

Deliverable 4.3

Common Risk Management Strategy

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1. EXECUTIVE SUMMARY

Deliverable D4.3 is a part of Work Package 4 of the PPI4Waste Project, which monitors the complete cycle of preparation activities for a PPI process to be implemented in the waste sector.

After delivering the report of targeted improvements from the demand side (Work Package 2, D2.3), having analysed the market situation, as well as drafting the roadmap for improvement on functional requirements (Work Package 3, D3.3), the next step in the methodology of preparation activities for the procurement implementation is to carry out a feasibility plan including different tasks.

The first of these tasks, Task 4.1, is on elaborating a “Feasibility Plan for a real/concrete public procurement of innovation”. This task aims to carry out a feasibility plan for the involved core buyers and for the buyer’s group to uptake a collaborative PPI and to reduce risk associated with the uptake of PPI. It is divided into two sub-tasks: Sub-task 4.1.a, to produce a “Definition of contract models and financing modelling of different approaches”, and Sub-task 4.1.b, which is about the “Development of a risk reduction strategy”. This latest sub-task is developed in this document, which delivers a common risk management strategy. For this purpose, Deliverable D4.3 provides an overall vision of risk management in public procurement of innovation, a brief description of the main types of risks that can be faced in these procedures and, finally, a risk management strategy in the PPI4Waste Project.

2. INTRODUCTION

Task 4.1.b of PPI4Waste Project involves the development of a **risk reduction strategy**. This task aims to define strategies in order to reduce risks **associated with innovation**, as well as to foster innovation all along the procurement process.

In this deliverable, a risk reduction strategy is going to be defined, based on the information coming from the previous Work Packages. All main innovation related risks will be assessed: legal risks, technological risks, organizational risks, financial risks... In addition, the following issues will be included in the strategy: monitoring of optional phase, control of performance indicators and guarantee of quality through **quality checks**, as well as **definition of roles and responsibilities** in the public procurement of innovation process, and analysis of **risk sharing between procurer and contractor**.

There is a lot to gain from implementing innovative solutions through procurement, whether the focus is on saving costs, benefiting the environment, or obtaining better products or services.

Innovation can be achieved by using existing knowledge in new contexts, to yield cost-effective and improved solutions. Innovation can also involve adopting the latest technology on the market to deliver better and safer products or services. In addition, innovation can require thinking out of the box about a problem and choosing new and better solutions.

Because of this, when undertaking public procurement of innovation, the procurers can be part of solving **societal challenges**, promoting development of **environmental technology** and providing **better products and services** to end-users.

Public procurement of innovation (PPI) concerns the acquisition of new products or services, of significantly improved existing products or services, or a new application of organisational innovation for the provision of existing products and services. Innovation can be developed by the individual contractor, a consortium of suppliers, further down the supply chain or in partnership with the buyer¹.

In public procurement of innovation, at least some **aspects** of the procured item or service are **uncertain or unknown**². Therefore, public procurement of innovation involves a **certain degree of risk** (in any case, a higher degree of risk than traditional public procurement), and most public procurers only take the risk and procure innovation if there are concrete instructions to do so from budget holders. If a public

¹ *Introduction to risk management in the public procurement of innovation* (Procurement of Innovation Platform; Project coordinator: ICLEI).

² *Risk management in the Procurement of Innovation. Concepts and empirical evidence in the European Union* (Expert Group Report. Directorate General for Research. European Research Area. European Commission).

procurer decides to take the procurement of an innovation into consideration, risks should be identified and managed/limited. The key is usually a controlled exposure to risk.

But **what is “risk”**? Risk is a **measurable uncertainty** (likelihood) for something to occur that lets projects fail, decreases their utility or increases their costs and duration³. It is possible for procurers/managers to deal with them.

A risk is a contingency that can have either a positive or negative effect on the public authority. Following the definition given above, a risk can either present an opportunity or a threat. The main actions in risk management are:

- 1) **Identify risks** beforehand and include them in a Roadmap. Identify these opportunities and threats before the event occurs and **allocate risks**, deciding who is going to be responsible (in the next Section “Phases of the risk management methodology”, this action fits *Step 1- Identify Objectives and Critical Success Factors* and *Step 2- Identify Risks*).
- 2) **Mitigate threats** beforehand as much as possible and **take advantage of the opportunities**, determining a strategy for minimizing the probably of threats and maximizing the probably of opportunities to occur (in the next Section “Phases of the risk management methodology”, this action fits *Step 3- Asses and Prioritise the Risks Identified*).
- 3) **Monitor risks** by using the Roadmap. **Take action** in case of threats and opportunities; determine how to respond to these events (in the next Section “Phases of the risk management methodology”, this action fits *Step 4- Establish Measures to Reduce Risks* and *Step 5- Follow up of Risks and Measures*).

³ D5.c Risk Management Report - PROBIS Project. Supporting Public Procurement of Building Innovative Solutions (TEHA. The European House Ambrosetti).

The ISO 31000 general framework (see below, figure 1) identifies the different steps in risk management, with communication and consultation placed opposite monitoring and assessment. This is the basis for identifying and responding to risks.



Figure 1: Risk Management with ISO 31000⁴

⁴ *Introduction to risk management in the public procurement of innovation* (Procurement of Innovation Platform; Project coordinator: ICLEI).

3. RISK MANAGEMENT

Risk management is the **identification, assessment and prioritisation** of risks followed by actions to **minimize** the likeliness and/or impact of **negative events**, or **maximize** the realization of **opportunities**. Risk management increases the likelihood of success and also reduces costs, as well as the likelihood of a negative impact.

