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BIRZEIT UNIVERSITY

CARISMED

CApitalization for Re-setting Innovation and Sustainability in MED-Cities (CARISMED)

Toolkit/Advisory guide of Urban Policy for Med-cities.




BIRZEIT UNIVERSITY
National Technical University of Athens
ceeIM
KAHE CRES
CMI
CRESM
collectif

Toolkit/Advisory Guide Urban Policy for Med-cities.

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CARISMED : CApitalisation for Re-setting Innovation and Sustainability in MED-Cities.
This project has received funding from the 2014-2020 ENI CBC Mediterranean Sea Basin Program, the Cross-Border Cooperation (CBC) initiative implemented by the European Union (EU) under the European Neighborhood Instrument (ENI).

Thematic objective :	A..2 Support to education, research, technological development and innovation.
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Disclaimer

The following disclaimer:

"This publication has been produced with the financial assistance of the European Union under the ENI CBC Mediterranean Sea Basin Programme. The contents of this document are the sole responsibility of < NATIONAL TECHNICAL UNIVERSITY OF ATHENS - NTUA/Birzeit University> and can under no circumstances be regarded as reflecting the position of the European Union or the Programme management structures".

"The 2014-2020 ENI CBC Mediterranean Sea Basin Programme is a multilateral Cross-Border Cooperation (CBC) initiative funded by the European Neighborhood Instrument (ENI). The Programme objective is to foster fair, equitable and sustainable economic, social, and territorial development, which may advance cross-border integration and valorise participating countries' territories and values. The following 13 countries participate in the Programme: Cyprus, Egypt, France, Greece, Israel,
Italy, Jordan, Lebanon, Malta, Palestine, Portugal, Spain, Tunisia. The Managing Authority (JMA) is the Autonomous Region of Sardinia (Italy). Official Programme languages are Arabic, English, and French. For more information, please visit: www.enicbcmed.eu".

Statement about the EU:

"The European Union is made up of 28 Member States who have decided to gradually link together their know-how, resources, and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance, and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders".

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FOREWARD/INTRODUCTORY NOTE

CARISMED project is implemented under the ENI CBC ***"Mediterranean Sea Basin Programme"*** (http://www.enicbcmed.eu). Its total budget is **1.1 million Euro** and it is financed for an amount of **1 million Euro by the European Union through the European Neighborhood Instrument**. The project is implemented in six countries and six Mediterranean cities: Hebron in Palestine, Athens in Greece, Murcia in Spain, Palermo in Italy, the city of Tunis in Tunisia, and Irbed in Jordan. The project's lead partner is Birzeit University in Birzeit (BZU). The project's duration is two years from November 2021 until November 2023.

The project overall objective is to develop urban policies for improving sustainability and integrating innovation into the urban setting of Mediterranean cities in order to effectively re-structure living and working conditions. This objective will be achieved through the following specific objectives:

. Promoting innovative approaches/ CE methodologies for re-setting the built environment at Med-Cities (both the building shell and its technological and business content) by developing a toolkit/advisory guide on upcycling buildings/areas of the built environment through CCI SMEs clustering.

. Establishing targeted pilot creative workshops at regional and national level in order to reach and involve new target groups/type of stakeholders through expertise outreach and advocacy of policymakers, local authorities, key sector stakeholders, organizations and SMEs, i.e., cross-border level.

. Making use of asynchronous e-learning platforms where knowledge and resources pooling results foster the mainstreaming of good practices towards central principles for planning interventions, improve sustainability and integrate innovation of CCI SMEs Clustering into the urban setting at Med-Cities.

CARISMED promotes the uptake of results achieved by 3 ongoing ENI CBC MED projects to develop policies for improving sustainability and integrating innovation into the urban settings of Mediterranean cities, through the capitalization of circular economy (CE) and creative approaches. Towards a more sustainable and smart urban development, a low-cost Adaptive Reuse Strategy will use MAIA-TAQA innovation practices and interlinks with policymakers, and INNOMED-UP model for CE procedures within Cultural Creative Industry (CCI) SMEs. CE supply chain will address urban challenges while creating business opportunities for SMEs by using INNOMED-UP model and SME4SMARTCITIES smart tools and techniques through 'ready to deploy' solutions as well as the outcomes obtained by the project UNDERGROUND4VALUE to enable cross-sector/border level cooperation between the Mediterranean cities. Cooperation agreements among cluster members will be further built up to enhance collaborative innovation schemes based on MAIA-TAQA policy instruments, SME4SMARTCITIES framework for collaboration between the public and private sector, and INNOMED-UP framework for CCI SMEs clustering. The synergy with MAIA-TAQA and SME4SMARTCITIES will be pursued in terms of policymaking & best practices adoption. A great deal of experience in re-setting the existing environment is provided by these projects through refurbishment and re-using underutilized or abandoned urban stock.

Therefore, CARISMED plan is to develop an integrated Urban Policy for improving sustainability and integrating innovation into the urban settings at med cities though capitalization of already acquired conceptual and systematic approaches as regards circular economy and creativity, policy and decision-makers to be reached. Around 8-10 SMEs from each participating city will benefit from being involved in the project and from their cooperation with researchers, 20 cross-border mentorship vouchers will be launched to establish transnational cooperation. Moreover, the digital e-learning platform will make the knowledge and resources pooling results and good practices available for mainstreaming and dissemination at cross-border level.

CARISMED consortium Enjoys a highly qualified & well- balanced partnership, capable- to address systematically cross-border leverage of CCI SMEs' production novelties, synergies, and cooperation through the implementation of circular economy principles. Smart technology and green architecture approaches. Towards this target, a range of key factors are involved to generate new knowledge or turn knowledge into new products, methodologies and procedures, building an effective system that could add value to societies and promote social inclusion through community engagement.

Birzeit University (BZU)- the Lead Beneficiary and the National Technical University of Athens (NTUA) are Universities with great project implementation experience and expertise in the fields of engineering, urban planning, creative economy, waste management, and institutional capacity building. They undertake the responsibilities of methodological issues, integration of new technologies and access to innovation through training. The Centre for Renewable Energy Sources and Saving (CRES) the European Business and Innovation Center of Murcia (CEEIM) , the Center for Economic and Social Research for the South of Italy (CRESM), the Institute for Studies on the Mediterranean (CNR-ISMed), Creatif Collectif of Tunis (CC) and Future Pioneers for Empowering Communities' Members in the environmental and educational fields (FPEC-Irbed) all are valuable partners utilizing their significant experience in the various fields of community policy and legislation, the protection of the environment and sustainable development, the entrepreneurial culture, business innovation in society, training and transfer of best practices and experiences, boosting the raising of intelligent capital and the professionalization of private investors the dynamics of the processes of growth and socio-economic development of the countries of the Mediterranean area.

The LCARS Model

The purpose of the Guide for Low-cost Adaptive Reuse Strategy (LCARS) in the Mediterranean is to capitalize the whole knowledge and experience gained during the implementation period of CARISMED. More specifically, this guide is planned to act as a model to contribute to the resetting of the built environment through the implementation of creative studios in six Mediterranean cities following the concepts of Low-Cost Adaptive Reuse Strategy (LCARS) in underutilized or abandoned urban stock, being area, space or building. It pretends to be a useful tool for further entities that are interested in improving knowledge on sustainability and applying good practices in rebuilt environment.

The main pillars of LCARS that are identified by CARISMED project cover:

- Fostering Green architecture: the building will be environmentally friendly, and the outdoor space will be exploited, solar energy system will be applied, and environmentally friendly solutions will be used in heating and air conditioning.

- Implementing SMART systems and solutions: in addition to using of the Internet, a technological infrastructure (ICT) will be applied to foster SMEs skills, knowledge and experience in the various fields of community policy and legislation, environment and sustainable development, the entrepreneurial culture, business innovation, training and transfer of best practices and experiences, and socio-economic development...etc.

- Recycling Recycled furniture and supplies (Circular economy): recycling- recycled furniture and supplies will be used inside the building, old used equipment and tools will be re-managed to serve the beneficiaries. Craftsmen will be encouraged to manufacture the furnishing and decorating of the LCARS Studio.

As such, the content of this guide will assist readers to get familiar with the CE concept both in theory and practice, by encouraging especially the Cultural Creative Industries Small-Medium Enterprises (CCI SMEs) to adopt a new paradigm shift that proves its potential to decouple economic activity from the consumption of finite resources. Yet, the community to be more aware of the Low-Cost Adaptive Reuse Practices (LCARs) and their benefits, that if/ when applied within the urban setting, they will give the opportunity to CCI SMEs to be less dependent on raw materials and to achieve a smarter use of our planet's limited available natural resources.

We are confident that the current Guide on Low-cost Adaptive Reuse Strategy (LCARS) practices combines in a useful approach the necessary circular practices with sustainable urban development practices for the Mediterranean cities, yet it adds significant contribution to the wide and global discussion on shifting towards a more livable urban environment in the future.

SHADI SAMI GHADBAN
Associate Professor
CARISMED Project Coordinator
Birzeit University, Palestine
December, 2023

01.
INTRODUCTION

1.1. ABOUT THE CARISMED PROJECT

The CARISMED (CApitalisation for Re-setting Innovation and Sustainability in MED-Cities) project is implemented in the framework of the 2014-2020 European Neighborhood Instrument Cross-Border Cooperation Mediterranean Sea Basin Programme (ENI CBC-Med). The project consortium includes 8 partners (5 from EU countries: Greece, Spain, Italy, and 3 from Mediterranean Partner Countries: Palestine, Tunisia, Jordan) and the Lead Partner is Birzeit University (Palestine). The project has a duration of 24 months.

The main objective of the project is to develop an Urban Policy for improving sustainability and integrating innovation into the urban setting at Mediterranean cities, in order to effectively re-structure living and working conditions. More specific objectives include:

- Promoting innovative approaches / circular economy methodologies for re-setting the built environment at Med-Cities (both the building shell and its technological and business content).
- Establishing targeted pilot creative workshops at regional and national level in order to reach and involve new target groups / stakeholders.
- Making use of asynchronous e-learning platforms to foster the mainstreaming of good practices towards central principles for planning interventions, improving sustainability, and integrating innovation of Cultural and Creative Industries (CCI) SMEs Clustering into the urban setting at Med-Cities.

Work Package 3 ("Urban Policy for Med Cities – improving sustainability & integrating innovation into urban setting") is a key component of the project, according to which the CARISMED Urban Policy for the Med-Cities will be established as one of the main outputs of the project. National, regional and local authorities are expected to benefit from the CARISMED Urban Policy for their future planning in order to foster Circular Economy in urban planning and policymaking. Local CCI & Circular Economy SMEs communities will benefit in the long run from the Policy, upgrading their innovation capacity, being offered networking opportunities and access to knowledge and systematically organized information on cross-border level.

1.2. THE PARTNERSHIP

BIRZEIT UNIVERSITY – LB – BZU (PALESTINE)

BIRZEIT UNIVERSITY

Birzeit University is a national, non-profit, pluralistic, independent university, dedicated to producing leaders and knowledge in service of humanity and Palestinians everywhere.
Since its inception as a small school for girls in 1924, Birzeit University defeated all odds, including severe restrictions on academic development and freedom imposed by the Israeli military occupation, and embodied a success story that inspires all Palestinians.
The university celebrated its first graduating class in 1976, the same year when it joined the Association of Arab Universities and became a member of the International Association of Universities one year later in 1977.

By the end of the 1970s and well through the 1980s, Birzeit University went through an academic and urban resurgence, where it launched more academic programs and continued its community outreach tradition by building numerous institutes and centers.
Birzeit University entered the third millennium relying confidently on a legacy of academic distinction and its well-designed university campus while winning several local and international awards.

Committed to freedom of thought and expression, democratic practices and social diversity, the university offers distinguished and globally engaged teaching, research and community-based programs designed to cultivate leadership skills, national and humanitarian values, critical thinking, lifelong learning and a spirit of initiative and responsibility towards society and the environment in the context of an institutional culture of sound governance, openness, pluralism, and autonomy.

Through 11 institutes and centers, Birzeit University engages in knowledge production both nationally and globally. It offers 127 academic programs, including 42 master's and three (3) PhD programs, serving 14, 743 students in nine (9) different faculties.

NATIONAL TECHNICAL UNIVERSITY OF ATHENS - NTUA (GREECE)

National Technical University of Athens

The National Technical University of Athens (NTUA) is the oldest and most prestigious public university in Greece. It has contributed unceasingly to the country's scientific, technical, and economic development since its foundation in 1837. It boasts for 9 Schools, 512 faculty members, 4.090 external collaborators, 23.914 students and 300.000 sqm of research infrastructures. According to QS World University Ranking (2016), NTUA is the leading academic institution in Greece and the only one in the top 400 institutions worldwide at the 67th place among technological universities. 194 laboratories operate

CENTER FOR RENIEWABLE ENERGY SOURCES AND SAVING - CRES (GREECE)

The Centre for Renewable Energy Sources and Saving (CRES) is the Greek national center for Renewable Energy Sources (RES), Rational Use of Energy (RUE) and Energy Saving (ES). CRES was founded in September **1987** and has been appointed as the national co-ordination center in its areas of activity.

It is a public entity, supervised by the Ministry of Environment and Energy and has financial and administrative independence. Its main goal is the promotion of RES/RUE/ES applications at a national and international level, as well as the support of related activities taking into consideration the principles of sustainable development.

CRES operates in two main fields of activity:

- **As the National Energy Center, working on energy planning and policy for RES, RUE and ES in accordance with the policy of the Ministry of Environment and Energy and developing the necessary infrastructure for the realization of RES/RUE/ES investment projects.**

- **As a Research and Technological Center for RES/RUE/ES, through applied research on new energy technologies and by technically supporting the market for the penetration and implementation of these technologies.**

BUSINESS INNOVATION CENTRE OF MURCIA - CEEIM (SPAIN)

CEEIM, the European Business Innovation Centre of Murcia (Southeast of Spain), is a non-profit Foundation that aims at creating and implementing innovative methodologies in the field of entrepreneurship and business creation, specifically meeting technology based start-ups' needs.

CEEIM's main mission is to promote and develop the necessary economic, social, and innovative activities, in order to stimulate and support technological business initiatives. In that regard, CEEIM addresses problems that innovative businesses face in accessing appropriate technology knowledge, market information, management assistance and access to capital, by providing reasonably priced office space, shared services to reduce overhead costs, and business, technical and funding mentoring.

CEEIM is promoting entrepreneurship and innovation on society by means of different kind of programs, events, training, workshops, courses, and projects. The main objectives of CEEIM are:

- Developing entrepreneurial spirit in society and promoting entrepreneurship at early ages.
- Attracting tech talent and supporting entrepreneurs in the creation of innovative businesses.
- Attracting funding for innovative and technology-based companies.
- Accelerating and internationalizing of innovative technology-based companies.

Furthermore, CEEIM counts with an International Initiatives department with a vast experience in the participation of European Projects and programmes (H2020, COSME, INTERREG EUROPE, INTERREG SUDOE, ENI CBC MED, ERASMUS + etc.). It has taken part in more than 25 projects, as both coordinator and beneficiary, creating, adapting, and implementing methodologies for supporting entrepreneurs and business creation, for accelerating technology-based companies, or working in the funding access scheme for SMEs.

CENTER FOR ECONOMIC AND SOCIAL RESEARCH FOR THE SOUTHOF ITALY - CRESM (ITALY)

CRESM is a non-profit social cooperative based in Sicily (Palermo and Valle del Belice). It has a 50 years of experience in local and rural development planning, community regeneration, migration, and social inclusion. It was founded in 1973 in Palermo by a group of social workers and activists, in the framework of the Sicilian non-violent movement, in order to support a conscious local development.

CRESM activities address farmers, entrepreneurs, youth, and vulnerable groups (unemployed, migrants, ex-offenders, disabled) in Italy and in the Mediterranean area.
In Palermo CRESM promotes the initiative "Nuove Officine alla Zisa" (New Workshop at Zisa) – NOZ, which is:

- A 1.200 sqm open space for crafts and technological workshops involving both migrants and Italians.
- A research center for artisan techniques and eco-compatible natural materials.
- An info-point for consultation of SMEs devoted to the promotion of entrepreneurial culture, corporate responsibility, and sustainable innovation through Circular Economy Principles.

NATIONAL RESEARCH COUNCIL OF ITALY – INSTITUTE FOR STUDIES ON THE MEDITERRANEAN -ISMed (ITALY)

The Institute for Mediterranean Studies (ISMed) is one of the most recent institutes of the CNR. ISMed is inspired by a vision of a Mediterranean of peace and prosperity, based on the values that unite the countries of the area. In particular, the Sicilian research group deals with research and training in Ecology and Economy, and also promote and participate in many initiatives to spread scientific culture on the theme of biodiversity in festivals, meetings, theme days, with projects, processing agreements, development plans, also working on the theme of social inclusion and on sensory disabilities.

COLLECTIF CREATIF (TUNISIA)

The Collectif Créatif (CC) was built around a group of people whose paths crossed on several occasions in different spots in the Medina of Tunis: Dar Ben Gacem, Dar Bach Hamba, Dar Lasram, Nokta, Doolesha, or else the café El Amba.
In a context of socio-cultural vibrancy in post-revolutionary Tunisia, the Medina is the ideal place to bring these meetings to fruition, thanks to its potential to foster the development of alternative cultures and to bring together the various ongoing initiatives. Driven by the need to further develop these dynamics and structure them, while operating in an open space for new ideas within a participatory approach, this community came together to collaborate through this organization, which was legally registered in 2016.

CC has been committed to sharing resources, know-how and skills with the community through its different initiatives and activities. Indeed, this organization has created an organic space for experimentation that now extends beyond the gates of the Medina. The Association Collectif Créatif works on the development of emerging creative professions, particularly in the fields of design and ecology, visual and digital arts, with a view to promoting social cohesion and experimenting with diversity in the local community.

Since its creation, CC has carried out projects with and for the local community.
Dar El Collectif: a platform, an inclusive space at the service of the Association's community. The space allows the implementation of activities around creative and design professions. The space includes a co-working space, an exhibition space, a design and material workshop, a digital design workshop and an audiovisual studio.

- **Fantek:** a digital art workshop project launched in 2018.
- **El Warcha:** A collaborative design workshop in La Hafsia and Nefta that aims to promote education and civic practices through the collective manufacture of urban and ecological furniture and through artistic installations with local residents.
- **Interference (IT Tunis):** a Light art Festival. IT Tunis promotes interdisciplinary exchanges within a diverse range of communities such as young artists, artistic mediators, artistic assistants, and young people of The Medina in the process of production of digital installations.
- **PSSKCH-Community Outreach:** A program that aims to engage the local community around the activities and projects carried out by CC through creating an inclusive cultural space in The Medina. "Dour wahdek": A mobile app offering an alternative urban guided tour in the Medina; this project was set up following the completion of the "Doura fel houma" project, led by the young people of Hafsia to create a personalized urban tour of the Medina.
- **Ecologic:** a design project that aims to initiate a dialectic around sustainable design by supporting, each year, a group of young designers in the process of experimentation, prototyping, and valorization of results.
- **CC media:** along with the upgrade of the CC website, this media platform offers content in different formats; written, audio (podcasts) and videos that mainly cover the activities of the association but also the local cultural dynamics.

FUTURE PIONEERS FOR EMPOWERING COMMUNITIES' MEMBERS IN THE ENVIRONMENTAL AND EDUCATIONAL FIELDS - FPEC (JORDAN)

FPEC is a local Jordanian non-profit organization established on March 20, 2012, with the aim to overcome poverty and contribute to human development in the most remote areas in Jordan. The main thematic areas of FPEC's work include socio-economic empowerment of women and youth, community dialogue, civic engagement, climate change adaptation measures, waste management, renewable energy, and WASH (water, sanitation, and hygiene), while human rights, gender, and environment remain crosscutting themes in all its work. In most of FPECs projects they target women, youth, and marginalized groups – identified as most in need of service.

Ever since its establishment, FPEC has also been closely involved in supporting the most marginalized groups in host communities, including both Syrian and Jordanian women, youth, and young females, through life and economic skills programs improving these groups' employability.

FPEC empowers communities through a long-term investment in local people, in five key thematic areas:

- Socio-economic empowerment of marginalized groups, including women and girls.
- Green economy and climate change adaptation.
- Environmental conservation and promotion of environmentally sustainable practices, including water governance and waste management.
- Civic engagement of women, youth, and marginalized groups.
- Community dialogue and conflict resolution, and waste management.

1.3 THE PURPOSE AND AIM FOR THE TOOLKIT/ADVISORY GUIDE OF THE URBAN POLICY FOR MED-CITIES

The purpose of the **CARISMED Toolkit / Advisory guide** is to support and effectively help all interested parties, entities from the public and private sector, as well as local communities, businesses, professionals, or individuals:

- To get familiar with the CE concept both in theory and practice, by encouraging especially the Cultural Creative Industries Small-Medium Enterprises (CCI SMEs) to adopt a new paradigm shift that proves its potential to decouple economic activity from the consumption of finite resources.

- To be informed about contemporary practices that manage to combine the sustainability principles with Creativity, focusing on a more eco-friendly and innovative economy.

- To become knowledgeable and familiar with innovative methods and techniques that gradually create the very dynamic field of the upcycling productivity.

- To be more aware of the Low-Cost Adaptive Reuse Practices (LCARs) and their benefits, that if/when applied within the urban setting, provide the opportunity for CCI SMEs to be less dependent on raw materials and to achieve a smarter use of our planet's limited available natural resources.

The CARISMED Toolkit aims to enhance the efforts and initiatives for the resetting of the built environment. Focusing especially on the transformation of **the building shell** on the one hand and on **the technological/business content** on the other, this guide is going to have a multi-layered function that will support the cross-border level and cross-sector cooperation.

As the main objective of the project is to develop an **Urban Policy for improving sustainability and integrating innovation into the urban setting at Mediterranean cities**, in order to effectively re-structure living and working conditions, the toolkit/ advisory guide will contribute as a key component. More specific, the main characteristics - goals include:

- Promoting innovative approaches / circular economy methodologies for re-setting the built environment at Med-Cities (both the building shell and its technological and business content).
- Providing useful material and data related with the institutional and economic level, business-related issues and entrepreneurship, the built environment, and urban policies etc.
- Highlight new fields of activity and entrepreneurship and approach new aspects of urban policies and practices for the built environment.
- Identifying stakeholders, parties, and networks at regional and national level in order to strengthen the collaboration and to reach and involve new target groups.
- To become the basis of the asynchronous e-learning platform, that will foster the mainstreaming of good practices towards central principles for planning interventions, improving sustainability, and integrating innovation of Cultural and Creative Industries (CCI) SMEs Clustering into the urban setting at Med-Cities.

In this way, the toolkit / advisory guide could be considered more successfully as an open and dynamic process. In conjunction with the CARISMED asynchronous e-learning platform we are aiming to create a flexible structure that will gather, collect and more important feedback with tools, directions, materials, practices, trends etc. Furthermore, this toolkit will work as a perpetual data collection field that we to aim to establish and enhance observation in each pilot area per participating city.

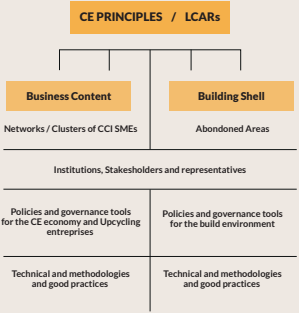
Under this context and given that the proposed CARISMED Toolkit / Advisory Guide is well suited for the resetting of the built environment both in the business content and in the building shell (in Mediterranean level and at the level of individual countries), you may identify, whether (if/ to what extent) there is/ are:

Examples at a local level with high potential of: (a) **CCI SMEs networks** that although inactive or in decline nowadays, can be revived in the near future, through activities related to the Circular Economy (CE) Concept? (b) **Areas in your city** that although abandoned, can be reused through Low-Cost Adaptive Reuse Practices (LCARs)?

A set of implemented **policies, governance tools or financial instruments** supporting similar actions in the direction of CE?

Technical methodologies and good practices which focus on improving sustainability, promoting circular economy principles, upcycling, and integrating innovation.

Institutions, Stakeholders, and representatives of the CCI SME's networks that can play important role.



02.

UNDERSTANDING THE MED-CITY LANDSCAPE

2.1. DEMOGRAPHIC TRENDS AND URBAN CHALLENGES

Between **1960 and 2020**, the Mediterranean Basin underwent significant demographic shifts, with its population more than doubling **from 239 million to 522 million**. However, despite this growth, the region's global share of the population decreased **from 8% to 6.7%** due to slower growth in Euro-Mediterranean countries (Plan Bleu Notes, 2020). Notably, the demographic epicenter moved southeastward, resulting in a generational imbalance: **48% of the 197 million young people under 25** live on the southern shore, whereas **65% of the 65 million people aged 65 or over** reside on the northern shore (*Plan Bleu Notes, 2020; The Barcelona Centre for International Affairs, 2015).*

Image 1 - Growth rate 2015-2035 in the Mediterranean basin. Source: Demographic Trends and Outlook in the Mediterranean, Plan Bleu Notes 38, 2020.

One of the most remarkable changes has been the rapid urbanization. In **1960**, approximately **50%** of the Mediterranean population lived in cities; **by 2020**, this figure **rose to 70%**. Southern and Eastern Mediterranean countries experienced dramatic urbanization, with rates soaring **from 30% to 70% between 1960 and 2015** in countries like Algeria and Turkey. Presently, almost three-quarters of the Mediterranean population resides in urban areas. Furthermore, it is predicted that by 2025, the urbanization rate will reach 74.4%, surpassing many European countries *(Plan Bleu Notes, 2020; The Barcelona Centre for International Affairs, 2015).*

Looking ahead, the United Nations Environmental Programme predicts an increase of almost 100 million people in the Mediterranean region by 2025, primarily from Middle Eastern and North African countries. This growth will pose challenges, particularly in the realm of urbanization. Major cities like Paris, Istanbul, and Cairo are becoming pivotal, accounting for a significant portion of the population (Plan Bleu Notes, 2020). However, these urban areas are grappling with providing essential services, adequate housing, and dignified living standards. Moreover, forward-looking urban planning is essential to accommodate both an aging population and the influx of new inhabitants. The need for efficient urban traffic, mobility solutions, and scaled public services, from waste management to cultural infrastructure, becomes paramount in this context *(The Barcelona Centre for International Affairs, 2015).*

These demographic realities presented above, emphasize the urgency for comprehensive and strategic planning, ensuring that Mediterranean cities can sustainably manage their growing populations, address generational imbalances, and create livable urban environments for all residents. Taking this into account a paradigm shift towards an urban strategy based on the principles of upcycling, innovation and circular economy appears to be paramount for the sustainability of Med cities.

2.2. ECONOMIC SECTORS

The Mediterranean area encompasses 24 countries from Europe, North Africa, and the Middle East. Due to their long history of trade and cultural exchanges, it is possible to identify several similarities between their economic activities between those countries. The region is primarily driven by tourism, service-based industries, agricultural and marine sectors, among others.

The Mediterranean region stands as the primary global tourist destination, contributing to approximately 30% of total tourism revenues worldwide. Moreover, it boasts **20%** of the global hotel accommodation capacity, encompassing over **10,000** destinations and hosting around **100,000 hotels** *(Ditta, 2022)*. Considering exclusively coastal area economies, tourism accounts for over **70%** of Production Value and Gross Value Added *(Plan Bleu, 2022)*. France, Spain, Italy, and Turkey are among the world's top tourist destinations. The African continent's most visited countries are Morocco, Tunisia, and Egypt *(Ditta, 2022)*. As per data from the WTTC (2017), **in 2016, 16%** of the Mediterranean region's population found employment within the tourism sector. These jobs encompass both direct roles in hotels, travel agencies, transportation services, and food and leisure industries heavily reliant on tourism, as well as indirect positions tied to travel and tourism investment spending, government expenditure, and supplier purchases. In the Mediterranean, Fisheries, including aquaculture, are ranked third in socio-economic value, after tourism and transport *(Petrick et al., 2017)*. However, the tourism industry is unevenly concentrated throughout the Mediterranean basin, as well as throughout the year as the majority of tourists concentrate between June and September, leading to significant visitor congestion and uneven income distribution throughout the year. This spatial and temporal pressure has led to phenomena of uncontrolled urbanization, specifically in coastal areas, as well as the so called "littoralization" or Marbellization phenomenon, signifying the intensive urbanization and indiscriminate land occupation, often leading to privatization of shorelines *(Jordi Juan Tresserras, 2003)*.

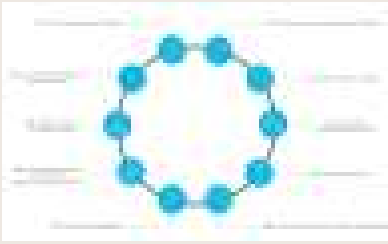


Image 2 – Critical issues concerning the tourism industry in the Mediterranean. Source: State of Play of Tourism in the Mediterranean, INTERREG MED, 2022.

The Mediterranean's strategic position has made it a dynamic economic area, enabling the movement of products, energy, and people. Trade flows within the region account for 25% of all international seaborne trade, which is significant for global trade (Petrick et al., 2022). As a result, Mediterranean countries are important players in the global logistics and supply chain.

This is further underscored by the presence of over 600 ports of various sizes in the Mediterranean basin, as indicated by Virto and Lode (2014). Additionally, the significance of the Suez Canal as one of the world's major commercial routes cannot be overstated. However, it's worth noting that the Mediterranean region is deeply engaged in the China-led Belt and Road Initiative (BRI), encompassing ports along both the northern and southern coasts of the Mediterranean, such as Piraeus in Greece, Ismailia, and Port Said in Egypt. According to MGI, 2017, the maritime transport and trade industry generates approximately 550,000 jobs for local populations and accounts for approximately 20%- 40% of GDP for most Mediterranean countries (MGI, 2017)..

