Mortar: Used to bond masonry units like bricks and stones.
- Ductwork: Components for HVAC systems.
- Fireproofing Materials: Used for fire protection in buildings.
- Scaffolding: Temporary structures for construction access and support.

These are always necessary for every project, however, due to the added complexity of passive techniques some elements are needed in order to ensure that the construction is following the standards and efficiency goals set previously and necessary to obtain certifications:

- Building materials must be sustainable, have low emissions and be sustainable when this is possible. Some have eco-friendly solutions such as flooring from reclaimed wood, or isolation from wool. These must also be of more advanced materials, as well as nontoxic.
- The aluminium must be energy-efficient and prevent emissions and energy loss.

- Renewable energy systems (although following current legislation these are already compulsory).
- Fixtures that are efficient, as well as, if possible, rain harvesting systems, used for watering and irrigation.
- Landscaping must be drought efficient and use native plants.
- Energy efficient HVAC (heating, ventilation, and air conditioning) systems as well as air filtration systems to ensure air quality.
- Moisture control materials
- Smart home technologies.

These added materials are a reason for the increase cost of the passive methodologies when compared to classical building, however as previously mentioned an essential part of achieving the advantages of the project.

In order to ensure safety and comfort of all the workers, as well as following legal requirements, it is also necessary to have safety equipment and PPE (Personal Protection Equipment). Prior to the opening of the site a safety and health plan must be developed, following legislation. Bathroom options must be present in the site, as well as a safe place to rest and eat. Workers must know what to do in case of emergency and adopt a risk prevention behaviour.

In terms of other materials and tools, the basic needed equipment is already owned by the company, as well as needed vehicles. Any other, and more specific machinery and equipment that might not, following the usual practices of Meca, is rented, and maintained by outside suppliers.

One resource that might offer Metathesis and this projects some advantage over competitors is the utilization of a BIM software. BIM is a process that is divided in project planning, conceptions, project analysis, programming of cost, construction, operations and maintenance, and demolition and renovation. This methodology provides all interested parties with information in real time and offers the ability to control every single aspect to the project, therefore reducing errors and saving time and money. As the leading risk from the project is that it becomes too expensive to be profitable, using a software such as Archicad or Revit to control every stage could help prevent it. These software's are, however, quite expensive, and would require added investment.

8.3.4 Sales force

As previously mentioned in the Marketing mix sale is achieved through a mix of realtor partners, leads through internet resources (social media, website, and SEO) and managed mostly by both the project manager and the CEO.

Several key factors must be taken into consideration by the above-mentioned players. The team needs to have a deep understanding of the sustainability features, how these can add value to the prospective buyers. To do so, knowing how to identify the target audience's preferences and how their behaviour can be impacted by these is essential. There must also be an added management of the relationship between the company and the customers, as well as their expectations.

When this is achieved careful documentation must be made, with the aid of the legal team, in order to ensure the company's protection of these transactions.

