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Circular and Dynamic Manufacturing Supply Chain Orchestration and OptimiSation

CIRCULOOS Open Call #3.1

Guidelines for Applicants

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Contents

Abbreviation	Full Term
BMPN	Business Process Model and Notation
CM	Circular Manufacturing
CLT	Cross-Laminated Timber
DIHs	Digital Innovation Hubs
eDIHs	enhanced Digital Innovation Hubs
EC	European Commission
EXDs	Experiments for Demonstration
FSTP	Financial Support to Third Parties
GDPR	General Data Protection Regulation
GHG	Greenhouse Gas
ICT	Information and Communication Technology
IoT	Internet of Things
LCA	Life Cycle Assessment
MS	Member States
MSMEs	Manufacturing SMEs (Small and Medium-sized Enterprises)
OCT	Overseas Countries and Territories
OC3.1	Open Call 3.1
OLAF	European Anti-Fraud Office
RAMP	RAMP platform
SCOPT	Supply Chain Optimization Tool
SCDT	Supply Chain Digital Twin
SGA	Sub-Grant Agreement
SMEs	Small and Medium-sized Enterprises

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CIRCULOOS Open Call 3.1 summary

Title	OC3.1: Enhancing CIRCULOOS Pilot Cases
When? *Timeframe*	Deadline: 11th of June 2025, 17:00 Brussels Time
Who? *Target entities*	**Individual entities** ● Manufacturing European mid-caps, MSMEs (as defined in EU law – EU recommendation 2003/361[9]) with a commercial activity in the manufacturing industry as a producer, or a technology/ service supplier for applications in the manufacturing industry ● Recycling & Processing Companies that add new recovery solutions to existing CIRCULOOS pilot lines Any necessary technical role for integration or technical development to offer automation, sorting, or data management solutions, etc. should be assumed by the entity above with or without external support via sub-contracting, which has to be clearly justified.
How? *Application pages*	OC3.1 Link: https://circuloos.eu/open-calls
What? *Supporting activities*	**Open Call 3.1** (OC3.1) - For single entities ● **Objective**: To enhance existing CIRCULOOS pilot lines with innovative solutions. ● **Funding**: Up to €60,000 per entity. ● **Duration**: 9 months. **For further information interested parties can also consult the Webinar 1, which took place on the 9th of April, and it is recorded:** https://youtu.be/bvUv-UckJOo
Informational Activities	● Webinar – 7th of May *Topic: CIRCULOOS Open Call 2& 3.1 objectives*

1. Introduction

This document provides relevant information regarding **Open Call 3.1 (OC3.1)** of the **CIRCULOOS project**.

2. What is the CIRCULOOS project?

CIRCULOOS helps micro, small and medium-sized production companies redefine their supply chains through Circular Economy.

Understanding a single product as a resource, which undergoes multiple transformations throughout its lifetime (i.e. change), manufacturing SMEs can be seen as 'service providers' which act to transform this product. From this viewpoint, the orchestration of any number of manufacturers is a parallel example from the ICT world. The micro-services architecture model was developed to enforce an efficient management scheme over an ecosystem of services. Through well-defined service models and interfaces very efficient orchestrators can be put in place to deliver seamless interactions, while maintaining the integrity of individual services. Taking this parallelism back to the manufacturing world, CIRCULOOS develops:

- the means for all actors with a part in each phase of reuse, repair and remanufacture to describe their service models in usable data models.
- the orchestrator mechanisms to aggregate and execute services in this multi-actor ecosystem.
- the optimization logic for efficient collaboration
- the systematic and dynamic assessment of circular and sustainable profiles of products produced.
- the Marketplace, which acts as a hub for the subscription of new actors to this multi-service ecosystem and as a sustainability enabler.
- cybersecure framework for trustworthy data sharing among the supply chain actors, by extending the existing IoT RAMP platform (www.ramp.eu).
- key AI and robotic functionalities to support the transition to disruptive circular products and/or services.

2.1. The vision & challenges to solve

Environmental and sustainability challenge

Reports indicate that doubling the circularity rate of 8.6% will cut 39% of emissions, and 28% of virgin resource usage. The manufacturing industry, which heavily relies on materials like steel, aluminum, and plastic, sees these as 30-45% of total costs. From 1995 to 2015, the share of global emissions from production materials increased from 15% to 23%. Raw material production contributes to 19% of global greenhouse gas (GHG) emissions, with waste management adding another 3%.

To achieve a reduction of 80-95% in global GHG emissions from 1990 levels by 2050, strategies must go beyond just low carbon energy and efficiency. They should include improved resource efficiency, recycling,

repair, refurbishment, reuse, and overall reduction in raw material consumption, aligning with a circular economy approach.

The R-strategies (Repair, Reuse, Recycle, Refurbish, Remanufacture, Repurpose) aim to extend product lifespans and minimize waste. The CIRCULOOS project focuses on these strategies, especially those that necessitate re-engineering of production processes and are challenging for small and medium-sized enterprises (SMEs) to implement. CIRCULOOS aims to facilitate collaboration among various actors through its data management and AI tools on the RAMP platform, which helps in mapping organizational cooperation for a circular economy.

RAMP enhances factory flexibility, reduces resource usage, and allows for equipment reconfiguration (like robots and assembly lines) while maintaining quality, working conditions, delivery, and time constraints.

Market opportunity and growth challenge

"Circular economy presents a unique market opportunity upwards of $4.5 Trillion, by 2030. Waste is designed out, and products are instead looped back into the production system at end of use. Growth is decoupled from scarce resources and materials are kept within productive use as soon as possible"[1]and "is attributed to greater circulation of materials, limited waste volumes directed to landfills, driven by accelerating digitisation, increased efficiency and cost optimisation"[2]. However, growth can be achieved only if valuable resources do not exit the supply chain as waste and only if the resources required for production are made available on time. This link reveals the connection between growth and efficient communication between the actors.

