Interreg Europe

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CLEAR CITIES

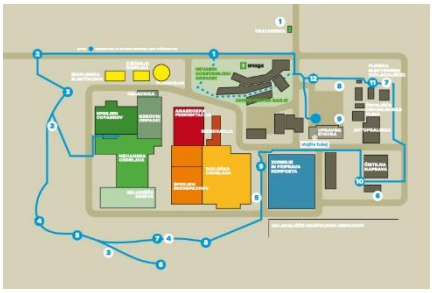
SITUATIONAL ANALYSIS

Ljubljana urban region

- ✓ **Part I:** Policy Frame Analysis
- ✓ **Part II:** Territorial SWOT Analyses
- ✓ **Part III:** Good Practices Inventory

LJUBLJANA URBAN REGION

ZERO WASTE LJUBLJANA



March 2025

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0. Introduction

General context

Urban Waste Management faces an unprecedented challenge: meeting the ambitious targets outlined in the EU Waste Directives (2018/850-851), including the promotion of waste hierarchy (waste prevention, reuse, preparation for reuse, recycling, and other forms of recovery), separate collection of specific waste streams and stricter recycling targets, among others, in a context marked by the increase in urban demography and waste generation per capita, derived from current consumption patterns.

Even though the waste management sector has successfully reduced GHG emissions in recent years, it is vital to make further efforts to prevent any potential regression resulting from the increasing demands placed on the sector.

It is therefore necessary **to transform EU waste management into an efficient, sustainable and resilient system**, enabling it to respond to the stringent targets imposed by the EU while reducing its carbon footprint, thus ensuring the protection of the environment and human health.

Despite the fact that regional and local policies in force all over Europe are increasingly observing the transition of the waste management sector towards the new targets, CLEAR CITIES aims at accelerating such transition.

The project rationale

In the frame described, the Interreg Europe project CLEAR CITIES – *"Promoting Carbon-less Urban Waste Management Policies for Sustainable, Safe and Resilient Cities"* - intends to be an accelerator for waste management moving from being part of the problem to becoming part of the solution towards the goal of making the EU climate neutral by 2050, as set out in the EU Climate Change Act.

The project brings together **public administrations with competences on waste management from 7 regions** from all over Europe.

For 4 years, **the partners will export and import waste management experiences** contributing to carbon-less territories, with the expected **result of new projects and improved policies** taking place in all the partner territories.

The purpose of the Situational Analyses projected

Interreg Europe is a programme for the exchange of experiences and policy improvement.

In line with this, the "studies/analyses" co-financed by the programme have not a pure research or scientific purpose, as this is not the programme rationale.

The goal of "studies/analyses" in an Interreg Europe context is these outputs **to contribute to and to facilitate the processes of exchange of experiences and policy improvements**.

Accordingly, the Situational Analyses to be produced by CLEAR CITIES partners should be **useful for each partner territory to prepare for/plan the 4 years of cooperation** to come, defining:

(I) Opportunities and gaps in the policy frame of each territory with regard to the topic.
(II) Strengths and weaknesses with regard to specific waste management issues.
(III) Good Practices to be shared with the rest of the partners during the seminars.

For sure, during the project new policy instruments, new exportable experiences and new areas of interest for the partners, not defined in this initial analysis, might emerge; but the purpose at this stage is, each partner territory making from the very beginning an **exercise of self-reflection useful for the cooperation to come, contributing to identify the benefits they could obtain from it.** For each Municipality/Agency, the Situational Analysis produced should be a roadmap throughout the project, serving for planning and optimizing the cooperation.

Hopefully, during the project lifetime, the local gaps identified with regard to policies and specific topics should be fulfilled thanks to new knowledge gained in the project.

The following pages offer a template model to display such information[1].

Despite their primarily local interest, once finalized all the analyses will be uploaded in the CLEAR CITIES webpage "Library" section, as a proof of the work done and as possible inspiration for other territories, that might decide undergoing similar analysis or learn from yours.

Probably, to obtain the information required, different means are needed, such as meetings with different local actors, interviews, surveys, revision of existing data and documents. **It is up to each local team to plan how to accomplish the analysis, to make the most out of it and on the basis of the local reality and available resources.**

Last, but not least, mentioning that stakeholders can play a central role in this exercise of self-reflection and planning. Involve them!

