creating an innovative estonia

Innovation studies

Innovation procurements – monitoring and proportion in all procurements in Estonia in 2015

Eesti tuleviku heaks

Euroopa Liidu struktuuritoetus

26 | 2017

Innovation procurements – monitoring and proportion in all procurements in Estonia in 2015

Prepared by: Paul Jaakson

Innovation studies

26 2017

Comissionied, financed and carried out by the Innovation Division, Ministry of Economic Affairs and Communications of the Republic of Estonia

Layout by Katrin Leismann

Tallinn 2017
© Ministry of Economic Affairs and Communications of the Republic of Estonia, 2017
Reproduction is authorized, provided the source is acknowledged
Additional information:
https://www.mkm.ee/en/objectives-activities/economic-development/entrepreneurship-and-innovation#state-as-a-smart-customer10

ISBN 978-9949-9752-3-5 (pdf)
ISSN 1406-8958

Author:

Paul Jaakson works since 2016 in the Ministry of Economic affairs and Communications in the Innovation Division. The author has worked in University of Tartu (2011-2016) with different projects between university and companies, mainly, in the field of product development. The author has a master's degree in (MSc) in materials science.

Foreword

Procurement of innovative solutions by public institutions may be considered a strong propelling mechanism for the quality of public services as well as for the economy at large. Procuring newer and better products and services which do not yet exist on the market is hoped to achieve good results but also involves risks.

Popularising innovation procurements is an important political trend for Estonia and monitoring of performance of the political goals is necessary so as not to make decisions based on gut feeling. There is currently no uniform method of monitoring innovation procurements in the European Union, this task is left up to the individual member states. This provides Estonia with the opportunity to develop the best monitoring system which also takes domestic specificities into account, such as the e-procurement register.

In order to ensure the reliability of data collected during monitoring, the monitored unit must be defined as clearly and unambiguously as possible. This was also one of the objectives of this survey – going into the word "innovation" and shedding light on the nature of this term in the context of public procurements.

For better realization of innovation procurements in public institutions, the idea of procuring innovation must be advertised. As this topic contributes strongly to the overall progress and development of the economy, the state should also alleviate financial risks of innovative projects if possible.

To sum up, the focus of this survey is on developing a monitoring system of innovation procurements, taking into account the best practices of other countries and also providing some suggestions for Estonia. The first step is determining the proportion of innovation procurements in 2015, to which the results of following years can then be added in order to form informative statistics on procuring innovation.

Based on cumulative information collected over the years, political goals can later be set based on facts. Let's spend public money wisely!

Deputy Secretary General for Economic Development

Viljar Lubi

Table of contents

List of Figures

List of Tables

1 Introduction

Every year, countries procure various things, services and construction works for large amounts of money which reach up to 19% of the GDP (European Commission 2011). In 2015, Estonia alone spent 1.6 billion euros on procurements. If more attention is paid to the novelty of the procured item, it is possible to contribute significantly to social progress with spending public money. A responsible contracting authority thinking "outside the box" is able, in addition to ensuring better quality of public services, also to pressure tenderers to keep up with newest developments by carrying out procurements in a way that supports innovation. The topic of innovation procurements – procurements which directly create new solutions or contribute to the distribution of innovation – is gaining increased attention in Europe and elsewhere, and several countries have begun to actively develop and apply corresponding policies (Edler 2013). Four main objectives and directions of using policies can be highlighted for innovation procurements (Lember et al. 2014; 2015):

- **Policy of developing technologies** – to resolve direct social and economic challenges through ordering new technologies (the state as the primary contracting authority or co-creator);
- **Policy of research and development** – to create new knowledge and solutions in the field of research, development and innovation (pre-commercial procurements);
- **Policy directed towards the overall innovation promotion** – promoting innovation as a horizontal objective is linked to the procurement activities of the entire public sector;
- **Non-invasive policy** – the state avoids specific policies promoting innovation and presumes that maximising competition and creating an open field at public procurements automatically meets the goals of innovation.

This classification shows how countries have historically used procurement activities in promoting innovation. As a rule, countries use various approaches simultaneously. While current global success stories of innovation procurements (incl. the creation of the ICT sector and creation of the Internet in the USA or the development of strong industrial sectors in Sweden) has largely arisen from the connection of public procurement activities with the goals of developing technology and supporting R&D (see Ruttan 2006, Edquist and Hommen 2000), then due to the change in the overall regulatory and ideological environment, the main focus of the past decade has been on developing general (horizontal) innovation procurement policies and related capabilities. Thus, several countries (Spain, Austria, the United Kingdom, Germany, Sweden, Finland, as well as South Korea, Brazil, Australia etc.) have developed or are developing horizontal innovation procurement policies which largely follow the same logic (Edler 2013; Lember et al 2014). First steps have also been taken towards developing field-based activities in the European Union as a whole and in separate member states.

Monitoring of changes occurred during the implementation of policies is an important step in developing the policy. A quantitative and qualitative overview of the innovation procurements being carried out enables to enforce further political decisions in a reasoned manner. Establishing innovative procurements carried out in Estonia in 2015 and developing an overall monitoring system of innovative procurements to assess the impact of political activities is the main goal of this survey.

