

# ANALYSIS OF THE CURRENT SITUATION REGARDING THE CIRCULAR ECONOMY IN THE CENTER REGION, ROMANIA



22 JANUARY, 2021

# I. WORKING METHODOLOGY

In the case of the Center Region, with a study focus on the localities of Făgăraș, Ocna Mureș and Cugir, we propose the identification of the sectors of immediate, medium and long interest:

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- Energy efficiency;
- Urban regeneration (reconversion, rehabilitation, redevelopment);
- Reducing pollution and waste;
- Smart urban mobility;
- Adopting local smart city policies;
- Complete GIS portfolio and constant monitoring of emissions, light noise, heating, etc.;
- The green city - urban green space rehabilitation policies;
- Valorization of the accessible proximity natural environment;
- Active citizenship solutions - creating a citizen consciousness sensitive to the precepts of the sustainable economy, building a responsible and active NGO environment;
- Cores of education at all levels, from school children to neighborhood associations.

# Criteria used for the analysis of the selected domains

## MULTICRITERIAL ANALYSIS:

Importance in the regional economy

Market

The intensity of innovation

Availability of qualified human resources

Capitalizing local resources

The level of collaboration between actors

The degree of technological sophistication

# STAGES OF THE METHODOLOGICAL APPROACH



# THE CURRENT SITUATION OF THE IMPLEMENTATION OF CIRCULAR ECONOMY IN THE CENTER REGION

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Particular advantages that may facilitate the transition to a circular economy in the component localities and cities:

- The continuous development, including in 2020, of environmental protection infrastructure: the degree of coverage of the population with sanitation services is over 93%, the share of the population connected to the sewage network is over 65%, and the share of the population with access to the water supply system reached 76% of the total resident population.
- The signatories of the Covenant of Mayors on Climate and Energy (Alba Iulia, Ocna Mureș, Brașov, etc.) in the region are actively engaged in the preparation and implementation of the Action Plan on Sustainable Energy and Climate (PAEDC), which addresses both mitigation and adaptation to change climate change before 2030.
- There is a balanced spatial urban infrastructure, with real inter-relationships in the economic, social and administrative field. The degree of electrification of the railway network is higher than at national level, and urban transport services and urban road networks are experiencing a continuous modernization.
- There is interest in the sustainable use of forest and agricultural biomass due to favorable economic factors (lower costs for energy production, revenues from the sale of raw materials, the growing number of SMEs operating in this sector) social factors (protection and creation of jobs in rural areas of the region) and the environment (reduction of organic waste, diversification of energy supply sources and reduction of CO2 emissions).

# EXISTING PARTNERSHIPS AND INNOVATIONS CAPACITY AT THE REGIONAL LEVEL ON THE CIRCULAR ECONOMY

- According to data provided by the 2019 RIO Report, Romania is a modest innovator: after a sharp decline until 2014 - mainly due to the low performance of indicators using CIS data, performance remained stable until 2016 and increased slightly in 2017 and 2019.
- The Central Region remains a modest innovator and regional innovation performance has declined over time (down 10.8% from 2011), indicating that the industry's innovative potential is under-utilized.
- Despite its status as a modest innovator, the Central Region ranked 2nd nationally in 2019 in terms of the number of active innovative start-ups.

| NUTS | REGION             | RII  | RANK | GROUP    | EVOLUTION |
|------|--------------------|------|------|----------|-----------|
| R012 | CENTER             | 27.3 | 233  | MODEST   | -10.8     |
| R032 | BUCHAREST - ILFOV  | 51.6 | 200  | MODERATE | -7.9      |
| R011 | NORTH WEST         | 29.7 | 232  | MODEST   | -9.8      |
| R021 | NORTH EAST         | 21.5 | 236  | MODEST   | -19.0     |
| R022 | SOUTH EAST         | 22.1 | 235  | MODEST   | -19.5     |
| R031 | SOUTH MUNTENIA     | 18.4 | 237  | MODEST   | -16.8     |
| R041 | SOUTH WEST OLTENIA | 14.3 | 238  | MODEST   | -16.4     |
| R042 | WEST               | 32.8 | 230  | MODEST   | -5.7      |

# Research fields and institutions relevant for the implementation of the circular economy

| University   | Research areas relevant to the Circular Economy  |
|--|--|
| Transilvania University of Braşov  | Renewable energies, high-tech products for vehicles, sustainable management of forest and hunting resources, advanced mechatronic systems, advanced manufacturing technologies and systems, ecobiotechnologies and equipment in agriculture and food, advanced electrical systems, advanced metallic, ceramic and MMC composite technologies and materials, process control systems, virtual and robotic industrial informatics, furniture eco-design, restoration and certification in IL, advanced welding ecotechnologies, etc. |
| Lucian Blaga University of Sibiu   | Textile production, agriculture, food industry, environmental protection, unconventional technologies and electrotechnology's, integrated technologies, materials engineering, biotechnologies, ecology, etc.  |
| "1 Decembrie 1918" University of Alba Iulia  | Geology, speleology, archeology, territorial development, legal sciences, education sciences, etc.   |
| George Emil Palade University of Medicine, Pharmacy and Technological Sciences, Tîrgu Mureş  | Advanced design and assisted manufacturing technologies, energy management, electrical technologies, informatics, economics, organization performance optimization, urban planning and public policies.  |
| Technical University of Cluj-Napoca - Alba Iulia extension: Faculty of Road Vehicles, Mechatronics and Mechanics   | Fuels and biofuels, traffic and road safety, noise pollution control and reduction, fuel burning agricultural machinery, energy systems.   |
| „Babeş-Bolyai” University of Cluj Napoca with academic extensions in 6 cities in the Center Region: Sfântu Gheorghe (3 faculties), Odorheiu Secuiesc (one faculty), Gheorgheni (1 faculty), Târgu Secuiesc (1 faculty), Sibiu (1 faculty ) and Târgu Mureş (1 faculty) | Ecotourism and sustainable development, Economy of trade, tourism and services.  |