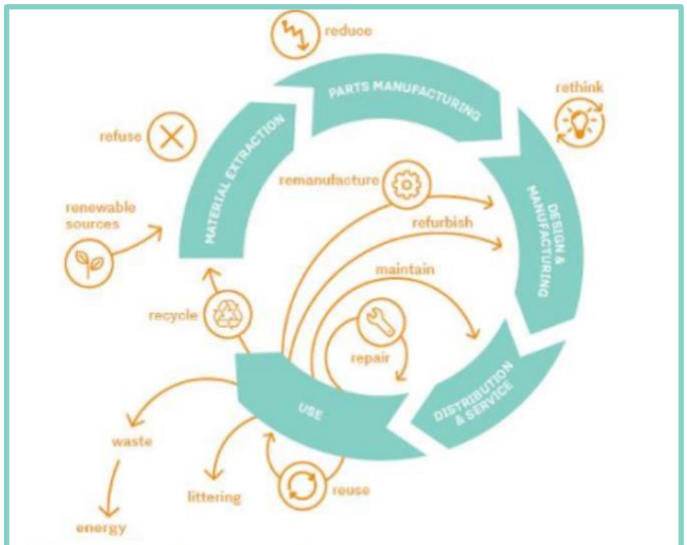

Figure 1: R-strategies

Cybersecurity challenge

The manufacturing sector is the second-most attacked industry[3], yet the sector lags behind when it comes to security. Smart factories are exposed to the same vulnerabilities and attack methods/vectors, similar to what other networks face and as more and more devices are connected to the internet, factories are exposed to more Cyber Risks. Industry 4.0 organisations face new challenges, including: expanded attack surface, cybercriminals interest in industrial enterprise, underestimation of general threat levels lack of understanding of specific threats that result in

[1] https://theprint.in/opinion/a-circular-economy-isnt-just-planet-friendly-its-a-trillion-dollar-market-opportunity/604408/

[2] https://www.globenewswire.com/news-release/2021/10/27/2321903/28124/en/Global-Waste-Recycling-and-Circular-Economy-Market-Report-2021-Revenue-was-457-14-Billion-in-2020-is-Expected-to-Expand-to-517-26-Billion-in-2021-at-a-Growth-Rate-of-13-3.html

[3] https://www.techradar.com/news/industry-40-suffering-major-security-issues

suboptimal selection of controls. Such challenges cannot be addressed solely by technical approaches and solutions, focus should be placed on the people, process, and technology components of these challenges.

Necessary data sharing practices are not enabled, nor spread

The value and culture of data sharing is not fully spread and captured along the manufacturing supply chains and there is still limited evidence on how data sharing can drive circular value and contribute to the shift to circular economy[4]. Overall, MSMEs do not fully understand the benefits of sharing data, and still need to cope with two challenging scenarios. First, the interfaces and data models in manufacturing supply chains are not standardised across data sharing ecosystems and there is no common solution compatible for all the actors. Second, cybersecurity features and data governance agreements are often developed on a case-by-case basis, the level of standardisation is also quite limited in this regard. Thus, the role of open standards and shared best practices is a cornerstone to help MSMEs address actual data sharing challenges regardless of their digitisation state.

2.2. How CIRCULOOS will solve the challenges

In the face of these challenges CIRCULOOS aims to deliver the tools to enable MSMEs to become full members of the Circular Manufacturing value chain. These tools orchestrate and continuously optimise the supply-chain end-to-end and integrate planning and execution monitoring to enable transparent and on-time communication. Combining these with direct calculation of the product sustainability and circularity profile, for both internal and external partners, this environment will enable them to configure and execute disruptive circular manufacturing processes for **sustainable productio**n that covers the entire **life cycle of products; either by recovering the value of product that ended-up as waste or from recycled and remanufactured products.**

To achieve this objective the project aims to deploy:

- Circular end-to-end supply chain orchestration for collaborative workflows which incorporates planning and execution metrics and integrates advanced and multimodal visualisation and analytics. The visualisation is delivered by comprehensive Digital Twins of the supply chains formulated, the factory processes and product design phases.
- Supply Chain Optimisation that monitors the global (across the supply chain) and local (within the factory) processes and execution, inputs and outputs and configuration parameters, to enable data-driven AI decision making, this way supporting continuous optimisation of targeted and measured performance and sustainability parameters.
- Dynamic Sustainability Assessment functionalities that investigate alternative supply-chain scenarios (varying in terms of materials used, processing technologies, suppliers involved and/or activated circular economy practices) in place of the existing schemes, quickly measuring their performance in terms of environmental sustainability and circular economy profile.
- Supply Chain Data Sovereignty platform for seamless, multi-level data flow across the supply chain partners, supporting the reuse of materials in novel products, the extension of the life-cycle of

[4] "Data sharing for circular economy in the Nordics", Nordic innovation, September 2021.

finished products (remanufacturing), and data-driven decisions for collaboration of parties offering matching services in the most dynamic and efficient way.

- Cybersecure and trustworthy data sharing across the supply chain by employing a distributed, trusted and efficient Identity and Access management system, that together with the associated trust framework will coordinate the identities of all IoT objects and ensure trustworthy
- Automatic recognition of recyclable parts by modern Machine Vision tools and Advanced Robotics, to enable optimised flows in the selection process.
- Novel circular business processes will be demonstrated supporting reusing, reducing, and recycling material in production and consumption systems. The new collaborative production models will provide quantifiable results on the sustainability increase across the supply chain, in terms of efficient use of raw materials, of by-products, of waste and energy and of emissions reduction.
- CIRCULOOS leverages the above with the RAMP integrated innovation IOT platform and the European network around it to deliver a CM ecosystem and platform for Manufacturing SMEs.
- Skills upskilling and reskilling will be provided in RAMP and through online courses, webinars, and best practice guides and success stories based on the pilots and Experiments for Demonstration (EXDs).

2.3. CIRCULOOS Pilot Cases

These pilots are already formed beforehand, and therefore, are presenting already formed value chains. In the Open Call 3 (upcoming) we will require to see also the formation of value chains, by presenting alternative options and criteria for selecting the best one with support of CIRCULOOS tools.

Wood Pilot

In an effort to create a more sustainable and efficient business model, three independent wood-related companies have joined forces under a new consortium within the CIRCULOOS framework to produce **sustainable construction panels**. This pilot project aims to integrate their operations, fostering a circular economy approach that maximizes resource utilization, minimizes waste, and enhances overall competitiveness in the industry.

The three companies operating in the Netherlands - each specializing in different aspects of the wood supply chain - have historically operated independently. Circu Leren is a company specializing in modular wood projects, such as wooden houses, using both virgin and recycled wood. The company focuses on modular building materials designed for assembly and disassembly, ensuring an extended lifecycle for their products. This approach allows furniture or houses to be dismantled and repurposed once a customer no longer requires them, enabling the materials to be reused for new constructions and minimizing waste.

HERSO is another company that specializes in collecting and processing waste wood, recycling it into new, high-quality materials for various purposes. They are experts in crafting new furniture from reclaimed wood, giving discarded materials a second life.

