ManuREfinery

D7.8.- Initial Quality Assurance and Risk Management Plan

Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

GRANT AGREEMENT NUMBER	101157679
DELIVERABLE NAME	Initial Quality Assurance & Risk Management Plan
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LEAD BENEFICIARY	ITA
CONTACT PERSON	José R. Valdés (ITA)
DISSEMINATION LEVEL	PU – Public
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PROJECT DETAILS

ACRONYM	MANUREFINERY
Title	Smart modular mobile biorefining of manure to zero-waste maximising resource and nutrient recovery for feed and fertiliser bioingredients in rural areas
Grant Agreement Number	101157679
Call	HORIZON-JU-CBE-2023
Project Coordinator	INSTITUTO TECNOLOGICO DE ARAGON (ITA)

DELIVERABLE DETAILS

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Work package	WP 7
Deliverable leader	ITA
Deliverable author(s)	José R. Valdés

REVISION HISTORY

VERSION	DATE	REVIEWER	MODIFICATIONS
1.0			

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DISCLAIMER

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INTRODUCTION

Quality Assurance and Risk Management issues constitute a monitoring process that will run during the lifetime of the project in order to continuously evaluate the quality of the work and the deliverables as well as to assess technical and management risks.

1. QUALITY ASSURANCE

One important factor to ensure the project quality is a constant examination of the work, assessing it against the planned objectives. The main quality assurance objectives are:

- Ensuring the quality of the deliverables that have to be submitted.
- Ensuring the quality of the internal documents and processes.
- Ensuring that the project remains in line with the Description of the Action.

A series of tools and procedures have been foreseen in order to achieve these objectives.

1.1. Supporting documents

There are several documents that provide crucial information about the project and its contractual objectives and obligations:

- The Consortium Agreement (CA), which defines the legal arrangements between the Consortium partners.
- Description of Action (DoA) Parts A and Part B, which provide a complete and detailed description of the project and work plan.
- The Grant Agreement (GA) which sets out the rights and obligations and the terms and conditions applicable to the grant awarded to the beneficiaries for implementing the action

1.2. Project templates

Several templates have been/will be designed for the different project documents that might be needed along the project duration. These templates will be available to all partners in the WP6 folder of the Teams project platform.

- Logo. BIOEAST has created a brand logo and selected the project website domain
- Presentation Template
- Deliverable Template
- Letterhead
- Internal document template
- Poster
- Roll-up
- Brochure/Flyer
- Postcard
- Invitations (to events)

1.3. List of Open Points (LOP)

The list of open points are documents that help to minitor the progress of the different work packages and valorisation lines. They are available on the Teams platform, in the document repository of each WP and line. These LOPs have to be updated by the WP and valorisation line leaders with the feedback of the task leaders and the partners involved. It is the responsabilityt of

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the WP leader or line manager to keep these files updated. This will allow the management team and the consortium to have a clear view of how the project progresses, with a clear view of the actions that are finished, in progress or planned. These actions are organised per task and include essential information such as responsible person, status, associated deliverables, deadlines and comments.

At the practical project level, it has been decided that WPs 2 and 3 will be managed by valorisation line. In order to do that, a valorisation line manager has been nominated for each valorisation line: UZ will manage the gas line, ITA the solid line and UVA the liquid line. The valorisation line managers will coordinate and track the progress of the design, construction and commissioning of the lines, in close collaboration with the unit designers & developers (SYS, BIO2, COL, DET, UG), the models & digital twin developers (ITA, UZ), the bio-ingredients evaluator (CEL) and the farm owners (INT, DEN, KIS, AGRO). All the tasks of WPs 2 and 3 can be distributed among the lines: there are some tasks that belong to one line and some tasks that have to be carried out for the three lines.