Natural resources, agricultural and manufactured goods are plentiful in countries in the Mediterranean, and they have long-standing trading relations. The exchange of energy is the dominant factor in the value of intra-Mediterranean trade.

Crude oil is exported from the majority of North African countries and Syria. Refined petroleum products, on the other hand, are primarily exported from Croatia, Cyprus, Greece, and Malta to a wide range of EU nations and Egypt. In the case of Bosnia and Herzegovina, electrical energy stands as its principal export commodity. Furthermore, the fertile soil of the Mediterranean region fosters the exchange of various natural resources. This includes aluminum sourced from Montenegro, precious metals, gemstones, and pearls from Palestine and Israel, and gold from Turkey, which stands as a primary export for the nation. Non-energy commodities traded within the Mediterranean area encompass medicaments from Italy and Slovenia, aircraft-related products from France, and vehicles from Spain and Morocco. Notably, Albania and Libya emerge as significant regional importers (Manoli, 2022).

Social unrest, political instability, regional and international wars (Libya, Syria, Ukraine) and internal conflicts (Sahel, Algeria, Tunisia, Spain) contributed to the demise of prosperity within the region in the last decades. Russia and Ukraine's war has caused an energy and food crisis that has now worsened the economic crisis that was already caused by the COVID-19 pandemic. In the present day, Mediterranean countries confront common challenges, largely because of their geographical proximity and robust global interconnections. These challenges encompass issues such as climate change, the depletion of fish stocks, biodiversity loss, high youth unemployment, regional disparities, and migration, to name just a few.

2.3. OVERVIEW OF THE BUILDING STOCK AT A EUROPEAN - MEDITERRANEAN LEVEL

The following information gives an overview of some key characteristics of the building stock at Mediterranean and European level:

There are approximately **131** million buildings within the EU Member States, the vast majority of which (**~90%**) are residential buildings (**~75%** if measured by floor area).

There are **119** million residential buildings in the EU, and their breakdown by building type is as follows: **42%** flats/apartments; **34%** detached dwellings; **24%** semi-detached dwellings.

There are **12** million non-residential buildings in the EU, and their breakdown by building type is as follows: **24%** public and private offices; **23%** wholesale & retail; **18%** educational buildings; **14%** other; **11%** healthcare; **10%** hotels & restaurants.

The largest proportion of the EU building stock is within urban centers (**43%**), with **33%** in urban clusters and **24%** in rural areas.

42% of non-residential buildings and **38%** of residential buildings in the EU were built pre-**1970**, before the widespread adoption of energy efficiency measures, hence there are significant opportunities for energy efficiency retrofits to both residential and non-residential buildings.

In **2002**, Energy Performance Certificates (EPCs) for buildings were introduced (A=most efficient; to G=least efficient), being implemented in the following years (to a different extent) by EU countries. Across the EU, approximately **35%** of buildings have an EPC rating between D and G, suggesting that there is considerable scope for improving existing buildings to reach the most efficient energy performance rating.

In addition to the above, it can be noted that the buildings sector represents approximately 40% of the European Union's total energy consumption and approximately 30% of the total energy consumption in Mediterranean Partner Countries (MPCs). In this respect, the EU has issued Directives on the Energy Performance of Buildings and on Energy Efficiency, and MPCs have been recently adopting regulations in this area.

UNUSED BUILDINGS

The currently available information regarding unused buildings at European level concerns mainly residential buildings:

- Based on **2011** data, more than **38** million conventional dwellings throughout Europe were unoccupied (i.e., vacant or used as seasonal or secondary residences). In ten European countries this represented a figure of more than **20%** of the total number of dwellings being unoccupied. The table below gives an overview of the scale of housing vacancy across the EU. According to national and regional contexts, vacancy rates may be linked to different reasons.

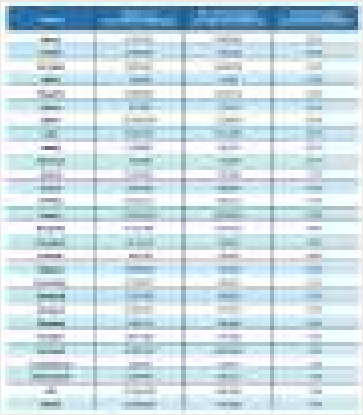


Figure 2 - Percentage of unoccupied dwellings. Source: Eurostat Census Hub, Census 2011

Based on the information sourced by the involved partners in the participating territories of the project, some key figures are summarized below:

	PALESTINE	GREECE	SPAIN	ITALY	TUNISIA	JORDAN
Total number of buildings (National level)	627,383	4,105,637	9,814,785	14,452,680 buildings + 63,115 building complexes		888,028
% of total that are resedential buildings	27,000 buildings in Hebron city containing flats	~79%	~99%	~84.33%		~80%
% of total in potential need of renovation		~58% (built prior to 1980) ~30% (built between 1981-2000)	~56% of residential buildings built before 1980	~25.90% of residential buildings built before 1946 ~60.20% built between 1946-1990		~12.3%(built prior to 1960) ~18.7% (built between 1960-1980) ~30.8% (built between 1980-1999)
% of total privately owned	98%	97%	76.7%	~60% owned ~10% leased		93.1%
Total number of dwellings	1,129,264	6,371,901	25,208,622	24,189,094		2,282,283
% of total unused and/or degraded		~35%	7 million dwellings are secondary houses (14.6%) or empty ones (13.7%).	4.14% of the residential buildings built before 1919 are very degraded;		- 18.5% are empty (21,255 buildings, 432,291 housing units) - 1% are closed (505buildings, 26,581housing units)

			7% of residential buildings considered as deficient, or in bad or ruins state; 0.6% considered as substandard housing.	4.03% of those built between 1919-1946; 1.01% of those built between 1946-1990; 0.17% of those built after 1990.		
% of unused dwellings in potential need of renovation		~56% (built prior to 1980) ~28% (built between 1981-2000)	~59.1% (built prior to 1980)			
Total number of unused buildings in pilot city	- Out of 2,600 buildings in the Old City of Hebron, 1,270 buildings are inhabited and 200 buildings are not appropriate for humans due to health. - 1,500 buildings have been rehabilitated and 800 buildings have been maintained.	~1,500 unused buildings (in Municipality of Athens)			105 locations / spaces, with abandoned buildings in the Medina of Tunis.	~21,760 unused (vacant or closed) buildings at national level.

2.4. IDENTIFYING KEY STAKEHOLDERS IN PARTNER COUNTRIES

Realizing a circular economy (CE) necessitates cooperation among various stakeholders, typically occurring within socio-technical ecosystem contexts where complementary actors work toward the overarching objective of enhancing circularity. These stakeholders and the specific ecosystem settings they operate in are highly diverse, which can influence how stakeholders are involved in pursuing CE goals. Therefore, different approaches to stakeholder engagement are required based on the specific characteristics of each ecosystem setting to successfully attain the objectives of a circular economy (Kaipainen et al., 2023).

Stakeholders advisory group (SAG):

For the purposes of the CARISMED project each partner country was called to form a Stakeholders Advisory Group to assist and guide the partners in issues relating to the urban strategy and selection of the pilot case LCARs implementation as well as the business content, clustering, and cross-border cooperation.

Following, we list the stakeholder's advisory group as selected by each partner in each participating city:

LB (BZU, Palestine):

- The Municipality of Hebron
- Hebron Chamber of Commerce
- Hebron Rehabilitation Committee
- Ministry of Tourism and Antiquities/ Hebron office
- Palestine Polytechnic University- faculty of Engineering
- Environment Quality Authority
- Ministry of Tourism and antiquities
- Palestine Technical University - Kadoorie
- The Ministry of Economy
- Ministry of telecommunication
- Dar AlKalima
- Centre for Cultural Heritage Preservation - CCHP

PP1 (NTUA, Greece) & PP2 (CRES, Greece):

- The Greek Ministry of Environment and Energy (YPEN)
- The Municipality of Athens (Greece)
- The Panhellenic Association of Greek Architects (SADAS-PEA)
- The Panhellenic Association of Engineers Contractors of Public Works (PEDMEDE)
- The Hellenic Section of ICOMOS (International Council of Monuments and sites)
- Region of Attica
- Central Union of Municipalities of Greece (KEDE)
  Technical Chamber of Greece

- Regional Union of Municipalities of Attiki
- Association for Sustainable Development of Cities (SBAA)
- EGTC Efxini Poli - Network of European for Sustainable Development
- Sustainable Building Council (SBC) Greece
- PSYPENEP – Panhellenic Association of Certified Building energy assessors
- Panhellenic Federation of Dealers and Craft Glass (PFDC)
- Panhellenic Federation of Craftsmen in Aluminium & Metal Constructions (POVAS)
- Panhellenic Association of Insulation companies
- Hellenic Federation of Solar Industries (EBIE)

PP3 (CEEIM, Spain):

- Regional Development Agency
- Regional Institute for Cultural Industries and Arts.
- Municipality of Murcia.

PP4 (CRESM, Italy) & PP5 (CNR-ISMED, Italy):

- Dario Distefano/ CCI green and/or innovative SMEs based in Sicily
- Giovambattista Platamone/ CCI green and/or innovative SMEs based in Sicily
- Giovanni Milazzo/ CCI green and/or innovative SMEs based in Sicily
- Giuseppe Guglielmino/green and/or innovative SMEs based in Sicily
- Filippo Condorelli/ green and/or innovative SMEs based in Sicily
- Valerio Lo Presti/ CCI green and/or innovative SMEs based in Sicily
- Marco Terranova/ CCI green and/or innovative SMEs based in Sicily
- Sinatra Salvatore/ CCI green and/or innovative SMEs based in Sicily
- Vincenzo Messina/ CCI green and/or innovative SMEs based in Sicily
- Giuseppe Trovato/ CCI green and/or innovative SMEs based in Sicily
- Benito Frazzetta/ CCI green and/or innovative SMEs based in the area of Palermo
- Anna Barba/ CCI green and/or innovative SMEs based in the area of Palermo
- Rosanna Romano/ CCI green and/or innovative SMEs based in the area of Palermo
- Adriana Di Caprio/ CCI green and/or innovative SMEs based in the area of Palermo
- Letizia Marcenò/ CCI green and/or innovative SMEs based in the area of Palermo
- Giulia Agnello/ CCI green and/or innovative SMEs based in the area of Palermo
- Fabrizio Sciarrino/ CCI green and/or innovative SMEs based in the area of Palermo
- Marco Vella/ CCI green and/or innovative SMEs based in the area of Palermo
- Carmela Dacchille/ CCI green and/or innovative SMEs based in the area of Palermo
- Aurelio Ciaperoni/ CCI green and/or innovative SMEs based in the area of Palermo
- Delia Russo/ CCI green and/or innovative SMEs based in the area of Palermo
- Dawda Barry/ CCI green and/or innovative SMEs based in the area of Palermo
- Grazia Pizzillo/ CCI green and/or innovative SMEs based in the area of Palermo
- Carmicino Giuseppe/ CCI green and/or innovative SMEs based in the area of Palermo
- Federica Tutino/ CCI green and/or innovative SMEs based in the area of Palermo
- Vincenzo Ganci/ CCI green and/or innovative SMEs based in the area of Palermo
- Mariangela Di Gangi/ green and/or innovative SMEs based in the area of Palermo
- Gabriele Tramontana/ CCI green and/or innovative SMEs based in the area of Palermo
- Salvatore Di Dio/ green and/or innovative SMEs based in the area of Palermo
- Marco Spinelli/ CCI green and/or innovative SMEs based in the area of Palermo

- Tatiana Lo Iacono/ CCI green and/or innovative SMEs based in the area of Palermo
- Alessandro Ferraro/ CCI green and/or innovative SMEs based in the area of Palermo
- Aurelio Greco/ CCI green and/or innovative SMEs based in the area of Palermo
- Claudia Di Bella/ Educational institutions
- Marco Picone/ Local Media
- Marta Genova/ Local Media
- Salvo Palazzolo/ Local NGOs
- Martina Andò / Local NGOs
- Cesare Arangio/ Local NGOs
- Nicola Teresi/ Local NGOs
- Tommaso Castronovo / Local NGOs
- Silvia Timoneri timoneri/ Local NGOs
- Mirna Summa/ Municipally owned corporation
- Sergio Maneri/ Public institutions
- Angela Errore/ Educational institutions
- Giovanni Battista Dagnino/ Educational institutions
- Giuseppe Notarstefano/ Public institutions
- Luciano Seta/ Public institutions
- Roberto Foderà/CCI green and/or innovative SMEs based in Sicily
- Luciano Falqui/Public institutions
- Antonio Giannettino/ Public institutions
- Fabrizio Geraci

PP6 (CC, Tunisia):

- Municipality of Tunis – International Relations
- Municipality of Carthage
- Municipality of Ariana
- Cleanliness Commission – Municipality of Tunis
- City of Culture
- AMPVCC: Agency for heritage enhancement and cultural promotion
- Hub Créatif Nejma Zahra
- The National Heritage Institute (INP)
- Impact Partner
- Minassa
- Afkar
- Shanti
- Croissant rouge
- M3ak
- Association React
- Asso. Tunisia Recycling
- New Silk Roads
- Moudha Okhra
- Carthagena
- GIE Mdinti
- El Space
- FabLab Orange
- M3ak
- Association React
- Asso. Tunisia Recycling
- New Silk Roads

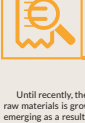
- Moudha Okhra
- Carthagena
- GIE Mdinti
- Atelier Recyclage Tunisie ART (Tunisie Recyclage) : upcycling de packaging divers en accessoires de décoration, accessoires de mode etc..
- Ghalia Dammak : Compo Roll (rotary composter for domestic use)
- Sofiene Rouis : Tunisie aquaponie (circular and 100% organic soilless cultivation)
- Lassad Zouari : Homemade composter / Bel Iron selective sorting bins
- El warcha (Benjamin perrot, Fourat Jomni, Radhouane BouDhraa) : research of bio-materials
- Jardin Amazygh – natural beauty productIs and Bulk Bar (sale of product without packaging).
- Ridha Ghrab : Diagonale Eco Art Design (Unique jewelry, handmade, decorative items such as baskets, paint in paper, cable and any other material ...)
- Rascal - Thomas Egoumendes
- Né à Tunis (Chamseddine Mechri)
- Pedalo - Amani Hamdani : delivery by bike
- Chkarty tote bags: texile waste upcycling
- Najen Nature
- L'arche": educological garden
- chutes de VP Meubles Sarl
- Indinya
- Khayreddine Khelifi CEO GREEN PLUS
- Myriam Nailli
- A'Deco_ Amine Yaiche
- lighting & basketry
- Atelier Recyclage Tunisie ART (Tunisie Recyclage) : upcycling of various packaging in decorative accessories, fashion accessories etc.
- Drosos
- Hivos
- Monegasque development cooperation
- UNDP
- A HABITAT
- Nawaat
- Boubli

PP7 (FPEC, Jordan):

- Ministry of Local Administration
- Ministry of Environment
- Ministry of Tourism and Antiquities
- Ministry of Industry
- Ministry of Municipal Affairs
- Municipality of Madaba
- Department of environment in Irbid Governorate
- Department of Tourism in Irbid Governorate

03.

THE CIRCULAR ECONOMY (CE) CONCEPT

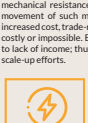


3.1 THE BACKGROUND

Until recently, the human-nature relationship was simplified to one of exchange value. The demand for raw materials is growing worldwide and the supply of crucial resources for production chains is limited, emerging as a result of overconsumption. Half of the world population lives in cities today, which makes them vital environments for socio-economic progress. At the same time, it has
been reported that cities account for between 60% of resources used and 70% of global carbon emission (UN, 2022; CESD, 2022). The overpopulation, finite supplies, resource scarcity, rapid urbanization, increase of social inequalities (energy poverty etc.) and climate change are augmenting threats challenging the livability of human settlements.

The dominant development models accumulate negative environmental impacts (Pintossi et al., 2021). Human environment along with anthropogenic pressures and human-related drivers of change play a detrimental role in the depletion of natural resources (Huovila, 2007; Kibert, 2007; IPCC, 2015; Sanchez et al., 2019), but gradually the urban areas take center stage at the sustainability agenda. The urban built environment circular approaches to counter the negative impacts of rapid urbanization are gaining traction, but implementation remains slow (CESD, 2022)..

Circularity of products from the construction and demolition sector is substantially affected by safety, mechanical resistance, stability, etc. Although the EU regulation provides a basis for the marketing and movement of such materials within the EU, previous experience has flagged substantial problems, e.g., increased cost, trade-related laws, red-tape issues, making moving throughout other regions to turn out to be costly or impossible. Besides standardized approaches, urban growth happens within informal settings, due to lack of income; thus, it is crucial to search for existing informal CE development alternatives and aim for scale-up efforts.



3.2 THE GREEN TRANSITION

The growing acceptance of climate change and (especially) the energy crisis, has led to policies that target to decrease energy emissions and consumption of scarce energy reserves. Green transition becomes one of the most important goals for the coming years and in this context a range of political declarations and measures are developed, as well as a range of scientific and technological approaches, solutions, and tools.

The 2016 Paris Agreement on Climate Change is the first universal, legally binding global climate agreement. Signed on 22 April 2016 and ratified by the European Union on 5 October 2016, aims to curb global warming to 1.5 ℃ compared to pre-industrial levels, recognizing that this will significantly reduce the risks and effects of climate change. Implementation of the Paris Agreement requires economic and social transformation, based on the best available science and through working on a 5- year cycle of increasingly ambitious climate action carried out by countries, which by 2020, submit their plans for climate action known as nationally determined contributions (NDCs).

Furthermore, the last scientific report of the Intergovernmental Panel on Climate Change (IPCC), emphasizes that human's influence on the climate is indisputable and emphasizes in every way, that the climate crisis is here. The changes that are observed are significant and, in many cases, irreversible -such as the continuous rise in sea level-. In all climate scenarios examined, it is observed that the temperature continues to rise in the coming years. In order to be able to contain the increase in the average global temperature to 1.5ºC, as proposed by the Paris Agreement, zero clean global greenhouse gas or zero balance emissions must be achieved by 2050 (climate neutrality). Human activities today still have the potential to determine the future course of climate change and therefore require significant and ongoing efforts and planning to curb climate change.

THE UN GLOBAL PERSPECTIVE

Needless to say, that the attempt to achieve the Green Transition is indissolubly linked with a global perspective seeing and understanding how any situation impacts or relates to people around the world. The United Nations has achieved ground-breaking agreements in recent years, offering 24 nations worldwide the framework to move towards greater environmental sustainability and social justice. The 2015 Sustainable Development Goals (SDGs) were adopted by 193 nations. They are 17 goals committed to ending poverty, protecting the planet, and ensuring prosperity for all. The Habitat III 2016 New Urban Agenda (NUA) was adopted by 167 nations and sets a new global standard for how people can plan, manage, and live in cities. These two agreements are closely connected, with the New Urban Agenda seen as the delivery vehicle for the Sustainable Development Goals in urban settlements. Integrating these two approaches and aligning the individual Sustainable Development Goals with the principles and commitments made in the New Urban Agenda is essential. In particular, this is demonstrated through the example of SDG11: Sustainable Cities and Communities. Enabling national, sub-national and local governments and all relevant stakeholders to work together for an urban paradigm shift is considered as a key instrument to achieve sustainable urban development.

FROM A EUROPEAN PERSPECTIVE

The EU aims to be climate-neutral by 2050, an economy with net-zero greenhouse gas emissions. This objective is at the heart of the European Green Deal and in line with the EU's commitment to global climate action under the Paris Agreement. The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a better future for all. All parts of society and economic sectors will play a role - from the power sector to industry, mobility, buildings, agriculture, and forestry.The European Green Deal aims to make Europe climate neutral by 2050, boost the economy through green technology, create sustainable industry and transport, and cut pollution. Turning climate and environmental challenges into opportunities will make the transition just and inclusive for all. As part
of the European Green Deal, the Commission proposed on 4 March 2020 the first European Climate Law enshrines the 2050 climate-neutrality target into law. The law also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Climate neutrality by 2050 means achieving net zero greenhouse gas emissions for EU countries, mainly by cutting emissions, investing in green technologies, and protecting the natural environment. The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part.

3.3 CIRCULAR ECONOMY

The concept of the circular economy responds to the ambition for sustainable development in the context of increasing pressure from the production and consumption of resources and the planet's environment. Until now, the economy has operated mainly according to the 'take-make-dispose' mode (Ellen MacArthur Foundation, 2013) - a linear model in which each product inevitably reaches the 'end of its useful life.'

Precious materials are used for food production, infrastructure and housing construction, the production of consumer goods, or energy supply. When these products are consumed or no longer needed, they are discarded. However, population and wealth growth are making the demand for scarce raw materials greater than ever before, leading to environmental degradation. Metals and minerals, fossil fuels, animal feed, food, but also clean water and fertile soils have become more expensive.

Every year in the EU, almost 15 tons of materials are used per person, while each EU citizen produces on average more than 4.5 tons of waste per year, of which more than half ends up in landfills. A linear economy based solely on resource extraction is no longer a viable option.

The transition to a circular economy requires a change of focus on reuse, repair, renewal, and recycling of existing materials and products. What was previously considered "waste" can be transformed into raw materials (INNOMED-UP, 2023).

Circular economy is a wide concept, applicable to all sectors. It is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution (Ellen MacArthur Foundation). It involves, among others, new production, and consumption models, as well as new forms of distribution or businesses' internal organization. A circular economy affects all dimensions of sustainability: economic, social, cultural, and environmental (INNOMED-UP, 2023).

Image 4 – Circularity Diagram. Source: United Nations Environment Program (2019), UNEP circularity platform

The use of the term Circular Economy has been first coined by Pierce and Turner in 1989, although the theory has older roots. In fact, the concept belongs to two conceptual streams that go back to the early days of the modern environmental movement in the 1960s and 1970s and have a subsequent symbiotic relationship with it. The first is related to the flow of materials through an economy (industrial ecology), and the second is concerned with thinking about the economic conditions that might bring about such a flow (Ekins et al., 2019).

The linear model maximizes the uses of collected raw materials before transforming them into products, eventually disposing of unusable material. Planned obsolescence is an underlying strategy of this model: products are designed to have a limited lifespan to encourage consumers to buy them again (European Parliament, 2022), promoting a high production rate and generating a large amount of waste to be disposed of. The open cycle exhausts raw materials and energy, which results in CO_2 emissions and several environmental impacts.

By adopting a circular approach, it is possible to close the loop of materials flow. Thus, life cycle extension strategies are pursued, extending the useful life of products acting at the designing stage, or carrying out actions at the end of the pipe, like recycling or recovery, to prevent the disposal of the product's component: when a product reaches the end of its life, its materials are kept within the economy wherever possible. These can be productively used again and again, thereby creating further value. Each life step of a product must be optimized until the end-of-life. At this point, it must be recovered and reused as starting material in another supply chain, adding value to the chain itself (INNOMED-UP, 2023).

Circular economy is achieved through the implementation of the following Nine Rs (Kirchherr et. al., 2017):

Refuse: Making a product redundant by abandoning its function or offering the same function with a radically different product.

Rethink: Making product use more intensive through sharing products or putting multifunctional products on the market.

Reduce: Increasing efficiency in product manufacture or use by consuming fewer natural resources and materials.

Reuse: Allowing another consumer to reuse a discarded product that is still in good condition and fulfills its original function(s).

Refurbish: Restoring an old product and bringing it up to date.

Remanufacture: Using parts of a discarded product in a new product with the same function.

Repurpose: Using discarded product or its parts in a new product with a different function.

Recycle: Processing materials to obtain the same (high grade) or lower (low grade) quality.

Recover: Incinerating materials with energy recovery.

The circular economy describes an economic system based on business models that replace the 'end-of-life' concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks), and macro level (city, region, nation, and beyond) to accomplish sustainable development (Kirrchherr et. al., 2017). The circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature.

The circular economy represents a sustainable way to preserve the environment while maintaining high-quality life standards. Moving toward a circular model could bring several benefits. The European Parliament reports that measures such as waste prevention, eco-design, and reuse could save 28 companies money while also reducing total annual greenhouse gas emissions. Currently, the production of materials utilized every day within Europe accounts for 45% of the CO2 emissions. Moving toward a more circular economy could deliver benefits such as reducing pressure on the environment, improving the security of the supply of raw materials, increasing competitiveness, stimulating innovation, boosting economic growth, and creating jobs.

The EU Parliament defines the circular economy as a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible. The circular economy represents a sustainable solution that addresses global challenges such as climate change, biodiversity loss, waste, and pollution, creating a pathway toward a more environmentally friendly and economically prosperous future (INNOMED-UP, 2023).

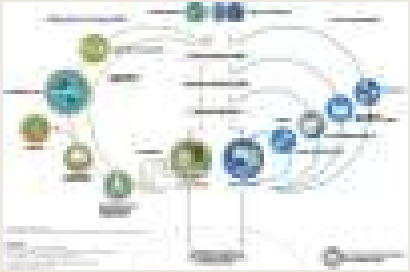


Image 5 – Circular Economy Butterfly Diagram. Source: Ellen MacArthur Foundation, Circular economy systems diagram (February 2019).

- **Companies often lack the awareness, knowledge or capacity required to pursue circular economy solutions.**

- **Existing systems, infrastructure, business models and technology often lock the economy into a linear model.**

- **Investments in efficiency improvement measures, or in innovative business models, remain insufficient as they are considered precarious and complex.**

- **Demand for sustainable products and services may remain low, especially when it requires behavioral changes.**

- **Prices often do not reflect the true costs to society of resource and energy use.**

The political impetus for the transition to a circular economy is not strong and consistentenough (Publication Office of the EU, 2014).

OPPORTUNITIES

Measures such as improved eco-design and waste prevention and reuse can generate net savings of up to €604 billion for businesses across the EU, equivalent to 8% of their annual turnover, while reducing total annual greenhouse gas emissions by 2-4% (AMEC et al, 2013). Overall, implementing additional measures to increase resource productivity by 30 % by 2030 could boost GDP by almost 1 %, while creating over 2 million new jobs in a common practice scenario (Cambridge Econometrics et al., 2014).

European Citizens are convinced that there is a strong positive link between growth, employment and resource efficiency. A recent Eurobarometer poll (Eurobarometer Flash 388) revealed that a significant majority of citizens believe that the impact of more efficient use of resources would have a positive impact on the quality of life in their country (86%), on economic growth (80%), as well as on employment opportunities (78%). Moreover, they see waste reduction and recycling, both at home (51%) and in industry and construction (51%), as the most important way to enhance resource efficiency.

3.4 THE LCARs STRATEGY

The proposed Urban Strategy of CARISMED Project marks just the beginning of our common journey, having a specific starting point in order for each interested party to be able to understand and then advocate for why we need to switch to a circular economy. A methodological approach is proposed as the pathway of generic character to explore and identify: what does LCAR stand for, who benefits from it, how does this work especially in the Mediterranean basin? Thus, there is a desirable endpoint we'll aim to reach to complete this process, concluding on: how will this proposed Strategy be accomplished -through the prism of CE?

This part provides as a first step suggestions on how to assess local and regional context needed to identify which targets to aim for and adopt the right policy strategies. It gives insights on how to choose and define priority areas.

The purpose is to put emphasis on a (micro/macro-)scale level, relating to diverse spatio-temporal qualities. In this regard, the approach sets four research axes, one of which intersects with each of the other four:

1. The Circular Economy (CE) concept beyond recycling -referred to as circularity, which "is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible" (EU Parliament, 2022).

2. The planning policies for the urban built environment, particularly in the **Mediterranean cities**, which "is a material, spatial, and cultural product of human labor" that provides the urban setting for human activity, including all supporting infrastructure (Elsevier-ScienceDirect, 2022).

3. The cultural heritage resources that constitute the unique identity features of a place, which "is an expression of the ways of living, developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions, and values. It is often expressed as either intangible or tangible cultural heritage" (ICOMOS-IICoCT, 2002)1.

4. The territorial impact from the point of view of CCI SMEs' business model in European Union Mediterranean Countries (EUMCs) and Mediterranean Partners Countries (MCPs), which "refers to the direct effect of socio-economic activities and natural events on the components of the [society, economy and] environment" (OECD, 2022).

1. Cultural heritage (definition): (a) monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of Outstanding Universal Value from the point of view of history, art or science; (b) groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of Outstanding Universal Value from the point of view of history, art or science; (c) sites: works of man or the combined works of nature and of man, and areas including archaeological sites which are of Outstanding Universal Value from the historical, aesthetic, ethnological or anthropological points of view https://whc.unesco.org/en/guidelines/

In pursuit of human wellbeing, the Strategy is well suited to cultural creative industries but also to the construction sector. In this way, upcycling of materials that were discarded after primary use, as well as refurbishing and adaptively reusing underutilized or abandoned buildings or areas can extend the life cycle of products and the useful lifespan of building stock. This implies reducing the consumption and waste of products and materials to a minimum. When a product reaches the end of its life, its materials are kept within the economy wherever possible.

These can be productively used again and again, thereby creating further value, contributing to future sustainable development by revitalizing the urban environment whilst achieving competitive advantages for a city and its citizens with low-cost solutions. LCARs are in direct opposition to the obsolescent traditional, linear economic model, which is based on a take-make-consume-throw away pattern ("the end-of-life concept"). They actually reflect the changing needs of local communities who seek a new balance and reject the previous consumption-based model. These consist of eco-design principles, including "do it yourself" (DIY) products and ready-to-deploy solutions but also sophisticated scientific techniques for the retrofit, rehabilitation and redevelopment for a wide range of buildings and areas. They are able to deliver benefits such as reducing pressure on the environment, improving the security of the supply of raw materials, increasing competitiveness, stimulating innovation, boosting economic growth, creating jobs, providing durable solutions, increasing the quality of life, saving money in the long run. A systemic change to be initiated and gradually achieved demands radical shifts in the consumption, production, planning, policies, lifestyle, cultures, and values.