Finally, Plennid focuses on repurposing wood from urban trees that have been removed due to disease, storm damage, or city maintenance. Instead of allowing this wood to go to waste, they process and distribute

it to third parties interested in using high-quality reclaimed urban wood, promoting a more sustainable approach to raw material sourcing.

The collaboration among these three companies to produce construction panels facilitates the coordination of production processes, minimizes reliance on virgin wood resources, and reduces environmental impact. Circuleren plans to utilize wood recycled by HERSO from Plennid's reclaimed urban timber to manufacture building applications (in the concept of Wood-As-A-Service, whereby the applications that most of the time are temporary (eg. Pavillions for exhibitions, can be dismantled and wood can return back to HERSO warehouse to be reused for other applications, hence providing a more sustainable alternative to cross-laminated timber (CLT) panels. The sustainability benefits of this integrated alternative will be assessed in GRETA using LCA methodology. The environmental indicators of the proposed system will be compared to those of commercially available CLT to quantify its advantages. This partnership could serve as a CE model within the wood industry, showcasing how small enterprises can collaborate to achieve significant sustainability goals, improve profitability, and strengthen their market position. If GRETA demonstrates positive outcomes, this approach could be expanded to include additional companies, further promoting circular economy principles in the wood sector.

Plastic Pilot

In an effort to establish a more sustainable and efficient business model, three independent companies in the plastics sector have formed a synergy within the CIRCULOOS framework to produce **plastic components with a recycled content**. This pilot project aims to integrate their operations, fostering a circular economy approach that maximizes resource utilization, minimizes waste, and enhances overall competitiveness in the industry.

The two companies, each specializing in distinct aspects of the plastic supply chain, have always operated independently. Thermolympic, based in Zaragoza (Spain), specializes in manufacturing plastic parts for the automotive industry using various moulding technologies. The company faces challenges in incorporating recycled materials due to customer requirements for high-quality, functional, and aesthetically precise parts. Currently, Thermolympic does not recycle its plastic waste, opting for incineration, which releases pollutants and contributes to environmental impact. Contenedores Lolo, the second company located in Spain, focuses on collecting and processing waste plastics. They purchase and collect plastics from wholesalers and retailers, aiming to provide high-quality recycled materials for various applications.

Canonical Robots is the third party in this pilot, contributing to the synergy by offering technological solutions to enhance recycling processes, aiming to improve efficiency and effectiveness in transforming waste plastics into valuable materials. Canonical Robots provide a robotic and vision-based sorting function which identifies the composition of the reclaimed plastic. This is a very important feature guiding procurement of plastic material in Thermolympic and in general in plastic industry.

Thermolympic plans to utilize recycled plastics processed by Contenedores Lolo, incorporating them into their manufacturing processes to produce plastic components that meet both recycled content and quality requirements. Canonical Robots will help to sort the plastic waste of Thermolympic to be processed in Contenedores Lolo. The collaboration among these three entities will be evaluated in GRETA to quantify the potential benefits of coordinating production processes and minimizing reliance on virgin plastic resources, through the reduction of environmental impact.

This partnership could exemplify a CE model within the plastics industry, demonstrating how small enterprises can collectively achieve significant sustainability objectives, enhance profitability, and strengthen market positions. If GRETA shows successful results, this approach could be expanded to include additional companies, further promoting circular economy principles in the plastics sector.

Leather Pilot

In this pilot, two independent companies in the leather goods industry located in Hungary have joined CIRCULOOS project to improve the sustainability of a **leather bag and smaller leather product** using the leftovers in craft activities. This pilot aims to integrate their operations, fostering a circular economy approach that maximizes resource utilization, minimizes waste, and enhances overall competitiveness in the industry.

The two companies are Mototextil and B&A, each specializing in distinct aspects of leather production. They have been operating independently until now. Mototextil Kft specializes in manufacturing leather goods products but currently incinerates leftover leather scraps, leading to significant environmental impact. B&A focuses on producing small leather goods, also generating waste during their manufacturing processes.

Through this collaboration, Mototextil will supply its leather scraps of the production of a leather bag to B&A for repurposing into smaller leather products, effectively reducing waste and minimizing the need for virgin materials. Any materials not utilized by B&A will be listed on a shared marketplace, allowing other interested parties to repurpose them. Some other reuse organizations have also joined the collaboration (e.g. NGOs, kindergarten), who also take over sewing leftovers for own craft activities. The sustainability benefits of the proposed alternative to the stand-alone processes will be evaluated in GRETA. Through a comparative LCA, the benefits of integrating theses 2 companies will be determined.

This partnership could exemplify a CE model within the leather goods industry, demonstrating how small enterprises can collectively achieve significant sustainability objectives, enhance profitability, and strengthen market positions. If successful, this approach could be expanded to include additional companies, further promoting circular economy principles in the leather goods sector.

3. Novel concepts for business that work upwards on the circular pyramid

The aim of the Open Calls new pilots, and extensions, is to propose novel value chains and innovative product development that are aligned with waste hierarchy pyramid to reduce waste and its negative environmental impact, particularly on climate change. The waste hierarchy prioritizes waste management options, which from bottom to top move from more linear to more circular practices and thus expected LCA indicators improvements. Also moving in the opposite direction, there is trend to keep the product and extend its life at the end, or moving down to smaller pieces of products till the recovery of its raw materials. By promoting a circular model, where products are increasingly reused or repurposed, the need for new production is reduced, cutting down on resource consumption.

