

SEP 2019
AUG 2022

IOTXCHANGE ACTION PLAN

MAKE FUNDÃO AN **IoT** CITY





Driving change for
better cities

URBACT III is an European Territorial Cooperation program, launched by the European Commission in the context of 2014-2020 cycle. It promotes and finances the thematic networks of cities which work to develop common solutions to contemporary urban challenges, reaffirming their key position in the face of more complex corporate changes.

URBACT III is managed in France by the Commissariat Général à l'Égalité des Territoires and has in Portugal a National Contact Point, managed by the Direção Geral do Território (DGT). In addition, the Comissão de Coordenação e Desenvolvimento Regional do Centro (CCDRC) is the regional interlocutor for the Centro region of Portugal.

Projects financed under URBACT III are organised under four main objectives:

- To improve the capacity of cities to manage sustainable urban policies and practices in an integrated and participative way;
- To improve the design of integrated urban and sustainable strategies/action plans for cities;
- To improve the implementation of integrated urban and sustainable strategies/action plans in cities;
- To ensure that practitioners and decision makers at all levels have access to knowledge and share know-how on all aspects of sustainable urban development.

Eligible beneficiaries: cities from EU 28, Norway and Switzerland, constituted in networks, which can also include Regional Authorities, Universities and Research Centre's.



URBACT WEBSITE



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UM
CIDADES
MUNICÍPIO DO ANO
PORTUGAL 2016
FUNDÃO

**Prémios
MARKETEER
2016**
Vencedor
Grande Consumo
Alimentar - Não Bebidas

**Cereja
do
fundão**
a original



A word from our Mayor

Paulo Fernandes

By positioning itself as the URBACT IoTXChange network leader, the Municipality of Fundão pursues the path set out since 2012, the year in which it created an Innovation Plan focusing on digital and technologies. In the scope of this strategy to promote innovation, attract investment and create jobs, the Municipality of Fundão intends to develop a pioneer ecosystem in the country to enhance the development of solutions and businesses in IoT environment, directed in particular to the empowerment of rural-based economic activities and the development of solutions for low density territories' challenges.

Through the IoTXchange project, whose initiative came from the Municipality of Fundão, it is intended to promote the adoption of IoT technology as a way to improve citizens' quality of life in small and medium sized towns and in more rural territories.

With the massification of technology associated to the Internet of Things, the cities of the future will necessarily be Smart Cities, focused on the citizens and economic actors' needs, otherwise they will lose competitiveness in attracting people and investments.

In Fundão we believe that all territories can be intelligent, regardless of the limitations that may be implicit to them due to their location, size, or number of inhabitants. In fact, the URBACT IoTXchange network is proof of this, as it counts with the participation of several small and medium-sized European cities, namely Razlog (Bulgaria), Dodoni (Greece), Nevers (France), Jelgava (Latvia), Ånge (Sweden) and Kežmarok (Slovakia), and the Finnish university Åbo Akademi.

In 2019, the city of Fundão was taking major steps towards having around 700 professionals working in ICT, after having set itself the goal of being a home for ICT a few years earlier. The municipality invested in an integrated strategy to make Fundão an attractive and competitive destination for new companies and professionals, with special attention to infrastructures, connectivity, incentives and mobility programmes, urban regeneration, social innovation, and advanced training. In a strategy that intended to diversify the municipality's economic reality, today the number advanced in 2019 has already been surpassed, with Fundão about to reach 1000 jobs in the digital sector, as a result of the installation of several IT companies, but also start-ups and remote workers who choose Fundão and the region for the ecosystem and lifestyle they find here. This new socio-economic reality was accompanied by a growth in other areas such as industry, agro-food or tourism, which leads to a very relevant flow of new professionals and families arriving in Fundão in recent years, coming from other regions and other countries (there are 67 nationalities in Fundão's professional market).

Having said this, the methodology used in the scope of the URBACT III programme, based on transnational cooperation between cities and the involvement of local action groups, provided Fundão with the necessary conditions to develop the present Integrated Action Plan, which serves as a guide to strengthen and continue the work that has been developed over the last few years, in a new era of digital transformation.

Paulo Fernandes

Mayor of Fundão Municipality





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INTRODUCTION

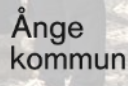
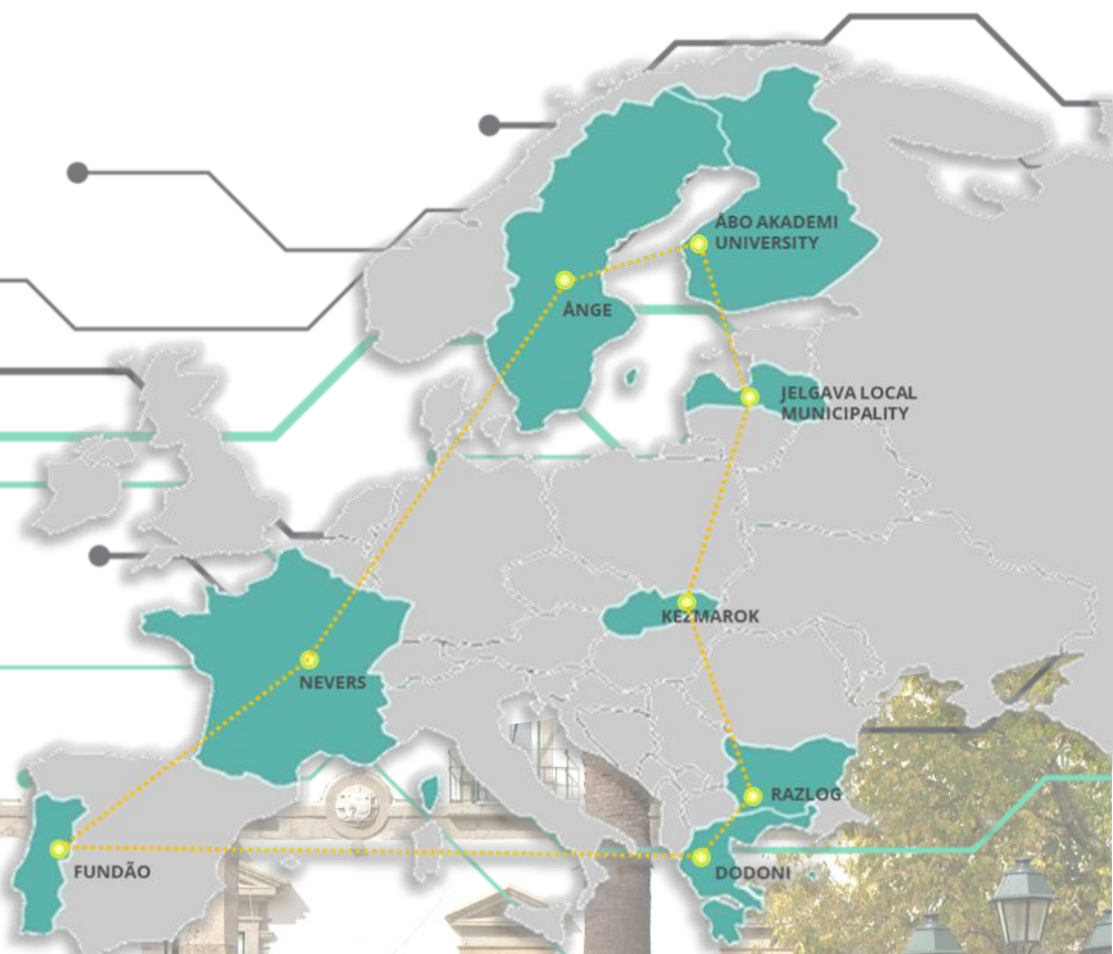
IoTXchange is an Integrated Action Planning Network of the URBACT programme composed of 8 European partners (7 cities and 1 university): Fundão (Portugal), Razlog (Bulgaria), Dodoni (Greece), Nevers (France), Jelgava (Latvia), Ånge (Sweden) and Kezmarok (Slovakia) and Åbo Akademi University (Finland).

IoTXchange encourages the creation of an European cities network committed to the design of digitalization plans based on Internet of Things (IoT) solutions to increase the quality of life in small and medium sized EU cities. Urbact methodology based on transnational cooperation between cities and engagement of **local groups** offers our network the conditions to develop an **Integrated Action Plan** that will guide us through a new age of digital transformation.

This URBACT project is co-financed by the European Regional Development Fund.



IoTXchange WEBSITE





LOCAL ACTION GROUP (LAG)

Each city partner in an URBACT network should create a Local Action Group (ULG) to bring together all important local stakeholders related to the chosen challenge that the city wants to solve. These stakeholders are encouraged to participate in the development and implementation of urban development policies. By bringing together partners to collaborate on a specific issue and exchanging their experiences at a transnational level, the Local Support Group guarantees a more rigorous and innovative result, leading to the co-production of a Local Action Plan.

INTEGRATED ACTION PLAN (IAP)

A Local Action Plan (IAP) is a strategic document that responds to identified needs, analyses problems and opportunities and presents sustainable and viable solutions. All partner cities of the URBACT network must produce a IAP and it can be structured in different formats. The Local Action Plan is first and foremost a concrete and useful tool for the city to solve a local problem and/or improve a local situation. At URBACT, the Local Action Plan is the result of the participatory process of the URBACT Local Action Group.



BUDGET - ACTION PLANNING NETWORKS

Action planning network budgets are reserved for learning, exchange and planning activities, not investment purposes.

2 PHASES
27 MONTHS

PHASE 1: 2 SEP 2019 - 2 MAR 2020
PHASE 2: 7 MAY 2019 - 2 AUG 2022

Beneficiaries
7 Cities
1 University

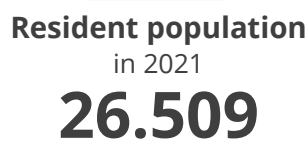
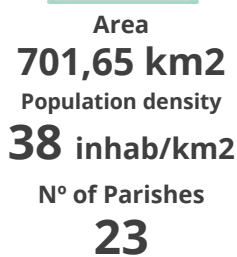
IoTExchange network budget
744.166,92€
590.794,12€ supported by ERDF

Municipality of Fundão budget
206.314,10€
85% co-financed by ERDF

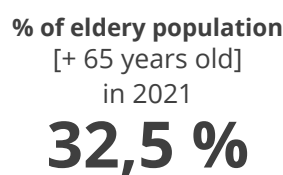
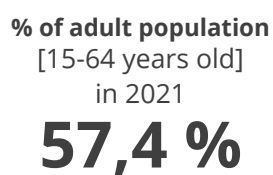
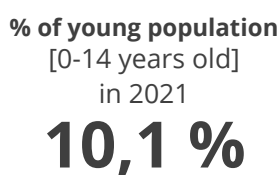
1.1 CITY PROFILE / SOCIO-ECONOMIC BACKGROUND



POPULATION



> In 2020, of the 26,480 residents in Fundão, 1,062 were foreigners, 645 more than in 2009. Foreigners represented 4% of the resident population in Fundão, a percentage that is the highest among the municipalities of Beiras and Serra da Estrela.



> In 2020, the difference between the number of births and deaths in Fundão was negative, translating into a natural balance of less 273 persons. On the other hand, the **migratory balance was positive** (more 242 people).

HOUSING AND LIVING CONDITIONS

> According to Census 2021, the municipality of Fundão has 11,568 flats or houses of habitual residence (78.9% are owned houses and 21.1% are rented houses).

> Between 2009 and 2019, in the municipality of Fundão the urban properties' average sale value increased from 56.817 euros to 86.319 euros.



% of buildings
owned
in 2021

78,9%

- 1,6 p.p.

Variation compared to 2011



Average purchase and
sale value of
properties
in 2019

61.405 €

112.470 €

Portugal



GDP
per capita in 2019

78,9

100,0

Portugal

> In 2019, the purchasing power parity per capita index in Fundão was 21% below the national average, while in 2009 it was 28% below.



Registered crimes
in 2020

966

- 13,8%

compared to 2019

LABOUR MARKET



Average monthly
earnings of
employees in 2019

955 €

1.206 €

Portugal



Unemployed
registered at IEFP
(%) in 2020

5,1%

5,8%

Portugal

> In 2019, in the Municipality of Fundão, in the universe of employed people, men earned, on average, 1027 euros per month and women 867 euros.

> In 2020, in the municipality of Fundão, there were, on average, 816 unemployed people registered at job centres per month, thus 44% less than in 2009 (1,456).



Nº of Companies
non-financial companies in 2020

3176

3240

in 2019

> Between 2009 and 2019, in Fundão, the number of non-financial companies increased from 2,926 to 3,240 (a growth of 10.7%).

> In the municipality of Fundão, the activity sector that concentrated the most workers in 2020 was Transformation Industries, a reality that was also observed in most of the previous years.

EDUCATION



No. of students in pre-
school
in 2020

488

715

compared to 2009



No. of students in
primary education
in 2020

1924

2991

compared to 2009



No. of students in high
school
in 2020

897

1430

compared to 2009



TOURISM



No. of Tourist Accommodation in 2020

18

4

compared to 2009



% Proportion of foreign guests in 2020

5,4

3,9

compared to 2009



No. of companies in the accommodation, catering and similars sector in 2020

262

285

compared to 2009

ENVIRONMENT



Electricity consumption (kWh) per inhabitant in 2020

3461,1

3560,8

compared to 2009



Water consumption per inhabitant-m3/hab In 2019

46,1

28,9

compared to 2012

> In 2020, 1,284 hectares of forest, undergrowth or agricultural holdings were burnt in the municipality of Fundão, a value 2.5 times higher than in the previous year (510 ha).



Burnt area in hectares (forest, undergrowth or agricultural holdings) In 2020

1.284

5.475

compared to 2017

107

compared to 2009



Tonnes of undifferentiated waste collected in 2020

10.092

11.574

compared to 2009



Tonnes of waste collected selectively, such as glass, paper or plastic in 2020

1.115

835

compared to 2009



% of waste to landfill in 2020

59,1

23,3

compared to 2009

> Fundão's environmental expenditure totalled 1,793 million euros, being 1.160 thousand euros in Waste Management and 596 thousand euros in Biodiversity and Landscape Protection.

> In 2020, in the municipality of Fundão, the percentage of waste in landfill was 59.1%, while in 2009 it was 23.3%



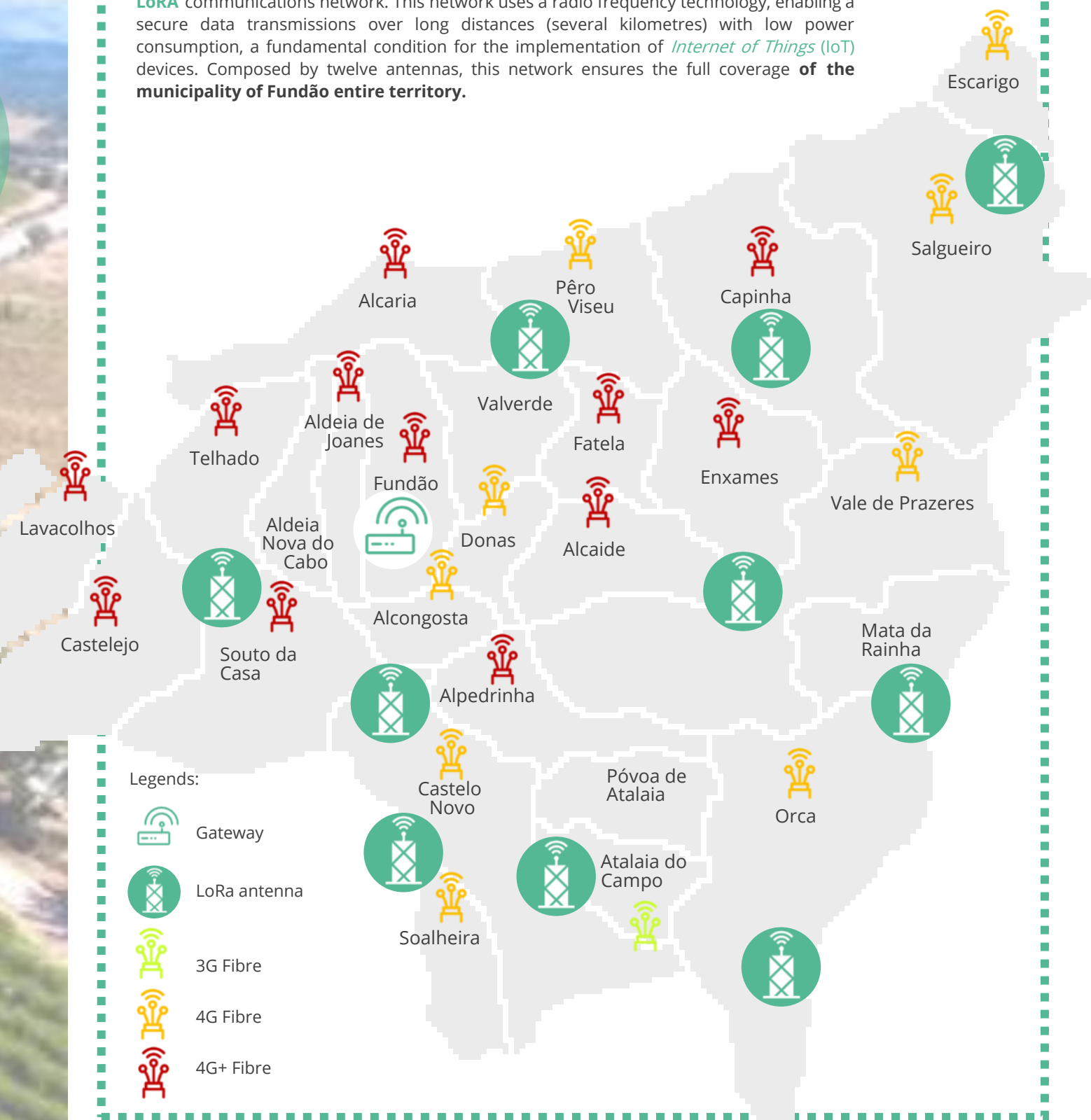
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LORAWAN NETWORK COVERAGE IN THE MUNICIPALITY OF FUNDÃO

Since 2019, Altice Portugal has taken an important step towards full coverage of the country by covering 100 more parishes with 100% optical fibre. The Municipality of Fundão and its parishes were included in this process. In almost all parishes of the municipality of Fundão, the full coverage of these territories is now guaranteed with this more robust, simpler and more reliable infrastructure in technological terms. Altice's ambition is to make Portugal the first country in Europe to offer fibre to all. Optical fibre allows us to have next-generation communication networks, guaranteeing the most diverse services and opportunities. The next step will be 5G.

