

Grant Agreement number: 101037031

Project acronym: FRONTSHIP

Project title: A FRONTrunner approach to Systemic circular, Holistic & Inclusive solutions for a new Paradigm of territorial circular economy

Type of action: Deployment of systemic solutions with the support of local clusters and the development of regional community-based innovation schemes



CIRCUPUNCTURE MODEL & CIRCUPUNCTURE ACTION PLAN FOR LODZKIE REGION

Deliverable Number: 2.6: Circular Governance Model,
operational framework, the Lodzkie Region CEAP
enhancement and implementation updates

Delivery type:	Report
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Contractual delivery date:	31.10.2023
Delivery date:	29.12.2023
Dissemination level:	Public

Partners



HISTORY OF CHANGES			
Version	Date	Author/Contributor	Changes
01	04/10/2023	UNIŁODZ/RIC	The first draft, theoretical framework
02	07/11/2023	UNIŁODZ/RIC	The second draft, CircuPuncture Model for Łódzkie Region
03	28/11/2023	UNIŁODZ/RIC	The third draft, CircuPuncture Model for Łódzkie Region, planned innovations in CSS
04	07/12/2023	UNIŁODZ/RIC	The fourth draft, CircuPuncture Model for Łódzkie Region, Challenges
05	08/12/2023	UNIŁODZ/RIC	The fifth draft, CircuPuncture Model for Łódzkie Region, Action Convergence Compass, Resource Benchmarking
06	15/12/2023	UNIŁODZ/RIC/OPUS	The sixth draft, CircuPuncture Model for Łódzkie Region and first draft CircuPuncture Action Plan
07	19/12/2023	UNIŁODZ/RIC/SŁOM Bzura/Parzęczew	Presentation during Regional Cluster Team Meeting
08	20/12/2023	UNIŁODZ/RIC/SŁOM/ Bzura/Parzęczew	The seventh draft, The changes incorporated the feedback from the meeting
09	20/12/2023	RIC/UNIŁODZ	Roadmap verification
10	22/12/2023	RIC/UNIŁODZ	Roadmap & CircuPuncture Action Plan second draft
11	27/12/2023	RIC/UNIŁODZ	The final version – the first verification
12	29/12/2023	RIC/UNIŁODZ	The final version before quality and technical review
13	10/01/2024	RIC	Editorial changes
14	24/01/2024	UNIŁODZ	Editorial changes
15	20/02/2024	UNIŁODZ/RIC	Corrections after internal review & quality assurance

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1. Executive summary

This report – Deliverable 2.6 (D2.6) – Circular Governance Model, operational framework, Lodzkie region CEAP enhancement and implementation updates – is the result of the work carried out under the Work Package 2 – Regional Systemic Circular Economic Approach, Task 2.2. – Regional Circularity Booster Toolkit. D2.2.

The change in the role of the Marshall Office within the project, as well as the results of the studies conducted as part of Task 2.1 and presented in Deliverable 2.1, necessitated the search for a different approach to developing the Circular Governance Model and Circular Economy Action Plan for the Lodzkie Region. The CircuPuncture Model and CircuPuncture Action Plan, as outlined in the report, consider policy, social aspects, and stakeholder involvement perspective.

The goal of the FRONTSHIP project is to ensure the green and just transition of the Polish Region of Lodzkie towards decarbonization and territorial regeneration through the demonstration of highly replicable regenerative Circular Systemic Solutions (CSS). These Systemic Solutions aim to address the current challenges and needs of the region, transforming them into opportunities for economic growth, social inclusion, decarbonization of production and consumption systems, improvement of the quality of life for citizens, and reconnection between the urban and rural area.

To achieve the objectives stated above, the Circular Governance Model and the Circular Economy Action Plan (CEAP) for the Lodzkie Region need to be elaborated. The frameworks for both documents are based on the assumptions adopted in the FRONTSHIP project and in regional strategic documents, such as The Development Strategy of the Lodzkie Region 2030 and the action plan developed in the scope of the REPLACE project. Both the Circular Governance Model and the CEAP are crucial for the proper deployment of the circular economy in the region because they provide essential guidance and facilitate the transition.

The Circular Governance Model defines the method of coordinating the activities of the region's stakeholders who are willing to act for the circular transformation of the Lodzkie Region. Diagnosis carried out in the first phase of the FrontSh1p project proved that in the Lodzkie Region we are dealing with a high level of market failures and governance failure. Moreover, the incentive system, including GPP, is not effective. Therefore, in the initial stage, the territorial scope of the Circular Territorial Cluster in the Lodzkie Region is limited to specific parts of the region. A territory was selected, including the capital of the region, which is coordinated by two large territorial networks: Łódź Metropolitan Area Association (SLOM) and Bzura Intermunicipal Association (Bzura). These organizations have strong potential and activity for circular transformation. Therefore, the boundaries of CTCs are fuzzy. They may change, eventually expanding to the entire Lodzkie Region. Numerous analyses and reports often point to similar difficulties in implementing the circular economy. Therefore, as part of the project, we have developed an innovative approach to the way of coordinating activities for circular transformation – the CircuPuncture Model. We propose a completely new resource-based approach to circular transformation at the local level. The new approach is adaptive. We offer a complete set of tools to coordinate the region's circular transition. The CircuPuncture Model can be used both at the level of the entire region (e.g. Lodzkie Region) or part of the territory coordinated by a specific network constituting the CTC in the first phase. In the case of the Lodzkie Region, we have prepared a co-governance model for CTC based on the partnership of Bzura and SLOM. However, CircuPuncture can also be implemented at the level of the smallest local government unit (in our case, a commune) and a single organization (e.g. university, enterprise, etc.). CircuPuncture is a complete set of tools and techniques for agreeing trade-offs among CTC stakeholders. CircuPuncture is a resource philosophy of setting resource missions and defining Circular Challenges and their implementation. CircuPuncture is easy to replicate anywhere in the world. This approach does not require the identification of difficult-to-access

resource indicators. The CircuPuncture Model is based on: (1) real market information generated by the platform (RCBT) and (2) basic information regarding Circular Economy project activity of stakeholders in the region. The engine of circular change in the CircuPuncture Model are innovations created according to logic: “systemic problems need systemic solutions”. Circular Systemic Solutions are the core of the CircuPuncture Model.

The operational document for the implementation of the strategic principles outlined in the CircuPuncture Model, is the CircuPuncture Action Plan. It represents the equivalent of Circular Economy Action Plan. The proposed Plan serves as an initial stage for consultations and further development. The outlined Circular Challenges are broad and represent more of a categorization than specific steps ready for implementation. Such an approach allows taking small steps that build a solid foundation and start shifting from viewing the circular economy merely as waste management to adopting the 5R principles, then the 6R, and beyond.

The last part of the report presents the entire concept in a graphical format as a roadmap towards circularity in any region.

2. Circular Governance Model – theoretical framework

2.1. Symbiosis and partnership in the Circular Territorial Cluster

The circular economy is territorial and is determined by global trends and transnational institutions. At the territory level, the pillars of the circular economy are active territorial partnerships, a social regulation mechanism, systemic innovation support and networking infrastructure (Fig. 1). Due to its resource focus, the circular economy strongly correlates with the socio-economic processes in a particular space. In this case, space is not just an arena for socio-economic processes but an active actor (partner/participant?). The circular economy requires the involvement of space – territory, that is, an active territorial partnership.

Territory includes a wide range of internal and external social, economic, cultural, and political relations between actors, adopting its development dynamics. Territory is a specific social construction based on a community's shared history, culture, knowledge and skills, along with institutions and networking between all actors of socio-economic life¹². Territory, to be an influential factor in the development of the circular economy, should be defined in five functional dimensions: spatial, economic, social, institutional and ecological. Such properties of space provide a real opportunity to launch active territorial partnerships. The market value of territory manifests in the ability to generate territorial capital. Under extremely limited resources, territories with high innovative capacity produce a new type of territorial capital – circular territorial capital. This capital is directly related to a new type of resource – circular resources.

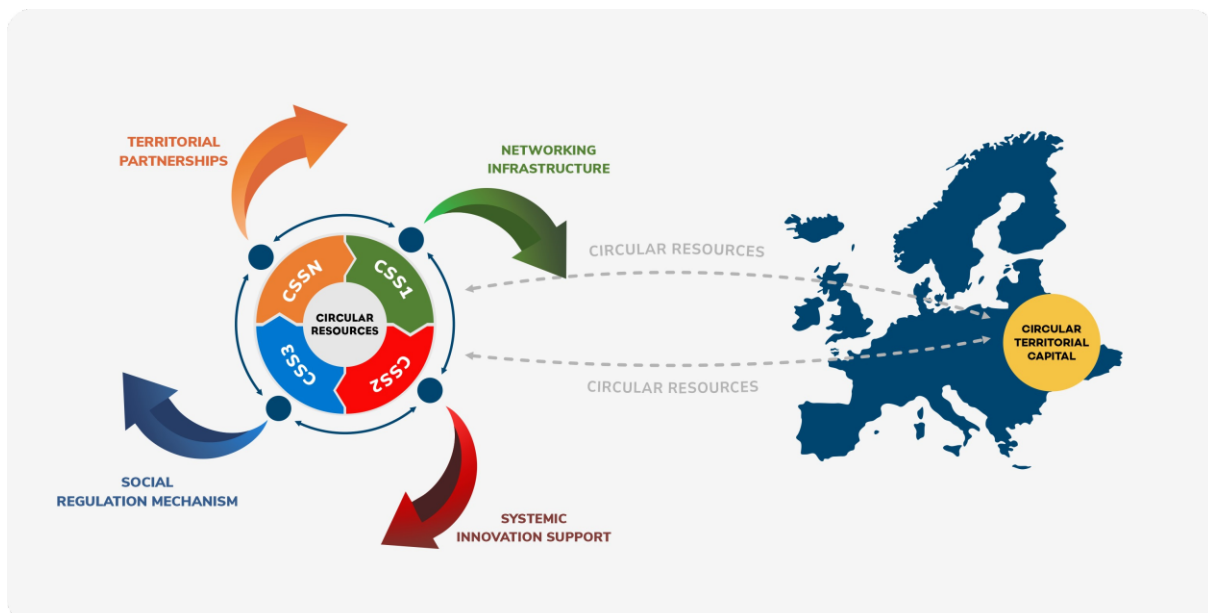


Fig. 1. Pillars of the circular economy.
Source: Own compilation.

The other pillars of the circular economy, a social regulation mechanism, systemic innovation support and networking infrastructure, are characterised later in the paper.

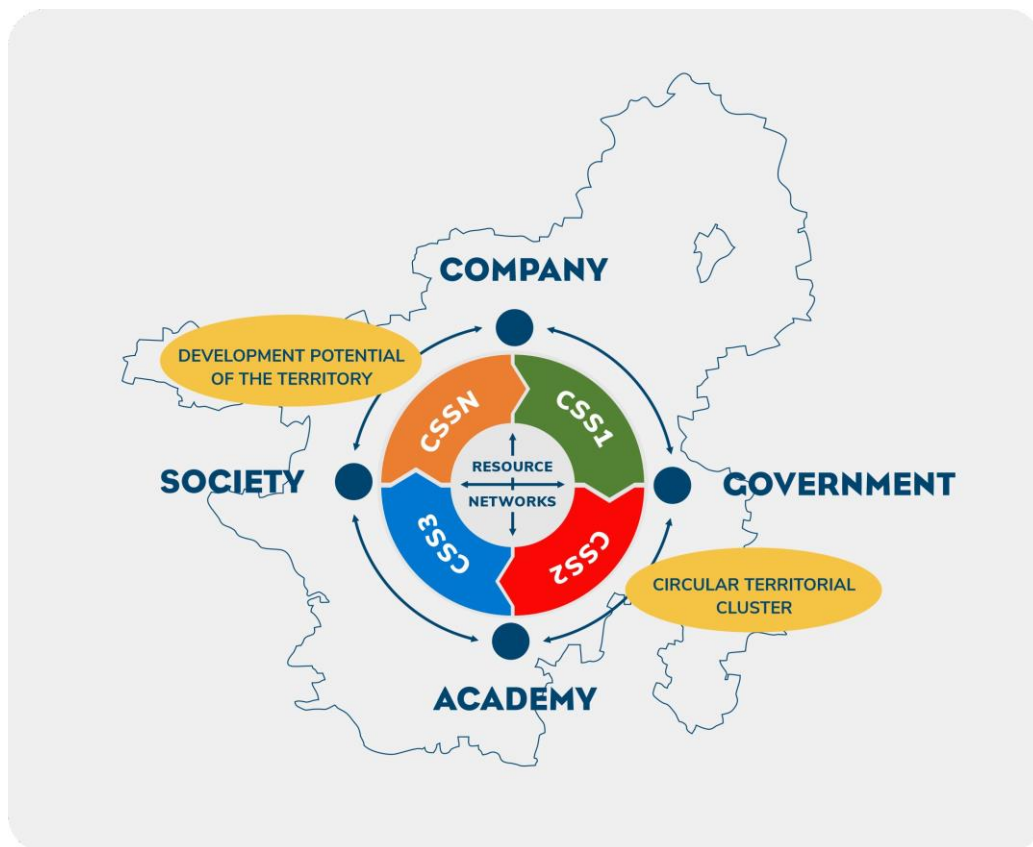
The processes of revealing, creating, and building circular territorial capital are based on the definition of processes typical of the circular economy. In particular, they can be identified with the 5Rs

¹ Pietrzyk I., (2000), Polityka regionalna Unii Europejskiej i regiony w państwach członkowskich, PWN, Warszawa

² Pietrzyk I., (2004), Globalizacja, integracja europejska a rozwój regionalny, [w:] A. Jewtuchowicz (red.), Wiedza, innowacyjność, przedsiębiorczość a rozwój regionalny, Wydawnictwo Uniwersytetu Łódzkiego, Łódź.

definition and its elaborations Rethinking, Repurposing, Reducing, Reusing, Recycling³. The circular resources can be both generic and specific. The resources are useful in market processes and are involved in strengthening the development when they are created, sustained, and aware. Such resources in economic terminology are called strategic resources. A resource can be considered strategic for a region or enterprise if it has the following characteristics: value, rarity, difficulty of imitation and irreplaceability.

A vital condition for circular territorial capital is a strong relationship between local actors of development processes. Following the logic of the quadruple helix, these actors include four groups of actors: entrepreneurs (company), academics (academy), public authorities (government) and residents (society). Relationships between these groups should be of coopetition (cooperation and competition), symbiosis and co-production. In addition, these relations should be based on cross-sectoral Open method of coordination (Fig. 2). Networks and partnerships determine the development potential of the territory. The creation and existence of network organisations is grounded on the principle of mutual benefits. A network's fundamental benefits are reciprocity, interdependence, loose coupling and the supply of new energy to network elements (power)⁴.



*Fig. 2. Regional stakeholders creating circular territorial capital.
Source: Own compilation.*

The territory can create a network with the characteristics of a cluster. A cluster is defined as a geographical concentration of interrelated companies, suppliers, and enterprises operating in related sectors. Companies operating within a cluster compete with each other but also find areas of mutual cooperation. It is a network of independent enterprises, more or less formalised, depending on the

³ Rethinking, Repurposing, Reducing, Reusing, Recycling; Ellen MacArthur Foundation, (2019) Completing the picture: How the circular economy tackles climate change

⁴ Moulaert F., Sekia F., (2003), Territorial Innovation Models: A Critical Survey, Debates and Surveys, „Regional Studies“, vol. 37.3.

needs and level of social capital between cluster participants⁵. Under traditional conditions of a linear economy, networks of this type are called industrial clusters based on sectoral concentration.

By contrast, these networks have a cross-sector dimension in a circular economy based on circular value-added chains. They operate in a model of industrial symbiosis. The concentration of local actors takes place around defined types of resources. The main aim of the network's operation is to maximise the benefits associated with the multiple use of resources. Partners identify and challenge each other, which leads to tightening and building closed loops during implementation. Circular territorial capital creation occurs within the Circular Territorial Cluster [CTC] (Fig. 3).

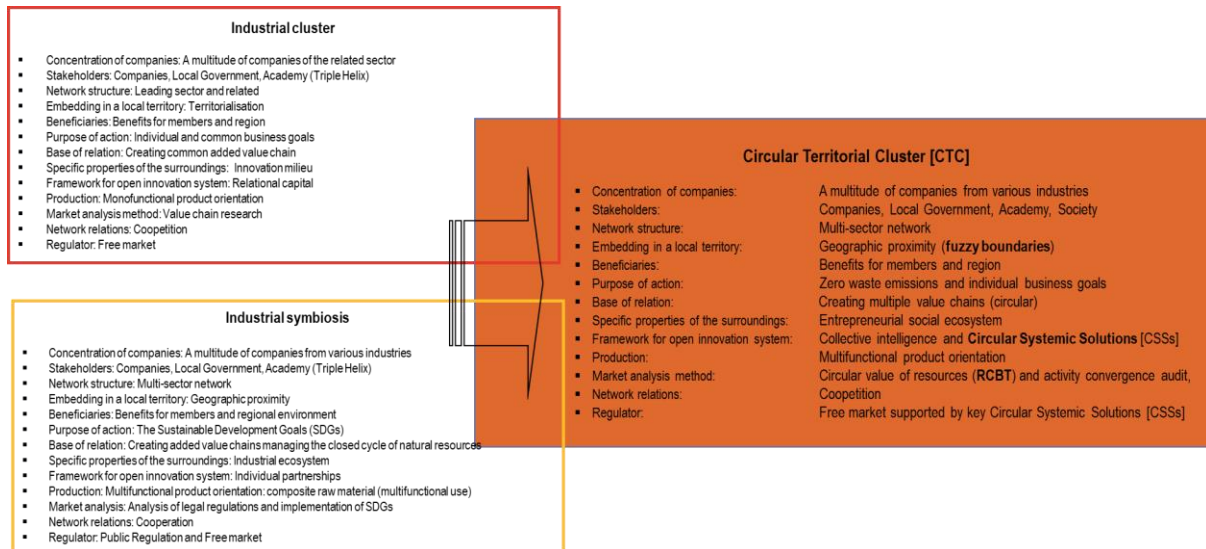


Fig. 3. Features of the Circular Territorial Cluster in the context of industrial cluster theory and industrial symbiosis theory.

Source: Own compilation.

Circular clusters follow from the scheme of the open innovation model. The diffusion of knowledge and cross-learning is based on multidimensional networking. Innovations are like intelligent collective decisions. This way of optimising choices minimises:

- the effects of limited market perception in the forming circular economy,
- the risk of the trap of legal and formal barriers,
- the risk of the trap of market failure,
- the risk of ineffective communication of incentives (support tools).

Circular clusters are also business organisations since profit is the strongest motivation to involve partners, including society. Hence, relations beyond cooperation between CE market participants are also competitive. The business model of local CE market organisation in the circular cluster can take various forms (for example, Retain Product Ownership (RPO), Product Life Extension (PLE), Design for Recycling (DFR)⁶, Circular Business Models Wheel⁷), but its essential feature is the dominant market character of regulation, reinforced by Circular Systemic Solutions⁸. A circular cluster can occur in at least two basic types:

- **Circular Territorial Cluster** – this type of circular cluster involves the implementation of several missions at the same time, accomplishing challenges in different areas of activity relevant to

⁵ Porter M., (2001), Porter o konkurencji, PWE, Warszawa

⁶ Atasu, A., Dumas, C., & Van Wassenhove, L. N. (2021), The circular business model. Pick a strategy that fits your resources and capabilities. Harvard Business Review, July-August. Retrieved September 14, 2021 from <https://hbr.org/2021/07/the-circular-business-model>.