# Existing policy and funding instruments regarding circular economy

- **European Regional Development Fund and Cohesion Fund (ERDF):** It aims to improve the economy and social cohesion in the European Union by correcting regional imbalances and supporting sustainable growth that promotes green technologies, water and waste management and biodiversity and nature and aims to improve the conservation of all natural assets, nature and biodiversity, clean air, water and waste management
- The summary of the central regional operational program 2021-2027, regarding the allocation by region is the following:

| Allocation Center Region ROP 2021-2027 |                           |
|--|---------------------------|
| ERDF allocation: 85%                   | 1.181.624.889 Euro        |
| BS allocation - 15%                    | 208.522.039 Euro          |
| <b>Total</b>                           | <b>1.390.146.928 Euro</b> |

- European Green Deal
- LIFE Programme
- Interreg Europe
- European Bank of Investments
  - UE Climate Bank

The EB will increase its investment share under its "climate action and environmental sustainability" priority to 50% by 2025

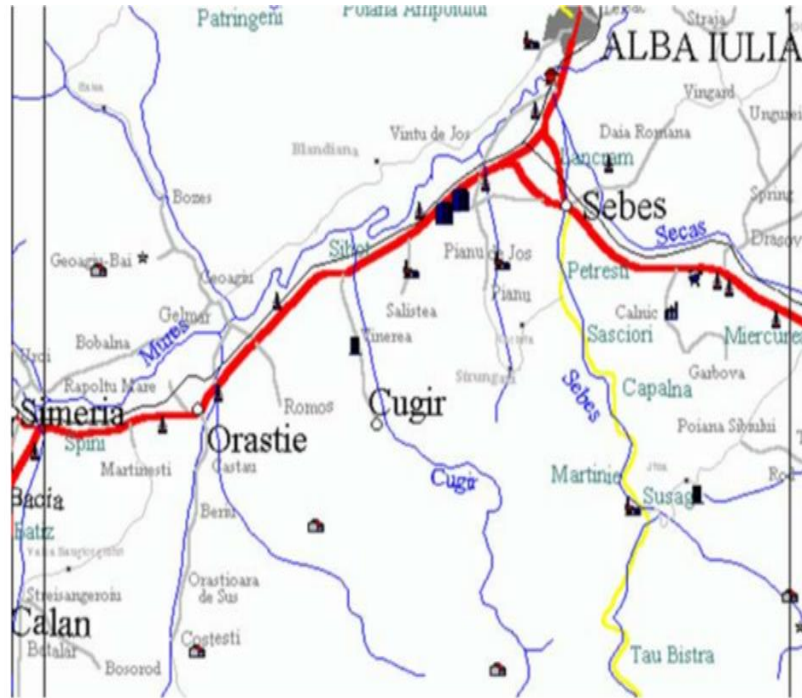
- COVID-19 Crisis Response

In 2020, as part of the EUs response to the economic consequences of the COVID-19 crisis, the EB set up a EUR 25 billion guarantee fund to enable the EB Group to develop European Union Fact Sheets - 2020 increases support for companies from all over the world EU Member States mobilizing an additional amount of up to EUR 200 billion.



# III. CASE STUDIES - CHALLENGES AND SOLUTIONS REGARDING THE IMPLEMENTATION OF THE CIRCULAR ECONOMY IN THE LOCATIONS IN THE CENTER REGION

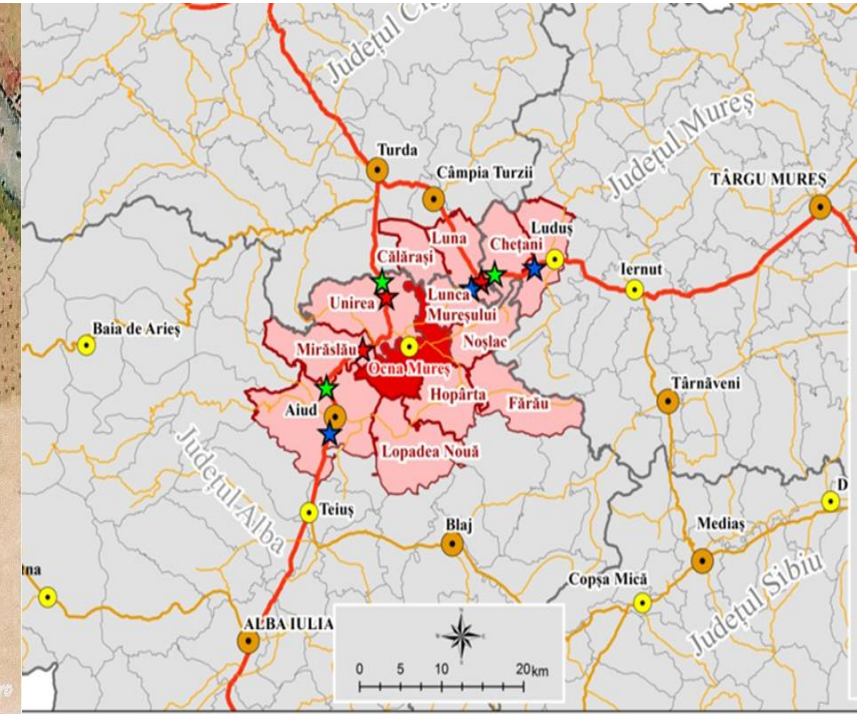
## 1. CUGIR, ALBA COUNTY



## 2. FĂGĂRAȘ, BRAȘOV COUNTY



## 3. OCNA MUREȘ, ALBA COUNTY



# 1. THE CITY OF OUGIR

## Challenges regarding the implementation of the circular economy in Ougir:

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**P1.** There is a **lack of storage space for construction waste and vegetable waste**, which often ends up in riverbeds, thus polluting the environment at the edge of the forest.

**P2.** The need for complete and selective waste collection at source, ensuring proper transport, efficient sorting and processing, and as little as possible pollution, efficient recovery and recovery, increasing selective storage as it already exists, revaluation of hospital waste and other hazardous waste, strict monitoring of peripheral areas, riverbeds, forests to avoid spills and abusive storage in the natural environment.

**P3.** Lack of renewable energy sources and energy efficiency. According to the data presented in the action plan for sustainable energy, the sectors responsible for CO2 emissions are highlighted, namely, 53.7% of the residential sector from the use of methane gas for heating, followed also by the residential sector from the use of electricity 16.4%.