The PBL Netherlands Environmental Assessment Agency (2018) defines ten strategies for circularity that can be used to build successful circular products and material flows across the EU (ESPON, 2019): Refuse (R0), Rethink (R1), Reduce (R2), Reuse (R3), Repair (R4), Refurbish (R5), Remanufacture (R6), Repurpose (R7), Recycle (R8), Recover energy (R9). Each one of these strategies is based on making use of different business models, infrastructures, relationships with different stakeholders, policies. At the same time, they are influenced by different drivers and various barriers.

Having substantial benefits by changing consumption and production patterns, e.g., a smarter product use and manufacture that minimizes the use of raw materials and resources or reduces waste generation.

Being less radical in reducing raw materials and resource consumption but still have a positive impact on our environment by extending the lifespan of products and their parts, e.g., by reusing, repairing, refurbishing, remanufacturing, etc.

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Being widely used, e.g., include the useful application of materials through recycling or recovery, but show the least results in terms of solving the environmental problems we face.

Figure 3 – Circular Economy strategies for circularity. Source: EPSON (2019).

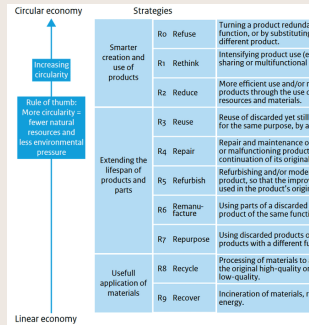


Figure 4 - Circular Economy strategies for circularity. Source: PBL Netherlands Environmental Assessment Agency (2018).

Having in view the promotion of CE strategies in Med-cities and the familiarization of CCI SMEs with the Low-Cost Adaptive Reuse Practices (LCARs), it is advised to look deep into the local characteristics of building stock, as well as the structure and dynamics of the production and supply chain:

- From each building unit up to a broader urban area.
- From newly built to relatively old building stock or cultural heritage of the recent or distant past.
- From an obsolete business model to the CE transition by making use of eco-design principles and cooperative modes, by enhancing the cross-border knowledge sharing and experience exchange.

Table 2 – MATRIX of socio-economic, environmental parameters for LCARS.Source: Based on CARISMED project approach.

Public **POLICIES**	Best **PRACTISES**	Med-cities **URBAN SETTING**		**CCI SMEs** target group
• international level **cultural heritage/ environmental protection** • EU level eg. Green Agenda, **Circular Economy,** New Bauhaus, etc • national level **urban planning**	• **low cost** **adaptive** (smart) **re-use** *recomposition (G. Giovannoni)	• **newly** built • relatively old of **recent** past old of **distant** past and/or cultural heritage resources	• microscale level **building** stock • macroscale level urban **area**	business model transition: • towards **circularity & up-cycling** • towards **cooperative modes**

Our goal is to map the current state of circularity in the urban built environment, existing challenges, potential circular solutions, and innovative approaches for implementing circular material flows at the urban level, most probably with a focus on construction and demolition waste or nature-based solutions, while exploring the concomitant cross-cutting theme of digitalization (CESD, 2022).

Thus, divided into the following successive stages, a LCARs rehabilitation strategy needs: (a) to decide which specific parameters are considered as drivers or barriers of change having a positive, negative or ambiguous impact, at a national and a local level; (b) to choose which strategic axes to set as more appropriate in their case; and (c) to focus on inter(-sections/dependencies) among public policies and characteristics of geographical space, composed by natural and artificial elements. E.g., The location or scale parameters include socio-economic, environmental, cultural, historic aspects, and define the spatial heterogeneity and development patterns for a broader territory or a community.

So, what might be a realistic and motivational orientation to drive forward our research on LCARs? Certainly, the Circular Economy (CE) to achieve a sustainable (resilient to multiple "crisis") economy; the building stock as well as the construction industry to achieve a lower environmental impact; the rapid urbanization trends worldwide that underscore sustainable urban planning research; the safeguard of cultural heritage resources embodied in the urban built environment, are proposed to be placed at the heart of our joint actions in CARISMED Project; keeping in mind the future sustainability for Med-cities. Through this approach, interested parties will be able to conclude on their own behalf, what are the fundamental elements of the specifications relating to the applications of Low-Cost Adaptive Reuse Practices (LCARs).

To summarize and refine the main areas for action, the Urban Strategy of CARISMED Project lies upon ESPON approach (2019), in order to support the innovation performance of CCI SMEs, proposes:

- **Assessing the local context and potential for a CE shift, e.g., by applying the SWOT analysis technique to trace the economic, regulatory, behavioral/socio-cultural, technological, and knowledge-related strengths, weaknesses, opportunities, and threats.**
- **Setting the right priorities for the strategy including targets and vision.**
- **Setting the governance and implementation by involving key stakeholders**
- **Ensuring favorable framework conditions via helping set a coherent policy mix that seems most suitable for each participating city..**

3.5 INSPIRING PRACTICES

In 2002, in Paris, Doina Petrescu and Costantin Petcou establishes "atelier d'architecture autogérée" (aaa - Studio for Self-managed Architecture), a practice based on the collaboration between local residents, institutions, universities and non-governmental organizations (NGOs), aiming to reuse the urban leftover space by participatory procedures both during the design phase and the future management of the infrastructure proposed. One of their recent projects, named Passage 56, consists of a productive garden placed in a Parisian "passage" constructed with low cost means and recycled materials in collaboration between residents and local administration.

An interesting case involving new technologies and innovation to answer major environmental and social questions of contemporary cities is that of Ezio Manzini, who is Professor on Design for Social Innovation at ELISAVA Barcelona School of Design and Engineering, Barcelona, Spain. Manzini promotes the use of design and technology to create tools that are engaged in the organization of small-scale, local and grassroots initiatives.

These strategies, highlighted as "service design", are suggested as active design methods, including people's collaboration, to confront contemporary everyday life.

In 2012, during the 13th Venice Biennale of Architecture the German Pavilion proposed an exhibition titled "Reduce/Reuse/Recycle" dealing with practices engaged with what already exists in the city. In the context of the Biennale Mathieu Wellner discusses with the architects Anne Lacaton and Jean Philippe Vassal their approach on cost effective solutions for the re-use and acknowledgement of the existing city's potential. Expanding their statement against demolition as a non-sustainable proposal, they developed through the years a series of projects regarding the refurbishment of existing social housing buildings based on alternation and the possibilities for reform space. Recently studio Lacaton & Vassal has been awarded with the two most prestigious architecture awards internationally, the Mies van der Rohe Prize (in 2019) and the Pritzker Architecture Prize (in 2021), highlighting their will through architecture towards democratization, and responding to ecological emergencies.

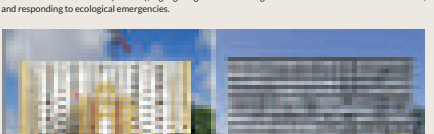


Image 7 – Inspiring Practices - Lacaton & Vassal – Transformation of 530 dwellings in Bordeaux,

In 2019 was published the brief for the architecture competition regarding the building for the services of the General Secretariat of Infrastructure of the Greek Ministry of Infrastructure and Transport. The winner proposal was the one of ARSIS ARCHITECTS, a project that provides an urban structure mainly formed of public space and landscape infrastructure. The project was awarded recently with the "Rethinking the Future 2022" first prize for an exemplary proposal concerning energy efficiency, sustainability, innovation, and adaptability.

In 2022, referring to this year's Pritzker Prize Laureate (2022), Diébédo Francis Kéré, born in Burkina Faso and practicing both there and in Berlin, is an inspiring case of the architectural process to provide quality space with the minimum means and resources, by reforming the local materials and building techniques. Transforming the local material's capacity through design offers social infrastructure, engaging social and economic environments in low cost and sustainable architecture methodologies.

Image 8 – Inspiring Practices. From left to right: Isla Architects – Loggia Baseliana Pavilion, Diébédo Francis Kéré – Lycée Schorge

IIn 2022, the Architekturwoche Basel (AWB) is a biennial event for architecture and urban development inaugurated this year, with the title "Reale Räume" (Real Spaces) confronting fields of a global scale such as climate change and the post pandemic effect in urban life. Under the AWB auspices the architecture studio "isla" developed the Project for Basel Pavilion named "Loggia Baseliana" to host the biennale's activities. The project consists of a pitched roof covering a linear passage in parallel with the railway tracks, composing a ceremonial pavilion made of reused building.

04.
THE BUSINESS CONTENT

4.1 THE ROLE OF CCI SMEs

According to study created by Earnest & Young (EY), published Dec. 2015 "Cultural times: The first global map of cultural and creative industries December 2015, page 11" published on the UNESCO website:

UNESCO defines cultural and creative industries as activities "whose principal purpose is production or reproduction, promotion, distribution or commercialization of goods, services and activities of a cultural, artistic or heritage related nature." (INNOMED UP, 2023).

The cultural and creative industries (CCIs) ecosystem represents approximately 3.95% of EU value added and employs around 8 million people, including around 1.2 million firms, over 99.9% of which are small and medium-sized enterprises (SMEs) (European Commission, 2023).

Development of cities is closely linked to creative productive activities. It is often observed that these activities are located in city centers, benefiting of the advantages offered by the location, such as the low cost of transportation and raw materials and products, affordable rents, and the possibility of finding a skilled workforce. In this favorable spatial context, the cooperation and networking are developed between related Cultural Creative Industries (CCIs) and other relevant Small Medium Enterprises (SMEs), and clusters are created. The resulting social and economic interconnections further strengthen this ecosystem, creating a particularly characteristic Historical Urban Landscape.

Cultural and Creative Industries (CCIs) have been important drivers of economic and social innovation. They flourish mostly at the local and regional level, boosting local economies and stimulating new activities while also present significant spill-over effects on other economic industries.

Activities such as design, architecture and advertising could play an important role in supporting other value-added activities as new technologies, digital economy, or environmentally friendly solutions. On the other hand, activities such as performing arts, theatre, music industry and so on are blooming both at European and international level, proving the importance of culture as a growth lever. Moreover, crafts, publishing, fashion, and other creative professions are the modern continuation of past, traditional roots across Europe and the Mediterranean, adding value to local economies and forming the symbolic aspects of urban centers too.

Dealing with creative and cultural industries linked concepts such as Creative Economy, Creative City, Creative Class etc. are popping up and this is a discussion which remains open among international and European organizations. Today, the Cultural and Creative Industries can boost urban economies by promoting new activities. They also strengthen other related economic sectors. Crafts, publishing, fashion, and a variety of other applied arts are the contemporary expression of traditional activities that flourished in cities, adding value to local economies, and shaping the symbolic aspects of urban centers.

It is considered that the CCIs can play an important role in achieving the goal of sustainable urbanization. Therefore, cities must create a resilient ecosystem that can create new networks of cooperation between SMEs and other actors that can contribute to the circularity of the urban environment.

4.2 DOMAINS AND SECTORS

The cultural and creative sectors encompass all areas where activities stem from cultural values or various artistic expressions, whether created by individuals or groups. These sectors play a vital role in the ongoing progress of societies and form the core of the creative economy. Relying heavily on knowledge and individual creative abilities, these sectors not only generate significant economic prosperity but also play a crucial role in shaping a collective European identity, culture, and values. They exhibit exceptional growth rates, providing employment opportunities, especially for the youth, and contribute to enhancing social unity (INNOMED-UP, 2023).

A study prepared for the European Commission (Directorate-General for Education and Culture) October 2006 by KEA, the pioneer study "The economy of culture in Europe" (KEA 2006) provides a thorough assessment of the Cultural & Creative sectors in Europe. In this study, various definitions of the cultural and creative industries are examined concluding to a proposed delineation of cultural and creative sectors that provides insight into the contribution of culture and creativity to the European economy.

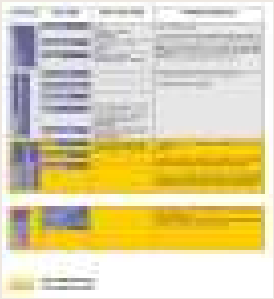


Image 9 – Delineation of the cultural and creative sectors. Source: "The economy of culture in Europe" (KEA 2006).

Image 10 – Different approaches in the delineation of the cultural creative industries in Europe. Source: "The economy of culture in Europe" (KEA 2006).

4.3 CIRCULAR PRACRTICES FOR CCIs -UPCYCLING APPLICANTS AND GOOD PRACTICES

The cultural and creative sectors can significantly contribute to the shift from a linear to a circular economy by visualizing and communicating resource and product consumption. They establish cultural ecosystems that showcase processes like cultural transformation, local production, and sustainable practices, fostering a circular approach. Within these sectors, there is a strong emphasis on circular elements such as waste prevention, eco-design, reuse, and repair. Various initiatives connect the circular economy and the creative sector, including repair cafés, maker movement initiatives, second-hand marketplaces, and educational activities initiated by local governments (INNOMED-UP, 2023).

In more formalized contexts, sectors like architecture, fashion, and design are demonstrating their potential in improving circular practices. Reusing, recycling, and upcycling have become integral concepts in these industries. Urban planning incorporates the reuse of abandoned buildings and public spaces, along with the implementation of green buildings. Eco-architecture focuses on the reuse and recycling of materials, and the fashion industry emphasizes recycling and upcycling as solutions to minimize the impact of textile items (INNOMED-UP, 2023).

It's crucial to recognize that embracing circular practices preserves the value of materials and enhances creativity within production processes. Human input, particularly in creatively reusing materials, adds value to the resulting products. The creative and cultural sector offers numerous upcycling applications, spanning various sub-areas, each emphasizing

specific upcycling practices. Several practical examples, including projects and brands, illustrate these applications, demonstrating the sector's potential in fostering a circular economy. This information was synthesized for the INNOMED-UP Guide on Circularity and contributed valuable insights to the CARISMED project.

Table 3 - Upcycling Applications and Practical Examples in CCI SMEs.
Source: INNOMED-UP Programme, 2023

			UPCYCLING APPLICATIONS	PRACTICAL EXAMPLES
CORE ARTFIELD	VISUAL ART	CRAFTS	Several examples of reusing product or parts of it, restoring or repurposing it into a new functional product. Examples may be found in the productive field, among handicraft SMEs, and in the domestic field. Emblematic of the latter case are the DYT movement, decoupage, or the repurpose of homewares and furniture. Academic literature on this regard is low, but a lot of handbooks and tutorials for consumer use are available.	No War Factory (Laos-Italy) produces jewelry starting from unexploded mines, and bombs' waste collected in Laos
CORE ARTFIELD	VISUAL ART	PAINTING	Upcycling painting means be aware of the material uses: often paints required several chemical processes to be made and sometime may be toxic. Artists should prefer natural colors, or at least certified. Alternatively, paints may be replaced with other materials, thus relying on the patchwork or the decoupage techniques.	Ian Berry: English artist who made painting using jeans scraps.

		SCULPTURE	Several examples of sculptures made by waste materials are available around the globe. This artistic trend aims to spread awareness regarding linear society. Plastic is indeed the most frequent waste material used in this regard.	Benjamin Von Wong is a Canadian artist who made sculpture with discarded plastics, specially using old single-use bottles. Yong Ho Ji is a South-Korean artist who made animal sculpture starting from old tires. Seo Yong Deok is another South-Korean sculptor who uses instead old bicycle's chains. Scart (Italy) is a project that uses industrial wastes like furniture's components, garments or lamps to create unique artworks or installations.
		PHOTOGRAPHY	Nowadays photography is almost dematerialized. Even if analogic machines are coming back in vogue, they remain niche products. Nonetheless, photos are still printed for various purposes (advertising, expositions etc.). Particular attention should be paid to the printing phase. Both inks and paper may be potentially toxic or polluting. Choosing to print photos in a sustainable fashion is a way to spread upcycling in the photography sector.	
		CINEMA OPERA DANCE THEATRE	Within the performing arts sector, upcycling often deals with costume design and sustainable set design. Those two dimensions may pertain to the design field, but in this arts context their potential may be enhanced. In fact, performing arts' purpose is to convey a message, and so they may effectively boost community awareness about circular economy or environmental crisis if they show consistency between their message and their process (so the materials involved in costume and stage).	Reet Aus is an Estonian set and fashion designer. She created the certification UPMADE for upcycling textile, and then she extended it to the theatre sector. The certification imposes the mapping of waste flow within the theatre. It also guarantees that almost all materials required in the set are collected locally, and materials should be assembled in a way to easy future disassembly and reuse in other sets.

		FESTIVAL	The festival field requires a separate discussion. Several festivals nowadays recognize the value of sustainability and circularity. Since they represent a spot in which people usually stay for more days, they experience a huge flow of materials, which eventually becomes a waste flow. Planning (starting from the decision of the location) and management (e.g., check of materials allowed to enter, rubbish bins) are two of the main important elements to bring the idea of upcycling in this context.	WeLoveGreen (Paris), DGTL (Amsterdam), Woodster (Lyon), and Flow Festival (Helsinki) are the most famous festivals coupling entertainment with sustainability. The latter aspect is generally implemented by supporting public or sharing transport to arrive at the festival's spot, not allowing the entrance of single-use plastic, providing free fresh water, and collecting separate waste flows. Eventually, festival stages are designed in an upcycled fashion, they may be made from recycled items, or they may be directly disassembled and reused somewhere else.
		MUSEUM	Waste museums, or museums hosting exhibitions based on waste, are becoming popular around the globe. They usually show sculptures or pictures made from residual waste. From the architectural point, renovation of museum's structures inspired to circular economy may enhance buildings' performance.	Waste Museum (Nigeria): the museum hosts a permanent section focused on plastic wastes collected in the ocean. Archeoplastica (Italy): the virtual museum collects various waste materials from the beaches, then they are catalogued to show their age and their original use. Waste Museum SOS (Mexico): it hosts sculptures and painting made from urban waste materials. Plastic Museum (Spain): a temporary museum built completely by plastic and showing several plastic items of common use. The whole construction can be disassembled and completely reused or safely recycled into new high-quality plastic.

		ARCHEOLOGICAL SITES	Archeological sites may benefit from a circular management aiming to upcycle the system. Upcycling in this context may pertains the adaptive reuse of ancient building, the choice of materials and paint to restore buildings, sculptures and paintings into the site, or, at the same time, to manage public access (through a check of allowed materials, differentiate bins, the provision of drinkable water).	
		LIBRARIES	Libraries, adopting the idea of books as a service, configure themselves as an upcycling system from the beginning. It should be noted that in recent times Tool Libraries are popping up around the globe.	Berkley Tool Library (USA), the oldest of North America, and the Library of Things of London (UK), just to name a few.
		ARCHIVES	Virtualization of Archives is the main action to upcycle this field. Archives usually involve huge amounts of paper (and ink), and even if they are well catalogued, researching papers and documents may be time expensive. Virtualization helps to reduce the material footprint, and ease research and knowledge-sharing. The digitization of archives, indeed, even if done for conservative purposes, opens the ways for creative readaptation of old collections.	Museums, Fashion Brands, Architects, not to mention governments, around the globe are starting to digitalize their archives.

		FILM, VIDEO, RADIO, TV, MUSIC, SOFTWARE, GAMES	Within Audio-visual Industries, upcycling pertains to the organization of the whole supply-chain. The industry should be able to track and guarantee for all the machineries and plants, and their materials component. The internal organization of a firm should be oriented to circular thinking. Especially within those industries, whose outputs are mainly dematerialized, the focus should be put on the organization of work, employees' transfers, differentiate collection on site, sustainable energy etc.	Green Film is an Italian voluntary certification for audio-visual firms. It guarantees the respect of environmental and social standards. In detail, it involves the sustainable management of transfer (of machineries and employees), a set energy efficiency, the provision of sustainable food and beverage, the utilizations of certified and recycled materials to design and build the scenes, and, finally, a correct management of the waste flows.
		BOOK PRESS	Books and Journals may be dematerialized or printed using natural inks (dissolvable in water without risk and able to be completely recycled into new ink) or made by recycled fibers of different materials (not just old papers or wood fibers).	Stone paper is a paperlike plastic product that is designed to be waterproof, durable, foldable, able to be bound, and recyclable with HDPE plastic. CRUSH is a production line of Favini (Italy), a well-known paper industry. Within that project, the fibers for paper from discarded orange peel. SiegWerk and Hubergroup are two companies certified Cradle to Cradle, producing sustainable ink and eventually returning de-inking sludges safely to the biosphere.

		FASHION DESIGN	To reshape and refashion old fabric waste, or to create new synthetic fibers able to feed the biological metabolism once they cannot be utilized again.	Marni, Maison Margiela, Vivienne Westwood, Stella McCartney, Recollection01 (Atelier&Repairs - LA). Upcycled by Miu Miu (Prada), Re-Nylon (Prada), Behen Studio (Portugal), Wrad (Portugal), Nasco Unisco (Portugal), Florania (Portugal), Bydeath (Denmark) are just few examples of fashion project based on upcycling, refashion and reshaping of old textile items.
		GRAPHIC DESIGN	Within the Graphic Design field, upcycling could deal with open-source software and the visual communication of the meaning of upcycling.	
		INTERIOR DESIGN	Upcycling of old furniture through reparation, paintings, and other techniques. It is possible also to reuse different items for domestic purposes (e.g., cars seat remake into sofa).	See Chair (Studio Swine) refers to a collection of chairs made from plastics recovered in the most polluted beaches of England.
		PRODUCT DESIGN	Modular design, design for disassembly and recycling, design for repurpose.	Heineken's Wobo (World Bottle): squared beer bottle usable in building; Clever Caps (Brazil): the company produces bottle caps compatible with lego bricks; Interface and Bureo: both uses to recover fish nets to produce, respectively, skateboard and carpets.

		ARCHITECTURE	To reshape and refashion old fabric waste, or to create new synthetic fibers able to feed the biological metabolism once they cannot be utilized again.	Upcycle house in Nyborg (studio Lendager - Denmark); Print your city (The new Raw studio - Netherlands): printing 3D bike racks, potholders or benches using recycled plastics.
		ADVERTISING	Upcycling may be applied within the advertising sector on two occasions: 1) when deciding which kind of advertising support to use; 2) when a message focused on sustainability has to be conveyed. In the first case, the focus is on the material: it is possible to choose old advertising support and directly reuse it; alternatively, paper-like, or plastic-like materials can be chosen if they show high degree of recyclability.	

4.4 CCI SMEs ENVIRONMENT PER PARTICIPATING COUNTY

Based on the data collected in relation to the territorial impact of CCI SMEs' business model, it appears that across participating cities in the CARISMED project, there are many similarities and a series of variations in the constitution, organization, and cooperation of CCI enterprises. While it is recognized that the CCI SMEs' have an important presence and potential for the centers of all the cities participating in the program, can be also recognized that there are differences in specializations (e.g., creation of raw materials for Murcia or products for Athens) and in the significant attendance of the tertiary sector.

As different ways of setting up small businesses and workshops are recognized and different levels of internal cooperation and collaboration with institutions are distinguished, most cities identified the need for networking, and modernization at the production and marketing level (Palestine).

Most of the cities claimed that there is much to be done in terms of changing legislative framework and strategies (Medina) and some as Murcia, highlighted the importance of institutions and programs that promote entrepreneurship and the areas of sustainability and circular economy in them.

Traditional and more contemporary CCI SMEs located at most of the cities showing interest to incorporate CE principles, looking forward to the adoption of greener approaches and approaches that promote re-use as well as more economically sustainable directions and cyclical practices.

In the following table, we present the CCI SMEs environment and territorial impact in each participating city of the mediterranean basin:

Table 4 – CCI SMEs territorial impact in each participating city. Source: CARISMED Project.

HEBRON (PALESTINE)	CCI SMEs' business model / Presence / fields of specialization	-CCI's are one of the main industrial sectors in Palestine. -Traditional industries there play an important role as their manufacturing reflect Palestinian heritage character, carry historical or religious expressions and features;
	Main characteristics / employment features	-The handicrafts in Palestine are made in small workshops; -Because it is a labor-intensive sector, thousands of workers in around 1,000 workshops around the West Bank are employed (19% Gaza Strip, 81% Bethlehem, Nablus and Hebron, very small percentage in Jericho);
	Obstacles	-Marketing problem is one of the most important problems. -Small volume of the local market and weak local demand. -Lack of local marketing centers distributed in different geographical areas and complexity - disruption of the export process due to the closure of the crossings borders and barriers set by the Israeli authorities. -Lack of quality factors in production, packaging, and supply, which weakens their competitiveness in front of imported products. -Migration of workers in the traditional industries, lack methods to maintain the occupational health and safety. -The traditional industries depend mostly on local raw materials;
	Challenges / Opportunities	-Lack of SMEs depending on waste as major input in production process. -Lack of knowledge and skills about the nature of waste raw materials and how to deal with it before processing. -Lack of awareness and acceptance by end users to purchase CCI products made from waste raw material. -Most CCI SMEs are willing to participate in training activities related to CE (especially strategies with appropriate tools, a collective online platform, mentoring and coaching). -CCI SME'S based on CE can reinforce the tourism industry and especially the Eco-tourism
ATHENS (GREECE)	CCI SMEs' business model / Presence / fields of specialization	- Athens was and remains the gathering place of SMEs with tradition in the creative arts professions (silver and goldsmithing, tannery, fashion design, clothing and footwear manufacturing, ceramics).Especially in the historic center: jewelry , clothing and design show remarkable dynamism. -Spatial aggregation / networking: CCIs congregate in the historic center of Athens and could be models of industrial coexistence within urban centers;
	Main characteristics / employment features	- Many/different organizations are specifically dealing with innovation, IoT and Education in various sectors. -Recently launched Smart and sustainable specialization strategy for the region of Murcia 2021-2027 (RIS4MUR). -Initiatives such as: 1. AGORA Digital Innovation Hub (regional level) which supports companies to undertake their digital transformation. 2. Centre of Murcia (CIMM) (municipal level) which promotes entrepreneurship and 3. "HUBs Murcia Inicia Emprende" which supports circular economy and technology sectors in the field of entrepreneurship.
	Obstacles	
	Challenges / Opportunities	-Need for transition to digital transformation and sustainability. (RIS4MUR, 2021-2027), based on the good experiences (2014-2020) and supporting programmes of challenges R&D circular economy, voucher for sustainable innovation, or the support for energy efficiency programme. -Challenges to be addressed in the upcoming years such as Sustainability - Green Deal, Digitalization, capacity and cooperation. As for the alignment with the CARISMED project : environment with a focus on bioeconomy and CE, reduction of consumption and rationale use of resources, or green economy, the Habitat with a focus on sustainable urban planning, sustainable construction, upcycling of materials and products, eco-innovation or new eco-material proceeding from agriculture and domestic wastes. (RIS4MUR, 2021-2027).