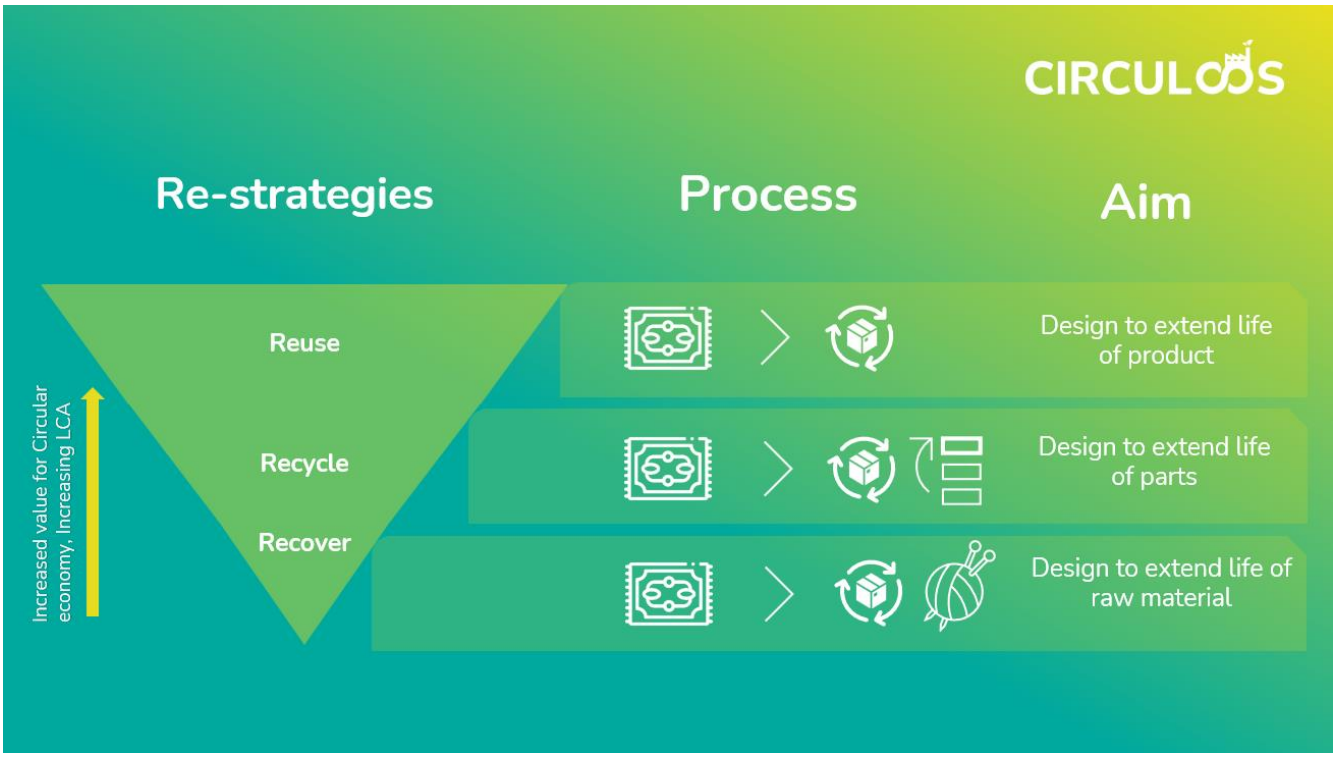

Figure 2 - Circular Pyramid representation

The principles outlined in the waste hierarchy can be generalized across various industries to create more sustainable systems. For example, in the manufacturing sector, companies can adopt lean production methods to reduce waste, reuse parts or products, recycle materials, recover energy from production by-products, and minimize landfill use.

By applying the waste hierarchy across different industries, businesses can contribute to a more sustainable and circular economy, focusing on reducing environmental impacts while optimizing the use of resources. This framework encourages industries to rethink waste as a valuable resource, and reverse the current mentality whereby it is considered as something to be discarded. On the contrary considered as a resource, it has intrinsic value and offers an opportunity to recover, repurpose, and reuse materials in innovative ways.

Here's an example of how the waste hierarchy applies to textiles found in the literature[5] :

- Reuse: Extending the life of products by using them again for their original purpose or finding new applications. Swapping, donating, reselling used clothing, renting textiles, repairing clothes, and repurposing damaged or returned items.
- Recycle: Processing waste materials into new products or materials. An idea here is to design products for closed-loop recycling, where materials are recycled back into the same product. Textiles that are no longer suitable for reuse can be recycled into new materials, such as fibers for creating new clothing or non-clothing products. Recycling helps to close the loop, reducing the need for virgin materials and lessening the environmental burden of producing textiles from scratch. Mechanical and chemical recycling processes support this transition.
- Recovery: Converting waste into energy and fibers. When textiles cannot be reused or recycled, another option is energy recovery. For example, this involves converting waste materials into energy processes like incineration. Although this step is not as preferable as the others, it can be a more sustainable option than landfill disposal, as it recovers some value from the waste.

- Disposal: Safe and responsible disposal of waste that cannot be prevented, reduced, reused, recycled, or used for energy recovery. Out of scope any activity here in CIRCULOOS project.

4. How does this apply to Open Call 3.1?

To accelerate the transition toward **circular manufacturing**, CIRCULOOS is launching **Open Call 3.1 (OC3.1)**, which enables single entities to extend the existing CIRCULOOS pilot value chains by introducing new R-strategies or enhancing existing ones. Selected entities will contribute by improving resource recovery, refining manufacturing processes, or identifying new market players to strengthen circularity.

This call has the goal to strengthen **circular economy practices. A new open call, named** Open Call 3.2 (a third one) will be launched at a later phase (tentatively 2026) with the goal to **strengthen the existing supply chains or the new ones selected on Open Calls 2 & 3.1, and will offer new products and/or new value chain options for collaboration (eg. to reduce a specific product's LCA indicator, or work on a specific R-Strategy not introduced with current supply chain)**.

IMPORTANT NOTE:

Applicants may submit proposals to Open Call 3.1 and can also apply multiple times. However:

- *Each entity can submit **a maximum of two applications per open call**.*
- *While multiple applications are allowed, each entity can only be **awarded funding for one proposal**. If an entity is selected for more than one project, it must choose which one to proceed with.*
- *No entity can receive more than **€60,000 in total** across all CIRCULOOS open calls.*

[5] https://www.interface.com/US/en-US/sustainability/recycling.html

- ***Double funding*** *for the same activities is strictly prohibited.*

The sections below provide detailed descriptions of **Open Call 3.1 (OC3.1)**, helping applicants determine how their expertise and project goals align with the available funding opportunities.

4.1. OC3.1: Enhancing CIRCULOOS Pilot Cases

Objective: Strengthen CIRCULOOS pilot value chains by **integrating new circular economy solutions** into existing projects.

How It Works:

Participants will collaborate with pilot stakeholders to:

- **Introduce new R-strategies** – Expanding recovery and reuse options within pilot industries.
- **Enhance existing processes** – Improving sorting, remanufacturing, or recycling efficiency.
- **Validate & refine CIRCULOOS digital tools** – Using real-world data to optimize lifecycle tracking and sustainability assessment.

CIRCULOOS is establishing **three pilot cases** as testbeds for circular manufacturing solutions, focusing on innovative concepts for **leather scrap reuse, circular using reclaimed wood (introducing the "wood as a service" concept), and plastic recovery by increasing the percentage of recycled materials** (for more information, please see section 3) These pilots demonstrate novel value chains for material reuse, waste reduction, and sustainable manufacturing.