The following figures show the initial LOPs for WPs 1,4,5,6. The LOPs for the valorisationline sare not shown for confidentiality reasons:

Smart modular mobile biorefining of manure to zero-waste maximising resource recovery for feed and fertiliser bioingredients in rural areas

Version Log:	1
WP Leader - Issued by:	UVA
Date:	01/09/2024

ManuREfinery List of Open Points

WP	Task	Open Point ID	Action	Time schedule	Entry date	Target Date	PRIORITY	Leader	Owner/ Responsible person	Other partners involved	Progress %	Finish Date	Related Open Points /Tasks / Deliverables	Comments
1			Framework, methodology and drivers	Feb21-Jul23				LEAR						
	1.1		Methodological Framework	Sep24-Nov24				ITA						
		1.1.1	Definition of different working groups		01/09/2024	31/10/2024		ITA	P.González	ALL			D1.1	
		1.1.2	Map the inputs and outputs (Team alignment maps)		01/09/2024	31/10/2024		ITA	P.González	ALL			D1.1	
		1.1.3	Summary of data flow (inputs/outputs)		01/09/2024	25/11/2024		ITA	P.González	ALL			D1.1	
		1.1.4	Preparation of D1.1 (M9)		07/11/2024	30/11/2024		ITA	P.González	ALL			D1.1	
	1.2		Potential regulatory and societal barriers and SSbD approach	Sep24-May25				ITA						
		1.2.1	PESTLE analysis		24/09/2024	31/03/2025			G. Ibarz	UVA, UGENT, SYS, COL, DET, BIO2, AGRO, FERT, CEL, UNIF, INE, IPT, BIOEST			D1.2	
		1.2.2	SSbd Framework		21/10/2024	31/03/2025			G. Ibarz				D1.2	
		1.2.3	Preparation of D1.2 (M9)		01/04/2025	30/04/2025			G. Ibarz				D1.2	
	1.3		Technical requirements	Sep24-May25				UVA						
		1.3.1	Characterization and technical requirements of the gas emission, pig manure and dried digestate	Nov-March 2025	31/10/2024	01/04/2025	✓	UVA	UVA	Inter, Dev, Agro, Kis, Col, Sys, UVA, Bio2		01/04/2025	D1.3	Information requested to partners for a second time
		1.3.2	Final requirements of the bioingredients	Nov-March 2025	31/10/2024	01/04/2025	✓	UVA	UVA	Agro, Guss, Fert		01/04/2025	D1.3	Information requested to partners for a second time
		1.3.3												
	1.4		Strategies for local deployment in rural areas	Sep24-May25				INE						
		1.4.1												
		1.4.2												
	1.5		Gender dimension	Sep24-May25				ITA		AGRO				
		1.5.1	Review of literature and reports related to gender dimension when designing technologies and engineering.	Sep-Nov 24										
		1.5.2	Review of tasks where gender dimension will be more relevant (WP2). Definition of guidelines and specifications.	Nov24-March25										
		1.5.3	First version of DLV 1.5: "Design for All principles: Gender Dimension in Manurefinery"	March-Apr25										
		1.5.4	Final document submission	Apr-May25										

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ManuREfinery	Smart modular mobile biorefining of manure to zero-waste maximising resource recovery for feed and fertiliser bioingredients in rural areas List of Open Points	Version Log:	1
		WP Leader - Issued by:	ENCO
		Date:	01/09/2024

WP	Task	Open Point ID	Action	Time schedule	Entry date	Target Date	PRIORITY	Leader	Owner/ Responsible person	Other partners involved	Progress %	Finish Date	Related Open Points /Tasks / Deliverables	Comments
5			Market analysis, business models and exploitation	Sep24-Aug28										
	5.1		Seeking synergies among local rural stakeholders engagement and c	Sep24-Aug28				INEUVO						
		5.1.1	Identification of local rural stakeholders, primary producers, end-users and other relevant actors in combination with T1.4											
		5.1.2	Consultation with stakeholders (at least one meeting to organise next steps and get first insights)											
		5.1.3	Definition and sending out of stakeholders survey											
		5.1.4	Identification of activities and possible dates + organize their promotion with BIOEAST											
	5.2		Market Analysis of the bioingredients and bioproducts for the demo	Sep24-Aug28				ENCO						
		5.2.1	Analysis of biorefinery and bioproducts EU market											
		5.2.2	Deep market analysis for ingredients (NaNO3, microbial protein, ammonium bicarbonate, caproic acid, P and K-rich ashes, protein from grass and bioproducts (biofertiliser, prebiotic and animal feed)											
		5.2.3	solutions											
		5.2.4	Analyse ManuREfinery competitors in each target market											
	5.3		Business Model and Business Plan for scalability and replication	Feb26-Aug28				INEUVO						
		5.3.1												
		5.3.2												
		5.3.3												
	5.4		Exploitation strategy	Sep24-Aug28				ENCO						
		5.4.1	Update KERs identified during stage proposal											
		5.4.2	Create the Innovation Working Group											
		5.4.3	Organization of Workshop on Exploitation											
		5.4.4	Develop a detailed route for each KER's exploitation method											
	5.5		Intellectual Property Rights and Innovation Management	Sep24-Aug28				ENCO						
		5.5.1	Definition of IPR Strategy and Innovation Management											
		5.5.2	Setting up of IP tools and share with partners											
		5.5.3	FTO analysis and scan the innovation potential of the main project results											