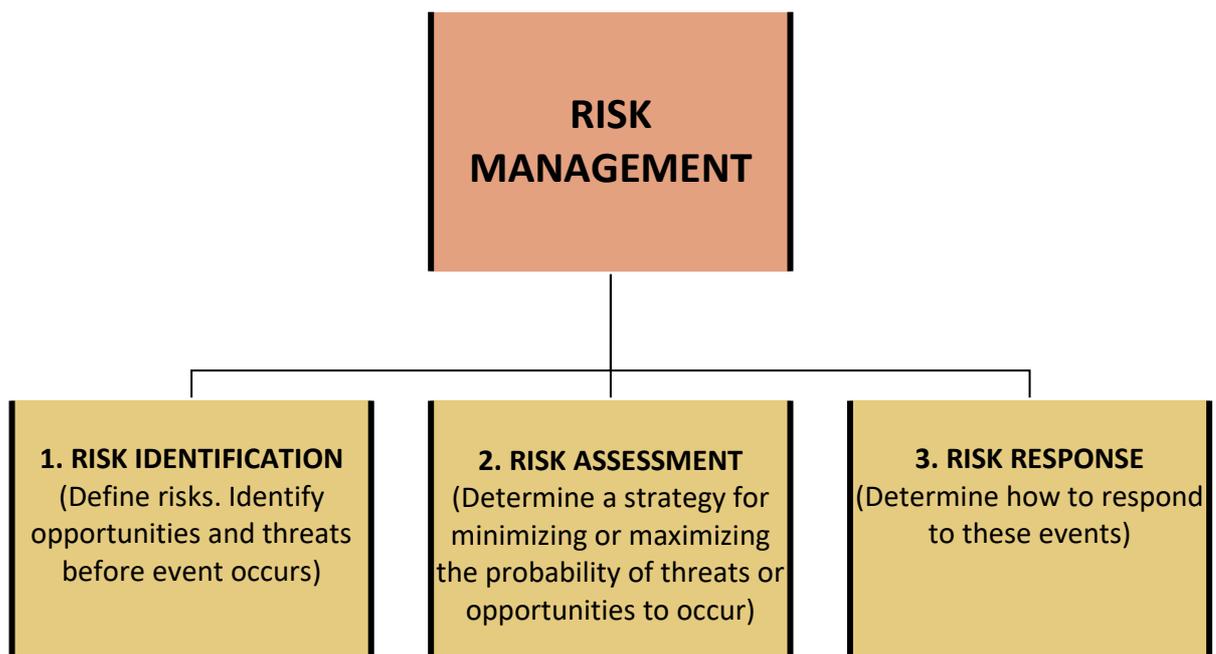


Figure 2: Risk Management scheme⁵

The different **phases** of risk management method can be represented as the following flow:

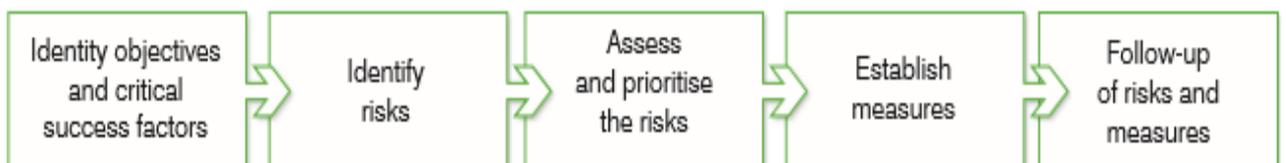


Figure 3: Phases of risk management⁶

⁵ Own elaboration.

⁶ *Risk Management in Public Procurement of Innovation*. (Direktoratet for Forvaltning og IKT).

PHASES OF THE RISK MANAGEMENT METHODOLOGY⁷

STEP 1 – IDENTIFY OBJECTIVES AND CRITICAL SUCCESS FACTORS

In order to assess the risks associated with the procurement, it is necessary to **define the objective** of the procurement. **What types of needs** should the procurement fulfil? Without a clearly defined starting point against which the risks should be assessed, it is not possible to comment on the consequences that a risk may lead to.

The needs assessment in a public procurement of innovation is an important phase. The **objectives** that are defined must be **as specific and clear as possible**. Describe the objective as a desired result or outcome, not as a tool or an activity description.

Critical success factors (CSF) are factors that are essential to attaining the objectives. When critical success factors are defined, risks can be more easily identified. They focus on the factors that are most important to succeeding in attaining the objectives.

STEP 2 – IDENTIFY RISKS

By identifying risks the objective is mapping what events (risks) may threaten the achievement of the procurement objectives. For this purpose it is necessary to use the critical success factors (CSF) as a starting point and **reformulate them into risks**. It is important to think about the whole period of use of the innovative solutions and to include an operating perspective on the goods and services being purchased. Long-life cycle of the products shall be taken into account.

Risks should be described as **specifically and clearly** as possible. This will provide a good basis for both the risk assessment and the preparation of measures. Write a **list of the risks** that have been identified, including a detailed description of each one.

Here are some examples of **types** of risks that in general are relevant to public procurement of innovation (they will be explained in a more detailed way below):

- **Organisational risks: political priorities** (changes in political priorities), **reorganisation** (the process is often driven forward by committed enthusiasts, and if these people leave, it may have a large effect on the project), **internal expertise** (the organisation often does not have the necessary specialised expertise, procurement expertise or innovation expertise internally), **time** (sometimes a public procurement of innovation takes longer than estimated) **or funds** (it can be demanding to set aside funds to a development process that will last several years).
- **Technological risks: lack of technology** or **technological challenges** (with projects using new technologies, there may be risks associated with whether the

⁷ Risk Management in Public Procurement of Innovation. (Direktoratet for Forvaltning og IKT).

solutions are compatible or can be adapted to existing technology. Market readiness for a new type of technology may also be uncertain).

- **Market risks: market competition** (it may be especially risky to end up in a lock-in situation where you are reliant on a supplier that has developed a long term unique solution: vendor lock-in) **or price** (one of the greatest elements of uncertainty).
- **Other risks: inherent to the tendering process** (if it has to be interrupted due to errors it can delay the process) **or associated to the user perspective** (the risk of whether the users can utilise the new solutions, and whether the gains turn out to be as expected).

