

PROJECT PARTNERS



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GENERAL INFORMATION

Title of the case	Matosinhos Living Lab
Sales pitch	Matosinhos Living Lab aims to test low-carbon technological solutions that increase energy efficiency and reduce pollutant emissions. The long run goal is to create a smart, zero-carbon emissions, resilient, accessible, participatory and connected neighbourhood.
Organisations	<ul style="list-style-type: none">• Municipality of Matosinhos• CEiiA (Centre of Engineering and Product Development)• Porto Polytechnic• Metro do Porto• Efacec• HealthyRoad• JCDecaux• Datarede• STCP• APDL• Porto Design Factory• Casas em Movimento• Biciway• Follow Inspiration• Bandora Systems• Revolution Answer• Omniflow• Philips Lighting Portugal• Associação Empresarial do Concelho de Matosinhos• Associação de Restaurantes de Matosinhos

Country Portugal

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Nature of interaction City Lab

Level of mechanism

- Government policy (e.g. law, funding framework)
- Organisational strategy (e.g. university/business/agency)
- Structural element (e.g. centre, lab, office)
- Operational level (e.g. activity or programme)

Length of programme

Unspecified	Formality	Both formal (internships) and informal (research)
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Curricula-bound, co or extra-curricular?

Co-curricula (Student internships)	Level of initiative	Inter-institutional, cross-disciplinary
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Summary

Matosinhos Living Lab is a delimited area between the City Council, CEiiA, the regional market and the city waterfront. The overall objective of Matosinhos Living Lab is to create a smart neighbourhood in this area through the implementation of technological solutions that could be scalable to other regions in the future.

The Lab focuses on areas such as mobility and transport, buildings, environmental innovation and the promotion of a circular economy. The testing of technological solutions, specifically with regards to their carbon-intensity, energy efficiency and quantity of pollutant emissions, which enables the pursuit of the main goal: to decarbonize the city.

It is a project of co-creation and open innovation of products, services, software, hardware and low-carbon urban interventions, where the municipality, a knowledge centre (CEiiA), companies (like Efacec, Philips Lighting Portugal, Metro do Porto, STCP, APDL), universities (like Porto Polytechnic), entrepreneurs and citizens interact. Within the lab, real context tests are performed for challenges like parking management, bike sharing, electrification of the fleet, and traffic monitoring, among others.



CASE STUDY PROFILE

BACKGROUND

The city of Matosinhos is preparing to become a living experience of what may be the cities of the future regarding the carbon intensity of daily activities. The citizens will be engaged in the creation and experimentation of cleaner and more intelligent technologies. The project also aims to promote entrepreneurship and the development of low-carbon business solutions.

When the Environmental Fund launched the appeal for the presentation of applications for the creation of “Living Labs for decarbonization”, the partnership between CEiiA and the municipality came naturally. The proposal included an “open call for innovations”. Hence, several companies, start-ups and knowledge centres presented technological solutions for testing and experimentation in the living lab territory. From the applications, the municipality chose 14 partners who became part of the project’s consortium.

The Living Lab Matosinhos was officially established in March 2018 and will last at least 3 years.

CEiiA led the application with the Municipality of Matosinhos with approximately 18 partners involved in the project. Among startups, private companies, public transport companies and institutional partners, we can highlight entities such as Leixões Port, Efacec, Metro do Porto, STCP and University of Porto.

Within the project, University of Porto, particularly the Polytechnic of Porto (ISCAP), had a primary role. Their role was to develop a methodology to assess the impacts on the citizens. Indeed, ISCAP has created a technological tool to monitor social impact on two levels: customer perception of the use of the technologies offered by the living lab and their appropriation of the concept of 'citizen centre'. This tool will be based on the use of the OLAP (Online Analytical Processing) cube, analysing the 3 perspectives presented by the BSC (Balanced ScoreCard): customers’ perspective, learning perspective and economic-financial perspective.

CONTEXT

Matosinhos is a city and a municipality in northern Porto.

The population has been increasing, with several buildings being constructed replacing ancient canning factories. So, there is a need for improving edification in order to be more energy efficient.

The city has an important port, which only served industrial purposes until a few years ago. However, in 2011 the cruise terminal was established bringing in many tourists.

Therefore, there is a need to improve the transportation system, in order to answer the needs of a higher number of people. It is crucial to alert people to the need to decarbonise the territory in order to free them from a dependency on cars and to inspire a new paradigm of mobility.

Nevertheless, the city presents a lack of attractive tourist places for the cruise passengers who ignore and "jump" the city in favour of Porto and other regional places, meaning that Matosinhos not only needs better mobility systems, but also needs to improve the green areas and other attractions, increasing the appeal of the city.

Matosinhos Living Lab appears as a solution for several problems: it enables the reduction of the carbon emissions and the carbon intensity of the activities, decreasing the energy consumption and promoting sustainable urban mobility, while contributing to improvements in the city.

The technologies tested under the "Living Lab" could then be extended into the urban area, involving citizens in the creation and experimentation of cleaner and more intelligent technologies.

