



ECOLE:

ECO industrial park network for the Alpine Regions Leveraging smart and Circular Economy

Transnational report on Local Systemic Thinking Community working sessions

Deliverable D1.3.3

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ECO industrial park network for the Alpine Regions Leveraging smart and Circular Economy



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Develop a methodology for a representative model of the systemic thinking community for circular economy in eco-industrial parks in the Alpine region.

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- PP 9 – Grenoble-Alps Metropole (FR): GAM
- PP10 – POLYMERIS (FR): POL
- PP 11 – Lombardy Foundation for the Environment (IT): FLA
- PP 12 – Lombardy Foundation for the Environment (DE): TUMint



ABBREVIATIONS USED

AP	Associated Partner
AS	Alpine Space
CM	Communication Manager
ECOLE	ECO industrial park network for the Alpine Regions Leveraging smart and Circular Economy
KPI	Key performance indicator
STCM	Systems thinking community model
UNIDO	United Nations International Organization
WP	Work Package
WPL	Work Package Leader



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1. Objectives and summary

This document aims to describe and present the report on 10 local STCs working session with their local and regional realities on action plans and pilots about technologies and procedures for the cost savings, environmental and social benefits.

The **section 2** will explore the concept of Systemic Thinking”, the process by which to achieve coordination and engagement in a structured and effective way to enable EIPs to reach their performance standards and to support traditional parks to successfully transform towards EIPs. We call this process a systemic thinking community model. “Systemic thinking” because achieving the type of outcomes necessary for EIP performance requires deep synergies across firms within and outside the industrial park and with the surrounding urban and/or rural communities. Hence, it calls for a systemic approach from design and planning to implementation and operation. The “community” term refers broadly to the close coordination and alignment of interests and resources necessary across the range of relevant stakeholders within and outside the perimeter of the industrial park. For this purpose, close communication and continuous engagement are critical for harnessing co-benefits (discussed in deliverables D1.1.1 and D1.2.1) and for the overall success of such a project, i.e., brownfield or greenfield EIP project.

Section 3 will describe the working session that have been made by the 10 local STCs with their local and regional realities on action plans and pilots. In particular it will present the calendar of the working session and the goals that each pilot aims to achieve through them.

Finally In **section 4** it will be presented the structure of the report that each pilot will produce at the end of each working session, followed by the questionnaire that each subject involved will be asked to do.

2. System Thinking and Systemic Thinking Community Model

The policy cycle is a useful tool to guide decisionmakers on the cyclical process required to get from an idea to implementation of a policy or intervention. As figure 1 suggests, the process is interactive and cyclical, implying that the process continues until the policy or intervention is perfected, adapted, or even abolished. Given the high level of coordination necessary for an effective EIP, and the high level of commitment and engagement across the EIP tenant firms and with public and financial institutions, as well as with education and training and the surrounding communities, we believe that the policy cycle offers an “organising” process for the STCM design and implementation.

Figure 1 – The stages of a policy cycle



Source: PP12 TUM design

Systems thinking is key across the entire policy cycle to both examine complexity and to simplify it (e.g., by recognizing patterns) in order to allow strategic and systematic action. Understanding and approaching problems from a systems perspective is especially important in technical and diverse stakeholders' environments.

Identifying and describing the relationships among entities related to the EIP system is key for its effective implementation across the policy cycle. Further, engaging the stakeholders in an effective way requires a good understanding of their role, their interests in and influence on the project design and implementation, as well as the relationships between them. Such an assessment allows one to identify who to focus on, in what way, and who else to bring to the table. In a nutshell, there are four fundamental steps to take towards mapping relevant stakeholders:

1. **Identify stakeholders:** Who is connected to, or who is interested in the project.
2. **Analyse stakeholders:** Their level of interest and power in this project.
3. **Map stakeholders:** Create a visualization to understand the ecosystem.
4. **Prioritize stakeholders:** Create a plan on how to engage with them.