[1] The template structure responds to the proposal shared with the partners and agreed with occasion of the project kick-off meeting in Gijon in September 2024.

1. Part I: Policy Frame Analysis

1.1. SWOT Analysis of the Policy Instrument initially linked to the project

The SWOT Methodology for Analysis – **S**trengths, **W**eaknesses, **O**pportunities, **T**hreats – is to be used for the Policy Instrument addressed analysis as well (and not only for territorial issues), as agreed with the partners during the kick-off meeting. This was decided for the sake of simplicity, making use of the same methodology of analysis throughout the entire document.

Remember that the main purpose of the partners identifying at the project preparation a policy instrument is **impacting that policy instrument positively through the project in different ways**: mobilizing funding from that instrument to develop initiatives inspired by the cooperation, changing the instrument itself in terms of contents (new or modified contents), or changing the instrument management maybe.

Accordingly, the SWOT analysis of the "policy instrument" initially addressed should serve to identify:

1) the gaps in the instrument that could be fulfilled thanks to the project (at thematic, available resources, beneficiaries, indicators or management level)
2) the opportunities the instrument offers to be used as a bridge to use the knowledge gained from the project.

For example, if the policy instrument has run out of funding at the moment of making this analysis, that is clearly a weakness of the instrument, since this prevents it from offering funding to us. However, if the impact we pursue does not concern exclusively or only the need of funding – but maybe changing some regulation or target - then the lack of funding might not be that important, to put only a couple of examples.

Remember that the "Policy Instrument initially linked to the project" is the one contained in the officially approved Application Form: please, refer to this document to select yours and make the SWOT Analysis with regard to it. Notice that the information with regard to the instrument and the plans for improving it was provided 2 years ago, when the project was drafted; some circumstances might have changed from then to now, so that the new analysis will serve to make a photograph of the present situation.

SWOT
Regional development programme of the Ljubljana urban region 2021–2027

The Regional Development Agency of the Ljubljana Urban Region (RRA LUR) has extensive experience in implementing innovative projects, leveraging its human and financial capacities to drive regional development. Its participation in the Clear Cities project represents a strategic opportunity to enhance waste management policies and foster sustainable practices within the region. Through collaboration with other regions, RRA LUR aims to gain valuable insights, develop new competencies, and create synergies among key stakeholders across different sectors. The implementation of EU-funded projects has consistently proven to be an effective platform for stakeholder engagement, facilitating knowledge exchange and the adoption of best practices.

Slovenia's governance model is based on a decentralized regional structure, where regional development is driven by strategic planning rather than direct governmental administration at the regional level. In this system, regional development agencies, such as RRA LUR, play a crucial role in coordinating initiatives, fostering collaboration, and ensuring balanced development among municipalities. Waste management follows this decentralized model, with municipalities independently managing waste treatment services. JP Voka Snaga, as the principal waste management provider, supports 11 municipalities, including Ljubljana, while other municipalities operate their own independent waste treatment services.
Currently, the Regional Development Programme (RDP) 2021-2027 serves as the principal strategic and programming document guiding regional development efforts. Anchored in the Promotion of Balanced Regional Development Act, the Decree on Regional Development Programmes, and the Operational Programme on the Participation of Ministries, the RDP sets forth objectives, instruments, and financial mechanisms for fostering balanced regional progress. It comprises both a strategic component—detailing the region's development priorities, vision, and key challenges—and a programming component, which includes specific action plans, financial evaluations, and monitoring mechanisms.

In the existing RDP, waste management is addressed under Priority 3: Green Region of Sustainable Solutions, particularly within the specific objective: Drinking water supply, wastewater drainage, and waste management (6.3.7)

While the current framework provides a foundation for waste management, the forthcoming Regional Development Programme (RDP) 2028-2034 will introduce a more comprehensive and focused approach. The updated RDP will dedicate a special chapter to waste management, emphasizing policies and strategies that promote waste reduction, reuse, and innovative business models based on secondary raw materials (SRMs).

