Introduction to Risk Management in the Public Procurement of Innovation

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Introduction
This guide aims to provide an overview of risk management in the context of public procurement of innovation (PPI). By definition, pursuing an innovative solution is a process that involves a higher degree of uncertainty towards the intended result compared to choosing for a proven solution. These uncertainties often act as a major barrier to innovation. Therefore, risk management is a key success factor within the public procurement of innovation.

Uncertainties in the public procurement of innovation may lead to events with both positive and negative results. Either way, when dealing with innovation a strategy to cope with these risks is important for a successful outcome of the process.

This guide offers insight into the specific risks and the possible management techniques in public procurement of innovation. The guide is primarily aimed at strategists and public procurement officers in public organisations who are already familiar with regular procedures. The guide does not explicitly mention general risks in public procurement processes. In general, it is important that risk be managed as explicitly and as professionally as possible, whilst keeping in mind that it can never be managed entirely.

The guide first introduces the concept of "risk", and risk management in a general sense. The next section describes a general approach to risk management in public procurement processes. Next, it proposes a specific framework to setup risk management within public procurement of innovation in a controlled and systematic way. Following this framework, it describes a case-study from the province Noord-Brabant. Finally, it presents this framework in a practical tool that can be used to support risk management.

There is extensive literature on risk and risk management, and a range of different definitions are proposed. This introduction uses the following definition of a risk:

A risk is a contingency that can have either a positive or a negative effect on the public authority.

Following this definition a risk can either present an opportunity or a threat. Risk management aims:
• To identify these opportunities and threats before the event occurs.
• To determine a strategy for minimizing (maximizing) the probability of threats (opportunities) to occur.
• To determine how to respond to these events.

The management of risks with a positive effect is also known as opportunity management.

When to apply risk management
Risk management is useful in all public procurement projects. Of course, the amount of time and resources spent on risk management should be proportional to the level of uncertainty involved in the procurement project. In less complex projects with few stakeholders, risk management can contribute to successful and efficient implementation, minimising delays and lowering costs. In innovative and complex projects with many stakeholders, risk management can be the difference between the failure and success of the project in many different dimensions: quality and fit of the solution, efficient and timely delivery the costs of the solution, etc.

A list of examples of publicy procured innovations with budget overruns, delayed delivery, and even complete failure because of a lack of acceptance can be easily compiled. Well known Dutch examples widely covered in the media are the procurement of a central communication system for emergency services as well as new high speed trains. Without going into the details and discuss to what extent risk management practices were adopted in these projects - these examples emphasise the importance of adopting risk management as a standard practice in all steps of the procurement process.

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Risk management is the identification, assessment, and prioritisation of risks – followed by actions to minimise the likeliness and/or impact of negative events, or maximise the realisation of opportunities.
Different types of risk play a role in risk management. Various categories are indicated below, accompanied by an example of an opportunity or a threat, and a method of how these risks can be identified.

- Technological risk: the innovative idea does not match the technical standards in practice and innovation is not feasible. Technological risks can be identified with market and technological intelligence, selection of high reputation procurers/advisers and can be backed up with appropriate insurance schemes.

- Organisational and societal risk: organisation within the public authority results in failure or under-delivery of the procurement – for example lack of social acceptance. Organisational and societal risks can be identified, reduced and mitigated through early discussions with all stakeholders.

- Market risk: potential target group is larger than expected. Market risks can be identified and reduced through a dialogue process with selected groups in the supply chain and potential users of new applications.

- Financial risk: budget is exceeded. Financial risks can be addressed with instruments such as internal cost calculations, review panels and scoring mechanisms to identify capital availability, its cost, volatility and potential cost overruns.

- Turbulence risk due to unforeseen circumstances: another innovative product is introduced onto the market, enhancing the success of the own intended product. Finally turbulence risks can be identified using discursive and brainstorming techniques.

Be aware that with too much focus on the minimisation of the negative effects, easily obtained opportunities might be missed. The recognition and the realisation of opportunities can greatly improve a procurement.

The ISO 31000 general framework (see diagram 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. The goal of this process is to identify and select these threats and opportunities that have an impact and a likeliness to occur, so time and effect can be spent effectively.