⁷ Hofmann F., (2019), Circular business models: business approach as driver or obstructer of sustainability transitions? Journal Cleaner Production, 224 pp. 361-374.

⁸Przygodzki, Z., et al., (2022), Policy Framework and Market analysis. Policy Model - Territorial Ecosystem Framework for Circular Economy in Lodzkie Region, Raport Frontship, Łódź

a specific territory. In this case, the territory of the cluster or its parts may adopt resource-oriented development strategies coinciding with the missions of the circular cluster.

- **Circular Branch Cluster** – the activity of this type of cluster is limited to the realisation of one selected mission and challenges in its area. Examples of this type of cluster are energy clusters, water clusters, food clusters, etc., as long as the priority goal of their activities is to keep circular resources. In the opposite case, these are traditional industrial clusters.

Contemporary conditions and trends related to the collaborative economy, on-demand economy and app/web-driven economy determine the mechanism of cluster functioning. **The primary venue for relations of circular cluster stakeholders is a transaction web platform with the Regional Circularity Booster toolkit.** The Regional Circularity Booster toolkit is a virtual broker of territorial circularity that enhances the market's efficiency by accessing real-time resource knowledge. The Regional Circularity Booster toolkit includes real-time information on resource availability at the CTC scale in the spatial context (maps).

All stakeholders of the circular cluster are involved in the co-creation of the platform: company, academy, society and government. The platform's purpose is also to connect the territory with the external environment (national and global). The efficiency of the actors within the circular platform depends on the degree of organisation of the territory – the circular atmosphere: awareness and commitment to share common values by all groups of CTC stakeholders.

2.2. CircuPuncture – specificity of the adaptive governance model

2.2.1. The philosophy of the CircuPuncture model

The creation of a circular atmosphere for the effective functioning of the Circular Territorial Cluster is implemented under one of two modes of Circular Government Models: anticipatory or adaptive.

Anticipatory mode is a holistic idea of coordinating the economy of a particular territory for circular transformation, based on multi-stakeholder public-social-private partnerships. Direct types of partnerships are usually promoted. Contracts are concluded and projects are implemented by companies, public entities and social sector institutions. The anticipatory mode often uses a strategic management model based on implementing a development strategy and a tree of strategic goals. The anticipatory mode of circular public management encompasses the entire “contracted space” of a particular territory (one or more associated local government units; examples include: (1) AGESP S.p.A., a company providing a selective waste collection service and producing gas and compost for the municipalities of Busto Arsizio and Fagnano Olona in the Milan metropolitan area; (2) The Municipal Association “Clean Town, Clean Municipality” with The Municipal Solid Waste Treatment and Neutralisation Plant “Orli Staw”, which includes 23 cities and municipalities from the Wielkopolskie and Lodzkie Regions). This model can be implemented in local systems that can self-adapt to new circular economy conditions. In other words, it applies to territorial systems without significant market failures⁹ and government failure^{101112131415 16171819}.

Adaptive mode is a point vision of coordinating the economy of a particular territory for circular transformation, based on cooperative but dispersed public-social-private partnerships. Partners are not obliged to cooperate on the same projects. They carry out their own projects. However, the goals of these projects and the results are similar. Integration and convergence of activities is achieved by understanding the philosophy of the circular economy. Hence, the partnership may not take the form of direct contracts. The anticipatory mode is most often based on an operational (short-term) management model. However, operational management can be ineffective for such a challenge as the transition of a linear economy to a circular one. Hence, the right solution is to use the **CircuPuncture Model**. The CircuPuncture Model combines strategic management's advantages with operational management's flexibility. The CircuPuncture Model is proposed in particular for implementing the circular economy in territories where a significant degree of market failure and government failure have been identified, including regulatory and legal problems.

It is observed that identifying development potential at the entire territory (CTC) level may be impossible or unreliable. This situation may be caused by:

- delays in adapting to megatrends,
- dispersion of development potentials by stakeholders,

⁹ Randall, A., (1983), The Problem of Market Failure, *Natural Resources Journal* 23 (1), pp. 131–148. Bator, Francis M. 1958. The Anatomy of Market Failure. *The Quarterly Journal of Economics* 72 (3): 351–79

¹⁰ Stiglitz, J. E. (2012), *The price of inequality*. Penguin Group, Penguin Books Ltd

¹¹ Stiglitz, E., (2004), *Ekonomia sektora publicznego*, PWE, Warszawa 2004

¹² Moreau, F., (2004), The role of the state in evolutionary economics, *Cambridge Journal of Economics* 28 (6), pp. 847–874. <http://www.jstor.org/stable/23602146>

¹³ Jackson, E.A., Jabbie, M., (2019), Understanding market failure in the developing country context, In: Filho, Walter L. et. al. (Ed.): *Decent Work and Economic Growth: Encyclopedia of Sustainable Development Goals*, Springer Nature, Switzerland, Cham, pp. 1–10, https://doi.org/10.1007/978-3-319-71058-7_44-1

¹⁴ Perman, P., Ma, Y., McGilvray, J., Common, M., (2003), *Natural Resource and Environmental Economics*, Harlow: Pearson Education

¹⁵ Acheson, J. M., (2006), Institutional failure in resource management, *Annual Review of Anthropology* 35, pp. 117–134

¹⁶ Orbach, B., (2013), What Is Government Failure?, *Journal on Regulation Online* 44 (2013), Arizona Legal Studies Discussion Paper 13-10, Available at SSRN: <https://ssrn.com/abstract=2219709>

¹⁷ Le Grand, J. (1991), The Theory of Government Failure. *British Journal of Political Science*, 21(4): 423–442

¹⁸ Keech, W.R., Munger, M.C. (2015), The anatomy of government failure. *Public Choice* 164(1): 1–42.

¹⁹ Stiglitz, J. E. (2012), *The price of inequality*. Penguin Group, Penguin Books Ltd

- severe market and government failures.

In territorial systems that cannot anticipate the conditions of the circular economy (do not have self-adaptive abilities), the opportunity for successful transformation lies in using adaptive mode. Then, the identification of development potential occurs at the level of the units that volunteer to participate and is insular. An adaptive mode means applying a “small steps” approach. The proposed in-point solutions should be implemented in a sandbox format. That is, they should be tested, revised, and implemented continuously. This way of fulfilling the mission to build a circular economy and achieve the challenges enables their promotion and diffusion, consequently replication in other areas²⁰. The local territory is treated as a laboratory for creating, implementing, and testing innovative projects – the Circular Local Booster (CLB). Adaptation of the anticipatory mode can take the form of a CircuPuncture Model. The model’s name comes from combining two words: “circular” and “acupuncture.” The idea of the model has its roots in urban planning and ways of reengineering cities^{21,22}. The CircuPuncture Model is:

- the method based on integrated interpersonal and collective communication tools supported by information and communication technologies (app economy);
- punctual, selective and staged way of implementing projects when it is difficult to initiate and implement a holistic vision of territory development in a single strategic plan or major project;
- way to coordinate and, in consequence, integrate multi-agency, dispersed sectoral, and cross-sectoral activities/projects;
- way of working towards strategic goals involving the development activities of individual stakeholders;
- bottom-up action method initiated by individuals/stakeholders aware of the conditions and needs of implementing a circular economy;
- mechanism of coexistence of social, economic, and environmental spheres based on market rules and shared value systems;
- mechanism of coexistence of social, economic and ecological spheres based on symbiosis and sharing.

2.2.2. Resource Missions and Circular Systemic Solutions

The core of the implementation of the CircuPuncture Model is a resource-based approach to setting critical action – Resource Missions (M1-N). Missions are key resource categories and unit activity areas in the Circular Territorial Cluster (Fig. 4). Resource missions identify activities for integrating the territory’s development potential in the area of selected resources for transforming the territory’s economy to a circular model. Additionally, they identify critical areas of innovation needs, i.e. areas of necessary improvement and necessary systemic innovation in the form of circular systemic solutions.



Fig. 4. Interpreting Resource Missions in the Circular Governance Model.

Source: Own compilation.

²⁰ Przygodzki Z., Adamus J., Chądzyński J., Trippner-Hrabi, J., (2023), Regional Circularity Booster Toolkit, Raport Frontsh1p, Łódź

²¹ Lerner J., (2014), URBAN ACUPUNCTURE. Celebrating Pinpricks of Change that Enrich City Life, Island Press

²² Iaconesi S., Persico O., (2017), Digital Urban Acupuncture. Human Ecosystems and the Life of Cities in the Age of Communication, Information and Knowledge, Springer. DOI 10.1007/978-3-319-43403-2

The choice of Resource Missions is carried out using heuristic methods, such as World Cafe. Heuristic methods are techniques and rules of conduct used to make the most appropriate decisions in complex situations that require analysis of available information as well as prediction of future phenomena; based on creative thinking and logical combinations. The basic criteria for the selection of Missions are at the same time the conditions that resources should meet to be treated as strategic resources on the one hand and circular resources on the other. These criteria constitute the **4NO filter** for the selection of Resource Missions and include the following:

- NOT managed resources area,
- NOT closed added value chains area,
- NO adaptation to climate change area,
- NO convergent activities area.

Resource Missions can be formulated at the level of the circular cluster or individual members of territorial cooperatives (local government units, associations of local government units, housing estates, etc.). The choice of Missions is based on diagnosing the territory's resources. Each Mission is presented on a separate wing of the windmill figure (Fig. 5).

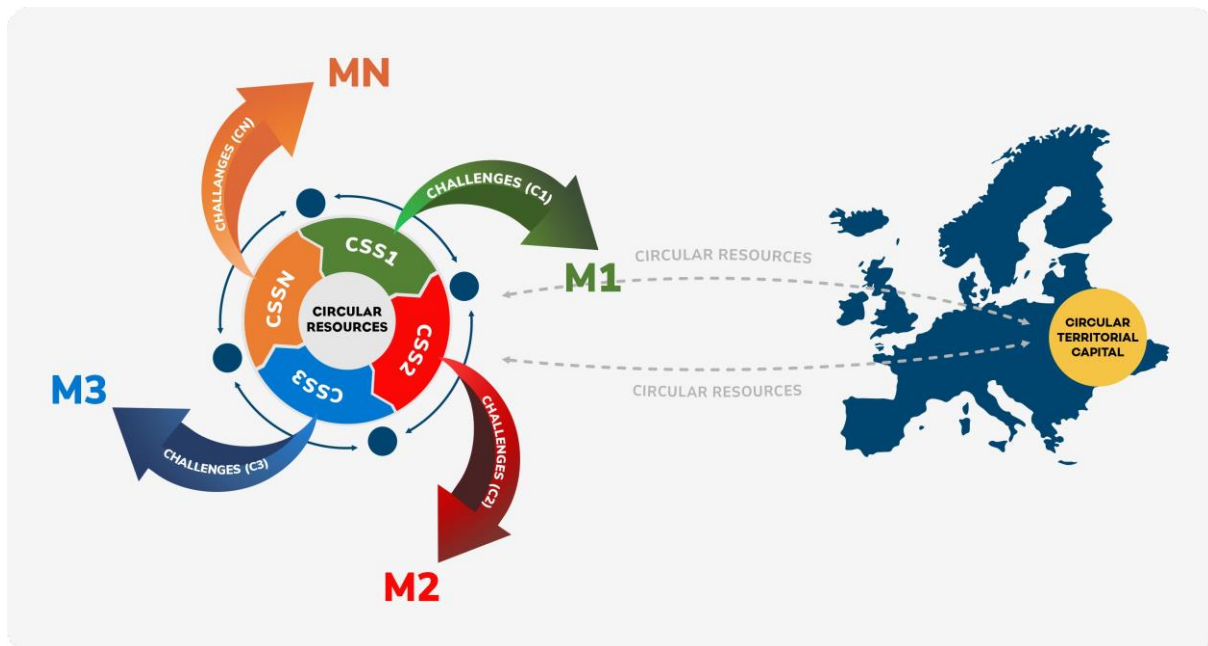


Fig. 5. Resource missions involving circular resources in territory development.
Source: Own compilation.

The **Regional Circularity Booster toolkit** facilitate the preparation of this type of diagnosis. The Regional Circularity Booster toolkit has an analytical and statistical module for identifying basic diagnostic data on the activities of CTC.

Resource Missions are critical areas of innovation needs, i.e. areas of necessary improvement and systemic innovation in the form of Circular Systemic Solution (Fig. 6).

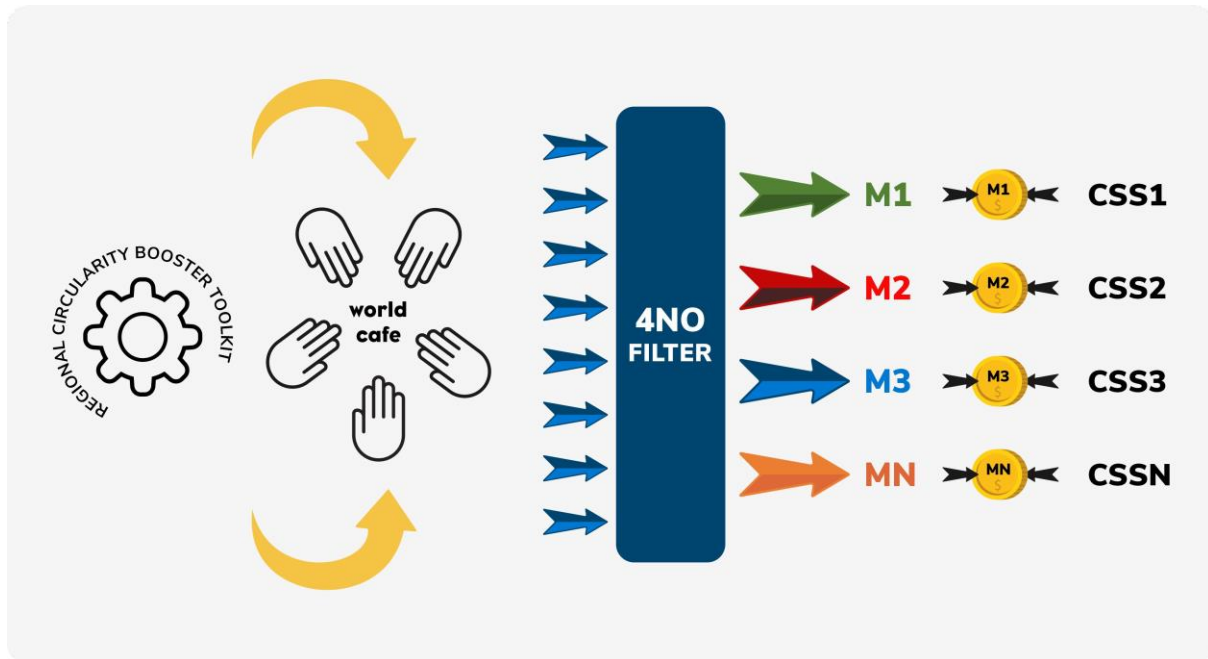


Fig. 6. Resource Missions as key areas of Circular Systemic Solution (CSS).

Source: Own compilation.

Circular Systemic Solutions are sets of innovations (technological, productive, process, market, social, organisational, ecological design, and marketing) **dedicated to particular types of resources**. Their goal is to minimise the negative environmental impact of products throughout their life cycle. Within each Resource Mission (MN), Circular Systemic Solutions (CSSN) should be initiated. As a result, socially, economically and environmentally integrated innovations are produced – demonstration projects (CSS11-n, CSS21-n, CSSN1-n). These projects aim to implement and strengthen the economy's transition to a circular in the Territorial Circular Cluster. CSSN1-n, as an innovation, should have a high potential for replicability and scalability to other territories. CSSN1-n impacts a local or regional level (Fig. 7).

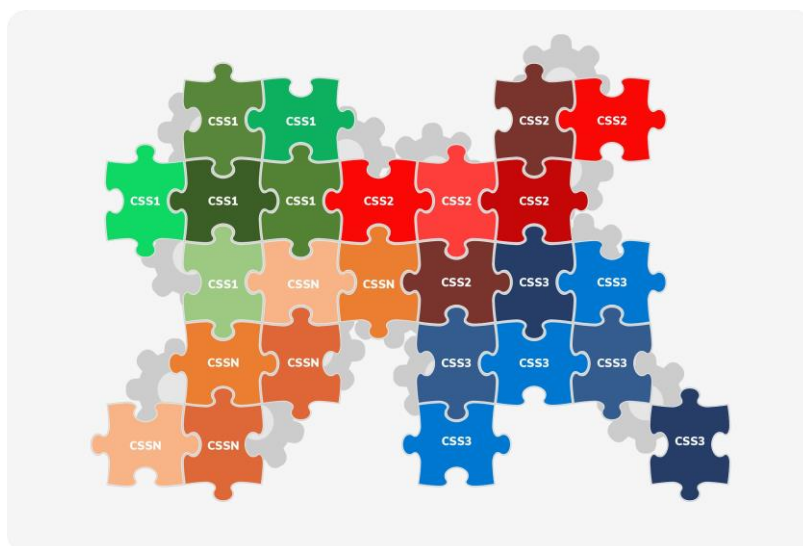


Fig. 7. Circular system solutions as sets of innovative projects.

Source: Own compilation.

Territorial regeneration will be achieved through the deployment of highly replicable, modular and scalable Circular Systemic Solutions. In such a circular territorial transition, CSSs should be multi-stakeholder and involve key local social, economic, academic, and public partners, putting the needs of citizens at the centre of development. CSSs should be addressed to more than one economic sector. Key product of value chain and technological processes of CSSs should be a target of the new EU CEAP that are linked with the decarbonisation of Europe and environmental safety. The sustainability challenge posed by key value chains requires urgent, comprehensive and coordinated actions, which will form an integral part of the sustainable product policy framework²³. The role of CSS is the fundamental rebuilding of the system by changing the structure of its key feedback loops. CSS aims to support an effective, safe, dynamic and sustainable symbiosis within and between economic sectors. In particular, they increase their circularity, involve circular participative social and governance models, and demonstrate sustainable products and services business models. CSS should help to create critical mass and facilitate public and private investments, including criteria of industrial ecology and ecodesign, increase the integration between production, services and consumers, and facilitate technology deployment, with particular attention to more efficient and sustainable technologies²⁴.

To summarise, System Solution Areas (CSS1-N) are Resource Missions undertaken by local, regional, or other cooperatives to minimise consumption, increase the efficiency of use, and close loops on resources and raw materials. The scope of Systemic Solution Areas is extensive. It can have varying levels of detail, such as plastic, rubber, food, fertiliser, solar energy, wind energy, building materials, wood, water, etc.

2.2.3. Circular Territorial Resource Networks

Circular systemic solutions are created through an open innovation and co-innovation process²⁵ based on networking and the Open Method of Coordination (OMC). Hence, the launch and functioning of Circular Territorial Resource Networks (thematic networks) within the CTC is crucial. Networks are built around each of the Circular Systemic Solution Areas (CSS1-N). Networks are a place and reason for dialogue, co-innovation, information exchange, building relational capital and trust, initiating partnerships, creating ideas, supporting each other, and gaining knowledge. Networks coordinate and negotiate regional, scientific, industrial, social and innovation policies on a transnational level (Fig. 8). Network members are stakeholders in a specific CSS area from each circular cluster sector (Company, Academy, Society, Government). Networks should be self-organising and self-sustaining.