Key focus areas will include:
- Promotion of Reuse and Zero-Waste Principles – In line with the EU Circular Economy Action Plan, which emphasizes initiatives across the entire product lifecycle—including design, manufacturing, consumption, repair, reuse, and recycling—we are committed to supporting the development of systems that facilitate reuse. This approach aims to extend product lifespans, reduce environmental impacts, and encourage sustainable consumption patterns.

- Development of Business Models Based on Secondary Raw Materials (SRMs) – Supporting enterprises that utilize recycled materials as core inputs for production. The development of business models based on secondary raw materials (SRMs) is essential for transforming waste into valuable resources, reducing reliance on virgin raw materials, and minimizing environmental impact. A successful SRM-based economy depends on efficient collection, sorting, and processing systems to ensure a steady supply of high-quality materials. It also requires strong market demand, driven by innovation and incentives that encourage industries to integrate recycled materials into their production processes. Industrial symbiosis plays a key role, where waste from one sector becomes a resource for another, enhancing resource efficiency. Establishing quality standards and regulatory frameworks ensures the reliability and competitiveness of SRMs, while financial support and investment help businesses transition to sustainable practices. By embedding SRMs into production systems, enterprises contribute to waste reduction, lower emissions, and a more resilient, circular economy while also benefiting from cost savings and sustainability-driven market advantages.

Given the decentralized nature of municipal waste management in Slovenia, the Clear Cities project will play a crucial role in advancing regional waste management policies and integrating circular economy principles into long-term development planning. Through its participation in Clear Cities, RRA LUR will drive policy innovation by incorporating reuse-focused strategies and business model adaptations into the new RDP 2028-2034. By addressing gaps in existing waste management frameworks and fostering collaboration among municipalities, the project will contribute to a more sustainable, efficient, and resource-conscious urban region.

The Regional Development Programme (RDP) 2021-2027 is available here: https://rralur.si/wp-content/uploads/2023/02/RRP-LUR-2021-2027_ENG.pdf

Strengths

- Established Waste Management Framework – The policy provides a structured approach to waste management within the broader environmental infrastructure strategy.
- Alignment with Circular Economy Goals – The focus on waste reduction, reuse, and improved collection aligns with EU circular economy objectives.
- Modernization and Infrastructure Expansion – Investments in municipal waste treatment facilities and utility system upgrades waste processing.
- High Rate of Waste Separation – Ongoing efforts to increase separate waste collection indicate a commitment to sustainability and recycling improvements.

Weaknesses

- Fragmented Waste Management System – The decentralized approach results in inconsistencies in waste collection and treatment efficiency across municipalities.
- Limited Infrastructure for Reuse Centers – While the policy mentions reuse centers, there is a lack of strong incentives and infrastructure to support their widespread implementation.
- Growing Municipal Waste Generation – Despite efforts, high and increasing volumes of municipal waste, particularly packaging waste, present a challenge.
- Illegal Waste Dumps – The persistence of illegal dumping sites indicates weaknesses in enforcement, monitoring, and public compliance.

• Public Awareness and Engagement – Campaigns and initiatives encourage responsible waste disposal and promote reuse practices.	• Dependence on Public Investment – Significant funding is required for waste treatment improvements, with limited private sector involvement or alternative financial mechanisms.
Opportunities • Expansion of Circular Economy Practices – Strengthening policies that support reuse, waste prevention, and the use of secondary raw materials can improve sustainability. • Technology-Driven Waste Management Solutions – Implementing smart waste collection, AI-driven sorting, and digital monitoring can optimize waste processing efficiency. • Public-Private Partnerships – Encouraging investment from private enterprises can enhance infrastructure development and innovation in waste management. • Regional Cooperation – Collaboration between municipalities can lead to more effective waste-processing strategies and shared facilities. • EU Funding and Legislative Support – Access to EU funds and alignment with updated EU waste management policies can drive further in waste reduction and treatment.	**Threats** • Increasing Waste Generation – Economic growth and urbanization may lead to rising waste production, straining existing systems. • Regulatory and Compliance Challenges – Stricter EU waste management regulations could require additional investments that municipalities may struggle to meet. • Public Resistance to Behavioral Change – Despite awareness campaigns, achieving higher waste separation and reduction rates may face societal and cultural barriers. • Environmental Risks and Climate Change – Extreme weather events and pollution-related concerns may exacerbate waste management challenges. • Financial Constraints – Insufficient funding for municipal waste infrastructure and technology upgrades could hinder policy effectiveness.