**Diagram 1: Risk management with ISO 31000**

**Step-by-step plan risk management in PPI**

To identify risks and apply risk management in the public procurement of innovation, we must first identify the different steps in the procurement process using Van Weele’s framework.

**Diagram 2: Steps in procurement process**

In this framework Van Weele identifies the following steps in procurement:

1. Specification: defining what the assignment is
2. Selection: choosing the business capable of carrying out the assignment
3. Contracting: preparing a contract
4. Ordering: administrative settlement of the contract
5. Monitoring: outstanding orders and invoices to be settled
6. After-sales service: settling disputes and recording the experience

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1. Risk management in the procurement of innovation; a report by an expert group setup by the European Commission Directorate-General for Research
Risk management is essential for all steps in the procurement process. To successfully carry out risk management, the following actions must be taken:

1. Identify risks beforehand and include them in a Roadmap
2. Allocate risks: who is responsible for which risks?
3. Mitigate threats beforehand as much as possible and take advantage of the opportunities
4. Monitor risks by using the Roadmap
5. Take action in case of threats and opportunities

These steps should be repeated continuously throughout the lifecycle of a (procurement) project, particularly when moving into a new project phase, when risks materialise or simply when time progresses. Public authorities can work out these steps for their own projects with the 'risk management tool'. The risk management tool is an instrument to identify the risks, and administer the ownership, mitigation plans, and risk management strategy.

It is important to include a description of risk management procedures, and responsibilities and mitigation plans for certain kinds of risks in a contract.

It is advisable to organise different workshops for the identification of positive and negative risks.

Risk management in stages of procurement process

The risk management tool deals with the risks 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
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
3. Specification of the scope of the works and the supplier selection: put an assignment to tender and award it to one or more suppliers
4. Verification / user test: testing prototypes in terms of technical details and market requirements
5. Realisation and implementation: execution of the assignment and delivery of the product

Risk aspects

Adhering to the following steps in the procurement process for each stage creates a clear overview for risk management. The steps are derived from the risk management methodology RISMAN, adjusted to suit application in the public procurement of innovation.

1. Risk: a risk is a contingency that can have either a positive or a negative effect for the public authority
2. Opportunities: events that can have a positive effect for the public authority
3. Threats: events that can have a negative effect for the public authority
4. Internal cause(s) of threats for public authorities
5. External cause(s) of threats for suppliers
6. Probability of opportunities and threats: the tool does not define this step as this may differ substantially for each project. The public authority indicates the probabilities for each specific project. These depend on specific characteristics of the public authority and external factors, like the type of businesses present in the market
7. Impact of opportunities and threats: the tool does not define this step as this may differ substantially for each project. The impact may increase as the project progresses, as more energy, time and financial means have been invested. The impact can also apply to the market in case changes have been made that have to be reversed if the innovation is not realised
8. Risk owner: in the first steps of the procurement process, the public authority usually owns the threat. This changes as the process progresses and suppliers are responsible for the realisation. However, best practice is to assign ownership to the party that is best able to manage the threat
9. Risk management strategy for public authorities: the strategy for creating opportunities and mitigating or preventing threats. After specification and award of the assignment, the suppliers own the risks
For the public authority, risks can be either positive or negative. That's why both opportunities and threats are presented in the risk management tool.

**Allocating across and sharing risks**

As a general rule, responsibilities can be allocated during the negotiation and included in the contract; those responsible then have the option to carry the risk themselves or pay to be insured against it. Some concrete ideas are given below.

- The better the potential market prospect of suppliers, the higher the likelihood that they will agree to allocate responsibilities to them. This refers to technological and market (supply side) risks in particular. Suppliers would then have to pay for insurance. The cost allocation can be included in the contract through payment plans linked to milestones. Late and reduced payments, as well as fines, can be used as instruments to shift risks to the supplier.

- The risks of lack of organisational or societal acceptance of innovations and innovative public services can be allocated to the procurer. If this is the case procurers need to invest resources before the project starts and sometimes throughout the project lifetime to get more information and monitor progress, as the mitigation plan will be their responsibility.