STEP 3 – ASSESS AND PRIORITISE THE RISKS IDENTIFIED

When all the risks that may arise have been mapped, the risks should be assessed: Which risks are most critical, and which other aspects should be further addressed?

A risk is assessed in relation to the **likelihood of it occurring**. And if it occurs, what are then the consequences for achieving objectives? One **model** for assessing and ranking risks can be a scale from 1 to 4 for both the likelihood of the risk occurring and the severity of the consequences if it were to occur.

Example of a model for assessing and ranking risks:

Likelihood of the uncertainty condition occurring on a rising scale from 1 - 4:

1. The uncertainty condition will probably not occur - occurs only in one in ten cases (or less);
2. Less chance of it occurring than not occurring;
3. 50/50 chance of it occurring;
4. Greater chance of it occurring than not occurring.

Examples of criteria for consequences if the uncertainty condition occurs may be:

Severity of the consequences if it occurs:

1. Minor consequences that can easily be rectified;
2. In isolation, it will not lead to a deviation from the criterion mentioned above, but in conjunction with an undesirable outcome of 1-3 from other risk conditions could lead to a deviation;
3. Will lead to deviation on at least one important criterion for attaining the objective (the criteria must be defined in more detail);
4. The suggested solution cannot be implemented.

Risk levels

The risk level is determined by multiplying the **likelihood** of the event occurring with the **associated consequences** ($L \times C = \text{Risk level}$). When risks are identified, the likelihood of them occurring, and any consequences, can be plotted in a risk matrix or a risk map. The matrix provides a visual representation of the risk factors that have been brought forward and makes it easier to communicate these. A specific table with all definitive

PPI4Waste risks has been developed and likelihood of the risks and possible consequences has been assessed.

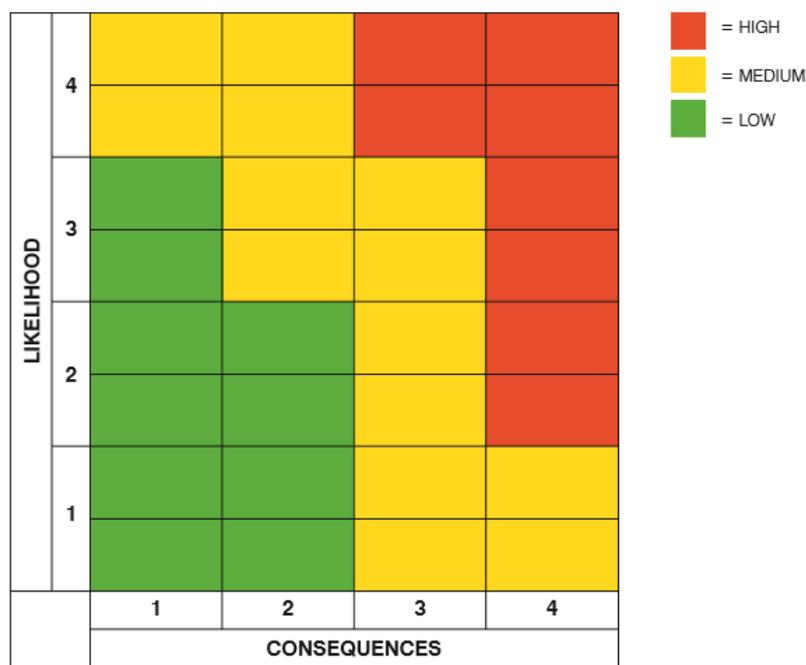


Figure 1 Risk matrix

Figure 4: Standard risk matrix⁸

The risk levels in the example above are specified as low, medium and high, as defined by the combination of likelihood and consequences (likelihood x consequences).

STEP 4 – ESTABLISH MEASURES TO REDUCE RISKS

“Innovation step-by-step” method

An important **risk-reducing measure** is to follow the "Innovation step-by-step" method when a public procurement of innovation is being undertaken. This means to conduct a needs assessment prior to the procurement and market engagement activities. With a good needs assessment, better planning and organisation can be achieved. It is (also VERY IMPORTANT TO identify better the objectives and purpose of the procurement). **Market dialogues**⁹ provide a good framework for innovation, as they are a way of testing if suppliers will be able to deliver the object of the procurement. Dialogues with the market will especially contribute to increasing expertise for both parties and will also lead to a more realistic picture of what can actually be done and what is uncertain.

⁸ Risk Management in Public Procurement of Innovation. (Direktoratet for Forvaltning og IKT).

⁹ PPI4Waste Project has organized meet-the-market events in Belgium, Croatia, Netherlands and Spain. For more information: <http://www.ppi4waste.eu/news-and-events/events/>

Establishing measures

Identified risks are used as the starting point. The position of the risks in the risk matrix determines whether it is necessary or not to establish special measures that will reduce the risk:

- **GREEN FIELD:** If risks are assessed in the green field, it is often **not necessary to implement any measures**. It is not likely that they will occur and if they do, the consequences will not jeopardise attaining the objectives.
- **YELLOW FIELD:** If risks are assessed in the yellow field, **measures may be required**. This particularly applies to risks that could have serious or very serious consequences, but a low probability of occurring.
- **RED FIELD:** If risks are assessed in the red field, **measures must be implemented**. High risks may be accepted in some cases, for example when the organisation does not have any possibility of influencing the risk, or when the costs of handling the risk are assessed as too high in relation to the benefit.

STEP 5 – FOLLOW-UP OF RISKS AND MEASURES

The risks must be followed up and it must be assessed whether the implemented measures are properly working through continuous **evaluations**. The scope, and how often measures should be followed up, depend on the progress of the project and the reporting routines in general.

If the follow-up activity shows that the risk is behaving as expected, it indicates that the established measures are working. If it shows that the risk is higher than expected, it may mean that there is a need for additional measures. It is important to place the risk with the party (purchaser or supplier) that is best suited to control the risk.