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		WP Leader - Issued by:	BIOEAST
	List of Open Points	Date:	01/09/2024

WP	Task	Open Point ID	Action	Time schedule	Entry date	Target Date	PRIORITY	Leader	Owner/ Responsible person	Other partners involved	Progress %	Finish Date	Related Open Points /Tasks / Deliverables	Comments
6			Dissemination and communication	Sep24-Aug28										
	6.1		Dissemination & Communication plan, project identity	Sep24-Feb25				BIOEAST						
		6.1.1	Establishment of Social Media Channels (LinkedIN, X, Facebook)		03/11/2024	04/11/2024		BIOEAST	Mary Tsinou			04/11/2024		
			Project Website		04/11/2024	30/11/2024								
			Project video											
			Press release in BHCR Website		15/10/2024	15/10/2024		BIOEAST	Mary Tsinou			15/10/2024		https://www.bio-hub.cat/en/news/manurefinery-consu...
			D&C Plan											
			Flyer											
			Social media e-Banner		04/11/2024	04/11/2024						04/11/2024		
			Poster and Roll-Up											
			Project document Templates (deliverable/report/presentation)											
			Project branding (logo, brand guidelines)		11/09/2024	11/09/2024						11/09/2024		Completed before the kick-off
	6.2		Dissemination and communication activities	Sep24-Aug28				BIOEAST						
		6.2.1	Establishment of Communication Team (CT)		08/11/2024									
			Thematic Knowledge Exchange Webinars (total no. tbd)		08/11/2024									
			Factsheets/ Flashcards (total no. tbd)		08/11/2024									
			Rural-targeted activities (total no. tbd)		08/11/2024									
	6.3		Involvement of professionals and training activities	Sep24-Aug28				BIOEAST						
		6.3.1	Training A from INTERPROD-pig farm		08/11/2024									
			Training B from INTERPROD-pig farm		08/11/2024									
			Training A from DENVER-chicken farm		08/11/2024									
			Training B from DENVER-chicken farm		08/11/2024									
			Training A from AGROCESA-pig farm		08/11/2024									
			Training B from AGROCESA-pig farm		08/11/2024									
			Training A from KIS-cow farm		08/11/2024									
			Training B KIS-cow farm		08/11/2024									
			Training report template		08/11/2024									
			Training library		08/11/2024									
			Lesson learned report per target group		08/11/2024									
			Pan-European online event for technical profile stakeholders		08/11/2024									
			Pan-European online event for general profile stakeholders		08/11/2024									
	6.4		Synergies and collaborations with other relevant projects and initiat	Sep24-Aug28				WAG						
		6.4.1	Mapping on projects and trainings		08/11/2024									
			Establish synergies with other projects		08/11/2024									
			Establish synergies with bioeconomy networks		08/11/2024									
			Online mobilisation and mutual learning workshop		08/11/2024									
	6.5		Recommendations to stakeholders	Sep26-Aug28				BIOEAST						
		6.5.1												

1.4. Project Management Platform

The coordination team has selected Microsoft Teams as the tool to store documents and manage the project. Microsoft Teams is a chat-based collaboration tool that provides global, remote, and dispersed teams with the ability to work together and share information via a common space. It offers one-on-one chat, team chat, team calls (video-calls) and a shared workspace for the various Office applications (e.g. PowerPoint, Word, Excel, Planner, OneNote, SharePoint etc.). The latter feature provides the project team with the option to work natively together, editing shared files.

The figure below shows the current appearance of the Microsoft Teams for the MANUREFINERY project, which consists of several channels. Every channel has a chat and a shared workspace. The MANUREFINERY team in Microsoft Teams was created, and is maintained by ITA. All other consortium partners have been invited to join as guests.