1.2. Reflection on complementary/ alternative Policy Instruments in force in the territory which could be used/ influenced:

1. Waste Management Program and Waste Prevention Program of the Republic of Slovenia

https://www.gov.si/assets/ministrstva/MOP/Operativni-programi/op_odpadki_2022.pdf

The Operational Programme for Environmental Protection in the Field of Waste consists of the Waste Management Programme and the Waste Prevention Programme (hereinafter referred to as: the Programme), which are instruments of the Government of the Republic of Slovenia for implementing waste prevention measures, ensuring prescribed waste management and achieving waste management objectives for the period until 2035 and, in view of new environmental requirements, represent an amendment to the programme adopted in 2016.

2. Ljubljana's circular economy strategy

https://www.ljubljana.si/en/ljubljana-for-you/environmental-protection/towards-circular-economy/

This document addresses three levels:

- Umbrella vision of the city until 2045 (underway) – consistency across all of COL's strategic documents, and their compatibility with EU and national legislation, to achieve optimum synergies and effective performance;
- Strategic guidelines incorporating circular principles – link with the City Administration's Code for Sustainable and Circular City Management (underway);
- Concrete activities in the 2027 perspective and guidance for monitoring their implementation – an open process allowing the inclusion of various players to create closed loops for selected areas.

3. 2030 Climate Neutrality Action Plan of the City of Ljubljana

https://netzerocities.app/_content/files/knowledge/4444/city_of_ljubljana_ccc.pdf

In Ljubljana, the commitment to climate neutrality by 2030 is a top priority, supported by the city leadership and deeply embedded in the organisational structure. Led by the mayor and supported by six deputy mayors, each responsible for specific areas (one specifically for environmental protection, climate change and spatial planning), the City of Ljubljana uses a broad-based committee approach to decision-making. This co-operative structure ensures comprehensive planning and implementation of strategies that are formally adopted by the City Council.

2. Part II: Territorial SWOT Analyses:

What is the state-of-the-art of your territory – **Ljubljana Urban Region** - about the following 4 issues?

- Waste generation
- Collection and transport of waste: emissions and efficiency
- Treatment, recycling, reuse and valorization of waste
- Emerging techs for carbon-less waste management

SWOT	
Responsible Waste Generation: minimization of the carbon footprint	
Strengths	**Weaknesses**
• In 2022, the state adopted the Waste Management and Waste Prevention Program in the Republic of Slovenia (Waste Management and Waste Prevention Program of the Republic of Slovenia 2022). Thus, additional weight is given to the first three areas of waste management (prevention, reuse and RE USE). • Stable municipal waste collection system. High share of separate municipal waste collection • Strategic documents adopted at the municipal level, which are the starting points for the implementation of sustainable business models, especially in the service sector (Circular Potentials of Ljubljana Strategy 2021-2027, with a view to Ljubljana, a circular city 2045) • Certain business practices in the field of waste prevention have already been established in society	• The total amount of municipal waste generated per capita is still increasing. • The general public is not yet aware of the importance of rational use of resources and, consequently, there is no breakthrough in the wider use of services that produce less or no waste. • Society is still strongly oriented towards increasing consumption. • Lack of system services for repair shops for individual products (clothing, WEEE, furniture, ... Repair Caffe, exchange shops, ... • Many business models in the field of Responsible Waste Generation need additional financing to survive, as they have difficulty competing with existing, already optimized business models, which usually do not include all "environmental" costs in the service prices. Mechanisms for providing systemic financial resources have not yet been established to the necessary extent.

Opportunities	Threats
• Establishing strategic communication in the field of responsible consumerism • Introducing a network of repair shops with the support or co-financing of local communities (Repair Card) • Supporting networks of packaging-free stores • Supporting local food production systems and short supply chains • Establishing a system of using reusable packaging at public events (sports, cultural, culinary, etc.). • Introducing returnable packaging or reusable packaging for both home food delivery and take-away services,	• There is a risk that less funding will be available for this area due to other priorities in society (armament). • Sustainable business models are usually either more expensive or less "convenient" or require changes in user habits. This means that many introductions of more sustainable services may be doomed to failure if there is insufficient support from the wider community.