8.4 Implementation plan

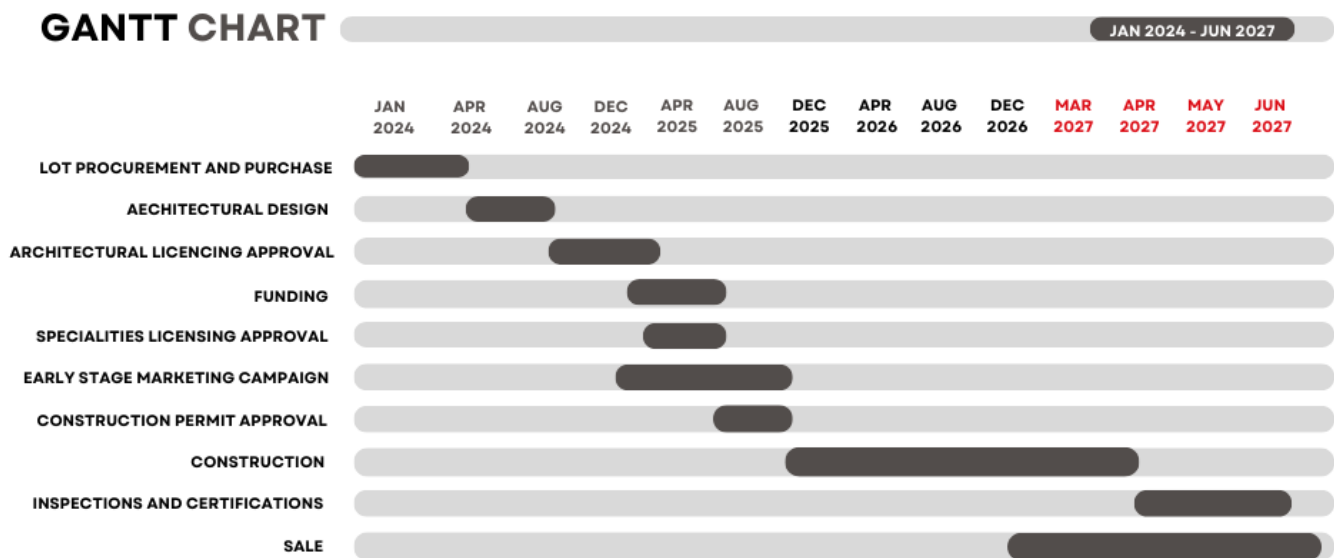
Following resource identification for the project, an implementation plan is required to outline and understand all the specificities when it comes to all the steps, timelines, responsibilities and how resources are used to reach completion.

As previously mentioned, the objective is to construct 6 energy-efficient and sustainable homes, Passive Houses, in the Lisbon Metropolitan Area. To do so the company must start by the selection of the site, designing and construction of the passive houses, and obtaining the building certifications. During this process a strong marketing campaign must be in place gather eco-active buyers.

While the construction timeline is around 18 months, a construction takes at least 3 years from start to finish, sometimes taking longer. This is mostly due to delays with project approvals from public authorities, inspection, site purchase, project design, arranging investment and the construction in and of itself, which can suffer delays due to weather conditions and other reasons that are out of control. This means that, if the company starts the project in January of 2024, in a positive outlook, it will only be concluded in 2027.

Using a Gantt Chart, we can visualize all the different steps of the project:

Figure 3: Gantt chart



Source: Self made

The above plan follows a timeline from January of 2024, and a 3-and-a-half-year window, ending in June of 2027. This timeline was set taking into consideration the time it takes to start and finish construction stage, approvals needed from the regulatory authorities and other phases of the project. While this will be the timeline followed for the current analysis, some aspects such as lot procurement can start earlier, in December 2023 and sales during the project stage, December 2025.

Firstly, it is necessary to find the lot on which construction will be made, analysing the terrain's characteristics and how they influence the passive aspect of the project. The lot must be well located in terms of convenience, accesses, topography, and infrastructures. Solar orientation, elevation and nature surrounding it (an area with more mature trees would aid energy consumption, as they prevent the sun from eating the building) are also aspects to take into consideration. Overall, as the first investment made in the project, it's important to find a site that allows for all these characteristics, while also having a good price/quality relation. After that, the purchase is made, which should take around 4 months.

While the architectural projects usually take around 30 to 45 days to be concluded, due to the added complexity of passive designing, the set timing for this stage is around 4 months. The architect must work with the passive expert Joaquim Neto Teixeira to make sure guidelines are

being followed, from the conceptual phase to a more schematic stage and finally to reach the end developments.

After this, the architectural licensing is requested to regulatory authorities. When this is close to being approved, the company can start looking for financing from banks and other entities. As financing is being acquired (and following the initial architectural project approval) the specialities project is sent to governing. While waiting, and after securing investment, the company can start the early stages of the marketing campaigns. Usually using 3D images Metathesis can start presenting the project to the public, on its website and social media, as strategized in the promotion study of the marketing-mix. This phase of the implementation plan happens during one full year.