**P4.** **Lack of modern infrastructure:** it is necessary to develop an infrastructure that covers all areas of the city, thus facilitating communication between businesses, local authorities, NGOs and other actors in the local community, but also facilitating access to a range of services for the population. Also in the same category is the fact that there are no bypasses (eg Friday locality) to decongest the traffic in the city, there is no detour for heavy traffic and there is no connection to the European Corridor 4 Highway (Arad-Deva- Sebeş- Sibiu) near the city.

**P5.** **Lack of water sources and irrigation** that can decisively influence agricultural production. To be sustainable, wastewater could be collected and treated so that it can be reused for irrigation, making it a free and easily accessible source that already contains significant levels of nutrients and no need for chemical fertilizers. Also, this source can be used for irrigation of parks, green spaces and other urban area

# Solutions to the challenges identified in Ougir:

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- Equipping with utilities and public services of general interest, in conditions of environmental protection and efficient use of resources, in order to increase the attractiveness and functionality of the territory;
- Reducing the amount of household and vegetable waste by composting. This has two benefits. One is that waste will be collected for recovery, and the second is that all biodegradable waste will be an environmentally friendly natural fertilizer that can be recovered;
- Reducing greenhouse gas emissions from the transport sector, by increasing the operational capacity of public transport, with a low degree of pollution;
- Reducing the impact on biodiversity by ensuring measures for the protection and conservation of biodiversity as well as ensuring the coherence of the national network of protected natural areas;
- Streamlining the waste collection system towards an integrated waste management system;
- Implementation of an ecological education and information system in order to educate the population on issues related to environmental protection and circular economy;
- Stimulating alternative transport favorable to environmental protection (construction of bicycle routes, pedestrian areas)
- Creation of bicycle routes;
- Capitalizing on the potential of renewable, solar, water, wind resources;
- Decreasing uncontrolled deforestation and increasing the degree of restoration of the forest fund through replanting actions;
- Creating an adequate road infrastructure for vehicles

# FĂGĂRAȘ MUNICIPALITY

## Challenges regarding the implementation of the circular economy in Făgăraș

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**P1. High volume of traffic**, including heavy traffic loading urban traffic. It is generated by the lack of a bypass and is a factor of noise pollution and decreased air quality by releasing toxins that significantly reduce the comfort of life in the city;

**P2. The entire network of roads and urban public spaces is insufficiently maintained** and has deficiencies in being provided with green spaces, sufficient aspect that contributes to the decrease of air quality and general appearance.

**P3. Utility distribution networks** - non-compliant and precarious electricity and district heating natural gas;

**P4. The public lighting system** and the electricity distribution network for consumers require modernization and rehabilitation due to the degradation over time of the equipment features that generate a low efficiency;

**P5. The need to set up a waste sorting station** resulting from urban consumption and an ecological landfill in the vicinity of the city, its lack generates negative effects on the environment and quality of life;

**P6. Insufficient encouragement and development of roads for transport by alternative means** - cycling, means of travel under 25 km/h;

**P7. Water supply and sewerage networks** are not adapted to the requirements either qualitatively (outdated) or as an extension. This aspect generates discomfort through faults and supply interruptions accompanied by the need for constant troubleshooting;

**P8. Road infrastructure needs rehabilitation and modernization.** Both at the level of the road and the pedestrian level, inconveniences are observed in the fluidity and stability of the traffic. There is an almost total lack of lanes dedicated to travel with alternative means of transport (bicycle).

# Solutions to the challenges identified in Făgăraș Municipality.

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1. Development of an alternative transport network - both for bicycles and for vehicles traveling under 25km / h alternatively to link points of interest. Development of car parks and other facilities to serve this network;

2. Implementation of a network of bypasses to take over from traffic mainly for heavy traffic;

3. Rehabilitation of degraded streets and their modernization in an integrated program that provides for the development of the road in harmony with the networks of technical and municipal utilities;

4. Development and modernization of the public transport network and completion with lines with seasonal program;

6. Modernization and extension of the wastewater treatment plant;

7. Development of an investment program in renewable energy installations and from non-consuming fossil fuel sources or dependent on the national supply network;

8. Construction of a "Station for sorting and mechano-biological treatment of household waste" that will serve the entire Făgăraș County, with the possibility of expansion in the county. In this new station, the construction and demolition waste of both the buildings and the road repairs will be recovered. The location of the new sorting platform in the vicinity of the city will generate a reduction in waste transportation costs;

# 3. The city of Ocna Mureș

## Challenges regarding the implementation of the circular economy in Ocna Mureș

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**P1. Insufficiently treated wastewater:** the lack of efficient treatment plants as well as the physical and chemical pollution of the Mureș River water in Ocna Mureș and in the related localities, Cisteiu de Mureș and Micoșlaca, puts additional pressure on the water quality management system. The insufficiency of water treatment is an important aspect that deepens the linear approach of the produce-use-throwtype of man-made water use, present at the moment.

**P2. Lack of an integrated waste management system:** The former landfill of Ocna Mureș is currently closed and in the process of greening. After being collected, all the waste is transported to Cristian, in Sibiu County. The lack of a storage space, located in the vicinity of the citizens of Ocna Mureș, favored the appearance of inadequate urban waste landfills, which still affect the quality of life.

**P3. Historically polluted industrial area:** Combat battles pollute a large number of hectares in the city, requiring a greening of the area, followed by identification of ways to capitalize. Over the years, pollutants have been released into the environment due to abnormal operation and accidental spills. Once released, the chemicals have moved to nearby areas by various means (including air, dust and / or water) and are even contributing to the complex nature of pollution in Ocna Mureș.

**P4. The lack of a strategy for improving energy efficiency and the collection of data on energy consumption recorded in the territory is sporadic, without continuity, there is no catalog of indicators to be monitored, clear reference periods or a periodicity of their reporting.**

# Solutions to the challenges identified in Ocna Mureș

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**1. Reducing the number of non-compliant landfills and increasing the degree of readiness for recycling:** In order to protect and improve the quality of the environment and the comfort of the local residential habitat, Ocna Mureș City Hall wants to contract through the Great Infrastructure program the implementation of selective collection systems, integrated waste management, which is currently lacking. The aim is therefore the construction of transfer and recovery / treatment facilities, including composting platforms and individual composting units, the construction of sorting and mechano-biological treatment stations but also the closure and rehabilitation of non-compliant landfills, which affect the quality of urban habitat and citizens. .