- Financial risks are not easy to allocate and depend on the specificities of each case. Assuring access to the capital needed may be shared by supplier and procurer in larger projects, but can usually be shifted to the supplier alone for smaller ones. In addition this allocation strongly depends on the potential rewards and expectations of future profits (originating from spill-over activities). Cost overruns can be allocated based on an agreement regarding how they occur: cost overruns because of incomplete contracts (interpreted as additional requests) are logically shifted to the procurer, while miscalculations are to be shifted to the supplier. Cost overruns due to macroeconomic problems can be dealt as turbulence risks and treated as suggested below. The cost of insurance or other provisions are then carried by the actor that accepted the allocation in the first place.

- Organisational and turbulence risks are the most difficult to foresee. At times they can be made explicit in each project and as such can be allocated, but often they are implicit and general provisions (or tacit agreements) may foresee that they are treated as a broader political responsibility.

- Finally, risks can be shared with actors outside of the concrete procurement, in cases where it can be combined with other instruments (beyond the procurement itself), e.g. research grants, Venture Capital, special research guarantees for lead markets, etc.

**Case study Province of Noord-Brabant: Clean-up programme Chemie-Pack**

In 2011 the Chemie-Pack site of chemicals manufacturing plant Chemie-Pack in Moerdijk was heavily polluted with many different types of chemicals as a result of a fire and subsequent explosions at the chemical plant. The Dutch province of Noord-Brabant is responsible for cleaning up the Chemie-Pack site. Together with the private sector, the Province of Noord-Brabant sought innovative solutions for cleaning up this area. The next section discusses the risks and the risk management Noord-Brabant applied for each phase of the Chemie-Pack clean-up programme.
Risk management for each stage in the procurement process:

1. **Identification strategy**
   In the Chemie-Pack project the procurement department offered their services directly to the project ‘core team’. The assistance of a procurement advisor assured correct application of the procurement strategy. From the start, general Noord-Brabant management identified two points of concern that were applicable to the project. The procurement department notified the core team of these concerns for all procurement or tender issues. To safeguard risks, the procurement team had a complete overview of all assignments awarded. In its advisory capacity, the team is able to think creatively and constructively about ways to manage risks.

   The first two years of the project 2011-2013 are characterised as a contingency stage (a kind of ‘First Aid’ stage) where Noord-Brabant took measures to gain control over the pollution problem. With these measures Noord-Brabant ‘bought time’ in the project, allowing them to consider other methods of procurement and tendering.

2. **Specification strategy and demand through preliminary market consultation**
   In earlier occasions in which Noord-Brabant involved the private sector in procurement projects, the main risk perceived by non-buyers in the project team was ‘are we allowed to talk to the market?’ The answer of the procurement advisor was - of course: ‘as long as you stick to the basic principles of the procurement process’ (objectivity, transparency and non-discrimination). This, according to the procurement advisor, ‘helped to ensure that we had market meetings and not just a preliminary market consultation’. During the market meetings, Noord-Brabant considered possible ways of organising the playing field together with the private sector. During the three brainstorm sessions with the private sector, the words ‘tender’ and ‘procurement’ were never mentioned, thus preventing the private sector from getting the idea the project had already entered the tender stage. By coming up with ideas, the private sector’s involvement was very constructive and went beyond each business just offering their own product.

   Prior to the third brainstorm session, Noord-Brabant requested a commercial organisation to perform a concise risk analysis with respect to the Chemie-Pack Sanitation Programme. In preparation for the last brainstorming session, the risk analysis focussed on two steps:
   1. Identifying the risks
   2. Prioritising the risks

   Noord-Brabant sent the following message to the organisation that was contracted to do the risk analysis: ‘This e-mail refers to step 1. You can enter your risks from today up until Tuesday 11 June 2013. Please consider that this will take about two hours, depending on the number of risks you anticipate. For the execution of step 2, a special invitation will be sent on Thursday 13 June 2013.

   A small document with instructions, login data and an explanation of the risk session’s objective is provided in the annex. Please pay close attention to these instructions.