When the specialities project is approved, the company can request the construction permit necessary to initiate production. As mentioned previously construction of a development with these characteristics should take around 18 months to be finalized. During this period builders and partners, as well as the project manager must follow the plan previously set, purchase the necessary materials required for each production stage and maintain all parties informed of the project's progress. This is essential to the financial analysis, as any time constraints will have an impact on the lucrativeness of the development. It is also required to understand if there are any necessary alterations to the plan. When it ends, the company should request inspections from the regulatory authorities and certifications (energetic and passive) requested. Although the previous cannot start without the ending of the construction stage, sale efforts can (and should) start before it is concluded.

As the sale process starts the marketing plan that was created is followed. There is a more aggressive social media presence and advertising, partner realtors also take more hostile sale tactics in order to try to achieve total sales by the end of the set time frame. This is essential to ensure maximal profitability.

The sale of a house involves a careful analysis of the buyer and requires a high level of customer service from the company's side. If the prospective customer decided to make the purchase, contracts must be signed, as a protection of both parties and as requirement for financing from the buyer's side.

Lastly, as the buyer's credit is approved the sale is made. It is important to take into consideration that following legal requirements, new build homes have a 5-year warranty for general issues and 10 years for structural issues.

9. Financial analysis

Table 4: Assumptions

-
- IVA tax: 23%
 - Taxa de IRC: 17% for the first 25 000€, 21% for the following amounts. An added 1.20% for the Municipal *Derrama* addition.⁴
 - Interest rates for new loans to non-financial companies: 5.72% in July 2023, as per the *Banco de Portugal* website.
 - Inflation rate of 3.7%, as per *INE* website, relating to August 2023.
 - Aimed profit of 5% to 10%.
 - IMI tax: 0.35%
-

Source: Self made

9.1 Cost analysis

A cost approach for a real estate project estimates the price that the buyer should pay for the property. It should take into account the cost of construction as well as the cost of land, less depreciation. When the property is newly built it yields the most accurate market value.

In order to ensure a comprehensive assessment, various components should be considered:

- Lot cost: For the construction of 6 terraced houses⁵, with an average of around 180 m² there is a need of around 90 m² for implementation. This means that the total lot should have at least 1300 m², and that the houses will have a garden area of 110 m². 10% of the total site must be considered to access creation, requiring 130 m² total. In the areas chosen previously the average price for such lots is around 270 000€.
- Construction costs: The cost of construction is set by a decree-law (287/2003) published by the *Diário da República*. For 2023 this was set at 665€, however, this value does not take into consideration the real cost of construction. For a project with the specificities chosen, price could range anywhere from 1300€ to 1600€ per square meter. This value already considers materials and labour cost for all necessary specialities. For the 180 m² and considering 1500€ per each, for the six individual houses (this price includes costs

⁴ Following the proposal 2022-634-DF of the *Câmara Municipal de Almada*, for 2023 the amount is 1.20%.

⁵ A terraced house is an architectural term for a form of medium density housing with a row of joined houses that share side walls.

for the garden areas), this means a total construction cost of 1 620 000€. Adding the 6% extra cost associated with passive methodologies the total value will be 1 717 200€ (1590 per m²). To this value we must add IVA tax, totalling to 1955.7€ per m², or 2 112 156€.