**2. Maintenance and restoration of degraded ecosystems:** Ocna Mureș City Hall also proposed in its development strategy, measures for decontamination and greening of historically polluted sites, including restoration of natural ecosystems and ensuring soil quality to protect human health. Following the decontamination, the demolition of degraded buildings located on the lands subject to interventions, the construction of pedestrian alleys, bike lanes, and landscaping (deforestation of existing vegetation; land modeling; planting perennials / lawning of surfaces, including tree planting and shrubs).

**3. Afforestation of hills** to stop and prevent landslides, Banța Hill can be transformed into a forest with a dual role, recreational and avoiding the risks of landslides and flooding at the base of the hill.

**4. Development of sustainable, low-CO2 urban transport systems** that promote intelligent management of sustainable urban mobility and link Ocna Mureș with satellite localities, with the major benefit of facilitating the commuting of students and other citizens, who travel from their hometown to go to school or work.

**5. Improving and developing intersectoral partnerships** at the level of non-governmental, academic, associative and public administration environment, in order to develop joint projects aimed at developing the local community, improving the quality of life and image of Ocna Mureș, and training human resources at the community level.

# Qualitative and quantitative investigation of citizens' behaviors towards the circular economy in the Central Region

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## THE CITIZEN PERSPECTIVE ON THE ECONOMY IN THE CENTRAL REGION

- This research was attended by experts, and the interview technique was the focus group, which included between 5 and 15 participants depending on key areas such as production, consumption, waste management, secondary raw materials, competitiveness and sectors of activity such as agriculture, biomass capitalization, food industry, water management, construction and infrastructure, plastics, energy, mobility, tourism and recreational activities and education. This research was attended by 140 people who were part of the working groups addressed to business, education, civil society and public authorities, who were asked the following questions:
    - **Question 1: In 10 years, the circular economy market in your city will be in the top of the national suppliers of ..?**
- This question was an open one, and the main topics that emerged from the participants' answers were: eco-tourism, renewable energy, recyclable packaging waste and local products and services.



# Qualitative and quantitative investigation of citizens' behaviors towards the circular economy in the Central Region

|  | Total disagreement | Disagreement | Indifferent | Agreement | Total agreement |
|--|--------------------|--------------|-------------|-----------|-----------------|
| <i>A food bank that would facilitate the reduction of food waste.</i>  | 0%                 | 0%           | 0%          | 21%       | 78%             |
| <i>Recovery of organic waste through biogas production.</i>  | 0%                 | 0%           | 0%          | 50%       | 50%             |
| <i>Integrating the principles of permaculture and sustainable agriculture.</i>   | 0%                 | 0%           | 0%          | 38%       | 61%             |
| <i>Involvement of children and young people in urban regeneration activities.</i>  | 0%                 | 0%           | 0%          | 0%        | 100%            |
| <i>Transforming your city as a pole of small sustainable urban development in Romania and attracting investments in the city.</i>    | 0%                 | 0%           | 0%          | 7%        | 92%             |
| <i>Creation of living laboratories in the city, in order to collect and analyze data on social and environmental functions, etc.</i> | 0%                 | 0%           | 0%          | 42%       | 57%             |
| <i>Enhancing and stimulating ecotourism and new carbon-neutral buildings.</i>  | 0%                 | 0%           | 0%          | 42%       | 57%             |
| <i>Schools to educate children in the direction of the circular economy.</i>   | 0%                 | 0%           | 0%          | 21%       | 78%             |
| <i>Support the introduction of green alternative energies in your city.</i>  | 0%                 | 0%           | 0%          | 21%       | 78%             |
| <i>Utilization of wastewater and stormwater by optimizing the efficiency of resources.</i>   | 0%                 | 0%           | 0%          | 28%       | 71%             |
| <i>Obtaining renewable energy from biomass.</i>  | 0%                 | 0%           | 7%          | 28%       | 64%             |
| <i>Eco-innovation by creating business incubators in your city.</i>  | 0%                 | 0%           | 0%          | 50%       | 50%             |
| <i>Finding alternatives to current building materials and recycling construction waste.</i>  | 0%                 | 0%           | 0%          | 35%       | 64%             |

## Question 2: What is your opinion on the objectives prioritized below?

To this question, the whole sample considered that the involvement of children and young people in urban regeneration activities is the first goal that must be set without delay to facilitate the transition to a circular economy. Subsequently, objectives such as the development of a food bank that would facilitate the reduction of food waste, schools to educate children in the direction of the circular economy and support for the introduction of green alternative energies were equally considered by 78% of participants, as the following stringent objectives that should be set at the level of the cities of origin.

# Qualitative and quantitative investigation of citizens' behaviors towards the circular economy in the Central Region

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**Question 3: Where do you think is the highest value lost in material flows in the city?**

This question was open-ended, and the main issues that emerged from the participants' answers were: food waste, non-recycling of waste, construction and disposal waste, and the lack of an integrated public transport system

**Question 4: Where do you think are the best chances for new circular employment opportunities?**

Open-ended question, and the main topics that emerged from the participants' answers were: construction waste recycling, eco-tourism, start-ups, the agri-food sector and the renewable energy production industry (photovoltaic, wind farms, biogas plants).

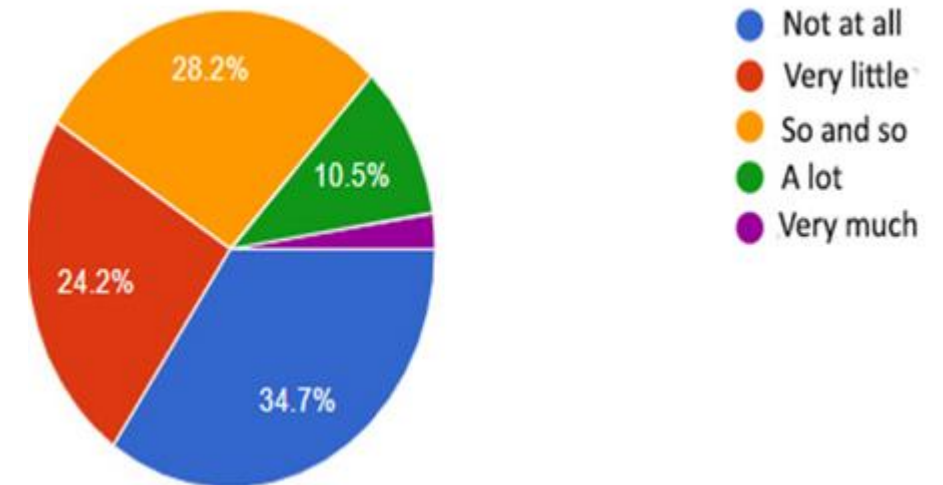
# Qualitative and quantitative investigation of citizens' behaviors towards the circular economy in the Central Region