Also, at the same time, the Municipality of Fundão completed the implementation of a **LoRA** communications network. This network uses a radio frequency technology, enabling a secure data transmissions over long distances (several kilometres) with low power consumption, a fundamental condition for the implementation of *Internet of Things (IoT)* devices. Composed by twelve antennas, this network ensures the full coverage **of the municipality of Fundão entire territory**.



1.2 POLICY CONTEXT

CONTEXT

The starting point of the process was the urgent need of Fundão's Municipality to answer the huge challenges it was facing, common to most municipalities of the interior of Portugal, namely **high qualified and unskilled youth unemployment; ageing population; decrease of economic activity in the municipality.**

Strategically, it was soon realised that this response would involve enhancing the region's distinctive characteristics, which place it at a competitive advantage in its territorial context:

- the geographical location combined with the existence of a vast historical, cultural and natural heritage;
- the existence of a strong commerce culture among its inhabitants and their hospitality;
- the existence of a set of high quality infrastructures in need of revitalisation through new utilisation forms.

One of the great pillars of the Fundão Innovation Plan was the Living Lab of Cova da Beira creation, which involves several infrastructures, namely a co-work space, a FabLab and a social and business Incubator.



STRATEGY

The Municipality of Fundão has been putting issues related to **Open Innovation and Social Innovation** at the centre of its strategic policy and intervention agenda. Thus, since 2012, it has inaugurated some valences that have been creating and enhancing innovation ecosystems with significant impacts on the economic and social fabric of the municipality. The strategy defined in the **FUNDÃO INNOVATION PLAN** was capitalised on the following premises:

- **Open Culture** - to learn and grow with new experiences and ideas;
- **Open Government** - for a bottom-up approach to address the wishes, interest and concrete and real needs of the population;
- **Open Resources and Open Data** - boosting transparency and public trust;
- **Open Arms** - to welcome and involve everyone;
- **Open Minds** - to foster a constructive, positive and innovative spirit.

2012

THE MUNICIPALITY OF FUNDÃO PLACED ISSUES RELATED TO OPEN INNOVATION AND SOCIAL INNOVATION AT THE CENTRE OF ITS STRATEGIC POLICY AND INTERVENTION AGENDA



2012

FUNDÃO INNOVATION PLAN

fundão
plano de inovação



Four intervention axes have been defined to implement the strategy defined in the Innovation Plan:

- **Axis 1 - To provide spaces, infrastructures and host services**, through the adaptation and requalification of existing buildings, to enable new functionalities dedicated to hosting innovative and technology-based entrepreneurs and companies. In this way, besides the valorisation attributed to the existing patrimony based on its recovery, infrastructures are provided at low cost to both the creative community and the companies.
- **Axis 2 - To support and stimulate entrepreneurship and creativity**, encouraging the installation of new companies in refunctionalised spaces, guaranteeing them the provision of support services for the development of their businesses.
- **Axis 3 - To innovate, highlight and affirm** solutions and initiatives that go beyond the borders of our municipality, promoting/facilitating partnerships between local producers and entrepreneurs with different contexts and realities.
- **Axis 4 - To communicate and promote** all the work to be developed and to evolve positively within the scope of this strategy, with a view to attract, internationalise and disseminate.



ONE OF THE GREAT PILLARS OF THE FUNDÃO INNOVATION PLAN WAS THE LIVING LAB OF COVA DA BEIRA CREATION, WHICH INVOLVES SEVERAL INFRASTRUCTURES, NAMELY A CO-WORK SPACE, A FABLAB AND A SOCIAL AND BUSINESS INCUBATOR.

IMPLEMENTATION

The most remarkable action resulting from this strategy was the constitution of **Living Lab Cova da Beira**, which is the result of a consortium led by the Municipality of Fundão and composed of companies, funding and development agencies, schools, health units and the University of Beira Interior. The Living Lab Cova da Beira intends to establish itself as a Territorial Living Lab where innovation is generated and applied on the territory for people who live in it.

The Living Lab Cova da Beira intends to generate a creative ecosystem in the spirit of open innovation, providing shared workspaces for companies incubation and entrepreneurship projects, providing shops in the old city centre of Fundão, as well as in the Historical Villages of the municipality.

This wide network of partners is composed of public entities (Municipality of Fundão), civic associations (ACICF, G21, NERCAB), companies (PT, YDreams, VitalGreen, financing institutions (Caixa de Crédito Agrícola), universities and schools (UBI, Escola de Turismo and Escola Profissional do Fundão, Instituto Politécnico de Castelo Branco), an hospital centre (CHCB), existing networks (Aldeias do Xisto), and also a formal partnership with the Smart Rural Living Lab (member of ENoLL).



THIS IMPORTANT NETWORK OF PARTNERS PROVIDES A SIGNIFICANT SUPPORT TO THE LIVING LAB OF COVA DA BEIRA, ALLOWING IT TO AFFIRM ITSELF IN THE REGIONAL AND NATIONAL CONTEXTS.

In parallel, the open and shared **CO-WORK** space was inaugurated, bringing together all the conditions for the first "incubation" phase of a company, fostering the productive exchange of ideas and best practices in a multidisciplinary environment.

As a product of the Living Lab, was created the **FABLAB Aldeias do Xisto**, a prototyping laboratory conceived to design, develop, manufacture and test innovative solutions. It provides, for example, a 3D printer and aims to connect the creative community with educational institutions and community in general.

Additionally to the two infrastructures mentioned above, the Living Lab Cova da Beira is also composed of a **SOCIAL AND BUSINESS INCUBATOR - A PRAÇA**.

Both Co-Work space and FabLab Aldeias do Xisto are interconnected with the Business Incubator which, besides its basic function of generating, supporting and fostering a favourable environment for the growth of new businesses derived from new ideas, also intends to be connected with the urban and social regeneration of the centre of Fundão, through the location of new businesses, the fruit of the incubation process, in the old part of the city.

All these valences are or are in the process of being complemented by the Thematic Houses, the **COVA DA BEIRA TRAINING CENTRE** (inaugurated in July 2017) or the Research and Development Pole for Telemonitoring in the area of Health.

The **Fundão PRODUCERS' CLUB** is also the result of an innovative approach. It has been very significantly affirming Fundão as a brand of excellence in various agro-food products, through its promotion especially in foreign markets aiming to export.

It was also from this atmosphere that the opportunity to create a **BUSINESS AND SERVICES CENTRE** in Fundão's Multipurpose Pavilion arose, through an intervention project that resulted in the qualification of this building for the installation of several technological companies that intend to innovate and ally Technology to the service of Society, Environment and Economy.

In line with this strategy of **Social and Economic Innovation**, complemented by the will to bring to the municipality a more transparent and participated democracy, the Municipal Executive has also decided to carry out an open data policy that intends to make municipal management data and urban information available to citizens, as well as to implement Participatory Budgets, allocating a portion of the Municipal Budget to respond to proposals or ideas coming from citizens.



CO-WORK



FABLAB ALDEIAS DO XISTO



SOCIAL AND BUSINESS INCUBATOR



RESULTS

As a result of this Innovation policy, more than 500 new jobs were created in the ICT sector, in companies that invested in Fundão throughout this period and are increasingly looking for human resources with high technological skills: Capgemini Engineering; ReadinessIT; InovaPrime; Convevo; Follow Inspiration; Softinsa IBM; Terra Pro; Trigger Systems, VeraCruz, among others.

Many of the executives hired by these companies have already settled in Fundão, especially in the old part of the city, a fact that has brought a growing dynamism to local life and economy.

In four years, the project boosted an integrated ecosystem that generated 68 startups and supported more than 200 private investment projects, investing in R&D, pioneering initiatives of professional conversion and digital skills.

As a result of our permanent contact with companies, we know that Fundão needs at least 300 new ICT professionals, preferably with skills in programming languages. Furthermore, if today there are 500 jobs created in Fundão in this sector, there would be even more if the education system produced the profiles that companies are looking for.

Therefore, in 2016 we implemented the **CODE ACADEMY BOOTCAMP**, with a simple goal: to reduce unemployment rate in Portugal by directing the lives of hundreds of Portuguese people to programming. An innovative approach that consists of holding intensive programming bootcamps, lasting 14 weeks, to train those who under the project are referred to as <Code Cadets>. After the bootcamps, direct entry into the labour market is guaranteed.

Also, in this sense, the Municipality of Fundão inaugurated in July 2017, together with various institutions in the region, the **COVA DA BEIRA ADVANCED TRAINING CENTRE**, with the aim of qualifying labour in different sector, namely agri-food, new technologies and polishing.

In terms of national and international projection, Fundão has hosted several events of great impact, as well as has been an active voice in several networks and partnerships, affirming itself at this moment as one of the rural areas innovation case studies in Portugal. The recognition of the work done is also materialised in international awards such as 1st national place in the "European Enterprise Promotion Awards 2015", and the **RegioStars 2018** award from the European Commission, with the Fundão Business and Shared Services Centre.

2014

BUSINESS AND SHARED SERVICES CENTRE



2016

CODE ACADEMY



2017

COVA DA BEIRA ADVANCED TRAINING CENTRE



2018

2018 REGIOSTARS AWARD WINNER IN THE CATEGORY "PROJECTS WITH A STRONG IMPACT IN TERMS OF JOB AND WEALTH CREATION" WITH THE BUSINESS AND SHARED SERVICES CENTRE PROJECT

SUCCESS STORIES



ACADEMIA DE CÓDIGO



itech-on

inova
prime

Follow
Inspiration
IS2you >

SOFTINSA

Smart Concepts, Intelligent Systems



trigger.
systems



TERRA
technologies



twintex



J3LP - GROUPE J3L



COMING NEXT...

Agriculture is increasingly a technological and knowledge activity, whose sustainability depends on the ability to harmonise production, technological and environmental issues, without neglecting its economic and social structure. Undoubtedly, the future of the country lies in the competitiveness and internationalisation of companies and agro-forestry products, stimulated by increased R&D in partnership with companies and scientific system entities.

This articulation is crucial to respond to the main challenges of the sector, therefore in Fundão, it was developed an experimentation and demonstration field of Internet of Things (IoT) and robotics technology for agriculture.

Several dozen projects and start-ups will have the opportunity to test in a real environment the technologies they develop for the agricultural sector.

Additionally, the completion of works process of several new valences is ongoing, with which we aim to enrich the whole ecosystem of entrepreneurship and innovation that has been created in Fundão in recent years.

The Municipality of Fundão wants to affirm itself as a creative city that enhances its cultural richness translated into its diversity and local identity. Thus, the **Design Factory** concept idea was developed with the following purpose: to support and develop creative and innovative projects in the cultural, artistic, economic and technological areas, focusing on attracting talent, promoting entrepreneurship and the spirit of initiative, but also on regional cohesion and competitiveness, awakening the interest for culture and citizenship.

The construction of **Technology Businesses Hosting Centre**, a new building aiming to host technology-based business, was designed to increase the installed capacity, of spaces and services, in the city of Fundão, since it is currently at maximum capacity. This investment will enable the installation of **2,000 IT highly qualified jobs** in the heart of the city. It will be available by the end of 2022.

The rehabilitation work of the Cine-Theatre Gardunha has been underway for approximately one year, with its completion scheduled for 2023. The project foresees a performance hall with capacity for 510 seats and 1200 standing places, as well as a room adaptable for different types of performances and the creation of an interior gallery square, besides other spaces and cultural services. This infrastructure is one of the most emblematic buildings of the city, which has been closed for over 30 years.

2022

AGROTECH IOT CENTRE

IoT Testbed



2022

FUNDÃO DESIGN FACTORY



2022

TECHNOLOGY BUSINESSES
HOSTING CENTRE



2023

CINE-THEATRE GARDUNHA





1.3 SWOT ANALYSIS



STRENGTHS

- Excellent quality of life index, including being mentioned as the municipality with the best air quality from the year 2012 to the present.
- Openness to the outside and willingness to support creativity.
- Consistent strategy of integrated urban development.
- Territorial dynamism that promotes investment in different sectors of activity.



WEAKNESSES

- Higher concentration of residents in the most urbanized area and consequent desertification of the villages.
- Population decrease and aging index increase.
- Insufficient coverage of the municipal transport network in relation to the population's needs.
- Soft mobility's means hardly used by citizens.
- Insufficient coverage of health services, especially in what concerns the most rural and isolated areas.



OPPORTUNITIES

- Enhance by the Municipality of policies that promote innovation, creativity and entrepreneurship, with consequences in terms of job creation, local economy growth and population attraction/fixation.
- Notoriety achieved through the success of the urban development and investment attraction strategy.
- Growing number of foreigners showing interest in residing and investing in the municipality of Fundão.
- New migratory contingents of people looking for healthier lifestyles to the region.
- Good atmosphere of understanding in the promotion of regional cooperation.

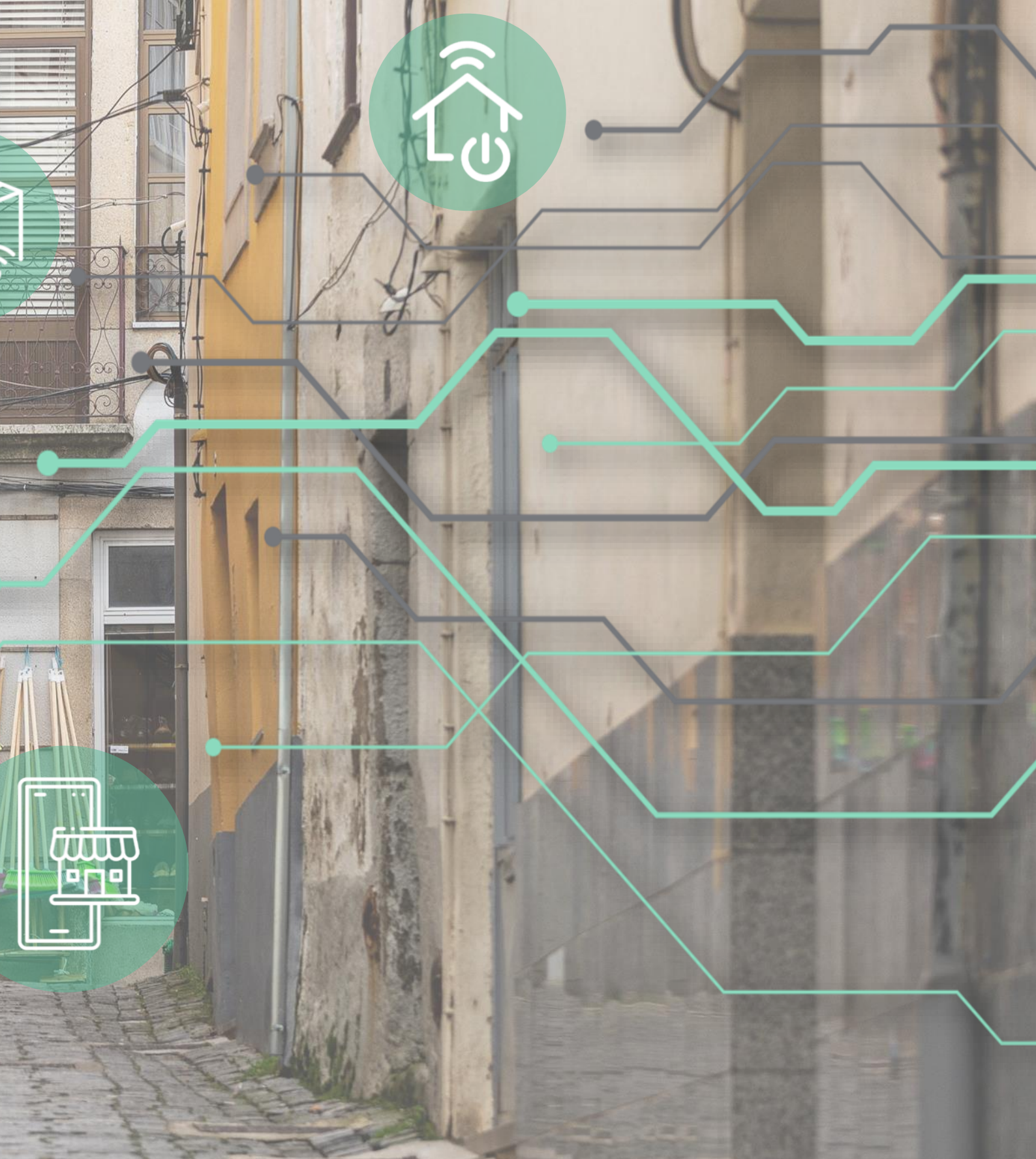


THREATS

- Population decline forecast for the coming decades.
- Portugal's weak economic situation / Low per capita income and precarious local economy.
- Aging and stagnant commercial fabric.
- Depopulation in the city's old area and peri-urban areas growth.