2 Method

The survey was planned to be conducted in three clearly distinct parts and the output of each part was the input of the next part. This striving towards the truth step by step starts with the basic task, the idea of which was the following: finding the innovative procurements from all public procurements carried out in Estonia in 2015 and provide suggestions for creating a functioning automatic or semi-automatic monitoring system. When looking into the basic task, it is revealed that in order to determine innovative procurements, a way to measure innovation is needed. Innovation must have a clear definition in the context of procurements. The figure (Figure 1) shows the scheme of conducting the survey with all parts.

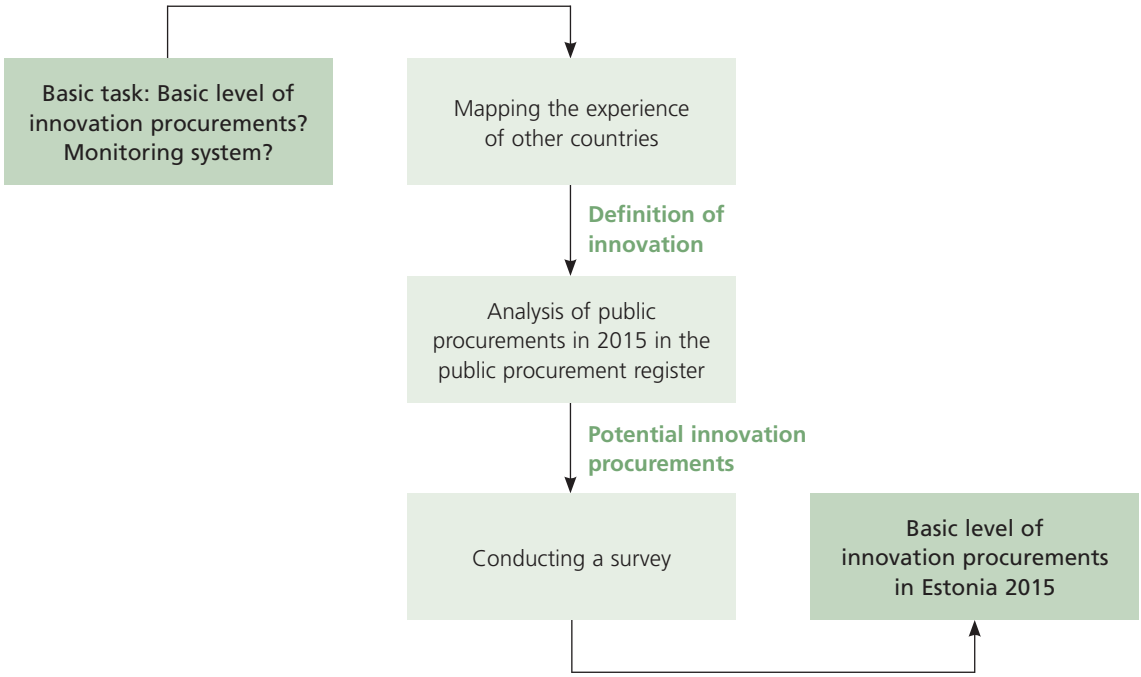

Figure 1. Scheme of survey of basic level of innovative procurements

2.1. Method of part I

Establishing the definition of innovation, mapping the experiences of other countries and introducing the objectives of innovation policy were the main tasks of the first part of this survey and their execution was ordered by the Ministry from the Ragnar Nurkse School at TUT.[1] Empirical information was first collected with the use of existing secondary data (political documents and analysis of various countries and international organisations, scientific articles), after this contact was made with various practical workers of different countries involved in innovation procurements and representatives of universities for collecting specific information (21 experts in total) and thirdly, interviews were carried out with practical workers of innovation procurements in six countries (see lists in annex 1 and 2).

The output of part I of the survey consists of four parts. Firstly, a brief overview is given of the objectives of innovation procurement policies. Secondly, the main logics, methods and related issues of monitoring innovation procurement are highlighted. After this, the experiences of three countries (Austria, Holland, Spain) in monitoring innovation procurements are mapped. Fourthly, suggestions for policies in Estonia are provided.

1 Lember, V. ja Hanson, R. 2016. Measuring of innovation procurements: best practices and recommendations for Estonia. Tallinn: Tallinn University of Technology, Ragnar Nurkse Department of Innovation and Governance.

2.2. Method of part II

The objective of part II of the survey is to gain an overview of all procurements carried out in 2015 which contain an innovative component. The result of the survey enables to:

- determine the basic level of procurements supporting innovation in Estonia;
- create a functioning system for monitoring innovation procurements;
- survey the contracting authorities and tenderers of innovation procurements.

The empirical survey was carried out in the public procurement register (RHR) and the input for innovative classification of procurements was received from part I. As the total number of procurements is relatively big (10650), the initial decision was made by the title of procurement. In cases when the decision could not be made based on the title, the procurement documents were reviewed and the decision was made based on information received from the documents. The criteria which an innovative procurement must meet were received from part I of the survey as input, where the 4 levels of an innovation procurement were established:

- Ordering research and development activities (R&D) (from R&D services to prototypes);
- Procurement creating innovation (a new solution in the public and private sector);
- Procurement promoting the distribution of innovation (new for the contracting authority or most market participants);
- Procurement impacting the extent and direction of innovation (innovations of process, organisation etc. arising from the procurement in the organisation of the contracting authority or the tenderer).

2.3. Method of part III

Part III of the survey was carried out in the form of an e-survey. The survey was commissioned from OÜ Faktum&Ariko and the input for formalising the questions came from the earlier two parts of the survey. The wording of questions was established based on information received in part I and the target group of the survey consisted of contracting authorities and tenderers of potential innovation procurements established in part II. The main objectives of part III were to determine the validity of results of part II and further open the various aspects of the completed innovation procurements. The questions asked from the contracting authorities and tenderers are provided in the annex (Annex 4).