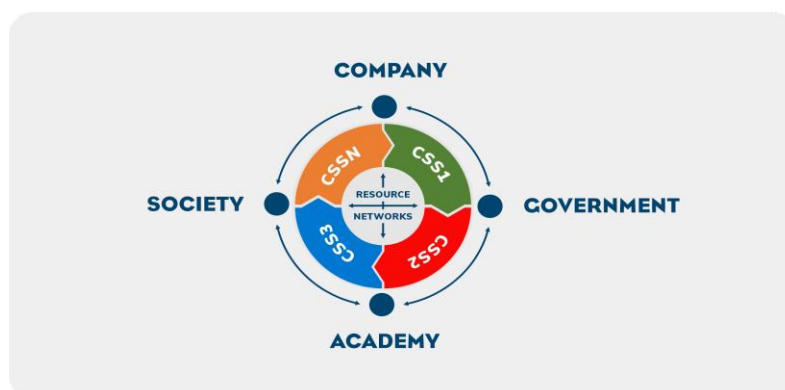


Fig. 8. Circular Regional Resource Networks.
Source: Own compilation.

²³ A new Circular Economy Action Plan. For a cleaner and more competitive Europe, Brussels, 11.3.2020, COM(2020) 98 final

²⁴ Przygodzki, Z., et al., (2022), Policy Framework and Market analysis. Policy Model - Territorial Ecosystem Framework for Circular Economy in Lodzkie Region, Raport Frontship, Łódź

²⁵ OECD/Eurostat (2018), Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg, <https://doi.org/10.1787/9789264304604-en>

2.2.4. Circular Challenges and selection tools

The following significant step after establishing Resource Missions is the identification of **Circular Challenges (CC)**. Challenges are set in the Missions. Nevertheless, they can be interdependent. In other words, implementing one of the Circular Challenges in a Mission may affect the implementation status of other Missions. At the same time, the CCs are reports of specific innovation needs – implementing individual CCs may require necessary systemic innovations in the form of Circular Systemic Solutions (CSSN1-n). CCs can be both simple and complex projects. Challenges can be infrastructure, organisational, as well as social projects.

The implementation– of CCs is circular acupuncture aimed at “touch-shot” key initiation sites: industrial synergy and symbiosis effects, improved proficiency, and improved CTC efficiency (Fig. 9).

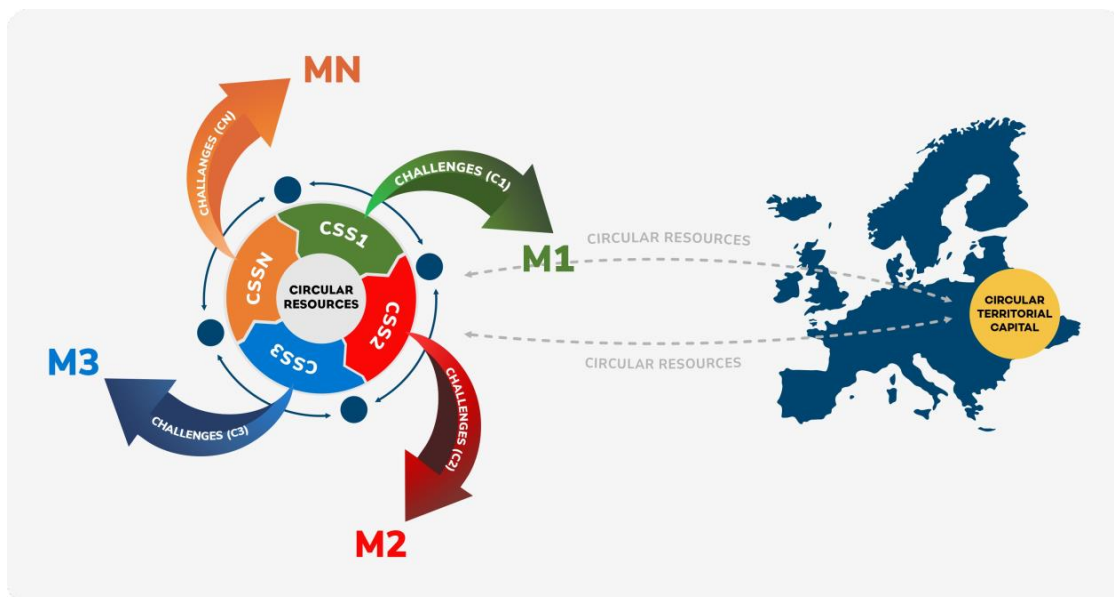


Fig. 9. CircuPuncture's resource strategy model.

Source: Own compilation.

CCs are identified using reactive methods: participatory observation, study visits, field discussions, brainstorming, etc. A diagnosis of local stakeholders' involvement in the functioning of circular economy conditions should follow the identification of CCs. For this purpose, a diagnosis using:

- the Regional Stakeholder Activity Convergence Compass (Fig. 10),
- Benchmarking of resource use directions (Fig. 11).



Fig. 10. Regional Stakeholder Activity Convergence Compass.

Source: Own compilation.



Fig. 11. Benchmarking of resource use directions.

Source: Own compilation.

The compass of convergence of regional stakeholder activities is an audit tool. It is used to check the level of convergence of shared and individual projects implemented by stakeholders to strengthen the circularity of the territory's economy. The compass provides the following information: to what extent the activities and various types of project activities of stakeholders operating in the region are convergent.

Procedure for carrying out the Regional Stakeholder Activity Convergence Compass:

1. Selection of circular projects from available databases (in the case of absence of databases conducting primary research). Selection criteria both in national and English language: raw materials, segregation, secondary, waste, recycling, garbage, resources, social integration, social involvement, ecology, eco, wooden packaging, food, feed, nutrients, water, sewage, fertilizer, plastic, rubber, circular economy, closed loop.
2. Preparation of the basic database – data matrix according to Fig. 12
3. Carrying out calculations according to the formulas in Fig. 14
4. Preparation of results according to Fig. 12

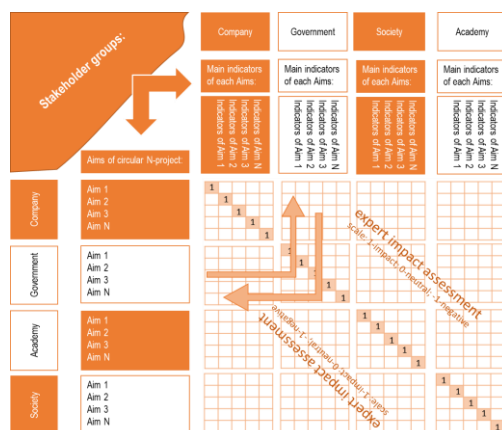


Fig. 12. Base formula for developing.
Source: Own compilation.

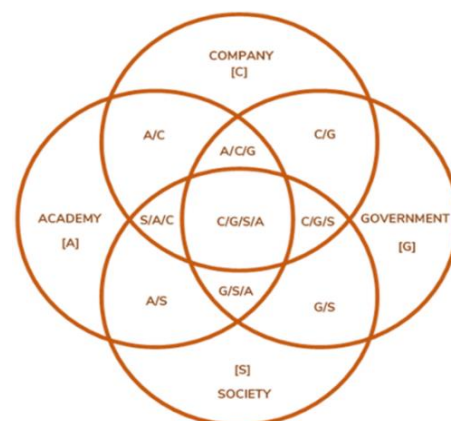


Fig. 13. The scope of convergence of activities
between stakeholder groups.
Source: Own compilation.

[I] intra-sectoral interaction (specific impact)	[II] cross-sectoral interaction (2.level)	[III] cross-sectoral interaction (3.level)	[IV] Integration (full convergence)
Formula: $CCnGGnSSnAA=CnGrnSA$	Formula: $(AC \cap CA) / 2 = AnC$ $(CG \cap GC) / 2 = CnG$ $(GS \cap SG) / 2 = GrS$ $(AS \cap SA) / 2 = AnS$ $(SC \cap CS) / 2 = SnC$ $(AG \cap GA) / 2 = AnG$	Formula: $[(CC \cap GG \cap AA) / 3 \cap (AC \cap CA + CG \cap GC + AG \cap GA) / 3] / 2 = AnCnG$ $[(CC \cap GG \cap SS) / 3 \cap (SC \cap CS + GS \cap SG + CG \cap GC) / 3] / 2 = CnGnS$ $[(GG \cap SS \cap AA) / 3 \cap (AS \cap SA + AG \cap GA + GS \cap SG) / 3] / 2 = GrnSA$ $[(CC \cap SS \cap AA) / 3 \cap (SC \cap CS + AS \cap SA + AC \cap CA) / 3] / 2 = SnAnC$	Formula: $[(C \cap G \cap S \cap A) / 4 + (A \cap C + C \cap G + G \cap S + A \cap S + S \cap C + A \cap G) / 6] / (A \cap C \cap G + C \cap G \cap S + G \cap S \cap A + S \cap A \cap C) / 4 / 3 = CnGrnSA$
synthetic index: $(CCnGGnSSnAA) / 4$	synthetic index: $(AC \cap CA \cap CG \cap GC \cap GS \cap SG \cap AS \cap SA \cap SC \cap SA \cap AG \cap GA) / 6$	synthetic index: $(AnCnG + CnGnS + GrnSA + SnAnC) / 4$	synthetic index: as above

The superscript "I" added in the formulas informs that the specified set relates to indicators

Fig. 14. Formulas for identifying products of sets and synthetic indexes.

Source: Own compilation based on The Council of Europe: European Heritage Strategy for the 21st.



Fig. 15. Framework for benchmarking resource use directions.
Source: Own compilation.

Benchmarking of the directions of resource use. This tool allows for two types of analysis in the areas of Resource Missions (CSS): assessment of the sustainability of the directions of resource use – identification of gaps and areas of underdevelopment of circular activities (5R: Rethinking, Repurposing, Reducing, Reusing, Recycling) in the context best market practice (pattern) and nominal identification of the directions of resource involvement in closed loop.

The role of local and regional governments, their associations and other social cooperatives is to prepare comfortable conditions for entrepreneurs, residents and researchers to take circular actions for circular inclusion. Hence, the target of the CIB tool is regional governments, local authorities, local government associations and community cooperatives. The conclusions of the CIB study reinforce the relevance of the identification of CCs. CCs are implemented in a sandbox or living lab format .

Effective implementation of the adopted findings requires the preparation of an **Action Plan (Circular Economy Action Plan)** with the division of competencies and activities to strengthen the circular synergy. Preparing a **Roadmap for CTC** defining the stages and chronology of activities is also necessary.

In summary, the procedure for implementing the Circular Governance Model in an adaptive mode in the form of the CircuPuncture Model is as follows (Fig. 16):

1. Identification of the territorial scope of the potential CTC
2. Diagnosis of resources (method: Regional Circularity Booster toolkit; ex-ante Action Convergence Compass)
3. Resource Missions and areas of systemic CTC solutions (heuristics: e.g., World Cafe)
4. Circularity Challenges of CTC (method: CIB, sandbox)
5. Initiation and development of Circular Territorial Resource Networks (subject matter)
6. Circular Economy Action Plan for CTCs
7. Roadmap for CTC

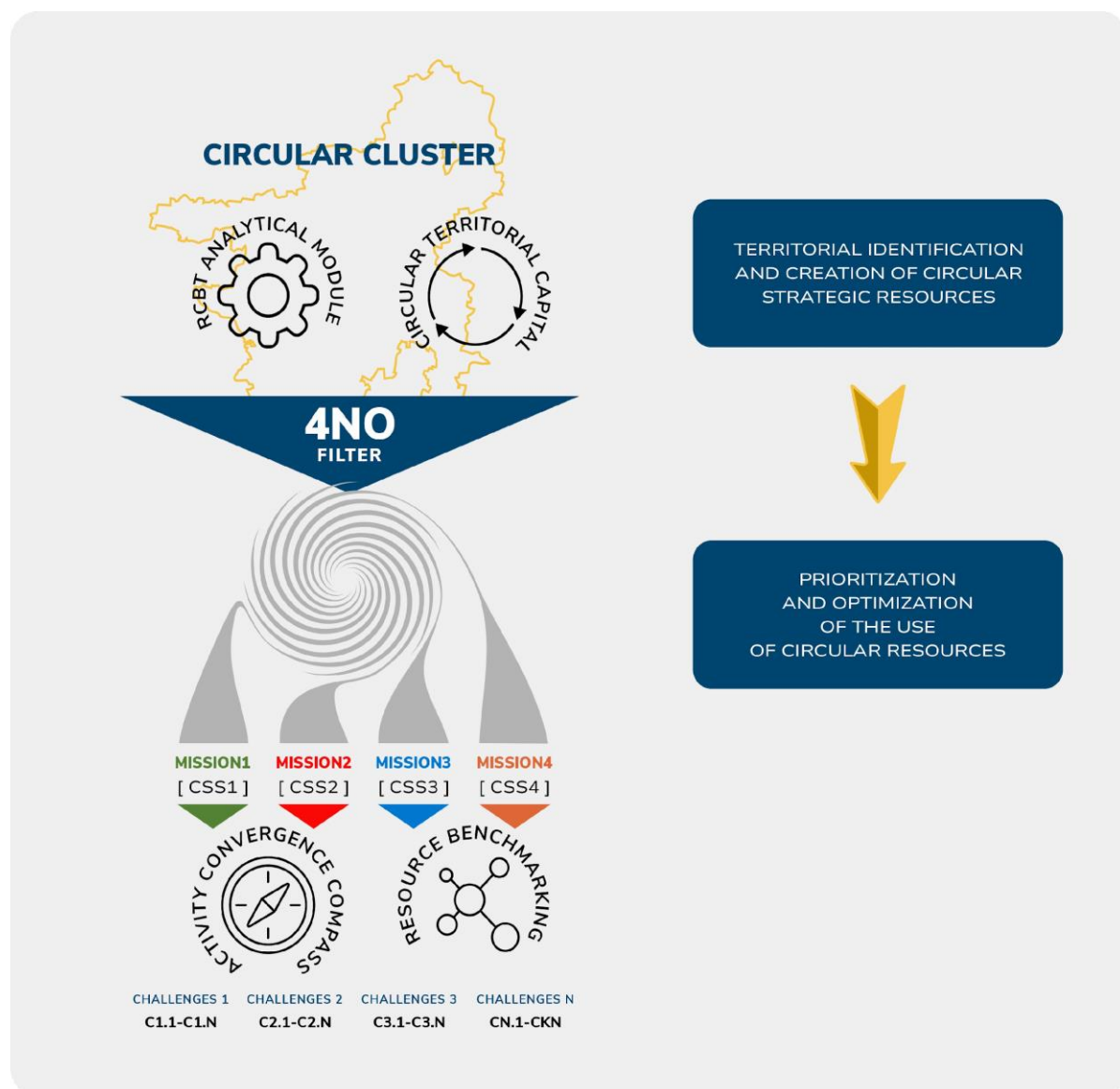


Fig. 16. CircuPuncture Governance Model implementation method.
Source: Own compilation.

3. CircuPuncture: support for the Regional Circular Booster Toolkit – Circular Governance Model in Lodzkie Region

3.1. Identification of the territorial scope of the Circular Territorial Cluster [CTC] in Lodzkie Region

3.1.1. Spatial scope

Lodzkie is a socially, economically, and environmentally diverse region. It is a central region of Poland formed by six different historical lands: Sieradz, Piotrkow, Rawa, Wieluń, Opoczno Lands and the Duchy of Lowicz. It covers an area of 18,218.95 km². In 2022, Lodzkie Region had a population of 2,394,946. The diverse potential of Lodzkie Region is well illustrated by the different types of functional areas identified in the Strategy for the Development of Lodzkie Region in 2021: 4 Urban Functional Areas, New Energy Area, Green Economy Areas, Active Integration Areas and Cities of Reclaimed Opportunities (Fig. 17)

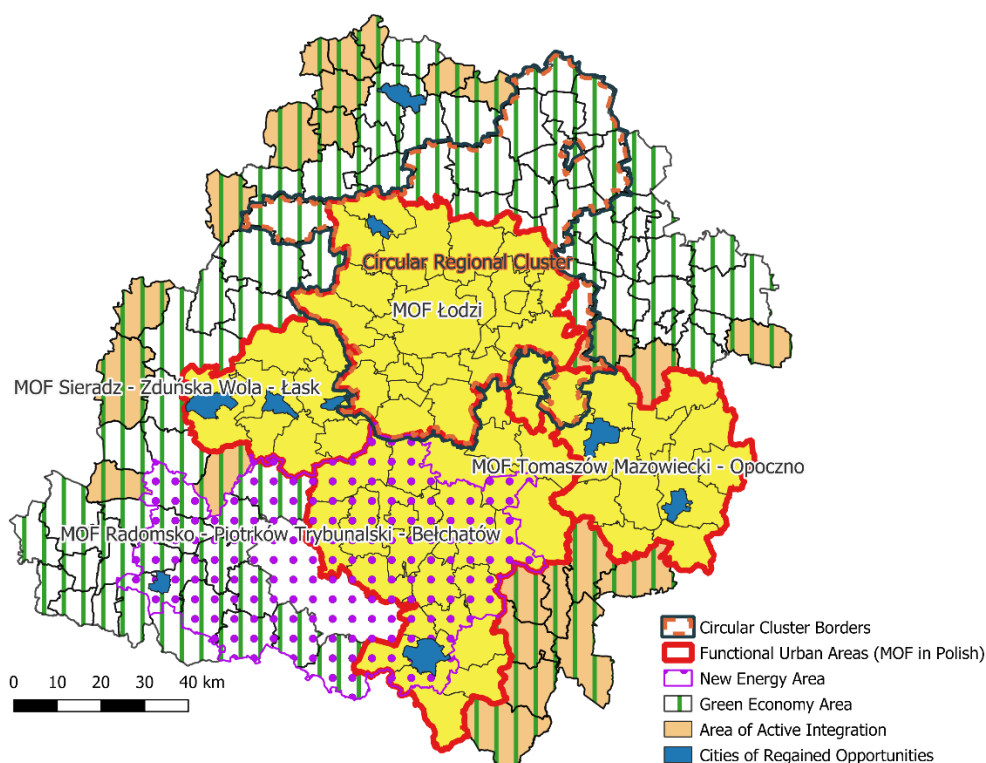
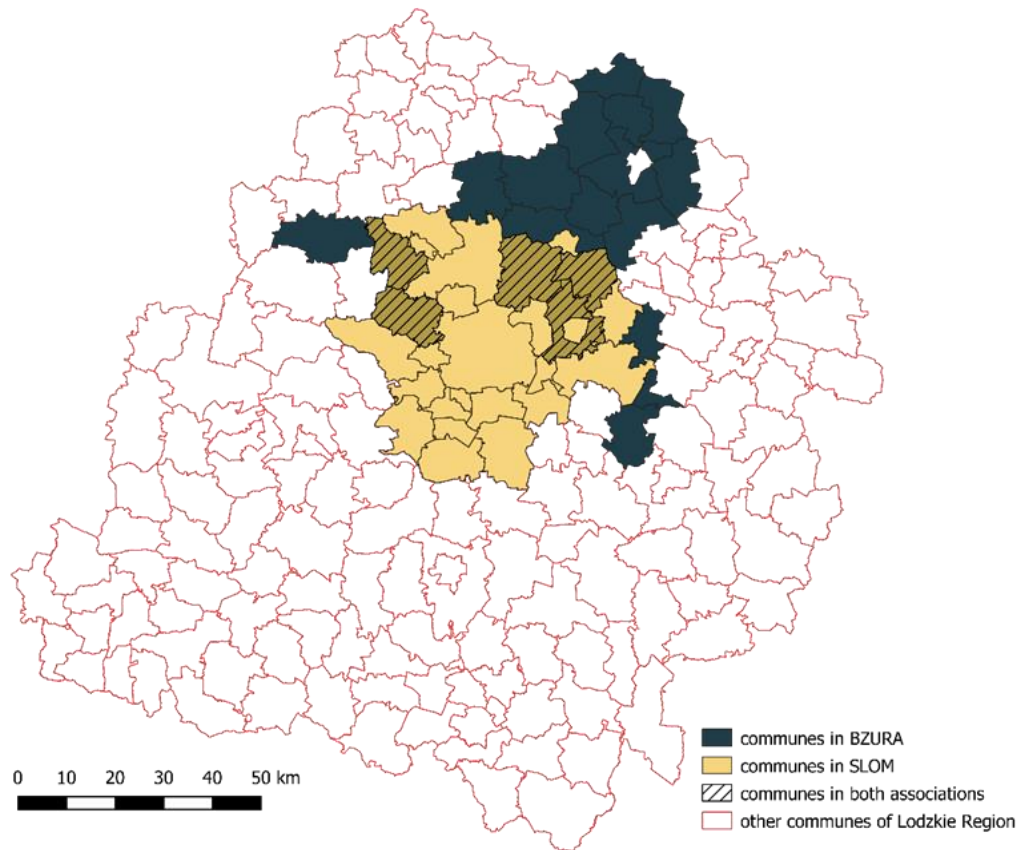