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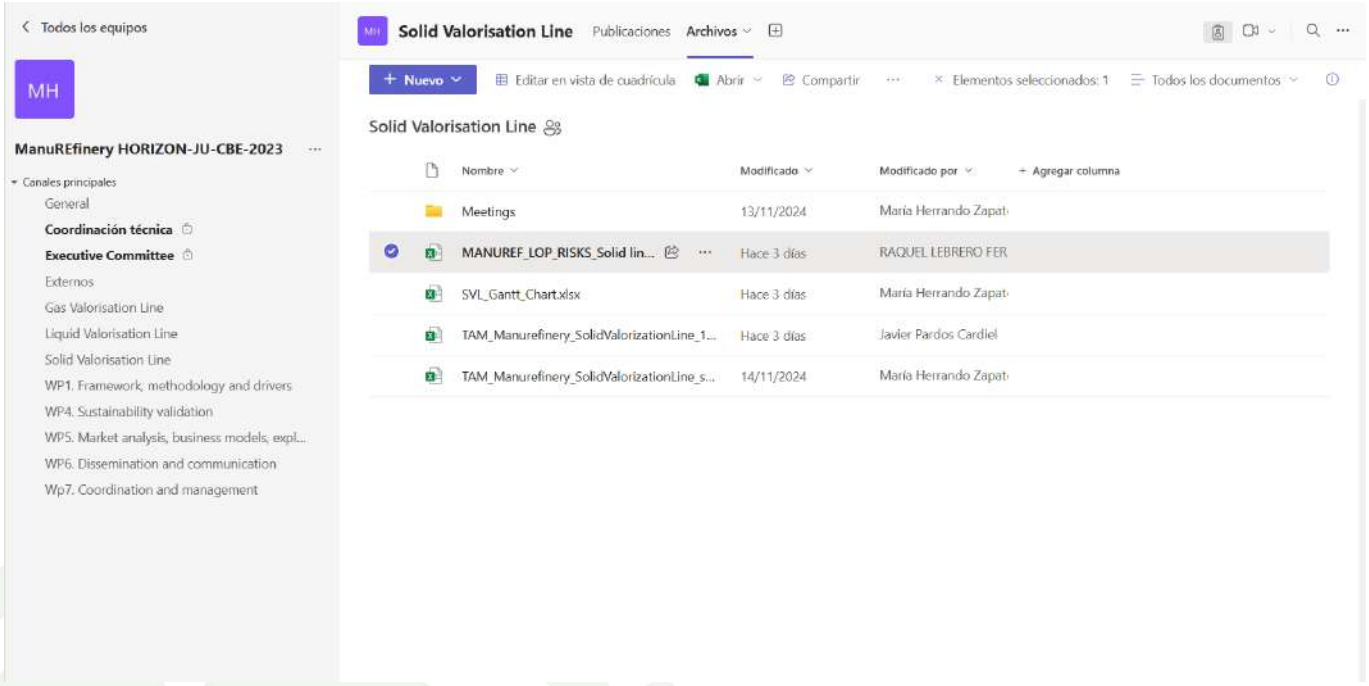

1.4.1. Quality Assurance Plan

The following processes will be used by the Technical Manager, the Project Coordinator and the Consortium in general in order to evaluate the quality of the work and deliverables.

Quality Evaluation Process

Day-to-day work progress will be constantly monitored and supervised at WP level for WPs 1,4,5 and 6 and at valorisation line level for the three lines.

Meetings of the Project Steering Committee will take place at least every 6 months. During these meetings, the progress of the project at line level and WP level will be presented. The progress and quality of the work performed, and the results reached will be reviewed during those meetings. Critical feedback will be provided, and corrective actions will be taken as a result of the discussions.

Meetings of the Executive Committee will take place every three months. These meetings will focus on the technical progress of the different tasks, issues that might come up and mitigation actions to correct the course of the project.

The following documents will be used by the project management to monitor the quality of the project:

- Half-yearly technical monitoring: the LOPs will be consolidated every 6 months by the project coordinator.
- Cost expenditure updates: the PC will ask the partners every 6 months to send a summary of the incurred, including the Person-Months/WP, personnel costs and other direct costs.

As part of the evaluation process, a risk management and mitigation approach will be applied in order to identify threats and apply corrective actions before these situations arise. The risk management plan is described in the following section.

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Deliverables Review and Approval Procedure

Deliverables will be prepared according to the deliverables table that can be found in the DoA and must be submitted to the European Commission (EC) by the due date.