MURCIA (SPAIN)	CCI SMEs' business model / Presence / fields of specialization	- Regional level (2020): Registration of 164.983 companies (95 % of the companies are micro-companies and self-entrepreneurs' ones). -City level (2020): 13.720 registered companies. The main economic activity sectors are following the regional trend with services (11028 registered companies), construction (1216 registered companies), following by industry (food, textiles, and chemicals) and agriculture. The services sector represents 81.35% of total employment in Murcia
	Main characteristics / employment features	-Many/different organizations are specifically dealing with innovation, IoT and Education in various sectors. -Recently launched Smart and sustainable specialization strategy for the region of Murcia 2021-2027 (RIS4MUR). -Initiatives such as: 1. AGORA Digital Innovation Hub (regional level) which supports companies to undertake their digital transformation, 2. Centre of Murcia (CIMM) (municipal level) which promotes entrepreneurship and 3.
	Obstacles	
	Challenges / Opportunities	-Need for transition to digital transformation and sustainability. (RIS4MUR, 2021-2027), based on the good experiences (2014-2020) and supporting programmes of challenges R&D circular economy, voucher for sustainable innovation, or the support for energy efficiency programme. -Challenges to be addressed in the upcoming years such as Sustainability - Green Deal, Digitalization, capacity and cooperation. As for the alignment with the CARISMED project : environment with a focus on bioeconomy and CE, reduction of consumption and rationale use of resources, or green economy, the Habitat with a focus on sustainable urban planning, sustainable construction, upcycling of materials and products, eco-innovation or new eco-material proceeding from agriculture and domestic wastes. (RIS4MUR, 2021-2027).
PALERMO (ITALY)	CCI SMEs' business model / Presence / fields of specialization	-Tight connection with the non-profit sector. -Several CCI SMEs are involved in social inclusion and/or educational projects. at the same time, "traditional" NGOs are influenced by creative and innovative processes. -Creative craft SMEs focus a lot on renovation of traditional techniques and reintroduction of eco-sustainable materials.
	Main characteristics / employment features	-Several SMEs, mostly located in the historic city-center of Palermo. -Two main categories of SMEs: 1. Family-run enterprises, which usually have solid manufacturing skills based on strong family tradition and experience and often face troubles in surviving the contemporary market dynamics. 2. New enterprises, that are often founded by highly educated young people with strong technical skills and attitude to innovation.
	Obstacles	-There is a very low awareness about the concepts of Circular Economy and about the life-cycle management of production systems. Upcycling examples are just isolated experimentations. Creative craft SMEs often usually have no entrepreneurial education or experience and struggle in reaching economic sustainability, heavily relying on tourism flows. Networking skills are often lacking. Support networks and knowledge exchange are not common. Collaboration is rare also in the production processes that are mostly managed internally. As they are often situated in the city-center, moreover, they have to comply with strict regulations concerning the architectural heritage protection. For these reasons, focus mostly on DIY practices based on traditional techniques and natural materials;

	Challenges / Opportunities	-Creative craft SMEs focus a lot on renovation of traditional techniques and reintroduction of eco-sustainable materials. The development of a network of creative artist/crafters trying to innovate local traditions is quite transversal to these categories. -Concerning the adoption of LCARs, CCI SMEs and non-profit organizations share the need for low-cost techniques in renovating their premises, as well as the desire to choose sustainable solutions
PALERMO (ITALY)	CCI SMEs' business model / Presence / fields of specialization	-Existing business, within central Medina: 59% of existing businesses are artisan production workshops, 8% are restaurant, 8% are cafes, 8% are street stands, 8% are homebased businesses, and finally 9% are Dar's which includes all sort of traditional home repurposing projects, such as guesthouses, cultural centers or NGO working spaces. -The products developed by CCI SME in CE are perceived by their own designers as new in the Tunisian market.
	Main characteristics / employment features	-Medina SMEs are 83% led by men and 17% led by women. -The age groups of artisans, business owners: 25% age 20 to 35 and 42% age 36-45 and 33% are over 45 years of age. Education level, 50% have attended school and 42% have a university degree. Only 25% have more than 5 employees, and 75% have 5 or less employees, 33% gained craft knowhow on the job, 25% had the craft knowledge passed down from generation to generation, and 42% had no training in the field of practice. -Location or working space ownerships: only 23% business own their place of work, 8% are start-ups with no permanent address, and the majority or 69% rent their working space. As with actual space size, the majority of 42% have less than 30m2 and 25% have a working space of between 31m2 to 70m2 and only 33% work in a space that is more than 70m2.
	Obstacles	-Today the old corporate system has disappeared, leaving 83% of business owners with no affiliations, in a context of insecurity and vulnerability. -The CE concept is still unrecognized by the general public and even less for decision-makers. Often entrepreneurs face additional burden, of advocacy for circular economy on top to commercial business aspects and administrative hurdle.
	Challenges / Opportunities	-Need for clustering, in order to improve sorted material absorption and to create shared economy, as a business model for better financial sustainability and growth. -Technological know-how and access to technology or support from human resources with CE expertism. -Challenges such as: profitability of activities, identification of the best market niche, and business promotion to attract the right conscious consumers. Reform of CE legislative procedures, which are extremely restrictive and outdated, even incompatible with circular economy activity. -Need of mediation work, carried out by the municipality of Tunis, and parallel coordination all of the administrative levels. -Awareness-raising to create a community of conscious consumers that can help sustain CE SME's business. -Emphasis on social networks, engaging innovative communication tools for Medina's wide community and trainings on best use of online communication tools. -Maintenance of offline communications, as many important cluster actors, might not master digital tools. -Engaging and working with civil society as a breeding ground for initiatives in various themes of medina's economic dynamic through cultural activities and as a source for capitalization of sustainable business model. -Emphasis on the interaction between start-ups in digital economy -related with heritage digital investments and urban attract -ability- and to existing traditional arts and crafts souks.

IRIBID (JORDAN)	CCI SMEs' business model / Presence / fields of specialization	
	Main characteristics / employment features	-CCI SMEs are willing to be improved, upgraded, and adopt new technologies in case they are provided with the required technical support and financial resources especially if these technologies proved their positive impact on improving the quality of their products and their return value in the market.
	Obstacles	-Low limits of customer budget that constraint practices in the direction of circularity.
	Challenges / Opportunities	-Creative craft SMEs focus a lot on renovation of traditional techniques and reintroduction of eco-sustainable materials. The development of a network of creative artist/crafters trying to innovate local traditions is quite transversal to these categories. -Concerning the adoption of LCARs, CCI SMEs and non-profit organizations share the need for low-cost techniques in renovating their premises, as well as the desire to choose sustainable solutions

05.
THE BUILDING SHELL

5.1 CIRCULAR ECONOMY AT THE URBAN LEVEL

As stated in the European Circular Cities Declaration, cities, and regions play an important role in the transition from a linear to a circular model of production-consumption. This becomes evident if we consider that 75% of natural resources consumption is occurring in cities, with an emphasis on energy and materials, while 50% of the global waste is coming from cities, with the number being even higher in the EU (Circular Cities Declaration, 2020).

Definition of a circular city
"A circular city is one that promotes the transition from a linear to a circular economy in an integrated way across all its functions in collaboration with citizens, businesses, and the research community. This means fostering business models and economic behavior which decouple resource use from economic activity by maintaining the value and utility of products, components, materials, and nutrients for as long as possible to close material loops and minimize harmful resource use and waste generation. Through this transition, cities seek to improve human well-being, reduce emissions, protect, and enhance biodiversity, and promote social justice, in line with the Sustainable Development Goals"(European Circular Cities Declaration, 2020). European cities and regions are increasingly adopting the principles of the circular economy, guided by policy documents from the European Commission. At the European level, there is growing support for circular cities.

For instance, the EU's New Urban Agenda established a specific Partnership on Circular Economy, which developed orientation papers to guide the implementation of circular economy practices in cities and regions (INNOMED-UP, 2023; Gravagnuolo et al., 2019). To aid policymakers in creating suitable frameworks for urban circular economy initiatives, various organizations and experts have identified key focus areas. According to the Ellen MacArthur Foundation, these areas include the built environment, energy systems, urban mobility, urban bioeconomy (covering food, waste, water, and soils), and local closed production systems (Ellen MacArthur Foundation, no date). Similarly, researchers (Gravagnuolo et al., 2019) highlight the food, mobility, and built environment sectors as crucial. These sectors are expected to potentially reduce greenhouse gas emissions by 48% by 2030 and 83% by 2050 compared to 2012 levels (EEA, 2016).

Image 11 – Key Sectors to facilitate the CE transition. Source: European Circular City Declaration, 2020.

Especially for the built environment sector, "increasing urbanization and demands for urban housing transform cities into a hub for waste resulting from construction and demolition works. The built environment is a key source of materials, while it also poses great challenges for circularity. Construction and Demolition Waste (CDW) consists of diverse materials, such as concrete, bricks, wood, metals, plastic, solvents and excavated soil. Many of these materials are fit for recycling or reuse, and have a high resource value. The technology for the separation and recovery of CDW is well established, accessible and relatively inexpensive. Yet, recycling rates across the EU vary greatly: some member states recycle 90% of CDW, others 10%. Materials in older buildings are often unknown or buildings are not assembled for re-use. Implementing circular solutions means taking a look at the whole life cycle of buildings and their materials such as: managing existing CDW, preventing CDW through adaptive reuse and creating a future built environment without waste" (Circular Cities Declaration, 2020).

Implementing circular practices in a specific area involves collaboration among municipalities, businesses, stakeholders, and citizens. This collaboration creates opportunities to minimize the depletion of new resources (Borsacchi et al., 2019). The circular city challenge goes beyond environmental concerns, encompassing economic and social dimensions. New policies need to engage citizens and entrepreneurs alike, bridging gaps in waste management and promoting social cohesion (Borsacchi et al., 2018). Achieving social cohesion involves constructing an inclusive and supportive community based on sharing and creative re-use principles, stimulating innovative business activities with social and charitable objectives (Borsacchi and Tacconi, 2019).

5.2 POLICIES AND GOVERNANCE TOOLS FOR THE BUILT ENVIRONMENT MEDITEREANEAN LEVEL

No. of Element	1
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**The European Green Deal [COM(2019) 640 final, 11.12.2019]** [Communication from the Commission]
Description / key aspects	The European Green Deal resets the Commission's commitment to tackling climate and environmental-related challenges. It is a response to these challenges, a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are **no net emissions of greenhouse gases in 2050** and where economic growth is decoupled from resource use. The construction, use and renovation of buildings require significant amounts of energy and mineral resources (e.g. sand, gravel, cement). Buildings also account for 40% of energy consumed. Today the annual renovation rate of the building stock varies from 0.4 to 1.2% in the Member States. This rate will need at least to double to reach the EU's energy efficiency and climate objectives. In parallel, 50 million consumers struggle to keep their homes adequately warm. To address the twin challenge of energy efficiency and affordability, the EU and the Member States should engage in a **'Renovation Wave'** of public and private buildings. While increasing renovation rates is a challenge, renovation lowers energy bills, and can reduce energy poverty. It can also boost the construction sector and is an opportunity to support SMEs and local jobs.
References	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52019DC0640&from=EN

No. of Element	2
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**A new Circular Economy Action Plan For a cleaner and more competitive Europe [COM(2020) 98 final, 11.03.2020]** [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions].

Description / key aspects	The Circular Economy Action Plan provides a future-oriented agenda for achieving a cleaner and more competitive Europe in co-creation with economic actors, consumers, citizens and civil society organisations. It aims at accelerating the transformational change required by the European Green Deal, while building on circular economy actions implemented since 2015. The Plan acknowledges that the built environment has a significant impact on many sectors of the economy, on local jobs and quality of life. It requires vast amounts of resources and accounts for about 50% of all extracted material. The construction sector is responsible for over 35% of the EU's total waste generation. Greenhouse gas emissions from material extraction, manufacturing of construction products, construction and renovation of buildings are estimated at 5-12% of total national GHG emissions. Greater material efficiency could save 80% of those emissions. To exploit the potential for increasing material efficiency and reducing climate impacts, the Commission will launch a new comprehensive Strategy for a Sustainable Built Environment. This Strategy will promote circularity principles throughout the lifecycle of buildings by: -addressing the sustainability performance of construction products in the context of the revision of the Construction Product Regulation, including the possible introduction of recycled content requirements for certain construction products, taking into account their safety and functionality; -promoting measures to improve the durability and adaptability of built assets in line with the circular economy principles for buildings design and developing digital logbooks for buildings; -using Level(s) to integrate life cycle assessment in public procurement and the EU sustainable finance framework and exploring the appropriateness of setting of carbon reduction targets and the potential of carbon storage; -considering a revision of material recovery targets set in EU legislation for construction and demolition waste and its material-specific fractions; -promoting initiatives to reduce soil sealing, rehabilitate abandoned or contaminated brownfields and increase the safe, sustainable and circular use of excavated soils. Furthermore, the 'Renovation Wave' initiative announced in the European Green Deal to lead to significant improvements in energy efficiency in the EU will be implemented in line with circular economy principles, notably optimised lifecycle performance, and longer life expectancy of build assets. As part of the revision of the recovery targets for construction and demolition waste, the Commission will pay special attention to insulation materials, which generate a growing waste stream.
References	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0098&from=EN

No. of Element	3
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**A Renovation Wave For Europe - greening our buildings, creating jobs, improving Lives [COM(2020) 662 final, 14.10.2020]** [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions].
Description / key aspects	The European Commission has set out a strategy to trigger a "Renovation Wave" for Europe, breaking down long-standing barriers to energy and resource-efficient renovation, supporting fresh investment over a sustained period starting from public and less efficient buildings, spurring digitalisation and creating employment and growth opportunities across the renovation supply chain. The objective is to at least double the annual energy renovation rate of residential and non-residential buildings by 2030 and to foster deep energy renovations. The increased rate and depth of renovation will have to be maintained also post-2030 in order to reach EU-wide climate neutrality by 2050. The key principles highlighted for building renovation towards 2030 and 2050 include: -'Energy efficiency first' as a horizontal guiding principle, to make sure we only produce the energy we really need; -Affordability, making energy-performing and sustainable buildings widely available; -Decarbonisation and integration of renewables; -Life-cycle thinking and circularity. Minimising the footprint of buildings requires resource efficiency and circularity combined with turning parts of the construction sector into a carbon sink, for example through the promotion of green infrastructure and the use of organic building materials that can store carbon, such as sustainably-sourced wood; -High health and environmental standards (high air quality, good water management, disaster prevention and protection against climate-related hazards, removal of and protection against harmful substances such as asbestos and radon, fire and seismic safety, accessibility); -Tackling the twin challenges of the green and digital transitions together; -Respect for aesthetics and architectural quality.
References	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0662&from=EN

No. of Element	4
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**General Union Environment Action Programme to 2030 [Decision (EU) 2022/591, 12.04.2022]** [Decision of the European Parliament and of the Council].
Description / key aspects	This Decision sets out a general action programme in the field of the environment for the period up to 31 December 2030 (the '8th Environment Action programme' or '8th EAP'). It lays down the priority objectives of the 8th EAP and identifies the enabling conditions necessary to attain those priority objectives. It establishes a monitoring framework to measure the progress of the Union and its Member States towards the attainment of the priority objectives of the 8th EAP and a governance mechanism to ensure attainment of those priority objectives. The 8th EAP aims to accelerate the green transition to a climate-neutral, sustainable, non-toxic, resource-efficient, renewable energy-based, resilient and competitive circular economy in a just, equitable and inclusive way, and to protect, restore and improve the state of the environment by, inter alia, halting and reversing biodiversity loss. It supports and strengthens an integrated policy and implementation approach, building upon the European Green Deal. One of the 8th EAP's priority objectives is: Promoting environmental aspects of sustainability and significantly reducing key environmental and climate pressures related to the Union's production and consumption, in particular in the areas of energy, industry, buildings and infrastructure, mobility, tourism, international trade and the food system.
References	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32022D0591&from=EN

No. of Element	5
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**Roadmap to a Resource Efficient Europe [COM(2011) 571 final, 20.09.2011]** [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions].
Description / key aspects	The Europe 2020 Strategy and its flagship initiative on "A Resource Efficient Europe" set the EU on the path to this transformation. The flagship called for a roadmap "to define medium and long-term objectives and means needed for achieving them".

	This Roadmap sets the milestones, which illustrate what will be needed to put us on a path to resource efficient and sustainable growth. A key sector in the Roadmap is "Improving buildings". It sets the following milestone: By 2020 the renovation and construction of buildings and infrastructure will be made to high resource efficiency levels. The Life-cycle approach will be widely applied; all new buildings will be nearly zero-energy and highly material efficient, and policies for renovating the existing building stock will be in place so that it is cost-efficiently refurbished at a rate of 2% per year. 70% of non-hazardous construction and demolition waste will be recycled".
References	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32022D0591&from=EN

No. of Element	**6**
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**Resource Efficiency Opportunities In The Building Sector [COM(2014) 445 final, 01.07.2014]** [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions].
Description / key aspects	The main objectives are to promote a more efficient use of resources consumed by new and renovated commercial, residential and public buildings and to reduce their overall environmental impacts throughout the full life cycle. Consumption of resources and related environmental impacts throughout a building's lifecycle can be reduced by: -Promoting better design that weighs resource use against the needs and functionality of the building and considers scenarios for deconstruction; -Better project planning which ensures a greater use of resource and energy efficient products; -Promoting more resource efficient manufacturing of construction products by, for example, using recycled materials, reusing existing materials and using waste as a fuel; -Promoting more resource efficient construction and renovation by, for example, reducing construction waste and recycling/re-using materials and products so that less is sent to landfill.
References	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0445&from=en

No. of Element	7
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**European Resource Efficiency Platform (EREP), Manifesto & Policy Recommendations** [Manifesto adopted in Brussels, 17.12.2012]
Description / key aspects	In the Manifesto, the European Resource Efficiency Platform called on business, labour and civil society leaders to support resource efficiency and the move to a circular economy. The policy recommendations that followed address a number of challenges that relate to improving resource efficiency in many sectors, including construction.
References	https://ec.europa.eu/environment/resource_efficiency/documents/erep_manifesto_and_policy_recommendations_31-03-2014.p

No. of Element	8
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**Level(s) – European framework for sustainable buildings** [Launched by the European Commission on 15.10.2020]
Description / key aspects	Level(s) is the new European framework providing a common language for assessing and reporting on the sustainability performance of buildings. It is a simple entry point for applying circular economy principles in our built environment. The Level(s) common framework is based on six macro-objectives that address key sustainability aspects over the building life cycle. Level(s) uses core sustainability indicators to measure carbon, materials, water, health, comfort and climate change impacts throughout a building's full life cycle. Level(s) is open source and freely available to all.
References	Level(s) – A common EU framework for core sustainability indicators for office and residential buildings https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents

No. of Element	9
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**Directive 2008/98/EC Of the European Parliament and Of the Council, of 19 November 2008, on waste and repealing certain Directives**
Description / key aspects	The Directive lays down measures to protect the environment and human health by preventing or reducing the generation of waste, the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use, which are crucial for the transition to a circular economy and for guaranteeing the Union's long-term competitiveness. It includes measures, to be adopted by Member States, for reducing construction and demolition waste and improving waste efficiency in the construction sector.
References	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0098-20180705&from=EN

No. of Element	10
Element of the legal or policy framework (e.g. Law, governmental decision,decree,regulation , directive, plan, etc.)	**Regulation 2020/852/EU on the "Establishment Of A Framework To Facilitate Sustainable Investment, And Amending Regulation 2019/2088/EU".**
Description / key aspects	This regulation establishes the criteria for determining whether an economic activity qualifies as environmentally sustainable for the purposes of establishing the degree to which an investment is environmentally sustainable. An economic activity can contribute substantially to the environmental objective of transitioning to a circular economy in several ways. It can, for example, increase the durability, reparability, upgradability and reusability of products, or can reduce the use of resources through the design and choice of materials, facilitating repurposing, disassembly and deconstruction in the buildings and construction sector, in particular to reduce the use of building materials and promote the reuse of building materials.
References	https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32020R0852&from=EN

5.3 CASE STUDIES

5.3.1 PALESTINE

A. OVERVIEW

Hebron is a hauntingly beautiful, ancient city twisted and torn by decades of unrest and conflict. It is the largest city in the West Bank, and second largest in Palestine after Gaza. It is home to around 215,000 Palestinians. Its Old City of stone roofs, archways and never-ending alleyways is the perfect playground for the sensory delight of the markets and bazaars. It is also a modernizing city, home to Hebron University and the Palestine Polytechnic University. Hebron is a hub of trade, primarily with the sale of marble from nearby quarries.

The area is also renowned for grapes, figs, limestone, pottery workshops and glassblowing factories.

The city of Hebron (al-Khalil in Arabic) is one of the oldest inhabited cities in the world, and its history dates back more than 4,000 years BC. According to Islamic tradition, God chose Abraham as his friend, and Hebron houses the tomb of Abraham: Khalil al-Rahman.

Hebron is the fourth holiest city for Muslims after Mecca, Medina, and al-Quds. Al-Haram Al- Ibrahimi, the Sanctuary of Abraham, or the Tomb of the Patriarchs, in the old city of Hebron is one of the ancient historical, religious, and heritage sites in Palestine.

Throughout the centuries, the city of Hebron was a constant target for Persian and Roman invaders until the Islamic conquest during which the city prospered and Muslim emirs and caliphs showed unwavering concern for the city. The ancient architecture of the old city, which dates to the Mamluk and Ottoman periods, has witnessed the development and sophistication of the city of Hebron.

B.INFORMATION ABOUT THE BUILIDNG STOCK

The results of general census conducted in 2017 showed that there were 627,383 buildings in Palestine of which 441,280 were in the West Bank (70.3%), and 186,103 in Gaza Strip (29.7%).

Additionally, the census results showed that there were 1,129,264 housing units in Palestine, of which 726,143 housing units were in the West Bank (excluding Jerusalem J1) (64.3%)and 403,121 housing units in Gaza Strip (35.7%).

HEBRON :

Image 12 – The Old City of Hebron.

Hebron (Al-Khalil) is one of the oldest inhabited cities in the world and is sacred to Muslims, Christians, and Jews. Numerous ancient monuments and buildings have been preserved, bearing witness to a rich and prosperous past. As well as a pilgrimage site for Judaism, Christianity, and Islam, Hebron serves as an economic and cultural centre at the crossroads between southern Palestine, Sinai, eastern Jordan, and the Arabian Peninsula. Its history and architecture are the legacy of these mixed cultures.

Jerusalem (J1) includes those parts of Jerusalem which were annexed by Israel in 1967. And the second part is Jerusalem (J2).

[Source: Palestinian Central Bureau of Statistics (PCBS) 2017].

Image 13 - The Haram al-Ibrahimi

The Haram al-Ibrahimi, principal monument of the Old City, quickly became a focal point of the city after the first Islamic Period (Umayyad Period), similar to the Haram al-Sharif in Jerusalem. Today, the historic center is dominated by the Mamluk architectural style, with influences from the subsequent Ottoman Period. Hebron is one of the rare Islamic cities to have faithfully preserved its ancient character, which can be clearly seen by any visitor.

General information about Hebron city:

27,000 buildings contain flats.
Average of 3.5 floors
About 98% are private properties, 2% are public properties.
About 95% are of stone construction.
Most expansions are vertical.
No power supply problems were encountered until 2020, in 2021 started a problem of load distribution.

Information about the Old City of Hebron shows:

. 2,600 buildings
. 1,500 buildings have been rehabilitated.
. 800 buildings have been maintained.
. Israeli occupation forces have forbidden rehabilitation of 180 buildings due to a "closed military zone".
. 1,270 buildings are inhabited, 200 buildings are not appropriate for humans due to health problems, part of the buildings have been abandoned due to Israeli regulations and obstacles.
. About 500 buildings consist of 4 floors.
. About 300 buildings consist of 3 floors.
. About 400 buildings consist of 2 floors.
. 90% of owners still live in their buildings, 10% are tenants.
. The prevailing construction system is load-bearing walls, cross arches and simple proportion arches using metal rollers and bridges.
. Power supply is always available, and sometimes as a result of heavy loads, some interruptions occur. The consumption is economical for the nature of buildings, especially in air conditioning.

. The ages of the buildings range from 150 to 800 years. Buildings are originally from Mamluki period and there are two Ayyubi's buildings.
. Most buildings are historical.
. Old City had been planned in a defensive style, and it has doors and structures around the Ibrahimi Mosque for religious reasons.
. The thickness of the walls is 2 to 3 meters in a barrel shape.
. The system of openings in buildings is like Shami (Syrian) houses, it consists of a yard surrounded by rooms, and this gives a system of privacy for the buildings. This system also helps in having more sun light inside the building. Most buildings have plants that help in the air conditioning.

C. POLICIES AND GOVERNANCE TOOLS FOR THE BUILT ENVIRONMENT

National Level:

The Palestinian National Spatial Plan:

Aiming to work on localizing SDG11 and the New Urban Agenda, The Palestinian national spatial plan is an ongoing effort towards achieving more sustainable and resilient Palestinian cities and communities.

The Green Building Guidelines for Palestine:

The Green Building Guidelines for Palestine main objective is to clarify the technical standards necessary to reach and evaluate sustainability requirements in buildings in Palestine with long term objectives of reducing the amount of water and energy used in buildings, reducing the materials consumed during construction and after occupancy and encouraging recycling, reducing the extent of the environmental impact of buildings on the surrounding environment, finding a starting point for preparing a building code for green buildings in Palestine and contributing to the creation of high-efficiency, healthy, sustainable, affordable and environmentally friendly buildings.

Local Level:

Hebron's Old City Preservation and Revitalization Master Plan, 2019.

The main goals of Hebron's Old City Preservation and Revitalization Master Plan, 2019 were establishing a general development strategy for the Old City for the next 25 years, to launch rules defining methods and techniques allowed for the intervention on buildings and open spaces by public or private agents considering sustainable practices, to highlight the participatory approach that has been undertaken to develop the projects through involving the local community in the planning, decision making and implementation, and to define the adequate follow up and evaluation mechanisms and structures during the master plan implementation.

The Master Plan of the City of Hebron.

A long-term planning document that guides the future growth and development is The Master Plan of the City of Hebron that includes analysis, recommendations, and proposals for a site's population, economy, housing, transportation, community facilities, and land use. It is based on data gathered through surveys on the existing development, physical characteristics, and social and economic conditions.

D. TECHNICAL METHODOLOGIES AND GOOD PRACTICES

The cultural Heritage resources:

Handicrafts are the core of the Palestinian heritage that has been passed down through the ages. The achievements of this sector fall under historical, cultural and religious headings related to life in Palestine. The abundance of resources and expertise in this sector has allowed us to offer a wide variety of premium products. Most of the precious handicrafts consist of olive tree woodcarvings, seashells, ceramic pots, glassware, pottery, embroideries, textiles and others.

Image 14 - The Use of Stones External and internal Facades and Rubbles with slaked lime in the inner of the traditional.

Image 15 - The Use of Slaked Lime, Ashes, Crashed Pottery and Hairs/Natural Fiber in Plastering Works in the traditional architecture.

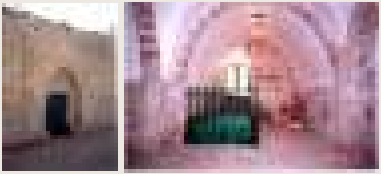


Image 16 - The Use of Slaked lime With Ashes for Re-Pointing Stone walls, and The Use of Slaked Lime for Painting Ceilings in the

Image 17 - The usage of traditional pottery (KIZAN) as natural roof fence that provides privacy and ventilation for users.

Good practices:

1.PROMOTION CENTER (ABU KHALF)

Project type (existing building renovation and / or urban area regeneration)	Existing buildings' large-scale renovation and selected interventions in the surrounding outdoor elevations.
Location (address / city)	Hebron old city 31o.31'.34"N 35O.06'.26"E
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Abu Khalaf Family
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	The Municipality of Hebron will operate this center and ensure its sustainability by providing the executive staff and mobilizing the necessary financial and operational resources to implement and sustain the programs and activities.
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	A construction company was responsible to implement the renovation project as Main Contractor By Hebron Rehabilitation Committee.
Project funding source (public / private; funding program)	Sida 2019-2021 Programme (co-financing by national funds)
Project status	Completed

Short project descirption

The Haram al-Ibrahimi, principal monument of the Old City, quickly became a focal point of the city after the first Islamic Period (Umayyad Period), similar to the Haram al-Sharif in Jerusalem. Today, the historic center is dominated by the Mamluk architectural style, with influences from the subsequent Ottoman Period. Hebron is one of the rare Islamic cities to have faithfully preserved its ancient character, which can be clearly seen by any visitor.

Key sustainable features

Large-scale energy-efficiency interventions were applied in the buildings and renewabletechnologies incorporated:

1. The development of architectural solutions for the reuse of the building and the work of architectural, construction, mechanical

and electrical drawings, and the work of the necessary details to facilitate the implementation work.

2. Restoration and rehabilitation of the old building and the outer courtyard through the treatment and insulation of floors and the reconstruction of stone walls

3. Implementation of educational activities and the implementation of courses and awareness and education meetings.

4. Technical consultations to oversee the project and follow up its implementation in accordance with the principles.

5. Surveying and documenting the building: - Where the work of the plans showing the status of the building and accessories of the screens and sectors and interfaces with the necessary work of photography.

6. Solving the ownership and making the necessary contracts according to the mechanism of Hebron Rehabilitation Committee.

2. INTERPRETATION MUSUEM

Project type (existing building renovation and / or urban area regeneration)	Existing buildings' large-scale renovation and selected interventions in the surrounding outdoor elevations.
Location (address / city)	Hebron old city 31o.31'.32"N 35O.06'.20"E
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Herbawi Family
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	The Ministry of Tourism will operate this center and ensure its sustainability by providing the executive staff and mobilizing the necessary financial and operational resources to implement and sustain the programs and activities.
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	A construction company was responsible to implement the renovation project as Main Contractor.
Project funding source (public / private; funding program)	Sida 2019-2021 Programme (co-financing by national funds)
Project status	Completed

Short project descirption

The project Old city museum was a Strategic project co-financed by the Sida 2020-2021 Programme.

The project targets all groups of the local and international community of different ages and races (children, youth, women, men, the elderly)

The project is also expected to serve as an Interpretation Museum for visitors and provide a variety of services in the historical and tourist areas and other projects aimed at empowering the community and achieving tourism development, preserve the Palestinian cultural heritage and the old buildings of the old town and rehabilitate and invest the tourism sector and the sector of services.

Key sustainable features

Large-scale energy-efficiency interventions were applied in the buildings and renewable technologies incorporated.

1. Solving the ownership and making the necessary contracts according to the mechanism of Hebron Rehabilitation Committee

2. The development of architectural solutions for the reuse of the building and the work of architectural, construction, mechanical and electrical drawings and the work of the necessary details to facilitate the implementation work.

3. Restoration and rehabilitation of the old building and the outer courtyard through the treatment and insulation of floors and the reconstruction of stone walls

4. Implementation of educational activities and the implementation of courses andawareness and education meetings.

5. Technical consultations to oversee the project and follow up its implementation in accordance with the principles.

3. Administration Building for Bethlehem Multidisciplinary Industrial Park – Bethlehem, Palestine.

Project type (existing building renovation and / or urban area regeneration)	New buildings' large-scale. This project is a pilot one for the whole West Bank
Location (address / city)	Bethlehem Industrial Park- Bethlehem
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Multidisciplinary Industrial Park-Bethlehem
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Administration staff of Bethlehem Industrial Park.
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	PIEFZA (Palestinian Industrial Estates & Free Zones Authority).
Project funding source (public / private; funding program)	It is a cooperation project between the Palestinian Ministry of Energy and the French Consultants and PIEFZA (Palestinian Industrial Estates & Free Zones Authority).
Project status	Completed

Short project descirption

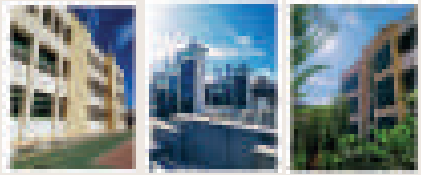
Administration building with a total area of 1000 m2. It consists of two floors, contains offices, lecture halls, bank areas, computer lab plus services and facilities. The project is the first in its type design with environmental Architectural urban planning using passive solar design without conditioning and heating.