## Organizational perspective on the circular economy in the Central Region

This questionnaire was answered by a sample of 270 participants (182 female, 88 male), aged between 21 and 70 years. Regarding their degree of schooling, 3.8% stated that they had completed doctoral studies, 18.9% master's studies, 32.6% undergraduate studies and 43.9% high school studies.

### Question 6: Is your organization discussing its transition to a circular economy?

The answers to this question were operationalized on a Likert scale where 1 = Not at all and 5 = Very much. Only 24% of respondents indicated that in their organization this is a topic very often invoked, and 10.5% answered that in their organization there is still much talk about the transition to a circular economy. Most participants, however, answered that their organization discusses very little about this transition (24.2%) or not at all (34.7%).



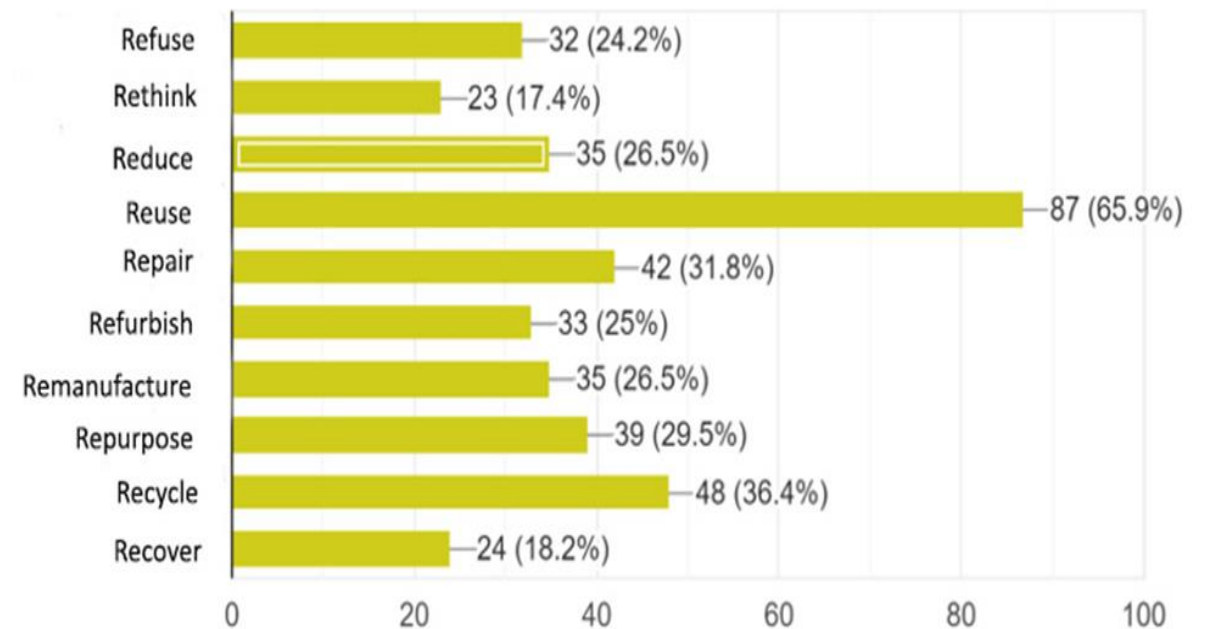
# Qualitative and quantitative investigation of citizens' behaviors towards the circular economy in the Central Region

## Question 7: Where did you hear about this concept (circular economy)?

Most participants (49.2%) have not heard of this concept. Instead, those who have heard of the circular economy so far, said that their source of information is social media (25%) followed by the organization in which they work (21.2%), TV (7.6%) and knowledge (6.8%).

## Question 8: What do you associate the concept of circular economy with?

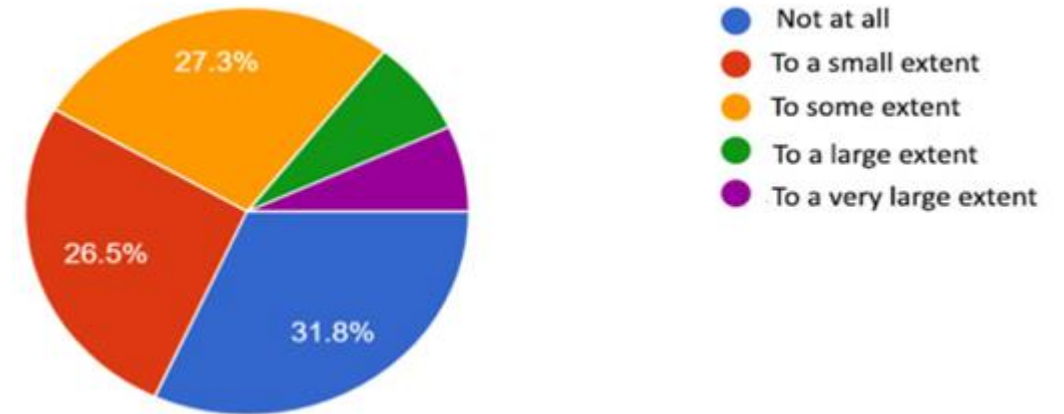
A majority of 65.9% of respondents associate the concept with the term "reuse", 36.4% associate it with recycling, followed by a percentage of 31.8% of respondents who associate it with the term repair.



# Qualitative and quantitative investigation of citizens' behaviors towards the circular economy in the Central Region

Question number 9: Do you know the reasons why we should develop circular organizations?

According to the illustrated diagram, the participants rather do not know what are the reasons why it is necessary to facilitate the emergence of circular organizations, 31.8% of the participants answering "not at all" to this question. The next majority category is that of respondents who know to some extent (27.3%) being close to those who said they know "to a small extent" (26.5%) the reasons why circular organizations should be developed.