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"A city is always a creation, a fundamental element of the space organisation, a knot in the mesh of relationships established voluntarily or spontaneously between inhabitants; a human area inserted in a piece of land, a surface fact of reduced dimensions but of the greatest significance by the connections it establishes."

Orlando Ribeiro

CASINO
FUNDANENSE

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IOTXCHANGE

INTERNET OF THINGS
AS A POLICY INSTRUMENT
FOR THE CITY CHANGE

KICK-OFF MEETING
IOTXCHANGE
FUNDÃO . PORTUGAL
PHASE 1
14TH - 16TH OF OCTOBER
2019

LEAD PARTNER PARTNERS



2. FUNDÃO & IOTXCHANGE

2.1 PROJECT BRIEF SUMMARY

IoTExchange project encourages the creation of an European cities network committed to the design of digitalization plans based on Internet of Things (IoT) solutions to increase the quality of life in small and medium sized EU cities.

The Municipality of Fundão is leader of the IoTExchange consortium. For the past years, the Municipality of Fundão has been gaining experience in URBACT projects, which was one of the motivating factors to apply itself as the IoTExchange project leader, within a thematic that is on the top of the municipal executive agenda, by promoting the introduction of technology in the municipality and in the region. Being the leader of the project, means not only having the responsibility of boosting the LAG, as it has already done in previous European cooperation projects (AGRI-URBAN and OSIRIS), but also means the necessity of providing support to the 7 partner cities / 1 university, so that the project is successful.

This application was carried out within the framework of the URBACT III programme, where 62 proposals were submitted involving 525 partners from 29 countries. The URBACT methodology, based on transnational cooperation between cities and the involvement of local groups, offers the network the conditions to develop integrated action plans to guide us through a new era of digital transformation.

With the massification of technology associated with the Internet of Things (IoT), the cities of the future will necessarily be Smart Cities, focused on the citizens and economic actors needs, otherwise they will lose competitiveness in attracting people and investments.

Each city has its particular set of challenges and opportunities, whether in **mobility, public safety, energy efficiency, management, sanitation or among others**. The focus will essentially be on IoT for public services, environment, smart public buildings, education, health, tourism, agriculture, education, energy and mobility. With a clear diagnosis it was possible to focus our project and build a strong network that will allow improving the standards of living and safety in the management of public services.

IOTXCHANGE NETWORK THEMATIC AREAS TO BE WORKED ON THE ACTION PLAN

IoT applied to small and medium cities



Public
Services



Health and
Quality of
Life



Agri-tech



Tourism
and
cultural
heritage



Education



Energy



Mobility

..... RESULT

INCREASE THE QUALITY OF LIFE

Fundão ecosystem is very focused on IOT for the rural world, especially for agriculture. However, it must be the ULG to decide which specific theme to develop in the Action Plan for Fundão.

2.2 IOT (INTERNET OF THINGS) APPLIED TO SMALL AND MEDIUM SIZE CITIES

The term IoT (Internet of Things (IoT)) was introduced in the late 1990s by Kevin Ashton, a British researcher at the Massachusetts Institute of Technology (MIT), who used it to describe an environment with physical objects connected to the Internet in order to share data regarding the state of the network.

IoT is now considered an ecosystem in which a large number of objects, sensors and devices are connected through a communication infrastructure to provide services and resources. The number of devices connected to the internet is increasing sharply also due to the evolution of IoT. These devices include not only personal computers, tablets, smartphones, and other handheld devices, but almost everything around us, as long as they are enabled with Internet connectivity and data processing power.

By scanning the following QR-code using a smartphone, you will access a video, developed within the IoTXchange project, summarising the IoT application in small and medium-sized cities.



Internet of Things Applications

There are countless possibilities of use, from some solutions that we are already used to, to others that are still out of our reality. Therefore, within the scope of the IoTXchange network, a more simplified list of applications aimed at small and medium-sized towns has been drawn up, considering the following 7 categories / themes:



IoT APPLICATIONS FOR PUBLIC SERVICES

Many local public services can benefit from the various use cases that the IoT has to offer. By automating processes, the Internet of Things can reduce costs, which is especially important for small towns, and also increase reliability. The Internet of Things can also help prevent problems and hazards and save more maintenance or repair costs. IoT applications can help connect citizens to better services, resulting in greater economic growth, environmental sustainability and public safety.



IoT APPLICATIONS FOR HEALTH AND QUALITY OF LIFE

At a time when cities have to deal with an ageing society, which increases the burden on public healthcare and assisted living solutions, and growing demands for a better quality of life, IoT can be a great help. Real-time monitoring through connected devices can save lives in case of a medical emergency like heart failure, diabetes, asthma attacks, etc. And monitoring applications can make life easier and save social security costs in caring for isolated elderly people.



IoT APPLICATIONS FOR AGRICULTURE AND FORESTRY

In agriculture, in particular, this control applies to the collection of information about sowing and harvesting. In other words, it allows you to make more informed and intelligent decisions, minimizing costs and losses. The system can measure temperature and precipitation rates, humidity and wind speed, for example. Not only the quantity, but also the quality can be monitored through the Internet of Things, with devices that alert about the incidence of possible pests.



IoT APPLICATIONS FOR TOURISM AND CULTURAL HERITAGE

Tourism is an integral part of the Smart City paradigm and with a wide area of IoT application, with high potential in small tourist towns. With IoT, Big Data, the destination can become a closely monitored space for the behaviour of tourists and/or protection of the places visited, such as shopping patterns, number of visits to each attraction, time spent and monetary benefits generated. The reports will lead to well-calculated decision making for the management and development of the tourism destination and ultimately impact on GDP growth.



IoT APPLICATIONS FOR EDUCATION

IoT can make education more accessible across geography, ability and status. IoT-based apps can give easier access to lessons, activities and assignments, anywhere, anytime and on any device. It could also bring teachers and students together on a common platform, helping them collaborate from anywhere in the world. Using cloud-connected platforms, teachers can optimise school work, improve the efficiency of the learning process and ensure student safety.



IoT APPLICATIONS FOR ENERGY

Energy is another area that is horizontal for all cities - small or big. IoT applications for smart lighting, for example, are relatively simple solutions that are becoming increasingly popular in more cities, saving important costs and addressing sustainability concerns. But IoT also addresses more complex energy management challenges, allowing to monitor, control and optimise energy consumption in public buildings or paving the way for a smoother introduction of renewable energy through the use of artificial intelligence algorithms and big data analytics.



IoT APPLICATIONS FOR MOBILITY

IoT-powered systems can control car sharing and autonomous vehicle driving, making travel interoperability easier by combining technology, software and real-time experiences. But it is probably in the area of traffic management where IoT can be most rapidly adopted by cities of all sizes, as technology can make traffic more fluid, but also contributes to better sustainability.

2.3 IOT USE CASE IN FUNDÃO

In October 2020, the Municipality of Fundão and Veracruz signed a protocol within the scope of the **IoT Agrotech Center** implementation and development. This structure, promoted by the Municipality of Fundão, aims to support and foster innovation and entrepreneurship and thus leveraging the integration of IoT solutions in the economy, especially in rural-based activities.

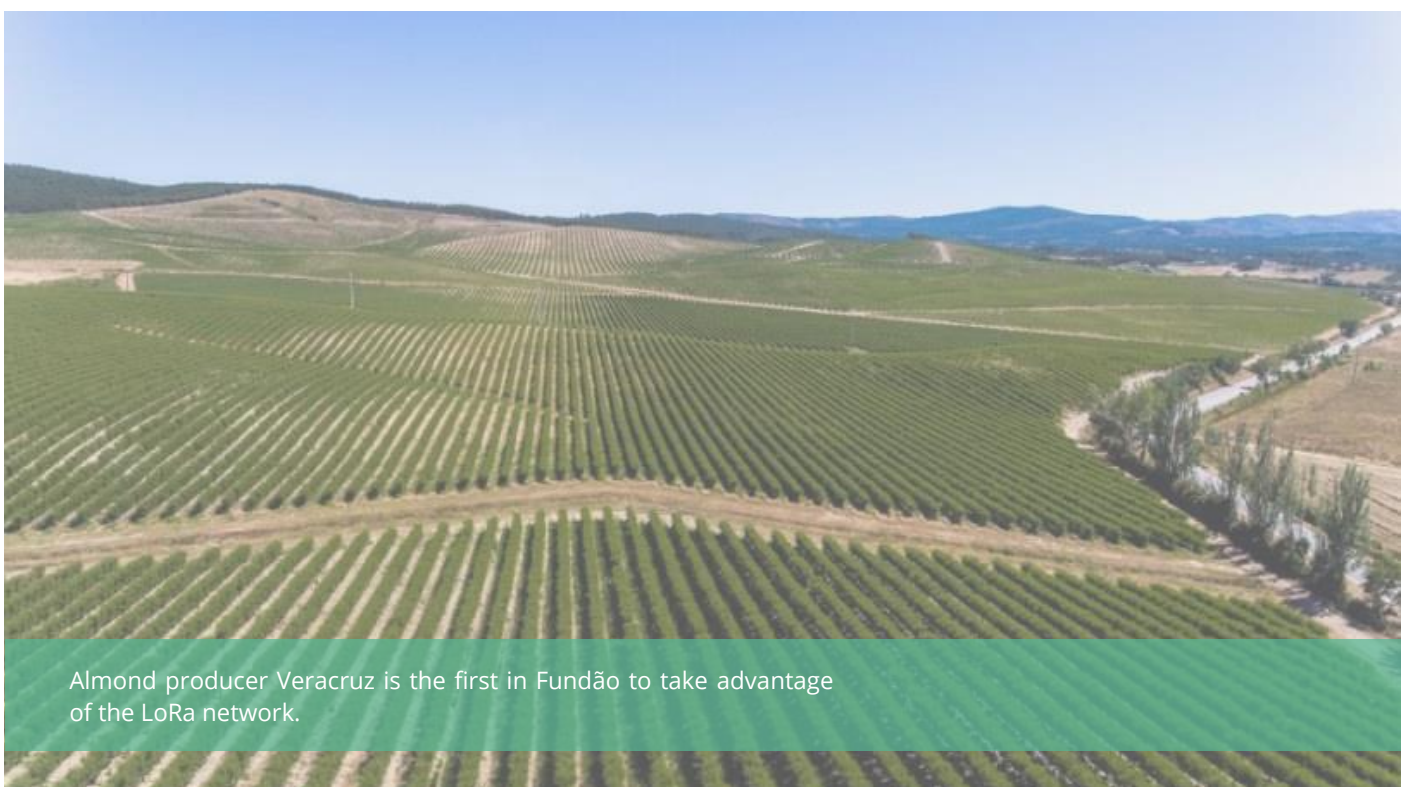
Additionally, the protocol also has the following objectives: attracting new entrepreneurs and investors; strengthening the connection with universities and polytechnics; reinforcing the conditions for hosting product and solution development teams based on technological processes; consolidating an ecosystem for the development and validation of IoT technology; unlock financial constraints for the development of business initiatives based on new technologies; disseminate best practices in the development and application of IoT in rural-based businesses; and create and dynamize a wide networking network.

The collaboration between a local authority, higher education institutions and companies in the region allows us to work together, promoting innovative and quality projects, improving not only the competitiveness of companies, but also a more efficient resources usage. This partnership represents another opportunity to promote technology transfer.

In a partnership between the almond producer Veracruz and the Polytechnic Institute of Castelo Branco (IPCB), VeraTech aims to develop a sensing system for almond holdings and to develop a set of relevant and impactful performance indicators in the agricultural activity, which promote productivity increases thanks to the correct rationalization of resources.

Based on the sensor network, it is intended to build dashboards with the indicators generated in real time, and also historical data. This technology makes it possible to analyse unforeseen occurrences and feed the agricultural planning system, helping Veracruz to manage production more effectively based on the information provided.

The implementation of Veracruz's almond holding in the Municipality of Fundão, was only possible due to the LoRa network provided by the Municipality of Fundão. **LoRa is free and universally available throughout the municipality** and allows communication between devices over long distances.



Almond producer Veracruz is the first in Fundão to take advantage of the LoRa network.







.IoT open lab fundão

Cobertura total LoRa • Open
data • Show
testes • Se

3. PROCESS OF DEVELOPING THE ACTION PLAN (IAP)

3.1 METHODOLOGY

The project methodology was established during Phase I of IoTXchange. The Project Team developed a methodology for transnational meetings and for working with Local Action Groups (LAGs) that was discussed and approved by the Local Groups and then developed through a series of meetings in an online (due to the pandemic situation-COVID 19) and/or face-to-face format.

The development of the Integrated Action Plan (IAP), with participatory action planning, was the focus of our work.

The chart on the right recapitulates the main steps in developing an action plan, which should encompass problems and opportunities as well as specific needs, establishing expected results and preparing a set of co-production actions with stakeholders.

At each IoTXchange meeting (transnational meeting), we work on a different step of the Action Planning Cycle.

HERE IS A SUMMARY OF THE MAIN STEPS AT LOCAL LEVEL:

1. LOCAL ACTION GROUP CREATION WITH PUBLIC AND PRIVATE SECTOR REPRESENTATIVES;
2. STAKEHOLDER ANALYSIS;
3. PROBLEMS AND CHALLENGES DEFINITION;
4. GATHERING EVIDENCE BASED ON CASE STUDIES AND FIELD WORK;
5. GENERATING IDEAS FOR SSA AND IAP SOLUTIONS;
6. SSA (SMALL SCALE ACTION) IMPLEMENTATION AND OUTCOME;
7. ACTIONS DEFINITION AND ACTION TABLES FINALISATION;
8. IDENTIFICATION OF POTENTIAL FUNDING MECHANISMS FOR IAP ACTIONS;
9. COMMUNICATION AND CONSULTATION WITH KEY STAKEHOLDERS AND IAP VALIDATION;
10. CLOSING PHASE 2 AND IAP FORMAL LAUNCH;

01 MEET

LOCAL ACTION GROUP CREATION

The main premise of this methodology is the creation of a Local Group, i.e. a group made up of local agents, concerned with local problems and with the theme of the action plan.



Since it was impossible to guarantee the participation of all the members in all the meetings that took place during the two years of the project, a CREATIVE MINUTE was generated after each meeting, summarising the main points dealt with, and sent out before the invitation to the next meeting. This made it possible to inform partners who were unable to attend the meeting and to remind partners who did attend of the key points dealt with. The CREATIVE MINUTES were an important result to keep stakeholders informed and also an important document for the elaboration of the Action Plan.

02 DEFINE

PROBLEM DEFINITION & CHALLENGES

Problem analysis to ensure that the Local Group is addressing the relevant problem, i.e. the problem discussed and identified together with all stakeholders.



03 COLLECT

GATHERING EVIDENCE & GENERATING IDEAS

Identify the objectives and vision, as well as the definition of resources relevant to the city and the theme of the action plan.



04 DEVELOP

DEFINING ACTIONS

Preparation of an action framework to provide a broad overview of the actions, including expected results, targets, milestones, outputs, human resources, partners, timing, budget and any other necessary information.



05 COMMUNICATE

COMMUNICATE ACTION PLANS AND STRATEGIES

Elaborate a communication strategy for the public presentation of the Action Plan. Organisation of the public presentation event inviting the local media.



3.2 THE BOTTOM-UP APPROACH - LOCAL ACTION GROUP

FUNDÃO LOCAL ACTION GROUP (ULG)

Stakeholders are individuals and organisations impacted by your city's actions. The Local Action Group is composed of stakeholders, i.e. a number of individuals/organisations

In this group, the main focus is on the people who represent the institutions, companies or associations (etc.), who bring all the know-how and knowledge about their entities.

We sought to structure a partnership that would guarantee a comprehensive representation of sectors, in the thematic areas of the project, and have an entity representation at the political level, at the level of knowledge, at the economic level and at the level of associative groups. In other words, to have a good critical mass, a Local Action Group must involve stakeholders from all the levels mentioned above.

THE BASIS OF THIS WHOLE PROJECT DEPENDS ON THE QUALITY AND COMMITMENT OF THIS LOCAL ACTION GROUP. The benefits that can be brought to the city, to businesses, to citizens, will all depend on the quality of the Local Action Group team.

Until 2022 (August) there have been a total of 10 meetings of the Local Action Group, defined in section 3.1 Methodologies.

The main objective is that this dynamic continues, even after the end of this project.