SWOT	
Collection & Transport of Waste: emissions & efficiency	
Strengths	**Weaknesses**
• Technologies are already available on the market (non-electric waste collection vehicles) that enable lower emissions and more efficient waste collection systems • The EU is investing heavily in the development of IT solutions in the field of optimizing waste collection logistics • Equipment and infrastructure solutions are also being developed that enable the optimization of waste collection and consequently more efficient processes in this area • Slovenia has one of the best separate municipal waste collection systems, which is an excellent starting point for upgrading and	• The EPR sector in the Republic of Slovenia is awaiting the final adoption of legislation and the consequent modernization of this sector. As a result, the EPR mechanism cannot be upgraded and consequently expanded to other common waste (textiles, furniture, mattresses, etc.). • The legislative framework and strategic documents do envisage the integration of the first three priorities (prevent, reduce, re-use) into the processes of mandatory municipal public services for municipal waste management, but this is being implemented too slowly.

achieving the goals set at the EU level and improving the quality of separately collected waste.	• The purity of separately collected fractions is not at a satisfactory level.
Opportunities • Upgrade collection systems by expanding the network of separate collection of waste cooking oil, clothing and small electrical and electronic equipment in so-called extended collection points. • In densely populated areas, establish a network of mini collection centers for the collection of such hazardous waste, useful items, clothing, small WEE equipment). • In waste collection centers, establish areas for the handover of useful waste. • Integrate RE-USE centers with repair shops into public services. • Upgrade the service billing system in a way that will stimulate users to better separate waste. • Strengthen separate waste collection at source • By integrating IT solutions into collection systems (chips on containers, level gauges, fraction purity sensors, optimization of waste collection routes, etc.), improve the efficiency of waste collection (more waste transported with less CO2 emissions), • Replace diesel-powered vehicles with electric vehicles propulsion or hydrogen • Improve the quality of separately collected municipal waste fractions • Divert a larger proportion of collected waste into reuse or material recovery.	**Threats** • Due to the upgrade of the separate collection system and the replacement of vehicles with low-emission ones, an increase in the price of the service is expected. • Rapid changes in the field of waste management also require that the legislative framework follows suit, which is a lengthy process due to the adoption procedures themselves and the need for interdepartmental coordination (as this area is becoming multidisciplinary and requires the involvement of various stakeholders and activities that were not necessary in the past). • Lack of understanding by local authorities for the implementation of the necessary upgrades to systems and services in the field of separate municipal waste collection.

SWOT	
Treatment, Recycling, Reuse & Valorization	
Strengths • The Regional Waste Treatment Centre - RCERO ensures the efficient treatment of mixed municipal waste, bulky waste and separately collected biological waste. • Separately collected packaging waste, WEEE, waste rubber, batteries, medicines, phytopharmaceuticals and waste candles are handed over to extended producer responsibility systems, which are obliged to ensure appropriate recycling for the waste collected in this way. • Separate collection of hazardous waste from households and consequently regulated final disposal has been implemented for more than 20 years.	**Weaknesses** • There is still a significant share of biological waste, plastic packaging, cardboard packaging, etc. in mixed municipal waste, in short, waste that, if properly collected separately at source, would be a source for material processing or recycling. • There are no waste collection systems in place to a sufficient extent for RE-USE. As a result, the amount of "waste" whose material is directed towards RE-USE is not significant. • There is no incinerator for municipal waste in the Ljubljana region for comprehensive management of waste streams. Only these are currently exported, which consequently puts pressure on the price of waste treatment services. • Due to the poorly functioning EPR system for waste packaging, sorting plants are not technologically developed, which consequently means lower quantities of sorted, more difficult-to-recycle materials, i.e. a lower share of municipal waste recyclability.

Opportunities	Threats
• Through upgraded mechanisms of extended producer responsibility – EPR schemes, ensure more recyclable products and consequently a higher share of waste in material and energy recovery. • By improving separate collection at source, ensure larger input quantities for individual reuse, recycling or material recovery processes. • By establishing waste collection for RE-USE, strengthen the infrastructure in this area.	• Due to the need for energy recovery from waste, recycling or material recovery and reuse processes will not be sufficiently developed. • By adding technological processes and redirecting mass flows to material recovery and recycling, there is a risk of higher service prices in the first period. • By significantly reducing the amount of waste generated or by developing new technologies for processing individual types of waste, there is a risk that existing processing processes will no longer be competitive.