- Design and planning costs: These account for architectural and specialities fees. An architectural project costs around 4000€ plus IVA tax for one single unit. As the construction will be for 6 unites terraced, it is budget that the cost will be of 20 000€ plus IVA tax, or 24 600€. The specialities project adds another 25 000€ plus tax, totalling to 30 750€.
- In the Almada area, following prior company's projects cost for all permits from the local authorities, the cost is expected to be of 50 000€ plus IVA tax to the entire 6 houses. This adds up to 61 500€.
- Certifications: Energetic certification costs on average 250€ per unit, plus IVA tax, 307.5€. Passive House Certification by the PassivHaus Institut must be signed off by a certified specialist (in Portugal the only certificatory entity in Portugal is Homegrid). There is not a price bracket for certification, as this through analysis of all characteristics of the project and later a budget is presented. An average estimation for this certification however, follows around 3000€ per unit. As the 6 houses being built have the same specifications (varying only on very specific details due to the lot) the certification would for the 6 should not have follow the estimation times 6. Due to these 6 certifications for the project should cost less than 10 000€. To this value we add IVA, meaning an investment of 12 300€.
- The construction company is required by law to have an insurance commonly called a civil responsibility insurance for all its activities. Given this, this cost does not require extra investment by the company. An extra insurance for the site owner is a must however, in order to protect against normal construction risks such as fires, explosions, effects of natural occurrences, as well as robberies and total or parica collapse of the construction. Usually, this insurance's cost is around 0.3% of the total construction cost, which means around 5000€ per year, and 7500€ for 18 months. Thia value already accounts for the added 23% IVA.
- Garbage disposal: As mentioned, correct garbage disposal from construction is compulsory by law. For a project with this size, it is expected that around 20 containers will be necessary. The cost of disposal for each is 160€, totalling 3200€, with IVA.

- Utilities: While constructing, utilities such as water and electricity will be necessary. The expected amount for these is an average of 120€ per month, totalling 2160€ for the entirety of the project. This amount was calculated with basis on previous projects of the same size. Of this value around 80% would relate to cost of electricity and 20% to water. This value already accounts for IVA.
- IMI tax: For the Almada area, in 2023, this tax was 0.35% of the current patrimonial value for urban houses and land for construction. For a lot of 270 000€ this would equate to 945€ to be paid yearly until the new evaluation and sale of the properties, totaling in 2835€ for the 3 years the company will own the site.
- Interest paid: Due to the need for loan in order to finance the project, we must also take into consideration the cost of capital, which includes the interest payments on the required loan. Following the *Banco de Portugal* information on interest rates on new loans for companies, this value should be of around 5.72%. Given the presumed cost previously calculated, the expectation is that the project would require a loan of 2.2 million €, with the rest of the investment being added by the company. This would mean a total cost of financing of 125 840€ (this value may vary depending on the interest rates of the moment applying for the loan, however, due to current economic uncertainty there is no accurate to predict the actual rate).
- Promotion costs: For sale promotion, 3D imaging according to previously anticipated data, average cost should be around 20 000€ with IVA tax, per house.

Following this analysis, the total cost of the project is:

Table 5: Costs

	Entire project	Per property	Per m2
Lot	€ 270,000.00	€ 45,000.00	€ 250.00
Construction cost	€ 2,112,156.00	€ 352,026.00	€ 1,955.70
Architectural project	€ 24,600.00	€ 4,100.00	€ 22.78
Specialities project	€ 30,750.00	€ 5,125.00	€ 28.47
Permits	€ 61,500.00	€ 10,250.00	€ 56.94
Energetic efficiency	€ 1,845.00	€ 307.50	€ 1.71
Passive certification	€ 12,300.00	€ 2,050.00	€ 11.39
Garbage disposal	€ 3,200.00	€ 533.33	€ 2.96
Insurance	€ 7,500.00	€ 1,250.00	€ 6.94
Utilities	€ 2,160.00	€ 360.00	€ 2.00
Financing cost	€ 125,840.00	€ 20,973.33	€ 116.52
Promotion costs	€ 120,000.00	€ 20,000.00	€ 111.11
IMI	€ 2,835.00	€ 472.50	€ 2.63
Total	€ 2,774,686.00	€ 462,447.67	€ 2,569.15

Source: Self made

Due to the fact that no extra personnel will be necessary (on Metathesis' behalf), apart from the current people working for the company, the expenditures with human resources will not be calculated, as they do not require additional investment. On the same basis, there is no need for extra investment on assets (apart from the land) and no depreciation on assets that impact the project.

9.2 Investment needs

While there are currently a number of incentives and funds for efficient construction, the most likely scenario, is that the required loan of 2.2 million € from external sources, in order to bring the project to completion, will be made by a bank.