Fundão Local Action Group IoTExchange

The structure of Fundão Local Action Group:

POLITICAL ENTITIES: MUNICIPALITY OF FUNDÃO

- Living Lab Cova da Beira
- Business Spot (*Espaço Empresa*)

POLITICAL ENTITIES: Regional Authority for Structural Funds and implementation of regional policies

- CCDRC—Coordination Committee for Regional Development of Centro region

PUBLIC ENTITIES: Security force of military nature

- Republican National Guard-Fundão

PUBLIC BODIES: EDUCATION

- Fundão Schools Group
- Gardunha and Xisto Schools Group
- Fundão Professional School

KNOWLEDGE: UNIVERSITY

- IPCB - Polytechnic Institute of Castelo Branco
- UBI - University of Beira Interior

COMPANIES:

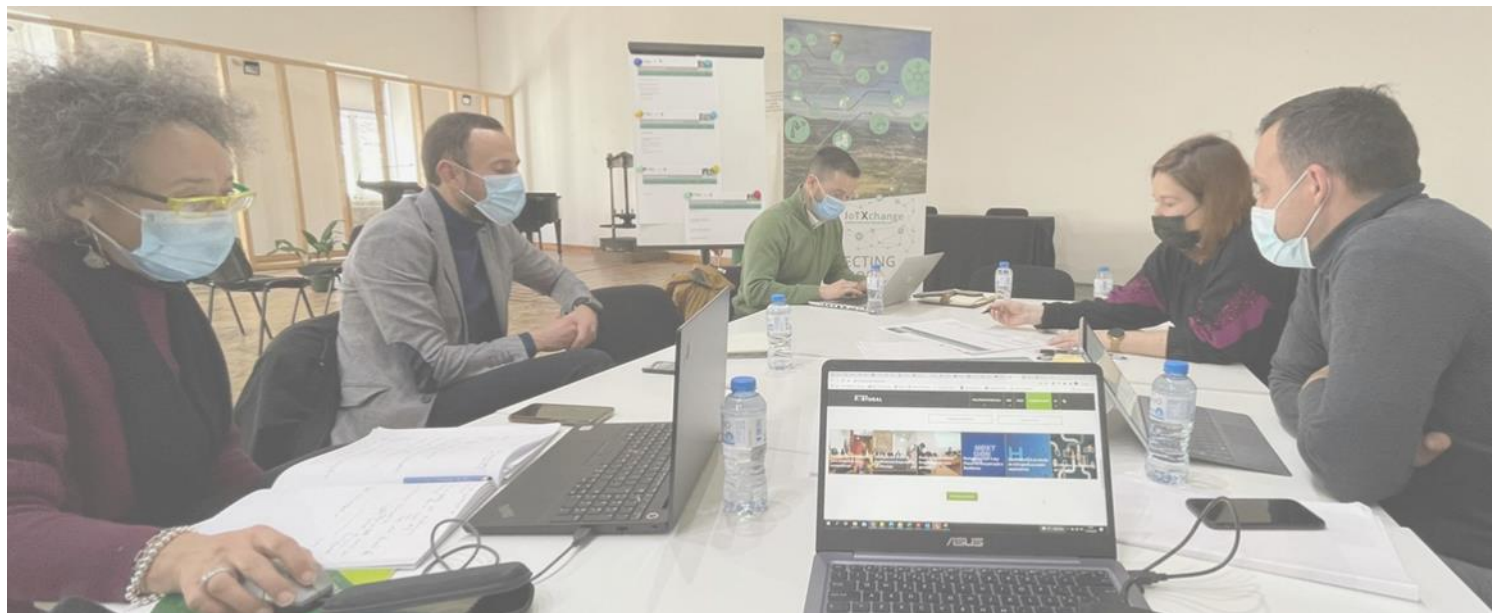
- Readiness IT
- Convevo
- Shimejito
- Capgemini
- Softinsa / IBM
- Trigger Systems
- Terra Pro
- Veracruz

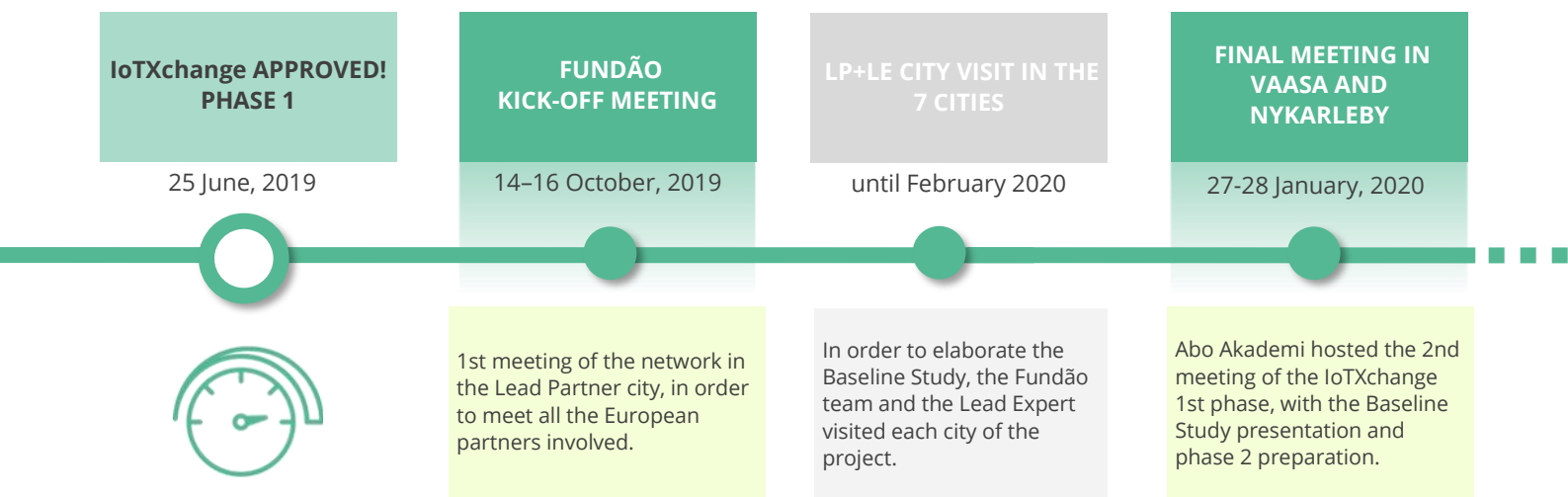




THE LOCAL ACTION GROUP MEETINGS WERE HELD ON THE FOLLOWING DATES AND FORMAT:

- OCTOBER 16th, 2020 | FACE-TO-FACE
- NOVEMBER 27th, 2020 | ON-LINE
- JANUARY 29th, 2021 | ON-LINE
- MARCH 5th, 2021 | ON-LINE
- APRIL 16th, 2021 | ONLINE
- JULY 2nd, 2021 | FACE-TO-FACE
- JANUARY 21st, 2022 | ONLINE
- MARCH 11th, 2022 | FACE-TO-FACE
- JUNE 17th, 2022 | FACE-TO-FACE





3.3 LEARNING AND SHARING AT EU LEVEL

The IoTXchange network journey began in October 2019, together with 7 European partners, committed to the design of digitalization plans based on Internet of Things (IoT) solutions to increase the quality of life in small and medium sized EU cities.

Transnational meetings are at the heart of all Networks, and IoTXchange is no exception. Representatives from each partner city visited each other during the project development, in order to exchange best practices ideas, share relevant case studies, develop new initiatives to tackle similar problems, which culminated in new ideas development in their own cities based on the knowledge shared. This transnational exchange is considered the most valuable element of the project as the ideas and learning generated between partners are being reflected in each IAP across the IoTXchange partnership.

THESE INTERNATIONAL MEETINGS MADE IT POSSIBLE TO FILTER, SHARE AND ANALYSE THE KNOWLEDGE AND GOOD PRACTICES OF THE PARTNERS, AND THEN TO CREATE NEW KNOWLEDGE WITH NEW OBJECTIVES AND NEW SOLUTIONS SET OUT IN THIS ACTION PLAN FOR THE FUNDÃO. On the next page, a photographic repertoire of the innovative spaces that have inspired us.

The Covid pandemic caused a big challenge to the achievement of the project goals, which was overcome by introducing new instruments of cooperation and socialisation that contributed to both the effectiveness and the inspiring atmosphere in each meeting, in each transnational meeting.

The following chart is a synthesis of our journey, which started in October 2019 and ended in June 2022, both in the city of Fundão, which leads the partnership.

TRANSNATIONAL MEETING Nr. 4 KEZMAROK #ON-LINE

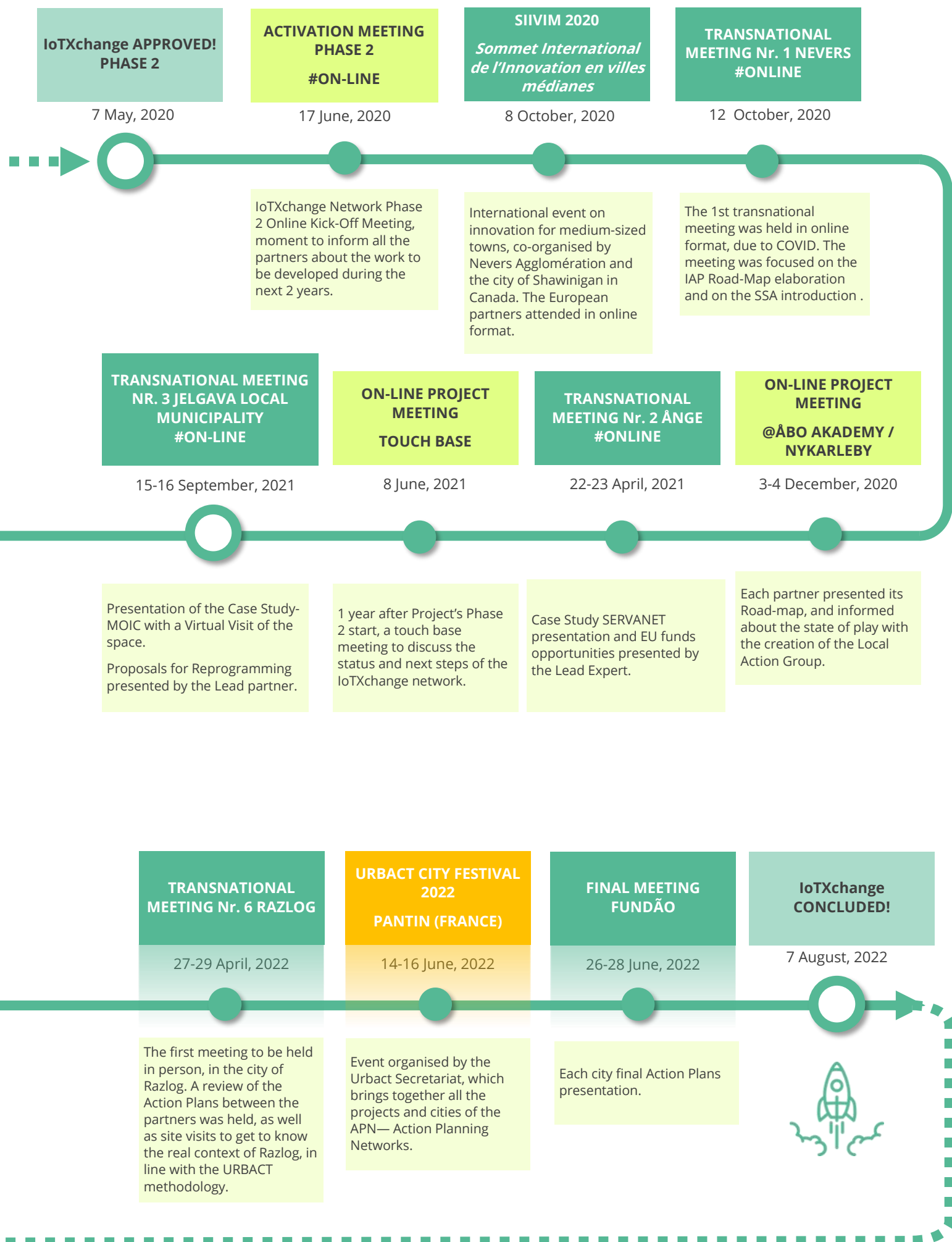
2-3 December, 2021

Each partner presented the 1st draft of its Action Plan.
Presentation of each city SSA videos.

TRANSNATIONAL MEETING Nr. 5 DODONI #ON-LINE

17-19 February, 2021

Each partner presented the 2nd draft of its Action Plan.
Open session on the new evolutions of IoT, presented by companies from the sector, Starbit and Terracom.

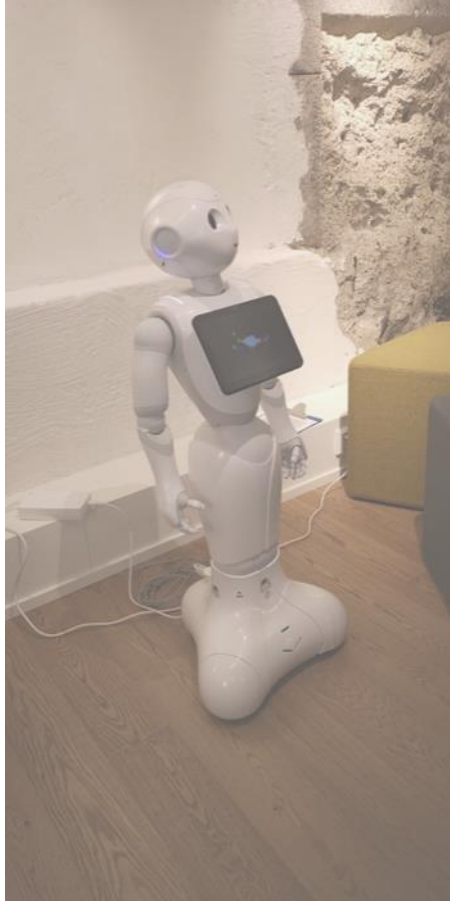


experience lab

ÂBO AKADEMI

EXPERIENCE LAB:

A space dedicated to exploring and measuring human experiences through digital solutions.



**JELGAVA LOCAL MUNICIPALITY
MUNICIPALITY OPERATIVE
INFORMATION CENTRE (MOIC):**

is a city Information and Control Centre to monitor the public space and critical infrastructure of Jelgava municipality, with resources from the latest technological solutions (24/7 citizen contact centre, video surveillance system, GIS, energy monitoring, flood maps, road accident map, drone image database, etc.)



KEZMAROK

APP SOS:

A recent control centre with surveillance cameras in strategic public spaces in the city and creation of an SOS app, developed with the municipal police.



NEVERS

KEOLIS AUTONOMOUS MINI-BUS:

A free, driverless electric shuttle has been introduced in the city centre. Called "Cours Innov", it is available to users to do their shopping in the city centre.



NEVERS

AGROPÔLE DU MARAULT:

This hub makes its infrastructure and agricultural areas available to farmers in the region to test and promote the alternatives they wish to develop, both in terms of field crops and pasture management. The plant also allows the organisation of innovation demonstration days, namely new technologies ready to enter de market (drones, home automation, digital, robotics, etc.).

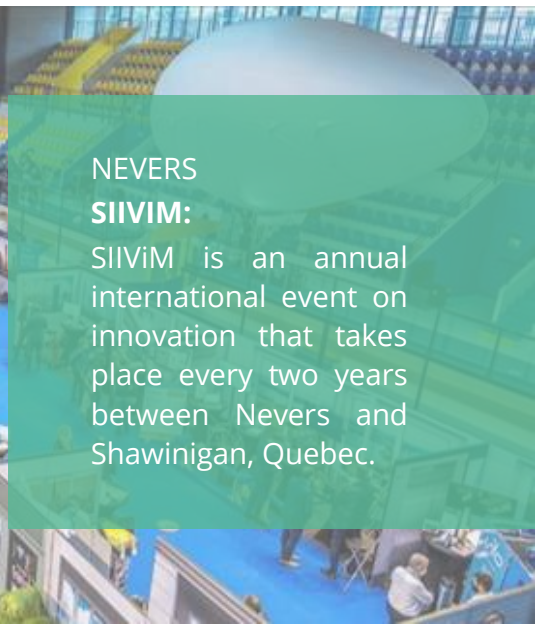
Also, a catering area allows the development and promotion of local products and knowledge.



NEVERS

SIIViM:

SIIViM is an annual international event on innovation that takes place every two years between Nevers and Shawinigan, Quebec.





fundão
365 dias à descoberta

4. STRATEGY FOR IOTXCHANGE

4.1 INTEGRATED ACTION PLAN

AN INTEGRATED ACTION PLAN (IAP) IS A DOCUMENT WHICH DEFINES THE ACTIONS TO BE CARRIED OUT FOR THE NEXT 7 YEARS (2021-2027), TAKING INTO ACCOUNT THEIR OBJECTIVES, TIMELINES, COSTS, FUNDING SOURCES, EXPECTED RESULTS, NECESSARY RESOURCES, AS WELL AS RISK ASSESSMENTS, MAKING THE DOCUMENT CLEARER AND HIGHLIGHTING THE LEVEL OF INVOLVEMENT OF PARTNERS IN THE ACTIONS IMPLEMENTATION.

AN IAP IS CONSIDERED A POLICY INSTRUMENT THAT CAN BE USED TO RESPOND IN A CONCRETE WAY TO A POLICY CHALLENGE.

EACH IOTXCHANGE IAP IS UNIQUE, IN TERMS OF LOCAL CONTEXT, THEMES AND COVERAGE.

CHALLENGE

The great challenge of the IoTXchange project is to understand where the points of common interest are and to share good ideas and projects that can be extended to other cities.

The development of IoT for the urban environment has already been evolving, with experiences of solutions for the so-called Smart Cities, mostly related to mobility and sustainability. For small and medium-sized cities located in rural areas, there are connectivity problems, namely limited coverage by fibre or LoRa. There is a need to train skilled labour for new technologies, regulation, integration and data sharing, being this a challenge for the IoT development.

We all need to be prepared for this new era. Education for technology and data, is key, whether at a personal level or at an organisational level. It is expected that there will be a massification of sensors in the coming years. The development of skills that allow the use of data and the analysis produced in favour of organisations are factors that make it possible to know the customers, the environment and achieve competitive advantage over the competition.