SWOT	
Emerging Techs for Carbon-less Waste Management	
Strengths	**Weaknesses**
• In recent years, the EU has invested heavily in various solutions for the processing of individual types of waste with the aim of increasing the share of material use or recycling of waste. • There is a general increase in awareness and understanding in society about the excessive use of resources and the correlation to climate change.	• New technologies usually require higher initial costs. • Large investments in the development of new technologies and their implementation in space rather than in the existing business environment. • As long as we only replace existing technologies with carbon-free or "low-carbon" technologies and do not simultaneously reduce the use of resources, we will not achieve realistic goals.

Opportunities	Threats
• Possibilities for developing new technologies, products and services. • By introducing IT solutions into all waste management processes and the resulting optimization, CO2 emissions are reduced. • In addition to reducing CO2 emissions, space is opened for reducing resource use and measuring it.	• Too slow adaptation of legislation in the field of implementation of new technologies. • Long-term obtaining of permits for placement of new devices in space • Due to global political shifts, there is a risk that the already set goals in the field of transition of society to a carbon-free society will be reduced due to other interests.

3. Part III: Inventory of Good Practices to share

Local Good Practices on **Responsible Waste Generation: strategies to minimise the environmental footprint**

Title: PAPLAB - handmade paper form invasive plants	
Location of the practice:	Ljubljana
Short summary:	Handmade paper production workshop – PAPLAB (paper laboratory) uses more than a hundred-year-old machines purchased from the paper factory Vevče. This way a more than 400-year-old craft has been awoken and further reinvented by designing innovative products. The PAPLAB workshop works under the wing of JP VOKA SNAGA. The workshop emerged as a part of the European project APPLAUSE for which the financial resources had been granted. In our workshop, we craft unique handmade paper and other products from Japanese knotweed, old paper, waste packaging, cellulose, and cotton—eco-friendly and sustainable. https://www.paplab.si/en/
Responsible organization:	JP VOKA SNAGA d.o.o.

Title: **Circular world with Smetumet**	
Location of the practice:	Ljubljana

Short summary:	Smetumet transforms waste into opportunities – through sustainable design and awareness-raising. They actively engage the general public to work together for a waste-free future. They act as a circular economy actor, seeking useful solutions for waste with a great deal of creativity and humor. The full-year association is driven by a committed team that carries out awareness campaigns about waste and designs products from waste materials, either among pupils, students or among the general public in cooperation with municipalities. They transform industrial waste into new products – often bought back by companies as business gifts, which are supplemented by waste management workshops for employees. They connect with experts and legislators to refresh traditional perspectives. They accompany contemporary design with storytelling and are particularly keen to include vulnerable groups. They add practical solutions to complex topics: for example, their stylish bags made from waste tarpaulins, climbing ropes and car belts are recognizable, and among children, new sPECIAL toys made from used toys. Through projects such as Sea of Plastic and 5 trillion cigarette butts - almost as many are estimated to be dumped in nature annually and represent the largest plastic waste by volume, which, in addition to nicotine, contains more than 7,000 chemicals, of which at least 250 are harmful to health - they raise awareness about various topics. They have already collaborated with more than 80 companies, 200 experts and 15 municipalities. You can find out more about how they are changing attitudes towards waste with creativity and innovative approaches at https://smetumet.com/
Responsible organization:	SMETUMET

Title: Jugošik - Upcycling	
Location of the practice:	Ljubljana
Short summary:	The Jugošik design studio connects contemporary design with the rich cultural heritage of the Yugoslav furniture and lighting industry. Today, forgotten 'Yugoslav' pieces often end up in the scrap heap. Jugošik carefully stores, displays and restores them. It does not reassemble cabinets, tables and lighting fixtures to their original state. Individual parts (doors, drawers, legs, glass, etc.) are subtly used to create new 'chic' products, where forgotten pieces get their happy ending. The minimalist and functional design of unique lighting fixtures and furniture emphasizes the design and material properties of reused pieces taken from another time. With a touch of nostalgia, it also illuminates the stories and memories recorded in them. Sustainable, authentic and locally made Jugošik products bring charm, elegance and soul to the space. https://jugosik.com/en/en-home/