Regulating risk in a contract

A **contract should contain** the following elements:

- The supplier's result/obligations
- Assessment from the procuring entity on whether the supplier has achieved the award criteria
- An alternative solution to the suggested one, if the original one is not working
- How contract management is to be handled
- A bonus system (and sanctions) that depends on the results achieved
- Regulations for intellectual property rights and relations to third party rights
- Training in relation to new solutions. This is an obligation for both parties, public procurer and bidder.

4. TYPES OF RISKS

There are six major types of risks in public procurement of innovation¹⁰:

- (a) **Technological risks** are all those risks that lead to non-completion, under-performance or false performance of the procured service or product for reasons that lie in the technical operation. In order to deal with technological risks it is advisable to involve all the stakeholders (suppliers and users) early in the process as well as to use market intelligence to screen potential suppliers.
- (b) **Market risks** refer to a situation where the private demand does not respond to the extent necessary or expected, public markets remain fragmented or there is a lack of companies delivering innovations. The better the potential market prospect of suppliers, the higher the likelihood that they will agree to allocate responsibilities to them.
- (c) **Organisational risks** take place when the resources are misallocated, when agency goals are in conflict with wider policy goals. Public Procurement of Innovation demands strong coordination between stakeholders and constant evaluation and learning. But coordination and evaluation involves transaction costs; however, under the current culture of public procurement, cost savings may still be perceived as the most important goal.
- (d) **Societal risks** are those related to a lack of acceptance and uptake by the users of the new or changed service delivered within society. When the risks of lack of organisational or societal acceptance of innovations and innovative public services are allocated in the procurer, they will need to invest resources before the project starts in order to get information and monitor progress. Marketing and awareness campaigns are very useful to mitigate this risk, also the use of complementary instruments.
- (e) **Financial risks** in public procurement are divided as follows:
 - a. Uncertainty in meeting target costs. If cost overruns are due to:
 - i. Incomplete contracts, the risk allocation is to be placed on the procurer.
 - ii. Miscalculations, which are to be shifted to the supplier.
 - b. Ability to secure the funds needed in the first place. Assuring access to the capital needed may be shared by supplier and procurer in larger projects, but can usually be shifted to the

¹⁰ *Risk Management in the Procurement of Innovation – A conceptual overview* (TEM seminar 3 February 2012, Ville Valovirta. VTT Technical Research Centre of Finland).

supplier alone for smaller ones. Moreover it will strongly depend on the potential rewards and expectations of future profits.

Contingency plans as well as payment modalities are useful tools to assess this risk.

- (f) **Turbulence risks** are those that are mainly associated with large-scale projects, are often a result of the interplay of various actions and actors within the whole project and include cost overruns due to macroeconomic problems. Therefore they are the most difficult to foresee. They can be implicitly allocated through general provisions (or tacit agreements) and treated as a broader political responsibility.

Source type	Institutional/ societal	Financial	Market	Technological	Other	Source type
Stages in the Procurement cycle	Definition risk Failure to define needs & communicate to market	Financial planning risk Innovation far beyond initial budget	Supplier market risk Not enough capable bidders	Technical risk Solution not feasible or suboptimal	Turbulence risk Unforeseen events mainly associated with large scale-projects	Stages in the Innovation cycle
Planning and preparation	Legal/regulatory Changes in regulations, misalignment with & proc. objectives	Financial market risk Failure to secure funding	Supply chain risk Supplier taking hidden risks Supply chain deficient	Contract design/award/evaluation proc. not adequate for technology		R&D stage
Notification and pre-qualification			Market spillover risk No spill over to private markets	Lack of complementarities with networks/standards		Adoption by public client
Tendering	Adaptation risks Internal Integration/external acceptance	Cost monitoring Poor cost controlling, and choice of payment modalities	Market competition risk Dependency on few suppliers/ Distorsion of competition	High cost of upgrade and maintenance		Diffusion in Public Realm
Evaluation	Policy spill over No adoption/use by other services/policies					Technological Lock-in
Contract Award						Maintenance and updating
Contract Management						New cycle
Evaluation						
Procurement Risks				Innovation Risks		

Figure 5: Types of Risks in Public Procurement of Innovation¹¹

¹¹ Risk Management in Public Procurement for Innovation: the case of Nordic-Baltic Sea Cities (Tarmo Kalvet and Veiko Lember)

5. RISK MANAGEMENT STRATEGY IN PPI4WASTE

One of the objectives of the PPI4Waste Project is to **assess the feasibility for cross-border PPI through the development of two pilot studies** of public procurement of innovation **focused on waste** in Croatia (Zagreb City Holding) and in Spain (Mancomunidad del Sur). Pilots have been analysed, the initial scenarios have been defined and the common needs to satisfy within the procurements have been evaluated. The aim is to find innovative solutions to deal with some of the five **needs identified** in relation to municipal waste management in Europe during the previous work packages of the project. These are:

- **Biowaste management**
- **Plastic separation**
- **Bulky waste management**
- **Separate collection** for specific waste streams/development of collection point
- **Decision support system** for waste management

5.1. STANDARD STAGES OF RISK MANAGEMENT IN PPI

The **risk management tool** developed by the Procurement of Innovation Platform¹² deals with risk in the following stages of the procurement process:

- 1) **Strategy identification:** the public authority develops a procurement strategy, ideally for each market segment for a longer period instead of per project.

In the first stage of the procurement process choices have to be made that determine whether or not the outcome of the procurement project will be successful. The choice of procurement procedure to follow, and how this procedure is worked out in detail, determines the “quality” of interaction with the market.

- 2) **Specification of strategy and demand through market interaction:** a dialogue with representatives from one market segment about the public authority’s procurement strategy and the market segment’s ideas.

The main achievement in this stage is identifying the match between the demand of the public authority and the innovative solutions provided by the market. This stage is about getting the right business at the table, and achieving discussions that go beyond companies simply selling their solution.