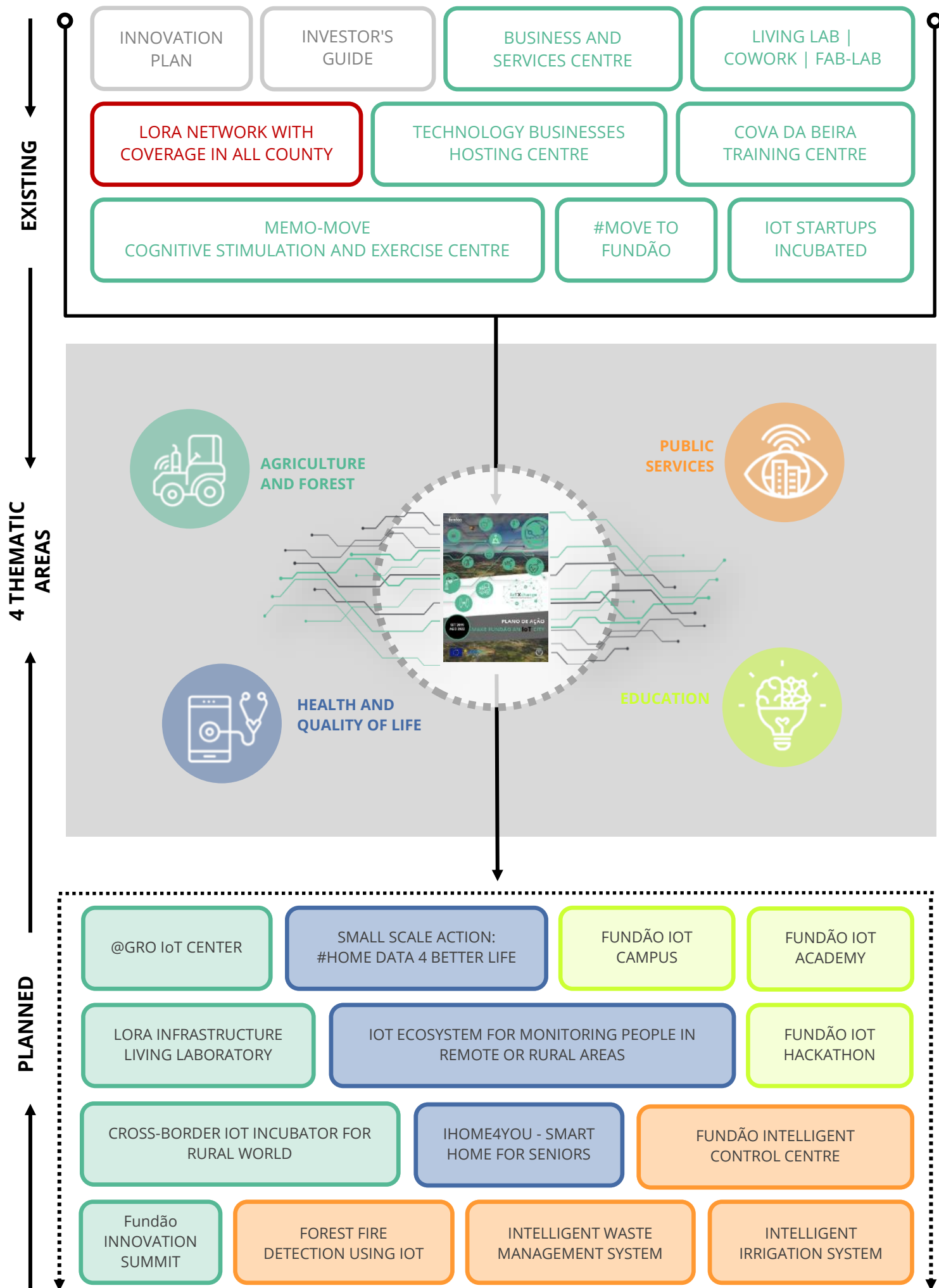
The IAP's **STRATEGIC VISION** for FUNDÃO focuses on the major theme of IoT - 'Internet of Things' applied to the urban-rural space. How can we foster the attraction of entrepreneurs, knowledge, technology and companies, so that we can help boost the technology companies ecosystem that focus mainly on the agricultural sector and the environment.

One of the most recent projects of the Municipality of Fundão was the installation of a LoRa (Long Range) network with free coverage throughout its territory, enabling future solutions for monitoring various aspects of the city and municipality, including public lighting, parking, air quality, water quality, preventing forest fire risks, among others.

The goal of IoT is to simplify processes, optimise resources and create efficiency, whether in people's lives, in business activities or at the global level of society. Aiming to improve the quality of life throughout the territory of Fundão.

Concerning the IAP's **EXPECTED RESULTS**, the municipality of Fundão aspires to become a smart, prosperous and attractive city, more open, dedicated and cosmopolitan, keeping, however, its characteristics of "rural city", in order to create efficient systems according to the needs of its population, with the ultimate goal of improving the quality of life.

The use and massification of sensors in the city will increase the efficiency of energy systems, mobility in public and private transport, urban planning and public administration, adapting services to the needs of the population.



4 THEMATIC AREAS | EXISTING & PLANNED

The graphic on the previous page summarises, in visual terms, the actual local context in terms of equipment and technological infrastructures, and thanks to the Integrated Action Plan, what we may acquire as new innovative answers for Fundão, within the IoTXchange project's addressed themes.

ACTIONS TABLE

Fundão proposes 14 actions (organised into 4 themes) outlined in the following action tables. A summary sheet for each category introduces the objectives, vision, context, focus and inspiration.

SMART OBJECTIVES - SMART CITY

For each action, 6 SMART objectives were identified whose aim is to increase the target for the municipality of Fundão in the scope of AGRICULTURE, ENVIRONMENT, HEALTH, SECURITY, TRAINING AND EVENT ORGANISATION.



**SMART
AGRICULTURE**



**SMART
ENVIRONMENT**



SMART HEALTH



SMART SECURITY



SMART TRAINING



SMART EVENT

1

AGRICULTURE & FOREST



TOPIC	IoT APPLICATIONS FOR AGRICULTURE & FOREST
MAIN GOAL	Leverage the integration of IoT solutions in the economy, especially in rural-based activities. A space for accelerating start-ups and innovative projects in the Agri-Tech area.
VISION	To make the rural areas of the municipality of Fundão stronger, more interconnected, prosperous and resilient, to promote well-being for all who live there. To strengthen the innovation ecosystem in Fundão.
BACKGROUND	Existing protocol between the Municipality of Fundão, universities and companies, within the scope of the IoT Agrotech Centre implementation and development, a support and promotion structure for innovation and entrepreneurship promoted by the Municipality of Fundão.
SMART ACTION	SMART AGRICULTURE SMART EVENT
INSPIRATION	Agropôle du Marault in Nevers / SIIVIM in Nevers

1. IoT AGROTECH CENTER

Implementation and development of the IoT AgroTech Centre, in the former seminary of Fundão, an infrastructure promoted by the Municipality of Fundão, aiming to support and promote innovation and entrepreneurship, as well as leverage the integration of IoT solutions in the economy, especially in rural-based activities.

The IoT Agrotech Centre aims to:

- Capture new entrepreneurs and investors;
- Strengthen the connection with universities and polytechnics;
- Strengthen the conditions for hosting teams to develop products and solutions based on technological processes;
- Consolidate a development and validation ecosystem for IoT technology;
- Unblocking financial constraints for the development of business initiatives based on new technologies;
- Disseminate best practices in the development and application of IoT in rural-based businesses;
- Create and boost an extended contacts network.

IoT AgroTech Center services structure:

- Business Incubation:** business ideas incubation and companies installation;
- Scale-Up:** programme of acceleration and ideas conversion into business projects;
- Open Lab:** testing and experimentation of IoT technologies in rural-based activities;
- Funding Hub:** funding facilitation and contact with investors;
- IoT Showroom:** space for demonstrating the technology developed and created;
- Networking Factory:** events programme.

Position itself as an IoT Centre specialised in supporting entrepreneurs and start-ups that develop technology applied to rural areas.

Strengthen the link between new technologies and the rural world.

Greater collaboration between business partners, entities of the scientific and technological system and the municipality, creating an innovation ecosystem.

Attract investment and qualified people to the municipality of Fundão, for the agricultural and forestry sector.

Democratisation of the access to these technologies by small local producers, with startups advancing with case-by-case solutions to problems that producers present to them.

Economic importance of the agricultural sector in the municipality of Fundão

Existence of companies in this area in the incubator

The project will advance in the facilities and land of the old seminary, with about 20 hectares

At this moment experimental fields are being prepared for technology experimentation in real environment

The municipality of Fundão is already covered by a telecommunications infrastructure, based on the open source technology LoRa, which allows having all the IoT sensors interconnected in the same platform.

Municipality of Fundão

Trigger Systems
EVOX
Altice
Veracruz
TerraPro
INIAV
IPCB

2. IoT Open Lab

Enhancement of the LoRa infrastructure for the development and testing of IoT solutions for rural areas.

Give free access to a laboratory open to the community, where everyone can share its knowledge, and develop and test IoT solutions anywhere in the municipality of Fundão.

The data transmission and operation over the network is totally controlled by the Municipality of Fundão, being freely available to the population, schools, universities and start-ups.

Greater internal and external dissemination of the existing LoRa network in Fundão.

+ Attracting investment and qualified people to the municipality of Fundão in the agricultural and forestry sector.

+ Support to the development of rural innovation ecosystems.

Fundão is the first municipality with full coverage of the LoRa network.

The network covers the entire municipality of Fundão, in an area of approximately 700 km². For this purpose the antennas must have a range superior to 22 km.

Municipality of
Fundão

Trigger Systems



3. CROSS-BORDER IOT INCUBATOR FOR THE RURAL WORLD

Aims to provide entrepreneurs, startups and new cross-border companies with a set of specialised services in IoT, namely support and specialised technical follow-up, in a comprehensive and personalised way, to meet their needs in the IoT area. The incubator will be set up temporarily, in the existing incubators in the cross-border areas (Fundão - Castilha Y León).

Collaborative process between cross-border incubators (Fundão - Castilha Y León) in order to share knowledge with actors, products, services, competences and IoT projects between both territories.

Need to create cross-border approaches in innovation policy, such as joint research and mobility programmes, partnerships and cooperation networks.

Knowledge sharing increase in the IoT area

↑ Incubation of cross-border companies and/or projects, mainly based on IoT technology

AGRO IoT CENTER

Living Lab Cova da Beira

Municipality of
Fundão

UBI

IPCB

University of
Salamanca



ACTION TITLE & SHORT DESCRIPTION

EXPECTED OUTCOME

RESOURCES & ASSETS

RESPONSIBLE ORGANISATION / KEY PARTNERS

4. Fundão INNOVATION SUMMIT

Inspired by Nevers' SiiVim, we aim to create an annual meeting in Fundão, focused on the IoT ecosystem for the rural world. Farmers, agribusiness leaders, technology pioneers and investors gather to exchange ideas, get inspired and identify future partners. The focus of this event is to value innovative entrepreneurial experiences that enhance the creation of wealth and sustainable development in the rural world.

First event of its kind to be created in Fundão





To establish + contacts between those involved in rural innovation in Portugal and worldwide

IoT AGROTECH CENTER
Business Spot
Living Lab Cova da Beira

Municipality of Fundão

Trigger Systems
EVOX
Altice
Capgemini
Veracruz
TerraPro
IPCB
UBI



ACTION TITLE	SMART ACTION	TIMELINE	BUDGET	FUNDING PROGRAMME
1. IoT AGROTECH CENTER	 SMART AGRICULTURE	2022 —————▶ 2026	318 702,96€	RRP: Investment RE-C05-i03 - i03: Research and innovation agenda for sustainability in agriculture, food and agro-industry
2. IoT Open Lab	 SMART AGRICULTURE	2024 —————▶ 2026	136 780,00€	Spain-Portugal Interreg Programme (POCTEP) 2021-2027
3. CROSS-BORDER IOT INCUBATOR FOR THE RURAL WORLD	 SMART AGRICULTURE	2024 —————▶ 2026	26 780,15 €	Portugal 2030 OP1 A smarter Europe
4. Fundão INNOVATION SUMMIT	 SMART EVENT	2024 —————▶ 2026	40 000 €	Portugal 2030 OP1 A smarter Europe

2

HEALTH & QUALITY OF LIFE



TOPIC	IoT APPLICATIONS FOR HEALTH & QUALITY OF LIFE
MAIN GOAL	To improve the health and well-being of local populations thanks to IoT applications; real-time health care monitoring provides improved life care for the ageing population in rural areas.
VISION	The use of IoT technologies could reduce costly healthcare costs for the rural population and the Municipality of Fundão.
BACKGROUND	At a time when cities have to deal with an ageing society, which increases the burden on public healthcare and assisted living solutions, and the growing demands for a better quality of life, IoT can be of great help. Real-time monitoring through connected devices can save lives in case of a medical emergency like heart failure, diabetes, asthma attacks, etc. Additionally, monitoring applications can make life easier and save social security costs in caring for isolated elderly people.
SMART ACTION	SMART HEALTH
INSPIRATION	Ideas from the Local Action Group

5. SMALL SCALE ACTION: #HOME DATA 4 BETTER LIFE

The most isolated parishes in the municipality of Fundão are benefiting from a pilot initiative that aims to analyse the energy efficiency of homes, using IoT technology.

This pilot project, which has been running since April 2022, involves the installation of several equipment and sensors in 8 homes in order to detect - and subsequently correct - anomalies even of construction that lead to excessive energy consumption.

The data is sent, stored and accessible in real time through a web platform adapted to this project for the Municipality of Fundão.

Sensors connected via IoT collect information on temperature, humidity and carbon dioxide in 8 houses. However, we intend to add a radon gas sensor and extend the pilot to 50 houses. High levels of CO₂, for example, could be a sign of ventilation and air quality issues, while low temperatures and high humidity levels could be an indicator that residents are unable to adequately heat their homes, and this is a barometer for potential financial difficulties.

Data from sensors installed in the houses is transferred over Wi-Fi, but is then forwarded using the LoRaWAN protocol and radio frequency technology that enables communication over long distances.

Improving the quality of housing life

Solve energy deficiencies in monitored houses

Higher energy savings achieved and more rapid response in repairs, avoiding further bigger damages.

50 houses monitored.

Helping the Municipality of Fundão to be aware of and take measures for the development of prevention strategies for houses indoor comfort and safety improvement.

Fundão with full LoRa network coverage
Informatics and Electrotechnical Engineering Pole of UBI- University of Beira Interior
Council Housing List

Municipality of Fundão

UBI

Parish Councils



6. IOT ECOSYSTEM FOR MONITORING PEOPLE IN REMOTE OR RURAL AREAS

Implement an innovative ecosystem of health solutions based on the IoT technology, to be applied in rural and remote areas. Generally, these areas have little or poor communication infrastructure, and their inhabitants are typically info-excluded. Besides focusing on users living in remote areas, this ecosystem is also geared towards people with reduced mobility. As such, the ecosystem to be conceptualised aims to make medical care accessible to these users through periodic monitoring and surveillance of their health status. Thus, the main focus is the research and conceptualisation of an innovative network of interoperable IoT sensors for monitoring physiological parameters, which operates in indoor and outdoor environments.

The solution developed must ensure the integrity and privacy of the data used, the implementation of a scalable architecture, the ability to ensure an interoperable solution independent of communication protocols and devices used, the need to ensure low power consumption in the transmission of information, among others.

Helping people living in rural and remote areas to access health services without leaving their homes.

50 users Pilot Project.

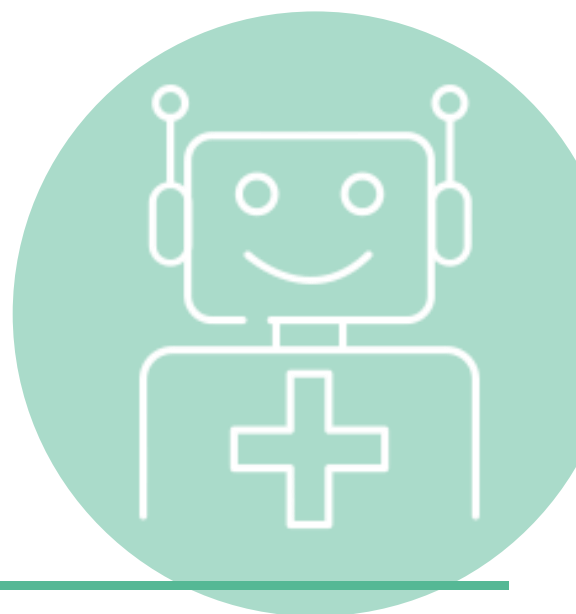
There is a great social and economic potential (over 11 trillion dollars/year in 2025) in the use of IoT technology in monitoring systems for patients or people with certain conditions, such as the elderly or chronically ill.

Fundão with full LoRa network coverage.

Informatics and Electrotechnical Engineering Pole of UBI- University of Beira Interior

Municipality of Fundão

UBI
Parish Councils
Health Care Centre
CHCB



ACTION TITLE & SHORT DESCRIPTION

EXPECTED OUTCOME

RESOURCES & ASSETS

RESPONSIBLE ORGANISATION / KEY PARTNERS

7. iHome4You - SMART HOME FOR SENIORS

A shop transformed into a showroom and laboratory space - pilot smart home, using e-health technology (it is an example of IoT application in gerontechnology). Start-ups and companies can play a crucial role in creating and testing their innovative products, prototypes and interact with the beneficiaries, in this case the elderly.

Replicating the model of a domotic house, this new learning space will be a testbed for new applications, products, services and systems, aimed at the ageing population.