Responsible organization:	Jugošik

Title: Etri Community for an innovative approach to creating an inclusive society as a basis for sustainable development	
Location of the practice:	Ljubljana
Short summary:	The Etri Community for an innovative approach to creating an inclusive society as a basis for sustainable development addresses the internal challenge of the Etri Community in the areas of human resource malnutrition and management of knowledge, fixed assets and capital that come to or are created in the Etri Community and are intended to be invested in the further development of organizations that embody the Etri Principles® as a powerful tool for their socially responsible and sustainable operations in the fields of ecology, ergonomics and ethical economy and an inclusive society. https://etri.si/
Responsible organization:	Etri Skupnost

Title: OILRIGHT scented candles made from waste oil -	
Location of the practice:	Slovenija
Short summary:	The OILRIGHT concept combines three innovative types of products that help you preserve the environment, have fun and stimulate your creativity. OILRIGHT DIY Innovative candle making kits with twelve different scents are the most environmentally friendly and fun way to recycle waste cooking oil, which you can do right at home. They contain everything you need to make a candle: wax making powder with non-toxic fragrances, cotton wicks, a measuring spoon and detailed instructions. All you need is waste cooking oil and a microwave or stove. Making candles is extremely simple and proven to provide a lot of fun for the whole family, while also protecting our beautiful nature. https://www.oilright.si/
Responsible organization:	Bolje d.o.o.

Local Good Practices on **Sustainable Logistics: reduction of emissions and efficiency in Waste Collection and Transportation**

Title: Use of CNG-powered garbage trucks	
Location of the practice:	Ljubljana and its surroundings
Short summary:	The public company VOKA SNAGA, which is a public service provider in the field of waste management, has been using 20 CNG (compressed natural gas) powered garbage trucks for more than 10 years. The carbon footprint is more than 20% lower than when using diesel fuel.
Responsible organization:	JP VOKA SNAGA d.o.o.

Local Good Practices on **Promotion of Circular Economy and Reduction of Greenhouse Emissions through Waste Treatment, Recycling, Reuse and Energy Revalorization**

Title: Municipal waste sorting analysis as a tool for upgrading municipal waste management	
Location of the practice:	Ljubljana and its surroundings
Short summary:	The sorting analysis of mixed municipal waste and its results is one of the key tools for determining further action to upgrade separate waste collection systems.
Responsible organization:	JP VOKA SNAGA d.o.o.

Title: Waste heat sharing - industrial symbiosis	
Location of the practice:	Ljubljana
Short summary:	Aquafil Slovenia, together with its partner Hella Saturnus, has developed a project to use excess heat from AquafilSLO for heating the Hella Saturnus company. By utilizing excess heat energy from AquafilSLO, they reduce resource consumption, emissions, and costs for both partners.
Responsible organization:	AquafilSLO and Hella Saturnus

Title: Acoustic insulation panel made of textile	
Location of the practice:	Krško
Short summary:	The material is made from 100% recycled mixed fabric, derived from locally collected work and post-consumer clothing, which is ground and bonded with a natural binder. No other chemicals or dyes are added. The panel composition is a cotton and polyester blend. The panels are easily installed on the wall with technical adhesive for the purpose of reducing echo, sound insulation or thermal insulation. The panels also combine perfectly with the MOWALL modular partition wall. https://knof.si/knoftex-akusticno-izolativni-panel-iz-recikliranega-tekstila/
Responsible organization:	ZAVOD KNOF SO. P.

Title: Ljubljana Regional Waste Management Centre – RCERO Ljubljana	
Location of the practice:	Ljubljana
Short summary:	In addition to processing mixed municipal waste, bulky waste and separately collected biological waste, RCERO Ljubljana also enables the use of their energy value, the production of electricity from biogas and prevents the release of greenhouse gases (mainly methane) into the atmosphere. The key task of the regional center is to extract as many usable materials as possible from mixed waste and to produce compost from separately collected biological waste. This is of the first quality class. RCERO Ljubljana solves the problem of municipal waste management in the central Slovenian region and represents a comprehensive solution to the problem of waste management and follows the consistent fulfillment of EU directives. In addition, the RCERO project reduces greenhouse gas emissions, especially methane (CH_4), enables the production of secondary energy sources, ensures the protection of water resources and ensures the optimal use of available landfill areas.
Responsible organization:	JP VOKA SNAGA d.o.o.