Fig. 17. Functional areas in Lodzkie region: Strategic Intervention Areas in Lodzkie Region.
Source: Feltynowski M., based on: The Development Strategy of the Lodzkie Region 2030 of the Regional Assembly of the Lodzkie Region, dated 6 May 2021

Among the functional areas mentioned, one type directly relates to circular transformation – the New Energy Area. This is the area of lignite mining and its associated power plant. This area has the

character of a circular industry cluster. So far, the strategic documents at the regional level have not distinguished functional areas with the potential of a territorial circular cluster. However, this does not mean that such areas do not exist. In particular, activities in the area of circular economy are carried out by the Inter-Municipal Union BZURA and the Lodz Metropolitan Area Association. Within the Union, the leader of circular activities is the municipality – the city of Parzęczew, while in the metropolitan area – Lodz, the capital of the Lodzkie region. Inter-Municipal Union BZURA includes 19 municipalities (2023), while Lodz Metropolitan Area Association comprises 30 local government units at the municipal and county level (Fig. 18)



*Fig. 18. Spatial scope of Circular Territorial Cluster in Lodzkie Region.
Source: Own compilation (Feltynowski, M.)*

3.1.2. Scope of public institutional support of Circular Territorial Cluster and Lodzkie Region

Public institutions of the core of the Circular Territorial Cluster:

1. Inter-Municipal Union BZURA
2. Lodz Metropolitan Area Association.

Local public leader of the Circular Territorial Cluster:

Municipality – City of Parzęczew

The regional public institutional surrounding of the Circular Territorial Cluster:

1. Lodzkie Marshal's Office in Lodz,
2. Lodzkie Regional Office in Lodz.

Regional Cluster Team (RCT) – Territorial cooperative to initiate Circular Territorial Cluster activities (Frontsh1p project institution):

1. Inter-Municipal Union BZURA
2. Lodz Metropolitan Area Association
3. Municipality – City of Parzęczew
4. K-FLEX (representatives of company; PC)
5. OPUS (social partner)
6. Lodzkie Marshal's Office in Lodz
7. University of Lodz
8. Technical University of Lodz

3.2. CTC Resource Missions in Lodzkie Region

Methods used for diagnosis of CTC resources: indicator diagnosis: analytical module of the Regional Circularity Booster toolkit platform (platform under construction), indicator analysis results in: Implementation Plans (non-technical part), no: D3.1, D4.1, D5.1, D6.1;

Technique for selecting and interpreting Resource Missions and Solution System Areas (CSS):

1. Brainstorming. As a result, 4 areas written in the Frontsh1p project were identified: Wood Packaging, Food and Feed, Water and Nutrients, Plastics and Rubber;
2. World Cafe – in-depth interpretation analysis of the role of stakeholders in the CSS areas.

Resource Missions and Systemic Solution Areas:

At the Circular Territorial Cluster level, 4 main action areas – Resource Missions, and thus key critical areas of circular system solutions, were selected (Fig. 19):

M1 < Wood Packaging > CSS1

M2 < Food and Feed > CSS2

M3 < Water and Nutrients > CSS3

M4 < Plastics and Rubber > CSS4

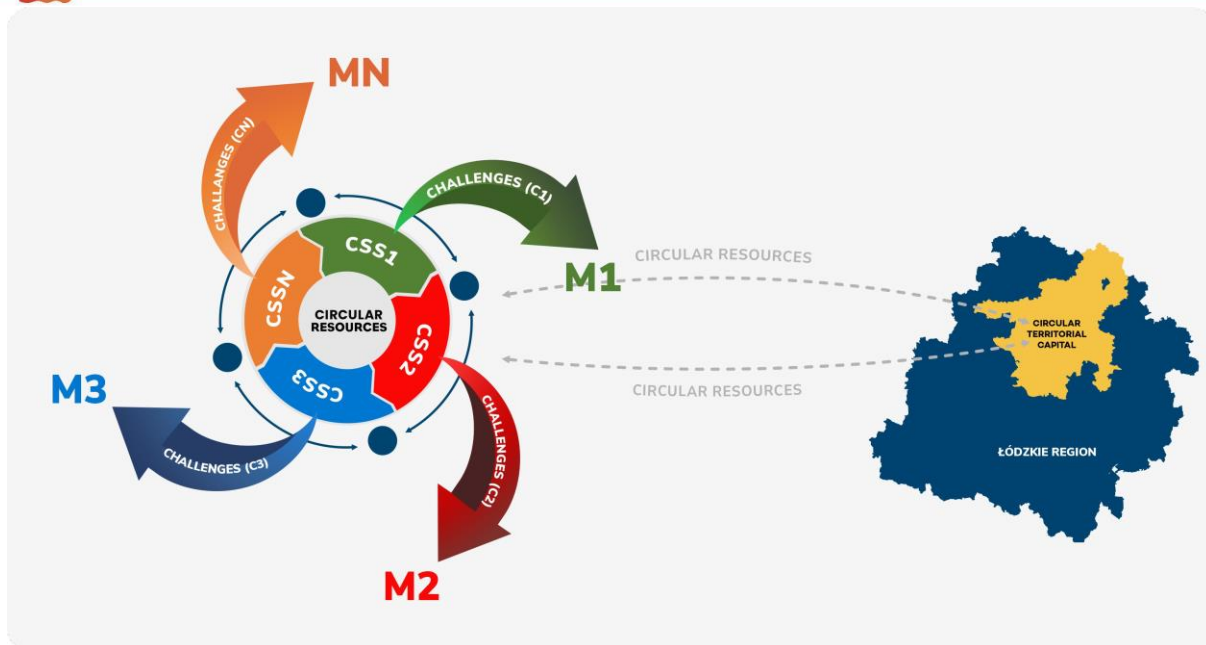


Fig. 19. Circular Transition Resource Missions in Lodzkie Region and the scope of circular systemic solutions (innovations).

Source: Own compilation

Twelve critical innovations will be prepared in 4 areas of circular systemic solutions (CSS) (Table 1). These innovations, under the terms of the Frontsh1p project, will be subject to replication in regions in Portugal, Greece, Italy and Netherlands.

Table 1: Critical solutions (innovations) being developed in Circular Systemic Solution areas 1-4.

Source: Frontsh1p project.

CSS1	1) Exploitation of char as pigment/filler in the plastic industry (as substitute of carbon black) or/and as an additive for compost; 2) Exploitation of the CO₂ captured after renewable gas (from wood waste) combustion in the plastic industry for biomaterials production. 3) Renewable gas to substitute natural gas for thermal energy production. 4) Char to substitute of carbon black in the plastic industry
CSS2	1) CO₂ captured after combustion of renewable gas and used in the industry
CSS2	1) To develop a CO₂ assisted pre-treatment of agro-industrial waste combined with biotechnological treatments for the obtaining of sugars and FFAs as components for foaming biomaterials; 2) To establish innovative genotypes of oil crops in marginal lands to obtain biodegradable biolubricants formulations, bio-oils for insulating materials and locally available animal feed; 1) To produce biobased building blocks (diols and dicarboxylic acids) from second generation feedstock (from regional agro-industrial waste) for the formulation of new compostable bioplastics for bags for separate OFMSW collection.
CSS3	1) To further develop to higher TRL a compact waste water management unit for nutrients (P, N, K) extraction from agricultural waste-waters and a bigger plant for municipal wastewater both using microalgae;

- 2) To produce circular bio-stimulants from wastewaters;
- 1) To close the water loop and recycle clean water.

-
- CSS4
- 1) To optimize a high TRL pyrolysis system for chlorinated compounds;
 - 2) To further develop a high TRL supercritical CO2 expansion system for insulating biomaterials;
 - 1) To demonstrate low-cost 3D printing for repairing of household appliances.

3.3. Circular challenges of CTC in Lodzkie Region

3.3.1. Interpretation of the results of the Compass of Convergence of Regional Stakeholder Activities

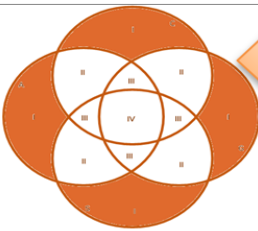
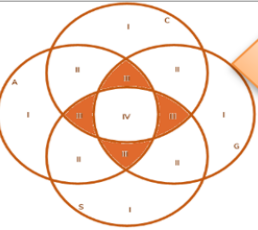
The characterization of the actual levels of convergence of project activities is intended to draw attention to: (1) the inclusion of entities whose activities do not bring the expected synergistic effects, (2) the use of strong areas of relationships between stakeholders in the CTC when identifying circular challenges. The analysis was based on a convergence study between 187 projects (Table 2). The results of the levels of stakeholder activities convergence in Lodzkie Region are summarized in Table 3.

Table 2: Number and sources of projects involved in the Compass of Convergence analysis.

Source: Own compilation.

Database:	Stakeholders	Number of projects
1. RPO (period: 2014-2021; Spatial scope: Lodzkie Region. Population: 3,410 projects; Keywords: as selected for CE	Company	28
2. NCN (period: 2014-2021; Spatial scope: Poland – inter-university projects with at least national scope; Population: 21,432 projects / Keywords: as selected for CE.	Academy	28
3. Primary data on Local Initiatives (data obtained from a diagnostic survey from all local government units – potential CTC members (80 respondents); period: 2019-2021)	Society	99
4. Primary data on Citizens' Budgets (data obtained from a diagnostic survey from all local government units – potential CTC members: (80 respondents, period: 2019-2021)	Government	32

Table 3: Level of convergence stakeholder activities in Lodzkie Region relative to potential maximum value.
Source: Own compilation.

	Level of convergence	Average value	Max value	Share of max. value
	[I] intra-sectoral interaction (specific impact)	2563	5171	50%
	[II] cross-sectoral interaction (bilateral relations)	577	3029	19%
	[III] cross-sectoral interaction (tripartite relations)	1356	4100	33%
	[IV] Integration (full convergence)	1498	4100	37%

The territorial compass of integration of activities indicates the scope of mutual impact of projects implemented by:

- Company on the goals and results of activities of other CTC partners (academy, society and government);
- Academy on the goals and results of activities of other CTC partners (company, society and government)
- Government on the goals and results of activities of other CTC partners (company, academy, society)
- The local community and results for the purposes of the activities of other CTC partners (company, academy and government).

Compass results are presented in point scale. You can compare them with each other and refer to the maximum potential value that can be generated with the selected list of analysed projects.

Main conclusion:

- Generally low level of involvement in project of CTC stakeholders in Lodzkie Region, especially in strengthening CE. A small amount of projects implemented in the region concerns CE;
- Very low level of convergence of project activities at the second-degree interaction, only every 5th project is involved bilateral relations;
- More than 2/3 of design activities are carried out outside the third-level interactive impact and integrated impact;
- CE strengthening projects are mainly sectoral, Society is a particularly isolated group;
- Projects undertaken by the Government and the Society rarely focus on strengthening the competitive position or inclusion in the added value chain. The projects of the Government and the Society rarely correspond to the projects of Company and Academy;
- The level of inclusion of the research sector in project interactions at a multi-sectoral level should be strengthened. Very low overall level of synergistic effects generated in partnership with the Academy.

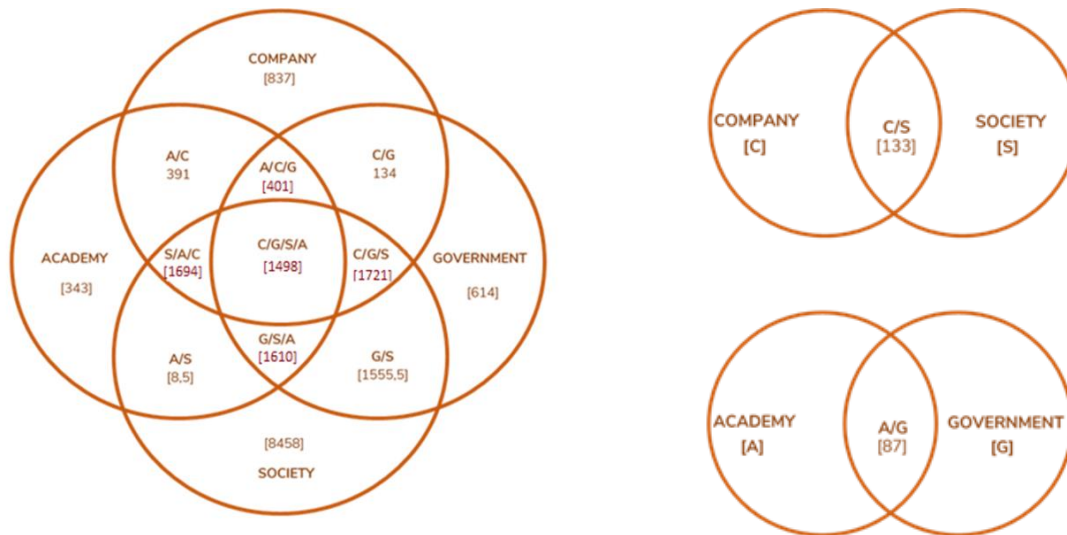


Fig. 20. Detailed Compass of Convergence results.
Source: Own compilation.

3.3.2. Results of Resource Benchmarking – directions of current activities

The purpose of the resource benchmarking diagnosis is:

1. to identify the current directions of impact of projects implemented in the field of CE implementation (in accordance with the definition of 5R),
2. to identify the scope of involvement of CTC stakeholders in the circular transformation of the Lodzkie Region,
3. to identify the scope of involvement of CTC stakeholders in the implementation projects in CSS's selected areas.

Most of the projects implemented in the CTC territory are primarily aimed at changing awareness and perception of new circular challenges (85% Rethinking). Only every third project concerns limiting the use of resources (31% Reducing) and recycling activities (33% Recycling). Every fifth project concerns the reuse of products and resources, and only 17% suggest new goals and functions for existing products (Fig. 21 and Fig. 22). It should be noted that the high value of indications in the Rethinking area results primarily from projects undertaken by local communities. However, the vast majority of projects from all stakeholder groups impact Rethinking. The projects undertaken by Academy have the largest scope of impact on the CE transformation, followed by Company in second place. The government is most often involved in Recycling and Reducing projects (Fig. 23). After replicating the CircuPuncture Model, it will be possible to determine the size of the gaps in relation to real patterns. Currently, Figure 22 indicates the directions of impact of projects implemented by CTC stakeholders only in relation to the number of projects. In other words, we reveal the gap with respect to the maximum, as the sum of all projects.

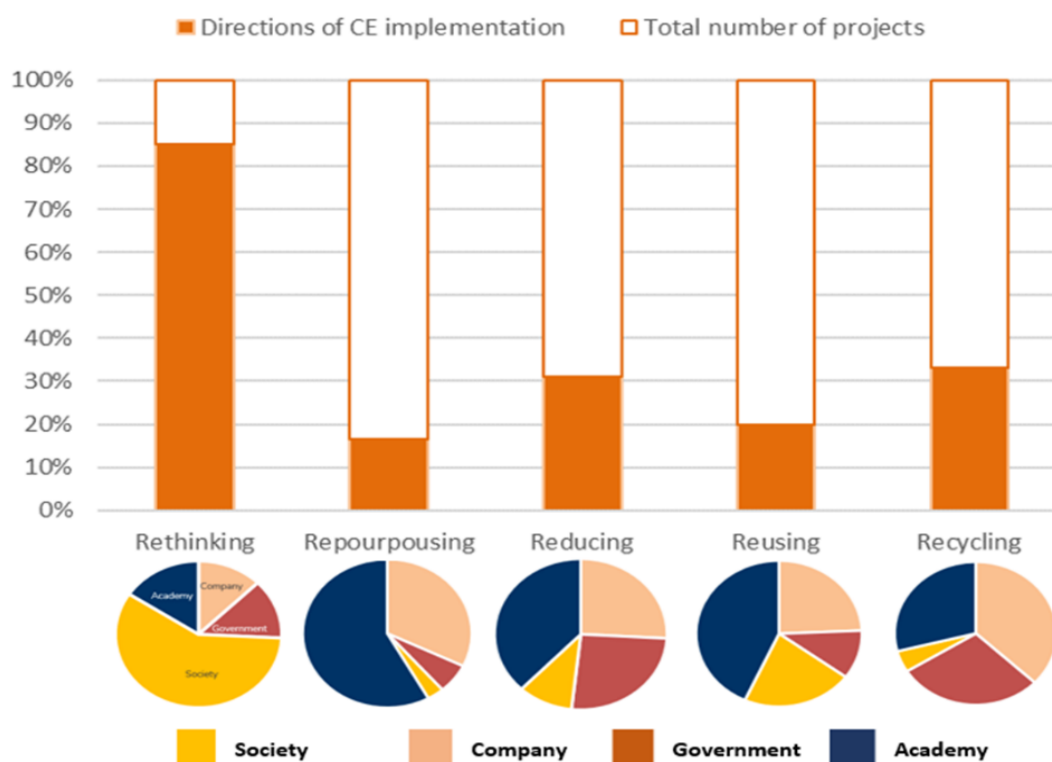


Fig. 21. Identification of gaps in cyclical activities in the context of the 5R CE definition.
Source: Own compilation.

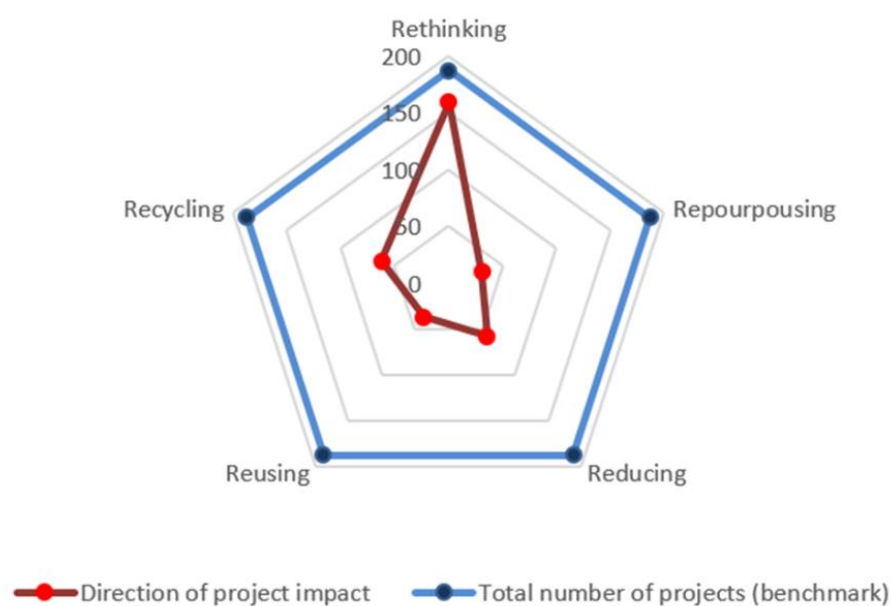


Fig. 22. Direction of project impact according to the 5Rs pattern.
Source: Own compilation.