For each deliverable, the owner or lead beneficiary (as set out in the DoA) will coordinate the preparation of the corresponding deliverable, involving all partners that have worked in the tasks associated to it. The deliverable owner will be responsible for the complete preparation of the document.

Once the deliverable owner has prepared the full deliverable, he will submit it to the WPL/line manager (unless the deliverable owner is also the WP leader or line manager). Several iteration loops between the deliverable owner and the WPL might take place until the WPL approves the document. Then the WPL/line manager will send it to the TM. At the same time the WPL will also circulate the document to the other partners involved, asking them to read it and provide feedback by a specific deadline. Changes proposed by the TM or other partners will be implemented by the Deliverable Owner.

The final document should be quickly supervised by the WPL and the TM. A final check will be performed by the PC, who will submit the deliverable to the EC. The small corrections made during this last cycle can be done directly by the WPL, the TM or the PC.

The above procedure for the deliverables review and approval is summarised in the table below. To allow this process to take place, the first draft of the deliverable (prepared by the deliverable owner and approved by the WPL) should be circulated to the TM and the consortium at least 15 days prior to the deliverable due date.

Step	When	Who	What
1		Deliverable Owner	Coordinates and prepares deliverable
		WPL/Line manager	Review and feedback to DO
2	2 weeks before due date	WPL sends to Technical Manager & other relevant partners	Review and provide feedback within one week
3	1 weeks before due date	Deliverable Owner	Implements changes and sends final versions to WPL, TM and PC
4	0.5 weeks before	TM & PC	Final check & submission

Quality control for dissemination materials

Dissemination activities are governed by the Consortium Agreement and the Grant Agreement (Article 17). In addition to the obligations outlined in these agreements, the effectiveness of dissemination materials is closely linked to the overall communication strategy. The Dissemination Manager (DM), BIOEAST, is responsible for strategic planning and quality management of all dissemination efforts. These include coordinating scientific dissemination targeted at the research community (see the following section on Publications), communication activities aimed at key stakeholders such as potential end-users and industrial associations, and fostering collaborations with similar projects, related initiatives, and relevant institutional bodies. The Task Leader is responsible for planning and coordinating these activities, under the supervision of the DM and in collaboration with the Project Coordinator (PC).

To support partners in their dissemination efforts, the Dissemination Manager (DM) will develop dedicated materials that introduce the project, its objectives, planned activities, and other key information. These materials will be created in various formats, including PowerPoint presentations, brochures, and posters, and will be regularly updated to reflect project progress. All communication materials will be accessible via the shared Teams workspace, allowing partners to use them at any time for events and meetings. The DM and the Project Coordinator (PC) will ensure that all dissemination materials align with the requirements set forth in the Grant and Consortium Agreements..

Accordingly, for any activity carried out by a Consortium partner that involves sharing project-related information with an external audience, the following procedure should be observed:

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- Each partner is encouraged to propose dissemination activities (e.g., participation in forums, conferences, meetings, etc.) by notifying the DM and PC in writing.
- Other partners may express their interest in joining the event. The involved partners will coordinate the organization and content of the dissemination activity under the supervision of the DM and PC.
- Dissemination materials will be shared with the Consortium in accordance with the Grant and Consortium Agreements. The DM will review these materials to ensure alignment with the project's communication strategy, adherence to branding guidelines, and inclusion of required credits.
- To maintain quality, a set of measurable parameters will be established to assess the impact of dissemination activities (e.g., number of participants, activities conducted, audience engagement, and distributed materials).
- These metrics will be documented in a dedicated Dissemination Report, available in the Teams shared workspace. Partners responsible for organizing and executing the activity must complete the report with the necessary details.

Quality control for scientific publications

Being strictly connected to the dissemination of results, and constituting also a possible conflict with the need to keep confidential specific IPRs for the purpose of patenting and subsequent commercialization of the technology, publications are disciplined by provisions set forth in the Consortium Agreement and the Grant Agreement on dissemination of results and confidentiality. In order to incentivize and facilitate publications as a coordinated effort by the whole Consortium, the DM proposes the following procedure:

Proposal for publication: Each Partner is entitled to propose scientific publications. The PC and the other Partners shall be informed via e-mail about this opportunity. Prior notice of any planned publication shall be given to the other Parties at least 45 calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement in writing to the DM and PC and to the Party or Parties proposing the dissemination within 30 calendar days after receipt of the notice.