Local Good Practices on **Waste 4.0: Emerging Technologies for advanced, sustainable and resilient Waste Management**

Title: Waste sorting using robots and AI	
Location of the practice:	Šmartno pri Slovenj Gradcu
Short summary:	Kocerod was the first waste management company in Slovenia to integrate a robot into the waste sorting process. With the help of artificial intelligence, the robot ensures a more efficient process and solves the problem of declining interest in the work of waste pickers, thereby ensuring better working conditions. The new technological acquisition also requires staff with a higher level of education in the field of mechatronics.
Responsible organization:	Kocerod d.o.o.

Title: SmartScan 2.0 for mixed municipal waste analysis	
Location of the practice:	Maribor
Short summary:	Pilot project SmartScan 2.0 technology detects materials such as organic waste, paper, plastic, cardboard, glass and PET packaging. Sensors identify improperly disposed waste, which enables better control and sorting. The sensors are installed on the garbage truck and directly identify the quality of waste when emptying each container. The goal of the project is to improve separation at source, reduce the amount of waste in landfills and increase the share of recycled materials.
Responsible organization:	Snaga Maribor d.o.o.

4. Conclusions

In the Ljubljana Urban Region, it is important to note that I have a stable and efficient waste management system, as at both regional and national level we separately collect slightly less than 75% of municipal waste. In order to increase this percentage, it is of course necessary to continuously improve the separate collection systems with an emphasis on collection at source.

Particular attention will need to be paid to specific areas of waste management, in particular waste prevention, as the total amount of MSW (municipal solid waste) generated is increasing. It will also be necessary to systematically increase activities in the field of re-use, prolonging the useful life of objects (furniture, clothing, electronics, vehicles, etc.), ensuring maintenance or repairs, etc. Increasing the amount of separately collected waste opens up the potential for innovative solutions in the field of recycling and other material processing of municipal waste.

It is necessary to increase the amount of waste or products for reuse and to emphasise the area of reuse, prolonged use and also the process of recycling and other material processing of MSW.

In particular, the recycling and recovery of waste into new products needs to be strengthened by investing in existing technologies and developing new solutions and creating a market for such products.

The legislative framework adopted in the field of waste management is in line with EU rules. However, the rapid changes in this area, the transition of society towards a sustainable society and the introduction of circular business practices, require a continuous alignment with the needs of society. In the RS, regulations are currently being regulated which define or will define the framework for the operation of EPR schemes, and in the near future we will have to update the legislative framework which defines the method of calculating the price of the services of the mandatory municipal public services in the field of waste management and defines the method of charging for this service, in particular in order to modernise the billing method, which will be more stimulating for users in terms of proper waste management.

A particularly relevant document is the 2030 Climate Neutrality Action Plan of the City of Ljubljana, which sets out a very well-defined and coherent set of actions for the transition to a carbon-free society. Many of the actions foreseen within this document allow for perhaps more attention to be paid to the management of organic biomass.

Communication and education of all citizens in all areas of waste management (waste prevention, reuse, proper separate collection, rational use of resources, etc.) should be a strategic and permanent task for the whole of society at an umbrella level, not just within individual subsystems. It is necessary not only to address the population but also to actively involve them in specific activities through direct actions on the ground.

The transfer of good practices in these areas between EU regions, and the resulting possible integration, can be a major contribution to the updating of legislation, strategy documents and ultimately the activities themselves for an effective transition to a "zero waste" society. There is an even greater need to link individual activities in the areas of waste prevention and re-use even more closely to MSW collection and treatment systems and to integrate them into the processes themselves.

The good practices shown strengthen cooperation between stakeholders, raise awareness among the population, create markets for products from the circular economy, create green jobs, etc.

The field of waste management needs to be upgraded so that it can be called, with full credibility, "**resource management**".