Fig. 23. Scope of project impact according to CTC stakeholders.

Source: Own compilation.

Projects regarding circular systemic solution in the field of Plastic and Rubber are most often implemented by Government and Academy stakeholders. In addition, stakeholders from the Government and Academy groups also implement a relatively large number of projects associated with CSS3. The Academy is also interested in projects in the field of Food and Feed. Unfortunately, the Society stakeholder group can be considered almost excluded from the implementation of projects related to each of the 4 CSS areas. An almost similar situation is with the Company group. In other words, Society and Company require the greatest scope of intervention for involvement in the circular transition of the Lodzkie Region (Fig. 24).

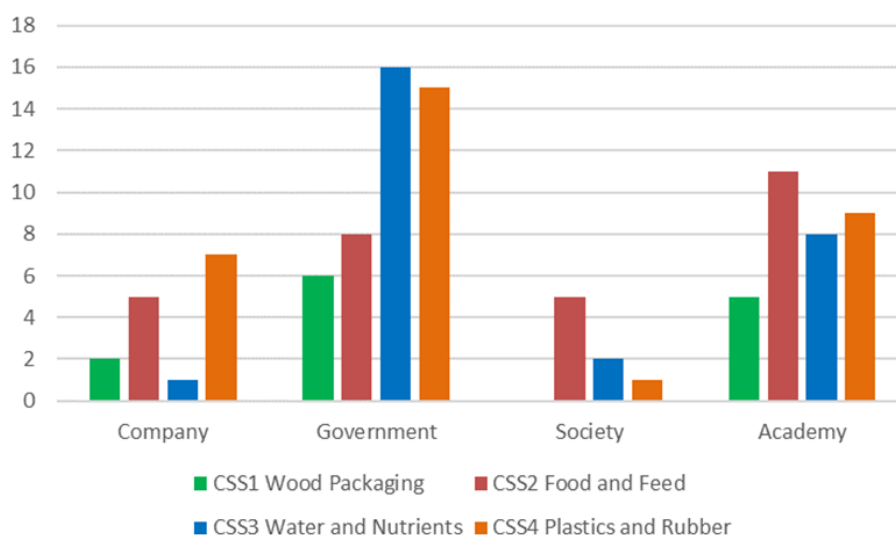
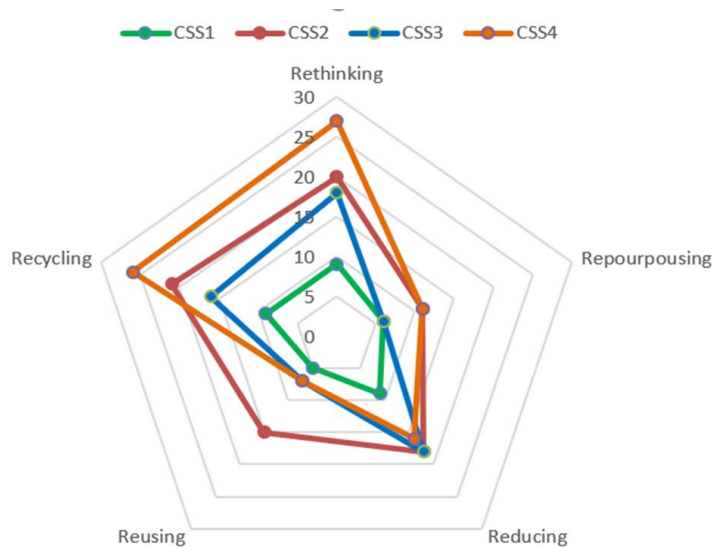


Fig. 24. Number of projects related to CSS's areas available to CTC stakeholders.

Source: Own compilation.

Moreover, CSS in each of the 4 interesting areas very rarely concerns such transformation directions as: Repurposing, Reusing. The fewest projects implemented by CTC stakeholders concern CSS1 and CSS3.



Repurposing is misspelled here.

Fig. 25. Number of projects implemented in CSS areas due to their scope of impact on CE.
Source: Own compilation.

3.3.3. Circular Challenges [C] in Circular Territorial Cluster in Lodzkie Region

Below, we present Circular Challenges for each of the Circular Systemic Solutions. They are divided into five categories:

1. legal framework
2. awareness and knowledge
3. participation and networking
4. infrastructure support
5. support for circular entrepreneurship.

Tabele: 4. Circular challenges identified in Circular System Solution - CSS1

CSS 1 WOOD PACKAGING		
1. LEGAL FRAMEWORK		
National & regional level	C 1.1	Diagnosis of government failure and market failure for the implementation of a circular value chain of wood packaging and its by-products
	C 1.2	Lobbying for changes in laws and interpretations of regulations to address identified barriers
	C 1.3	Active participation in public consultations to influence legislative changes regarding the circular management of wooden packaging waste and by-products

	C 1.4	Integrating a circular economy approach, including the CSS1 scope, into the Regional Development Strategy
Local level	C 1.5	Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of wooden packaging and its by-products
	C 1.6	Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law
	C 1.7	Development of a handbook Public-Private Partnership to support the development of CSS1
	C 1.8	Development of tailored incentives for diverse stakeholder groups, such as entrepreneurs, non-governmental organizations, local communities, to promote the circular management of wooden waste
	C 1.9	Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS1
	C 1.10	Integrating a circular economy approach, including the CSS1 scope, into the Local Development Strategy
2. AWARENESS AND KNOWLEDGE		
Education	C 2.1	Promotion/facilitating the exchange of information among stakeholders at the CTC regarding the quantity and location of wooden waste - increasing the number of Regional Circular Booster Toolkit platform users
	C 2.2	Informational activities concerning wood packaging, gasification technologies and the possibility of using by-products throughout the value chain in alignment with circular economy principles
	C 2.3	Educational activities concerning wood packaging, gasification technologies and the possibility of using by-products throughout the value chain according to the principles of the circular economy
	C 2.4	Increasing knowledge on how to improve the efficiency of conducting local circular development policies
	C 2.5	Ongoing development of online workshops on the RCBT platform regarding the circular use of wood waste and its by-products
	C 2.6	Encouraging the local community through informational campaigns and training initiatives to adopt a circular approach to the use of wooden waste
	C 2.7	Developing and conducting training sessions for local circular economy leaders, including council members, officials, local activists, NGOs, etc., focusing on efficient management of wood waste
	C 2.8	Development of educational modules for students at all levels of education, focusing on the field of circular economy and covering topics related to CSS1
Information & promotion	C 2.9	Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"),

dedicated to CTC with the involvement of external partners including foreign ones

- | | |
|--------|---|
| C 2.10 | Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of wood waste and its by-products management |
| C 2.11 | Developing and implementing an ongoing social media campaign focused on wood waste management |
| C 2.12 | Promotion of funding sources for circular projects in the scope of wood waste: European Funds for Lodzkie 2021-2027, Horizon Europe, LIFE and others. |
| C 2.13 | Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS1 area, reinforcing the circular transformation of the Lodzkie Region |

3. PARTICIPATION & NETWORKING

- | | | |
|----------------------|-------|---|
| Participation | C 3.1 | Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promoting resource-efficient management with a connection to CSS1 |
| | C 3.2 | Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS1 |
| Networking | C 3.4 | Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: wooden packaging, as a part of the Social Dialogue Council (SDC) |
| | C 3.5 | Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS1 |

4. INFRASTRUCTURE SUPPORT

- | | | |
|------------------------------------|-------|--|
| Infrastructural investments | C 4.1 | Gasification of wooden pallets and char production in K-FLEX |
| | C 4.2 | Utilization of ash from a heat plant for biomass in Parzęczew |
| ICT infrastructure | C 4.3 | Continuous updating of the database of entities connected to the value chain of wood waste and its by-products |
| | C 4.4 | Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of wood waste and its by-products |
| | C 4.5 | Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS1 |
| | C 4.6 | Development and presentation of business models for various initiatives within the value chain of wood waste and its by-products |
| | C 4.7 | Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of wood waste |

5. SUPPORT FOR CIRCULAR ENTREPRENEURSHIP

Expert support	C 5.1	Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to wooden packaging
	C 5.2	Development of a business model for a social enterprise in the field of wood waste management
Financial support	C 5.3	Ongoing presentation of available funding sources for initiatives carried out in the value chain of wood waste and its by-products
Technological support	C 5.4	Continuous promotion, by academic institutions within CTC, of technological support opportunities for entities implementing projects in the value chain of wood waste and its by-products

Table 5 Circular challenges identified in Circular System Solution - CSS2

CSS 2		
FOOD AND FEED		
1. LEGAL FRAMEWORK		
National & regional level	C 1.1	Diagnosis of government failure and/or market failure to implement a circular value chain of food&feed and their by-products processing
	C 1.2	Lobbying for changes in laws and interpretation of regulations for identified barriers
	C 1.3	Active participation in public consultations concerning legislative changes related to the circular management of a circular value chain of food&feed and their by-products processing
	C 1.4	Integrating a circular economy approach, including the CSS2 scope, into the Regional Development Strategy
Local level	C 1.5	Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of food&feed and their by-products processing
	C 1.6	Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law
	C 1.7	Development of a handbook for Public-Private Partnership to support the development of CSS2
	C 1.8	Development of tailored incentives for diverse stakeholder groups, such as: entrepreneurs; non-governmental organizations; local communities, to promote the circular management of food&feed
	C 1.9	Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS2
	C 1.10	Integrating a circular economy approach, including the CSS2 scope, into the Local Development Strategy
	C 1.11	Identification of 'marginal lands' for the cultivation of innovative oil crops to obtain vegetable oils that can be transformed into biodegradable biolubricants, insulating materials and locally available animal feed supplements formulation
2. AWARENESS AND KNOWLEDGE		
Education	C 2.1	Promotion/facilitating the exchange of information among stakeholders at the CTC regarding the quantity and location of organic waste (food&feed) – increasing the number of Regional Circular Booster Toolkit platform users
	C 2.2	Informational activities concerning possibilities of food&feed waste processing in accordance with circular economy principles
	C 2.3	Educational activities concerning organic waste management and the possibility of using its by-products throughout the value chain in alignment with the principles of the circular economy

	C 2.4	Increasing knowledge on how to improve the efficiency of conducting local circular development policies in the scope of organic waste
	C 2.5	Ongoing development of online workshops on the RCBT platform regarding the circular use of organic waste, its by-products and marginal lands
	C 2.6	Encouraging the local communities through informational campaigns and training initiatives to adopt a circular approach to the use of organic waste
	C 2.7	Developing and conducting training sessions for local circular economy leaders, including: council members; officials; local activists; NGOs; etc., focusing on efficient management of organic waste
	C 2.8	Development of educational modules for students at all levels of education, , focusing on the field of circular economy and covering topics related to CSS2
Information & promotion	C 2.9	Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"), dedicated to CTC with the involvement of external partners including foreign ones
	C 2.10	Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of organic waste and its by-products management
	C 2.11	Developing and implementing an ongoing social media campaign focused on organic waste management
	C 2.12	Promotion of funding sources for circular projects in the scope of organic waste management: European Funds for Lodzkie 2021-2027; Horizon Europe; LIFE and others.
	C 2.13	Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS2 area, reinforcing the circular transformation of the Lodzkie Region
3. PARTICIPATION & NETWORKING		
Participation	C 3.1	Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promotion of resource-efficient management - with a connection to CSS2
	C 3.2	Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS2
Networking	C 3.4	Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: food&feed, as a part of the Social Dialogue Council (SDC)
	C 3.5	Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS2

4. INFRASTRUCTURE SUPPORT

Organization	C 4.1	Organization of a food-sharing system
ICT infrastructure	C 4.2	Continuous updating of the database of entities connected to the value chain of organic waste and its by-products
	C 4.3	Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of organic waste and its by-products
	C 4.4	Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS2
	C 4.5	Development and presentation of business models for various initiatives within the value chain of organic waste and its by-products
	C 4.6	Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of organic waste

5. SUPPORT FOR CIRCULAR ENTREPRENEURSHIP

Expert support	C 5.1	Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to organic waste
	C 5.2	Development of a business model for a social enterprise in the field of organic waste and its by-products usage
Financial support	C 5.3	Ongoing presentation of available funding sources for initiatives carried out in the value chain of organic waste, its by-products and marginal lands
Technological support	C 5.4	Continuous promotion of technological support opportunities for entities implementing projects in the value chain of organic waste, its by-products and marginal lands by academic institutions within CTC

Table 6 Circular challenges identified in Circular System Solution - CSS3

CSS 3		
WATER AND NUTRIENTS		
1. LEGAL FRAMEWORK		
National & regional level	C 1.1	Diagnosis of government failure and/or market failure to implement a circular value chain for wastewaters treatment and by-products processing, especially algae biomass and nutrients
	C 1.2	Lobbying for changes in laws and interpretation of regulations for identified barriers
	C 1.3	Active participation in public consultations to influence legislative changes regarding the circular management of wastewaters, by-products processing, especially algae biomass and nutrients
	C 1.4	Integrating a circular economy approach, including the CSS3 scope, into the Regional Development Strategy
Local level	C 1.5	Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of wastewaters and by-products processing
	C 1.6	Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law
	C 1.7	Development of a handbook for Public-Private Partnership to support the development of CSS3
	C 1.8	Development of tailored incentives for diverse stakeholder groups, such as: entrepreneurs; non-governmental organizations; local communities, to promote the circular management of wastewaters and by-products processing, especially algae biomass and nutrients
	C 1.9	Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS3
	C 1.10	Integrating a circular economy approach, including the CSS3 scope, into the Local Development Strategy
2. AWARENESS AND KNOWLEDGE		
Education	C 2.1	Promotion/facilitating the exchange of information among stakeholders at the CTC regarding available industrial and municipal wastewater, by-products (CO ₂ , nutrients) and algae biomass – increasing the number of Regional Circular Booster Toolkit platform users
	C 2.2	Informational activities regarding the general possibilities of utilizing wastewater in line with circular economy principles
	C 2.3	Educational activities concerning wastewater management and the possibility of using its by-products (CO ₂ , nutrients, algae biomass) throughout the value chain in alignment with the principles of the circular economy

	C 2.4	Increasing knowledge on how to improve the efficiency of conducting local circular development policies in the scope of water management
	C 2.5	Ongoing development of online workshops on the RCBT platform regarding the circular use of industrial and municipal wastewater, its by-products (CO ₂ , nutrients, algae biomass)
	C 2.6	Encouraging the local communities through informational campaigns and training initiatives to reduce water consumption
	C 2.7	Developing and conducting training sessions for local circular economy leaders, including: council members; officials; local activists; NGOs; etc., focusing on efficient management of water, wastewater and by-products
	C 2.8	Development of educational modules for students at all levels of education, focusing on the field of circular economy and covering topics related to CSS3
Information & promotion	C 2.9	Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"), dedicated to CTC with the involvement of external partners including foreign ones
	C 2.10	Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of industrial and municipal wastewater and by-products management, especially algae biomass and CO ₂
	C 2.11	Developing and implementing an ongoing social media campaign focused on industrial and municipal wastewater treatment, reducing water consumption, possible by-products usage, especially CO ₂
	C 2.12	Promotion of funding sources for circular projects in the scope of water and nutrients management: European Funds for Lodzkie 2021-2027; Horizon Europe; LIFE and others.
	C 2.13	Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS3 area, reinforcing the circular transformation of the Lodzkie Region
3. PARTICIPATION & NETWORKING		
Participation	C 3.1	Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promotion of resource-efficient management - with a connection to CSS3
	C 3.2	Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS3
Networking	C 3.4	Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: water & nutrients, as a part of the Social Dialogue Council (SDC)
	C 3.5	Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS3

4. INFRASTRUCTURE SUPPORT

Organization	C 4.1	Development of assumptions for the feasibility study of an investment project involving the construction of an intermunicipal wastewater treatment plant and algae technology
ICT infrastructure	C 4.2	Continuous updating of the database of entities connected to the value chain of industrial and municipal wastewater and its by-products (CO ₂ , nutrients, algae biomass)
	C 4.3	Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of water management
	C 4.4	Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS3
	C 4.5	Development and presentation of business models for various initiatives within the value chain of water, wastewater and its by-products (CO ₂ , nutrients, algae biomass)
	C 4.6	Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of water consumption

5. SUPPORT FOR CIRCULAR ENTREPRENEURSHIP

Expert support	C 5.1	Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to water consumption
	C 5.2	Development of a business model for a social enterprise in the field of water& nutrients
Financial support	C 5.3	Ongoing presentation of available funding sources for initiatives carried out in the value chain of water& nutrients
Technological support	C 5.4	Continuous promotion of technological support opportunities for entities implementing projects in the value chain water& nutrients by academic institutions within CTC

Table 7 Circular challenges identified in Circular System Solution - CSS4

CSS 4		
PLASTIC&RUBBER		
1. LEGAL FRAMEWORK		
National & regional level	C 1.1	Diagnosis of government failure and/or market failure to implement a circular value chain of plastic&rubber waste and by-products processing (e.g. filaments for 3D print)
	C 1.2	Lobbying for changes in laws and interpretation of regulations for identified barriers
	C 1.3	Active participation in public consultations to influence legislative changes regarding the circular management of plastic&rubber waste and by-products processing
	C 1.4	Integrating a circular economy approach, including the CSS4 scope, into the Regional Development Strategy
Local level	C 1.4	Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of plastic&rubber waste
	C 1.5	Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law
	C 1.6	Development of a handbook for Public-Private Partnership to support the development of CSS4
	C 1.7	Development of tailored incentives for diverse stakeholder groups, such as: entrepreneurs; non-governmental organizations; local communities, to promote the circular management of plastic&rubber waste and its by-products processing
	C 1.8	Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS4
	C 1.9	Integrating a circular economy approach, including the CSS4 scope, into the Local Development Strategy
2. AWARENESS AND KNOWLEDGE		
Education	C 2.1	Promotion/facilitating the exchange of information among stakeholders at the CTC regarding availability of different kinds plastic&rubber waste – increasing the number of Regional Circular Booster Toolkit platform users
	C 2.2	Informational activities regarding the general possibilities of using plastic&rubber waste in line with circular economy principles
	C 2.3	Educational activities concerning plastic&rubber waste and the possibility of using its by-products throughout the value chain in alignment with the principles of the circular economy
	C 2.4	Increasing knowledge on how to improve the efficiency of conducting local circular development policies in the scope of plastic&rubber waste

	C 2.5	Ongoing development of online workshops on the RCBT platform regarding the circular use of industrial and plastic&rubber waste and by-products
	C 2.6	Encouraging the local communities through informational campaigns and training initiatives to adopt a circular approach to the use of plastic&rubber waste
	C 2.7	Developing and conducting training sessions for local circular economy leaders, including: council members; officials; local activists; NGOs; etc., focusing on efficient management of plastic&rubber waste and by-products
	C 2.8	Development of educational modules for students at all levels of education, focusing on the field of circular economy and covering topics related to CSS4
Information& promotion	C 2.9	Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"), dedicated to CTC with the involvement of external partners including foreign ones
	C 2.10	Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of plastic&rubber waste
	C 2.11	Developing and implementing an ongoing social media campaign focused on plastic&rubber waste management according to 6 R rules.
	C 2.12	Promotion of funding sources for circular projects in the scope of plastic&rubber waste management: European Funds for Lodzkie 2021-2027; Horizon Europe; LIFE and others.
	C 2.13	Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS4 area, reinforcing the circular transformation of the Lodzkie Region
3. PARTICIPATION & NETWORKING		
Participation	C 3.1	Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promotion of resource-efficient management - with a connection to CSS4
	C 3.2	Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS4
Networking	C 3.4	Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: plastic&rubber , as a part of the Social Dialogue Council (SDC)
	C 3.5	Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS4

4. INFRASTRUCTURE SUPPORT

Organization	C 4.1	Development of assumptions for the feasibility study of an investment project involving the construction of an intermunicipal plastic&rubber treatment plant
	C 4.2	Analysis of the possibilities of implementing a deposit system for plastic packaging and selected plastic goods
ICT infrastructure	C 4.3	Continuous updating of the database of entities connected to the value chain of plastic&rubber waste and its by-products (e.g. filaments for 3D print)
	C 4.4	Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of plastic&rubber waste management
	C 4.5	Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS4
	C 4.6	Development and presentation of business models for various initiatives within the value chain of plastic&rubber waste and its by-products
	C 4.7	Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of plastic&rubber waste

5. SUPPORT FOR CIRCULAR ENTREPRENEURSHIP

Expert support	C 5.1	Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to plastic&rubber
	C 5.2	Development of a business model for a social enterprise in the field of plastic waste, especially connected with 3D printing
Financial support	C 5.3	Ongoing presentation of available funding sources for initiatives carried out in the value chain of plastic&rubber management
Technological support	C 5.4	Continuous promotion of technological support opportunities for entities implementing projects in the value chain of plastic&rubber waste by academic institutions within CTC

3.4. Initiation and development of Circular Territorial Resource Networks

Initiation and support of the functioning of a **resource network** based on 4 selected areas of Circular System Solutions (CSS1-4):

- Resource network: Wood Packaging,
- Resource network: Food and Feed,
- Resource network: Water and Nutrients
- Resource network: Plastics and Rubber.