Following data from the *Banco de Portugal* website on new loans for small to medium companies, in July 2023 this value was 5.72%, meaning that by the time the loan is completely reaches the final delivery deadline, the company will have paid an extra 125 840€ to the loaning authority. The rest of the needed investment (574 686€) will be put by Metathesis.

Table 6: Investment sources

Source	Amount
Loan	€ 2,200,000.00
Equity	€ 574,686.00
Total	€ 2,774,686.00

Source: Self made

9.3 Sale projections

The sale projection of the house, following the previous cost analysis and taking into consideration the anticipated cost of the project of 459701.3326€ per unit, and the 5% return that the company focuses on achieving (taking into consideration that this is a minimum value, and that it is dependent on inflation and changes in the real estate market), the projected return is of 137910.3€, or around 22985.07€ per unit built and sold.

This value would implicate an average of 2684.3€ per m².

While 5% profit is the minimum rate the company tries to achieve in its real estate investments, it usually has a bigger profit margin, of 8% to 10%. Following this, the final sale price would be adjusted, as per the below:

In this more positive scenario, the final average price per m² would be 2812.17€.

Both these values are in line with the current sale price for new builds in the chosen area, so final sale price will be impacted mostly by the economic situation at the sale moment, and how the real estate market has evolved in the 3 years.

Table 7: Sale projections by scenario

Scenario/Year	2027
Pessimist (5%)	2 899 093.05€
Realist (8%)	2 981 924.28€
Optimist (10%)	3 037 145.1€

Source: Self made

9.4 Project valuation

Following the current IRC tax for a realist sale projection, the company would have to pay in 2028 (relating to profit of 2027), a total tax of:

Table 8: Total gross profit

	Sale price	Cost	Total
€	2,981,924.28	€ 2,774,686.00	€ 207,238.28

Source: Self made

Table 9: Total liquid profit

	IRC	Value	Total per amount
18.2%	€	25,000.00	€ 4,550.00
22.2%	€	182,238.28	€ 40,456.90
Total added			€ 45,006.90

Source: Self made

Accounting for the total investment of 2 774 686€, and IRC of 45 006.9€, as well as the total final sales of 2 981 924.28€, the project would make an end profit of 162 231.38€. As the total investment is recovered in July 2027, as per projected, the total payback period is 3 years. This makes the business plan economically viable.

10. Implementation issues and risk management

Real estate investments have risk associated that can present challenges. Some considerations to address prior to the start of the project must be carefully analysed, in order to try to find ways to minimize them as much as possible and create mitigation strategies.

The first and most important is related with economic and environmental considerations: an example of this is the covid-19 pandemic that impacted supply chains and construction delays. As mentioned previously in the present business plan, pauses and setbacks in production, permits and project suspensions (specifically after expenses such as site purchase and investment in project design) can and will impact the final sale price. The markets willingness to pay a premium price for sustainable properties can fluctuate following crisis and economic

hardship, affecting pricing and sales. As any other business venture the goal is to maximize profitability, but real estate is deeply impacted by this, as price can not be increased due to risk of not being bought by consumers. As this project will already have a higher cost due to its passiveness, this risk is even higher than in traditional ventures. Delay in the sale stage will also add unnecessary costs to the company.

Another challenge is the current skilled labour shortage in the industry, specially when accounting for the other works that Meca will be developing for external clients. Expertise in sustainable construction is not as common, meaning that teaching and training workers will involve both a time and money investment, that must be carefully planned for, in order to reduce any constraints that it can cause to the activities. This as well as any possible extra disruptions in supply chains require the diversification of materials suppliers and creation of contingency plans in order to source them.

Risk management is therefore the most important aspect to be taken into consideration. The project's manager job in this will be identification of these risks, following careful considerations of possible market dynamics, environmental factors and possible regulatory changes that may occur during the implementation of the project. Risks must be prioritized based on their impact on the project's success, developing as such mitigation strategies, such as contingency budgets that take into account any possible budget overruns and delays. Provisional contracts with suppliers are a way to address these, as well as ensure quality, and insurance policies that cover environmental liabilities, unforeseen events and loan impacts should be considered – due to Metathesis' business choice of making ventures under its own company (compared to competitors that open different legal entities, as previously mentioned) makes this an even more important factor that should be considered.