¹² *Introduction to risk management in the public procurement of innovation* (Procurement of Innovation Platform; Project coordinator: ICLEI). <https://www.innovation-procurement.org/>

- 3) **Specification of the scope of the works and the supplier selection:** put and assignment to tender and award it to one or more suppliers.

This stage is about translating the information gained in stage 2 into a specification that guarantees the best solution will “win”. There should be sufficient incentives for innovation combined with a large enough degree of freedom to prevent exclusion of suppliers, and allowing efficient offers.

- 4) **Verification/user test:** testing prototypes in terms of technical details and market requirements.

Innovative solutions are by definition different from current practice to a certain extent. Therefore, extensive verification and user testing is important to ensure that the delivered solution meets the agreed criteria of the public authority. Cooperation with the supplier and the level of adaptation of the innovative solution contribute to a successful outcome.

- 5) **Realisation and implementation:** execution of the assignment and delivery of the product. Fundamental changes to the solution will no longer be possible at this stage. The main goal is an on-time, efficient delivery.

The **risk management tool** supports systematic risk management in public procurement of innovation. The framework consists of the **five stages in the procurement process** and **nine risk aspects that need to be identified and determined**.

Classification and administration of risks according to this framework provides the overview of when certain risks may become relevant, what effects can be expected, who is in charge of taking action, and which actions should be taken.

5.2. MAPPING RISKS

In order to follow the standard stages of risk management in PPI the first step is to map risks.

The evaluation of the different typologies of risks that these processes could mean, identified in the former “**risk maps**”, and the measures adopted to reduce them have been described.

Due to the use of innovative products and technologies which are not still entered in the market, the standard public procurement of innovation risk map (see Figure 6) has uncertainties related to each phase of the procurement.

The PPI4Waste Risk Map will be the result of the assessment of the identified risks by the partners.

		TYPOLOGY OF RISKS					
		ORGANISATION AND SOCIETY	FINANCIAL	MARKET	TECHNOLOGY	SOCIETAL	OTHERS
PHASES OF THE PROCUREMENT	Planning and preparation	High	Medium	Medium	High	Medium	Low
	Notification and pre-qualification	Low	Low	Medium	Medium	Low	Low
	Tendering	Low	Low	Low	Low	Low	Low
	Evaluation	Medium	Low	Medium	Medium	Medium	Low
	Contract award	Low	Low	Low	Low	Low	Low
	Contract management	Medium	Medium	Medium	High	Medium	Medium
	Evaluation and Monitoring	Low	Low	Low	Medium	Low	Low
	Use and management	Low	Medium	Low	High	Medium	Medium
	Dimission and disposal	Low	Low	Low	Low	Low	Low

Legend

High	HIGH
Medium	MEDIUM
Low	LOW
Minimum	MINIMUM

Figure 6: Standard PPI Risk map ¹³

5.3. RISK ASSESSMENT

Once risks have already been identified, the next step is to assess them in order to create the PPI4Waste Risk Map. All partners' contributions were required to complete this task.

A. METHODOLOGY FOR THE RISK ASSESSMENT

The evaluation of the risk level is determined by multiplying the **likelihood of the event occurring** with the severity of any **associated consequences** ($L \times C = \text{Risk Level}$). When risks are identified, the likelihood of them occurring, and the severity of any consequences, can be plotted in a risk matrix or a **risk map**. The matrix provides a visual

¹³ Own elaboration. This is the average risk map in public procurement of innovation.

representation of the risk factors that have been brought forward and makes it easier to communicate these. The objective of this evaluation was to create a *PPI4Waste Risk Map*.

Tables with risks identification and a column in each one to evaluate risk level were provided to partners. Risk can be “HIGH”, “MEDIUM”, “LOW” or “MINIMUM”. The classification of each risk was indicated with colours or writing, as Examples I and II in next pages.

	HIGH
	MEDIUM
	LOW
	MINIMUM

HIGH: high likelihood of the event occurring // important consequences, high impact

MEDIUM: low likelihood of the event occurring // important consequences, high impact

LOW: high likelihood of the event occurring // minimum consequences, low impact

MINIMUM: low likelihood of the event occurring // minimum consequences, low impact

Example I

RISK ASPECTS/ TENDER STAGE	RISK	TYPE OF RISK	EVALUATION OF THE RISK
1. IDENTIFICATION STRATEGY	Strategy remains abstract; no clear questions formulated yet	<i>Organisational Risk</i>	
	Limited innovation culture in Croatia and Spain	<i>Organisational and Market Risk</i>	
	Limited scope for innovation	<i>Organisational and Market Risk</i>	
	A lack at formal organisation for procurement and a lack of local policy for PPI	<i>Organisational Risk</i>	

Example II

RISK ASPECTS/ TENDER STAGE	RISK	TYPE OF RISK	EVALUATION OF THE RISK
1. IDENTIFICATION STRATEGY	Strategy remains abstract; no clear questions formulated yet	Organisational Risk	Low
	Limited innovation culture in Croatia and Spain	Organisational and Market Risk	Medium
	Limited scope for innovation	Organisational and Market Risk	Minimum
	A lack at formal organisation for procurement and a lack of local policy for PPI	Organisational Risk	High

B. RESULTS: PARTNERS ASSESSMENT

Partners evaluation of risks identified in each stage of *Standard Stages of Risk Management in PPI*.