It will be necessary to create a new valence in the Fab-Lab Aldeia de Xisto, the **MakeloT**, to reinforce the space with electro-technical equipment enabling the manufacture of sensors and the development of IoT prototypes in various areas.

2 Start-ups supported to introduce new products in the Market.

Employment for 2 recent graduates.

Knowledge transfer.

Creation of a functional and innovative Showroom to demonstrate and a MakeloT lab in the FAB-LAB to produce better solutions and prototypes

1 shop transformed into a Smart Home T0 at the Neuro-Motor Centre.

Rehabilitation of the second floor of the Cidade Nova Shopping Centre (Town Centre Mall) into a Neuro-motor Centre soon.

Fab-Lab Aldeia de Xisto.

Municipality of Fundão

Memo Move

CCDRC

UBI

Living Lab Cova da Beira (LLCB)

Convevo

Capgemini



ACTION TITLE

SMART ACTION

TIMELINE

BUDGET

FUNDING PROGRAMME

5. SMALL SCALE ACTION: #HOME DATA 4 BETTER LIFE



SMART HEALTH

2023 2024

45.000,00€

Portugal 2030
OP1 A smarter Europe

6. IOT ECOSYSTEM FOR MONITORING PEOPLE IN REMOTE OR RURAL AREAS



SMART HEALTH

2024 2025

55.000,00 €

Portugal 2030
OP4 A more social Europe

7. iHome4You - SMART HOME FOR SENIORS



SMART HEALTH

2024 2025

iHome4You:
25.000,00€
Make IoT:
70.000,00€

INTERREG EUROPE
Portugal 2030
Portugal 2030
OP1 A smarter Europe

3

EDUCATION



TOPIC	IOT APPLICATIONS FOR EDUCATION
MAIN GOAL	Create new ways for students to learn by providing more personalised and dynamic learning experiences, such as immersive digital textbooks and game-based learning.
VISION	The evolution of the Internet of Things (IoT) marks an exciting new era in the education landscape, bringing with it the promise to revolutionise educational tools and greatly improve teacher and student outcomes.
BACKGROUND	<p>In Education, the Internet of Things enables improved educational management by connecting not only the stakeholders of the educational process (teachers, headmasters, parents and students), but the environments and resources that are used in their teaching journey (rooms, labs, software etc).</p> <p>In addition, there is the ability to collect data in real time, allowing the institution to track more accurately the evolution of each student.</p> <p>Thus, it is possible to offer a more valuable teaching, through an active methodology that precisely explores the weak points of each individual.</p>
SMART ACTION	SMART TRAINING SMART EVENT
INSPIRATION	Ideas from the Local Action Group

8. FUNDÃO IOT CAMPUS

Creation of an UBI university campus in Fundão - Fundão IoT Campus -, located in the Technology Businesses Hosting Centre, with specialized teaching equipment in the area of IoT. Intended to develop Postgraduate and Master's degrees in the IoT field.

Beneficiaries:

- Professionals in the Design area who want to understand the technological needs underlying the IoT;
- Professionals in the area of Information and Communication Technologies (ICT), who want to deepen their knowledge and acquire new skills related to IoT;
- Professionals or students in the area of Information and Communication Technologies (ICT), recent graduates who wish to deepen their knowledge and simultaneously develop their portfolio with differentiating elements.

Protocol signed with UBI for the installation of the IoT Campus in Fundão.

Creation of 1 Post-Graduation Degree and 1 Master Degree in the IoT area, for 40 students.

At the end of the course, the students should be able to create, prototype and present innovative solutions, integrating multidisciplinary teams, for existing problems in society.

Technology Businesses Hosting Centre

Municipality of Fundão + UBI relationship - protocol signature

Municipality of Fundão

UBI

Schools Groups in the Municipality of Fundão

9. FUNDÃO IOT ACADEMY - TRAINING FOR PROFESSIONAL IOT USERS

In Fundão IoT Academy, users will be able to choose among several technical training courses and workshops aimed at IoT professionals and users.

Several training programs will be available to the interested community. Ex: The course "Internet of Things (IoT - Internet of Things)" from Técnico allows people to know the main concepts of IoT, in order to make better decisions regarding operational and investment proposals in IoT.

Creation of 3 Trainings Courses per year addressed to IoT professionals and users/ consumers

- 60 beneficiaries per year

Technology Businesses Hosting Centre

Municipality of Fundão

UBI

Code Academy



ACTION TITLE & SHORT DESCRIPTION

EXPECTED OUTCOME

RESOURCES & ASSETS

RESPONSIBLE ORGANISATION / KEY PARTNERS

10. FUNDÃO IoT HACKATHON

Fundão IoT hackathon is the event where developers meet with representatives of Fundão ICT companies and collaborate on challenges, for which they shall develop a prototype solution, in an area that will be defined.

IT professionals, passionate about technology, architects of digitization processes, designers, business and marketing experts, can apply and test their platform, own sensors or virtual sensors, among other solutions.

Annual 4-day event

80 participants per year

Business and Services Centre

Municipality of Fundão

Altice

Capgemini

IBM

Vera Cruz



ACTION TITLE

SMART ACTION

TIMELINE

BUDGET

FUNDING PROGRAMME

8. FUNDÃO IOT CAMPUS



SMART TRAINING

2024

2027

138.730,00€

RRP: Investment RE-C06-i01

i01: Modernisation of vocational education and training supply and establishments

9. FUNDÃO IOT ACADEMY - TRAINING FOR PROFESSIONAL IOT USERS



SMART TRAINING

2024

2025

166.815,00€

RRP: Investment RE-C06-i03

i03: Incentive for adults

10. FUNDÃO IoT HACKATHON



SMART EVENT

2023

2024

40.000,00 €

Self-financing of the Municipality of Fundão



The CODE ACADEMY programme has already received two national and international awards:

- ⇒ 1st Social Impact Bond in Portugal and Southern Europe
- ⇒ World Summit on the Information Society (WSIS) Prize 2017.





4

PUBLIC SERVICES

TOPIC	IOT APPLICATIONS FOR PUBLIC SERVICES
MAIN OBJECTIVE	<p>Serving citizens better: managing all city systems and services more intelligently for the benefit of citizens and businesses;</p> <p>Saving resources: using resources more effectively and allocating the necessary resources quickly;</p> <p>Monitor operations: Management system that provides a global, real-time and centralised view into operations across the city;</p> <p>More agile response: Effective communication and response to events and incidents promptly based on alerts received from citizens.</p> <p>Develop conditions for the municipality of Fundão to become more sustainable.</p>
VISION	Implement a FUNDÃO INTELLIGENT CONTROL CENTRE, with IoT solutions for a smart management of the city of Fundão, which integrates information from various public bodies to improve incident response capacity. It will allow solutions such as real-time monitoring of waste collection, through the control of waste collection trucks, which ensures greater transparency and quality to the waste collection process and translates into benefits to the environment and population; street lighting control, energy and water management; prevention and detection of urban or forest fires; real-time information; security; health; education; and e-governance.
BACKGROUND	Currently, the municipality of Fundão faces problems such as forest fires that, every year, consume hundreds of hectares of forest area, causing serious ecological and economic damage. Also, the waste collection in the municipality of Fundão is the target of much criticism from the population, as well as the water supply.
SMART ACTION	SMART SECURITY SMART ENVIRONMENT
INSPIRATION	MOIC from Jelgava Local Municipality SOS App from Kezmarok

11. FUNDÃO INTELLIGENT CONTROL CENTRE

The Fundão Intelligent Control Centre, installed either in the Municipality of Fundão (Civil Protection) or in the new GNR Station in Fundão, is a key element in the Municipality's strategy to become more efficient in the territorial management.

The Centre integrates an operations room, a crisis and coordination room and a room for support teams. From this room the entire city will be monitored in real time and all operational management activity and respective communication will be coordinated 24/7. The crisis and security room is intended to monitor and coordinate situations of greater complexity and the coordination/support room is intended to host all the work of management, analysis and action in situations that can be expected in the city.

In the city of Fundão, in identified arteries, sensor solutions will be implemented for data collection in areas such as smart street lighting, video surveillance, tele management of water conducts, smart irrigation, waste collection and prevention of forest fires. The information is aggregated and worked on an Urban Intelligence Platform, accessible only at Fundão's Intelligence Control Centre.

6 permanent staff (3 Civil Protection Municipal Technicians + 3 GNR) - 2 people per shift

Improving quality of life by increasing safety, health and the environment, reducing costs and boosting the economy.

Reduce costs by saving resources.

New GNR station in Fundão

Or

A Civil Protection room

Hiring an external legal service to obtain a Legal and Regulated study about how the Implementation of a Control Centre shall be conducted

Urban Intelligence Platform created by a start-up / IT partner company based in Fundão.

Municipality of Fundão

Civil Protection of the Municipality of Fundão

GNR (Police)

Altice

PT

Aqualia

Resistrela

Fire department

UBI



12. FOREST FIRE DETECTION USING IOT

Every year Portugal, namely the municipality of Fundão, is affected by the forest fires, which have caused huge impacts in social, economic and environmental perspective, such as the destruction of houses, natural wealth, but mainly people's lives. Although millions of euros are spent every year on forest prevention, this problem continues to cause irreplaceable losses.

A smart fire detection solution involves an innovative solution that is low cost, easy to install and scalable. Based on artificial vision and IoT technology, it is possible to detect forest fires in advance by monitoring equipment and weather conditions 24 hours a day. This fire detection system consists of devices placed on electricity towers / watchtowers that are able to detect and identify smoke or light sources, which could be focuses of fires. In addition to collecting data from the field through images captured in 360°, the solution enables alerts to be generated and sent to the FUNDÃO INTELLIGENCE CONTROL CENTRE with the aforementioned location and information on the incident. The devices are also equipped with sensors capable of detecting non-visible aspects such as temperature, humidity or atmospheric pressure, in order to avoid false alarms.

Early detection of fires is key to contain damage and avoid total devastation in forest areas.

Reducing costs by saving resources.

Improving quality of life by increasing safety and the protect the environment.

FUNDÃO INTELLIGENCE
CONTROL CENTRE

IoT applications using LoRa technology are more accessible and promising for systems with low data rates and over longer distances.

Municipality of
Fundão

Civil Protection of
the Municipality of
Fundão
GNR (Police)
Fire department



13. INTELLIGENT WASTE MANAGEMENT SYSTEM

One of the contemporary society central problem is the production and management of waste, aiming to reduce the impact of human activity on the environment. There is an urgent need, from the Municipality of Fundão, to find an integrated solution for waste management.

The 360Waste solution developed by the company EVOX, which is located in Castelo Branco (near to Fundão), provides an integrated solution for waste management. It is composed by volumetric reading sensors installed in containers and an online platform endowed with a set of tools that help the management process and allows a costs reduction.

Save on logistics costs and promote pollution reduction:

Reduce collection fleet costs;

Optimise planning;

Register the state of the containers, etc;

Reduce costs by saving resources;

Provide a better service to the population.

FUNDÃO INTELLIGENCE
CONTROL CENTRE

Bringing real-time information to the Control Centre to facilitate intelligent and efficient waste collection.

Municipality of
Fundão

Evox

Resistrela



14. INTELLIGENT IRRIGATION SYSTEM

With an irrigation system based on the IoT platform, it is possible to act in real time according to the weather conditions and soil conditions, avoiding the unnecessary use of water.

That is, through parameterised and automated systems, it is possible to suspend the irrigation plan for the city gardens, green spaces, sports parks or other municipal public spaces, if the rain forecast justifies it. Later, using humidity sensors, the system may or may not be activated if the soil humidity levels do not meet the parameterised needs.

Saving of "between 20% to 40% in water costs

Saving 10% to 30% in energy costs, as the water pumps and the controller will only work as much as necessary.

FUNDÃO INTELLIGENCE
CONTROL CENTRE









Gather information in real time, made available in the Control Centre.

Municipality of
Fundão

Aquália

ViverFundão

Trigger Systems

ACTION TITLE	SMART ACTION	TIMELINE	BUDGET	FUNDING PROGRAMME
11. FUNDÃO INTELLIGENT CONTROL CENTRE	 SMART SECURITY	2023 2027 	460.000,00 €	Portugal 2030 OP1 A smarter Europe
12. FOREST FIRE DETECTION USING IOT	 SMART ENVIRONMENT	2024 2025 	167.000,00 €	RRP: Investment RE-C08-i04 i04: Rural fire prevention and control systems
13. INTELLIGENT WASTE MANAGEMENT SYSTEM	 SMART ENVIRONMENT	2024 2025 	88.000,00 €	Portugal 2030 OP1 A smarter Europe OP2 A greener Europe
14. INTELLIGENT IRRIGATION SYSTEM	 SMART ENVIRONMENT	2024 2025 	144.000,00 €	Portugal 2030 OP1 A smarter Europe OP2 A greener Europe





ESPAÇO CIDADÃO

1

2

3

fundão
365 dias à descoberta



fundão
365 dias à descoberta

4.2 SMALL SCALE ACTION

HOME DATA 4 BETTER LIFE

This pilot project foresees an Internet of Things ecosystem construction, aiming to monitor homes in remote locations in the municipality of Fundão. The pilot consists in the installation of several sensors, in 8 to 10 houses located in remote locations, to measure different variables, such as temperature, humidity, CO, CO₂, radon gas, among others.

The aim is that, after collecting data and visualising it in the information system, an evaluation of these remote locations can be made so that vital decisions can be taken **to improve the living conditions of its inhabitants**.

Pilot 1st Phase

After pandemic, many electronic components sold out worldwide until today, so the installation of the pilot was delayed a bit and in a first phase not all sensors were installed.

Sensors installed during the 1st phase

Esp32 Microcontroller

DHT11 sensor (humidity and temperature)

BMP280 (temperature, pressure and altitude)

The data is currently being acquired at 30 minute intervals and sent in real time to a cloud database to be able to access it in real time and create/analyse statistical reports.

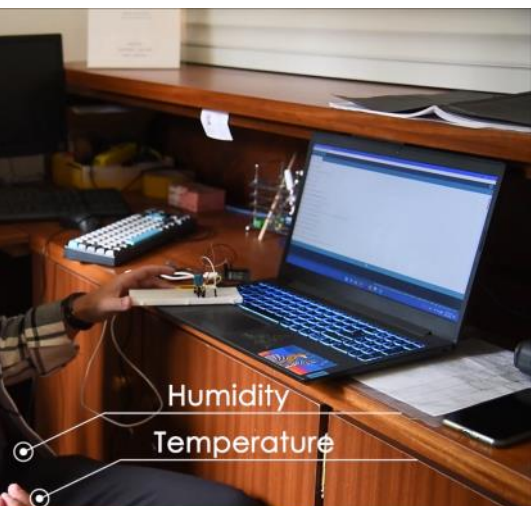
Pilot 2nd Phase

In the second phase of the pilot, a module for communication with the LoRa network (installed in the whole municipality of Fundão) will be added, as well as new sensors such as **CO (Carbon Monoxide)** and **radon gas**, which are not available yet.

Information System

The information system is under development and testing. This system aims to present data collected in real time, as well as an interactive map with all the pilot homes and a history of collected data.

Sensor	Registo
Humidade	64.00 %
Temperatura	22.90 °C
Data	21/6/2022 16:4:0



FACTS AND FIGURES

CONTACT PERSON "HOME DATA 4 BETTER LIFE"

Bruno Silva

Pilot coordinator "HOME DATA 4 BETTER LIFE"

bsilva@di.ubi.pt

CONTACT PERSON AT MUNICIPALITY OF FUNDÃO

Ricardo Gonçalves

IoTExchange project coordinator

ricardogoncalves@cm-fundao.pt

SOLUTION

Monitoring services for houses in remote or rural areas - IoT Ecosystem

SERVICE PROVIDER

University of Beira Interior

bsilva@di.ubi.pt

BUDGET

8.130,08 € + VAT

PROCUREMENT

Direct Adjustment Tender nº 55/SC/2021



MOVIE
HOME DATA 4 BETTER LIFE

4.3 RISK ANALYSIS | PESTLE

To outline a successful strategy, in the 4 key categories / 14 actions of the “Make Fundão na IoT City” Action Plan, it is fundamental to be aware of the risks that may affect the performance of the project, and to create a mitigation plan (carried out by the MONITORING COMMITTEE) in the resolution of the foreseen risks.

In this sense, the ULG performed a risk analysis with the PESTLE tool, composed of 5 FACTORS (P - Political factors; E - Economic factors; S - Social factors; T - Technological factors; E - Ecological factors; L - Legal factors), having these risks been subject to a classification out of 10 based on the probability of this risk occurring, and, if necessary, its impact on the project.

POLITICAL FACTORS

POLITICAL CHANGES

(-) A common risk for medium-sized Local Authorities, such as the Municipality of Fundão, may come from a change in the strategy following an election or any other political changes. As the municipal organisation is small, changing budget priorities may impact the ability to follow the action plan.

(+) Thus, to reduce the risk, actions with a larger budget should be secured and signed off as a priority to protect them from variable budgets.

HUMAN RESOURCES

(-) Another common risk in medium-sized Local Authorities, such as the Municipality of Fundão, is the risk that the person responsible for the execution of the Action Plan either leaves the organisation or takes on new functions/responsibilities, leaving the old responsibilities unattended.

(+) To avoid this risk, any action in IAP is led by a group or organisation rather than a single person.

ECONOMIC FACTORS

FUNDING SOURCES

(-) The successive delays in the availability of European funding, such as Portugal 2030, Centre 2030, etc., can jeopardize the applicants in case that the period available to submit the application will be shortened.