3 Results of the survey

3.1. Experiences of other countries

The task set in part I of the survey prescribed an analysis of the monitoring system and practical experience of innovation procurements in three countries. Eight countries were observed on the basis of the analysis of initial secondary data: Austria, Spain, Holland, France, Sweden, Germany, Finland and the United Kingdom. Based on initial feedback from practical workers and representatives of universities from corresponding countries (see annex 1), three countries were selected for a more thorough analysis: Austria, Spain[2] and Holland.

Based on practical experience of countries analysed during the survey, we can say to sum up that even though new innovation procurement policies are being developed in many European countries, no country observed during the analysis has a fully developed and functional system of monitoring and measuring innovation procurements in real time. First steps have been taken in many countries. For example, France has adopted the goal of 2% of all public procurements being innovation procurements by the year 2020, and has also created an initial monitoring system where the contracting authorities themselves must report the extent of their procurement activities qualifying as promoting innovation. The definition of innovation procurement is rather loose across countries, ranging from new technologies to marketing and new business models and covering gradual as well as radical innovation. However, as the majority of contracting authorities do not report, the system cannot be considered functional. A new system is being developed. Finland has adopted the goal of 5% of public procurements being directed towards innovation, and has begun an analysis process spanning 1.5 years in order to determine the prudence of developing a monitoring system of innovation procurements and its possible content. In the United Kingdom, varied information is being collected on support of pre-commercial procurements issued in the framework of the SBRI programme, which is used as basis for attempting to assess the success of the specific programme.[3] At the same time, the programme stands separate from the regular public procurement activities. A strategy of innovation procurements on a broader scale is being developed in Germany and Sweden.

The current – if very initial – experience of the selected three countries in monitoring innovation procurements will be investigated further below.

3.1.1. Austria

The Austrian policy of innovation procurements began in 2012 when the action plan for promoting innovation procurements was adopted. After this, political support has been received for the innovation procurement measures (incl. budgetary), institutional framework has been created (incl. legislation, competence centres (see annex 3) and first projects have been initiated. Today, Austria has not set a measurable goal such as proportion of innovation procurements in all procurements, but aims to provide better public services through innovation procurements. At the same time, Austria is considering different quantitative objectives in the next stage of policy of innovation procurements. An initial procurement monitoring system has also been established, based on surveys. (Buchinger 2014)

The institution responsible for monitoring innovation procurements is *Statistik Austria* (the statistics board). A pilot survey was conducted among contracting authorities in the first stage of the monitoring in order to gain an idea about the proportion of innovation procurements in all procurement activities. In the second stage, a questionnaire was sent to all contracting authorities of procurements in the public sector (data was collected on the year 2013). A sample was formed out of respondents in order to validate the results of the survey, whose responses were specified via e-mail and telephone. In the survey, procurements promoting innovation were defined as: 1) research and development procurements; 2) first buyers of novel products; 3) procurements related to distribution of products/services which are particularly new to the market (diffusion). This survey indicated that 2.2-3.3% of the total budgetary volume of public procurements is used for innovation procurements. (Buchinger 2016)

The next survey is planned for the end of 2016. The action plan of Austria also provides an assessment of the impacts of innovation procurements in 2017. At present, the assessment of impacts is being prepared. The corresponding report with results should be completed in 2018.

2 Interviews could not be carried out with practical workers at Spain during the period prescribed for carrying out the survey, therefore disclosed materials and information collected via e-mail are taken as basis.
3 Most recently, the assessment of impacts of SBRI pre-commercial procurements was conducted in 2016; its results will be published in the second half of summer 2016.

3.1.2. Spain

In Spain, innovation procurement is defined as a procurement wherein a service or product is purchased which would stimulate entrepreneurs to invest in new innovative solutions in order to meet the unmet needs of organisations. Two main objectives of innovation procurements may also be highlighted for Spain, which are developing and improving public services and promoting innovation in companies.

The strategic objective has been established for 3% of the budgetary volume of procurements to be innovation procurements. This is measured with the use of a centralised public procurement platform PACE, where the contracting authorities of procurements must establish the innovation level and type of the procurement. On this platform, the contracting authority of the procurement can establish the type of contract and procurement, where two options relating to innovation procurements are provided: pre-commercial procurement or new innovative technology. At the same time, at present it is not yet measured whether the objective set has been met or not. It has also not been analysed yet how well the current monitoring system can identify innovation procurement. One method of validation planned is including a question on the volume of R&D contracts in the innovation survey of Spanish companies. Single cases of innovation procurements which have been funded by the Innodemanda and Innocompra programmes have undergone thorough assessment to determine the innovation of procurements. (ERAC 2015).

3.1.3. Holland

Innovation procurement policy in Holland began in 2009. The coordinating institution is PIANOo, which is the procurement competence centre in Holland. Initially, the focus was on first buyer, but the framework was expanded in the scope of the action plan and the entire procedure of innovation procurement was taken as basis, and as a result, the goal was set that 2.5% of the total budget for procurements should be innovation procurements. 2.5% is not a binding objective (hard target) for contracting authorities, rather expressing the political ambition. The target was set first and foremost to direct various units of the public sector to use procurement practices promoting innovation more often.