   The link below will take you to the login screen of the RiskID programme with which the risk analysis will be carried out.’

   The findings of the risk analysis were shared with the participating organisations in the third brainstorming session to see if they were recognised and what the commissioning party and contractor would have to do to control and/or to quantify these risks financially.

   Noord-Brabant aims to finalise the clean-up programme in 2015. Currently, in the fourth quarter of 2013, the clean-up programme is moving from the calamity stage to the implementation stage. Preparations are underway to commence the tendering process(es) for the clean-up of the soil and groundwater.

3. **Specification of assignment and supplier selection**
   From the beginning, the project consisted of multiple tenders. The largest part of the spending (or savings) has been attributed to two large tenders: the clean-up of the soil and the clean-up of the groundwater. The risks in this section comprise the usual risks in tendering procedures. In addition, there is a specific
risk with respect to how the internal organisation of Noord-Brabant regards the tendering procedures as they have been conducted for this programme to date. As a management measure, Noord-Brabant prepared a procurement strategy for the calamity stage, including the intended vision of the procurement and the tendering procedure including the required exceptions. For the implementation stage, Noord-Brabant aims to also prepare such a procurement strategy, and as such operate according to the new Public Procurement Act.

- **Verification/user test**
  As part of the groundwater clean-up, Noord-Brabant aims to start a series of pilots. The province intends to tender the groundwater clean-up through a competitive dialogue. At this stage it is too early to predict which risks Noord-Brabant will encounter during this procedure.

- **Realisation and implementation**
  The realisation and implementation are expected to take place in 2015. Noord-Brabant is already starting to think about the possible risks they may encounter in managing the project at the implementation stage.

**Legal framework**
Currently there is no clear legal basis for risk management.
**Risk management tool**

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.

**Periodic review of risks**

As mentioned earlier, simply filling out this tool once the project has started is not sufficient to deal with potential risks. In each new stage of the project the situation relevant to risks may change. This may introduce new risks, while making other risks obsolete. Also, the agreed management strategy may no longer be optimal. Therefore, it is important to periodically evaluate the risk management framework. Logically, in more dynamic and changing environments, a higher frequency of evaluations is required.

The next section provides a summary of the most relevant aspects of risk management in each of the five stages. The final part of this guide looks at the framework in more detail per stage, identifying risks that apply in general to public procurement of innovation. It also proposes a management strategy.

1. **Strategy identification for each stage**

In this first stage of the procurement process choices have to be made that, to a large extent, 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 amount and ‘quality’ of interaction with the market. Careful consideration of the procurement strategy, taking into account experience in previous processes of procurement of innovation is critical.

2. **Specification of strategy and demand through market interaction**

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 businesses at the table, and achieving discussions that go beyond companies simply selling their solution.

3. **Specification of assignment and supplier selection**

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**

Innovative solutions are by definition different from current practice to a certain extent. Therefore, extensive verification and/or user testing is important to ensure that the delivered solution meets the agreed criteria of the public authority. Close cooperation with the supplier and the level of adaptability of the solution contribute to a successful outcome at this stage.

5. **Realisation and implementation**

Fundamental changes to the solution will no longer be possible at this stage. The main goal in this stage is an on-time, efficient delivery. Implementation of innovative solutions takes more time and energy, meaning stakeholders may get cold feet.