Question number 10: What are the practices that are taken into account in your organization?

To this question, the main practices that respondents identified as being present in the organizations of origin were low energy consumption, recycling and product life cycle thinking.

# IV. REGIONAL NEEDS AND PROPOSED MEASURES FOR THE DEVELOPMENT OF THE CIRCULAR ECONOMY IN THE CENTER REGION

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## 1. Lack of an integrated strategy for recycling, sorting and recovery of waste

- M1. Implementing effective measures to penalize companies that do not comply with legal rules in the field of environmental protection;
- M2. Development and expansion of separate waste collection systems in order to promote high quality recycling; Capitalization operations by which materials are transformed into products, raw materials or substances, that will be used for the same purpose for which they were designed or for another purpose. This includes the reprocessing of organic materials, but does not include energy recovery and conversion for the use of materials as fuel or for filling operations;
- M3. Recovery of household and vegetable waste by composting, which is thus recovered in the form of ecological natural fertilizer;
- M4. Education: Encouraging the prevention of waste generation and reuse for greater resource efficiency.

# IV. REGIONAL NEEDS AND PROPOSED MEASURES FOR THE DEVELOPMENT OF THE CIRCULAR ECONOMY IN THE CENTER REGION

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## 2. The need to reduce the impact of pollution produced by former industrial platforms or mining operations in urban areas

- M1. Decontamination of industrial sites: Specific activities for the rehabilitation and greening of historical contaminated sites such as the release of contaminated surface and decontamination of soil, including affected groundwater where necessary, with a focus on bio decontamination or bioremediation;
- M2. Urban regeneration: Regeneration of the sites of exploitation and production battles, by eliminating or diminishing the existing contamination effects, in order to bring the area to its initial state, thus recovering the land that can be later redistributed, in accordance with legal provisions in environmental protection;
- M3. Environmental quality monitoring: Once decontamination and regeneration measures are implemented, monitoring of environmental quality indices is essential to maintain progress. This can be achieved by installing air quality monitoring panels but also by constant and consistent water and soil quality checks.

# IV. REGIONAL NEEDS AND PROPOSED MEASURES FOR THE DEVELOPMENT OF THE CIRCULAR ECONOMY IN THE CENTER REGION

3. The need to expand the area of green spaces in urban areas in order to comply with the European minimum standard and the recommendations of the WHO (World Health Organization)

- M1. Creation of urban gardens, parks and recreational areas. This thus contributes to improving air quality;
- M2. Afforestation actions. Through this type of action thus preventing soil erosion and determining the improvement of rainwater absorption;
- M3. Surveillance measures and the constant and consistent application of legislative measures on the destruction of green spaces;
- M4. Reintroduction of unused green spaces in urban areas.

4. The need to develop a modern road and rail transport infrastructure

- M1. Modernization, extension and optimization of roads in successive stages depending on their degree of service, thus reducing the carbon footprint and greenhouse gas emissions
- M2. Promoting transport investment projects that contribute to the achievement of a sustainable transport system, with measures to avoid and reduce adverse effects, such as pollutant emissions into the atmosphere, noise pollution in urban areas and on busy roads
- M3. Ensuring an environmentally friendly transport network, by implementing bypass projects and alternative routes.



# IV. REGIONAL NEEDS AND PROPOSED MEASURES FOR THE DEVELOPMENT OF THE CIRCULAR ECONOMY IN THE CENTER REGION

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5. The need to reduce the high number of old and polluting vehicles

- M1. Facilitate the use of public transport by citizens. Increasing the attractiveness of public transport by materializing dedicated lanes;
- M2. Creating a bicycle infrastructure, thus facilitating the safe movement of cyclists, thus increasing the number of users;
- M3. Promoting car sharing services. Creating or using existing car sharing platforms in order to reduce the number of vehicles participating in traffic.

6. The need for innovation at regional level

- M1. Promoting access to funds for innovative enterprises and research with a focus on the circular economy;
- M2. Facilitate the integration of existing research centers and universities to create regional structures dedicated to innovation together with the business environment;
- M3. Developing the culture and awareness of the role of innovation in the development of the regional economy;
- M4. Creating a hub for circular enterprises in order to facilitate communication between important factors thus helping to develop the concept and these types of enterprises in the Central Region.

# IV. REGIONAL NEEDS AND PROPOSED MEASURES FOR THE DEVELOPMENT OF THE CIRCULAR ECONOMY IN THE CENTER REGION

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7. The need to stop or significantly reduce illegal deforestation and sustainably exploit forests
  - M1. Reducing the land footprint of consumption and encouraging the consumption of products from supply chains that do not involve deforestation.
  - M2. Starting eco-tourism projects based on natural forests with a rich biodiversity,
  - M3. Obtaining wood from sustainable sources: recycling wood and wood fibers is a valid solution for logging. Recycled materials are increasingly used for the production of both paper and wood products. The recovered wood and fibers come from building materials, pallets, paper and cardboard
  
8. The need of organization and cooperation between small agricultural producers in order to reduce food waste
  - M1. Stimulating local supply: cities can procure substantial quantities of food produced in peri-urban areas (up to 20 km from cities), thus forming more circular food systems for the city.
  - M2. Establishment of food banks
  - M3. Incentives for low-impact urban agriculture (The transition from traditional to hydroponic agriculture for vegetable production can save up to 90% of water consumption.)

# V. POSSIBILITIES FOR COOPERATION BETWEEN REGIONAL ACTORS IN ORDER TO EXPLOIT THE POTENTIAL OF THE CIRCULAR ECONOMY IN THE CENTRAL REGION

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❖ Within the COLOR CIRCLE project, IRCCEM also analyzed the possibility of transferring the good practices identified by the project partners so that they support the development of the circular economy in small urban localities by creating strong partnerships between local authorities and the regional academic institutions and also by implementing innovative measures to increase the capacity of local authorities to realize the full potential of the circular economy. Therefore, below are some examples of good practice, which can be replicated in the Central Region.