The network members are stakeholders interested in specific topics from each of the 4 sectors that make up CTC: Company, Academy, Society and Government. Resource networks together create **Dialogue Council**.

3.5. Circular Economy Action Plan for Lodzkie Region - CircuPuncture Action Plan

The CircuPuncture Action Plan for the Lodzkie Region is an operational document that puts into action the strategic principles outlined in the CircuPuncture Model. This entails a transition from a top-down approach to a bottom-up approach, leading to significant adjustments in elements such as action, operational territory, source of financing, and, most importantly, ownership of the Plan.

The objective of the CircuPuncture Action Plan remains the same as in the Circular Economy Action Plan – the transition towards a circular economy. A key distinguishing feature of the CircuPuncture methodology is the resource&territorial-based approach. Resources are identified within each Mission of CircuPuncture Model and in the next step, they are transformed into Challenges in the CircuPuncture Action Plan becoming actions aiming to close loops and generate circular resources. Consequently, territorial capital evolves into the circular capital of a specific region. Circular Challenges are identified in response to the needs and specific locations. They are like “pins” that puncture specific circular problems and are formulated taking into account resource management processes and stages at which circularity effect can be achieved. Challenges are thus formulated bottom-up by various stakeholder groups, influencing the management approach of the Plan.

The essence of the CircuPuncture methodology lies in the decentralized formulation of guidelines for the development of a circular economy. In the CircuPuncture approach, the responsibility for creating and implementing the Plan is distributed among multiple actors spontaneously engaging in generating solutions. The coordinator of the Plan is identified through a bottom-up approach, driven not by the formally assigned role but by a genuine recognition of needs and conviction regarding the benefits of implementing circular principles, both for the local economy and communities. In the case of the Lodzkie Region, the coordinator is the Circular Territorial Cluster, with its organizational core entities - Lodz Metropolitan Area Association (SLOM) and Inter-Municipal Union BZURA. These institutions play a crucial role in mobilizing and coordinating the actions of various entities responsible

for implementing Challenges. Regional authorities, as the Marshal's Office and the Voivodeship Office, play a supporting role constituting the institutional environment with such a task as:

1. interpreting legal regulations regarding the management of circular resources within the Circular Territorial Cluster,
2. monitoring and controlling the management of selected resources, and primarily
3. creating financial incentives.

The initial reference area for establishing the Cluster is the territory where favourable conditions exist (consciousness and inclination of stakeholders to take on circular challenges). The core of the Circular Territorial Cluster is dedicated to the development of Circular Systemic Solutions. Nevertheless, the scope of stakeholders' demand for systemic solutions in the territory is expanding over time and space, driven by emerging needs, innovations and new market opportunities.

Unlike the traditional anticipatory approach in strategic management led by the regional government, the financing mechanism for implementing specific Challenges is distinctive in the Plan developed within the CircuPuncture methodology. It involves creating a financial patchwork in which each participating entities seek to contribute to the costs, either through its own resources or by applying for external funding. While this method might prolong the Plan's preparation and requires frequent updates, it highlights its genuinely participatory nature—a critical aspect in building a circular economy.

The final and distinctive element of the Circular Economy Action Plan, developed in accordance with the CircuPuncture methodology, lies in how activities are defined. Instead of conventional actions, the Plan introduces Circular Challenges derived from Resource Missions, for which Circular Systematic Solutions are identified. This punctuated approach to interventions, in various resource management areas in the region, aims to rectify areas that function poorly or not at all in line with the principles of a closed loop. As a result, these 'pins' or Circular Challenges aim to initiate resource management within a closed loop in the region. In fact, the CircuPuncture approach leads to achieving more targeted, sustainable, efficient, and lasting outcomes.

Taking into account the aforementioned methodological principles, especially those related to Circular Challenges within the four Circular Systemic Solutions, the CircuPuncture Action Plan has been developed. It comprises the following modules:

1. **Circular Challenges:** In this module, precise identification of Circular Challenges supported by Circular Systemic Solutions is conducted. Each Challenge is based on a Resource Mission identified within the CircuPuncture Model, emphasizing sustainable development, innovation, and adaptability. Circular Challenges can range from short and simple interventions to complex, long-term actions. Therefore, given its operational three-year horizon, the Action Plan may include only a segment of the Challenges or a specific stage of Circular Challenge implementation.
2. **Coordinator:** The CircuPuncture approach assumes that the Circular Territorial Cluster plays a crucial role in mobilizing stakeholders based on identified Resource Missions and resulting Circular Challenges. The Cluster facilitates the formation of groups – Implementing Parties – that are willing to assume responsibility for the implementation of specific Challenges. The identification of participants in these groups occurs organically, reflecting genuine needs and

a collective conviction among all parties regarding the benefits and transformative changes, steering social and economic progress towards circularity in the region.

3. **Implementing Parties:** The accurate identification of the entity or group of entities responsible for implementing Circular Challenges is considered a crucial success factor. Each entity engages spontaneously, seeking ways to implement the Challenge in accordance with the principles of the circular economy. An entity proposing a Challenge can transition into the Implementing Party, which, with the support of the Cluster, finalizes the composition of the implementing group.
4. **Financing:** Assuming that one Challenge can be jointly undertaken by several entities with different legal personalities, the financing approach may involve patchworking financial resources. The implementation budget can take into account individual contributions (e.g., in the form of in-kind contributions), public funds obtained individually by each party, or public funds acquired by a consortium. This participatory financial model, although requiring regular updates, underscores the genuine commitment of various stakeholders to building a sustainable foundation for the circular economy.
4. **Timeframe:** Depending on the type of the Challenge, a specific implementation deadline or defined stages are determined. For Challenges already underway or with a duration extending beyond 3 years, specific deadlines for individual stages are outlined accordingly.
5. **Results:** The expected results for each Circular Challenge are outlined, aiming for a thorough transformation of territorial resources into circular resources aligned with each Resource Mission, utilizing Circular Systemic Solutions.
6. **Indicators:** A set of result indicators is established to track progress in meeting the Challenges. These indicators are essential for effectively assessing and adjusting the Plan according to current needs. They are defined in the scope of deliverable 2.3 and individually by assigned Implementing Parties.

Table 8. CircuPuncture Action Plan for Circular Territorial Cluster in Lodzkie Region for 2024-2026 – CSS 1

CSS 1 WOOD PACKAGING	
LEGAL FRAMEWORK	
C 1.1 Diagnosis of legal and formal barriers (government failure) and market failure for the implementation of a circular value chain for wood packaging and processing by-products	
Coordinator	RIC
Implementing Parties	UNILODZ
Timeframe	Phase 1 – October 2022 Phase 2 - ongoing monitoring in the scope Circular Territorial Resource Networks from January 2024 to December 2026
Financing	Phase 1 – FrontSh1p Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 2.1 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.2	

Lobbying for changes in laws and interpretations of regulations on identified barriers	
Coordinator	Circular Territorial Cluster (CTC)
Implementing Parties	Local governments within the CTC territory and their associations
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of local governments Funding opportunities identified within D 2.5
Results	To be defined after consultations with the specified Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.3 Active participation in public consultations concerning legislative changes related to the circular management of wooden packaging and by-products	
Coordinator	Regional Cluster Team
Implementing Parties	To be assigned by the Coordinator
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties Funding opportunities identified within D 2.5
Results	To be defined after consultations with the specified Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.4 Integrating a circular economy approach, including the CSS1 scope, into the Regional Development Strategy	
Coordinator	LR
Implementing Parties	LR
Timeframe	Incorporating Circular Economy at the stage of constructing or updating regional strategy
Financing	Budgets of Implementing Party
Results	Updated strategy
Indicators	To be defined after consultations with the implementing party and in the scope of D 2.3
C 1.5 Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of wooden packaging and its by-products	
Coordinator	Regional Cluster Team entities
Implementing Parties	Phase 1 – D 3.1 - UNIBZ Phase 2 - ongoing monitoring within CTC
Timeframe	Phase 1 – December 2022 Phase 2 - ongoing monitoring from January 2024 to December 2026
Financing	Phase 1 – FrontSh1p Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 3.1 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.6	

Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law	
Coordinator	Phase 1 - RIC Phase 2 – SLOM, Bzura
Implementing Parties	Phase 1 – D2.1 Public Circular Procurement scheme dedicated to Circular Systemic Solutions - UNILODZ Phase 2 – Product identification and preparation of schemas for selected products SLOM, Bzura, UNILODZ, Parzeczew
Timeframe	Phase 1 – October 2022 Phase 2 – December 2024
Financing	Phase 1 - FrontSh1p Phase 2 - FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 2.1 Phase 2 - Set of templates
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.7 Development of a handbook Public-Private Partnership to support the development of CSS1	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, UNIBZ
Timeframe	December 2024
Financing	FrontSh1p
Results	Handbook
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.8 Development of tailored incentives for diverse stakeholder groups, such as entrepreneurs, non-governmental organizations, local communities, to promote the circular management of wooden waste	
Coordinator	Phase 1 -RIC Phase 2 - Regional Cluster Team
Implementing Parties	Phase 1 – D 2.1 Identification incentives for creation Circular Regional Cluster, Report - UNILODZ Phase 2 – Updating of incentives dedicated to CSS1, including financial ones - SLOM, Bzura KPMG
Timeframe	Phase 1 – October 2022 Phase 2 – May 2025
Financing	FrontSh1p
Results	D2.1, D2.5
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.9 Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS1	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local governments selected in the CTC

Timeframe	Annually at the stage of constructing programs from January 2024 to December 2026
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local programmes
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.10 Integrating a circular economy approach, including the CSS1 scope, into the Local Development Strategies	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local governments within CTC
Timeframe	from January 2024 to December 2026, at the stage of constructing or updating Local Development Strategies
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local Development Strategies
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
AWARENESS AND KNOWLEDGE	
C 2.1 Promotion/facilitating the exchange of information among stakeholders in the CTC regarding the quantity and location of wooden waste - increasing the number of Regional Circular Booster Toolkit platform users	
Coordinator	SLOM, Bzura (CTC), EURADA
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.2 Informational activities concerning wood packaging, gasification technologies and the possibility of using by-products throughout the value chain in alignment with circular economy principles	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.3 Educational activities concerning wood packaging, gasification technologies and the possibility of using by-products throughout the value chain according to the principles of the circular economy	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, OPUS, UNILODZ, TUL and others developing content for e-learning platform
Timeframe	Phase 1 -October 2024

	Phase 2 – e-learning platform promotion - ongoing activity until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 2.2, D 7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.4 Increasing knowledge on how to improve the efficiency of conducting local circular development policies	
Coordinator	UNILODZ
Implementing Parties	UNILODZ
Timeframe	December 2024
Financing	FrontSh1p
Results	Publications, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.5 Ongoing development of online workshops on the RCBT platform regarding the circular use of wood waste and its by-products	
Coordinator	TUL, EURADA
Implementing Parties	Phase 1 - TUL Phase 2 – all project partners Phase 3 – stakeholders of CTC
Timeframe	Phase 1 – Development of the e-learning platform – December 2024 Phase 2 – Content development for the e-learning platform - December 2024 Phase 3 – Ongoing promotion of the e-learning platform - until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	e-learning platform
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.6 Encouraging the local community through informational campaigns and training initiatives to adopt a circular approach to the use of wooden waste	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA
Implementing Parties	Local governments, local NGOs within CTC
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1
C 2.7 Developing and conducting training sessions for local circular economy leaders, including council members, officials, local activists, NGOs, etc., focusing on efficient management of wood waste	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA, STAM
Implementing Parties	OPUS, Parzeczew, STAM and local governments, local NGOs within CTC,

Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1, D7.2
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1, D7.2
C 2.8 Development of educational modules for students at all levels of education, focusing on the field of circular economy and covering topics related to CSS1	
Coordinator	SLOM, Bzura (CTC), UNILODZ
Implementing Parties	SLOM, Bzura (CTC), UNILODZ
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of developed educational programs
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.9 Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"), dedicated to CTC with the involvement of external partners including foreign ones	
Coordinator	Parzeczew, Bzura
Implementing Parties	Parzeczew, Bzura, SLOM, UNILODZ, TUL, RIC, OPUS
Timeframe	Annually, the first edition in June 2024 until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, sponsors, budgets of Implementing Parties
Results	3 Circularity Festival
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.10 Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of wood waste and its by-products management	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC), RIC, UNILODZ, LR, TUL, OPUS, Parzeczew
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.11 Developing and implementing an ongoing social media campaign focused on wood waste management	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC)
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties

Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.12 Promotion of funding sources for circular projects in the scope of wood waste: European Funds for Lodzkie 2021-2027, Horizon Europe, LIFE and others	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, KPMG, RIC, LR
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	To be defined by Implementing Parties e.g. number of founded projects
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.13 Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS1 area, reinforcing the circular transformation of the Lodzkie Region	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, LR
Timeframe	January 2025
Financing	FrontSh1p, budget of Implementing Parties
Results	Scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS1 area
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
PARTICIPATION & NETWORKING	
C 3.1 Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promoting resource-efficient management with a connection to CSS1	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Regional Cluster Team
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	Signed agreement
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.2 Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS1	
Coordinator	SLOM, Bzura (CTC), Parzeczew
Implementing Parties	SLOM, Bzura (CTC), Parzeczew, local authorities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	Report with defined recommendations
Indicators	To be defined after consultations with the specified Implementing Parties

C 3.3 Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: wooden packaging, as a part of the Social Dialogue Council (SDC)	
Coordinator	Regional Cluster Team
Implementing Parties	Regional Cluster Team entities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Updated CircuPuncture Model and CircuPuncture Action Plan, others to be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.4 Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS1	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Regional Cluster Team entities
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of established collaboration networks with a connection to CSS1
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
INFRASTRUCTURE SUPPORT	
C 4.1 Gasification of wooden pallets and char production in K-FLEX	
Coordinator	K-FLEX
Implementing Parties	K-FLEX
Timeframe	May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by K-FLEX
Indicators	To be defined after consultations with K-FLEX and in the scope of D 2.3
C 4.2 Utilization of ash from a heat plant for biomass in Parzeczew	
Coordinator	Parzeczew
Implementing Parties	Parzeczew
Timeframe	December 2026
Financing	Own budget, funding opportunities identified within Deliverable 2.5
Results	To be defined by Parzeczew
Indicators	To be defined after consultations with Parzeczew and in the scope of D 2.3
C 4.3 Continuous updating of the database of entities connected to the value chain of wood waste and its by-products	
Coordinator	RIC
Implementing Parties	RIC, STAM, local authorities within CTC
Timeframe	Phase 1 – D2.2 -October 2022 Phase 2 - ongoing activity from January 2024 to December 2026

Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.4 Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of wood waste and its by-products	
Coordinator	STAM, RIC
Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.5 Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS1	
Coordinator	STAM, RIC
Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.6 Development and presentation of business models for various initiatives within the value chain of wood waste and its by-products	
Coordinator	VELTHA
Implementing Parties	VELTHA with support of CTC
Timeframe	D7.3 – April 2025
Financing	FrontSh1p
Results	To be defined by VELTHA
Indicators	To be defined after consultations with VELTHA and in the scope of D 2.3
C 4.7 Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of wood waste	
Coordinator	OPUS
Implementing Parties	OPUS with support of CTC
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - D7.3 – April 2025
Financing	FrontSh1p
Results	Self-assessment tool, others defined by OPUS and in the scope of D2.3

Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
SUPPORT FOR CIRCULAR ENTREPRENEURSHIP	
C 5.1 Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to wooden packaging	
Coordinator	OPUS
Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
C 5.2 Development of a business model for a social enterprise in the field of wood waste management	
Coordinator	OPUS
Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
C 5.3 Ongoing presentation of available funding sources for initiatives carried out in the value chain of wood waste and its by-products	
Coordinator	KPMG, STAM, RIC
Implementing Parties	KPMG, STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 5.4 Continuous promotion, by academic institutions within CTC, of technological support opportunities for entities implementing projects in the value chain of wood waste and its by-products	
Coordinator	CTC
Implementing Parties	RIC, UNILODZ, TUL
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with Implementing Parties and in the scope of D 2.3

Table 9 CircuPuncture Action Plan for Circular Territorial Cluster in Lodzkie Region for 2024-2026 – CSS 2

CSS 2 FOOD AND FEED	
LEGAL FRAMEWORK	
C 1.1 Diagnosis of government failure and/or market failure to implement a circular value chain for food&feed and their by-products processing	
Coordinator	RIC
Implementing Parties	UNILODZ
Timeframe	Phase 1 – Deliverable 2.1 - 2022 Phase 2 - ongoing monitoring within CTC from January 2024 to December 2026
Financing	Phase 1 – Deliverable 2.1 Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – Deliverable 2.1 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified implementing parties and in the scope of Deliverable 2.3
C 1.2 Lobbying for changes in laws and interpretation of regulations for identified barriers	
Coordinator	Circular Territorial Cluster (CTC)
Implementing Parties	Local governments within the CTC territory and their associations
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of local governments Funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with the specified implementing parties
Indicators	To be defined after consultations with the specified implementing parties and in the scope of Deliverable 2.3
C 1.3 Active participation in public consultations concerning legislative changes related to the circular management of a circular value chain for food&feed and their by-products processing	
Coordinator	Regional Cluster Team
Implementing Parties	To be assigned by the Coordinator
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties Funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with the specified implementing parties
Indicators	To be defined after consultations with the specified implementing parties and in the scope of Deliverable 2.3
C 1.4 Integrating a circular economy approach, including the CSS2 scope, into the Regional Development Strategy	
Coordinator	LR
Implementing Parties	LR