1. Identification Strategy

RISK	TYPE OF RISK	EVALUATION				
		Mancomunidad del Sur	Zagreb CH	ACR+	IAT	ICLEI
Strategy remains abstract; no clear questions formulated yet	<i>Organisational Risk</i>					
Limited innovation culture in Croatia and Spain	<i>Organisational and Market Risk</i>					
Limited scope for innovation	<i>Organisational and Market Risk</i>					
A lack at formal organisation for procurement and a lack of local policy for PPI	<i>Organisational Risk</i>					

2. Specification Strategy and Demand through Market Dialogue

RISK	TYPE OF RISK	EVALUATION				
		Mancomunidad del Sur	Zagreb CH	ACR+	IAT	ICLEI
Usually they are the same companies which join preliminary stage. Effective and wide market involvement is not always guaranteed	<i>Organisational and Market Risk</i>					
Over duration of the procurement execution	<i>Organisational and Market Risk</i>					
Risk of vendor lock-in	<i>Others</i>					
Insufficient strategy building through co-creation and connection requirement of public authority with offer and ideas from business	<i>Organisational and Market Risk</i>					

3. Description of Specifications and Selection of Awarded Companies

RISK	TYPE OF RISK	EVALUATION				
		Mancomunidad del Sur	Zagreb CH	ACR+	IAT	ICLEI
The information about the procurements and the calls won't reach a relevant number of possible interested companies	<i>Organisational and Market Risk</i>	Yellow	Yellow	Yellow	Red	Yellow
Bidders are not innovative companies	<i>Market Risk</i>	Yellow	Yellow	Yellow	Yellow	Green
Bidders do not put forwards innovative solutions or misunderstand the procurement aims	<i>Market Risk</i>	Red	Yellow	Yellow	Yellow	Yellow
Undefined evaluation criteria and sub-criteria of the offers	<i>Organisational Risk</i>	Red	Red	Red	Yellow	Green
Bidders ask higher price for innovative solutions than expected	<i>Financial Risk</i>	Red	Yellow	Yellow	Yellow	Yellow

4. Verification/User Test and Monitoring

RISK	TYPE OF RISK	EVALUATION				
		Mancomunidad del Sur	Zagreb CH	ACR+	IAT	ICLEI
Prototype does not match the demand of the intended clients	<i>Societal and Market Risk</i>	Orange	Orange	Yellow	Orange	Orange
Financial risk connected with non performing, underperforming or malfunctioning of the products and technologies provided	<i>Financial and Technological Risk</i>	Red	Yellow	Orange	Orange	Orange
The need to change design or technology during the works	<i>Financial and Technological Risk</i>	Red	Yellow	Yellow	Orange	Yellow

5. Realisation and Implementation

RISK	TYPE OF RISK	EVALUATION				
		Mancomunidad del Sur	Zagreb CH	ACR+	IAT	ICLEI
One societal risk in the use of the innovation is the correct transfer of information to users for the correct and best use of the technologies installed (if necessary)	<i>Societal and Technological Risk</i>	Red	Orange	Orange	Orange	Yellow
Activities to be able to implement innovation require more time and money than expected	<i>Financial and Organisational Risk</i>	Red	Red	Yellow	Orange	Orange

Once partners had evaluated the risks, the results of the assessment were analysed and the level of each risk was determined by merging partners' inputs.

1. Identification Strategy

RISK	TYPE OF RISK	LEVEL
Strategy remains abstract; no clear questions formulated yet	<i>Organisational Risk</i>	High
Limited innovation culture in Croatia and Spain	<i>Organisational and Market Risk</i>	Very High
Limited scope for innovation	<i>Organisational and Market Risk</i>	High
A lack at formal organisation for procurement and a lack of local policy for PPI	<i>Organisational Risk</i>	Very High

2. Specification Strategy and Demand through Market Dialogue

RISK	TYPE OF RISK	LEVEL
Usually they are the same companies which join preliminary stage. Effective and wide market involvement is not always guaranteed	<i>Organisational and Market Risk</i>	
Over duration of the procurement execution	<i>Organisational and Market Risk</i>	
Risk of vendor lock-in	<i>Others</i>	
Insufficient strategy building through co-creation and connection requirement of public authority with offer and ideas from business	<i>Organisational and Market Risk</i>	

3. Description of Specifications and Selection of Awarded Companies

RISK	TYPE OF RISK	LEVEL
The information about the procurements and the calls won't reach a relevant number of possible interested companies	<i>Organisational and Market Risk</i>	
Bidders are not innovative companies	<i>Market Risk</i>	
Bidders do not put forwards innovative solutions or misunderstand the procurement aims	<i>Market Risk</i>	
Undefined evaluation criteria and sub-criteria of the offers	<i>Organisational Risk</i>	
Bidders ask higher price for innovative solutions than expected	<i>Financial Risk</i>	

4. Verification/User Test and Monitoring

RISK	TYPE OF RISK	LEVEL
Prototype does not match the demand of the intended clients	<i>Societal and Market Risk</i>	
Financial risk connected with non performing, underperforming or malfunctioning of the products and technologies provided	<i>Financial and Technological Risk</i>	
The need to change design or technology during the works	<i>Financial and Technological Risk</i>	

5. Realisation and Implementation

RISK	TYPE OF RISK	LEVEL
One societal risk in the use of the innovation is the correct transfer of information to users for the correct and best use of the technologies installed (if necessary)	<i>Societal and Technological Risk</i>	
Activities to be able to implement innovation require more time and money than expected	<i>Financial and Organisational Risk</i>	

5.4. PPI4WASTE RISK MAP

The merged results can be seen at a glance in the following table:

		TYPOLOGY OF RISKS					
		ORGANISATION AND SOCIETY	FINANCIAL	MARKET	TECHNOLOGY	SOCIETAL	OTHERS
TENDER STAGES	Identification Strategy	Red	Green	Yellow	Green	Green	Green
	Specification Strategy and Demand Through Market Dialogue	Yellow	Green	Yellow	Green	Green	Yellow
	Description of Specifications and Selection of Awarded Companies	Red	Yellow	Yellow	Green	Green	Green
	Verification/User test and Monitoring	Green	Yellow	Yellow	Yellow	Yellow	Green
	Realisation and Implementation	Red	Red	Green	Yellow	Yellow	Green

5.5. RISK ASSIGNMENT AND ACTIONS TO MITIGATE RISKS

Finally, the identified and assessed risks were assigned and actions considered to mitigate the risks. This is done in the tables below:

1. IDENTIFICATION STRATEGY

RISK ASPECTS/ TENDER STAGE	RISK	TYPE OF RISK	EVALUATION OF THE RISK	THREATS/ OPPORTUNITIES	INTERNAL CAUSES AT PUBLIC AUTHORITY	EXTERNAL CAUSES AT BUSINESS	RISK OWNER/ CARRIER	RISK MANAGEMENT STRATEGY PUBLIC AUTHORITY
	Strategy remains abstract; no clear questions formulated yet	<i>Organisational Risk</i>		-Common Needs Identification too general, no specific issues	-Not yet clear how to translate big problems into specific needs		Contracting Authority	-Embed political objectives and questions in administrative organisation
	Limited innovation culture in Croatia and Spain	<i>Organisational and Market Risk</i>		-Limited number of incentives to innovate -Lack of management commitment -Innovation department and public procurement are unaware of each other activities	-Lack of knowledge of market offer, possibilities in public procurement law, business models -Carrier perspective of procurement professionals not based on innovation		Contracting Authority	-Train and support procurement professionals and raise awareness -Create room to experiment, launch and support pilots -Train procurers in innovation -Prioritise innovation through KPIs that control the amount of innovation conducted
	Limited scope for innovation	<i>Organisational and Market Risk</i>		-No room for ideas from the private sector	-Strategy and demand are overly defined or too detailed to promote innovation		Contracting Authority	-Develop a procurement strategy with basic choices and objectives for each market segment for a longer period (not per project) -Include needs assessments and potential solutions with help of market consultations
	A lack at formal organisation for procurement and a lack of local policy for PPI	<i>Organisational Risk</i>		-Experiences are always useful in order to learn about past fails and provide trust in PPI -This could cause doubts about viability -Sometimes first experiences are the most successful -Pioneering sometimes gives advantages	-PPI is not really implemented in Croatian and Spanish Administration -Not many experiences of public procurement of innovation in waste management in Croatia and Spain		Contracting Authority	-An efficient political strategy is necessary to promote public procurement of innovation in waste management in both countries -Procurers should look for experience in other territories

RISK ASPECTS/ TENDER STAGE	RISK	TYPE OF RISK	EVALUATION OF THE RISK	THREATS/ OPPORTUNITIES	INTERNAL CAUSES AT PUBLIC AUTHORITY	EXTERNAL CAUSES AT BUSINESS	RISK OWNER/ CARRIER	RISK MANAGEMENT STRATEGY PUBLIC AUTHORITY
	Usually they are the same companies which join preliminary stage. Effective and wide market involvement is not always guaranteed	<i>Organisational and Market Risk</i>		<ul style="list-style-type: none"> -It is an opportunity that parties are familiar with each other and this can make the conversations and meetings easier -Different working methods from those applied by these parties are insufficiently known which can slow down innovation -Many companies that could be interested are not aware about these initiatives 	<ul style="list-style-type: none"> -Public authority has insufficient knowledge of the market and only issues invitations through the same regular channels -Not enough contacts in country and outside 	<ul style="list-style-type: none"> Only limited business investment regarding staying in touch with public authorities and looking for market invitations 	Contracting Authority	<ul style="list-style-type: none"> -Announcements have to be made, in addition to the institutional means, through launching conferences, press conferences and specific mailing -Publish year plan on TED -Organise information meetings for businesses -Appoint a trend watcher at the public authority that keeps in touch with business through online platforms, like innovation market and social media -Contact other public authorities to ask for relevant contacts
	Over duration of the procurement execution	<i>Organisational and Market Risk</i>		<ul style="list-style-type: none"> -Procurement terminates a long time in the future but if the contract hasn't have long duration, enterprises are not interested 	<ul style="list-style-type: none"> -In Spain to make the concession attractive, the contact has to have very long duration 		Contracting Authority	<ul style="list-style-type: none"> -Try to avoid long-term public procurements -To breach the (long-term) contract. The public authority has to make a cost-benefit consideration -Inclusion of a revision clause
	Risk of vendor lock-in	<i>Others</i>		<ul style="list-style-type: none"> -The public authority depends on one vendor or has a long-term procurement with one supplier which exploits this dependency commercially (it is something usual in Spain with long-term allocated contracts in waste management plants) 	<ul style="list-style-type: none"> -The public authority has not arranged appropriate sharing on IP or the procurement terminates a long time in the future 	<ul style="list-style-type: none"> -There are no substitutes for the innovative product or service (IPRS) -Business has monopoly power based on IP 	Contracting Authority	<ul style="list-style-type: none"> -Agree on appropriate strategy to share IP rights, for example through license agreement -Get technical information from different sources
	Insufficient strategy building through co-creation and connection of public authority with offer and ideas from business	<i>Organisational and Market Risk</i>		<ul style="list-style-type: none"> -Through consultation with private sector, demand can be better adjusted to the market -Companies indicate that a regular and well-functioning solution is already in the market, so innovation is not required -Some companies fear to reveal business secrets 	<ul style="list-style-type: none"> -Not sufficiently defined what public authority is looking for -Insufficient trust that innovative ideas will be treated confidentially 	<ul style="list-style-type: none"> Companies wish to maintain ownership of their ideas and do not disclose everything 	Contracting Authority	<ul style="list-style-type: none"> -Organise bilateral sessions for each market segment at a strategic level, where ideas from market side are dealt with confidentially and previously secured on a legal basis -Additional general awareness and education measures to enable broader private uptake of the innovation -The public authority has to be open minded and recognises new ideas and questions from the market