This project is a pilot one for the whole West Bank. It is a cooperation project between the Palestinian Ministry of Energy and the French Consultants and PIEFZA (Palestinian Industrial Estates & Free Zones Authority).

Key sustainable features

The project is the first in its type designed with environmental Architectural urban planning using passive solar design without air conditioning and heating.

4. HAFITH AL-NATSHEH SCHOOL



Project type (existing building renovation and / or urban area regeneration)	New buildings' large-scale. The school is considered as the first environmental school the region, the school was designed by the Belgian government in 2015 and constructed under the supervision of MoE of Palestine.
Location (address / city)	Hebron
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Ministry of Education
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Public School
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Belgian government and Palestinian Ministry of Education
Project funding source (public / private; funding program)	Belgian government
Project status	Completed

Short project descirption

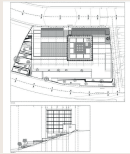
Hafith Al-Natsheh School in Hebron is considered as the first environmental school the region, the school was designed by the Belgian government in 2015 and constructed under the supervision of MoE of Palestine.

Hafith al Natsheh school is considered the first in Palestine and the middle east with platinum certificate of LEED foundation with its passive designed systems and renewable energy using to achieve comfort educational environment and less energy consumption.

Key sustainable features

The school contains several environmental systems to achieve thermally efficient spaces in summer and winter, starting from the underground tunnels system, the air filtration system, Sun-breakers and thermal plates system and solar chimneys.
The project was designed to Improve climatic conditions in the school building by implementing passive techniques contain geothermal ducts, solar walls, sun breakers and solar chimneys, working with active systems like solar cells and water harvesting well, to achieve more comfortable learning environment for students and staff at the schools.
Hafith Natsheh school building east facing rooms are equipped with a so-called solar wall. This orientation was selected because it can heat up the classrooms in the morning. The outdoor air first hits the solar wall metal sheet, gets heated up at the surface, and enters through the holes into the manifold before passing the opened supply grille. Temperature difference between indoor and outdoor is a result of solar radiation and flow rate induced by wind and chimney effect.
The school also incorporates monitoring equipment, which is located at each room of school, on the solar chimney, PV system and in the solar wall outlet.

5. AL QATTAN FOUNDATION BUILDING



Project type (existing building renovation and / or urban area regeneration)	New buildings' large-scale. Conceived as a metaphorical lighthouse, the Foundation's office building and cultural center in Ramallah is an embodiment. The first buildings that received a green building certificate from the Palestinian Higher Building Council, it was constructed according to the Palestinian Green Building Guidelines.
Location (address / city)	Ramallah
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Qattan Foundation http://qattanfoundation.org/en
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Qattan Foundation, a not-for-profit developmental organization based in Ramallah.
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Qattan Foundation
Project funding source (public / private; funding program)	Qattan Foundation
Project status	Completed

Short project descirption

Conceived as a metaphorical lighthouse, the Foundation's office building and cultural center in Ramallah is an embodiment of its commitment to innovation and excellence in content and form. In addition to work offices, the A.M. Qattan building houses state-of-the-art public facilities that hosts the Foundation's events and activities and those of collectives, individuals and organizations who may wish to use them.

Key sustainable features

• Site sustainability: the mandatory condition in this clause is to prevent pollution resulting from the construction process. To achieve this, a pollution prevention scheme has been created to prevent air, water and soil pollution, noise, and light pollution.
• Water Pollution: Several strategies have been made to prevent water pollution, and all materials have been covered so that any pollutants are prevented from leaking onto the soil and water, by placing nylon under the materials.
• As for the general site, there were many criteria that must be met, such as that at least 10% of the site should be green areas, and olive trees were transferred to neighboring lands and replanted again. It also prevented the formation of heat islands that usually formed as a result of the use of solid, dark-colored materials that absorb heat, such as asphalt, as all the floors for all the corridors and outdoor yards were white stone or tiles, and the cool pavement technique planted with grass was used.
• Indoor Environmental Quality (IEQ)
1. Controlling the smoking, as smoking was prohibited except in designated places, and there was an agreement between the owner and the operator of the organization to find places for smoking to be very ventilated.
2. Determine the minimum air quality, and this is related to the fact that the materials used in the building are free of any volatile materials. Very difficult restrictions were imposed on the materials used in the process of finishes and adhesives, and the AlQattan building achieved the conditions effectively as it contained air much less than the permissible limit of these materials.
3. Thermal Comfort Passive and active design, thermal insulation of all parts of the building, effective shading through the use of vertical louvers with specific openings in precise proportions that allow light to enter and do not obstruct vision from the inside, Design Builder software used for simulation and the passive design 100% thermal comfort achieved throughout the year.

4. The system used is Next Mode, and this means that the HVAC system does not work 24 hours throughout the year, and in moderate days such as spring and autumn, the air conditioning and cooling are normal.
5. Thermal Mass: It was doubled in some places to effectively adjust the heat.
6. Smart Sensor: When the building is closed due to heat or cold, these sensors measure the percentage of CO2, and accordingly the air is entered as required so that no heat loss occurs.
7. Heat Recovery: Technologies have been created that can heat the air entering the building in the winter by recovering part of the heat of the air exiting the building andvice versa in the summer.
8. BMS: It was used in all rooms for monitoring and control in order to know the requirements of each room.
9. Material quality: not to use dangerous, toxic and volatile materials, especiallynmaterials for finishes and paints.

E. LOCAL STRATEGY

	Hebron PALESTINE
Motto of Hebron	Circulating the Economy by Circulating the Identity
Vision statement of Hebron	Abandoned buildings at Hebron Old city are renovated using LCARS and operated by CCIs SMEs as Creative Studios
General and specific goals of Hebron	- Identify old building at Hebron Old City that are used and operated by public body - Choose a specific space inside the building - Apply LCARS in the space - Cluster start using the space as creative studio - Repeat this model in other old buildings - Building the capacity of CCI SMEs inside the cluster
Measurable targets of Hebron	- Number of identified buildings (at least 3) - LCARS to be applied (in at least 1space) - Studio lab is operated (at least 1) - Cluster is operating (at least 1) - Training has been conducted (for at least 5 CCISMEs)

5.3.2 GREECE

A. OVERVIEW

The city of Athens is an old, historic city with rich cultural heritage, which is the capital of Greece. The metropolitan area of Athens is the center of political decision-making and houses 40% of the total population and produces about 50% of the national GDP. It could be described as an open city as political and social movements often develop, as well as the social stratification is wide and includes minorities such as immigrants, refugees, LBGTQ communities and so on.
There have been many changes in economic activities during the financial crisis, but the main one is that many trade companies have closed and given way to food and beverage serving services. Also, the development of tourist services (city break tourism) is intense, and it remains to be seen how these activities have been affected and to what extent by the recent pandemic. At the same time, Athens was and remains the gathering place of SMEs with a tradition in the creative arts professions (silver and goldsmithing, tannery, fashion design, clothing and footwear manufacturing, ceramics).
The presence of creative professions remains obvious and dynamic despite the adversity created by the crisis. Especially in the historic center, the activities of jewelry, clothing and (more recently) design show remarkable dynamism.
Athens belongs to the network of Mediterranean Cities and has historically developed trade and economic relations with neighboring cities. As for CCIs, there is an exchange of dialogue on techniques and know-how, but there are still many steps to be taken to make the results more robust.

The development of the dialogue on the integration of new technologies (e.g., 3D Printing), for models of cooperation and business at the Mediterranean level (co-working or making spaces), on materials and techniques that would enhance the transition to the cyclical production model is crucial.

B. INFORMATION ABOUT THE BUILDING STOCK

The following describes key information / statistics regarding the existing building stock at overall national level in Greece, as well as some information regarding the unused (empty) building stock.

All building types:

- At national level in Greece there are in total 4,105,637 buildings.
- 52% of the total number of buildings are ground floor buildings, 33% include ground + 1 level, 9% include ground + 2 levels, 3% include ground + 3 levels, 2% include ground + 4 levels, 1% include ground + 5 levels and 1% ground + 6 levels.
- 4% of the total number of buildings includes an exposed floor above ground (pilotis).
- ~73% of the total number of buildings are residential buildings and an additional ~6% are mixed use buildings of which the principal use is residential. So in total ~79% of buildings are residential buildings. ~5% of buildings have a commercial (office / retail) use, and other uses (≤1%) include educational buildings, healthcare buildings, hotels, religious buildings etc.
- ~79% of the total number of buildings are residential buildings, ~5% of buildings have a commercial (office / retail) use, and other uses (≤1% each) include educational buildings, healthcare buildings, hotels, religious buildings etc.

- ~58% of the total number of buildings are built prior to 1980, ~30% are built between 1981-2000 and ~12% are built from 2001 onwards.
- ~58% of the total number of buildings use concrete as the main construction material, 21% use brickwork/blockwork, ~18% use stone and ~3% use other materials (timber, metal etc.).
- ~40% of the total number of buildings have a flat roof, whereas ~60% have a pitched roof (with ceramic tiles or other roof covering material).
- ~35% of the total number of buildings are adjacent to other buildings (not detached).
- 97% of the total number of buildings are privately owned, whereas only 2.9% are public buildings and 0.2% are owned by both public and private owners.
- Out of the total number of public buildings, ~37% are religious buildings, ~14% are educational buildings, ~14% have a commercial use (office / retail), ~9% have a residential use, ≤4% are hotels, healthcare buildings, industrial use buildings, and ~22% have an 'other use'.
- Out of the total number of public buildings, ~47% are used by public entities of public law, 24% are used by local authorities (Regions, Municipalities and entities under their jurisdiction), 3% are used by Central government, 3% are used by two or more entities, and ~18% are used by other types of occupants.

Residential buildings:

- The following describes key information / statistics regarding the existing building stock at overall national level in Greece, as well as some information regarding the unused (empty) building stock.
- Out of the total number of inhabited dwellings:

- 60% have a central autonomous heating system, ~18% have a central non-autonomous heating system, ~18% have a different type of heating system and ~5% have no heating system.
- ~49% are located within a multi-residential building, ~34% are single-family dwellings, ~17% are within buildings with two-dwellings and <0.5% are within non-residential buildings.
- ~30% have double-glazed windows, ~6% have external walls insulation, ~16% have both double-glazed windows and external walls insulation, ~41% are uninsulated.

Degraded & unused buildings:

There is a large number of unused buildings in Greek cities however there is currently no consolidated information (through statistics, registries etc.) on their number at national level. Unused buildings may be under either private or public ownership. It is estimated that only within the Municipality of Athens there are up to 1,500 unused buildings. It is planned within upcoming foreseen legislation (by the Ministry of Environment & Energy) to create in the coming months a registry of unused buildings in each Greek Municipality, as well as a legal framework for the process of rehabilitation / reuse of unused buildings or building units through the establishment of a Management entity.

The currently available information regarding unused buildings at national level concerns residential buildings (dwellings), and a summary of their main characteristics is presented below:

- 35% of the overall number of dwellings in Greece (i.e., ~2,250,000 dwellings) are empty.
- Out of the total number of empty dwellings:

- ~38% have a central autonomous heating system, ~12% have a central non-autonomous heating system, ~25% have a different type of heating system and ~25% have no heating system.
- ~32% are used as holiday homes, ~28% are used as secondary homes, ~20% are empty because they are up for rental, ~4% because they are up for sale, and ~16% for other reasons.
- ~38% are located within a multi-residential building, ~47% are single-family dwellings, ~15% are within buildings with two-dwellings and <0.5% are within non-residential buildings.
- ~10% have double-glazed windows, ~4% have external walls insulation, ~6.5% have both double-glazed windows and external walls insulation, ~30% are uninsulated.
- ~56% are built prior to 1980, ~28% are built between 1981-2000 and ~16% are built from 2001 onwards.

C. POLICIES AND GOVERNANCE TOOLS FOR THE BUILT ENVIRONMENT

National Level:

1. Law 4122/2013 on the Energy Efficiency of Buildings - Transposition of the recast EPBD directive 2010/31/EU into the Greek legislation

The legislation addresses energy efficiency of new and renovated buildings. It put into force the requirement for the definition of the cost-optimal levels of the minimum energy performance requirements following the supplementary EU regulation 244/2012 (methodology for the determination of cost-optimal levels).

It put into force the requirement for Nearly Zero Energy Buildings (NZEBs):

- From 1.1.2019 all new public buildings should be NZEB
- From 1.1.2021 all new buildings should be NZEB.

It put into force the requirement to prepare a National plan for increasing the number of NZEBs, and set out the methodology for calculating buildings' energy performance and issuing Energy Performance Certificates. It introduced the concept of "smart readiness" of buildings.

2. Law 4342/2015 on Energy Efficiency - Transposition of the EED directive 2012/27/EU into the Greek legislation

The legislation introduced the requirements for the exemplary role of public buildings. It put into force the requirement for the formulation of a National Energy Efficiency Action Plan that constitutes a policy tool for the development of a strategy to improve energy efficiency (in buildings and other sectors). It introduced the requirement for producing a National long-term strategy for renovation of the building stock (residential and commercial, public and private). It put into force the obligation for a 3% of floor-area annual renovation (starting from 1.1.2014) of buildings owned and occupied by the central government (above 250m2), towards complying with the legislation minimum energy performance requirements. It put into force the obligation for regional and local public authorities, for buildings under their jurisdiction, to:

(a) Conduct Energy Efficiency plans for the improvement of the energy efficiency of their public-building stock, to be monitored, updated and submitted to the Ministry of Environment and Energy every 2 years;

(b) Apply an energy management system including energy audits;

(c) Where feasible, take advantage of innovative financial schemes, including energy performance contracting (ESCOs), for the implementation of the energy upgrading projects foreseen in the Energy Efficiency plans. Buildings included in Energy Efficiency plans at regional and local level have priority in being eligible for financial incentives and programmes.

3. Law 4685/2020 - Transposition of directive 2018/844/EU into the Greek legislation (amending 2010/31/EU on the energy performance of buildings and 2012/27/EU on energy efficiency)

The Law updates articles of L.4122/2013 and L.4342/2015. It introduces incentives to support building renovation towards NZEB. It puts into force that from 01/06/2021, for the construction permit of a new building, the submission of an Energy Performance Study is required to demonstrate that the building meets the energy performance and minimum standards of a NZEB building.

4. Law 4843/2021- Transposition of directive 2018/2002/EU into the Greek legislation, relating to "amending Directive 2012/27/EU on energy efficiency, adapting to the provisions of the Regulation 2018/1999/EU on the Governance of the Energy Union and Climate Action, and to the provisions of Regulation 2019/826/EU on the contents of comprehensive assessments of the potential for efficient heating and cooling and related regulations for the energy efficiency in the building sector and for the promotion of Renewable Energy Resources and competition on the energy market".

Among others, Article 6 of this legislation defines the "exemplary role of buildings belonging to the
public sector". For local and regional authorities, an Energy Efficiency Plan for their building stock
must be prepared, according to the template posted on the website of the Ministry of Environment and Energy, including:

- The characteristics of the building stock.
- Prioritization of the building stock for energy renovation.
- Techno-economic analysis of energy renovation.
- A detailed plan for achieving a specific energy target.

5. Long-term strategy for the renovation of the public and private building stock and its transformation into high energy efficiency low carbon building stock by 2050 (approval by Ministerial Decision)

The Law presents the Strategy for the implementation of L.4342/2015 regarding the energy renovation of buildings (Article 4 of 2012/27/EU). It includes policy measures for triggering investments towards the energy upgrading of the national building stock; estimations and projections of buildings' energy retrofitting rates towards 2030; policy recommendations to comply with the 3% renovation rates of buildings owned or occupied by the central government.

6. Law 4759/2020 Modernization of Spatial and Urban Planning Legislation and other provisions

Simplification, acceleration and improvement of the efficiency of the spatial and urban planning system. Update of previous Law.

7. National Energy and Climate Plan (2019)

The Greek government's strategic plan for climate and energy issues, setting out a detailed roadmap regarding the attainment of specific energy and climate objectives by 2030.

The NECP stresses Greece's priorities and development potential in terms of energy and addressing climate change and aims to serve as the key tool for drawing up the national energy and climate policy in the next decade, taking into account the Commission's recommendations and the UN sustainable development goals.

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The NECP sets out and details the individual policy priorities for the forthcoming period and the corresponding policy measures that are being planned for implementing the priorities and attaining the objectives of the NECP, under seven different themes:

1. Climate change, emissions and removals of greenhouse gases
2. Renewable energy sources
3. Improvement in energy efficiency
4. Security of energy supply
5. Energy market
6. Agriculture, shipping, tourism (new theme)
7. Research, innovation and competitiveness)

The NECP addresses:

- An integrated model for sustainable and viable growth in all economic sectors
- Combined energy sector development and environmental protection through bold measures for addressing climate change
- Choosing energy policies with the most cost-benefit ratio for energy transition
- Waste management and utilisation by the use of state-of-the-art circular economy technologies
- Transforming Greece into an energy hub with a strong contribution to the EU's energy security and security of supply

- Ensuring the strategic diversification of energy imports, while at the same time modernising and developing energy infrastructures and putting an end to the energy isolation of the islands
- Setting up attractive investment environment to support energy transition, focusing on innovation and new technologies
- Ensuring the maximum possible use of community resources and mechanisms
- Ensuring openness and innovation in order to achieve growth that will create new jobs

8. Circular Economy, the new Action Plan Of Greece

Promoting environmental aspects of sustainability and reducing key environmental and climate pressures related to the national production and consumption, in particular in the areas of energy, industry, buildings and infrastructure, mobility, food waste and tourism.

Promoting measurements for improvement of durability and of adaptation of the existing assets according to the principles of circular economy and digitalization, for instance buildings of high efficiency in terms of energy resources, materials and water.

Usage of the framework Level(s) for incorporating the assessment of life cycle in public contracts.

Setting of goals for the management of construction and demolition waste.

Promoting initiatives for the rehabilitation of abandoned buildings or treatment of contaminated

industrial areas and development of a safe, sustainable and circular usage of the excavation soil.

Promoting actions and new legislation adjustments to enhance the sustainable management of excavation, construction and demolition waste. Giving incentives for further increase of geographical coverage of the Alternative Management Systems for excavation, construction and demolition waste.

Development of markets for secondary materials of processed waste from excavation, construction and demolition, with primarily usage in public constructions or when this not an option, use as secondary raw materials in industry or other uses. There is also provision for the creation of a list with the recycled raw materials that can be used in public constructions and the promotion of their usage through the green public contracts.

Integration of circularity principles in buildings , such as the reuse of materials, consideration of life cycle performance, consideration of life expectancy of the constructed elements during the assessment of the proposals in renovation programmes for public and private buildings, such as the funding programmes "Energy Saving at home", "Electra" and the programmes from the initiative "Renovation Wave".

The creation of a new funding programme from the new National Strategic Reference Framework 2021-2027 or from the Recovery Fund for a) renovation of abandoned buildings, infrastructure, buildings, and facilities aiming for their restoration for the same purpose or for a different one to the one they were constructed for, b) rehabilitation of facilities in contaminated land, so that can be utilized again. Remediation of abandoned or degraded areas, such as industrial facilities, commercial facilities in the framework of preparation for regeneration.

9. Law 4819/2021 - Complete framework for the management of waste

Incorporation of the Directives 2018/851 and 2018/852 of the European Parliament and of the Council of 30 May 2018 for amendment of Directive 2008/98/EC on waste and Directive 94/62/EC on packaging and packaging waste, organisational framework of the Hellenic Recycling Organization, provisions for plastic products and the protection of the natural environment, spatial planning - urban planning, energy and emergency related regulations.

This Law provides a unified legal framework for waste management and emphasizes on prevention and preparation for waste reuse and recycling. Including measurements for the environment and people's health protection, increase of recycling, reduction of negative consequences from waste production and management, minimizing the total impact from the usage of resources and improvement of their efficiency focusing on a circular economy. Also includes organisational issues of the Hellenic Recycling Organization while regulating related issues.

Regional Level:

Regional Operational Program of the Region of Attica for 2021-2027.

- Strengthening the ecosystem of research and innovation, with further connection of research and productive activities (priority 1.1)
- Enhancing the competitiveness, resilience and extroversion of companies, to adapt to the modern environment and to mitigate the effects of COVID-19 pandemic (priority 1.2)
- Promote the principles of Circular Economy, through the organisation of recycling sites for materials, objects and equipment, as well as public awareness actions (priority 2.4)

• Strengthen the role of culture and sustainable tourism in social inclusion and social innovation (priority 4.8)

• Promote energy efficiency in public / municipal buildings and infrastructure of local importance as well as promote renewable energy sources (priority 2.1)

• Protection, improvement and promotion of the natural and urban environment through the promotion of green actions and the strengthening of municipalities infrastructures (priority 2.5)

• Promote sustainable urban development through the continued implementation of the approved initiatives / interventions of Programming Period 2014-2020, and any necessary adjustments to strategies and intervention areas (priority 5.1) [Integrated Territorial Investment Plan of Municipality of Athens]

• Integrated spatial development interventions in selected spatial units of Attica with unique special characteristics and needs (Culture, tourism, environment, analysis of pandemic effects, strengthening of the productive environment and social cohesion) (priority 5.2) [Protection and promotion of the historical and cultural heritage of Attica and enhancement of the tourist product through the utilization of innovations – Cultural ARC Athens-Elefsina-Lavrio]

• Interventions of integrated spatial development in selected thematic axes, value chains and spatial units of the metropolitan area (priority 5.3)

[Integrated Territorial Investment Plan of Cultural product promotion – cultural infrastructure, modern culture, creative economy]

Flagship actions under the above objectives include:

• Reconstruction and conversion of Lysiatreio into a Centre for Entrepreneurship and Innovation Support.

• Promotion of recycling and sorting actions at source (green corners).

• Strengthen the social economy and social entrepreneurship.

• Support entrepreneurship with an emphasis on mitigating the effects of COVID-19 and other catastrophic incidents.

• Energy upgrade in municipal buildings and infrastructure as well as energy saving interventions in the street lighting network.

Climate Action Plan – Municipality of Athens.

The Municipality of Athens launched in June 2022 its updated Climate Action Plan for the period 2021-2030 (building on the original Climate Action Plan published in 2014), including actions for both mitigation and adaptation to climate change. The Action Plan integrates the commitments of the local authority towards EU and international initiatives e.g.: the Covenant of Mayors for Climate and Energy; the C40 Cities network; the 100 Resilient Cities – now Global Resilient Cities Network etc.

The key quantitative target of the Climate Action Plan is a 61% reduction of CO2 emissions by 2030 and a 100% reduction by 2050. The Plan includes 7 strategic axes, amongst which:

• Energy generation from Renewable Energy Sources and energy upgrade of the builtenvironment (Axis 1) [Sub-axes: Energy retrofit of municipal and private buildings; Upgrade of businesses in the Historical center of Athens for green operation and improving their profile; Exploit Empty

Buildings and Conservation of cultural heritage]

The Municipality aims to undertake energy retrofits of 30% of municipal buildings by 2030, and by 2050 all municipal buildings to have been transformed to Nearly Zero Energy Buildings. For private buildings, an initiative is currently in place (by the Municipality in collaboration with ANAPLASI SA) providing subsidies for renovating building facades in the City center. A financing instrument for businesses of the City center is in place (Athens Business Green Toolkit) and other instruments for energy retrofits of private buildings are under assessment.

For empty abandoned buildings of high architectural value, mainly found in the City center, the Municipality is currently undertaking a strategic plan, together with relevant stakeholders, aiming at their renovation, exploitation, conservation of the city's cultural heritage and sustainable operation. A number of abandoned buildings in the city center have been cleared so as to be restored to their former use, and maintenance / restoration works are ongoing in some empty municipal buildings.

The Municipality of Athens launched in June 2022 its updated Climate Action Plan for the period 2021-2030 (building on the original Climate Action Plan published in 2014), including actions for both mitigation and adaptation to climate change. The Action Plan integrates the commitments of the local authority towards EU and international initiatives e.g.: the Covenant of Mayors for Climate and Energy; the C40 Cities network; the 100 Resilient Cities – now Global Resilient Cities Network etc.

The Plan includes 7 strategic axes, amongst which:

• Circularity and sustainable water and waste management (Axis 6) [Sub-axes: Expansion of recycling bins network; installation of red bins for clothes recycling;
creation of 'green corners' for recycling / reuse; awareness-raising actions for citizens
actions to promote reuse and responsible consumption; recording water consumption footprint of the Municipality; reuse of rainwater run-off from buildings; water-saving measures in public spaces; urban farming programmes for citizens and businesses; etc.]

• Transition to a Green and Smart City (Axis 7) [Sub-axes: Education and awareness-raising actions for citizens on Climate Change; Supporting Entrepreneurship and Innovation; etc.]

D. TECHNICAL METHODOLOGIES AND GOOD PRACTICES

The Cultural Heritage resources:

Greece consist of a continuous layering over the centuries. Architecture heritage from antiquity to neoclassic era are saved and protected institutionally from public authorities, conforming a widely constrained series of procedures to possible interventions. However, during the 20th century and Modern Movement, a different building typology takes place and forms the majority of the constructed volume in the country. Post-war Athens, in the two decades after World War II, acquired approximately 40,000 residential buildings, established even in the international literature as "polykatoikia".
The phenomenon of ''polykatoikia'' consist of a typology structured enough on standardized in situ construction procedures, liberating the architectural form from the need of special technical capabilities. Initial references of ''polykatoikia'' are found during the decade of 1930s, when it was proposed as a multilevel apartment building, mainly in property of the upper economical class. After World War II, embodies a different role regarding the Governmental response to the housing problem caused by the extensive increment of the population.

The law of ''antiparochi'' allowed to the owners of land to exchange their right with a future property of an apartment in a multistorey building. Consequently, this effects the property model of ''polykatoikia'' on its very nature. Multilevel buildings are formed of a vast sprawl of properties, as every apartment is dedicated to a different ownership in most of the cases. Effectively, this condominium provoked by the multi property condition engages major constrains regarding interventions, and decisional procedures. Hence, ''polykatoikia'' has formed the major part of the Greek city, as a consequence of the elevated number of its presence. During the post war decades, it is interesting the fact that the use of construction methods and technics developed and practiced through ''polykatoikia'' are the same besides the economic provenience of the owner.
Le Corbusier's Dom-Ino "ossature" seems to be part of the very nature of polykatoikia's conception. A rationalized structure system which provides different possibilities towards the open plan. Although, analyzing ''polykatoikia'' as the main architectural typology of the Athenian Modern Movement heritage, a wide field of construction and architectural techniques have been generated, based on the labor potential and the limited resources of materials produced in the country. Specific concrete based plaster finishes, terrazzo pavement, and wooden structure shading systems, are some of these techniques providing a sustainable low cost response to the housing need of that era.
Today, 50 years later, Athens faces a paradoxical problem. While there is theoretically a strong disincentive to the demolition of aging buildings due to the invested building factor, resulting in their need for renovation , this is rare at least at the level of total building reconstruction. Patchwork renovations scattered throughout each apartment building cannot bring the building stock up to 21st century standards. The result is that there is

huge, although research wise unspecified, stock of empty apartments or even entire buildings that would theoretically solve the city's housing immersive problem. The fragmentation of ownership among many owners, even per apartment in each building, and the complex institutional framework for permitting building reconstruction interventions create impasse conditions that require the investigation and methodological introduction of redevelopment tools for the latent potential of Athens' buildings.

Good practices

1. Green Pilot Urban Neighborhood




Project type (existing building renovation and / or urban area regeneration)	Existing buildings' renovation and surrounding urban area regeneration.
Location (address / city)	Municipality of Agia Varvara. Site boundaries: Sifnou Str., Smyrnis Str., Voutenis Str., Kolokytha Str. GPS coordinates: Latitude: 37.986, Longitude: 23.661
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Private owners (low-income citizens)
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Private owners (low-income citizens)
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	CRES implements the project in cooperation with the Municipality of Agia Varvara. A construction company is responsible to implement the renovation project as the Main Contractor.
Project funding source (public / private; funding program)	Public: National Strategic Reference Framework (NSRF), Operational Programme: Environment - Sustainable Development
Project status	Ongoing

Short project description

Programme "Environment – Sustainable Development". CRES implements the project in cooperation with the Municipality of Agia Varvara (Region of Attica).

The project aims to promote sustainable economic and social cohesion by focusing on raising quality of life and upgrading the living environment of low-income residents, who face dense urban conditions in blocks of flats originally built by the Ministry of Social Providence in 1965.

The project concerns a pilot energy refurbishment project on an urban building complex (4 social housing blocks - 72 apartments, total floor area 4.800 m2 with surrounding outdoor space 2.500 m2), showcasing the "zero energy balance" concept. The pilot action will transform the housing apartments by implementing energy saving measures in order to drastically reduce the buildings' energy demand, with the balance being met by renewable technologies. In addition, interventions will be implemented in the surrounding area of the buildings, in order to upgrade the environmental conditions in the area. As a result, residents will benefit from reduced energy bills and improved comfort in their apartments and surrounding courtyards in winter and summer.