Examples of risks and administration are included within the risk management tool.
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<tr>
<th>Identification strategy</th>
<th>Risk aspects/ Tender stage</th>
<th>Threats / Opportunities</th>
<th>Internal causes at public authority</th>
<th>External causes at businesses</th>
<th>Risk owner/ carrier</th>
<th>Risk management strategy public authority</th>
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<tbody>
<tr>
<td></td>
<td>Limited scope for innovation</td>
<td>No room for ideas from the private sector in the market meetings</td>
<td>Strategy and demand are overly defined/ too detailed</td>
<td>Contracting Authority</td>
<td>Develop a procurement strategy with basic choices and objectives for each market segment for a longer period and not per project</td>
<td></td>
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<tr>
<td></td>
<td>Strategy remains abstract; no clear question formulated yet</td>
<td>Project delayed</td>
<td>Not yet clear how to translate into a specific question</td>
<td>Contracting Authority</td>
<td>Embed political objectives and questions in administrative organisation</td>
<td></td>
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<td></td>
<td>Past experience does not play a role in formulating a strategy</td>
<td>Cyclical process in which own experience is instructive fails to materialise</td>
<td>Evaluation and improvement of the organisation insufficiently incorporated</td>
<td>Contracting Authority</td>
<td>Incorporate experience from previous projects and incorporate improvement of the processes</td>
<td></td>
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<tr>
<td></td>
<td>Limited innovation culture</td>
<td>Limited number of incentives to innovate Lack of management commitment Risk averse procurement professionals Innovation department and public procurement are unaware of each other activities</td>
<td>Lack of knowledge of market technologies, possibilities in public procurement law, business models Carrier perspective of procurement professionals not based on innovation</td>
<td>Contracting Authority</td>
<td>Train and support procurement professionals and raise awareness Create room to experiment, launch and support pilots</td>
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<tr>
<td>Risk aspects</td>
<td>Risk</td>
<td>Threats / Opportunities</td>
<td>Internal causes at public authority</td>
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<tr>
<td>Tender stage</td>
<td>Only regular companies join preliminary stage</td>
<td>Different working methods than applied by these parties are insufficiently familiar which can slow down innovation. Parties are familiar with one another, this can make the talks easier.</td>
<td>Public authority has insufficient knowledge of the market and only issues invitations through the regular channels.</td>
<td>Only limited business investment regarding staying in touch with public authorities and looking for market invitations.</td>
<td>Contracting Authority</td>
<td>Publish year plan on TED. Organise information meetings for businesses. Appoint a trend watcher at the public authority that keeps in touch with businesses through online platforms, like innovation market and social media.</td>
</tr>
<tr>
<td>Specification strategy and demand through market meeting</td>
<td>Risk of vendor lock-in</td>
<td>The public authority depends on one vendor, who exploits this dependency commercially.</td>
<td>There are no substitutes for the innovative product or service, and the public authority has not arranged appropriate sharing of IP.</td>
<td>Companies wish to maintain ownership of their ideas and do not disclose everything.</td>
<td>Contracting Authority</td>
<td>Agree on appropriate strategy to share IP rights, for example through license agreement. Get technical information from different sources.</td>
</tr>
<tr>
<td>Insufficient strategy building through co-creation and connection requirement of public authority and offer and ideas from businesses</td>
<td>Insufficient strategy building through co-creation and connection requirement of public authority and offer and ideas from businesses.</td>
<td>The public authority's question remains unanswered. 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 place, so innovation is not required.</td>
<td>Picture of the market is different that practice. Not sufficiently defined what public authority is looking for. Insufficient trust that innovative ideas will be treated confidentially.</td>
<td>Companies wish to maintain ownership of their ideas and do not disclose everything.</td>
<td>Contracting Authority, Economic Operator</td>
<td>Organise bilateral sessions for each market segment at a strategic level, not connected to specific projects, where ideas from businesses are dealt with confidentially and this has been secured on a legal basis. Appoint trend watcher at public authority that recognises new ideas and questions from the market. At times, additional general awareness and education measures may be needed to enable broader private uptake of the innovation.</td>
</tr>
<tr>
<td>Risk aspects/ Tender stage</td>
<td>Risk</td>
<td>Threats / Opportunities</td>
<td>Internal causes at public authority</td>
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<tr>
<td>Bidders are not innovative companies</td>
<td>Selection criteria for type of companies hinder innovative companies</td>
<td>Identify the effect of certain selection criteria and apply this in formulating an assignment</td>
<td></td>
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<tr>
<td>Tender provides too few incentives for innovation</td>
<td>Awarding criteria do not stimulate innovation, quality less important than the price</td>
<td>Describe an assignment that offers scope through information from market meetings and certain procurement procedures (For market: insure the risks in innovation, thus allowing for innovation)</td>
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<tr>
<td>Companies are risk-averse</td>
<td>Not wanting to reveal information in the procurement process</td>
<td>Involve other contracting authorities Bundle tenders to bring down costs</td>
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<tr>
<td>Bidders do not put forward innovative solutions</td>
<td>Innovation is too expensive and cannot be realised</td>
<td>Discuss the calculation model at market meetings</td>
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<tr>
<td>Can prevent financial problems at a later stage</td>
<td>Wrong model-calculations, for instance with Total Cost of Ownership (TCO) calculation for mobile operations</td>
<td>(For market: develop business case and models regarding the areas of overlap with the ideas on the intended market)</td>
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<tr>
<td>Awarding criteria do not stimulate innovation</td>
<td>Wrong calculation or cost level too high due to the choice for specific suppliers</td>
<td>(For market: appoint trend watcher at public authority that recognises new ideas and questions from the market)</td>
<td></td>
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<tr>
<td>Bidders ask higher price for innovative solutions than expected</td>
<td>Contracting Authority</td>
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<tr>
<td>Innovation is too expensive and cannot be realised</td>
<td>Economic Operator</td>
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<td>Can prevent financial problems at a later stage</td>
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<tr>
<td>Prototype does not match the demand of the intended clients</td>
<td>Insufficient analysis beforehand to ascertain if the innovation appeals to the potential client</td>
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<tr>
<td>Product cannot be used to the full extent in practice</td>
<td>Solution has a limited adaptability</td>
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<td>Activities to be able to implement innovation require more time and money than expected</td>
<td>Budget exceeded</td>
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<td>Schedule not met; this has an impact on other projects</td>
<td>Organisation more complex than expected</td>
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<tr>
<td>High costs for maintenance are rising due to dependence on limited number of suppliers</td>
<td>Economic Operator</td>
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<tr>
<td>No experience with unforeseen issues due to innovative nature of the assignment</td>
<td>The market must carry the risks. If different agreements have been made, the following should be taken into account:</td>
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<td>Ongoing Monitoring and assessment of the project at a distance; take action if required</td>
<td>Phased payment based on milestones</td>
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<td>Risk funds shared by public authority and awarded businesses</td>
<td>The provision of stand by loans mitigates the consequences of cost overruns</td>
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<td>For market: insure the risks of innovation. However, one needs to keep in mind that in some cases insurers may refuse to insure overly uncertain projects as the insurance becomes too costly</td>
<td>For market: appoint trend watcher at public authority that recognises new ideas and questions from the market</td>
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Final recommendations