In this context, OC3.1 **invites individual entities**—such as **technology providers, material innovators, recyclers, upcyclers, waste collectors, complementary manufacturing factories, designers**, etc.—to join the CIRCULOOS pilot cases. These participants will bring specialized expertise and solutions to enhance existing processes, extend them, offer more sourcing options for reclaimed materials, or design and produce new products that increase circularity. Unlike OC2, which supports the formation of new supply chains, OC3.1 focuses on **strengthening pre-existing pilots**. It **emphasizes regional collaboration to validate, optimize, and scale circular strategies for industrial adoption**.

4.1.1. Key Activities Required for OC3.1 Experiments:

Participants will collaborate with pilot stakeholders and technical teams to test, refine, and integrate the tools developed within the project. These tools address critical areas such as:

- Data Sharing and Value Chain Formation: Facilitating seamless data exchange and value chain development for specific indicators improvement.
- Orchestration/Optimization and Execution Tools: Improving supply chain management and factory workflow based on specific indicators through advanced tools.

- Automated Data Capturing for Reclaimed Materials and Products: Streamlining data collection processes.
- Robotic Supported Sorting: Implementing efficient sorting processes with robotics and robotic embedded vision systems.
- Life Cycle Assessment (LCA) Tracking: Monitoring environmental impacts throughout product life cycles.

The experiments under OC3.1 will focus on:

- Extending Circular Sourcing and Adding New R-Strategies: Expanding sourcing options and incorporating new circular strategies for novel products.
- Enhancing existing Pilots Capabilities: Integrating advanced sorting, remanufacturing, and recycling processes to extend life- cycle of existing products or create new products from parts or reclaimed materials.
- Validating and Improving CIRCULOOS Digital Tools: Refining CIRCULOOS tools for tracking material flows, sharing and composing production processes, assessing sustainability indices, and optimizing circular value chain management.
- Developing New Methods for Scaling Circular Strategies: Ensuring practical implementation in industrial environments with real market potential as successful circular products for inspiring further innovation.
- Capturing Real-World Data and Feedback: Refining circularity indicators to measure sustainability performance impact.

Selected participants will play a crucial role in shaping the next generation of circular manufacturing processes, contributing to the long-term transformation of European industry towards more circular, sustainable, and resource-efficient future.

4.2. Adopting CIRCULOOS tools:

CIRCULOOS aims to establish a Circular Manufacturing (CM) ecosystem with the vision to bring together tools and a pioneering ecosystem of circular value chain actors, thus becoming the European Hub for Circularity in the European regions. The initial version of tools and platform are being co-developed by CIRCULOOS consortium including technical teams and 3 initial value chain pilots already partners.

The applicants from the Open Call #3.1 are obliged to use in their experiments the following tools as:

- Mandatory: RAMP, Circuloos data platform, LifeCycle Assessment Tool, Supply Chain Digital Twin, Supply Chain Orchestrator
- Optional: Supply Chain Optimization tool

It is noted that in cases where the mentoring team and the CIRCULOOS Consortium find that added value can be gained in the supply chains created by OC3.1, they may recommend the use of some of the optional tools. This is to be understood as a collaborative effort between the OC3.1 experiment and the responsible of the CIRCULOOS tool. In any case, clear identification of the necessary data for each of the optional tools is mandatory, even if the optional tools are not selected to be implemented by the applicants.

These tools in more details are:

- **Circuloos Data Platform:** collects data from the production facilities by connecting IoT devices; data is sent to a central repository hosted by European Dynamics - respecting the ownership of data; data models have been created for the entities handled by the project; the experiments will need to extend these data models if different business entities are handled by the experiment.
- **Supply Chain Optimization tool (SCOPT)**: is a tool that proposes optimal (or optionally sub-optimal) solutions to intra-factory logistics of the pilot or the circular supply chain arrangement based on data available on the Data Platform. The optimization metrics are based on the available LCA indicators. For the utilization of the SCOPT tool, information regarding the following needs to be made available: the factory input resources/material, output products, waste production, internal processes as well as the interaction of the factory with suppliers and consumers. Moreover, information of envisioned or active circular supply chains should be provided that are based on real data (i.e. actual supply chain actors). For each of the above information categories, an array of alternative options (wherever possible) needs to be provided. An example could be the following: consider the Factory X utilizes 4 different raw materials that pass through 5 different operations in order to produce 2 different final products and scrap. The Factory X interacts with Factory A and Factory B to receive raw materials, with Factory D to provide its final products and with Factory E to provide its scrap. The raw materials are considered as input resources, the final products are considered as output products and the scrap is the waste. Moreover, the suppliers and the consumers are needed to be specified. In this example the suppliers of Factory X are: i) the Factory A that provides raw material A and raw material B and ii) Factory B that provides the raw material C and raw material D. The consumers of Factory X are: i) the Factory D that receives the final products and ii) the Factory E that receives the scrap. Additionally, the relevant cost indicators should be provided for each process (i.e. CO_2 emission or energy consumption per process). Following this example, the intra-factory logistics of Factory X as well as the interaction of Factory X with suppliers and consumers is defined.
- **Supply Chain Digital Twin (SCDT):** is a tool to simulate and visualize the factory operation and its supply chain arrangement. SCDT uses the data available on the Data Platform to provide a visual representation of the factory inputs, outputs, and internal processes as well as the interaction between the factories in the supply chain. SCDT can simulate the solutions for the factory or the supply chain provided by the SCOPT. SCDT requires the same information that is provided to SCOPT.
- **Supply Chain Orchestrator:** orchestrator of business and manufacturing processes using Business Process Models; it is backed by a cloud deployment of the Camunda Engine and uses standard Business Process Management Notation (BPMN).
- **RAMP Marketplace:** acts as the entry point for accessing the technical tools of the Circuloos platform, the registration of businesses adopting circularity practices, their interaction (in the form of establishing new business relationships) and the finding of available resources or potential collaborators.
- **LifeCycle Assessment Tool (GRETA):** retrieves data, mainly LCI (Life Cycle Inventory), calculates environmental indicators, and reports these assessments back to the Circuloos Data Platform. This data can be utilized by other tools, such as Supply Chain Optimization, to perform various analyses and optimizations at both the factory process and supply chain levels. GRETA may also directly interact with end users, including sustainability experts from MSMEs, workers, and employees, through the front end, providing valuable insights into the environmental impacts of specific

processes and products. GRETA platform should be utilised to assess the benefits in term of environmental point of view by the consortia built during the Open Calls. The use of the platform will be either direct (i.e. the end users from the consortium interact with the platform) or mediated by SUPSI as owner of the solution and of the expertise in environmental assessment. The use of other tools, for instance provided and/or already in use within the consortia, for the same purpose is not allowed as the scope of the open call is to test the CIRCULOOS platform and application landscape.