(+) Thus, to reduce the risk, a team from the Planning office of the municipality, will be attentive to new funding opportunities and inform all parts involved about the necessary documentation to submit the application.

COSTS VARIATION

(-) The Covid-19 pandemic and the Russia-Ukraine war are having huge implications on the costs of goods and services, which might affect the implementation of some actions, thus strong changes in the current budget plan may occur.

(+) In each action, it is important to seek various forms of funding. At the same time, considering the strong partners network already in place, it is important look at the project and make it viable from a private investment point of view.

SOCIAL FACTORS

(-) Businesses and governments often treat IoT as a technological project rather than something that can have impact in several areas and transform the operating model in force, which means it ends up being led by the IT department, without taking into account the insights from different departments.

(+) Making a project more comprehensive to several areas of territorial development implies a multidisciplinary team, composed of technicians from the municipality as well as relevant stakeholders, representing different fields of interest.

TECHNOLOGICAL FACTORS

(-) Despite the potential of IoT in all axes in which it operates, the communication infrastructure of IoT equipment has known flaws from the point of view of security, and is therefore susceptible to breaches in the privacy of the data transmitted.

(+) IoT is fundamental for the evolution of smart cities, but it requires a very important effort in terms of cybersecurity. There are more and more possibilities of connection and communication and we have to take advantage of them, but scrupulously protecting the data. We must continue to innovate, but with maximum reliability and security.

ECOLOGICAL FACTORS

(-) The negative environmental impact associated with the usage of more connected devices, using more energy, in particular if the energy and materials used do not come from renewable and sustainable sources.

(+) The environmentally friendly, durable and recyclable production of devices should also be ensured, so that the implementation of new devices does not compromise the environmental benefits that IoT could bring at other levels.

LEGAL FACTORS

(-) Development activities in the public sector are usually heavily regulated by bureaucratic public procurement processes. Often, this is a critical barrier that diminishes the end result quality of any goods and services procurement, due to the main criterion that defines that the lower price offer should be the chosen one.

(+) In such cases, the adjudicator must be clear and explicit on the cost criteria, namely by making reference to average prices obtained in any preliminary consultations.

RISK TYPE	RISK LEVEL
ECONOMIC FACTORS COST VARIATION	7/10
ECONOMIC FACTORS FUNDING SOURCES	5/10
TECHNOLOGICAL FACTORS	4/10
POLITICAL FACTORS HUMAN RESOURCES	3/10
LEGAL FACTORS	2,5/10
ECOLOGICAL FACTORS	1,5/10
POLITICAL FACTORS POLITICAL CHANGES	1/10

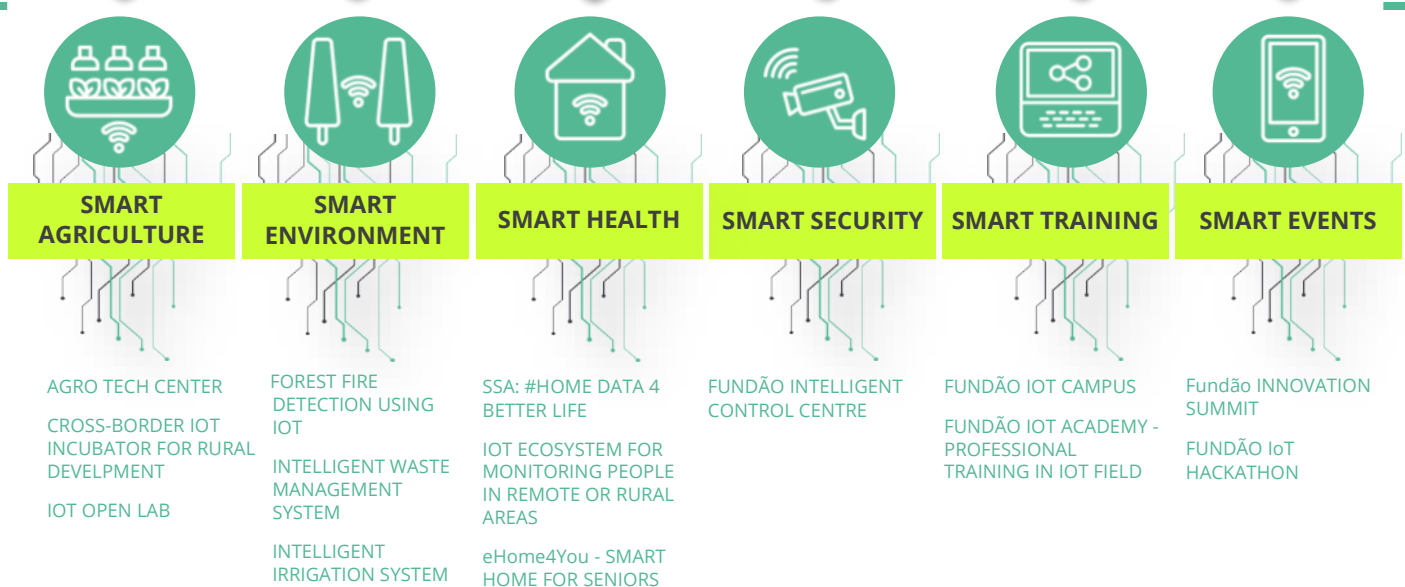
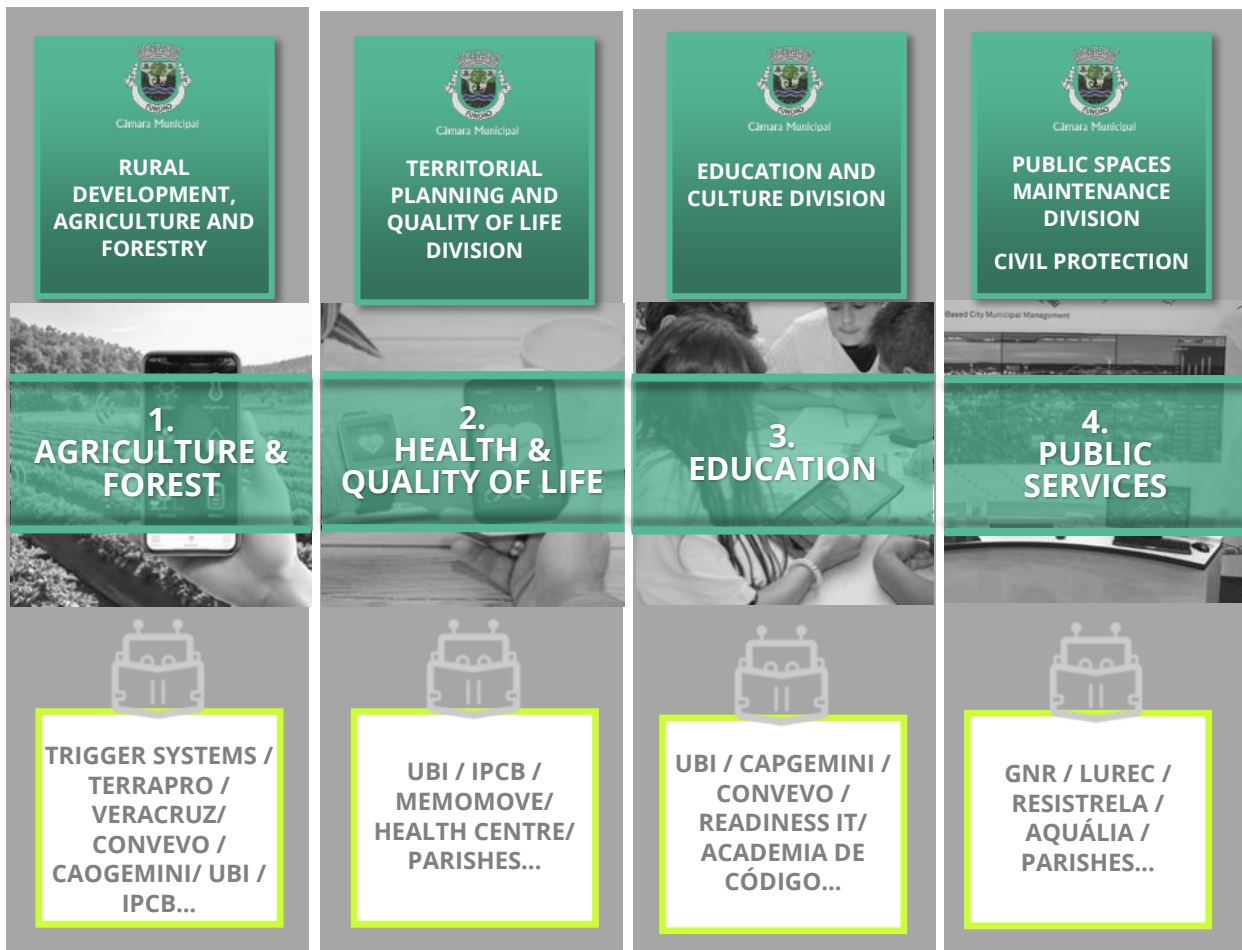
4.4 IMPACT ASSESSMENT AND EVALUATION

The **results' evaluation is essential**. We have defined, within the scope of this Action Plan and in order to be able to improve citizens' living conditions and quality of life through the usage of IoT solutions in the city, to make Fundão an INTELLIGENT CITY. These are the identified outcome objectives. To ensure a good coordination and monitoring of this process, a **MONITORING COMMITTEE** will be set up, bringing together different stakeholders. The composition of the Committee will be as follows:

- **Municipality of Fundão:** executives and technicians of various offices and organisms (In the next page chart, it is possible to understand the responsibilities of each Office / Division, according to each key action to be developed, in articulation with other entities involved)
- **Parish Councils:** all the Parish Councils of the Municipality of Fundão
- **Universities and Research Centre:** the Informatics and Electrotechnical Engineering Pole of UBI -University of Beira Interior, and IPCB-Instituto Politécnico de Castelo Branco
- **Schools:** Representatives of the Fundão School Group, Gardunha e Xisto School Group and Fundão Professional School
- **Associations:** Commercial and Industrial Association of Fundão
- **Health:** Cova da Beira Hospital (ACES) and Health Care Centre
- **Companies or training institutions:** IEFP-Institute of Employment and Professional Training, Cova da Beira Training Centre, Code Academy
- **Clusters:** Business and Services Centre Companies (ICT'S) - CAPGEMINI, CONVEVO, READINESS IT, INOVAPRIME, ITECH-ON, SOFTINSA...) and IoT (Terra Pro, Trigger Systems, ...) and ALTICE.

The committee will meet **twice a year** to ensure that the actions are being developed. It will be sought, on an ongoing basis, to ensure the collection and processing of data to readjust the activities to the established objectives, and a **MITIGATION PLAN** may be developed if necessary, in order to guarantee the success of the Project and ensure the stakeholders involvement in the reflection processes and improvement strategies to be implemented, according to the defined actions. This continuous evaluation will be based on the constant unfolding of the plan-action-evaluation-adequacy cycle, with a view to achieve the outlined objectives and goals. The work to be carried out by the **monitoring committee** will be:

- **Assess** the achievement degree of the general objectives and targets that have been set.
- **Evaluate** the development and impact of the different actions, as well as how they are articulated to promote the success of the Action Plan.
- **Evaluate** whether the various problems of the Mitigation Plan have been solved and/or mitigated.
- **Inform** beneficiaries about existing community support, the legal and institutional frameworks favourable to IAP actions, and put into perspective the possibilities for project evolution.
- **Ensure** the involvement of stakeholders in the reflection processes and in the improvement strategies to be implemented.
- **Creating** the various reports on the process of monitoring the project, as well as the final report.



+ COMPANIES
+ TALENT
+ PEOPLE
+ QUALITY OF LIFE



Innovation, Investment and Planning Division

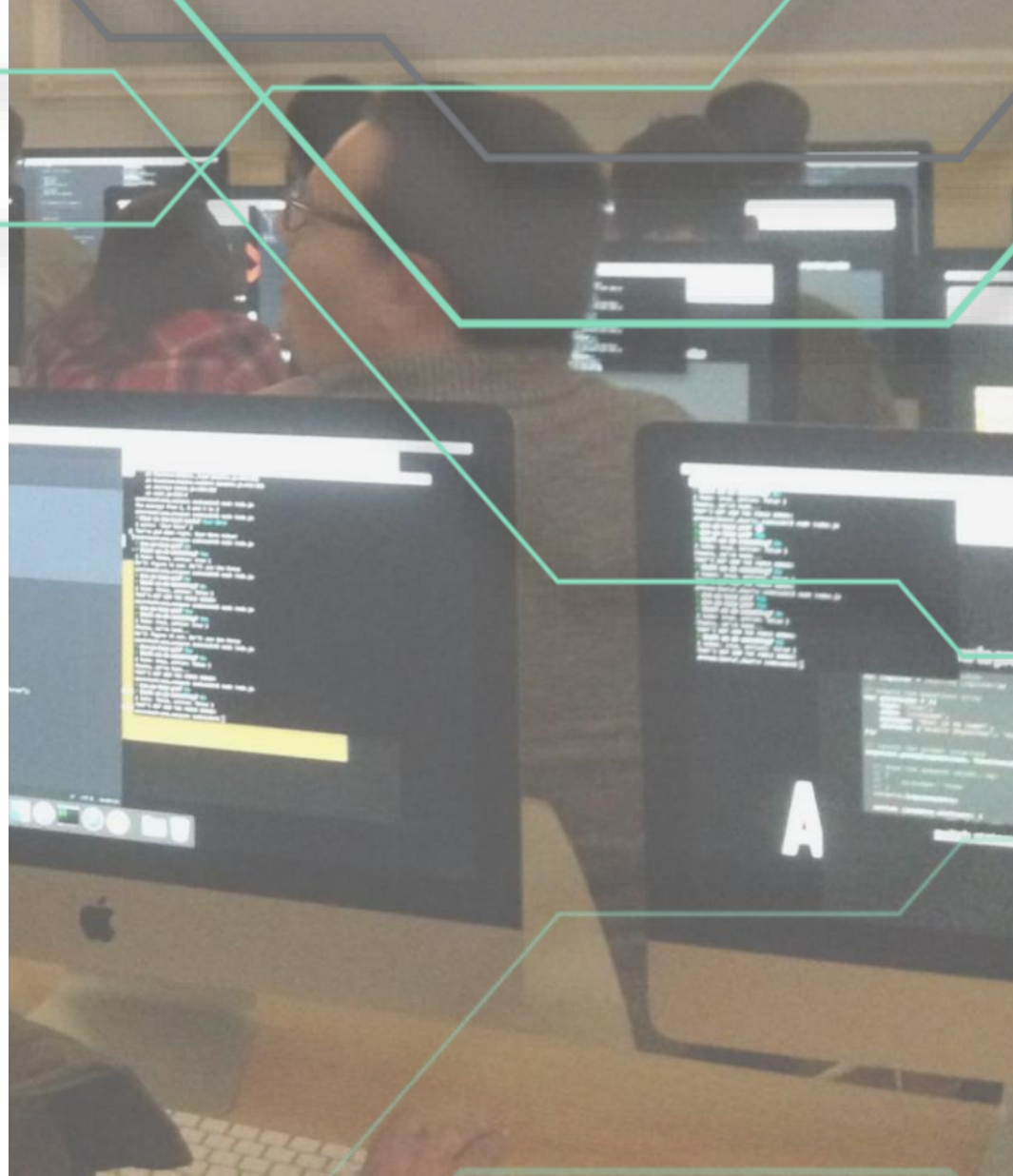
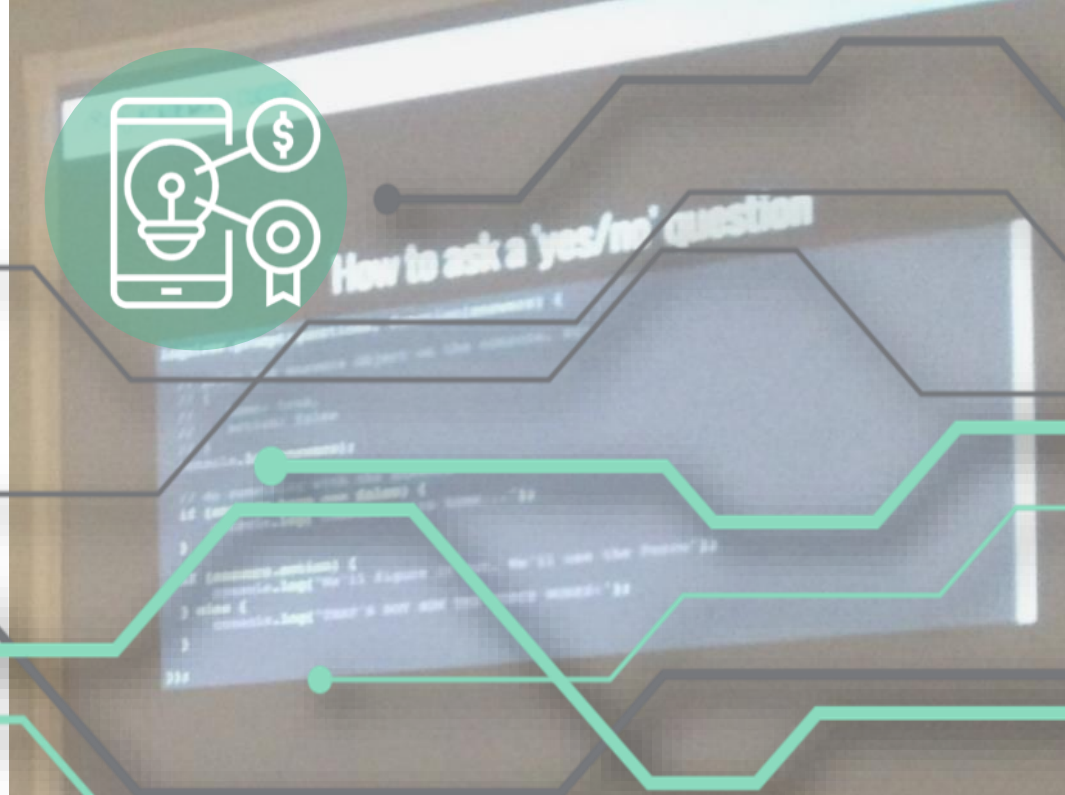
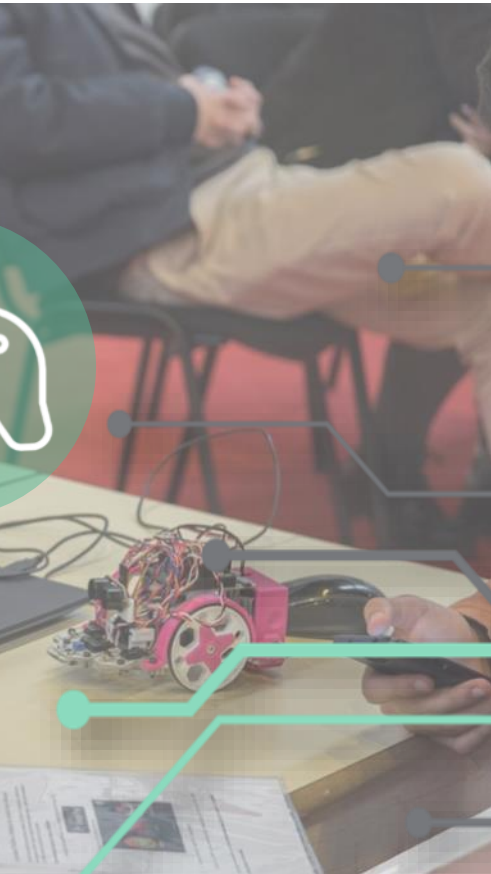
Monitoring Committee