In 2013, PIANOo conducted the first systematic test to determine and monitor innovation procurements. A sample was used to determine the budgetary proportion of innovation procurements, formed by public procurements on the level of the Dutch central government passing the threshold in the TED database. Procurements were immediately left out if their only assessment criterion was lowest price or if they were intended for trainings, communication services, market research, computer maintenance, etc. Procurements were also eliminated if they did not include contact information. 13 different criteria were used to determine innovation procurements. For determining the importance of those criteria, officials responsible for public procurements at ministries were asked how important these criteria were, and corresponding weights were assigned to the criteria based on their responses. After this, each procurement was assessed separately on corresponding criteria with the use of an online questionnaire which was sent to contracting authorities on the basis of the sample. Innovation procurement level was established with the use of four different levels where procurements of the third and fourth level were deemed innovation procurements.

The corresponding levels were:

- Level 1 (result between 0 and 25), not an innovation procurement or is to a very small extent
- Level 2 (result between 25 and 50), innovation procurement to a small extent
- Level 3 (result between 50 and 75), innovation procurement to a large extent
- Level 4 (result between 75 and 100), innovation procurement to a very large extent

Criteria:

- The contracting authority actively attempted to find an innovative solution (8.37)
- The contracting authority involved market participants before approving the procurement criteria (9.21)
- The contracting authority used "competitive dialogue" procurement proceedings (6.69)
- The contracting authority used "design competition procedure" procurement proceedings (5.44)
- Tenderers were allowed to make several alternative tenders (6.90)
- Criteria of the procurement were functional (9.62)
- One of the criteria for the procurement was an innovative solution (8.16)
- The intellectual property rights for the innovative solution remained with the winner of the procurement (6.69)

- Risks of the procurement were divided between the contracting authority and the participant based on the procurement contract (6.90)
- The procurement contract contained monetary stimuli, according to which the contracting authority and the winner of the procurement divided the proceeds on equal grounds (i.e. expenses saved) (7.11)
- The contracting authority allowed participants to offer an innovative solution (9.00)
- The participant involved innovative thinkers (8.16)
- Existing types of procurement proceedings were used and adapted to the maximum extent to get an innovative solution (7.74)

Running this monitoring system involves a large administrative load (the object of the analysis is approx. 5000 procurements per year) and there is still no consensus on forming a sample and the criteria used. According to practical workers of Holland, this is difficult to execute because there is no exact data on expenses of the public sector on innovation procurements and an innovation procurement is also difficult to define. (ERAC 2015). In Holland, all procurements must be stated in the central public procurement system TENDERNET (open access database). The development of an automatic monitoring system has been hindered by the fear that if contracting authorities need to enter in the register themselves whether the procurement promoted innovation or not, then office workers may not be able to do this and the management load could potentially increase as a result. It was also highlighted that in the case of a numerical target, the contracting authority will be motivated to state as many procurements as innovation procurements as would be needed to meet the political target (gaming).

For this reason, the target 2.5% is not separately promoted. At present, PIANOo is reviewing its innovation procurement policy. In the future, the desire is not to focus just on the desire of contracting authorities to promote innovation (innovation in the public sector), but to address the wider spectrum and also analyse in more depth the impact of innovation procurements on companies (innovation through the public sector). It is also planned to focus on pre-procurement activities (market consultations and other interactive activities).

Another attempt to monitor innovation procurements in Holland is also worth mentioning. The *Rijkswaterstaat* (RWS), which is a national agency of developing and managing infrastructure, governed by the Dutch Ministry of the Environment and Infrastructure, developed a method to measure the proportion of innovation procurements in all procurements (Lendenrink 2015). The method was tested three times, but their application has now been discontinued. The test of RWS undertook to monitor all procurements exceeding 50,000 euros, developing two methods. The first attempted a qualitative assessment (expert assessment) with the use of a questionnaire (question scheme) based on data of procurement documents in the database. The scheme explaining this questionnaire is provided in the table (Table 1).

Table 1. Questionnaire of innovative procurements

	Question	*yes*	*no*
1	Does the procurement concern the hiring of additional staff?	The procurement is **not** considered IFP	Move on to question 2
2	Is the purchase on innovative solutions an objective of the procurement?	The procurement is considered IFP	Move on to question 3
3	Is the development of innovative solutions an objective of the procurement?	The procurement is considered IFP	Move on to question 4
4	Is the testing of innovative solutions an objective of the procurement?	The procurement is considered IFP	Move on to question 5
5	Does the procurement lead to additional opportunities to the market for development or testing of innovative solutions?	The procurement is considered IFP	The procurement is **not** considered IFP

According to a definition developed in the Dutch government, an innovation forwarding procurement (IFP) is a procurement, the target of which is to develop an innovative solution by public facilities or create opportunities to market participants to create, develop and provide innovative solutions. (Lenderink 2014). The benefit of using this method is the opportunity to determine the procurements' conformity to the definition through expert assessments and procurements can be classified this way. However, assessments remain subjective and the direction and extent of innovation also cannot be determined with this definition. In addition, using this method results in high administrative load. The problem of classifying innovation procurements is also an issue upon scheme-based assessment of the questionnaire, where experts may classify procurements differently depending on the questionnaire.