5. Who can apply?

5.1. OPEN CALL 3.1 (Single Entities Joining Pilots):

The following type of singly entities are eligible for this Open Call:

- Manufacturing European mid-caps and MSMEs (as defined in EU law – EU recommendation 2003/361[9]) with a commercial activity in the manufacturing industry as a producer, or a technology/ service supplier for applications in the manufacturing industry
- Recycling & Processing Companies that add new recovery solutions
- Any necessary technical role for integration or technical development to offer automation, sorting, or data management solutions, etc. should be assumed by the entity above with or without external support via sub-contracting, which must be clearly justified.

Applications from single entities are only permitted under OC3.1, which contribute to the extension of the existing CIRCULOOS pilot cases (presented above, see section 3.C).

5.2. Eligible Countries

Applying entities must be based in:

- The Member States (MS) of the European Union (EU), including their outermost regions.
- The Overseas Countries and Territories (OCT) linked to the Member State[6];
- Horizon Europe associated countries (those that have signed an agreement with the EU as identified in Article 7 of the Horizon 2020 Regulation): according to the updated list published by the EC (please check the document in the footnote[7]);
- UK applicants are eligible under the conditions set by the EC for Horizon Europe participation at the time of the deadline of the call.

[6] Entities from Overseas Countries and Territories (OCT) are eligible for funding under the same conditions as entities from the Member States to which the OCT in question is linked.

[7] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/list-3rd-country-participation_horizon-euratom_en.pdf

6. Submission Process

Entities interested in applying to CIRCULOOS Open Call 3.1 must register on the F6S platform, which will serve as the main interface for managing the submission and evaluation process. The official application portal will be available at:

6.1. Steps for Submission

Applicants must follow these steps when preparing their proposal:

- Create an F6S account (or log in if they already have one).
- **Navigate to the CIRCULOOS Open Call 3.1 page** and review all provided information:
    - Open Call 3.1: https://www.f6s.com/circuloos-open-call-3.1/apply
- Complete the online application form on the F6S platform and provide all mandatory information.
- Attach all required documentation, ensuring:
    - For OC3.1 applicants: Submit Annex III (Application Form for OC3.1) in PDF format with the following naming: **[Lead_Applicant_Name]_OC3.1_Application.pdf.**
- **Review contractual obligations in advance:** Applicants are strongly advised to review Annex IV (Sub-Grant Agreement) and the relevant Declarations of Honour before submission, as they will be mandatory for selected applicants.
- **Ensure timely submission:** It is highly recommended that applicants submit their proposal well before the deadline to avoid last-minute issues. Late submissions will not be accepted under any circumstances.
- **Resubmission requests:** If an error is discovered before the deadline, applicants may contact the CIRCULOOS team via [support email] to request a correction. However, resubmissions may not be possible if requested within 48 hours of the deadline.
- **Deadline extensions:** Extensions will only be granted in the case of significant technical issues affecting the F6S platform. If an extension is applied, all applicants will be notified accordingly.

Failure to submit a complete proposal before the deadline will result in automatic disqualification from the Open Call.

6.2. F6S Platform

The F6S platform allows applicants to edit and save drafts before final submission. However, once submitted, applications cannot be modified. Applicants are strongly advised to review their entries carefully before clicking submit.

- Detailed information about the Open Call application process and all relevant documentation can be found at the CIRCULOOS Open Call page on the CIRCULOOS website.

- Applicants are required to apply online by filling in the CIRCULOOS online application form on the F6S Platform and to answer all mandatory questions with no exception. This is the only way of applying to the CIRCULOOS Open Call.
- Only submissions before the deadline will be accepted. After the official CIRCULOOS Open Call closure **(11th of June 2025 at 17:00 CET),** no additions or changes to the submitted application form will be considered.
- Requests or inquiries about the submission process or the Open Call itself, received after the closure of the Open Call will neither be considered nor answered.
- It is strongly recommended not to wait until the last minute to fill in and submit your application form.
- Be specific and concise when answering the questions – they have character limitations.
- Applicants that do not accept the CIRCULOOS Open Call terms and conditions listed in the online application form will be declared non-eligible.
- The CIRCULOOS application form is self-contained. Additional materials and/or hyperlinks to additional information, which have not been specifically requested in the online application form, will not be considered by the evaluators.
- Please do not consider the limit of the characters under each section as a target! It is in your interest to keep your text as concise as possible since evaluators rarely view unnecessarily long applications in a positive light.
- If the applicant discovers an error in the application form, and if the Open Call deadline has not passed, the applicant may request support to open again, and/ or re-submit the proposal at: support@f6s.com
- The platform also enables applicants to receive notifications and updates regarding their application status.
- For any other inquiries related to the Open Call, the applicants can send email at: circuloos.eu@gmail.com

All applications must be submitted **before the deadline on 11th of June 2025, at 17:00 CET**. Late submissions, incomplete applications, or non-compliant proposals will be **automatically disqualified**.

7. Proposal Documentation

CIRCULOOS Open Call 3.1 is supported by the following documentation, which can be accessed on the official project website (https://circuloos.eu/open-calls/). Applicants must carefully review all relevant materials before proceeding with their submission.

The following annexes are required for the application process and must be completed and submitted via the F6S platform:

- **Annex I** – Guidelines for Applicants (this document).
- **Annex III** – Application Form for Open Call 3.1 (OC3.1), to be filled and submitted on F6S.
- **Annex IV** – Sub-Grant Agreement (SGA) template, outlining the contractual obligations for selected beneficiaries.
- **Annex V** – Bank Account Information Form, required for financial transactions for selected beneficiaries
- **Annex VI** – Consortium Declaration of Honour, to be signed by all OC3.1, to be signed by selected OC3.1 applicants
- **Annex VIII** – SME Declaration, assessing the SME status of selected applicants.

8. Grant & maximum funding per third-party

Open Call #3.1 will fund €60,000 per entity. **The applicable funding rate for every project will be 60% of the eligible costs for profit making entities, or 100% for non-profit or academic organisations.**

Therefore, the open call 3.1 will provide a maximum **of €60,000 grant (total cost of maximum 100K).** Funds will be disbursed based upon the successful delivery and approval by the CIRCULOOS project, of the submitted technical and business reports and demonstrators, along the 9-month implementation program, scheduled to launch with the contract signature of the winning consortia.

An estimated number of 6 entities will be funded up to the total of the available budget of 360k€.