LIVING LAB

COVA DA BEIRA





5. FINANCIAL RESOURCES

Key to the delivery and implementation of the ACTION PLAN is the funding. Without the necessary support and financial resources, it is unlikely that the actions will be implemented and therefore the plan will not have the impact envisaged in its vision, goals and objectives. However, there is no single source that provides sufficient funding to finance all the individual aspects of the ACTION PLAN. Within the Action Tables, possible funding schemes and instruments (within the PORTUGAL 2030 programme) have been identified and, therefore, are considered important potential funding sources, which will be pursued throughout the implementation phase of the project.



Portugal 2030 materialises the Partnership Agreement to be established between Portugal and the European Commission, setting the major strategic objectives for the application, between **2021 and 2027**, of the global amount of **24.182 M€**, from the European Regional Development Fund (ERDF), the European Social Fund + (ESF+), the Cohesion Fund, the Just Transition Fund (FTJ) and the European Maritime, Fisheries and Aquaculture Fund (EMFF).

Its programming is built around five strategic objectives of the European Union: a **smarter**, **greener**, **more connected**, and **more social** Europe that is closer to its citizens.



OP 1

A SMARTER EUROPE

Investing in innovation, digitalisation, business competitiveness, skills for smart specialisation, industrial transition and entrepreneurship.



OP 2

A GREENER EUROPE

Accompanying the climate emergency and incorporating decarbonisation targets by supporting innovation and the circular economy, benefiting sustainable production methods.



OP 3

A MORE CONNECTED EUROPE

Supporting the connection between strategic transport networks and the implementation of new generation communications networks supporting the digital transition.



OP 4

A MORE SOCIAL EUROPE

Supporting education, equal access to healthcare, quality employment, lifelong learning and social inclusion, in line with the priorities set out in the European Pillar of Social Rights.



OP 5

A EUROPE THAT IS CLOSER TO ITS CITIZENS

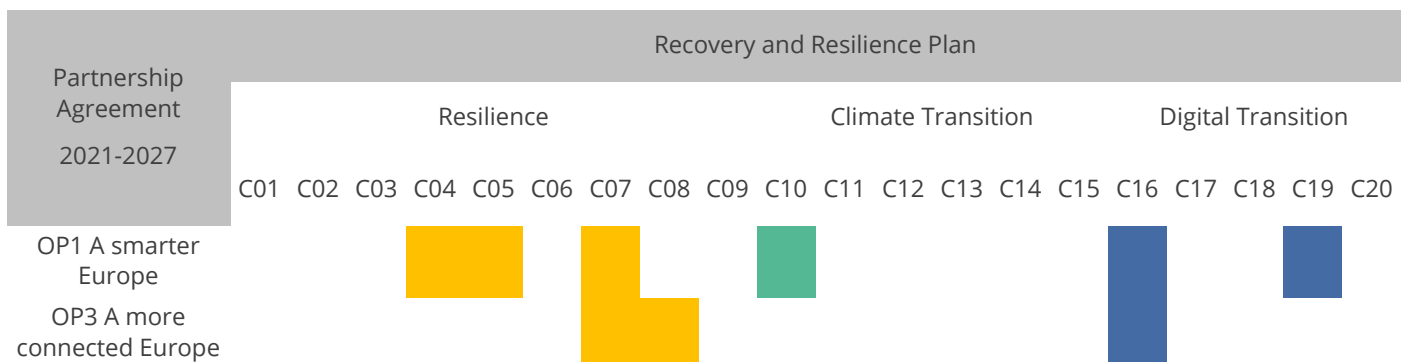
Supporting development strategies at local level, promoting social and territorial cohesion, and supporting sustainable urban development, based on the concept of interconnected networks, centred on people's needs.

The Portugal 2030 Strategy is the guideline of public policies for 2030. This strategy is structured around 4 Thematic Agendas, of which **Agenda 2 - Innovation, Digitalisation and Qualifications as engines of development** and **Agenda 4 - A country that is competitive externally and cohesive internally** are of interest to this IAP.

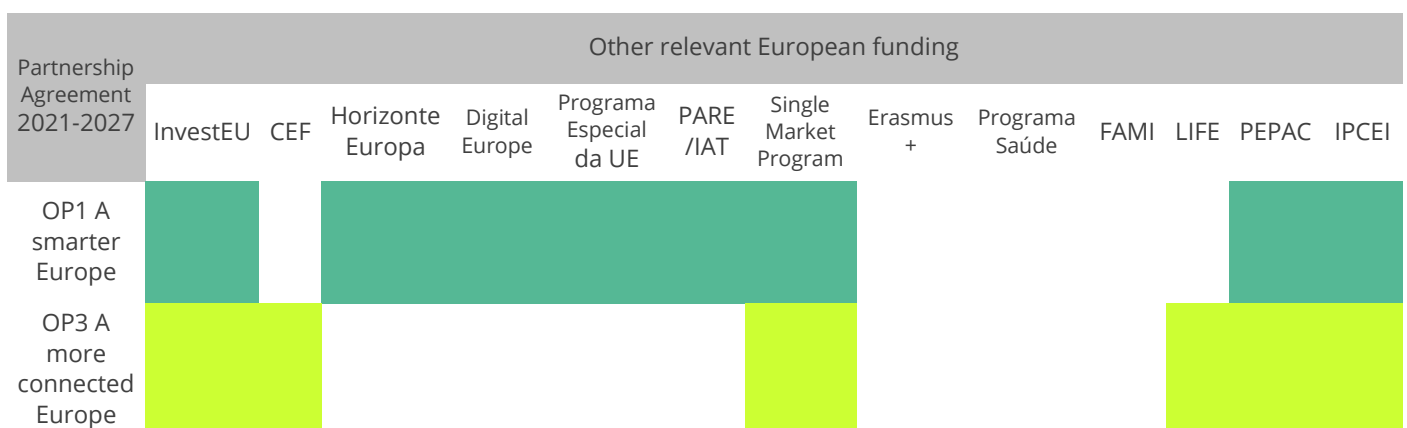
This strategy frames the investments to be supported by European funds for the period 2021-2027 and also establishes the operational structure of the Cohesion Policy funds for the same period:

- Three Thematic Operational Programmes (OP) in Continental Portugal, in which **the Innovation and digital transition OP** is of interest. Financed by ERDF and ESF+ Funds, it is aimed at the less developed regions in the country and mainly complies with OP 1, thus supporting digitalisation, innovation and R&D, and internationalisation of companies, interface institutions and the scientific system. It also supports companies in OP2 and OP4, in decarbonisation and asset training projects, respectively.
- Five **Regional Ops**, of which **CENTRO OP** applies for Fundão's territory. Financed by FEDER and ESF+, the Regional Programmes mobilise most OPs, with particular emphasis on OP5, OP2 and OP1. These OPs are particularly focused on the territorial dimension of public policies/territorialisation, also including the Territorial Plans for a Just Transition, to be financed by the Fund for a Just Transition.
- And the European Territorial Cooperation Operational Programmes. Under the aim of European Territorial Cooperation, Portugal participates in a set of Operational Programmes, which are in the process of programming and negotiation, in partnership with the other relevant Member States, in the cross-border, transnational and outermost regions strands, as well as with other Member States and the European Commission, in the interregional strand. Here we identify **SUDOE, POCTEP, URBACT** and **INTERREG EUROPE programmes**.

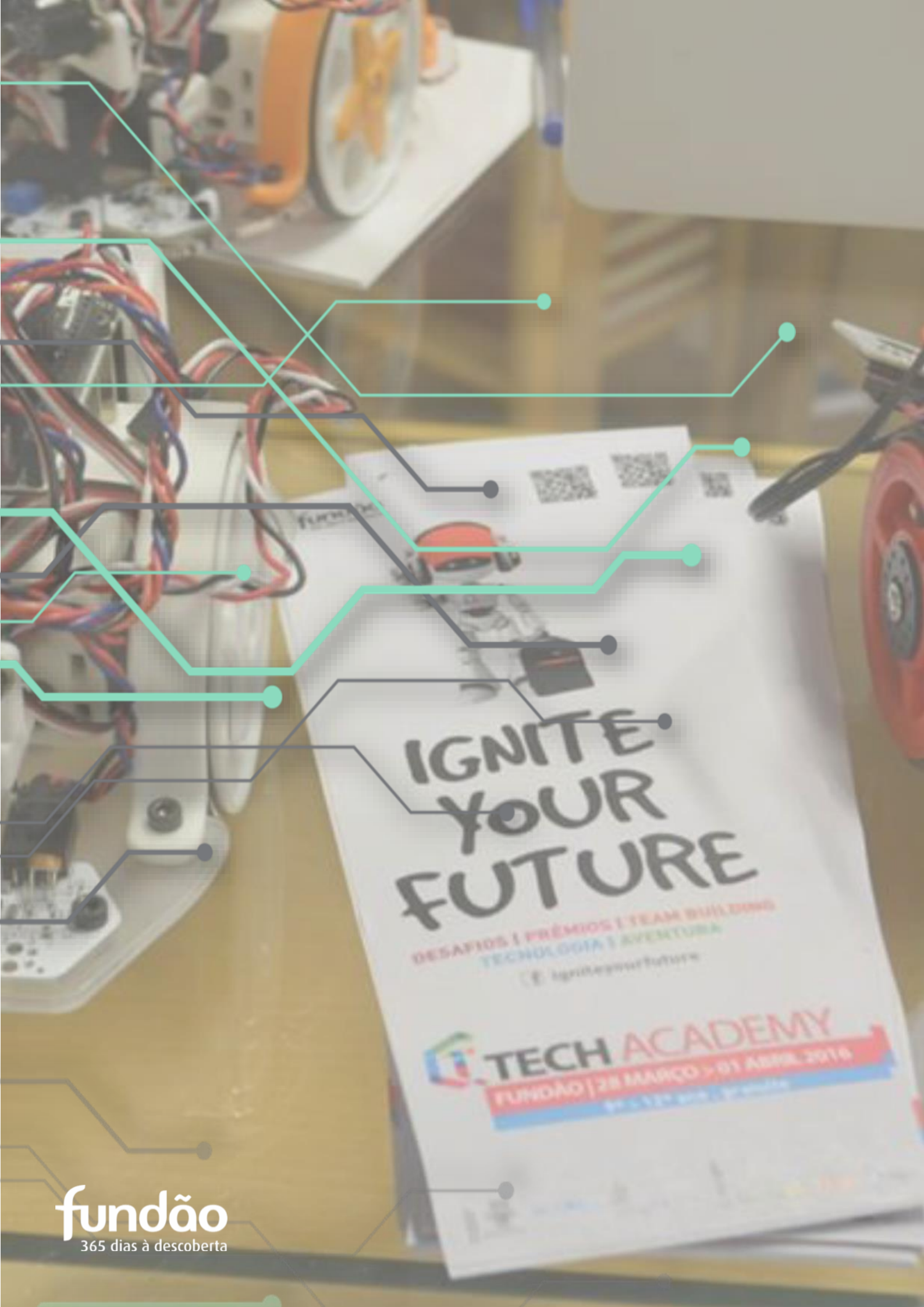
Portugal 2030 is also aligned with the components of the **Portuguese Recovery and Resilience Plan**. The combined mobilisation of the envisaged funding allows for a reinforced capacity in the support available in OP1—A smarter Europe and OP3—A more connected Europe.



Portugal 2030 is complemented by other European instruments to support economic and social development, centrally managed by the European Commission.



The Innovation, Investment and Planning Division of the Municipality of Fundão will be attentive to the opening notices of these European financial resources in line with the actions of this IAP and all diligences will be taken together with the Monitoring Committee.



IGNITE YOUR FUTURE

DESAFIOS | PRÊMIOS | TEAM BUILDING
TECNOLOGIA | AVENTURA
(E Ignite your future)

TECH ACADEMY
FUNDAÇÃO | 28 MARÇO > 01 ABRIL 2016
9h < 12h para o público

6. COMMUNICATION AND CONSULTATION STRATEGY

Communication plays a vital role in the success of the project **MAKE FUNDÃO AN IOT CITY**, thus this ACTION PLAN becomes a strategic document referential for political changes. It is necessary, for this, that its communication and dissemination, captures the interests of the region and country politicians.

The **Communication Office of the Municipality**, in articulation with the **Monitoring Committee**, will have the function of disseminating internally and externally the different activities of this Action Plan, through the following means of communication available or to be made:

- Municipality of Fundão website and social networks;
- [MOVE TO FUNDÃO](#) website;
- Creation of animations, videos and photographs during the project's implementation;
- Local and regional media;
- Coverage and dissemination of local and/or national press conferences to present the project results;
- SMART EVENTS actions coverage and dissemination;

Participation and consultation during the implementation process of the action plan and proposals for change will be provided by the **Innovation, Investment and Planning Division**, namely by the project coordinator, in the daily communication with the stakeholders involved in the development of the Plan's activities.

7. THE FUTURE...

"If I have seen further it is by standing on the shoulders of Giants"

Isaac Newton

In 2022, the municipality of Fundão is 275 years old. It is an age that can serve as a motto for reflection and for redefining the path we aspire to our municipality. For our community. But do not think that we are starting from scratch. This path is already being taken, gradually, but decisively. We know exactly where we want to go. For where we are heading to. We have no doubts about the need to continue with the development model adopted a few years ago, with a reiterated focus on attracting and settling people in our territory and on developing sustainable, integrated and participatory solutions capable of responding to the new social challenges we are facing.

The municipality of Fundão is located in a territory of low population density. Year after year, we witness a growing depopulation, resulting from a negative natural balance and the continued emigration of young people. Despite successive appeals by its population and local political representatives, the measures implemented at national level have not succeeded in reversing - or even halting - this situation. As a result of this panorama, it is difficult to attract investment to a region where there is a shortage of labour (from the most traditional to the most qualified). The Municipality of Fundão has made its priority to counter this current state of affairs.

We are the first municipality in the country that teaches programming to children in all the public schools in the municipality, from the first cycle onwards. Looking at the value chain, we have several interface processes and projects in research and development, an area in which we are also positioning ourselves strongly, making the triangulation between polytechnics, universities, and companies in very relevant sectors.

Innovation is transversal to the municipality. We wanted to bring innovation to local public policies. Our development strategy has innovation as a central factor, and not only technological, also social innovation, which has been determinant to achieve the goal of making Fundão a home for information and communication technologies, and in governance, by becoming the municipal management model more open. All this fits very well in the positioning of a municipality that is known for having agricultural reference products, such as the famous Fundão cherry brand, but also for the work and value creation in technological areas. Besides innovation and the brands that are created here, Fundão is also a land of inclusion, without prejudice and where anyone, regardless of their nationality, religion or the language they speak, can develop their life project.

Our ambition is to become a multicultural region and to spread good examples to neighbouring regions. Everywhere. We understand that good policies and good practices start from the bottom up. That is our purpose. There is still a lot to be done, but we are working on it. We are on the right path, because we believe that there are no territories convicted to failure.

Fundão, a land of hospitality

ALK WITH US

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ARE WALKING**

VALUES
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altran

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PHOTOGRAPHS

Municipal Photographic Archive

This Action Plan had the participation and contribution of a wide range of people and entities that have greatly contributed to the development of this project.

The Municipality of Fundão team is very grateful for everyone's contribution.

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We are all in this together!

"BEM HAJAM!", "OBRIGADO!", THANK YOU!"

And you are always be welcome in Fundão :)

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