Timeframe	Incorporating Circular Economy at the stage of constructing or updating regional strategy
Financing	Budgets of Implementing Party
Results	Updated strategy
Indicators	To be defined after consultations with the implementing party and in the scope of D 2.3
C 1.5 Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of food&feed and their by-products processing	
Coordinator	NVMT , Regional Cluster Team entities
Implementing Parties	Phase 1 – D 4.1 - NVMT Phase 2 - ongoing monitoring within CTC
Timeframe	Phase 1 – January 2023 Phase 2 - ongoing monitoring from January 2024 to December 2026
Financing	Phase 1 – FrontSh1p Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 4.1 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.6 Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law	
Coordinator	Phase 1 - RIC Phase 2 – SLOM, Bzura
Implementing Parties	Phase 1 – D2.1 Public Circular Procurement scheme dedicated to Circular Systemic Solutions - UNILODZ Phase 2 – Product identification and preparation of schemas for selected products SLOM, Bzura, UNILODZ, Parzeczew
Timeframe	Phase 1 – October 2022 Phase 2 – December 2024
Financing	Phase 1 - FrontSh1p Phase 2 - FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 2.1 Phase 2 - Set of templates
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.7 Development of a handbook for Public-Private Partnership to support the development of CSS2	
Coordinator	NVMT, SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, NVMT
Timeframe	December 2024
Financing	FrontSh1p
Results	Handbook
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.8	

Development of tailored incentives for diverse stakeholder groups, such as: entrepreneurs; non-governmental organizations; local communities, to promote the circular management of food&feed	
Coordinator	Phase 1 -RIC Phase 2 - Regional Cluster Team
Implementing Parties	Phase 1 – D 2.1 Identification incentives for creation Circular Regional Cluster, Report - UNILODZ Phase 2 – Updating of incentives dedicated to CSS2, including financial ones - SLOM, Bzura KPMG
Timeframe	Phase 1 – October 2022 Phase 2 – May 2025
Financing	FrontSh1p
Results	D2.1, D2.5
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.9 Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS2	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local governments selected in the CTC
Timeframe	Annually at the stage of constructing programs from January 2024 to December 2026
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local programmes
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.10 Integrating a circular economy approach, including the CSS2 scope, into the Local Development Strategy	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local government within CTC
Timeframe	from January 2024 to December 2026, at the stage of constructing or updating Local Development Strategies
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local Development Strategies
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.11 Identification of 'marginal lands' for the cultivation of innovative oil crops to obtain vegetable oils that can be transformed into biodegradable biolubricants, insulating materials and locally available animal feed supplements formulation	
Coordinator	NVMT
Implementing Parties	Phase 1 – D4.1 – UNILODZ Phase 2 – Bzura, NVMT
Timeframe	Phase 1 – D4.1 – UNILODZ – January 2022 Phase 2 – ongoing update until 2026
Financing	Phase 1 - FrontSh1p

	Phase 2 - FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D4.1 Phase 2 - To be defined by Implementing Party
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
AWARENESS AND KNOWLEDGE	
C 2.1 Promotion/facilitating the exchange of information among stakeholders at the CTC regarding the quantity and location of organic waste (food&feed) – increasing the number of Regional Circular Booster Toolkit platform users	
Coordinator	SLOM, Bzura (CTC), EURADA
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.2 Informational activities concerning possibilities of food&feed waste processing in accordance with circular economy principles	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.3 Educational activities concerning organic waste management and the possibility of using its by-products throughout the value chain in alignment with the principles of the circular economy	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, OPUS, UNILODZ, TUL and others developing content for e-learning platform
Timeframe	Phase 1 -October 2024 Phase 2 – e-learning platform promotion - ongoing activity until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 2.2, D 7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.4 Increasing knowledge on how to improve the efficiency of conducting local circular development policies in the scope of organic waste	
Coordinator	UNILODZ
Implementing Parties	UNILODZ
Timeframe	December 2024
Financing	FrontSh1p
Results	Publications, others to be defined according to D 2.3

Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.5 Ongoing development of online workshops on the RCBT platform regarding the circular use of organic waste, its by-products and marginal lands	
Coordinator	TUL, EURADA
Implementing Parties	Phase 1 - TUL Phase 2 – all project partners Phase 3 – stakeholders of CTC
Timeframe	Phase 1 – Development of the e-learning platform – December 2024 Phase 2 – Content development for the e-learning platform - December 2024 Phase 3 – Ongoing promotion of the e-learning platform - until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	e-learning platform
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.6 Encouraging the local communities through informational campaigns and training initiatives to adopt a circular approach to the use of organic waste	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA
Implementing Parties	Local governments, local NGOs within CTC
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1
C 2.7 Developing and conducting training sessions for local circular economy leaders, including: council members; officials; local activists; NGOs; etc., focusing on efficient management of organic waste	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA, STAM
Implementing Parties	OPUS, Parzeczew, STAM and local governments, local NGOs within CTC,
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1, D7.2
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1, D7.2
C 2.8 Development of educational modules for students at all levels of education, , focusing on the field of circular economy and covering topics related to CSS2	
Coordinator	SLOM, Bzura (CTC), UNILODZ
Implementing Parties	SLOM, Bzura (CTC), UNILODZ
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5

Results	To be defined by Implementing Parties e.g. number of developed educational programs
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.9 Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"), dedicated to CTC with the involvement of external partners including foreign ones	
Coordinator	Parieczew, Bzura
Implementing Parties	Parieczew, Bzura, SLOM, UNILODZ, TUL, RIC, OPUS
Timeframe	Annually, the first edition in June 2024 until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, sponsors, budgets of Implementing Parties
Results	3 Circularity Festival
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.10 Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of organic waste and its by-products management	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC), RIC, UNILODZ, LR, TUL, OPUS, Parieczew
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.11 Developing and implementing an ongoing social media campaign focused on organic waste management	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC)
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.12 Promotion of funding sources for circular projects in the scope of organic waste management: European Funds for Lodzkie 2021-2027; Horizon Europe; LIFE and others	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, KPMG, RIC, LR
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	To be defined by Implementing Parties e.g. number of founded projects
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3

C 2.13	
Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS2 area, reinforcing the circular transformation of the Lodzkie Region	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, LR
Timeframe	January 2025
Financing	FrontSh1p, budget of Implementing Parties
Results	Scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS2 area
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
PARTICIPATION & NETWORKING	
C 3.1	
Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promotion of resource-efficient management - with a connection to CSS2	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Regional Cluster Team
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	Signed agreement
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.2	
Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS2	
Coordinator	SLOM, Bzura (CTC), Parzeczew
Implementing Parties	SLOM, Bzura (CTC), Parzeczew, local authorities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	Report with defined recommendations
Indicators	To be defined after consultations with the specified Implementing Parties
C 3.3	
Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: food&feed, as a part of the Social Dialogue Council (SDC)	
Coordinator	Regional Cluster Team
Implementing Parties	Regional Cluster Team entities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Updated CircuPuncture Model and CircuPuncture Action Plan, others to be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.4	

Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS2	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Regional Cluster Team entities
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of established collaboration networks with a connection to CSS2
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
INFRASTRUCTURE SUPPORT	
C 4.1	
Organization of a food-sharing system	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local authorities, NGOs within CTC
Timeframe	January 2025 – December 2026
Financing	Budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of food-sharing points
Indicators	To be defined after consultations with the specified Implementing Parties
C 4.2	
Continuous updating of the database of entities connected to the value chain of organic waste and its by-products	
Coordinator	RIC
Implementing Parties	RIC, STAM, local authorities within CTC
Timeframe	Phase 1 – D2.2 -October 2022 Phase 2 - ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.3	
Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of organic waste and its by-products	
Coordinator	STAM, RIC
Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.4	
Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS2	
Coordinator	STAM, RIC

Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.5 Development and presentation of business models for various initiatives within the value chain of organic waste and its by-products	
Coordinator	VELTHA
Implementing Parties	VELTHA with support of CTC
Timeframe	D7.3 – April 2025
Financing	FrontSh1p
Results	To be defined by VELTHA
Indicators	To be defined after consultations with VELTHA and in the scope of D 2.3
C 4.6 Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of organic waste	
Coordinator	OPUS
Implementing Parties	OPUS with support of CTC
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - D7.3 – April 2025
Financing	FrontSh1p
Results	Self-assessment tool, others defined by OPUS and in the scope of D2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
SUPPORT FOR CIRCULAR ENTREPRENEURSHIP	
C 5.1 Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to organic waste	
Coordinator	OPUS
Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
C 5.2 Development of a business model for a social enterprise in the field of organic waste and its by-products usage	
Coordinator	OPUS
Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026

Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
C 5.3 Ongoing presentation of available funding sources for initiatives carried out in the value chain of organic waste, its by-products and marginal lands	
Coordinator	KPMG, STAM, RIC
Implementing Parties	KPMG, STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 5.4 Continuous promotion of technological support opportunities for entities implementing projects in the value chain of organic waste, its by-products and marginal lands by academic institutions within CTC	
Coordinator	CTC
Implementing Parties	RIC, UNIŁODZ, TUL
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with Implementing Parties and in the scope of D 2.3

Table 10 CircuPuncture Action Plan for Circular Territorial Cluster in Łódzkie Region for 2024-2026 – CSS 3

CSS 3 WATER AND NUTRIENTS	
LEGAL FRAMEWORK	
C 1.1 Diagnosis of government failure and/or market failure to implement a circular value chain for wastewater treatment and by-products processing, especially algal biomass and nutrients	
Coordinator	RIC
Implementing Parties	UNIŁODZ
Timeframe	Phase 1 – October 2022 Phase 2 - ongoing monitoring in the scope Circular Territorial Resource Networks from January 2024 to December 2026
Financing	Phase 1 – FrontSh1p Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 2.1 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.2	

Lobbying for changes in laws and interpretation of regulations for identified barriers	
Coordinator	Circular Territorial Cluster (CTC)
Implementing Parties	Local governments within the CTC territory and their associations
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of local governments Funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with the specified implementing parties
Indicators	To be defined after consultations with the specified implementing parties and in the scope of Deliverable 2.3
C 1.3 Active participation in public consultations to influence legislative changes regarding the circular management of wastewaters, by-products processing, especially algae biomass and nutrients	
Coordinator	Regional Cluster Team
Implementing Parties	To be assigned by the Coordinator
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties Funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with the specified implementing parties
Indicators	To be defined after consultations with the specified implementing parties and in the scope of Deliverable 2.3
C 1.4 Integrating a circular economy approach, including the CSS3 scope, into the Regional Development Strategy	
Coordinator	LR
Implementing Parties	LR
Timeframe	Incorporating Circular Economy at the stage of constructing or updating regional strategy
Financing	Budgets of Implementing Party
Results	Updated strategy
Indicators	To be defined after consultations with the implementing party and in the scope of D 2.3
C 1.5 Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of wastewaters and by-products processing	
Coordinator	Regional Cluster Team entities
Implementing Parties	Phase 1 – D 5.2 - LNEG Phase 2 - ongoing monitoring within CTC
Timeframe	Phase 1 – April 2023 2024 Phase 2 - ongoing monitoring from January 2024 to December 2026
Financing	Phase 1 – FrontSh1p Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 5.2 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.6	

Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law	
Coordinator	Phase 1 - RIC Phase 2 – SLOM, Bzura
Implementing Parties	Phase 1 – D2.1 Public Circular Procurement scheme dedicated to Circular Systemic Solutions - UNILODZ Phase 2 – Product identification and preparation of schemas for selected products SLOM, Bzura, UNILODZ, Parzeczew
Timeframe	Phase 1 – October 2022 Phase 2 – December 2024
Financing	Phase 1 - FrontSh1p Phase 2 - FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 2.1 Phase 2 - Set of templates
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.7 Development of a handbook for Public-Private Partnership to support the development of CSS3	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, UNIBZ
Timeframe	December 2024
Financing	FrontSh1p
Results	Handbook
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.8 Development of tailored incentives for diverse stakeholder groups, such as: entrepreneurs; non-governmental organizations; local communities, to promote the circular management of wastewaters and by-products processing, especially algae biomass and nutrients	
Coordinator	Phase 1 -RIC Phase 2 - Regional Cluster Team
Implementing Parties	Phase 1 – D 2.1 Identification incentives for creation Circular Regional Cluster, Report - UNILODZ Phase 2 – Updating of incentives dedicated to CSS3, including financial ones - SLOM, Bzura KPMG
Timeframe	Phase 1 – October 2022 Phase 2 – May 2025
Financing	FrontSh1p
Results	D2.1, D2.5
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.9 Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS3	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local governments selected in the CTC

Timeframe	Annually at the stage of constructing programs from January 2024 to December 2026
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local programmes
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.10 Integrating a circular economy approach, including the CSS3 scope, into the Local Development Strategy	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local government within CTC
Timeframe	from January 2024 to December 2026, at the stage of constructing or updating Local Development Strategies
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local Development Strategies
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
AWARENESS AND KNOWLEDGE	
C 2.1 Promotion/facilitating the exchange of information among stakeholders at the CTC regarding available industrial and municipal wastewater, by-products (CO ₂ , nutrients) and algae biomass – increasing the number of Regional Circular Booster Toolkit platform users	
Coordinator	SLOM, Bzura (CTC), EURADA
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.2 Informational activities regarding the general possibilities of utilizing wastewater in line with circular economy principles	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.3 Educational activities concerning wastewater management and the possibility of using its by-products (CO ₂ , nutrients, algae biomass) throughout the value chain in alignment with the principles of the circular economy	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, OPUS, UNILODZ, TUL and others developing content for e-learning platform
Timeframe	Phase 1 -October 2024

	Phase 2 – e-learning platform promotion - ongoing activity until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 2.2, D 7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.4 Increasing knowledge on how to improve the efficiency of conducting local circular development policies in the scope of water management	
Coordinator	UNILODZ
Implementing Parties	UNILODZ
Timeframe	December 2024
Financing	FrontSh1p
Results	Publications, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.5 Ongoing development of online workshops on the RCBT platform regarding the circular use of industrial and municipal wastewater, its by-products (CO2, nutrients, algae biomass)	
Coordinator	TUL, EURADA
Implementing Parties	Phase 1 - TUL Phase 2 – all project partners Phase 3 – stakeholders of CTC
Timeframe	Phase 1 – Development of the e-learning platform – December 2024 Phase 2 – Content development for the e-learning platform - December 2024 Phase 3 – Ongoing promotion of the e-learning platform - until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	e-learning platform
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.6 Encouraging the local communities through informational campaigns and training initiatives to reduce water consumption	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA
Implementing Parties	Local governments, local NGOs within CTC
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1
C 2.7 Developing and conducting training sessions for local circular economy leaders, including: council members; officials; local activists; NGOs; etc., focusing on efficient management of water, wastewater and by-products	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA, STAM

Implementing Parties	OPUS, Parzeczew, STAM and local governments, local NGOs within CTC,
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1, D7.2
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1, D7.2
C 2.8 Development of educational modules for students at all levels of education, focusing on the field of circular economy and covering topics related to CSS3	
Coordinator	SLOM, Bzura (CTC), UNILODZ
Implementing Parties	SLOM, Bzura (CTC), UNILODZ
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of developed educational programs
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.9 Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"), dedicated to CTC with the involvement of external partners including foreign ones	
Coordinator	Parzeczew, Bzura
Implementing Parties	Parzeczew, Bzura, SLOM, UNILODZ, TUL, RIC, OPUS
Timeframe	Annually, the first edition in June 2024 until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, sponsors, budgets of Implementing Parties
Results	3 Circularity Festival
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.10 Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of industrial and municipal wastewater and by-products management, especially algae biomass and CO2	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC), RIC, UNILODZ, LR, TUL, OPUS, Parzeczew
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.11 Developing and implementing an ongoing social media campaign focused on industrial and municipal wastewater treatment, reducing water consumption, possible by-products usage, especially CO2	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC)

Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.12 Promotion of funding sources for circular projects in the scope of water and nutrients management: European Funds for Lodzkie 2021-2027; Horizon Europe; LIFE and others.	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, KPMG, RIC, LR
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	To be defined by Implementing Parties e.g. number of founded projects
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.13 Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS3 area, reinforcing the circular transformation of the Lodzkie Region	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, LR
Timeframe	January 2025
Financing	FrontSh1p, budget of Implementing Parties
Results	Scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS3 area
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
PARTICIPATION & NETWORKING	
C 3.1 Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promotion of resource-efficient management - with a connection to CSS3	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Regional Cluster Team
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	Signed agreement
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.2 Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS3	
Coordinator	SLOM, Bzura (CTC), Parzeczew
Implementing Parties	SLOM, Bzura (CTC), Parzeczew, local authorities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties

Results	Report with defined recommendations
Indicators	To be defined after consultations with the specified Implementing Parties
C 3.3 Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: water& nutrients, as a part of the Social Dialogue Council (SDC)	
Coordinator	Regional Cluster Team
Implementing Parties	Regional Cluster Team entities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Updated CircuPuncture Model and CircuPuncture Action Plan, others to be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.4 Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS3	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Regional Cluster Team entities
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of established collaboration networks with a connection to CSS3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
INFRASTRUCTURE SUPPORT	
C 4.1 Development of assumptions for the feasibility study of an investment project involving the construction of an intermunicipal wastewater treatment plant and algae technology	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	RIC, UNILODZ, TUL, Parzeczew, Bzura, SLOM
Timeframe	December 2025
Financing	Funding opportunities identified within Deliverable 2.5
Results	Report
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 4.2 Continuous updating of the database of entities connected to the value chain of industrial and municipal wastewater and its by-products (CO2, nutrients, algae biomass)	
Coordinator	RIC
Implementing Parties	RIC, STAM, local authorities within CTC
Timeframe	Phase 1 – D2.2 -October 2022 Phase 2 - ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.3	

Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of water management	
Coordinator	STAM, RIC
Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.4 Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS3	
Coordinator	STAM, RIC
Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.5 Development and presentation of business models for various initiatives within the value chain of water, wastewater and its by-products (CO2, nutrients, algae biomass)	
Coordinator	VELTA
Implementing Parties	VELTHA with support of CTC
Timeframe	D7.3 – April 2025
Financing	FrontSh1p
Results	To be defined by VELTHA
Indicators	To be defined after consultations with VELTHA and in the scope of D 2.3
C 4.6 Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of water consumption	
Coordinator	OPUS
Implementing Parties	OPUS with support of CTC
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 – D7.3 – April 2025
Financing	FrontSh1p
Results	Self-assessment tool, others defined by OPUS and in the scope of D2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
SUPPORT FOR CIRCULAR ENTREPRENEURSHIP	
C 5.1 Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to water consumption	
Coordinator	OPUS

Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
C 5.2 Development of a business model for a social enterprise in the field of water& nutrients	
Coordinator	OPUS
Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
C 5.3 Ongoing presentation of available funding sources for initiatives carried out in the value chain of water& nutrients	
Coordinator	KPMG, STAM, RIC
Implementing Parties	KPMG, STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 5.4 Continuous promotion of technological support opportunities for entities implementing projects in the value chain of organic waste, its by-products and marginal lands by academic institutions within CTC	
Coordinator	CTC
Implementing Parties	RIC, UNILODZ, TUL
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with Implementing Parties and in the scope of D 2.3

Table 11 CircuPuncture Action Plan for Circular Territorial Cluster in Lodzkie Region for 2024-2026 – CSS 4

CSS 4 PLASTIC&RUBBER	
LEGAL FRAMEWORK	
C 1.1 Diagnosis of government failure and/or market failure to implement a circular value chain for plastic&rubber waste and by-products processing (e.g. filaments for 3D print)	
Coordinator	RIC
Implementing Parties	UNILODZ
Timeframe	Phase 1 – October 2022 Phase 2 - ongoing monitoring in the scope Circular Territorial Resource Networks from January 2024 to December 2026
Financing	Phase 1 – FrontSh1p Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 2.1 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.2 Lobbying for changes in laws and interpretation of regulations for identified barriers	
Coordinator	Circular Territorial Cluster (CTC)
Implementing Parties	Local governments within the CTC territory and their associations
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of local governments Funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with the specified implementing parties
Indicators	To be defined after consultations with the specified implementing parties and in the scope of Deliverable 2.3
C 1.3 Active participation in public consultations to influence legislative changes regarding the circular management of plastic&rubber waste and by-products processing	
Coordinator	Regional Cluster Team
Implementing Parties	To be assigned by the Coordinator
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties Funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with the specified implementing parties
Indicators	To be defined after consultations with the specified implementing parties and in the scope of Deliverable 2.3