With the second method, the most economically advantageous tendering (MEAT) procurement criteria were used to determine innovation procurements, where an assessment criterion in addition to price is also conformity to procurement requirements and qualitative value to determine the winner of the procurement. This means that one part of the MEAT procurement criteria is used to determine the proportion of budgetary innovation procurements, which is fictional reduction on tendering price, where it is assessed how much the contracting authority would be prepared to pay extra for the value added received. This amount is taken into account to measure the budgetary proportion of innovation procurements in the total budget of procurements. In the case of MEAT and reduction on tendering price methods, innovation is not directly measured, but it is essentially indicated how much RWS would be prepared to pay for generating possible value added (incl. innovation) compared to the price-based assessment method. As a result, the definition of an innovation procurement is already determined with the use of the MEAT criteria, even though it does not reflect the actual innovation of the procurement.

3.2. Monitoring innovation procurements

Even though countries have tested various approaches, none of the analysed countries use a systematic and fully developed innovation procurement monitoring or assessment system today. Based on existing practices (interviews) and literature, different potential methods for monitoring innovation procurements can be highlighted, which can be taken as basis for developing a corresponding practice in Estonia. The table (Table 2) provides various potential monitoring systems to be applied in Estonia (in real time as well as for *ex post* monitoring).

Table 2. Various methods for monitoring innovation procurements and assessing their impact

	Content	*Pros*	*Cons*	*Examples*
Monitoring in real-time				
a) Based on assessments of the contracting authority	The contracting authority determines the connection of every procurement with innovation in the central public procurement register based on criteria provided	Simple and cheap; takes the actual experience of contracting authorities into account	Difficult to ensure reliability of data (awareness and objectivity of the person inserting the data); increases management load for the contracting authority	Spain
b) Based on text analysis	Algorithm-based monitoring system where the extent of innovation procurements is determined based on content criteria (keywords) of an innovation procurement on the basis of procurement notices and reports	A fully automatized system enables to collect information in real time; operative; low operating costs	Indicates the intention of the contracting authority rather than actual connections with creating/distributing innovation; technological risks; unevenness/lack of data	Not used in the context of innovation procurements; very initial plans allegedly in place in Finland (with involvement of TEKES)
c) Based on use of procurement methods	The use of certain types of procurement (e.g. competitive dialogue) or assessment methods (MEAT criteria) or type of procurement (e.g. ordering R&D) is monitored	Enables to collect coherent information which can be compared in time; simple and cheap	Indicates openness to innovation rather than actual connection (e.g. competitive dialogue is used little, the use of MEAT criteria does not rule out the use of "old" solutions, R&D procurements contain a lot of consulting activities	RWS (Holland)

	Content	*Pros*	*Cons*	*Examples*
Ex post monitoring				
a) Questioning contracting authorities and/or tenderers	Determining the proportion of innovation procurements with the help of questionnaires to contracting authorities or tenderers	Enables to collect additional information not available in the register; thorough	Difficult to ensure the reliability of data (awareness and objectivity of the person inserting the data)	Contracting authorities: PIANOo (Holland); the Statistics Board (Austria). Tenderers: academic surveys and question-naires of international organisations (CIS, WEF, Innobarometer)
b) Indicator-based analysis	Use of various existing indicators (e.g. patents) to identify connections between the input (public procurement) and output (innovation)	Enables to monitor the dynamic of impact over time	Does not directly indicate the dynamics of innovation procurements; not operative; limited opportunities in small countries	Academic analyses
c) Case study	In-depth analysis of specific cases of innovation procurement	Enables to determine in-depth trends, success factors and hindrances	Limited generalizing capability	The most common method for academic research; also used by several countries for promoting the policy
d) Programme study	Analysis of the processes and impacts of specific political measures	Enables to determine the impacts of innovation procurements and related processes	Does not indicate the overall dynamics of innovation procurements	SBRI (United Kingdom)
e) Text analysis	The extent of innovation procurements is determined on the basis of procurement notices and reports with the help of expert assessments	A register-based analysis enables to make generalized conclusions	Indicates the intention of the contracting authority rather than actual connections with creating/distributing innovation; takes a lot of time; unevenness/ lack of data	PIANOo and RWS (Holland)

3.2.1. Monitoring solution for innovation procurements

Local conditions such as the e-procurement register must be taken into account in order to develop an efficient system which functions in Estonia. The centre of the monitoring system is the definition of innovation in the context of public procurements. This enables to classify procurements as specifically as possible and to identify the nature of innovation. Four levels of innovation were developed in the nature of innovative procurements upon analysing policies of other countries and consulting with experts (part I of the survey). The content of those levels is well expressed in the following 4 questions, where an affirmative answer means that the aspect of innovation is present in the procurement:

- Did you procure research and development activity in the scope of this procurement? (For example: basic research, application research, testing and development etc.)
- Was the object of the procurement new for the contracting authority as well as the tenderers? (For example: Defence Forces procured a blocking device for the activation signal of explosives set off by radio which did not previously exist on the market.)
- Was the solution procured in the scope of this procurement new for the contracting authority? (For example: the procurement of a control system of smart street lighting. Must be novel in Estonia but may be used in another country.)
- Did the procured solution make the work processes at the facilities of the contracting authority more effective? (For example: using an IT solution in new fields such as the procurement for a traffic flow control and planning system at Tallinn harbour)

Examples provided with the question help the respondent focus better and this ensures the increased reliability of responses.

For Estonia, the most suitable location for a monitoring system is the e-procurement register. A significant part (over 95%) of procurements in Estonia are carried out in the e-procurement register. Carrying out procurements in an online environment is convenient for the contracting authority, the tenderers as well as state institutions who compile statistics on procurements. Inquiries can be made in the database regarding extremely varied aspects of a procurement and the keyword of innovative aspects will also be added to the database in 2017.