2. SPECIFICATION STRATEGY AND DEMAND THROUGH MARKET DIALOGUE

3. DESCRIPTION OF SPECIFICATIONS AND SELECTION OF AWARDED COMPANIES

RISK ASPECTS/ TENDER STAGE	RISK	TYPE OF RISK	EVALUATION OF THE RISK	THREATS/ OPPORTUNITIES	INTERNAL CAUSES AT PUBLIC AUTHORITY	EXTERNAL CAUSES AT BUSINESS	RISK OWNER/ CARRIER	RISK MANAGEMENT STRATEGY PUBLIC AUTHORITY
	The information about the procurements and the calls won't reach a relevant number of possible interested companies	<i>Organisational and Market Risk</i>		-Reduction of the competition and, consequently, the level of the awarded offer or, at worst, deserted bidding			Contracting Authority	-Development of meet-the-markets events -Mailing -Conferences and press conferences at the launch of the tenders -Advertising on newspapers, web info and in PPI4Waste partners websites
	Bidders are not innovative companies	<i>Market Risk</i>			-Selection criteria for type of companies hinder innovative companies			-Identify the effect of certain selection criteria and apply this in formulating assignment
	Bidders do not put forwards innovative solutions or misunderstand the procurement aims	<i>Market Risk</i>		-Tender provides too few incentives for innovation -Companies are risk-averse	-Awarding criteria do not stimulate innovation, quality is less important than the price -Contract size and overall market demand is too small -Demand is not attractive for the market because of low scaling possibilities in the market	-Not wanting to reveal information in the procurement process		-Describe an assignment that offers scope through information from market meetings, and certain procurement procedures -Involve other contracting authorities -Bundle tenders to bring down costs
	Undefined evaluation criteria and sub-criteria of the offers	<i>Organisational Risk</i>		-if the procurement strategy is too open and so not exactly prescribing the solutions, there could be the possibility it receives very different offers and then to evaluate different and even scarcely comparable projects			Contracting Authority	-It is essential to prioritise the definition of the evaluation criteria in the process.
	Bidders ask higher price for innovative solutions than expected	<i>Financial Risk</i>		-Innovation is too expensive and cannot be realised -Can prevent financial problems at a larger stage	-Wrong model-calculation	-Wrong calculation of too high cost level due to the choice for specific suppliers and no calculation of cost elements during the different phases of life cycle of product or service (design-production-use/maintenance-end of life)	Contracting Authority and Economic Operator	-Discuss the economic viability during market dialogue phase -Include hidden costs and benefits in the calculation -Use of Life Cycle Costing methodology to ensure selection of MEAT (most economically advantageous tenders)

RISK ASPECTS/ TENDER STAGE	RISK	TYPE OF RISK	EVALUATION OF THE RISK	THREATS/ OPPORTUNITIES	INTERNAL CAUSES AT PUBLIC AUTHORITY	EXTERNAL CAUSES AT BUSINESS	RISK OWNER/ CARRIER	RISK MANAGEMENT STRATEGY PUBLIC AUTHORITY
4. VERIFICATION/ USER TEST AND MONITORING	Prototype does not match the demand of the intended clients	<i>Societal and Market Risk</i>		-Products cannot be used to the full extent in practice		-Insufficient analysis beforehand to ascertain if the innovation appeals to the potential client -Solution has a limited adaptability or scalability?	Contracting Authority and Economic Operator	-Develop business case and models regarding the areas of overlap with the ideas on the intended market
	Financial risk connected with non performing, underperforming or malfunctioning of the products and technologies provided	<i>Financial and Technological Risk</i>		-Notwithstanding they are all technology ready for the market and, therefore, already provided by the test and certification required in the EU market, some amount of risk is implicit in the new products and designs		-Innovation and new products and services always carry some type of risk	Contracting Authority and Economic Operator	-Minimum, clear and unequivocal KPIs -Require written guarantees on the different products and technologies provided to contractors or providers -Guarantees can regard the minimum lifetime on the whole or on the critical parts of products and technologies and level on performance in time
	The need to change design or technology during the works	<i>Financial and Technological Risk</i>		-An unappropriated choice could affect the result of the pilot and/or its cost		-The development of new products and services can involve this risk. A certain amount of risk is always implicit in the evaluation of innovative technologies	Contracting Authority and Economic Operator	-Very fast evaluation and decision and an unappropriated choice -A group of experts, ready to support the procurement authority and the contractors in the evaluation of the best solutions to adopt, along all the works, could protect the pilot from this risk

RISK ASPECTS/ TENDER STAGE	RISK	TYPE OF RISK	EVALUATION OF THE RISK	THREATS/ OPPORTUNITIES	INTERNAL CAUSES AT PUBLIC AUTHORITY	EXTERNAL CAUSES AT BUSINESS	RISK OWNER/ CARRIER	RISK MANAGEMENT STRATEGY PUBLIC AUTHORITY
5. REALISATION AND IMPLEMENTATION	One societal risk in the use of the innovation is the correct transfer of information to users for the correct and best use of the technologies installed (if necessary)	<i>Societal and Technological Risk</i>	Yellow	-if users do not know how to use the technologies, they won't use them and this will lead to the failure of all the process	-Contract innovative Products, solutions or services that cannot be used by the average citizen	-Development of non «user friendly» technologies	Contracting Authority and Economic Operator	-This risk can be controlled at the tender stage by demanding for “user friendly” solutions and by a budgeted and mandatory activity of information and learning, carried on by expert in communication and relationship with the specific social target - To involve users in an early phase (co-create) or to involve users panels during the process. In necessary, create campaigns in order to train final users, develop the knowledge of the product -Sometimes it is not in the hand of the private sector and must be set up and enforced by local public authorities, in spite of being designed by the bidder
	One societal risk in the use of the innovation is the correct transfer of information to users for the correct and best use of the technologies installed (if necessary)	<i>Financial and Organisational Risk</i>	Red	-Budget exceeded -Schedule not met ; this has an impact on other projects			-Organisation more complex than expected -High costs for maintenance arising due to dependence on limited number of suppliers and due to lack of prevision on maintenance costs -No experience with unforeseen issues due to innovative nature of the assignment	Economic Operator

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