Key sustainable features

The key energy and environmental interventions to be applied, with the aim to improve the sustainability of the buildings and the surrounding urban environment, include:

- External thermal insulation in the buildings' walls and roofs
- Replacement of windows and integration of shading systems
- Cool materials in roofs and walls

- Intelligent networks
- Renewable energy sources (photovoltaic panels on the roof; geothermal heat pumps for heating / cooling; solar hot water panels)
- Environmental upgrade of the surrounding outdoor space, with the addition of vegetation, water and shading elements

2. ELIH-MED (Energy Efficiency in Low-Income Housing in the Mediterranean).






Project type (existing building renovation and / or urban area regeneration)	Existing buildings' large-scale renovation and selected interventions in the surrounding outdoor space.
Location (address / city)	Democritus University of Thrace, Komotini Campus
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Democritus University of Thrace
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	University students (selected based on social and financial criteria)
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Democritus University of Thrace was the main entity responsible for the project implementation. CRES provided technical support for the planning, implementation and monitoring of the renovation.

	and the Region of Eastern Macedonia and Thrace was responsible for communication / dissemination activities. A construction company was responsible to implement the renovation project as the Main Contractor.
Project funding source (public / private; funding program)	MED 2007-2013 Programme (co-financing by national funds)
Project status	Completed

Short project description

The project ELIH-MED was a Strategic project co-financed by the MED 2007-2013 Programme. The main project objective was the identification, through large scale experimentation on > 500 households in six Mediterranean countries (Spain, France, Italy, Greece, Cyprus and Malta), the feasibility of cost-effective technical solutions, financial mechanisms backed with European Regional Development Funds (ERDF) and Smart Metering solutions, to foster energy efficiency investment in low income housing in the Mediterranean area, and improve the EU strategy for energy-efficiency in the MED area, so that it can reach the EU2020 objectives. In Greece, the pilot project was implemented by the Democritus University of Thrace, in collaboration with CRES and the Region of Eastern Macedonia and Thrace. It concerned the pilot energy refurbishment of 5 Student Residences buildings of the Democritus University of Thrace of a total built floor area of approx. 12.800 m2, accommodating 700 students.

Key sustainable features

Large-scale energy-efficiency interventions were applied in the buildings and renewable energy
technologies incorporated:

- External insulation on all buildings' elevations and exposed floors

• Space heating control and metering devices (in 1 building)

• Installation of metering-monitoring equipment for thermal and electrical energy, temperatures, and water consumption

• Installation of an energy display screen in the Students' restaurant

• Pilot installation of roof-mounted PV and external PV powered light fitting

• Monitoring of the buildings' energy performance before and after the implementation of the pilot works

• Participatory planning and consultation with local stakeholders and with the building users throughout the progress of the works

• Extensive awareness-raising campaign on energy-efficiency, renewable energy and protection of the environment, with interactive actions for the residents - students

• Information events for all involved stakeholders (Municipality, Region, University technical services department, buildings' managers, building industry professionals, the wider public etc.) on energy-efficiency in buildings, renewable energy, and sustainability in the built environment

3. REPUBLIC-MED (Retrofitting Public spaces in Intelligent Mediterranean Cities).

Project type (existing building renovation and / or urban area regeneration)	Existing buildings' renovation and urban areas (open public spaces) regeneration (note: the project included studies only).
Location (address / city)	3 pilot public buildings in the Municipality of Piraeus: (1) PIKPA – Mixed use Municipal building, (2) 27th elementary school, (3) 1st secondary school, 1st and 6th High school. 2 open public spaces in the Municipality of Piraeus: (1) Karpathou Square (2) Sotirou Dios pedestrian street
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Municipality of Piraeus
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Building (1): Social institution -residents and employees; Buildings (2) and (3): pupils
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	The Municipality of Piraeus is the entity that would implement the project (if it was to proceed to actual implementation). CRESprovided technical support for the energy
Project funding source (public / private; funding program)	MED 2007-2013 Programme (co-financing by national funds)
Project status	Completed (note: the project included studies only).

Short project description

CRES was the coordinator of the project REPUBLIC-MED, which focused on the development and experimentation of a new methodology for conducting complete techno-economical studies towards the retrofit of public buildings and open spaces (public spaces), and the testing of the methodology in pilot studies of different typologies of Mediterranean buildings and open spaces.

Building energy performance studies and Urban Heat Island assessments were undertaken for selected pilot sites in each partner country (Greece, France, Spain, Italy, Croatia).

In Greece, the pilot studies concerned the energy / environmental retrofit of 3 public buildings and 2 open urban public spaces in the Municipality of Piraeus, in the Region of Attica. The selected buildings included 1 mixed-use Municipal building, 1 elementary school and 1 secondary school, of total built area floor area approx. 6.500 m2.

Key sustainable features

A number of measures' scenarios were studied, for improving the energy and environmental performance of the selected public buildings and open public spaces:

- Cool paving materials
- Addition of new deciduous trees
- Replacement of street lighting with LED
- Photovoltaics on public square shading elements
- Water features

4. SOLE (ex-HELIOS)_High efficiency for the public stock buildings in the Mediterranean.

Project type (existing building renovation and / or urban area regeneration)	Existing building, energy upgrade, renovation
Location (address / city)	Laboratories building, National Technical University of Athens (NTUA) historical complex Stournari Str., Athens
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	National Technical University of Athens
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	University Professors, researchers, administrative, staff
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	NTUA research team
Project funding source (public / private; funding program)	EU and National funds Under 2014 - 2020 Mediterranean Sea Basin ENI CBC Programme
Project status	Ongoing

Short project description

SOLE aims to create joint strategies to support cost-effective and innovative energy-saving interventions in the public building sector in order to enhance the capacity of public institutions in Mediterranean countries to plan and implement sustainable energy policies. The project is built in strengthening knowledge about energy rehabilitation. SOLE tests innovative technics and energy measures in 7 public buildings (Italy, Egypt, Jordan, Lebanon, Spain, Tunisia), in order to improve energy performance, as well as implement capacity-building and awareness campaigns to promote behavioral change and capitalize on these results at the Mediterranean level.

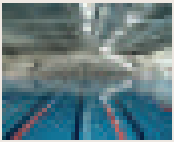
In Greece, the pilot project is implemented by the National University of Athens, and it concerns the pilot energy refurbishment of one building, at the NTUA historical complex. More specifically the implementation which concerns measures such as the installation of photovoltaic panels and the replacement of the heating and lighting system, will take place in a laboratory building of a total built floor area of approx. 920 m2, accommodating 50 users.

Key sustainable features

A number of measures scenarios were studied, for improving the energy and environmental performance of the selected public buildings:

- Photovoltaic panel installation
- Replacement of energy consuming lighting with LED
- Installation of metering-monitoring equipment for thermal and electrical energy, temperatures and water consumption
- Replacement of energy consuming heating/cooling system
- Installation of metering-monitoring equipment for thermal and electrical energy, temperatures and water consumption
- Space heating control and metering devices
- Replacement of windows and integration of shading systems
- Cool materials in roof
- Intelligent networks

5. Serafio Sports & Cultural Center.



Project type (existing building renovation and / or urban area regeneration)	Existing building renovation & new construction; selected interventions in the surrounding outdoor space.
Location (address / city)	Echelidon 19 & Pireos 144, 11854, Athens Latitude: 37.97379, Longitude: 23.70704

Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Municipality of Athens
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Municipality of Athens Innovation Hub: This is Athens (tourism and travel industry), Athens Film Office (culture industry), POIO workshop, The START Project (technology, entrepreneurship, digital literacy and inclusion for all the people), Hellenic Film Academy (culture industry), DAEM SA (technology and digital industry) CSYOMA (culture, sports & youth organization of the City of Athens). The building also includes an exhibition space, an R&D room and a TEC room (technology, engineering, creation) housing activities, exhibitions and events by Entities, Institutions, Businesses and Schools.
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Municipality of Athens
Project funding source (public / private; funding program)	The project was implemented under the Region of Attica Regional Operational Programme, using NSRF Funds (co-financing of Greece and the European Union) in two programming periods (2007-2013 and 2014-2020).
Project status	Completed

Short project description

The Serafio of Municipality of Athens is a complex of Sports, Culture and Innovation, of total area approx. 3500m2, that includes sports and cultural facilities, and at the same time hosting the innovation hub of the Municipality of Athens. Serafio's history begins in 1939, when the expatriate from America, Alcibiades Serafis, leaves in his will a bequest to the Municipality of Athens for the construction of a bath building on the Municipality's plot, which will cover the hygiene needs of the residents of the area. A few years

later, in 1972, the Municipality of Athens enriched Serafion with the construction of a swimming pool. Its operation was interrupted by the strong earthquake of 1999, which caused irreparable damage to the facilities.

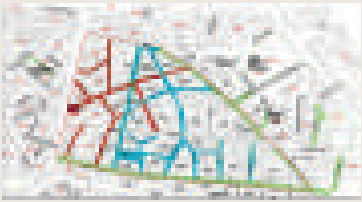
After 17 years, in October of 2017, the historic swimming pool of the city opened its doors again to the residents and visitors of the City, this time as part of the Serafio complex, which functions as an integrated sports and innovation hub of the Municipality of Athens. The Serafio project was implemented by the Municipality of Athens under the Region of Attica Regional Operational Programme, using NSRF Funds (co-financing of Greece and the European Union) in two programming periods (2007-2013 and 2014-2020). The aim of the project was to restart operation of the Serafio swimming pool as well as to use part of the building as a Hub hosting

artists, creators and citizens, aiming to support entrepreneurship and social innovation.

Key sustainable features

- The project vision is to contribute to a sustainable and accessible city
- Redevelopment of existing facilities combined with new construction, to create a contemporary integrated Sports & Cultural Centre
- Promoting social aspects of sustainability: supporting entrepreneurship and social innovation

6. Athens' Pilot Urban Regeneration Project.



Project type (existing building renovation and / or urban area regeneration)	Urban area regeneration in the commercial triangle of the centre of Athens.
Location (address / city)	Commercial triangle, Athens, Greece
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Municipality of Athens
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	N/A
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Municipality of Athens
Project funding source (public / private; funding program)	NSRF funds
Project status	Initial phase – Completed

Short project description

The project aims to promote growth and mitigate the urban heat island effect locally and serve as a good example to be replicated in other parts of the city.
The project aims to:
• transform the main streets into pedestrian and low circulation zones with the aim of reducing private car use and increasing sustainable mobility options by encouraging cycling and walking,
• deliver accessible options to blind people and people with kinetic difficulties,
• reorganize pathways and rest places according to shading in summer and sun (where possible) in winter,
• plant more trees, where possible. Where the width of streets does not allow it, pergolas are used where shade is needed and large plant pots are placed, to increase evapotranspiration.
• use cool and natural materials, with low embodied energy for covering pedestrian areas and low circulation streets,
• use LEDs in public lighting,
• interventions in the urban drainage system
• addition of urban equipment (seats, waste bins, water fountains etc.)
This holistic approach in a very important area in the city center aims to show that change is possible.
The first sustainable neighborhood aims at revitalizing the commercial triangle by facilitating access and providing opportunities for professionals to increase their income so as to respond the financial crisis.
The project was initially planned since 2016 and some of the interventions completed. An ongoing expansion of the project is included within the latest Climate Action Plan (2021-2030) of the Municipality of Athens, including urban regeneration actions for selected parts of the Athens Commercial Triangle.

Key sustainable features

- Increasing pedestrian / low-circulation zones so as to reduce private car use and encourage cycling and walking.
- Improve accessibility to people with disabilities.
- Increase the use of vegetation, shading and cool materials, improving people's comfort in the urban microclimate and reducing the heat island effect.
- Use low-embodied energy materials thus reducing environmental impact.
- Use LEDs in public lighting thus reducing energy consumption.
- Interventions in the urban drainage system.
- Revitalizing the urban area based on the above interventions, facilitating access to residents, visitors and local businesses.

7. Athens Plans for a Greener and Cooler City – Installation of Green Roofs in 14 school complexes of the Municipality of Athens.

Project type (existing building renovation and / or urban area regeneration)	Existing buildings' renovation (addition of green
Location (address / city)	Various locations of schools complexes in the 7 Municipal Units of the Municipality of Athens

Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Municipality of Athens
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Schools (Nursery schools, Primary, Secondary and High schools)
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Municipality of Athens
Project funding source (public / private; funding program)	"Green Roofs" Programme, Region of Attica Regional Operational Programme 2007-2013, NSRF fundsRegional Operational Programme 2007-2013,
Project status	Initial phase – Completed Maintenance / Reinstating – Ongoing

Key sustainable features

The Greener and Cooler City project aims to address one of Athens's main priorities: the improvement of basic environmental parameters and of the quality of life for all residents.

The Directorate of Urban Green Space and Environment has set a target for making Athens a Greener and Cooler City, by proposing specific sustainable actions, achieving measurable goals regarding environmental improvement and taking into account other social and economic issues.

The main environmental objectives are:

- Mitigation of Urban Heat Island Effect
- Reduction of energy consumption and CO_2 related emissions
- Improvement of bioclimatic indices (indicator of distress or thermal comfort, etc.)
- Increase of CO_2 absorption and dust restrain
- Increase of shade

• Reduction of noise

• Management of storm water

• At the same time, in social terms, the project aims to restore the city center as a residential area and stop its continuous degradation, to offer a healthier environment and improve the quality of life for all who live or work in Athens.

In order to make Athens a greener and cooler city, two basic types of actions are planned:

1. The reassessment of existing green spaces, with a main objective of increasing tree canopy

2. Implementing actions in districts that lack or don't have access to organized and functional green spaces.

New green spaces were planned to be developed, to contribute to the mitigation of the Urban Heat Island effect in Athens, which tends to be more frequent and more intense due to climate change.

That includes the implementation of the proper infrastructure works to allow the planting of new trees on pavements, the further development of the green roofs programme, as well as the development of vertical green spaces and green facades.

In the above context, green roofs have been constructed in 14 school buildings, which has led to a reduction of the buildings' consumption and improved the microclimatic conditions in the areas where the buildings are located.

The project was completed in 2016. A maintenance / reinstating project of the initially planted green roofs is included within the latest Climate Action Plan (2021-2030) of the Municipality of Athens.

Key sustainable features

The installed green roofs on the 14 schools contribute to the following sustainability aspects:

- Energy saving
- Soundproofing
- Enhancement of Flora-Fauna
- Rainwater management
- Dirt retention
- Aesthetic value - Care

E. Local Strategy.

	Athens Greece
Motto of Athens	Methodologies of re-use for the vacant Athens urban stock.
Vision statement of Athens	Methodological tools and framework on the basis of which the vacant building stock of Athens could be redeveloped through LCARS.
General and specific goals of Athens	- Identify areas with vacant building stock - Identify areas with vacant plots of land or free public space - Investigate specific conditions such as: permit framework, property regime, building condition, legislative framework. - Develop the methodological framework of reuse by the application of LCARS strategy Clustering workshops to develop the methodological framework.
Measurable targets of Athens	-Number of identified areas/neighborhoods (5) -Number of identified buildings and empty plots of land (4) Framework to be developed to at least (1) space.

5.3.3 SPAIN

B. INFORMATION ABOUT THE BUILDING STOCK

Murcia is a municipality located in the southeast of the Spain and is the capital of the autonomous region of Murcia. In 2021, the city had 460,349 inhabitants (INE 2021), making it the seventh largest provincial capital in Spain by number of inhabitants. It is an extended city with 28 districts and 55 surrounding boroughs ("pedanías" which, according to the Diccionario of lengua Española, can be defined as "a place/borough attached to a municipality and governed by its own mayor") and occupies a surface of 881,86 km2 encompassing both the city centre and boroughs, and with a density of 520,9 hab/km2 (Murcia en cifras.2020)

The municipality of Murcia has developed various initiatives to promote sustainability and circular economy practices within the city carrying out participative activities to clarify the state-of-the-art in terms of consumption and identify the needs to further establish some key areas of actions in the framework of its Circular Economy strategy (2020). This strategy is implemented over a period ranging from 2021-2025 and is articulated around 12 circularity goals proposed for 2030, 22 priority lines and 30 actions addressing 6 focus areas: Consumption, Waste Management, Water Management, Urban Spaces Sustainability, and Mobility and Cross-cutting Policies. Furthermore, Murcia has also developed the Action plan Murcia 2030 aligned with the Urban Agenda 2030 for a sustainable and circular urban development.

B. INFORMATION ABOUT THE BUILDING STOCK

Types of buildings:

- At national level, in Spain, in 2011, there were 9,814,785 buildings, of which 2,809,125 (28.6%) have one floor, 4,997,156 (50.9%) have two floors and the rest 3 or more.

- 83,786 of those buildings were used for other purpose than mainly or only dedicated to residential one.
- From all the building stock, more than 6 million buildings are located in Municipalities of more than 5,000 inhabitants.

Residential buildings:

- There were 25,208,622 dwellings in Spain in 2011, distributed as follows: 71.7% are main dwellings and 28.3 % secondary and empty dwellings.
- In 2011, 63.3% of dwellings were located in Municipalities with more than 20,000 inhabitants and 53% of the main residential dwellings were located in Municipalities of more than 50,000 inhabitants.
- In 2011, a total of 793,401 residential buildings were built before 1900, representing 8% of the total number of existing stock at that moment. 2,142,531 were built between 1900 and 1960.

44.4% of the residential building stock was built after 1980, and up to 80% after 1960 (5,324,534 were built between 1960 and 2001, and 1,470,533 from 2002 until 2011).

- Out of the total number of inhabited dwellings:

o 25% have gas use,
o 90.13 % have sewage disposal via sewerage,
o 43.40 % have a central hot water system

- In 2018, 45.5% of dwellings had a floor area of between 61 and 90m2. 41.7% correspond to dwellings of more than 90m2, while those smaller than 60m2 account for only 12.7%.
- In 2018, 76.7 % of Spanish main dwellings had an ownership tenure status.

Energy use in buildings:

- In 2016 the share of NZEB (Nearly Zero-Energy Buildings) in new construction for residential buildings was only 0.2%. However, from 2021 onwards, all new buildings for residential use in Spain must be NZEB.
- In 2014 the energy consumption of residential buildings was 107.82 kWh/m2 (below the EU average: 173.18 kWh/m2).
- In 2013 the energy consumption of non-residential buildings was 318.76 kWh/m2 (above the EU average: 251.39 kWh/m2).

On-site Renewable Energy:

- In 2013, 11.67% of the buildings had wood or biomass heaters (above the EU average).
- In 2013, 4.91% of the buildings had solar PV installed (above the EU average).
- In 2013, 0.88% of buildings had solar heaters (above the EU average).
- In 2013, 0.05% of the buildings used geothermal energy (below the EU average).

Energy certification of buildings:

- Since 2013, it is mandatory in Spain to make available to buyers or tenants of buildings (or part of them) an energy efficiency certificate. Each building has to be assigned a label that provides information on its energy consumption and CO2 emissions, classifying it within a scale. This classification varies from class A, for the least energy consumers, to class G, for the most consumers when compared in terms of consumption, and in the same way in terms of emissions.
- 81.0% of existing buildings are classified as E, F, and G in terms of emissions, rising to 84.5 % of buildings in the case of energy consumption.

Degraded & unused buildings:

Degraded buildings

- The main issues of the dwellings are the lack of accessibility, although it is mainly an urban issue as most of these dwellings were located in Municipalities with more than 50,000 inhabitants.
- Another issue is the lack of preservation. In 2011, 7% of the residential buildings were considered as deficient, or bad or in ruins state, and 0.6 % considered as substandard housing.

The deficiencies in the state of preservation (1,763,307 dwellings) mainly affected the main residential stock (56.6%) and the vacant stock (29.2%).

In that sense, the LONG-TERM STRATEGY FOR ENERGY RENOVATION IN THE BUILDING SECTOR IN SPAIN (ERESEE) has stated 3 types of problems to be tackled when it comes to renovation:

- 'Conservation' defects in the building's construction systems and installations. In accordance with the applicable legislation, these defects must be assumed – and therefore paid for up to the economic limit of the legal duty – by the owner, as a result of the duty of conservation inherent in the ownership.

- Problems of physical accessibility to the dwelling, which, with regard to 'reasonable accommodation' in terms of accessibility, are also obligatory in nature.
- Improvements in the energy efficiency of the building, which are only voluntary.
- Between 2000 and 2019, 588,222 buildings benefited from a rehabilitation permit for cementation building, to repair building roofs or facades or upgrading of commercial premises.
- Between 2000 and 2019, 230 528 buildings were totally demolished while 231 868 building were affected by partial demolition.

Unused buildings

- In 2011, more than 7 million dwellings were secondary houses (14.6 %) or empty ones (13.7%).
- The empty stock is the oldest of the stocks (secondary and main dwellings), with 59.1% of the stock built before 1980.
- The vacant dwellings are located by 15.3% in Municipalities with less than 5,000 inhabitants compared to 12% in larger Municipalities.

C. POLICIES AND GOVERNANCE TOOLS FOR THE BUILT ENVIRONMENT

Sustainable Energy and Climate Action Plan (SECAP)

The Sustainable Energy and Climate Action Plan (SECAP) is the key document that shows how a Covenant signatory will reach its commitments by 2030. The development of the SECAP primarily draws on the findings from the Baseline Emission Inventory (BEI) and the Climate Change Risk and Vulnerability Assessment (RVA). Through the development of the BEI, the signatory is able to develop an overview of its greenhouse gas (GHG) emissions, and set appropriate strategies to reach its reduction target (of at least 40% by 2030 compared to the baseline). Similarly, the RVA identifies the most relevant climate hazards and vulnerabilities affecting the local authority, facilitating the process of addressing such risks through the development of an adaptation strategy and identification of appropriate adaptation actions. Through the combination of these aspects, the SECAP defines concrete measures for both climate mitigation and adaptation, with timeframes and assigned responsibilities, translating the long-term strategy into action. Signatories commit themselves to submitting their SECAPs within two years following adhesion.

National Level:

Sustainable Energy and Climate Action Plan (SECAP)

The Sustainable Energy and Climate Action Plan (SECAP) is the key document that shows how a Covenant signatory will reach its commitments by 2030. The development of the SECAP primarily draws on the findings from the Baseline Emission Inventory (BEI) and the Climate Change Risk and Vulnerability Assessment (RVA). Through the development of the BEI, the signatory is able to develop an overview of its greenhouse gas (GHG) emissions, and set appropriate strategies to reach

its reduction target (of at least 40% by 2030 compared to the baseline). Similarly, the RVA identifies the most relevant climate hazards and vulnerabilities affecting the local authority, facilitating the process of addressing such risks through the development of an adaptation strategy and identification of appropriate adaptation actions. Through the combination of these aspects, the SECAP defines concrete measures for both climate mitigation and adaptation, with timeframes and assigned responsibilities, translating the long-term strategy into action. Signatories commit themselves to submitting their SECAPs within two years following adhesion.

Spanish Circular Economy Strategy 2030

España Circular 2030 establishes the basis to promote a new production and consumption model in which the value of products, materials and resources are maintained within the economy for as long as possible, with minimal waste and reusing as much as possible the waste that cannot be avoided.

Regional Level:

Regional Strategy for Circular Economy 2019-2025.

Local Level:

Murcia Action Plan 2030

The municipality of Murcia has also developed the Murcia Action Plan 2030 aligned with the Urban Agenda 2030 for a sustainable and circular urban development. It counts with 6 axes (1. Murcia and its environment, 2. Murcia near to you, 3. Sustainable Murcia, 4. City for the citizens, 5. Open governance, 6. Economic promotion and employment), 31 strategic objectives and 186 lines of action. The first axis "Murcia and its environment" is particularly interesting in the framework of the CARISMED project context as it supports various strategic objectives such as Land development and integration of Murcia into its environment, Regeneration of deprived areas and urban landscape, Valorisation of the cultural, ethnographic and heritage assets, green infrastructures. A series of activities and projects are listed in that context: e.g. Revision of the General Urban Development Plan, Action Plan for the Orchard, the River Project, Inventory of heritage, architectural, environmental and ethnographic infrastructures, Catalogue of Assets and Rights of Murcia City Council, Actions in unique and heritage buildings, Green Infrastructure Plan.

In terms of urban development, the city council of Murcia has implored the Murcia City Strategy 2020 together with the main relevant economic and social actors and organizations of Murcia with the participation of thousands of citizens to launch a strategic reflection on priorities, challenges and development models of the city. This strategy addresses the revitalisation and integral regeneration of neighbourhoods. Some strategic projects are being developed under the umbrella of the Murcia City Strategy 2020, such as the Archaeological Site recovery of San Esteban, Rehabilitation and transformation of the ancient prison into

a cultural center, Green pedestrian and bicycle pathway along the former railway line, Renovation of the artillery barracks, River Murcia (landscape and natural recovery of the riverbed lighting and accesses), pedestrianisation of the avenue Alfonso X El sabio, Value enhancement of the medieval ancient wall, Archaeological park of Las fortalezas del Rey Lobo, Sustainable mobility or SMART Cities.

Murcia's Circular Economy Strategy (MCES)

This strategy is implemented over a period ranging from 2021-2025 and is articulated around 12 circularity goals proposed for 2030, 22 priority lines and 30 actions addressing 6 focus areas:

Consumption, Waste Management, Water Management, Urban Spaces Sustainability, and Mobility and Cross-cutting Policies. Among the most relevant priority lines in the framework of the CARISMED project, we can underline the Sustainability of urban spaces, that tackles the improvement of energy efficiency; the increasing of resilient, self-sufficient, sustainable, green spaces and improving connectivity; or the optimisation of the urban system. Two foreseen activities are directly related to CARISMED: the establishment of an inventory of degraded areas and recovery proposal from a point of view of interconnectivity and the elaboration of the Green and Blue infrastructure strategy. Furthermore, some additional activities linked to the cross-cutting policies contemplate the creation of a hub of disruptive, circular and innovative enterprises, or the development of the municipal sustainable public procurement manual.

Circular Cities' Declaration

The **"Circular cities' declaration"** is meant to be a commitment of local and regional bodies to go from "a linear to circular economy in Europe" through the establishment among other principles of clear circular economy goals and strategies, awareness, circularity in urban planning or economic incentives. This European Circular Cities Declaration has been designed and promoted by a multisector and multi-actor consortium of European organizations, such as the EIT Circular Economy Community or the European Committee of the Regions or the European investment Bank, as part of a H2020 research project.

"ADN Urbano"

A good example of integrated urban regeneration in the city of Murcia is also the project "ADN Urbano" (https://adnmurcia.es/) embedded in the City Strategy 2020 through participative methodology. It is an "initiative of Murcia City Council for the renovation and social activation of the city's neighborhoods, a common point where public resources can be brought closer to the real needs of residents and shop owners". This initiative is carrying out in various districts of the city, taking into account their specificities, identity and needs. Finally, this strategy has developed 5 growth patterns for the city: social, territorial, productive, cultural and smart city.

D. TECHNICAL METHODOLOGIES AND GOOD PRACTICES

The Cultural Heritage resources:

The city of Murcia, based on its long history, presents itself as an open-air museum. It has a relatively small historic Centre in which buildings of different architectural styles and with different functionalities coexist.
After the Christian conquest and the change of creed, the location of temples was affected by the location of temples in places where previously there were ancient mosques. A representative example of this would be that on the site where the Cathedral is built, there used to be a Muslim aljama. Inside a chapel of the Cathedral, the heart of Alfonso X the Wise himself can be found in a sepulchral urn.
Later, in the 19th century, the period of ecclesiastical confiscation began. With it, numerous enclosures (convents and orchards) that were in the hands of the religious establishment were liberated. On the site of some of these, well into the 20th century, what would today be the Romea Theatre and the University of Murcia were built.
Among the traditions with the greatest projection and representation are three festivities that have been recognised as being of International Tourist Interest and Intangible Cultural Heritage of Humanity. Firstly, Holy Week: an activity of a religious nature that is a consolidated sign of identity with a deep-rooted tradition. From Passion Friday before Good Friday to Easter Sunday, fifteen confraternities from Murcia take part in the processions, taking to the streets a legacy of sculptural and musical heritage that has been built up over centuries.
The "Archicofradía de la Sangre" was founded at the beginning of the 15th century, whose works are carried in processions with a penitential sentiment and were pioneers in the incorporation of elements of nature and of the territory. The Salzillo Museum, inaugurated in the 1960s, of the Brotherhood of "Nuestro Padre Jesús" brings together the largest collection of carvings by the Baroquesculptor Francisco Salzillo. Both museums provide a permanent opportunity to contemplate its cultural wealth.

In the second and third part, there are celebrations of a civil nature that date back to the middle of the 19th century and are known as the "Fiestas de Primavera", which consist of: the Burial of the Sardine ("Entierro de la Sardina") and the "Bando de la Huerta". The Burial of the Sardine is of a carnival nature and arose as a minority event at the hands of a group of young students from Murcia in Madrid who, on their return to Murcia to commemorate the end of Lent, presented in their area a humorous recreation of a funeral procession that ended with the burning of a sardine. Years after its first performance, it received definitive support when civil society linked this event to the masked balls organised by the "Real Casino" and the city's "Círculo Industrial". However, the stability of this festivity was only achieved in the last decades of the last century with the creation of the sardine group, which currently includes 23 sardine groups. For its part, the Bando de la Huerta is a celebration of the popular culture of the rural scene which, during that day, projects the habits of the peripheral irrigated land through the streets and squares of the city, thus paying homage to its agriculture. It has five essential elements of the huertano heritage: the Panocho language, traditional clothing, the folklore of the orchard of Murcia, typical gastronomy and customs. It was consolidated in 1982 with the constitution of the Federation of "Peñas Huertanas", which currently brings together more than seventy of these "peñas".
These associations are also in charge of keeping alive another distinctive Murcia Christmas tradition: the making of nativity scenes. In relation to the landscape, it is an element that gives Murcia, also known as Europe, its renowned identity. The city has a key institution called the Council of Good Men. This is the highest legal body for the key

the orchard of management of the scarce resource of water in Murcia, which has a semi-arid climate. It is recognised by UNESCO as Intangible Heritage.
In terms of culture, the municipality has declared culture as essential activity and in that regard, has established the participative Murcia Cultural Model 2030 which counts with 3 objectives: Provide opportunities and support to artists in their professional life with specific support to cultural production and exhibition, Bringing culture closer to the public with exhibition in public areas and in all the districts and neighbourhoods, and deepen the roots and cultural identity of Murcia based on the traditions.
Furthermore, a new initiative called "Reactivos culturales" (cultural assets) was launched in 2021 as a programme of activities that aims at "enabling artists and creatives to prepare projects, boosting networking and cultural production in all fields (amateur, professional, national and international) and in all sectors of culture, and promoting the use of digital tools (platforms, apps, digitisation, etc.)".
Artistic projects are selected by experts and representatives of the municipality and shall be embedded in one of the different activity lines of the programme: Creativity, Gastronomy, Children's Mediation, Performing Arts, Visual Arts, Photography, Architecture and Design, Murcia Street Installations, Audiovisual and Digital Production, Tradition and Popular Culture, Historic, Medieval and Three Cultures Murcia or Landscape, City, Market Garden and Water Line.