In order to collect information which is as specific as possible, it must be acquired at the right time from the right people. In the case of innovation procurements, the best time to collect information would be the moment when the procurements are uploaded in the e-register. This way, the contracting authority will have recent memories of aspects related to the procurement and is most likely to recognize innovative aspects. At that moment, it would be useful to ask the contracting authority to specify the information for the purpose of quality of the information. For the maximum effectiveness of the process, balance must be achieved between the increase of management load and reasonable information flow in identifying the innovative aspects of a single procurement. With this particular issue, sufficient information for one procurement would be the knowledge involving the 4 questions concerning innovation above. Responding to four yes/no questions takes 30-60 seconds for a person who is aware of the content of the procurement and this way, the necessary amount of information can be collected with minimal increase of management load.

By having an overview of the presence of innovative aspects in procurements as well as a specific classification with the use of the 4 questions, innovation procurements can be monitored in real time. As the information collected this way would be based on assessments of the contracting authorities, then the information should be occasionally validated. For validation, information should also be collected from the tenderers and the responses of contracting authorities and tenderers of the same procurement should be compared. The validation frequency should be once per 3 years and the statistical overlap coefficient received as a result of the validation process would be a factor considered in the upcoming years.

3.3. Basic level of innovative public procurements in Estonia in 2015

3.3.1. Empirical survey in the public procurement register

RHR classifiers[4] were used to prepare the statistics on innovation procurements. Part II of the survey revealed that in 2015, a total of 10,650 procurements were carried out in the public sector and 1.84% of those procurements (196 procurements) were potentially innovative. The table (Table 3) provides 10 institutions which carried out the most potential innovation procurements.

Table 3. 10 institutions which carried out the most potential innovation procurements

Contracting authority	*Number of procurements*
Information of System Authority	13
Estonian E-health Foundation	10
Ministry of Economic Affairs and Communications	10
IT centre of the Ministry of Finance	10
Tallinn University of Technology	8
Ministry of Education and Research	7
IT and development centre of the Ministry of the Interior	7
Elering AS	6
Road Administration	6
Estonian Agricultural Registers and Information Board	6

4 https://riigihanked.riik.ee/register/SeadedKlassifikaatorid.html

It was revealed upon reviewing procurements in the register that 84% of the potential innovation procurements are in the field of information technology (IT) or directly connected to it. The representation of the IT field is well displayed also in the table of contracting authorities of innovation (Table 3) where the top of the table contains e.g. the Information of System Authority and the Estonian E-health Foundation. The main area of activity of both contracting authorities or a defining part of it is connected to IT systems.

The biggest issue with this empirical survey of the public procurement register is the fact that procurements are assessed by a person who has not been connected to specific procurements but is a generalist in the context of the survey. The survey suits well to determine an initial sample to use as basis for further activities such as an online survey of the contracting authorities and tenderers. In this case, people who were directly connected to the procurements will respond in regards to specific procurements. In addition to questioning contracting authorities, questioning tenderers also provides important additional information. Responses of tenderers may reveal innovative aspects of a procurement which are related directly to the work processes of the tenderer and remain "invisible" to contracting authorities during the procurement.

3.3.2. Online survey

An online survey was carried out among contracting authorities and tenderers in order to validate the results of the empirical survey. The questionnaire is provided in the annex (Annex 4). The questionnaire was prepared with consideration for saving time of the respondents and the first 4 questions determine whether further questions are necessary. The content of the 4 clarifying questions is provided from part I of the survey, specifically from the 4 levels of innovation (page 16). If at least one question out of 4 received an affirmative response, additional questions (up to 7) were generated for respondents. The number of extra questions generated depended on the role of the respondents (contracting authority or tenderer). Extra questions probed the procurement in depth and attempted to clarify different aspects for contracting authorities and tenderers:

- Overview of the market situation
- Intellectual property rights incurred with the procurement
- Improvement of quality of public services
- Improvement of quality of work at the institution of the contracting authority
- The need to procure a novel solution
- Difference from a "regular" procurement
- Progress of procurement proceedings
- The opportunity to sell the tendered product to other clients

Ideally, all these aspects are part of an innovation procurement and all aspects are characterised by a deeper meaning. For example, an overview of the market is highly important because in a situation of knowing the market well, the procurement documents prepared by the contracting authority have better focus and technical descriptions. Dividing intellectual property rights between the contracting authority and the tenderer so that the tenderer can also sell the product to others is also important for an innovation procurement. If the contracting authority demands for all intellectual property rights, they lock the innovative product for their use only and the tenderer has no opportunity to sell the developed product again.

The survey was carried out on 196 potentially innovative procurements and 140 procurements were covered with the responses (71%). Contracting authorities responded about 86 procurements (44%) and tenderers about 75 procurements (38%). There were 21 procurements which received responses from the contracting authority as well as the tenderer (11%). 76 procurements turned out to be innovative according to the survey. The reference number, name, contracting authority and tenderer of all 76 procurements are provided in the annex (Annex 5). Procurements on which the questionnaire was not filled were deemed unspecified and therefore, 0.7-1.2% of all public procurements carried out in Estonia in 2015 were innovative.

The distribution of fields of the 76 innovative procurements is provided on the figure (Figure 2). 90% of innovative procurements are in the field of IT or related to IT. The remaining 10% of procurements were divided between different fields.