- Technological risks, especially with radical innovations designed for a long term application, can be reduced by combining the long term procurement process with research grants, so that a potential supplier shares the risk with a public funding organisation in coordination with the procuring body.
- Market risks (triggered by the supply chain) may be reduced if combined with venture capital investing in new-technology-based firms participating in public bids.
- Information increases and uncertainty diminishes as time passes, so it may be good to split the process if high risks are identified. Disentangling the first stage from the rest of the procurement cycle can reduce risks particularly in the case of radical innovations.
- If societal risks are identified, it is advisable to mobilise the relevant stakeholder groups, make them aware of the benefits of the innovative solution and, if needed, be prepared to adopt and absorb them. In specific cases this may entail binding contracts with potential private lead users.
- Explicit risk analysis is more important for mega projects or generally, for projects that involve innovations which disrupt user patterns and involve high transaction costs. It helps to construct worse case scenarios as part of the exercise.
- Trusted committees for monitoring and early warning, composed of experts in different disciplines (technical, financial, social) and from different stakeholder groups, give an opportunity for flexible corrective action.

Note: the selection of risks included in this overview are not complete, nor tailored to specific situations. For each new procurement initiative the public authority itself should analyse the risks using this framework.

Further resources


Procurement of innovation platform: www.innovation-procurement.org
Introduction to risk management

Procurement of Innovation Platform
ICLEI – Local Governments for Sustainability
PIANOo – Dutch Public Procurement Expertise Centre
Rebekka Dold, Freiburg, Germany | www.rebekkadold.de
Vijfkeerblauw

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Please share any comments or observations on this publication with us. We are keen to hear your views. Contact us at info@innovation-procurement.org