C 1.4 Integrating a circular economy approach, including the CSS4 scope, into the Regional Development Strategy	
Coordinator	LR
Implementing Parties	LR
Timeframe	Incorporating Circular Economy at the stage of constructing or updating regional strategy
Financing	Budgets of Implementing Party
Results	Updated strategy
Indicators	To be defined after consultations with the implementing party and in the scope of D 2.3
C 1.5 Analysis of operational conditions and needs at the local level regarding the adjustment of legal regulations in order to optimize the management of plastic&rubber waste	
Coordinator	Regional Cluster Team entities
Implementing Parties	Phase 1 – D 6.1 - VELTHA Phase 2 - ongoing monitoring within Circular Territorial Resource Networks
Timeframe	Phase 1 – December 2022 Phase 2 - ongoing monitoring in the scope Circular Territorial Resource Networks from January 2024 to December 2026
Financing	Phase 1 – FrontSh1p Phase 2 – funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 6.1 Phase 2 – Annual reports
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.6 Circular Public Procurement Step by Step - templates for use by local entities subject to the Public Procurement Law	
Coordinator	Phase 1 - RIC Phase 2 – SLOM, Bzura
Implementing Parties	Phase 1 – D2.1 Public Circular Procurement scheme dedicated to Circular Systemic Solutions - UNIŁODZ Phase 2 – Product identification and preparation of schemas for selected products SLOM, Bzura, UNIŁODZ, Parzeczew
Timeframe	Phase 1 – October 2022 Phase 2 – December 2024
Financing	Phase 1 - FrontSh1p Phase 2 - FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Phase 1 – D 2.1 Phase 2 - Set of templates

Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.7 Development of a handbook for Public-Private Partnership to support the development of CSS4	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, UNIBZ
Timeframe	December 2024
Financing	FrontSh1p
Results	Handbook
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.8 Development of tailored incentives for diverse stakeholder groups, such as: entrepreneurs; non-governmental organizations; local communities, to promote the circular management of plastic&rubber waste and its by-products processing	
Coordinator	Phase 1 -RIC Phase 2 - Regional Cluster Team
Implementing Parties	Phase 1 – D 2.1 Identification incentives for creation Circular Regional Cluster, Report - UNILODZ Phase 2 – Updating of incentives dedicated to CSS4, including financial ones - SLOM, Bzura KPMG
Timeframe	Phase 1 – October 2022 Phase 2 – May 2025
Financing	FrontSh1p
Results	D2.1, D2.5
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.9 Enhancement of local cooperation programs with non-governmental organizations by incorporating activities that promote the development of CSS4	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Local governments selected in the CTC
Timeframe	Annually at the stage of constructing programs from January 2024 to December 2026
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local programmes
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 1.10 Integrating a circular economy approach, including the CSS4 scope, into the Local Development Strategy	
Coordinator	SLOM, Bzura (CTC)

Implementing Parties	Local governments within CTC
Timeframe	from January 2024 to December 2026, at the stage of constructing or updating Local Development Strategies
Financing	Local governments budgets, funding opportunities identified within Deliverable 2.5
Results	Local Development Strategies
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
AWARENESS AND KNOWLEDGE	
C 2.1 Promotion/facilitating the exchange of information among stakeholders at the CTC regarding availability of different kinds plastic&rubber waste – increasing the number of Regional Circular Booster Toolkit platform users	
Coordinator	SLOM, Bzura (CTC), EURADA
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.2 Informational activities regarding the general possibilities of using plastic&rubber waste in line with circular economy principles	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, Bzura, OPUS, UNILODZ, TUL, STAM
Timeframe	ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 7.1, D7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.3 Educational activities concerning plastic&rubber waste and the possibility of using its by-products throughout the value chain in alignment with the principles of the circular economy	
Coordinator	Regional Cluster Team
Implementing Parties	SLOM, OPUS, UNILODZ, TUL and others developing content for e-learning platform
Timeframe	Phase 1 -October 2024 Phase 2 – e-learning platform promotion - ongoing activity until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	D 2.2, D 7.2, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3

C 2.4	
Increasing knowledge on how to improve the efficiency of conducting local circular development policies in the scope of plastic&rubber waste	
Coordinator	UNILODZ
Implementing Parties	UNILODZ
Timeframe	December 2024
Financing	FrontSh1p
Results	Publications, others to be defined according to D 2.3
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.5	
Ongoing development of online workshops on the RCBT platform regarding the circular use of industrial and plastic&rubber waste and by-products	
Coordinator	TUL, EURADA
Implementing Parties	Phase 1 - TUL Phase 2 – all project partners Phase 3 – stakeholders of CTC
Timeframe	Phase 1 – Development of the e-learning platform – December 2024 Phase 2 – Content development for the e-learning platform - December 2024 Phase 3 – Ongoing promotion of the e-learning platform - until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	e-learning platform
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.6	
Encouraging the local communities through informational campaigns and training initiatives to adopt a circular approach to the use of plastic&rubber waste	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA
Implementing Parties	Local governments, local NGOs within CTC
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1
C 2.7	
Developing and conducting training sessions for local circular economy leaders, including: council members; officials; local activists; NGOs; etc., focusing on efficient management of plastic&rubber waste and by-products	
Coordinator	SLOM, Bzura (CTC), TUL, EURADA, STAM
Implementing Parties	OPUS, Parzeczew, STAM and local governments, local NGOs within CTC,

Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined according to D 2.3, D7.1, D7.2
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3, D7.1, D7.2
C 2.8 Development of educational modules for students at all levels of education, focusing on the field of circular economy and covering topics related to CSS4	
Coordinator	SLOM, Bzura (CTC), UNILODZ
Implementing Parties	SLOM, Bzura (CTC), UNILODZ
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	Budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of developed educational programs
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.9 Development of the concept and organization of a cyclic event promoting circular resource management ("Circularity Festival"), dedicated to CTC with the involvement of external partners including foreign ones	
Coordinator	Parzeczew, Bzura
Implementing Parties	Parzeczew, Bzura, SLOM, UNILODZ, TUL, RIC, OPUS
Timeframe	Annually, the first edition in June 2024 until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, sponsors, budgets of Implementing Parties
Results	3 Circularity Festival
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.10 Promotion of intensive networking among businesses, researchers, public institutions, and local communities to foster the creation of circular systematic solutions and initiatives in the field of plastic&rubber waste	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC), RIC, UNILODZ, LR, TUL, OPUS, Parzeczew
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.11 Developing and implementing an ongoing social media campaign focused on plastic&rubber waste management according to 6 R rules	

Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura (CTC)
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.12 Promotion of funding sources for circular projects in the scope of plastic&rubber waste management: European Funds for Lodzkie2021-2027; Horizon Europe; LIFE and others.	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, KPMG, RIC, LR
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	To be defined by Implementing Parties e.g. number of founded projects
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 2.13 Development and sharing of a promotional scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS4 area, reinforcing the circular transformation of the Lodzkie Region	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	SLOM, Bzura, LR
Timeframe	January 2025
Financing	FrontSh1p, budget of Implementing Parties
Results	Scenario for investments carried out by stakeholders of the Territorial Circular Cluster (CTC) in the CSS4 area
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
PARTICIPATION & NETWORKING	
C 3.1 Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promotion of resource-efficient management - with a connection to CSS4	
Coordinator	Cross-regional, interinstitutional agreement aimed at implementation of Circular Economy in the Lodzkie Region and promoting resource-efficient management with a connection to CSS4
Implementing Parties	SLOM, Bzura (CTC)
Timeframe	Regional Cluster Team
Financing	January 2024 – May 2025

Results	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.2 Recommendation for local authorities (CTC participants) to include circular and resource-efficient actions or investments in participatory budgets - with a connection to CSS4	
Coordinator	SLOM, Bzura (CTC), Parzeczew
Implementing Parties	SLOM, Bzura (CTC), Parzeczew, local authorities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5, budgets of Implementing Parties
Results	Report with defined recommendations
Indicators	To be defined after consultations with the specified Implementing Parties
C 3.3 Coordination of the Circular Territorial Resource Networks (informally referred to as working groups) within the Resource Missions area: plastic&rubber , as a part of the Social Dialogue Council (SDC)	
Coordinator	Regional Cluster Team
Implementing Parties	Regional Cluster Team entities
Timeframe	January 2024 – May 2025
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	Updated CircuPuncture Model and CircuPuncture Action Plan, others to be defined by Implementing Parties
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 3.4 Identification of diverse collaboration networks and relationships in the field of circular economy in the Lodzkie Region with a connection to CSS4	
Coordinator	SLOM, Bzura (CTC)
Implementing Parties	Regional Cluster Team entities
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties e.g. number of established collaboration networks with a connection to CSS4
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
INFRASTRUCTURE SUPPORT	
C 4.1 Development of assumptions for the feasibility study of an investment project involving the construction of an intermunicipal plastic treatment plant	
Coordinator	SLOM, Bzura (CTC)

Implementing Parties	RIC, UNIŁODZ, TUL, Parzeczew, Bzura, SŁOM
Timeframe	December 2025
Financing	Funding opportunities identified within Deliverable 2.5
Results	Report
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 4.2 Analysis of the possibilities of implementing a deposit system for plastic packaging and selected plastic goods	
Coordinator	SŁOM, Bzura (CTC)
Implementing Parties	RIC, UNIŁODZ, TUL, Parzeczew, Bzura, SŁOM
Timeframe	December 2025
Financing	Funding opportunities identified within Deliverable 2.5
Results	Report
Indicators	To be defined after consultations with the specified Implementing Parties and in the scope of D 2.3
C 4.3 Continuous updating of the database of entities connected to the value chain of plastic&rubber waste and its by-products (e.g. filaments for 3D print)	
Coordinator	RIC
Implementing Parties	RIC, STAM, local authorities within CTC
Timeframe	Phase 1 – D2.2 -October 2022 Phase 2 - ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.4 Development and implementation of functionality on the RCBT platform to facilitate mutual equipment sharing for the execution of activities within the value chain of plastic&rubber waste management	
Coordinator	STAM, RIC
Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.5 Development and implementation of functionality on the RCBT platform to promote local purchases in connection with CSS4	
Coordinator	STAM, RIC

Implementing Parties	STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 4.6 Development and presentation of business models for various initiatives within the value chain of plastic&rubber waste and its by-products	
Coordinator	VELTA
Implementing Parties	VELTHA with support of CTC
Timeframe	D7.3 – April 2025
Financing	FrontSh1p
Results	To be defined by VELTHA
Indicators	To be defined after consultations with VELTHA and in the scope of D 2.3
C 4.7 Development and implementation of functionality on the RCBT platform for a self-assessment tool to measure the level of circularity in households and municipalities in the field of plastic&rubber waste	
Coordinator	OPUS
Implementing Parties	OPUS with support of CTC
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - D7.3 – April 2025
Financing	FrontSh1p
Results	Self-assessment tool, others defined by OPUS and in the scope of D2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
SUPPORT FOR CIRCULAR ENTREPRENEURSHIP	
C 5.1 Implementation of a micro-grant program for residents to support the promotion of their own circular initiatives, including those related to plastic&rubber	
Coordinator	OPUS
Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3

C 5.2 Development of a business model for a social enterprise in the field of plastic waste, especially connected with 3D printing	
Coordinator	OPUS
Implementing Parties	OPUS, SLOM, BZURA
Timeframe	Phase 1 – D7.1 – March 2024 Phase 2 - ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined after consultations with OPUS and in the scope of D 2.3
Indicators	To be defined after consultations with OPUS and in the scope of D 2.3
C 5.3 Ongoing presentation of available funding sources for initiatives carried out in the value chain of plastic management	
Coordinator	KPMG, STAM, RIC
Implementing Parties	KPMG, STAM, RIC with support of CTC
Timeframe	Phase 1 – D7.2 – April 2024 Phase 2 – ongoing update until December 2026
Financing	FrontSh1p, funding opportunities identified within Deliverable 2.5
Results	To be defined by RIC&STAM
Indicators	To be defined after consultations with RIC&STAM and in the scope of D 2.3
C 5.4 Continuous promotion of technological support opportunities for entities implementing projects in the value chain of plastic&rubber waste by academic institutions within CTC	
Coordinator	CTC
Implementing Parties	RIC, UNILODZ, TUL
Timeframe	Ongoing activity from January 2024 to December 2026
Financing	FrontSh1p, budgets of Implementing Parties, funding opportunities identified within Deliverable 2.5
Results	To be defined by Implementing Parties
Indicators	To be defined after consultations with Implementing Parties and in the scope of D 2.3

The presented CircuPuncture Action Plan serves as an initial stage for consultations and the further development. The outlined Circular Challenges are broad and represent more of categorizations than specific steps ready for implementation. To provide more details, it is necessary to reach an agreement on the ownership of the Plan and confirm the Implementing Parties. In the first step, it is crucial to strengthen the Circular Territorial Cluster and Circular Territorial Resource Networks. Both entities are needed to actively engage in the decision-making process regarding the ownership of specific Challenges.

The CircuPuncture methodology is a novel and innovative concept, so it's understandable that it will require numerous adjustments. However, its greatest strength lies in the fact that it was developed in response to real needs, particularly considering the initial stage of circular economy development in the Lodzkie Region.

The Challenges presented in the Plan have been formulated based on:

1. results from studies conducted under D2.1, where barriers and expected incentives in the circular economy were identified.
2. Implementation Plans for specific Circular Systematic Solutions
3. Results from the "world cafe" study, conducted during General Assembly, where participants expressed expectations for actions within CEAP from the perspective of all participating regions in the project.

The Plan covers the next three years, from January 2024 to December 2026, and involves ongoing monitoring and updates. This approach allows for taking small steps, beginning with actions that establish a solid foundation and initiate the shift from viewing the circular economy merely as waste management to adopting the 5R principles, then the 6R, and beyond.

The CircuPuncture Action Plan serves as a continuation of The Action Plan for the Lodzkie Region, developed within the framework of the project "REPLACE - Regional Policy Actions for Circular Economy." The actions planned within the latter involved incorporating into the Regional Programme entitled "European Funds for Lodzkie 2021-2027" (FEŁ2027) financing from the European Regional Development Fund for the implementation of projects related to, among others, investments enabling a transition from a linear business model to a circular one.

FEŁ2027 serves as a key regional policy instrument for managing pro-environmental investments. It encompasses a catalogue of investment directions and areas, as well as potential project interventions to be implemented in the current financial perspective (2021-2027). Under Priority 2 "European Funds for Green Lodzkie," Specific Objective RSO2.6 "Supporting the transition to a circular and resource-efficient economy," the following opportunities have been planned:

- Investments in selective collection (coupled with community education, including promotion of reuse), bio-waste treatment facilities, waste purification facilities, or waste recycling facilities.
- Investments aimed at waste prevention or promotion of reuse.
- Investments supporting circular economy practices in enterprises.
- Education or mentoring on circular economy principles and preparation of planning documents related to circular economy initiatives.

Furthermore, these actions align with the Second Policy Objective, focusing on transitioning towards a greener, low-carbon economy and a resilient Europe by promoting clean and fair energy transition, green and blue investments, circular economy practices, climate change mitigation and adaptation, risk prevention and management, and sustainable urban mobility.²⁶

Thanks to the implementation of the Action Plan developed within the REPLACE project, the Lodzkie Region currently has funds that can be utilized to implement the CircuPuncture Action Plan.

The proposed approach to both the CircuPuncture Model as a regional strategy and the CircuPuncture Plan as CEAP introduces a novel, bottom-up method for implementing the circular economy. We believe that this approach aligns with the philosophy of circularity, placing decisions in the hands of individuals.

²⁶ Action Plan for Lodzkie Region <https://bruksela.lodzkie.pl/wp-content/uploads/2022/07/REPLACE-Regional-Action-Plan-for-the-Lodzkie-Region.pdf>

3.6. Roadmap for CTC in Lodzkie Region – How to implement CircuPuncture Governance Model

Below is presented a roadmap summarizing the main stages of preparing the CircuPuncture Model and CircuPuncture Action Plan.

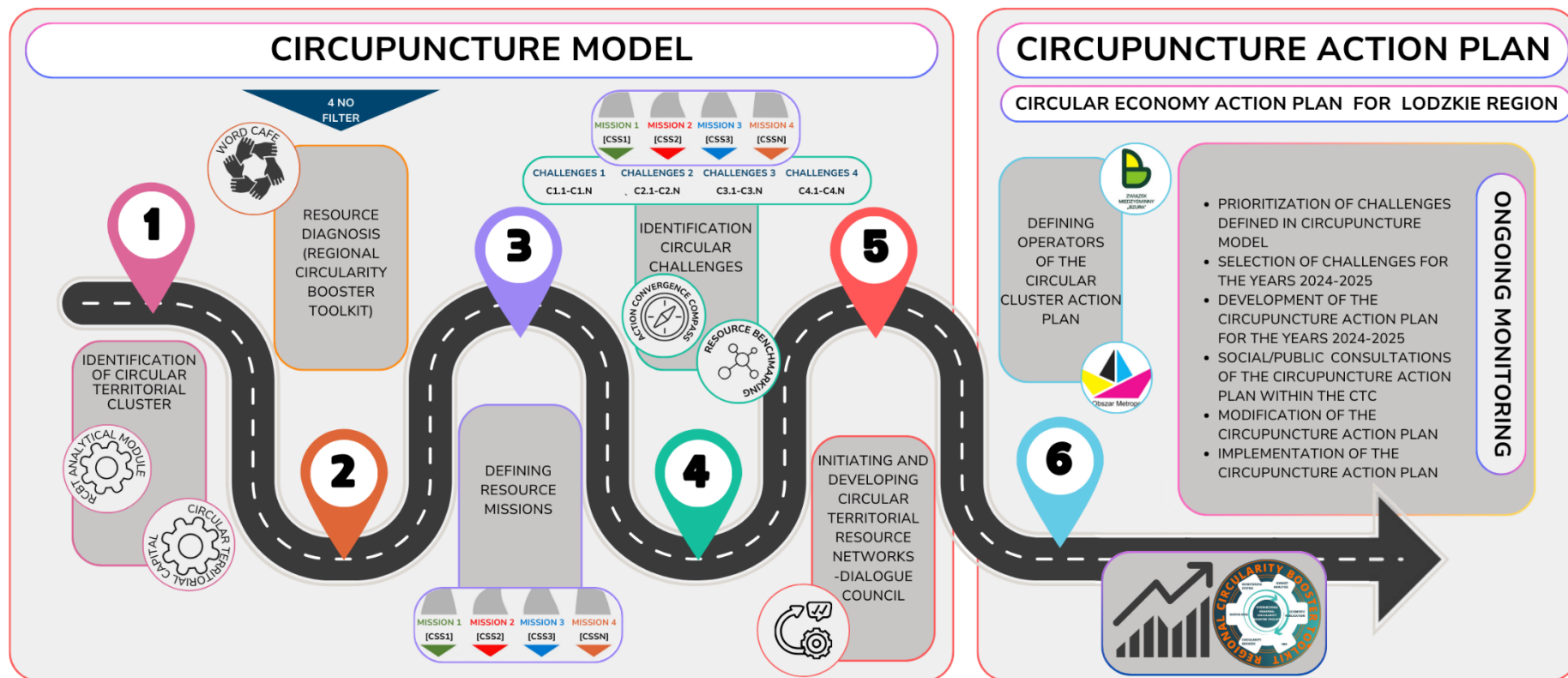


Fig. 26. Roadmap for CircuPuncture Governance Model&CircuPuncture Action Plan.

Source: Own compilation