11. Impact of literature in the proposal

Following the literature analysis mentioned, several pivotal themes emerged, that impacted the elaboration of the present business plan, and their weight in the context of a real estate project in the Portuguese landscape.

As a main driving force for the innovative project, entrepreneurship, and its idea that for a project to be successful it does not necessarily require complete uniqueness, but on the contrary, it should aim to fulfil a market gap, was the leading concept that impacted the idea for the business plan. On the other hand, competitive strategy, while focusing on a different thematic,

followed the same idea: how the product differs from the ones that the competitors offer is the most important aspect in achieving competitive advantage over them. Subsequently, the strategy developed held this idea at its core: more important than creating a passive product that can be compared to another passive product, Metathesis project presents an idea that should be compared to normal construction methods and properties.

These elements converge in the business plan crafted and serve as a blueprint for its elaboration. The entrepreneurial theme fuelled the innovation, and the competitive analysis refined the strategy developed. Understanding the current passiveness and sustainability in construction in the Portuguese real estate sector served as a basis in the practices that the company must develop while bringing the project to light, and the main factors that it must take into consideration, such as the lack of interaction between the stakeholders. This is one of the most important and impactful aspects in the success of the plan, going hand in hand with external factors at economic and environmental level.

Overall, this consolidation of themes empowered the project by creating a navigation line that must be followed while implementing it.

12. Conclusion

This business plan was prepared with the purpose of understanding the feasibility of a passive building project in the Lisbon Metropolitan Area. To do so actions and following implementation strategies were presented, following comprehensive analysis of the industry in Portugal and Europe.

Goals set by the EU in the achievement of zero carbon efficiency in building and construction, a project with the presented characteristics would help Metathesis to get ahead of competitors, and therefore gaining advantage over them.

Lacking regulation can be both a deterrent and a positive aspect in the project, as while no unique restraints must be followed set by the Portuguese government to achieve “passiveness”, this also means that there is no guideline in terms of production practices to be followed, and therefore planning offers particular challenges.

While passive construction is still not a big reality in Portugal, worldwide trends in construction point to an increase of sustainability concerns and policies that are aiming for its complete adoption in the sector. The real estate and construction industry, as an important powerhouse

in the economy, must play a significant role in environmental and social responsibility, and focus on finding ways and implement laws that aim in this direction.

It's important to emphasize that, when it comes to real estate investments, these can bring very high profits, however, the construction industry is extremely impacted by the movements of the economy, meaning that all these values, as they account for a very long-time frame, can change, making the project less profitable or even not economically viable.

The ambition of Metathesis to focus on passive construction goes hand in hand with trends, so we can expect that in the coming years, if the project becomes a reality, Metathesis can become an important player in the field, bringing the possibility of making bigger, more innovative and impactful projects.

Overall, after a simple financial analysis on the project and a comprehensive analysis of the company, its strategy and the current players, we can conclude that the plan is viable.

This research was limited by the amount of information, specially relating to real costs that exists, as the industry works mostly with each specific case. Due to this, a big amount of information had to be provided by the CEO of the company and the Civil Engineer that partners with it. As a result, some factors may change when applied in the field, impacting the financial analysis of the project. This brought to my attention the need that there is in more studies about the construction industry in Portugal, and more specifically, research into passiveness in Portugal, as this is wildly unexplored in the country.

Over the completion of this project, I gained many insights in what goes into a real estate project in Portugal, and how many walls there are that can deter investment, as they require much information, insights into regulations and experience that the average person does not have. It is clear that the construction industry is in grave need of an update and analysis from governmental entities, as well as the support to companies that focus on this industry.

While this project was conducted in an academically capacity, the effort and research put into it led me to gain more experience and interest in a field that holds a important space in my life, and I am hopeful this project shows the importance of eco-practices in the industry, and on construction with a focus on building for the future.

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