EGP (example of good practice) 1: Following the Spanish and European initiatives, Andalusia adopted in 2018 its own Circular Bioeconomy Strategy

Proposed project 1: Adoption of a Circular Bioeconomic Strategy at the level of the Central Region. This strategy could support sustainable growth at regional level, adapting its solutions to current societal challenges in a cross-cutting, multidisciplinary and multisectoral way, ensuring the sustainable exploitation of resources, minimizing the negative effects on the climate, conserving biodiversity and stimulating the use of renewable energy sources are in addition to reducing dependence on fossil fuels and obtaining new products with high added value.

# V. POSSIBILITIES FOR COOPERATION BETWEEN REGIONAL ACTORS IN ORDER TO EXPLOIT THE POTENTIAL OF THE CIRCULAR ECONOMY IN THE CENTRAL REGION

EGP 2: KOMA Modular, Modular houses preventing waste creation, Bohemia.

## Proposed project 3: Initiation of a Modular Housing Program

The principle is that all products, materials and raw materials can be reused and that their value must be exploited as much as possible. The project aims to reduce the environmental impact of modular construction (including CO<sub>2</sub> emissions and waste treatment) throughout the life cycle of that construction. Municipal modular constructions are becoming increasingly popular among decision-makers at all institutional and governmental levels. Thus, permanent modular apartment buildings can be a sustainable solution to the challenge of building social housing in small localities. They are also an opportunity for investors in the Central Region. Demand for affordable housing is leading investors and developers to look for ways to set up homes quickly and efficiently, and modular construction has proven to be a way to build affordable housing facilities where they are rare. More and more investors use this method for the topicality, the professional approach of the production and the proven quality of the modular structures



**Figure 1.** Modular Building. Adapted from Koma Modular Ltd. Retrieved from: <https://www.koma-modular.cz/en/for-who/pro-statni-institutuce-mesta-a-obce>

## V. POSSIBILITIES FOR COOPERATION BETWEEN REGIONAL ACTORS IN ORDER TO EXPLOIT THE POTENTIAL OF THE CIRCULAR ECONOMY IN THE CENTRAL REGION

### EBP 3: Cyrkl, Waste to Resource Marketplace, Bohemia

Proposed project 4: Create a reuse market that in turn facilitates the transformation of waste into resources.

### EBP 4: Food Waste Market, Norderoost Frisland

Proposed Project 5: Creating a Recovered Food Market. The role of this public policy instrument is to investigate residual flows and secondary flows that can be used to create and market new products. This encourages circular agriculture, the organization of regional markets, new products and business plans. Contact, communication and exchange tool.

### EBP 5: BOWNJ Campus For Sustainable Circular Building, Norderoost Frisland

Proposed project 6: A meeting place for knowledge with innovation, which brings together specialists with volunteers, all passionate about innovative construction. The construction campus is an open environment of specialization and communication. Knowledge and experience are brought and shared. The collaboration aims to create a better built environment, more sustainable and more friendly to the natural one, in order to develop the region.



**Figure 2.** Green Infrastructure. Adapted from Kadans Science Partner. Retrieved from: <https://kadans.com/kadans-science-partner-redevelops-meulensteen-house-of-robotics-on-tu-e-campus/?lang=en>

## V. POSSIBILITIES FOR COOPERATION BETWEEN REGIONAL ACTORS IN ORDER TO EXPLOIT THE POTENTIAL OF THE CIRCULAR ECONOMY IN THE CENTRAL REGION

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**EBP 6:** Opportunity for training organizations to meet high societal expectations, Bourgogne-Franche-Comté

**Proposed project 7:** Creation of a cluster environment in order to facilitate a network of organizations that meet societal requirements. Here the precepts of environment and ecology are combined with those of developing a culture of business innovation and at the same time the development of new economic models and job creation are encouraged.

**EBP 7:** The call for projects for circular economy by Bourgogne-Franche-Comté Agency of energy management (ADEME BFC) and Bourgogne-Franche-Comté Region, Bourgogne-Franche-Comté

**Proposed project 8:** Initiation by RDA Center of a Call for Circular Economy Projects to stimulate creativity and at the same time to identify opportunities in the region.



**Figure 3.** Recycling sign. Adapted from Summary: Climate Change Round Table Event, by IoD, 2019. Retrieved from: <https://www.iod.com/news-campaigns/news/articles/Summary-Climate-Change-Round-Table-Event>

# VI. PROJECT PROPOSALS / INITIATIVES CARRIED OUT IN PARTNERSHIP WITH PUBLIC AUTHORITIES

## 1. Type of intervention: Bio-fermentation

### Project title: Recovery of organic waste through biogas production

#### The Project necessity:

The need for alternative sources of green energy in order to reduce the negative impact on the environment by capitalizing on waste to produce biogas, thus helping to reduce waste disposal costs. The matter resulting from anaerobic digestion can supplement the best quality organic fertilizers with similar properties.

#### Purpose, General objective

Recovery of organic waste through the production of biogas, thus increasing the percentage of renewable energy used

#### Specific objectives

1. Creating alternative energy sources
2. Recovery of organic waste
3. Reducing logistics costs in terms of waste management
4. Production of organic fertilizers necessary for agriculture especially local producers through the production of biogas

#### Expected Results

1. Additional production capacity for energy from renewable sources (of which: electricity, heat)
2. Number of agricultural associations and energy communities from renewable sources receiving support
3. Number of fertilizer beneficiaries resulting from waste processing

#### Type of applicants, involvement, LPA role, possible source of funding:

Applicants - Direct beneficiaries: local agricultural associations, units whose purpose is to obtain energy from renewable sources. The indirect beneficiaries are the local producers.

The role of the **Local Public Authorities** is to disseminate the advantages resulting from the application of this new way of capitalization by initiating promotional actions - courses, conferences, networking events and know-how exchange.

**Sources of funding** through the European Regional Development Fund (ERDF), European Green Deal or Horizon Europe

# VI. PROJECT PROPOSALS / INITIATIVES CARRIED OUT IN PARTNERSHIP WITH PUBLIC AUTHORITIES

## 2. Type of intervention: Urban Regeneration and Technology Transfer Facilitation

### Project title: Establishment of a Technology Transfer Park on a circular economy in Cugir

#### Project need:

The need for such a park results primarily from the lack of technology transfer opportunities in small urban areas, but with potential for the development of circular products and services but also from the presence of non-functional and unproductive land that could have an important economic purpose.