Collaboration offer: Each Partner can express its interest in participating in the publication (for instance, performing part of the activity resulting in the publication, drafting part of the content, revising the content, etc.). Each Partner willing to participate informs the author(s) on the contributor(s) and their specific contribution. This way a list of authors and co-authors is drafted.

Publication drafting: The author(s) and the involved Partners arrange the specific terms, organization, contents, and deadlines for the publication activity. Once the plan is agreed upon, the article is drafted and revised by the authors.

For peer-reviewed scientific publications, the authors must comply with the EU's open access policy (see Annex 5, section INTELLECTUAL PROPERTY RIGHTS (IPR) – BACKGROUND AND RESULTS – ACCESS RIGHTS AND RIGHTS OF USE – ARTICLE 16) of the Grant Agreement. The DM will ensure that all the relevant provisions set out in the Grant and Consortium Agreements apply.

All the Consortium shall be acknowledged by a credit text containing the Partners' Institutes.

The publication should also contain the acknowledgement to the EC " The project is supported by the Circular Bio-Based Europe Joint Undertaking and its members. Grant Agreement Number 101157679", and a disclaimer excluding the Commission responsibility " Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CBE JU. Neither the European Union nor the CBE JU can be held responsible for them".

The list of publications (proposed by a partner, under review, or published) will be made available to the Consortium in Teams and will be regularly updated by the DM.

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2. RISK MANAGEMENT PLAN

Risk assessment is a key component of project management, enabling the identification of potential risks and uncertainties that could affect project execution. This process involves evaluating the potential impact of these risks, prioritizing them based on severity, and determining appropriate responses—whether immediate mitigation, ongoing monitoring, or minimal intervention. Critical risks are proactively managed, while lower-priority ones are addressed as needed.

Each work package undergoes an initial risk assessment, with Work Package Leaders (WPLs) and Valorisation Line Leaders responsible for regularly updating risk evaluations and defining mitigation measures at each reporting period. The Project Coordinator (PC) and Technical Manager (TM) will oversee project progress, ensuring objectives and deliverables are met. Should any discrepancies arise, the WPL must provide justifications and propose corrective actions.

If a technical objective cannot be fully realized, the shortfall will be analyzed and quantified to assess its impact. The Project Steering Committee (PSC) will determine whether to proceed with or discontinue the affected activity. In cases where a technical goal must be abandoned for the project's overall benefit, the European Commission (EC) Project Adviser will be consulted. All risk-related developments will be documented in a continuously updated Risk Log, ensuring transparency and informed decision-making within the PSG.

The risk management consists of different phases:

At the project's outset, a comprehensive risk management plan will be developed to ensure that the approach is tailored to the project's scope, complexity, and importance. This process will define the appropriate level of risk management measures, their type, and their visibility. To accomplish this, risks related to technical aspects, quality, and performance will be identified and categorized based on their potential impact on costs, timelines, and overall project success.

Qualitative risk analysis will involve prioritizing identified risks based on their likelihood of occurrence (rated on a scale of 1-9, as shown in Table 3) and their potential impact on project objectives (rated on a scale of 1-9, as outlined in Table 4). These two factors will be combined to calculate an overall risk score (Table 4), which will help determine which risks require immediate attention and mitigation measures.

Risk evaluation: Probability of occurrence and impact on the objectives

Category	Probability	Impact	Score
Low	Risk event not likely to occur	< 10% cost impact <5% schedule impact Minor areas impacted	1-3
Medium	Risk event may or may not occur	10%-20% cost impact 5-10% schedule impact Major areas impacted	4-6
High	Risk event expected to occur	<40% cost impact >20% schedule impact Impact unacceptable	7-9

Overall risk score

Risk Level	Range	Action
Low	1-20	No immediate action required
Medium	21-40	Action may be required soon
High	41-60	Action required immediately
Extreme	61-81	Risk may jeopardise project: urgent and immediate action must be taken

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To effectively address identified risks, contingency plans will be developed to mitigate potential threats to project objectives. These plans will be tailored to the severity of each risk, ensuring they are cost-effective, feasible within the project scope, and implemented in a timely manner. All response strategies will be agreed upon by the relevant stakeholders, with a designated risk owner assigned to oversee the implementation and make final decisions on necessary actions.