As described in the D131 Representative Model of the STC for Circular Economy in EIP in Alpine Regions, in ECOLE a STCM is defined as following: **“A systemic thinking community model (STCM) is a process meant to leverage synergies for urban/rural-industrial symbiosis in industrial parks, enable the deep integration of the circular economy solutions in the products and services that derive from industrial park tenants, and extend the EIP benefits beyond the EIP to the surrounding communities and network of suppliers”.**



STCM is important for industrial parks already in operations, which already have developed established dynamics across stakeholders and for greenfield projects, in the context of which stakeholder relations are explorative, at first, but which need to evolve into deeper engagement to ensure support (regulatory and financial) and drive interest and commitment.

Such an assessment allows one to identify potential missing communication / coordination / engagement links between relevant stakeholders, and/or already existing basis for engagement that could be further enhanced.

3. Working sessions on STCMs

The main Objective of the working session is to structure a long term and continue collaboration among project partners, private and public sectors, academia and representative of citizens communities around the industrial parks.

Each Pilot will work with their local and regional realities in designing and applying circular economy, technologies and procedures for the cost savings, environmental and social benefits and the main results of each working sessions will be presented and discussed during the ECOLE meeting in order to:

- Present to the partnership the local realities on which each Pilot is working on
- Open a dialogue on the main topics of discussion
- Understand from the others STCMs experiences and best practices

3.1. Calendar

According to the ECOLE Gantt, 3 Transnational network STCs Meeting are planned:

- Project Partner Meeting, summer 2023 Slovenia: Kick Off Meeting – RA Sora
- Project Partner Meeting, summer 2024, Germany: Meeting – ITALCAM
- Project Final Meeting, summer 2025, Italy: Meeting - COSELAG

4. Report template on STCM working sessions

In this chapter it will be briefly described the structure and the template of the report that each pilot is asked to fill in after each working session. This has the main objective to create a common and logical framework for all the working session that could be easily capitalized by ECOLE project for the implementation of these activities and for the development of Eco Industrial Parks, contributing to the ECOLE project Outputs:

- Output 1.1. A systemic Thinking Community (STC) model for the integration of circular economy (CE) in industrial parks;
- Output 2.1 Guideline for Circular economy principles in Eco Industrial Parks in the Alps: pilot actions report;
- Outputs 3.1 Alpine set of jointly developed solutions for industry stakeholders combined with policy and strategy recommendations to boost the circular economy transition in Alpine industry.



4.1. Working session Report template

Table 1: template of the STCM working session

Summary	
Title	
Country/region	
Date and place	
Pilot	
Participants	
Main topic	
Main Goals	
Key notes and conclusions	
Elements of the pilot action expected to contribute to the development of Systemic Thinking Committee Model for Circular Economy in Eco Industrial Parks	
Lessons learned	
Evaluation	

Working session questionnaire

1. Please state your level of satisfaction with the overall organization of the working session?

- Very satisfied (5)
- Satisfied (4)
- Neutral (3)
- Dissatisfied (2)
- Very dissatisfied (1)

2. Please state the level of your interest with the topics presented at the working session?

- Very interested (5)
- Interested (4)
- Neutral (3)
- Uninterested (2)
- Very uninterested (1)

3. Please specify, if applicable, which elements/topics presented will be useful for the design and development of your pilot action?



4. Please describe here the main lessons learned and added value gained from the organize working session.

5. Please state a level of interaction between speakers and participants.

Very interactive	(5)		<input type="checkbox"/>
Interactive	(4)		<input type="checkbox"/>
Neutral	(3)		<input type="checkbox"/>
Non-interactive	(2)		<input type="checkbox"/>
Completely non-interactive(1)		<input type="checkbox"/>	

6. Please insert here your suggestions for improvements, as well as your observations regarding the organized working session.