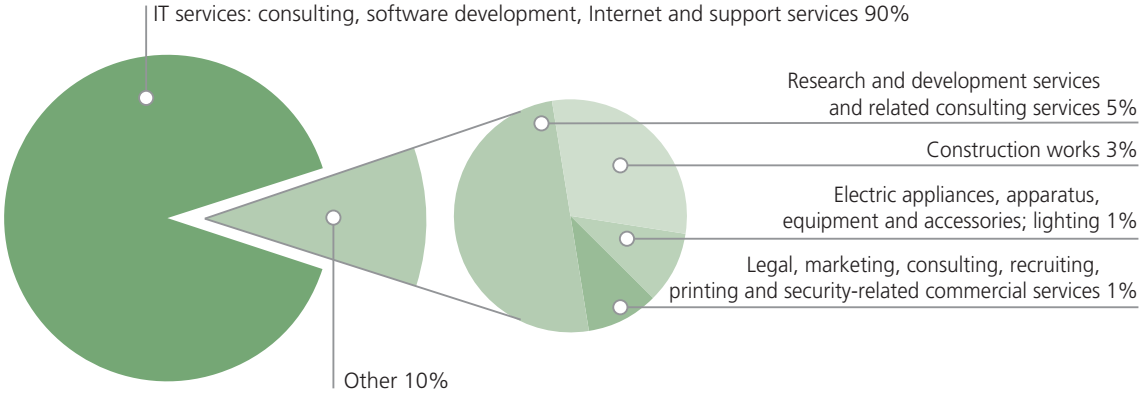

Figure 2. Fields of procurement objects

The figure (Figure 3) provides types of proceedings used to carry out the procurements. The types of proceedings used reveal that the majority of procurements (78%) were carried out with types of proceedings where the contracting authority and tenderers have no opportunity to have a dialogue (simple proceedings and open procurement proceedings). Upon procuring an innovative product or service under simple or open procurement proceedings, it is important that the contracting authority has the technical description of the object figured out in very great detail.

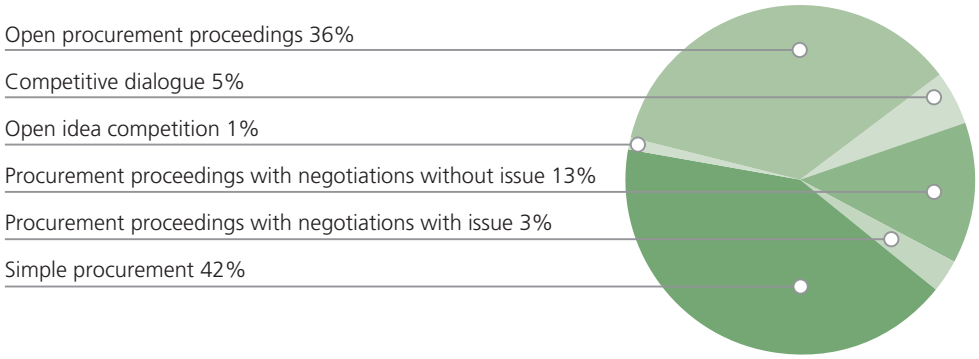

Figure 3. Distribution of innovative procurements by types of proceedings

22% of innovative procurements were carried out with types of proceedings which enabled negotiations. Planning negotiations into procurement proceedings is strongly recommended for procuring innovation. As the risks of the contracting authority are bigger for procuring a novel product, then those risks can be significantly alleviated with negotiations. In addition, negotiations allow for developing of a more flexible solution in a situation where the nature of the problem to be solved with the procurement is not yet clear to the contracting authority.

In the online survey, **contracting authorities** were requested to report other circumstances related to the procurement in addition to the innovative aspects of the procurement. For example, 32 contracting authorities out of the 76 who responded found that the procurement significantly improved the quality of public services and 35 contracting authorities found that the procurement significantly improved the quality of work within the public institution. The procurement proceedings went smoothly for 45 of the contracting authorities who responded. The incentive of contracting authorities for procuring a novel solution was also revealed in the course of the survey. The table (Table 4) provides the incentive of contracting authorities for procuring a new solution and it is revealed that the strongest incentive was the need for a more effective solution among respondents.

Table 4. Incentive of contracting authorities to procure innovation

Incentive of contracting authorities to procure a new solution	*Number of contracting authorities*
The need for a more effective solution	28
The law	2
Obligations	2
The market	1
Lack of information	1

39 contracting authorities responded negatively to the question whether the innovation procurement carried out differed significantly from other procurements. 7 contracting authorities who stated that the procurement differed significantly from other procurements found that the causes for differing were a more extensive preliminary work and an unknown field. One contracting authority noted that as the procured solution was new and the development volume was large, then there was a risk that the targets of the procurement would not be met, but everything progressed and functioned as expected. This remark is a good example of risks involved in procuring innovation, but also of the possibility of preventing the realization of those risks.

When analysing the information received from responses of the **tenderers**, it can be said that out of 10 tenderers out of 76, the tender was significantly different from previous tenders. The reasons for the difference involved the following keywords: volume of tender, originality, basic task based on need, technologically complicated solution. The tenderers responded to the question on what incited them to offer the novel solution as indicated in the table (Table 5).