Risk Monitoring and Control**:** This process involves continuously tracking identified risks, assessing residual risks, and identifying any new risks that may arise. It ensures that risk mitigation plans are implemented effectively and evaluates their success in reducing potential threats. As part of an ongoing Quality Assurance and Risk Management cycle, risks will be regularly reassessed to determine whether additional actions or adjustments are necessary.

Risk identification will be carried out at the work package (WP) level and valorisation line level. Each LOP worksheet includes a dedicated "Risks" sheet, serving as a risk register where potential risks will be documented, assessed, monitored, and mitigated. Work Package Leaders (WPLs) and Line Leaders will be responsible for maintaining and updating the register. Additionally, all project partners are strongly encouraged to communicate and collaborate with WP and application project leaders to identify potential risks and develop appropriate response strategies.

The risks initially identified in the Description of Action (DoA) of the Grant Agreement (GA), along with their corresponding mitigation plans, must be recorded in the Risk sheet of the relevant worksheet and uploaded to the Teams project platform. As a dynamic document, the risk register will be continuously updated by the Work Package Leaders (WPLs) and Valorisation Line Leaders throughout the project's duration to ensure it reflects emerging risks and evolving mitigation strategies.

The identified risks will be documented in the risk register, capturing key details such as risk ID, description, associated work package, date of entry, probability rating (1-9), impact rating (1-9), responsible partner (risk owner), proposed mitigation measures, current status, evaluation of implemented actions, and any necessary follow-up steps. The overall risk score (ranging from 1 to 81) will be automatically calculated, determining the risk level classification (Low, Medium, High, or Extreme).

Risks can be of different nature:

- Technical (e.g. ambitious aims)
- Organizational, e.g. under-performing partner or partner leaving the project
- Executional, e.g. key milestone or critical deliverable delayed
- Communication issues between partners
- Exploitation and IPR

At the end of each period beneficiaries will fill out in SYGMA the state of play of every risk and mitigation action identified in the Description of Action, providing if necessary new risks and mitigation measures as the project evolves.

The following image shows the risk register table for one of the lines. There will be one risk register pero WP (1,4,5,6) and line (gas, solid, liquid) that will be regularly updated, consildated every 6 months and reported in SYGMA at the end of each period (M18, M36, M48).

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ManuREfinery

Smart modular mobile biorefining of manure to zero-waste maximising resource recovery for feed and fertiliser bioingredients in rural areas	Version Log:	1
	Line Leader - Issued by:	UZ
ManuREfinery Risk Register	Date:	01/09/2024

WP	Risk ID	Risk description	Entry date	Probability [1-9]	Impact [1-9]	Overall Score [1-81]	Risk Level	Leader	Mitigation measures	Owner/ Responsible person	Status	Evaluation	Further action
		GAS VALORISATION LINE						LEAD		0			
2	R2.1	Scarce and/or poor-quality data available from labscale equipment for building hybrid models of key unit operations. This will hinder appropriate sizing of equipment.		2	5	10	LOW	ITA	Data will be enriched by new experiments at lab and/or information from literature and/or CFD simulations of specific equipment		OPEN		
											Done		
											Pending		
2	R2.2	Uncertainty predicted on performance by DT for one or more valorisation lines is high and potentially difficult to manage		5	5	25	MEDIUM	ITA	DT will be used to re-design the configuration of the valorisation line to improve its control. In addition, improved control strategies will be digitally tested before the start-up of the valorisation line.		OPEN		
											Done		
											Pending		
3	R3.1	poor nitrficiation activity in the biotrickling filter due to variations in NH3 concentration or presence of inhibitory compunds in air		2	5	10	LOW	UVA/SYS	Activated carbon filter will be installed to buffer NH3 concentrations and remove any potential sulphurous or organic contaminants		OPEN		
											Done		
											Pending		
				2	5	10	LOW				OPEN		
											Done		
											Pending		
3	R3.7	One or more technologies do not deliver the expected performance or experience delays in construction.		5	2	10	LOW	SYS, BIO2	Continuous updating status between partners and technical discussion on troubleshooting in technical network.		OPEN		
											Done		
											Pending		
3	R3.8	Composition of bioingredients is non-compliant with specifications.		5	5	25	MEDIUM	CEL	Improvements in the operation of the technologies to increase purities.		OPEN		
											Done		
											Pending		

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