#### Purpose, General objective:

Construction of a Technology Transfer Park on a circular economy consisting of technology transfer and innovation infrastructures, using unproductive land, reclaimed to facilitate research innovation and ensure technology transfer from research to private companies and other institutions to benefit from the latest information for the purpose of their economic development.

#### Specific objectives:

- Stimulating the innovative and technical-scientific potential of academic and university staff, researchers of students and pupils in the field of eco-innovation by building modern laboratories capable of capitalizing on the market of research results in energy, green productions, CO2 footprint, etc. .
- Stimulating the economic agents for the active participation in the development and capitalization of the research and innovation in the field of the circular economy, by realizing some commercial products of high technicality;

#### Type of applicants, involvement, LPA role, possible source of funding:

**Applicants** - Direct beneficiaries can be local and regional, national and international enterprises that find space for the development of technologies specific to the circular economy in a comfortable environment that facilitates the exchange and promotion of their activity. The whole local community by increasing the opportunity for employment and specialization. Indirect beneficiaries - local entrepreneurial market to which new opportunities for business development and communication are opened.

**The role of the LPA** is to engage in the provision of land and its endowment with access infrastructure and municipal technology, concept creation, implementation and monitoring of the development over time of the whole.

**Sources of funding** that can be accessed for this project are either the European Regional Development Fund (ERDF), the European Green Deal and / or Horizon Europe.



# VI. PROJECT PROPOSALS / INITIATIVES CARRIED OUT IN PARTNERSHIP WITH PUBLIC AUTHORITIES

## 3. Type of intervention: Sustainable urban mobility. Ecological energy. Dedieselation and decarbonization. Pollution reduction.

**Project title: Cugir city. Development of the green public transport system and support of the private one by developing the electric bus fleet and the service area, as well as the network of alternative fuel supply points (electricity), both in the urban and peri-urban perimeter.**

### **Project need:**

At the level of the functional area of Cugir, a problem was identified regarding urban mobility based on public transport and private transport.

### **Purpose, General objective:**

The project aims to encourage the purchase and use of alternative means and electricity by the population, by providing the necessary infrastructure for alternative fuels, aiming at the gradual deselection and gradual replacement of heat engines with those using green energy according to the EU directive. In this way it will be possible to reduce pollution and decarbonization in order to increase air quality and thus the quality of life, as well as discourage school dropout by facilitating access to school for children in rural areas disadvantaged by the lack of transport.

**The specific objectives** provide for the purchase of electric means of transport for servicing the urban perimeter, travel with a range of up to 10 km.

OS1. Creation of a network of alternative fuel supply points (electricity) located at nodal points of traffic, designed to facilitate the supply of electric vehicles;

OS2. Increasing the number of public transport users by expanding the road network, with new routes to ensure OS3 mobility. Ensuring car park management through intelligent solutions, modernization, surveillance, monitoring, equipment with ANPR system

OS4. Location of electronic display panels for air quality monitoring.

### **Type of applicants, involvement, LPA role, possible source of funding:**

**Applicants** - Direct beneficiaries: local public administration. Indirect beneficiaries: local community

**The LPA's role** is to elaborate and carry out until the implementation and elaboration of opportunity studies and urban plans by specific order addressed to the expert entities.

**Sources of funding** (ERDF), European Green Deal and / or Horizon Europe.

# VI. PROJECT PROPOSALS / INITIATIVES CARRIED OUT IN PARTNERSHIP WITH PUBLIC AUTHORITIES

## 4.Type of intervention:Capitalizing the local / regional heritage through Tourism

### Project Title: The cultural heritage of the City of Ocna Mureş

**Project need:**

At the level of Ocna Mureş locality, the insufficient development of both brand and economic development opportunities offered by the cultural-historical context was identified.

**Purpose, General objective:**

The project aims to capitalize on the tourist potential of the city (classical history, industrial archeology, the story of salt, etc.) through programs to rebuild the cultural tradition - Teleki Castle, industrial and spa - Salt Baths, to promote tourism and support it through a platform of operators to provide specific services and local production. This project will be realized as a partnership between the Ministry of Culture, International Associations of European localities with the same industrial profile, local entrepreneurship based on tourism, NGOs, cultural associations.

**Specific objectives:**

SO 1. Creating a network of local operators and local producers;

SO 2. Building a program to promote the short, medium and long term action plan;

SO 3. Increasing the number of tourists to enjoy the offer of Ocna Mureş, in conditions of both comfortable and healthy accessibility;

SO 4. Development of a local economy to ensure the integration of labor in sectors of the circular economy by ensuring the prosperity of the area;

SO 5. Brand consolidation and wide promotion of local identity.

**Type of applicants, involvement, LPA role, possible source of funding:**

**Applicants** - Direct beneficiaries: local public administration, local operators from various economic sectors - Horeca, local production, tourism, non-profit associations specialized in protecting and capitalizing on the cultural tourism potential of the city. Indirect beneficiaries local producers, cultural sector, locals

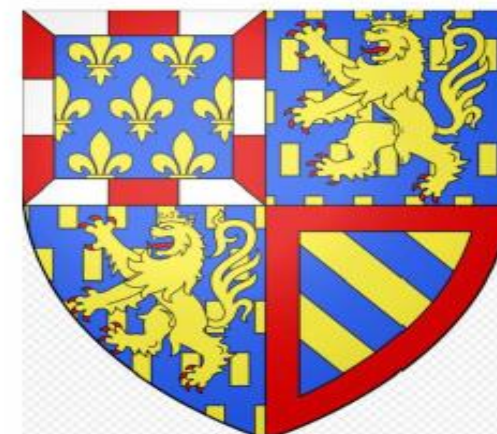
**LPA** - supporting role in the development and promotion of the concept through sustained advertising campaigns. Urban regulation conforms to the concept of environmental protection and built heritage and in accordance with the specific thinking of a sustainable and harmonious development. Elaboration of opportunity studies and urban plans through the specific order addressed to the expert entities.

**Sources of financing;** (ERDF), European Green Deal and / or Horizon Europe

# PROJECT MADE IN COLLABORATION WITH



HESAM UNIVERSITÉ



Regional Council of Burgundy-Franche-Comté



# THANK YOU FOR YOUR ATTENTION

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