IMPORTANT NOTE: Applicants should be aware that to receive the 60% funding from CIRCULOOS Open Call #3, they must contribute 40% of their own funds.

The financial support is provided through the **Financial Support to Third Parties (FSTP) framework**, meaning recipients are not direct beneficiaries of Horizon Europe but instead receive funding through the CIRCULOOS project.

To maintain financial transparency, **each funded entity must provide a detailed budget breakdown** as part of their proposal submission. This must include estimated costs for personnel, subcontracting, equipment, and other relevant expenses. The budget should align with project objectives and proposed work and reflect a cost-effective approach to achieving measurable results. The budget will be evaluated for its alignment to the proposed concept and methodology in Criterion 3 (implementation).

9. Origin of Funds

Selected applicants under CIRCULOOS Open Call 3.1 will receive funding through a sub-grant funding agreement with the CIRCULOOS consortium. The funds originate directly from the **Horizon Europe programme,** under the European Commission Grant Agreement **No. 101092295**. These funds remain the property of the **European Union** until the final balance payment is completed. The management rights of these funds have been transferred to the **CIRCULOOS project consortium** in accordance with the terms outlined in the grant agreement.

As part of the funding process, beneficiaries will enter into a **Sub-Grant Agreement (Annex IV)** with the CIRCULOOS consortium, which establishes the financial, technical, and reporting obligations that the funded projects must comply with. This agreement will outline:

- The **funding structure,** including maximum financial contributions and payment conditions.
- The **monitoring and reporting requirements**, ensuring proper documentation and progress tracking.
- The **obligations of sub-grantees to align with Horizon Europe** regulations, including compliance with ethical standards, open science policies, and dissemination of results.

The CIRCULOOS consortium is responsible for **overseeing the disbursement of funds** and ensuring that selected projects meet the necessary criteria and milestones as set by the European Commission. Beneficiaries are required to **adhere to the contractual obligations** stated in the Sub-Grant Agreement, ensuring their activities contribute to the overarching objectives of CIRCULOOS in advancing **circular manufacturing solutions**.

10. Evaluation Process

10.1. Eligibility

After submission, all proposals will go through a **formal eligibility check** to ensure compliance with basic application criteria. This process involves verifying:

- Whether the proposal was **submitted on time**.
- Whether the applicant meets the **eligibility criteria** (entity type, location, and role in the consortium).
- Completeness of the required **supporting documentation**.
- Compliance with **financial and co-funding requirements**.

Proposals that **fail any of these eligibility criteria** will not proceed to the **evaluation phase**. The CIRCULOOS team will notify applicants if their proposal is deemed ineligible, and no further revisions will be allowed after the deadline.

To avoid disqualification, applicants should double-check their submissions for **accuracy and completeness** before submitting. In cases where eligibility is unclear, applicants may be contacted for additional clarifications.

10.2. Evaluation Criteria

Eligible proposals will be evaluated by **a panel of two external experts and one internal expert (partner from CIRCULOOS consortium)** based on the following criteria:

1. Excellence (0-5 points)

- Clarity of objectives, well-documented and convincing **circular value chain scenario extension, and R-strategy**.
- Clear evidence of the novelty introduced in the proposed product and value chain by comparing both the existing alternative business, market trends and the novel product and production processes.
- Clear description of the technical approach to implement the demonstrator, to document the role of the value chain actor in close connection with the other actors, the data shared for the formation of the value chain for the specific R-strategy and description of how the selected **CIRCULOOS technical tools** will be used. Clear description of the data to be provided for the use of the optional tools even if not be directly used by the consortium.
- The obligatory tools, optional tools and new tools proposed make good value and are well documented in the support of the concept to be demonstrated.
- The data to be captured and shared are clearly presented.
- Measurable indicators to be improved across the value chain.

2. Impact (0-5 points)

- Potential impact and added value to the circular economy in the specific sector.
- Who is the target audience of this product and why would they like to buy the product?
- The potential of the value chain actors to sustain/extend/alter the value chain in the future, and document the business opportunity.
- Estimated potential environmental (quantified), economic, and potential social impact of the above demonstration (eg. reduced use of raw material, reduced cost of material sourcing, or reduced overall cost of product, or more efficient value chains, social benefits, etc.)

3. Implementation and resources (0-5 points)

- Technical feasibility and realistic work plan, timeline, and deliverables.
- Deliverables include suitable demonstrators, dissemination and business impact estimation in terms of LCA improvements, and other relevant parameters.
- Clear roles, competence and experience of the new entity and their envisaged work and complementarity with existing pilot actors.
- Capacity to execute the project by the profiles of the key people and their previous expertise.
- Convincing budget allocation and justification of all expenses.

Each criterion is scored from **0 to 5**, with a **minimum threshold of 3 per criterion** required for a proposal to be considered.

10.3. Scoring and Thresholds

Each proposal receives a total score out of **15 points**, based on three evaluation criteria (Excellence, Impact, Implementation & Resources), each scored from 0 to 5.

To be considered for funding, a proposal must:

- Achieve a minimum score of **3/5** in **each** evaluation criterion.
- Receive an overall score of at least **10/15**.
- Rank within the available funding budget based on the highest scores.

In the event that two or more proposals receive the same total score, the selection committee will prioritize proposals based on the **higher impact potential** and **feasibility of implementation**.

10.4. Ranking and Selection of Proposals

Once proposals are scored, they are ranked in descending order. The highest-ranked proposals will be shortlisted for funding until the allocated budget is exhausted. The number of projects funded will be **a total of 6 entities for OC3.1**, or until the available budget is exhausted.

Only proposals that pass the evaluation threshold (**10/15 points**) and achieve at least **3/5 in each individual criterion** will be considered for selection. If an insufficient number of proposals meet the threshold, the remaining budget may be reallocated to future open calls.

All applicants will receive **individual feedback** on their evaluation scores, highlighting strengths and areas for improvement.

- **Selected applicants** will be invited to the **grant agreement phase**.
- **Rejected applicants** will receive a **formal rejection letter** via email.

11. Implementation and Reporting

Project Execution Framework

Once selected, funded projects will enter the **implementation phase**, for Open Call 3.1 projects will run for 9 months (September 2025 – June 2026). During this period, beneficiaries must **execute their proposed activities**, achieve key milestones, and comply with reporting and monitoring requirements. Each project will be guided by the **detailed work plan which will be provided at the proposal and a relevant mentoring team to be established from CIRCULOOS project**, ensuring that the objectives outlined in the proposal are effectively met.