OBJECTIVES AND MOTIVATIONS

The project aims to:

- Decarbonize the city
- Decrease energy consumption
- Provide a test bed for solutions that can be scaled to the whole city, at first, then to other cities, and eventually to other countries
- Have more comfortable and sustainable mobility
- Promote the use of renewable energies

STAKEHOLDERS

The stakeholders of the Lab include:

- Representatives from governmental organizations: Municipality of Matosinhos
- Representatives from public organizations including STCP, Metro do Porto, APDL, Associação Empresarial do Concelho de Matosinhos
- Students, professors and researchers from Polytechnic of Porto
- Representatives from the research centre CEiiA

- Representatives from private companies, including Efacec, HealthyRoad, JCDecaux, Datarade, Casas em Movimento, Biciway, Follow Inspiration, Bandora Systems, Revolution Answer, Omniflow, Philips Lighting Portugal

PROCESS

INPUT

The main inputs are:

- Knowledge, skills and experiences of university professors, researchers and industry representatives
- Students' participation (mainly through internships)
- Citizen's involvement
- Funding (Environmental Fund)

ACTIVITIES

The general activities undertaken as part of the Living Lab project include:

- Development, testing and experimentation of innovative and integrated technological solutions in real context, intersecting mobility, energy, buildings and connectivity
- Promotion of strong user involvement with the co-creation of solutions
- Evaluation of social adoption of these solutions
- Measurement and evaluation of carbon emissions in real time powered by mobi.me (CEiiA's mobility management platform)
- Intelligent traffic monitoring in Matosinhos using radars and sensors
- Placement in bus stops of real-time information monitors, managed by mobi.me, displaying the time, the atmospheric temperature and the waiting time for the incoming buses
- Promotion of entrepreneurship and new business creation related to low carbon solutions (development of new products and services)

More specifically, as part of the project, the following activities were undertaken:

- Philips implemented luminaires that detect people and vehicles (including the subway) in order to adjust the light intensity according to real-time needs, which means more safety, increased energy efficiency and reduced energy costs
- Pavnext developed a solution that reduces vehicles' speed without any action from the driver by extracting kinetic energy. This energy is then transformed into electrical energy in a sustainable way, which will be used to power a road safety solution or to charge electric bikes
- Follow Inspiration designed an autonomous urban cleaner robot



OUTCOMES AND IMPACT

OUTPUTS

The outputs of the activities carried out include:

- Auto sustainable lamps that measure carbon emissions
- Pavement that reduces vehicle speed without drivers' intervention
- Bike sharing connected to the public transport system with a real time measurement of CO2 emissions spared
- A house that moves along with the sun and stores energy through solar panels on the roof
- An autonomous robot to support urban cleaning
- A local carbon market that allows citizens to exchange CO2 emissions spared by goods and services
- Provision of information to municipalities, companies and citizens about critical urban indicators, which supports decision-making and innovation
- Improvement of traffic monitoring and management by the municipality
- Management and monitoring of operations, decision support and territorial planning

IMPACTS

The impact of the project in the region includes:

- Reduction of carbon emissions (it is estimated to save 8 tons per year in streets within the lab, meaning that the application in the whole municipality would save 800 tons and 90 tons in the City Hall)
- Higher quality of public spaces
- More energetic efficiency
- Better life quality inside public buildings
- Improvement of road safety
- Increasing connectivity between citizens and all agents
- More informed decisions (Municipality)
- Costs saving (Municipality)
- Research topics, access to data, internships (Polytechnic)

SUPPORTING ENVIRONMENT & SYSTEM

SUPPORTING MECHANISMS

The supporting mechanisms that can be pointed out are:

Support from Municipality of Matosinhos and its involvement in research & development activities to ensure the sustainability of the project and its activities. Another important support mechanism includes CEiiA's support with the trial and demo of mobility solutions.

BARRIERS AND DRIVERS

Barriers to the implementation of the project include:

- Struggle in mobilizing the citizens for the project
- Need for raising additional funding sources
- Need for public procurement

Elements driving the processes include:

- Living Lab Matosinhos is located in a limited, central area of the city composed of several points with distinct physical, economic and social characteristics
- The support and interaction of several organizations, namely municipalities, knowledge centres, companies, entrepreneurs and citizens



LESSONS LEARNED

CHALLENGES

Challenges include:

- High dependency on third parties
- Risk of delays in the installation of technological solutions

KEY SUCCESS FACTORS

One of the distinguishing elements of Living Lab is the ability to monitor and measure carbon emissions in real-time and thus evaluating the impacts of the activity in the intervention zone.

Additionally, there are several key success factors that can be pointed out:

- Integration
- Intelligence
- Monitoring
- Citizen focus
- Scalability

Living Lab Matosinhos is not proposed to be a time-bound project so the ambition of the Municipality is to ensure the continuity of the initiative after the funding of the Environmental Fund. To this end, all consortium partners are committed to maintaining and monitoring technological solutions up to three years after the end of the project.

Sustainability measures:

- Replication of the solutions implemented in the living lab area
- Exploitation of the results of the project, namely integrating new features, through new partnerships' establishment
- Launch new "open calls for innovation"

Continuous implementation of actions related to citizen involvement on the innovation process and on the definition of ideas for the municipality, through new models inducing behaviour change (sharing economy, reward system, etc.).



FURTHER INFORMATION

AWARDS AND RECOGNITION

European Enterprise Promotion Award (EEPA) in the category "Support for the development of ecological markets and resources efficiency"

TRANSFERABILITY

It aims at being scaled to Matosinhos as a whole, other cities in Portugal and other countries

LINKS

http://www.cm-matosinhos.pt/pages/242?news_id=5080

<https://www.ceiia.com/single-post/2018/04/09/Living-Lab-Matosinhos>

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