Good practices

1. Rehabilitation of two halls within the Cuartel de Artilleria.

Project type (existing building renovation and / or urban area regeneration)	Existing building renovation and urban area regeneration for cultural promotion
Location (address / city)	Murcia city center, District of Carmen Cartagena street, s/n, 30002 Murcia
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Municipality of Murcia
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Cultural and Production Center and exhibition
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Murcia City Council
Project funding source (public / private; funding program)	
Project status	Completed

Short project description

The Artillery Barracks is a former military complex located in the city of Murcia and built between 1921 and 1925. In 1998, the complex was ceded to the Murcia City Council.

The objective is to carry out an in-depth restoration project to transform the complex into a multipurpose space with cultural centers and exhibition spaces and connect the complex with the local urban environment.

The first phase of the project consisted in turning the 2 halls (Pabellón 1 and 2) of the Cuartel de Artilleria into a cultural creation center and converted it into reference spaces dedicated to the promotion and dissemination of cultural events.

This project is part of the Strategic projects of the municipality for urban regeneration.

Key sustainable features

- Comprehensive refurbishment of the buildings with the reinforcement of the structure,
- Creation of large rooms
- Restoration of facades (preserving its original materials, ornamentation, joinery, and openings)
- Reparation of balustrades, balconies, and roofs
- Improvement of accessibility
- Creation of green area around the Cuartel
- New charging points for electric vehicles

2. Rehabilitación y puesta en uso de la Fase I de la antigua prisión provincial de Murcia (Rehabilitation and put into use of the first phase of the former ancient Prison of Murcia).

Project type (existing building renovation and / or urban area regeneration)	Existing building renovation.
Location (address / city)	Murcia city center, Avenue General Primo de Rivera, 2, 30008 Murcia
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	City Council Murcia
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Municipality of Murcia
Project funding source (public / private; funding program)	Public + EU (50 % FEDER) Estrategia de Desarrollo urbano sostenible integrado MurciaIT
Project status	First phase completed

Short project description

Rehabilitation in different phases of the ancient prison and adjacent spaces that was built at the beginning of the 20th century, opened in June 1929 and closed in 1981 to be converted into a multi-purpose space, for cultural and leisure, with exhibitions, cultural activities, or events.

The building has been catalogued as Singular element of the urban stock.

This project is part of the Strategic projects of the municipality for urban regeneration.

The first phase consisted in refurbishing the main entrance building, and accommodated it for multipurpose uses including an exhibition hall, a conference room, space for historical memory, creating also new ways of access and a cycle lane.

Key sustainable features

- Refurbishment of the main entrance building, and its adaptation for social, cultural and recreational uses
- Creation of landscaped outdoor spaces and new pedestrian access as well as a cycle path.

	Murcia SPAIN
Motto of Murcia	Smart Cities Initiatives in Irbid city through applying different low-cost adaptive measures.
Vision statement of Murcia	Irbid is a model for Green Cities through encouraging circular economy initiatives at different levels and indifferent sectors
General and specific goals of Murcia	Collaborating the efforts of all relevant stakeholders to make Irbid a model for green and smart cities
Measurable targets of Murcia	Rehabilitate the public building in Al-Zhara'a Park to be a studio lab for SMEs and entrepreneurs in Irbid

5.3.4 ITALY

A. OVERVIEW

In Palermo and Sicily Circular Economy constitutes an important opportunity for facing the challenging problem of waste management, promoting, at the same time, the local CCI SMEs networks. Public policies, nevertheless, currently do not (at national, regional, and local level) include any smallscale local-based solutions or clear paths for a circular transition.
Despite the lack of encouraging public policies, some creative craft SMEs clusters are experimenting with upcycling processes based on a mix of traditional and innovative techniques using mainly wood and high-density cardboard.
In the construction and architectural field sustainable practices are only recently being introduced.
In Palermo creative craft SMEs, often organized as non-profit entities in the start-up phase, have strong cooperation networks with other non-profit NGOs.

In this context, the CARISMED project promotes the experimentation of low-cost traditional techniques based on natural and sustainable materials – adapted for DIY applications – as tools for the renovation of buildings in the city-center. It is the case of "cocciopesto" (opus signinum), renovation of wooden shutters, production of wooden furniture, use of arundo donax for furniture and structures.
Small maintenance works, in fact, are not subject to long and complex authorization processes.
Encouraging collaboration and exchanging can contribute to the development of cooperation networks in the field of Circular Economy.

B. INFORMATION ABOUT THE BUILDING STOCK

The following paragraphs describe key information / statistics regarding the existing building stock at overall national level in Italy, as well as some information regarding the unused (empty) building stock.

All building types:

- At national level in Italy there are in total 14,452,680 buildings and 63,115 building complexes.
The National Statistics Institute (ISTAT – Istituto Nazionale di Statistica) defines a building as a single, independent construction with spaces regularly usable for residential purposes and/or for the production of goods and services (offices, workshops, etc.). It is delimited by external and dividing walls and roofs. It has at least one access to the street. A building complex is defined as a non-residential group of constructions, buildings and infrastructures, usually in a delimited area (often a gated one), dedicated exclusively or mainly to a single entity's activity.
- Among the 20 Italian regions, Lombardy and Sicily have the highest number of buildings (around 1.7 million buildings each).
- The use distribution, at national level, is indicated in the following table:

Table 5 – Use distribution of buildings at national level in Italy. Source: CARISMED Project.

Use	Buildings		Buildings Complexes	
Residential	12,187,698	84.33%		
productive	287,039	1.99%	15.332	24.29%
Commercial	246.039	1.70%	6.342	10.05%
Offices	60.462	0.42%	1.709	2.71%
Tourism	61.426	0.43%	3.098	4.91%
Services	178.356	1.23%	14.971	23.72%
Other	688.182	4.76%	13.160	20.85%
Unused	743.435	5.14%	8.503	13.47%
Total	**14.452.680**		**63.115**	

- 6,975,977 (48.27%) buildings use bearing walls; 3,594,695 (24.87%) use reinforced concrete; 1,617,026 (11.19%) use other systems.

Residential buildings:

- Among residential buildings, 2,083,389 (17.09%) have only 1 floor (ground floor); 5,981,256 (49.08%) have 2 floors (ground floor + 1 level); 2,948,147 (24.19%) have 3 floors (ground floor + 2 levels); 1,174,906 (9.64%) have 4 or more floors (ground floor + 3 or more levels).
- The table shows the distribution of buildings according to their period of construction, as well as the percentage of very degraded buildings per period:

	Before 1919			1919-1946		
	Number	%	% of very degraded buildings	Number	%	% of very degraded buildings
Italy	1,832,504	15.00%	4.14%	1.327.007	10.90%	4.03%
sicily	98,560	6.90%	9.60%	171.546	12.00%	8.00%
	1946-1990			After 1990		
	Number	%	% of very degraded buildings	Number	%	% of very degraded buildings
Italy	7.332.087	60.20%	1.01%	1.696.100	13.90%	0.17%
sicily	982.431	68.60%	2.03%	178.882	12.50%	0.26%

- In Italy there are 24,189,094 dwellings. There is not available data about their actual occupation.

Degraded and unused buildings:

Italian southern regions have a higher number of very degraded buildings than central and northern regions. The table above shows the distribution of very degraded buildings according to the period of construction at national level as well as at regional level in Sicily.

Ownership status:

According to the Income Revenue Authority (Agenzia delle Entrate) of the Ministry of Finance 2019 publication "Properties in Italy - 2019 | Wealth, income and real estate taxation", 75.2% of the families (as per the statistical definition of family) resides in owned properties. Almost 60% of the 57 million properties owned by natural persons in Italy are used as a main residence. More than 10% of the housing stock is leased, while the available homes (typically referred to as "second homes") are above 17%.

There are just under 900,000 units, 2.7% of the total, the houses given free of charge to a family member who "habitually resides" there. As regards the distribution by territorial areas, in the South 53.5% of the total homes of natural persons are used as main dwellings, in the North and in the Center the share is higher, respectively 56.8% and 58.5%.
Homes owned by natural persons have a total value of €5,526 billion, while the ones owned by not natural persons entities €474.40 billion.
The breakdown by geographical areas shows a concentration in the North of the total national residential value of 50%, while the remaining 50% is divided between the Central area and the South and Islands area.

Table 7 – Ownership status of buildings in Italy. Source: CARISMED Project.

	Real estate units of natural persons		Real estate units of not natural persons		Real estate units of natural persons	
North	28.258.502	49.50%	4.064.043	55.49%	32.322.545	50.18%
Centre	10.695.555	18.74%	1.558.293	21.28%	12.253.848	19.02%
South	18.133.716	31.76%	1.700.940	23.23%	19.834.656	30.79%
Total	**57.087.773**		**7.323.276**		**64.411.049**	

C. Policies and governance tools for the built environment.

National Level:

Testo Unico per l'Ambiente

The National Law about Environment Protection is a wide national law, covering diverse topics in the framework of environment protection. The law regulates, among other, how industrial plants (big, medium and small) have to deal with waste management. In particular, production scraps have to be managed as "special waste" through authorised farms

and operators. This process is very expensive. Only in certain cases, authorised farms can re-introduce waste in the production cycle as secondary raw material. Any other use is defined as "waste trafficking".

Regional Level:

Piano Regionale di Gestione dei Rifiuti Urbani (PRGRU, Regional Plan for Urban Waste Management)

In the framework of the ERDF OP 2021-2027 preparation, the Sicilian Regional Government developed a Regional Plan for Urban Waste Management (4/3/2021). In principle, the PRGRU, envisages an upgrade of waste management and recycling in a circular economy and upcycling
perspective. Nevertheless, preliminary guidelines currently focus mostly on the production of biogases from organic (and mainly forestry and agriculture) waste.

Piano Regolatore Generale della città di Palermo (Masterplan for the City of Palermo).

The Masterplan is currently under discussion in the City Council. Nowadays only a short summary has been shared with citizens and/or stakeholders. Despite the interest in participation processes and dynamics shown by the municipality in the last decade, poor attention and time have been paid to the involvement of citizens and/or stakeholders. Thanks to their experience in the revitalisation of the city-centre through creative and sustainable small businesses based on CE, CCIs have often claimed a public debate on these topics.

Local Level:

Piano Industriale 2022-2024 della RAP

Whilst the Sicilian Regional Government is responsible for waste treatment (cf. §A.1), the Municipality of Palermo takes care of the waste collection through the municipally owned corporation RAP s.p.a.. RAP s.p.a. releases a three year operational plan (Piano Industriale). The Operational Plan 2022-2024 shows how waste collection will be managed both for recyclable and non-recyclable materials

Piano Comunale della Raccolta Differenziata

The Municipality defines guidelines and general goals in the domain of waste collection for RAP s.p.a. through a Municipal Plan for Differentiated Waste Collection. As the responsibility of waste treatment is under the Sicilian Regional Government, the Municipality can only manage the waste collection.

PO FESR 2014-2020 / PO FESR 2021-2027 (ERDF OP 2014-2020, ERDF OP 2021-2027)

Both the 2014-2020 and 2021-2027 Operational Programmes in the framework of the European Regional Development Fund, focus on ecological transition and CE. They define funding instruments and policies for local administration and SMEs. SMEs and CCIs have benefited in 2014-2020 and will benefit in 2021-2027 from funding programs aimed at enhancing the social and spatial impact of creativity in urban city-centres, as well as promoting environmentally responsible entrepreneurship and upcycling processes. These programs have been contributing to the revitalisation of the citycentre of Palermo through the establishment of creative SMEs.

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Mercato del Riuso dell'Albergheria (Second hand and re-use market)

In the city-center of Palermo, next to the market "Ballarò" there is a traditional, informal secondhand market called "Mercato del Riuso dell'Albergheria". It has been regularized in 2020, thanks to the cooperation between the municipality and a local NGO that plays the role of mediator with migrants and marginalized groups that traditionally sell second-hand products. Although the market plays an important role in the reduction of waste, still the sellers leave a considerable quantity of undifferentiated waste in the streets every week and costs of disposal are covered by the local municipality.

D. Technical Methodologies and Good Practices.

The Cultural Heritage resources:

A great variety of traditional construction or craft techniques are based on natural materials, optimize the use of resources and are potentially useful in a renovation project.

Nevertheless, the context and need analysis conducted with the target groups shows the importance of focusing on a low-budget choice and, as a consequence, on techniques that it is possible to adapt for a DIY application (cfr. § B.2, D, E.2). Even if, as previously mentioned (cfr. §B.2 and E.1.2), renovation projects entail some authorizations from the Municipality, the Italian law allows private owners/tenants to realize some maintenance works by themselves. This circumstance is not commonly
known, and it will be the topic of some training/information sessions in the framework of the CARISMED project as it constitutes an opportunity for low-budget SMEs
CRESM – PP4, thus, identified four of traditional practices related to LCARs within two major categories:

1) Renovation of the building.

a) "Cocciopesto" (opus signinum). Different forms of natural lime and limewash used to be adopted in Palermo and Sicily, as well as in the rest of the Mediterranean. "Cocciopesto", nevertheless, (probably dating back to the Phoenician age) is particularly relevant in a CE perspective because it allows the reuse of different types of scraps (also from pottery).

b) Renovation of wooden shutters. Wooden shutters, during the last decades, are often being replaced by metal or plastic ones. The maintenance, in fact, is quite long and complex, as well as a knowledge crafters are gradually losing. The renovation of shutters, as a DIY intervention, as multiple advantages: it can be realized almost for free and without any authorizations by public authorities (because it respects the traditional materials and appearance of historic buildings); it preserves a traditional knowledge; it promotes the use of wood (very well known as an extraordinary construction material, both in terms of energy efficiency and sustainability).

2) Renovation of furniture and equipment.

a) Wooden furniture design and production. Palermo has an important tradition of cabinet-making and fine furniture production. Within Cantieri Culturali alla Zisa (cfr. §E.1.2), in particular, the industrial area was dedicated to the production of art nouveau furniture. Creative craft clusters are renewing the traditional techniques adapting them to contemporary technology, such as digital fabrication, in order to create products suitable for the contemporary market.

b) Use of arundo donax. The arundo donax is a shrub plant very common throughout the Mediterranean basin. It has always been used for furniture and construction because it is a very flexible and robust material. In Sicily in particular it has always been used in the field of rural architecture, but in recent decades it has been progressively abandoned in favour of synthetic materials. In present days it is only used to mark borders between agricultural lands, when it is not considered as a weed to be eradicated. Because of its characteristics, the arundo donax is a suitable material for bio-architecture and, as it is often an agricultural waste, for Circular Economy practices.

Good Practices:

1. Abitare sociale 1/Milano – Via Cenni.

Project type (existing building renovation and / or urban area regeneration)	Urban area regeneration
Location (address / city)	Via Cenni, Milano, Italy
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Fondo Immobiliare di Lombardia
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Residents (mainly low income families)
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Rossi Prodi Associati (planning and project design) Fondo Immobiliare di Lombardia (funding)
Project funding source (public / private; funding program)	public and private
Project status	completed

Short project description

Via Cenni is a social housing project. It was developed in the framework of a planning contest launched by the fund "Abitare Sociale" and designed by the associated architectural firm "Rossi
Prodi Associati". The project was completed in 2013.
The tower-design was chosen in order to augment the density rate and respond to the housing needs dedicating large areas to services, public and green spaces.
Attention is paid to pedestrian and slow mobility, both within the renovated area and in connection with the neighborhood and the city.
In terms of technology Via Cenni is considered a best practice. It includes, in fact, several low-tech and low cost solutions. Moreover, at the time of the construction, Via Cenni was the biggest social housing project realized through a wooden weight-bearing structure.

Key sustainable features

The connection between technological innovation and architectural form has been present since the conceptual definition of the project, which took into consideration aspects such as efficient energy use, quality of indoor air, natural lighting and acoustic isolation.
More in detail:

- Buildings are oriented in order to optimise solar radiation, natural ventilation, protection from winter winds and permeability for the summer breeze.
- Green areas in the courtyards and on the roofs contribute to micro-climatic control.
- The ring-shaped morphology optimises excavation costs and optimises pedestrian circulation.
- Building envelopes are designed to optimise the energy management.
- Building design contributes to acoustic isolation.
- Dry construction systems and wooden load-bearing structures (using X-Lam wood panels) guarantee flexibility (both during construction and for long-term maintenance), as well as the possibility to reuse and recycle the material in the future.

2. Darsena di Ravenna – Lotto 4.

Project type (existing building renovation and / or urban area regeneration)	New building construction in the framework of an urban area renovation project.
Location (address / city)	Darsena, Ravenna, Italy
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Region Emilia Romagna
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Residents (mainly low income families)
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Cino Zucchi Architetti (project design) Iter Cooperativo – Region Emilia Romagna (funding)
Project funding source (public / private; funding program)	public and private
Project status	completed

Short project description

The building is included in a wider project for the renovation of the Darsena, the waterfront of Ravenna. It consists of a mix of social and free-market housing.
The building has been designed focusing on the relationship both to the existing urban fabric and to the water, including several semi-public areas connected to the future promenade on the waterfront. It also includes services and commercial areas.
The colorful plasters on the facade recall the tradition of polychrome mosaics in Ravenna.
The different height of the blocks is related to the view from the inner city and to the solar orientation.

3. PASS (Progettazione Attiva Spazi Sociali).

Project type (existing building renovation and / or urban area regeneration)	existing building renovation
Location (address / city)	Giussano (provincia di Monza e della Brianza,
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	ALER (economic public entity)
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Residents (mainly low income families)
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Comune di GIUSSANO, ALER COMO MONZA VARESE BUSTO ARSIZIO, Spazio Giovani Onlus Cooperativa Sociale, Fondazione Residenza Amica Onlus, Il Girasole Cooperativa Sociale, F.A.T.A. - Fuoco Aria Terra Acqua Cooperativa Sociale, Mestieri Lombardia - Consorzio di Coop. Sociali, Consorzio SIS, Comunità Pastorale S. Paolo – Caritas

Project funding source (public / private; funding program)	Regione Lombardia (through European
Project status	completed

Short project description

PASS (Progettazione Attiva Spazi Sociali, Active design for social places) has been implemented in a small, socially very vulnerable area.

The project developed a method for renewing some buildings through training activities in the building sector contributing to the inhabitants' social inclusion.

The partnership included the municipality of Giussano, the regional economic public entity in charge of social housing, a building company and some NGOs.

PASS focused on the idea of "do ut des": the possibility of a free training, a short job contract in the framework of the project and the renovation of the beneficiaries' dwellings, was conditional on giving something in return to the community (mainly a manual contribution to the renovation of public areas).

Key sustainable features

The sustainability features of PASS lie on two different aspects:

1. Social sustainability. The project focuses on community building and place-making. In a socially vulnerable area, the involvement of inhabitants in the renovation of social housing buildings, as well as of public spaces contributes to the development of the sense of place and of the community bond.

2. Low cost, low tech sustainable traditional techniques. Even if the training activities aimed at developing participants' professional skills, it was necessary to focus on techniques easily and rapidly accessible to non-professional. The choice was made on traditional
techniques and natural materials.

E. Local Strategy.

	Palermo ITALY
Motto Of Palermo	The CARISMED strategy promotes cooperation among profit and non-profit SMEs for the renovation of traditional low cost and low tech techniques based on natural materials in the framework of creative craft ship and the development of CE networks.
Vision statement of Palermo	In a context where public policies do not actively support the circular transition, networks of CCI SMEs will promote Circular Economy focusing on cooperation and renovation of traditional techniques both within their businesses and for the renovation of buildings in the citycenter.
General and specific goals of Palermo	General goal: supporting the development of CE business models among local CCI SMEs. Specific goals: 1. Supporting the renovation of traditional techniques in a CE perspective in the field of creative craft. 2. Supporting the renovation of buildings in the city-center through LCARs.
Measurable targets of Palermo	Targets: 1. Number of products developed in a CE perspective. Number of SMEs trained in LCARs.

5.3.5 TUNISIA

A. OVERVIEW

The Municipality of Tunis was founded on the 30th of August 1858. It is the first municipality created in the Arab world. Its historic heart is the Medina, has been listed since 1979 as a UNESCO World Heritage. Tunis is also a member of UNESCO's Creative Cities, member of AIMF, and member of Learning Cities network.
Thanks to safeguard projects, an economic, social, and touristic dynamic has been created in the city. But the projects realized could only be considered as successful pilot interventions because a major part of the Medina suffers from a general degradation: built heritage collapsed, infrastructures deteriorated, and networks of water, gas, communications, and wastewater very old and often over exploited. It is consequently necessary to consider innovative solutions and to ensure youth and civil society mobilization to succeed a real and fruitful transition.
Its population is estimated in 2014 to be about 700 000 inhabitants. Nevertheless, Tunis receives about three million visitors daily. This important number of daily visitors requires the strengthening of the municipal efforts and interventions to guarantee necessary services and to manage waste as well as general degradation of city's infrastructure. It is also a major challenge given the decline of resources. That's why circular economy is a real solution for the city.
Tunis has also acquired an international reputation thanks to the Revolution of 17 December 2010 – January 14, 2011. This pacific Revolution allowed the city to become part of the world's democratic capitals. The Revolution also enabled the city, and the country, to begin a process of deep changes, certainly long and difficult, but important and encouraging.

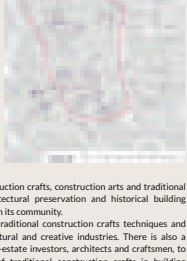
These changes have allowed for more open collaboration and participative planning and budgeting with civil society, which permitted to the Municipality of Tunis, to participate in strengthening small youth led associations, partner with start-ups and community collaborations on social, gender and environmental issues. Municipality of Tunis is also the first Tunisian city to produce a mapping of a city with gender lens through the FEMMEDINA project. This new governance is based on partnership, clustering and encouraging innovation.

B. Information about the building stock.

The Medina of Tunis witnessed important socio-urban transformations in the last century, which impacted on its built heritage negatively. Many buildings, within central Medina's urban limits, are rich in construction craft, human social culture and buildings have a long re-use and transformation history over their years of existence. Today, the Medina has 105 visible abandoned, collapsed buildings within its 100-hectare area. This list is not exhaustive, as some buildings look good on the outside, but neighbors in the community, are aware that buildings are abandoned and are almost collapsing.
Many buildings have been left by their owners, after independence, who moved to new northern or southern suburbs, where they chose to settle in their secondary homes which were more adapted to modern living needs. Some buildings, which are more than 100 years old, were owned by many decedents, and today building ownership is shared between siblings, cousins, and distant cousins. For a private person to buy those homes, it will require an important investment to find all owners and buy the share of each one. This process could last for years, after finding and convincing all owners to accept to sell, agree on a price and approve the new buyer. This lengthy legal process often discourages investors and causes historical buildings to collapse.

Abandoned buildings, are often squatted, or reused as informal dumps; spaces to complete the informal supply-chain trade of illegal substances, and unfortunately, contain easy to collect old ceramics, marble, and woodwork treasures, ready for antique dealers to collect, sell or sadly export. Also abandoned buildings, or what is left of them, could provide important opportunities for young architects to interact with the communities; to design ways that could reintegrate the space in a way that is safe, secure, positive, and protective of Medina's built heritage. Repurposing readapting andbring life back into a historical abandoned building, could create important cultural dynamic and hence jobs.

The map on the right, shows all 105 locations / spaces, where field researchers, were able to identify abandoned buildings. As shown on the map, an important total unconsumed space, is available, for a Medina that lacks communal spaces, and / or sports and leisure areas, or evenspaces for circular economy to thrive.
Next step would be, an investigation of ownership status, of each building through the real estate property department of the Municipality of Tunis and analyze what is the best method to re-integrate the property in its community in a way that is beneficial to its actual surroundings, through community involvement and space needs analysis.



Map 1 – Abandoned buildings in the Medina of Tunis.
Source: CARISMED Project.

Those sites are also important case studies, in construction crafts, construction arts and traditional construction techniques; an opportunity for architectural preservation and historical building repurposing, and hence recycling of building use within its community.
Other opportunities include the documentation of traditional construction crafts techniques and patterns for reuse and reintegration into other cultural and creative industries. There is also a potential need to improve cooperation between real-estate investors, architects and craftsmen, to create new opportunities and reinforce the use of traditional construction crafts in building restorations.
Due to multi-ownerships of historical buildings, purchasing process is lengthy and costly; and once complete, and all official real estate registrations have been made, Medina building restorations permits are subject to lengthy administration regulations, with unclear architectural protection specifications, that are not documented nor published. Unclear standards, result in having a large majority of Medina's inhabitants, restore without applying for a building permit.
Once the restoration permit is acquired, often the restoration costs are at least triple the cost of the home purchase. The restoration execution time is unpredictable, as it is dependent on rare to find, highly in demand, master artisan.
In Tunisia, both real estate developers and local government urban plans are almost always directed towards new undeveloped land. For real estate developers, the return on investment of a home in the Medina, is very low taking into account the above-described process. Also, the unwritten Medina community laws make the investment a very risky business, compared to investments on agricultural and rural areas.

C. Policies and governance tools for the built environment.

National Level:

Private Public Partnership' legislation

The 2015 approved 'Private Public Partnership' legislation could spark important opportunities for the Municipality of Tunis, to improve its waste management through waste sorting, then providing to environment companies in search for waste valorization opportunities. Unfortunately, the PPP law has been difficult to implement, and in the absence of a strong internal government administration will, the informal sector will remain the most important beneficiary of waste valorization.

Code du patrimoine archeologique, historique et des arts traditionnels' related to cultural heritage protection no. 94-35 published in 24/2/1994.

Medina's rich built heritage appears dependent on this law, which has many loopholes that give the minister of culture absolute power, in protecting and preserving heritage, including built heritage. Nevertheless, the law does not mention how to manage, restore or register cultural heritage and archaeological sites, but also the ministry of culture does not have the means to control nor to implement the law.

D. Technical Methodologies and Good Practices.

The Cultural Heritage resources:

Craft production and trade have been, throughout the history of the Medina of Tunis, an important sustainer of life through commerce and continuous cultural exchange, over generations of Mediterranean migrants. The Medina was founded by the Arabs in the 7th century.

Since then, till today, the Medina embraced within its walls, immigrant jewelers from Italy, Andalusian silk weavers, Jewish carpenters, Ottoman embroiderers and saddle makers. Some of immigrant grandchildren still carry the legacy of their ancestors today, as they continue producing, adapting and even exporting their Medina made Tunisian products.
The Medina has managed to reinvent itself throughout its 1300 years. Its dense agglomeration of alleys and covered passages, full of intense colors, noise and scents kept its trade activities, thanks to continuously adapting itself to newcomers, new lifestyles, and dynamic socio-economic factors. New Medina culture emerges as new cultures settle themselves in their new Medina homes, to create a blend of Medina specific traditions that sustains itself through change.
The Association of Medina Preservation (ASM) has launched in 2014 an important field research, part of MEDNETA project, to assess and evaluate the status of artisanship in the Medina. The study localized over 500 artisan workshops practicing over 30 different crafts today. Even though the numbers are considerably high for the area covered, they demonstrate a decline when taking into account that in the 18th century, the medina housed over 27000 artisans and in the 19th century, there were more than 13000 artisans.
The decline is due to several factors. The obvious ones are industrialization and decreased youth involvement. Industrialization brought to the market all needed consumer goods, and made some craftsmanship obsolete due to lower pricing, faster production, and more variety. On the other hand, being an artisan is not as prestigious a job as it used to be in the previous centuries, where one had to go through artisans to get life's necessities. This resulted in decreased youth interest and loss of traditional craft production knowledge.

Other less obvious factors are the continuous increase in commodity prices, which has not been reflected by a similar increase in handicraft product prices, and hence artisan pay decreased, causing economic hardship. Economic hardship could also lead to decrease innovation, as artisans are forced to custom produce rather than innovate which requires saved assets to buy raw materials and develop prototypes for market testing. Decreased innovation threatens artisan-entrepreneur business sustainability and is a big threat to intangible heritage preservation.
The Medina provides a variety of positive vectors to the continuation of crafts and design as a form of economic activity, it is a great touristic site with a rich assortment of monuments which are frequented my tourists almost all year round. This allows for artisans to not only produce for the local market, but also for a mixed audience from abroad. The fact that artisan workshops have always been a central part of the Medina's socio-cultural and even economic scene provides established workshops and know-how which works towards the amelioration of local productivity.
The Medina is also logistically convenient due to the presence of raw material suppliers, distribution networks as well as vendors and customers all being geographically centralized within the Medina. This combined with the rich inventory of various know-how and vast network of workshops in such close proximity makes for a creative products hub.
Opportunities also lie on the side of the government which might provide support in this larger project. The first is to review the vocational training system which is currently in place. The incorporation of for example entrepreneurial studies, the increased cooperation with artisan workshops and the possible implementation of long-term apprenticeship programs will work towards the amelioration of the current situation among artisans in the Medina.