The execution framework is structured into phases, each with defined deliverables and monitoring checkpoints. The first stage involves onboarding and initial setup, where selected entities will meet with the CIRCULOOS coordination team to finalize work plans, clarify reporting requirements, and gain access to relevant resources such as CIRCULOOS technical tools and pilots. The payment schedule is directly linked to the relevant stages of the awarded project, and payments will be disbursed in instalments according to the following tentative schedule:

Phase/Stage	Date	Requirements	Amount (%)
Pre Financing	M1	Sub-grant agreement must be fully signed by both parties.	30%
Interim Review	M3	Mid-term of the demonstrator following the successful assessment of deliverables and milestones due by M3.	30%
Final Review	M9	At end of the demonstrator project following the successful approval of ALL deliverables and milestones by the CIRCULOOS consortium.	40%

During the implementation phase, projects will be expected to engage in **collaborative knowledge-sharing activities**, leveraging the CIRCULOOS teams to exchange insights, refine methodologies, and strengthen impact.

Entities working within **OC3.1 pilot value chains** must actively participate in technical and pilots planning and design evaluations and integrate into the existing value chains demonstrations by adding new use cases/extending them.

Project execution will be monitored through a **structured review process**, where beneficiaries submit periodic progress updates. These reviews ensure that activities remain aligned with funding conditions and that challenges are identified and addressed early. Beneficiaries who fail to meet their commitments may be subject to **corrective actions or funding adjustments**.

To ensure continuity and scalability, each project must also provide a **sustainability and some market analysis to position the new value chain in the market, and a potential roadmap for achieving this,** in its final report. This strategy should outline how the developed circular value chain can be **maintained, scaled, or commercialized beyond the funded period**, reinforcing long-term benefits for the industry.

12. Redress process

Within three (3) working days of receiving (1) a rejection letter informing the proposal as non-eligible or (2) an ESR of non-acceptance, an applicant may submit a request for redress if they believe the results of the eligibility checks have not been correctly applied, or if they feel that there has been a shortcoming in the way their proposal has been evaluated.

In such a case, an internal review committee from CIRCULOOS will examine the applicant's request for a redress. The committee's role is to ensure a coherent interpretation of such requests, and equal treatment of applicants. Requests for redress must:

- Be related to the evaluation process or eligibility checks.
- Clearly describe the complaint (in English).
- Sent by the entity's legal representative that has also submitted the proposal.

The committee will review the complaint and will recommend an appropriate course of action. If there is clear evidence of a shortcoming that could affect the eventual funding decision, it is possible that all or part of the proposal will be re-evaluated. Please note:

- This procedure is concerned only with the general evaluation and/or eligibility checking process. The committee will not question the scientific or technical judgement of the evaluators.
- A re-evaluation will only be carried out if there is evidence of a shortcoming that affects the final decision on whether to fund the proposal or not. This means, for example, that a problem relating to one evaluation criterion will not lead to a re-evaluation if a proposal has failed anyway on other criteria.
- The evaluation score following any re-evaluation will be regarded as definitive. It may be lower than the original score.

All requests for redress will be treated in confidence and must be sent to the CIRCULOOS team at: circuloos.eu@gmail.com

13. Additional considerations and Responsibilities of the beneficiaries

The selected entities are indirectly beneficiaries of EC funding. Therefore, selected entities are responsible for the appropriate use of the funding and must comply with obligations under Horizon Europe specific requirements as described in Horizon Europe. Specific details and guidelines related to all aspects of the responsibilities of the beneficiaries are provided in the sub-grant agreement.

13.1. Conflict of interest

Beneficiaries must take all measures to prevent any situation where the impartial and objective implementation of the sub-project is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest ('conflict of interest'). They must formally notify the CIRCULOOS coordinator without delay of any situation constituting or likely to lead to a conflict of interest and immediately take all the necessary steps to rectify this situation. The CIRCULOOS coordinator will verify if the measures taken are appropriate and may require additional measures to be taken by a specific deadline. If a sub-granted project consortium member breaches any of its obligations, the sub-grant agreement may be automatically terminated. Moreover, costs may be rejected.

13.2. Checks and reviews

The EC may, at any time during the implementation of the sub-project and up to five years after the end of the sub-project, arrange for a check and review to be carried out, by external auditors, or by the EC services themselves, including the European Anti-Fraud office (OLAF). The procedure shall be deemed to be initiated on the date of receipt of the relevant letter sent by the EC. There will be no financial checks, reviews, or audits to check costs, since beneficiaries have no obligation to document the costs incurred for the action. Checks, reviews, and audits will focus on the technical implementation of the action.

13.3. Promoting the action and give visibility to the EU funding

The beneficiary must promote the sub-project, the CIRCULOOS project and its results, by providing targeted information to multiple audiences (including the media and the public) in a strategic and effective manner and to highlight the financial support of the EC.

13.4. Data protection

To process and evaluate applications, CIRCULOOS consortium will need to collect personal and industrial data. F6S Network Ireland Limited (F6S), will act as Data Controller for data submitted through the F6S platform for these purposes. Please see our privacy policy here. A Data Protection Officer (DPO) has been appointed by F6S generally, to ensure compliance with data protection regulations, such as the General Data Protection Regulation (GDPR), and that personal data is collected, processed, and stored in a secure manner. The F6S platform's system design and operational procedures ensure that data is managed in compliance with the General Data Protection Regulation (EU) 2016/679 (GDPR). Each applicant will have to accept the F6S terms to ensure compliance. Please refer to https://www.f6s.com/privacy-policy to review the F6S

platform's privacy policy and data security policy. Apart from the F6S platform, data will also be stored in the F6S Google Drive. Please note that the CIRCULOOS consortium must retain generated data until five years after the balance of the CIRCULOOS project is paid or longer if there are ongoing procedures (such as audits, investigations or litigation). In this case, the data must be kept until the end.

14. Contacts

- Contact: circuloos.eu@gmail.com
- Apply via: https://www.f6s.com/circuloos-open-call-3.1
- More info at: https://circuloos.eu/

15. Complementary Annexes

- Annex I - CIRCULOOS – OC3.1 Guidelines for Applicants (This document)
- Annex II – Application Form for Open Call 3.1 (OC3.1), to be filled and submitted on F6S.
- Annex IV – Sub-Grant Agreement (SGA) template, outlining the contractual obligations for selected beneficiaries (this document).
- Annex V – Bank Account Information Form, required for financial transactions.
- Annex VI – Consortium Declaration of Honour, to be signed by all OC3.1 consortium members.
- Annex VIII – SME Declaration, assessing the SME status of applicants.

CIRCULOOS

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