7. Report template on STCM working sessions

Main objectives of the working sessions collected by the ECOLE partners:

- Transformation of Industrial Parks into Eco-Industrial Parks: reducing environmental impact through the adoption of circular economy practices;
- Optimizing resource use through waste recycling and sustainable materials management.
- Promotion of renewable energy: installing photovoltaic systems, producing biogas, and using renewable energy sources to reduce the carbon footprint.
- Development of systemic collaboration models through the creation of a Community Model (STCM) to foster cooperation between businesses, public institutions, and local communities.
- Innovation in industrial processes: experimenting with innovative technologies for waste reuse (e.g., producing biodiesel from used oils and digestate from biogas plants).
- Development of an it tool: developing an IT tool to monitor the energy input and output of the industrial area of Trieste.
- Promotion of a renewable energy community: encouraging the creation of a renewable energy community within the industrial park.
- Fostering business collaboration: promoting cooperation between companies to enhance environmental sustainability and reduce greenhouse gas (GHG) emissions.
- Assessment of excess heat potential: evaluating the technical and economic potential for using excess heat in four industrial parks.
- Identification of synergies: identifying synergies between companies for the use of residual heat in production processes or for public applications.
- Municipal engagement: involving municipalities to attract future users interested in heat recovery.
- Strengthening industrial park governance: enhancing governance in the southern industrial park and creating synergies between businesses.



- Promotion of circular economy initiatives: promoting circular economy through shared projects between businesses and local institutions.
- Implementation of sustainable transportation solutions: implementing sustainable transportation solutions for park employees.

Participants:

Table 2: STCM working session participants

Organization	Implementations
Private companies and SMEs	<ul style="list-style-type: none"> • JATA EMONA, KOTO, VOKASNAGA for waste management and biogas production. • HHLA PLT and Trieste Trasporti, Local Energy Agency of Gorenjska, ENEKOM – Energy Consulting Institute.
Public Entities and Local Authorities	<ul style="list-style-type: none"> • Ministries, municipal and regional authorities playing a central role in project regulation and co-financing. • ARERA, Port Network Authority of the Eastern Adriatic Sea, Friuli Venezia Giulia Region. • Service providers: TERNA, AcegasApsAmga, Hera, SIOT, Grenoble Alpes Métropole, Grenoble Chamber of Commerce and Industry.
Research Institutions and Universities	<ul style="list-style-type: none"> • Collaboration with academic institutions to develop new technologies and provide technical support. • University of Trieste, Polytechnic University of Milan, Sincrotrone
Civil Society Organizations	<ul style="list-style-type: none"> • Engagement of local communities and citizens in waste separation and sustainable waste management programs. • Local Competitiveness Clusters: Vegepolys Valley, Tenerrdis, CIMES, Axelera.

Below a summary of the Reports that have been collected from the working sessions each partner has organized within its local stakeholders.

Main topics of the Systemic Community Working Sessions:

- Sustainable waste management: pilot projects for the recycling of used cooking oil and biogas production from organic waste; treatment of sewage sludge and management of animal waste.
- Energy efficiency and renewable sources: use of residual heat from industrial plants to provide heating for other companies; creation of renewable energy communities within industrial areas.
- Collaboration between businesses and institutions: partnerships between companies, public authorities, and universities to promote research and innovation in environmental sustainability; proposals for resource and service sharing between businesses to reduce costs and environmental impact.
- Digitalization and monitoring: development of it tools to monitor energy consumption, waste production, and potential synergies between companies.
- Introduction of new regulations on renewable energy use: discussion on the latest legislative developments aimed at fostering the use of renewable energy sources.
- Potential development of an industrial symbiosis networks: exploration of industrial symbiosis networks to facilitate resource sharing and collaborative practices among industries.

- Planning for future energy needs: implementation of on-shore power supply solutions in ports to meet future energy demands.
- Presentation of excess heat potential analysis results: discussion on the importance of managing residual heat and future collaborative opportunities.
- Exploring synergies between companies and local authorities: encouraging collaboration between businesses and municipalities for improved resource management.
- Strengthening industrial park governance: defining priority actions and improving governance within industrial parks to enhance coordination.
- Circular economy projects: collection and reuse of industrial waste and the management of residual heat within eco-industrial parks.
- Implementation of an online platform: facilitating collaboration between companies through a digital platform designed to enhance communication and cooperation.