Furthermore, the improvement of the financial services for artisan business, that is making loans more readily available, will also increase production and the ease of opportunities for young artisans. As regards to designers, legislation will need to be written and installed for designers, for in the current situation, designers are very limited in their possibilities due to the lack of any proper legislation.
Despite the vibrant live of artisan workshops in the Médina and the range of opportunities which lie ahead for the further development of these artisan workshops there are some threats posed by these developments. The first of which being the possible negative impact on the historical buildings in the Médina. Many of the current workshops are located in former residential homes which have been transformed into workshops. However, many of these houses are inappropriate locations due to their construction, but also due to the pollution which they create. The increase of pollution, both in noise and in actual waste, negatively affects the residents of the Medina.

Good practices

1.DAR BEN ACHOUR

Project type (existing building renovation and / or urban area regeneration)	Historical building belonging to the family of Ben Achour, converted to a public library belonging to the municipality of Tunis.
Location (address / city)	Medina of Tunis
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Municipality of Tunis
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Municipality of Tunis
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	ASM Tunis
Project funding source (public / private; funding program)	Public Funds
Project status	Completed operational

Short project description

Dar Ben Achour was the property of Ben Achour family, then became an abandoned building, after which the property was transferred to the municipality of Tunis, which restored it with the support of ASM Tunis, and converted it into a public library.
Today the building is a hub for researchers, since all municipal council reports since the 1920's are housed at Dar Ben Achour but is also an important safe space for youth in the community, who are looking for a quiet gender-neutral space, where they can study.

Key sustainable features

Dar Ben Achour is well integrated in the community, and making itself accessible to activities in the community, which lacks many open public safe spaces.

2. DAR EL COLLECTIF

Project type (existing building renovation and / or urban area regeneration)	The building is privately owned, was abandoned, strategically located on Pasha Street, in the Medina of Tunis. Today it houses Collectif Creatif, an NGO which unites several community activities in the medina of Tunis.
Location (address / city)	Medina of Tunis
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Privately Owned
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Collectif Creatif
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Collectif Creatif
Project funding source (public / private; funding program)	Collectif Creatif
Project status	Completed

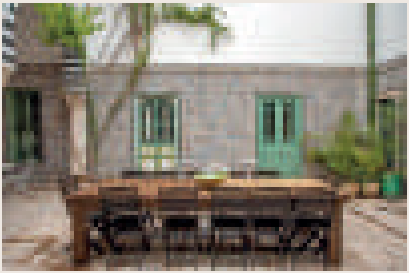
Short project description

The building is private owned, and today has several owners that part inherited the building. There is no consensus between the many owners, and is not occupied by Collectif Creatif, which have repurposed the building and made it open to an important number of creative youth, in search of space to meet, experiment, design, create cultural initiatives in the Medina of Tunis, which contribute to urban revival.

Key sustainable features

Dar Ben Achour is well integrated in the community, and making itself accessible to activities in the community, which lacks many open public safe spaces.

3. DAR BEN GACEM.



Project type (existing building renovation and / or urban area regeneration)	Built in the 15th century, transfred from the Anoun family to Ben Gacem family in 2007; today a boutique hotel of 7 rooms.
Location (address / city)	Medina of Tunis
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Dar Ben-Gacem
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Dar Ben-Gacem
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Dar Ben-Gacem
Project funding source (public / private; funding program)	Private funds
Project status	Completed

Short project description

Boutique hotel social enterprise for shared economy social inclusion and urban revival.

Key sustainable features

- Shared economy with neighboring businesses.
- Employment of staff from the community.
- Reinvestment of profits in restoring spaces.

E. Local Strategy

	Medina TUNISIA
Motto of Medina	New socio-cultural dynamic in the Medina of Tunis through abandoned urban stock valorisation

Vision statement of Medina	Medina of Tunis, a hub for innovation in architecture, design, and circular economy.
General and specific goals of Medina	Uniting private, public, and civil society for urban revival and repurposing of abandoned urban stock in the Medina of Tunis.
Measurable targets of Medina	Design 3 abandoned space repurposing proposals, to be used as examples for better urban stock capitalization in the Medina of Tunis

5.3.6 JORDAN

Irbid Governorate is in the northern part of Jordan. The Governorate enjoys a few natural resources, such as valleys, springs, fertile plains, and a diverse climate. These natural characteristics make Irbid Governorate one of the most important agricultural areas in Jordan in terms of the amount of cultivated land, constituting 11% of the total cultivated land in the country.
Irbid is characterized by being the second largest governorate in Jordan in terms of population. Furthermore, in terms of the number of economic enterprises in operation, Irbid is the second governorate after Amman, with a contribution rate of up to 71% of the total economic enterprises in operation in the north, and a rate of about 16.7% Kingdom-wide.

On the other hand, it has the second largest industrial city in the Kingdom in terms of the volume of investment.
Irbid enterprises are distributed in diversified sectors, mainly commercial and industrial.
Commercial activities include retail and sale processes in food, drink, and tobacco, followed by shops selling clothing, shoes and leather products, then computer and furniture shops. Wholesale and retail commerce; vehicle and motorcycle repairs also constituted a good percentage. Irbid industrial activities include food industries, metal industries, non-metal industries besides furniture, clothing, and wood industries.

B. Information about the building stock.

The following describes key information / statistics regarding the existing building stock at overall national level in Jordan, as well as some information regarding the unused (empty) building stock.

All building types

• At national level in Jordan there are in total 888,028 buildings. 80% are residential and 20% are governmental, commercial and other types of buildings.
• 6.7% of the total number of buildings are ground floor buildings, 42% include ground + 1 level, 22.5% include ground + 2 levels, 8.3% include ground + 3 levels, 6.6% include ground + 4 levels, 2.8% include ground + 5 levels and ground level, 2.8% include ground + 6 levels, 1.2% include ground + 7 levels, and 7.1% other types of buildings.
• 96.7% have no elevator, 3.3% have an elevator.

• 80% of the total number of buildings are residential buildings and an additional 7% are mixed use buildings of which the principal use is residential and work. 6.4% of buildings have a commercial (office / retail) use, and others include educational buildings, healthcare buildings, hotels, religious buildings etc.
• 5.7% of the total number of buildings are built in 2015, 4.7% (2014), 3.2% (2013), 1.8% (2012), 1.4% (2011), 3.2% (2010), 18.2% between 2000 - 2009, 30.8% between 1980 -1999, 18.7% between 1960 - 1980, and the remaining 12.3% before 1960.
• 20% of the total number of buildings use Cut stone as the main construction material, 11.6% use cut stone and concrete, 26% use reinforced concrete, 41% use concrete bricks, 0.3% Mud Bricks & Stones, 1.5% other materials (timber, metal etc.).
• 42% have one housing unit in the building. 22.5% have two housing units, 8.3% have three housing units, 6.6% have four housing units, 2.9% have five housing units, 2.8% have six housing units, while the remaining 14.9% have more housing units.
• 93.1% of the total number of buildings are privately owned, whereas only 5.2% are public buildings. The remaining 1.7% are either shared between public and private or do not have clear status.
• Out of the total number of public buildings, ~11.4% are religious buildings, ~80.4% have a commercial use (office / retail), ~4.2% have a recreation and culture use, and 1.3% are hotels. While the remaining 2.7% represents other types of buildings

Residential buildings:

• At national level there are in total 2,282,283 housing units (dwellings), 18.5% are empty, 1% are closed.
• Out of the total number of inhabited dwellings:
o 3.7% have central heating, 22.1% use kerosene and diesel heating, 5.6% use electric heater, 35.3% gas heater, 1% air conditioning, while the remaining 32.3% are using other sources such as cutting woods in villages or other sources that they didn't declare.

o 76.4% are occupied by a private household or more, 0.5% occupied by collective household, 0.2% occupied by a collective house unit, while the remaining 0.1% are hotels, 18.1% are vacant, 1.8% is closed, 2.9% is under construction.
o –31.6% are located within a multi-residential building, –43% are single-family dwellings, –22.7% are within buildings with two-dwellings and 2.7% are within nonresidential buildings.

Degraded & unused buildings:

There is a large number of unused buildings in Jordan cities however there is currently no consolidated information (through statistics, registries etc.) on their number at national level. Unused buildings may be under either private or public ownership. It is estimated that there are almost 21,760 unused (vacant or closed) buildings at national level.
Currently, the Municipality Greater Amman is sending warnings to the owner of any unused building either to re-use it or demolish it with the exception to historical locations.

The currently available information regarding unused buildings at national level concerns residential buildings (dwellings), and a summary of their main characteristics is presented below:
• There are only 21,255 buildings that are empty. They include 432,291 housing units.
• 505 buildings are closed. They include 26,581 housing units.
• Out of the total number of empty buildings:
o –8.7% are residential, 5.4% are establishments (private companies or NGOs premises).

C. Policies and governance tools for the built environment.

National Level

Jordan Renewable Energy & Energy Efficiency Fund JREEEF

The Jordan Renewable Energy & Energy Efficiency Fund JREEEF was established in response to meet the needs of the Kingdom to invest in various sources of renewable energy, and widen benefit in various sectors, such as residential, educational (schools), health (hospitals) as well as private, public , industrial and service sectors . This fund encouraged the people to procure solar panels or energy efficient ACs through loans with Zero interest.

Jordan Green Building Council (Jordan GBC)

The Jordan Green Building Council (Jordan GBC) has worked on Green Building Guidelines that are adapted to the local context and benchmarked with international rating systems.

Local Level

Sustainable Energy and Climate Action Plan (SECAP)

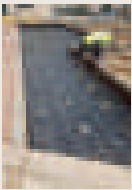
As part of the EU support to the local authorities, the Municipality of Greater Irbid has developed and adopted the Sustainable Energy and Climate Action Plan (SECAP). It has committed to reducing its total emissions by 2030 to at least 40 per cent below 2015 rates, conditionally and subject to availability of international financial assistance and support.

D. Technical Methodologies and Good Practices.

The Cultural Heritage resources:

The answer to this question were different from one stakeholder to but based on our experience with the SMEs in the INNOMED-UP project and based on the interviewed stakeholders, the SMEs and people in general will be enthusiastic to adopt the LCARs interventions if there are sufficient technical and financial support. This was very clear in the awarded innovation sub-grants.
There is a need to have a group of CCI SMEs, representatives of local authorities , representatives of local community such as workers in the construction fields in order to formulate a community committee that can be the hub for the LCARs interventions.
This committee will be provided by the technical training about the different LCARs interventions, how to implement them and discuss the feasible solutions that they can implement easily. This will give clearer idea about the appropriate ways of introducing the mild interventions of LCARs.





the capacity building training and the introduced technical knowledge, the SMEs will be more receptive and acceptable to the new introduced technologies.
Future Pioneers added value that it is has implemented several projects related to LCARs. It has implemented wide projects related to encouraging local communities, schools, worship houses, and municipalities to adopt different green practices such as:

- Installing renewable energy and energy efficiency systems
- Installing water efficiency systems such as grey water systems and efficiency devices
- Solid waste management and recycling projects and green businesses.

Good Practices:

1. UPGRADING OF FATIMA ALZAHRA' PARK IN MARKA.

Project type (existing building renovation and / or urban area regeneration)	Rehabilitation of existing public park in consultation and participation of local community
Location (address / city)	One public space in Marka/Amman
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Municipality of Greater Amman
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	Public space for local community with special focus on the inclusion of children with disabilities.
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Design and implementation was done by Future Pioneers
Project funding source (public / private; funding program)	UN-HABITAT in Jordan
Project status	Completed

Short project description

Future Pioneers has conducted the required studies for an old public garden (public space) that is used heavily by the local community.
The place lacks the safety factors and the beautification elements . So, Future Pioneers in consultation with UN-HABITAT developed several scenarios and designed the architectural drawings accordingly for the best scenario for more safe public area to be a model for other locations as described below.

Key sustainable features

- Safe access to children with disabilities and install special and safe games for them
- Cool paving materials
- Addition of new deciduous trees
- Replacement of street lighting with LED
- Use of recycled tires as seating for the children's parents

2. Sustainable Education Through Renewable energy in the governorates affected by the Syrian Crisis.






Project type (existing building renovation and / or urban area regeneration)	Maintenance activities of (100) existing schools, and providing them with renewable energy and energy efficiency equipment
Location (address / city)	100 schools located in Irbid, Mafraq and Jordan Valley
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Ministry of Education
Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	These are public schools occupied by local students and their teachers.
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Awarded bidders who are specialized in similar works under the consortium which Future Pioneers is part of
Project funding source (public / private; funding program)	Dutch Ministry of Foreign Affairs
Project status	Completed

Short project description

This project aims to contribute to the overall efforts aiming at mitigating the impact of the Syrian crisis in line with the Jordan Response Plan (JRP) focusing on the Northern governorates (Mafraq, Ramtha, Irbid, and North of Balqa'a Governorates) that are most affected by the Syrian crisis. This will be achieved through the use of Renewable Energy (RE) and Energy Efficiency (EE) systems to reduce the growing energy demand, improve the learning environment in schools, increase enrollment and retention of Jordanian and Syrian students, improving the livelihood of surrounding communities and promote the social cohesion at the same time.

The (110) schools have been completed and handed over by the deadline. This will directly benefit more than 56,205 Jordanian and Syrian students of which are 23,204 boys and 33,001 girls, 45,625 are Jordanian students while 10,580 are Syrians.

Key sustainable features

- Install Solar system with a capacity that is sufficient to cover the electricity needs of the school.
- Replace all lights with LED ones that save energy.

- Install ACs that save energy and provide heating/cooling system.
- Maintenance activities that will increase the efficiency of the installed systems such as maintaining the windows, doors, walls, electrical cables and others.
- Conduct wide awareness activities inside the schools and in the surrounding communities to change behaviors and encourage people to adopt renewable energy and energy efficiency equipment.
- 47 of the above schools managed to get the international Eco-schools certification.

Project type (existing building renovation and / or urban area regeneration)	Renovation activities for an existing building to change it into a modern private school
Location (address / city)	One building in Amman
Owner (i.e., who owns the building / area where the renovation / regeneration took place)	Private sector

Occupier (i.e., who occupies the building / area where the renovation / regeneration project took	The building was privately owned and it will be occupied later on by students
Project implementation entity (ies) (i.e., who was responsible for the implementation of the project)	Zukhurf for engineering consultations
Project funding source (public / private; funding program)	Private
Project status	50% Completed

Short project description

This project aims to change the purpose and use of a privately owned villa into a private school to extend the area of the original school that is located adjacent to the villa.

So, we are changing the use of the building from residential to educational use.

The project is designed by Zhokurf and implemented by one of the local contractors.

Key sustainable features

- Change the internal partitions and spaces inside to suite the educational purposes.
- Change all internal decorations to ensure safe environment for children.
- Rehabilitate the management area.
- Install Solar system with a capacity that is sufficient to cover the electricity needs of the school.
- Replace all lights with LED ones that save energy.
- Install ACs that save energy and provide heating/cooling system.

- Change the external landscape and install safe rubber and play area.
- Change the external design using the cladding.
- Rehabilitate the electromechanical systems including sound systems, LED lights, sensors , and water saving devices.

E. Local Strategy.

	Irbid JORDAN
Motto of Irbid	Smart Cities Initiatives in Irbid city through applying different low-cost adaptive measures.
Vision statement of Irbid	Irbid is a model for Green Cities through encouraging circular economy initiatives at different levels and indifferent sectors
General and specific goals of Irbid	Collaborating the efforts of all relevant stakeholders to make Irbid a model for green and smart cities
Measurable targets of Irbid	Rehabilitate the public building in Al-Zhara'a Park to be a studio lab for SMEs and entrepreneurs in Irbid

06.
FINAL NOTE

The Toolkit-Advisory Guide for Urban Policy in Mediterranean Cities encapsulates a rigorous analysis of the multifaceted challenges faced by urban centers within the region. Grounded in previous experience and the results of multiple ENI CBC MED Programmes as well as empirical research and case studies implemented in the scope of the CARISMED Project, this guide provides a systematic framework for addressing issues pertaining to sustainable development, cultural preservation, CCI SMEs empowerment and territorial impact, climate resilience, and social inclusivity.

Throughout the guide, emphasis has been placed on the imperative of a paradigm shift towards a circular economy through an innovative urban policy, taking into account the opportunities presented by the role of CCI SMEs in shaping the urban environment while preserving the rich cultural heritage of Mediterranean cities. The good practices and practical examples discussed here are underpinned by economic viability and social enrichment, ensuring the longevity and vitality of the unique cultural fabric characterizing each city.

Moreover, the guide underscores the pressing need for proactive measures to mitigate the adverse impacts of climate change. The incorporation of upcycling methods in urban development,

green infrastructure, adoption of renewable energy sources, and low-cost adaptive reuse practices both at the urban and entrepreneurial level are central for an effective and inclusive green transition that is based on the resilience of urban centers and the creative industries they host. A central tenet of the guide is the promotion of social inclusivity and community engagement as a pivotal factor to facilitate this transition.

In closing, this Toolkit-Advisory Guide stands as a comprehensive resource for policymakers, urban planners, and stakeholders.

It is our hope that the pragmatic approaches and evidence-based strategies presented herein serve as catalysts for informed decision-making and policy formulation in Mediterranean cities. Our expectation is that by embracing the principles outlined in this guide, cities can navigate the complexities of contemporary urban challenges and pave the way for sustainable, inclusive, and resilient urban environments.

07.
BIBLIOGRAPHY

• Agenda Urbana Plan de acción de Murcia 2030, Ayuntamiento de Murcia.
• Archivo General del Patrimonio Cultural de la Región de Murcia.
• Aurelli, Pier Vittorio, Giudici, Maria S., Issaias, Platon (2012), From Dom-ino to Polykatoikia, Domus-web.
• The Barcelona Centre for International Affairs, (2015). Mediterranean Trends and Urban Challenges – Policy Brief, MEDCITIES Annual Conference.
• Belavilas, N. and Prentou, P. (2015). Abandoned buildings and vacant shops: The Spatial pattern of the crisis. Athens Social Atlas. Vacant shops - Athens Social Atlas.
• Borsacchi, L. and Tacconi, D. (2019) 'SUSTAINABLE & CIRCULAR RE-USE of spaces & buildings', Sustainable Land Use: European Urban Agenda.
• CARISMED (2023). Baseline Report for Activity 3.1.2.: Built-environment situation analysis and diagnostic mapping of degraded & unused buildings / areas at Med-Cities. Implemented by the Center for Renewable Energy Sources and Saving.
• Castillo Fernández, J., Catálogo de documentos del Reino de Murcia en el Registro General del Sello. 1475 – 1503, Murcia, 1998
• Circular Economy Solutions Dialogues (CESD) (2022, June) The circular economy imperative - What is at stake for cities? Deep Dive Webinar: Circular Solutions for the Urban Built Environment, Construction & Demolition Waste and the role of Digitalization.
https://www.global-solutions-initiative.org/policy-advice/circular-economy/
• Definición de estrategias de regeneración, ADN Urbano, La Asomada Observatorio socioeconómico de Murcia.
• Diagnóstico del Estado de la economía circular en el municipio de Murcia, Ayuntamiento de Murcia, Centro Tecnológico de la Energía y del Medio Ambiente. 2020
• Doranova, A., Roman, L. and R. Zhechkov (2019) CIRCTER - Circular Economy and Territorial Consequences Policy Guide. Technopolis Group. ESPON.
https://www.espon.eu/sites/default/files/attachments/CIRCTER%20Policy%20guide.pdf
• EEA (2016) Circular economy in Europe: Developing the knowledge base. Available at:
https://www.eea.europa.eu/publications/circular-economy-in-europe#additional-files.
• Ekins, P. et al. (2019) The Circular Economy: What, Why, How and Where. Managing environmental and energy transitions for regions and cities. Available at:
https://www.oecd.org/cfe/regionaldevelopment/Ekins-2019-Circular-Economy-What-WhyHow-Where.pdf.
• Elena Ambrosetti (2020). Demographic Challenges in the Mediterranean, IEMED Mediterranean Yearbook 2020.
• Ellen MacArthur Foundation (2013) 'Towards the circular economy. Journal of Industrial Ecology', pp. 23–44.
• Ellen MacArthur Foundation (no date) Circular economy introduction. Available at:
https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview.
•Elsevier ScienceDirect(2022), https://www.sciencedirect.com/topics/engineering/builtenvironment
• Estrategia de desarrollo urbano sostenible, Murcia I'T, Ayuntamiento de Murcia.
• Estrategia Española de Ciencia, Tecnología e Innovación 2021-2027, Ministerio de Ciencia e Innovación.
• Estrategia de ciudad Murcia 2020, Ayuntamiento de Murcia, 2016.
• Eteron Housing 360o , A depiction of the housing issue in Greece > 4. Vacant Houses. Vacant houses - ETERON Στέγαση 360°
• European Circular Cities Declaration (2020). Available at:
https://circularcitiesdeclaration.eu/fileadmin/user_upload/Images/Pages_Images/Circular_City_Declaration/Circular-Cities-Declaration-Template_new_logos.pdf.

• European Commission (2010) Green Paper - Unlocking the potential of cultural and creative industries.
Available at:
https://op.europa.eu/en/publication-detail/-/publication/1cb6f484-074b-4913-87b3-344ccf020eef/language-en.
• European Commission (2011) Roadmap to a Resource Efficient Europe (COM 2011/571).Brussels.
• European Commission (2015) The EU Circular Economy Action Plan (COM 2015/614 final). Brussels.
• European Commission (2018) 'Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Creative Europe programme (2021 to 2027) and repealing Regulation (EU) No 1295/2013', 0190(366 final), pp. 1–43.
• European Commission (2019) European Green Deal (COM 2019/640 final). Brussels.
• European Commission (2022) Cultural and Creative Sector.
• European Commission. Construction products - review of EU rules.
https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12458-Construction-products-review-of-EU-rules_en
• European Parliamentary Research Service. The Circular economy.
https://www.europarl.europa.eu/thinktank/infographics/circulareconomy/public/index.html
• European Parliament (2022) Circular economy: definition, importance and benefits.
• Fontana, A. A., Rossi, L. and Barni, A. (2021) D4.1 Circular Economy- driven lifetime-extension strategies. Available at:
https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5db5b6032&appId=PPGMS
• Foster, G. (2020, January) "Circular economy strategies for adaptive reuse of cultural heritage buildings to reduce environmental impacts", Resources, Conservation and Recycling 152, 104507.
• Francisca Colomer Pellicer, Ana Costa Pérez María Costabile Sánchez, Álvaro Jacobo Pérez Ana Belén Martínez Pérez, Pascual Santos López., Patrimonio de la Región de Murcia Patrimonio Histórico – Artístico,. julio 2018.
• Gravagnuolo, A., Angrisano, M. and Fusco Girard, L. (2019) 'Circular Economy Strategies in Eight Historic Port Cities: Criteria and Indicators Towards a Circular City Assessment Framework', Sustainability, 11, p. 3512. doi: 10.3390/su11133512.
• Guía Para Estrategias Locales De Rehabilitación Urbana, Observatorio ciudad 3.R, Ministerio de Transportes, Movilidad y Agenda Urbana
• Hellenic Statistical Authority, 2011 Population and Housing Census, Piraeus..
https://www.statistics.gr/documents/20181/1215267/A1602_SAM05_DT_DC_00_2011_01_F_EN.pdf/9b9aeab0-eeda-4818-8196-b6ff988081c1
• Huovila, P. (2007) Buildings and climate change: status, challenges, and opportunities. UNEP/Earthprint.
• ICOMOS (2002) ICOMOS international cultural tourism charter: principles and guidelines for managing tourism at places of cultural and heritage significance. International Council on Monuments and Sites, ICOMOS International Cultural Tourism Committee.
• The INNOMED-UP Project, WP4 - SMES CLUSTERING CAPACITY ENHANCEMENT THROUGH ROADMAPS AND SMART TOOLS > OUTPUT 4.1: STRATEGY DESIGN FOR SPECIALIZATION OF THE INNOMED-UP HOLISTIC APPROACH AT LOCAL LEVEL > ACTIVITY 4.1.2: SWOT-PEST ANALYSIS REPORTS FOR EACH CITY.

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• The INNOMED-UP Project, WP4 - SMES CLUSTERING CAPACITY ENHANCEMENT THROUGH ROADMAPS AND SMART TOOLS > OUTPUT 4.1: STRATEGY DESIGN FOR SPECIALIZATION OF THE INNOMED-UP HOLISTIC APPROACH AT LOCAL LEVEL > ACTIVITY 4.1.3.
• INNOMED-UP (2023). Guide for Circularity Strategy for Cultural Creative Industries & Small and medium-sized enterprises in the Mediterranean.
• INNOMED-UP (2023). Guide for access to financial tools for CCI SMEs who want to innovate in the CE.
• Intergovernmental Panel on Climate Change (IPCC) (2015) Climate change 2014: mitigation of climate change. Cambridge University Press, Cambridge.
• Interreg Baltic Sea Region (2021) Circular place. Available at: https://ndpculture.org/wpcontent/uploads/2022/04/CircularPlace.pdf.
• Jackson, T. (2016) Prosperity without growth. Foundations for the economy of tomorry. 2nd edition. Edited by Routledge. London. doi: https://doi.org/10.4324/9781315677453.
• Jordi Juan Tresserras (2003). Tourism in the Mediterranean: Trends and Perspectives. Panorama: The Mediterranean Yearbook 2003.
• Journal, D. (2022). The Public Private House. Modern Athens and Its Polykatoikia: and other reviews. Docomomo Journal, (60), 94–95. Retrieved from https://docomomojournal.com/index.php/journal/article/view/379
• KEA (2006). The Economy of Culture in Europe, Study prepared for the European Commission (Directorate – General for Education and Culture.
• Kibert, C.J. (2007) The next generation of sustainable construction. Build Res Inf 35(6):595-601.
• Kirchherr, J., Reike, D. and Hekkert, M. (2017) 'Conceptualizing the circular economy: An analysis of 114 definitions', Resources, Conservation and Recycling, 127, pp. 221–232. doi: https://doi.org/10.1016/j.resconrec.2017.09.005.
• Kirchherr, J. et al. (2017) 'Breaking the Barriers to the Circular Economy'.
• Linking the SDGs with the New Urban Agenda. https://www.sdgsnewurbanagenda.com/home.html
• Maloutas, Thomas, Spyrelis, Stavros (2015), Vertical social segregation in Athenian apartment buildings, Athens Social Atlas.
• Manoli Panagiota (2021). Economic Linkages across the Mediterranean: Trends on trade, investments and energy, Hellenic Foundation of European and Foreign Policy.
• Municipality of Athens. (2022) Climate Action Plan Part A. https://www.cityofathens.gr/wpcontent/uploads/2022/08/schedio-gia-tin-klimatiki-allagi-9-6-2022.pdf
• Murcia's Circular Economy Strategy Action Plan, Ayuntamiento de Murcia, Centro Tecnológico de la Energía y del Medio Ambiente. 2020
• OECD (2022) Glossary of Statistical Terms, https://stats.oecd.org/glossary/index.htm
• Pintossi, N., Kaya, D.I. and A. Pereira Roders (2021) "Assessing Cultural Heritage Adaptive Reuse Practices: Multi-Scale Challenges and Solutions in Rijeka", Sustainability 13, 3603.
• OECD (2022) 'Defining and measuring cultural and creative sectors', in The Culture Fix:Creative People, Places and Industries. OECD Publishing. doi: https://doi.org/10.1787/77902c78-en

• Plan Bleu (2022). State of Play of Tourism in the Mediterranean, Interreg Med Sustainable Tourism Community project.
• Plan Bleu (2020). Demographic Trends and Outlook in the Mediterranean, Plan Bleu Notes #38.
• Regional Operational Program Attica (2021). The New Regional Operational Program "Attica 2021 – 2027", as a tool for the recovery of the region in the post Covid-19 era. https://patt.espa2127.gr/sites/default/files/2021-11/THE%20NEW%20REGIONAL%20PROGRAMME%20ATTICA%202021-2027%20AS%20A%20RECOVERY%20TOOL.pdf
• The Riwaq-centre for architectural conservation from Palestine. http://www.riwaq.org/
• Rosenfield, K. (2012, August) "Venice Biennale 2012: Reduce/Reuse/Recycle | German Pavilion", Archdaily. https://www.archdaily.com/267151/venice-biennale-2012-reducereuserecycle-german-pavilion
• Sanchez, B., Esfahani, M.E. and C. Haas (2019) "A methodology to analyze the net environmental impacts and building's cost performance of an adaptive reuse project: a case study of the Waterloo County Courthouse renovations" in: Environment Systems and Decision Springer.
• Siatista, D. and Arapoglou V., Policies for the use of vacant buildings and dwellings to meet housing needs, in Kourachanis, N., (edit.) (2019). Housing and Society. Problems, Policies and Movements, Dionikos Publications. (In Greek)
• Sustainable Recycling Industries (SRI). Informal approaches towards a circular economy, learning from India. https://www.sustainable-recycling.org/informal-approaches-towards-acircular-economy-learning-from-india/
• SWITCHMED, Sustainable consumption and production action plan in Palestine, 2016.
• Triantafyllopoulos, N. (2015). The building stock of central Athens. Athens Social Atlas. Real estate - Athens Social Atlas
• UNCTAD (2015) 'Creative Economy Outlook. Trends in international trade in Creative Industries'. Available at: https://unctad.org/system/files/officialdocument/ditcted2018d3_en.pdf.
• UNESCO (2013) United Nations Creative Economy Report Special Edition. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000224698.
• UNESCO (2021) The Operational Guidelines for the Implementation of the World Heritage Convention. https://whc.unesco.org/en/guidelines/
• United Nations et al. (2003) Handbook of National Accounting: Integrated Environmental and Economic Accounting 2003.
• URBAN AUDIT Seguimiento estadístico 2020, Ayuntamiento de Murcia, Murcia en cifras,2020

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