Key conclusions of the Systemic Community Working Sessions:

- Positive effects of Public-Private Partnerships: the projects demonstrated that synergies between public entities, businesses, and universities enhance the effectiveness of sustainability strategies.
- Scalability of pilot models: initiatives launched in industrial parks can be replicated in other regions, contributing to the spread of circular economy practices.
- Need to overcome regulatory and financial barriers: large companies like KOTO face challenges in accessing funding, while SMEs require incentives to adopt green solutions.
- High motivation for shared projects: companies are motivated to participate in collaborative projects, especially to improve the image of the industrial park.
- crucial involvement of businesses and institutions: engaging more companies and institutions is essential for creating effective synergies.
- Strong interest in efficient heat management: both businesses and municipalities show a strong interest in managing excess heat effectively.
- Need for a coordinating body: establishing a central organization is necessary to facilitate information collection and collaboration among stakeholders.
- Strong Public-Private Cooperation: effective collaboration between public and private entities is crucial for improving energy efficiency.
- Replicable IT platform model: the IT platform developed can serve as a replicable model for other industrial parks.
- Active participant engagement: participants showed strong involvement, focusing on solutions that are scalable and replicable across different contexts.

Summary: lessons learned from the Systemic Community Working Sessions

- Several companies, such as JATA EMONA and VOKASNAGA, have highlighted innovative approaches to waste management. Examples include transforming manure into fertilizer and collecting used cooking oil for biodiesel production.
- Collaboration among stakeholders has proven essential for the success of pilot projects, fostering synergies between public entities, businesses, and local communities.
- COSELAG: The local community has shown significant interest in the circular economy and its application in industrial parks. Public-private collaboration is crucial for improving environmental performance and reducing greenhouse gas (GHG) emissions.



- Initiatives to install photovoltaic systems (e.g., JATA EMONA and KOTO) have emphasized the importance of reducing the carbon footprint through solar energy and energy efficiency improvements.
- Managing residual heat for industrial cooling has been discussed as an innovative solution to reduce energy waste.
- Difficulties have emerged in collecting data on the energy needs of residential buildings (RA SORA).
- The creation of Systemic Thinking Committee Models has facilitated stronger collaboration among different stakeholders (companies, public authorities, and universities) to promote the circular economy in eco-industrial parks.
- The lessons learned highlighted the need for stakeholder engagement strategies from the early stages of the project.
- A systemic approach has proven essential for creating effective synergies between businesses and institutions.
- Companies are motivated to participate in joint initiatives to improve the park's image and reduce environmental impact.
- The creation of an online platform to facilitate synergies between companies is considered a strategic element.
- The lack of a centralized governing body for industrial zones is seen as a barrier to collecting information on residual energy (RA SORA).

Summary: evaluations of the Systemic Community Working Sessions

- All participants expressed a high level of satisfaction with the organization of the workshops, with an average score of 5 out of 5 for session quality and interactivity.
- Topics such as **sustainable waste management, renewable energy production, and cross-sector collaboration** were met with great interest.
- In particular, pilot projects on **used cooking oil recycling** and **biogas production** garnered significant attention for their potential replicability.
- The synergies created between public entities, universities, and private companies were positively evaluated for their contribution to improving **environmental sustainability and operational efficiency**.
- Participants recognized the value of **cross-sector cooperation** as a key element in achieving decarbonization goals and reducing waste.
- Some reports suggested further discussion on financial aspects, such as **return on investment (ROI)** for green infrastructure projects.
- Improving communication between stakeholders was recommended to increase transparency and enhance the effectiveness of initiatives.
- Participants positively evaluated the organization of the sessions.
- Discussions highlighted the importance of an **IT platform** for sharing data on energy demand and waste production. The possibility of replicating the pilot project in other industrial parks in the region was confirmed.
- The working sessions were highly rated by participants.
- Companies expressed strong interest in collaborating with municipalities to harness the potential of **excess heat**.



- Participants called for joint meetings between businesses and local administrations to strengthen synergies.
- The workshops received positive feedback, with strong participant engagement. Industries requested further meetings to delve into specific topics and improve collaborations.
- The value of **online platforms** for managing industrial synergies was recognized.