Table 5. Incentive for providing an innovative solution

What incited you to provide a new solution	*Number of tenderers*
The basic task	11
Motivation of the contracting authority	10
EU requirements	1
The market	3

The tenderers also considered the following thoughts to be important: it was positive that the price was not the only assessment criterion and if possible, they would also sell the solution to other clients. With the last thought, it pays to point out that the distribution of intellectual property involved in the procurement should be such that tenderers would be able to sell the novel product to other clients as well, with consideration for the public gain from an innovation procurement.

4 Activities to increase the level of innovative procurements

4.1. Distributing the idea of innovative procurements

The basic level and monitoring of innovation procurements are activities which in and of itself do not make public institutions procure more. Monitoring is merely a tool which allows to measure the behaviour of persons required to procure and the meeting and impact of political targets. In order to increase the basic level of innovative procurements, a more in-depth involvement in the topic is needed.

As the idea of innovation procurements is relatively new in Estonia and overall awareness of the topic is quite low, then extensive introduction and promotion of this idea in the country should be applied. The topic should receive a widespread, or so-called horizontal approach (Lember et al. 2014; 2015).

4.1.1. Financial measures

One opportunity to support innovative procurements is to finance them. As of 2016, the support measure for innovative procurements is available in Estonia in cooperation of Enterprise Estonia and the Ministry of Economic Affairs and Communications. The objective of this measure is to incite contracting authorities to change their procurement practices to support innovation[5]. In the scope of the measure, projects of innovative procurements which meet the criteria receive financial support to a maximum of 50% and a maximum of €500,000. By the time of completion of this survey, the first round of this measure was complete and 3 contracting authorities passed it successfully (Tartu City Government in cooperation with Harku Rural Municipality Government, the Ministry of Social Affairs and the Road Administration). As this measure has not yet been used in Estonia, the organizers find that the first round can be deemed satisfactory. When looking at the results of the first pilot round of the measure of innovation procurements, it is revealed that contracting authorities have plenty of good ideas and interest in executing them. According to the summary of the round, there is a lack of specific skills such as conducting a market analysis, describing risks (including financial risks) and meeting the technical criteria of the project. The second round will be opened in January 2017 with consideration for all issues of the first round.

Handing out financial support is one of the possible ways to popularise innovation procurements, but financial support alone is not enough to sustain the political target.

4.1.2. Popularising activities

For more innovation procurements to be carried out, the target groups must be constantly informed of the importance of the issue. Awareness activities should be present in the public media, where the entire society is the target group, as well as in classrooms and conference rooms, where the target group is the office workers carrying out the procurements. Trainings allow to spend more time on details and cover all aspects important for innovative procurements, such as establishing the problem to be resolved, market analysis, legal procedures of the procurement, results of and lessons from successful innovation procurements previously conducted. Awareness activities should also take place on the level of top managers of public institutions where the topic is addressed on a philosophical level.

For the best result, the awareness activities and financial measures should correspond to each other in time, which would enable the novel ideas and knowledge/skills to be formed into a successful procurement project with the help of the support.

5 http://www.eas.ee/teenus/innovatsiooni-edendavate-hangete-toetamine/

5 Summary

The objective of this survey was to determine which of the public procurements carried out in 2015 were innovation procurements. The survey was carried out in three stages:

- Analysis of policies and experiences of other countries;
- Empirical analysis in the public procurement register;
- E-questionnaire on potential innovation procurements.

Finally, 76 procurements turned out to be innovative procurements, 90% of which were various procurements in the **field of IT.** As responses could not be collected on some of the potential innovation procurements, then **0.7 – 1.2%** of procurements carried out in 2015 were innovative. In addition to determining innovation, the questionnaire also revealed other issues related to the procurement, such as the incentive to procure the novel solution, the influence of the procurement on the quality of public services, distribution of intellectual property, etc.

In addition to determining the basic level, the objective of the survey was also to offer a monitoring solution of innovation procurements which would suit Estonia. In the opinion of the authors, the best way for this was the questionnaire located in the e-procurement register, which would concern the 4 levels of innovation explained in chapter 3.2.1.

To sum up, the authors provided a suggestion to the state of Estonia on activities to increase the popularity of innovation procurements. These are a parallel and purposeful application of awareness activities and financial measures. This ensures the arising of good ideas, correct selection and execution of procurement procedures, and financial support for innovative solutions.

References

Albano, G., L., (2012) "Discussion Paper on Public Procurement Performance Measures" OECD, Paris, OECD Conference Centre, 11-12 February 2012

Aschhoff, B., Sofka, W. (2009) "Innovation on demand—Can public procurement drive market success of innovations", Research Policy, No. 38 (8), 1235–1247

Buchinger, E. (2014) "Public Procurement Promoting Innovation in Austria" Policy Brief, Austrian Institute of Technology

Buchinger, E. (2016) "Austria's Innovation Procurement Performance in the EU and OECD Context", PPPI Policy Notes, Austrian Institute of Technology

Bedin, S., Decarolis, F., Iossa, E., (2015) "Quantifying the impact of Pre-Commercial Procurement (PCP) in Europe based on evidence from the ICT sector", European Commission DG Communication Networks, Content & Technology

Criscuolo, C., Haskel, J.E., Slaughter, M.J. (2005) "Global Engagement and the Innovation Activities of Firms" NBERWorking Paper No. 11479. Cambridge, MA

Edquist, C., Hommen, L. (2000) "Public Technology Procurement and Innovation Theory" in Edquist, C., Hommen, L., Tsipouri, L. (Ed.), Public Technology Procurement and Innovation, Springer: New York, 5-70

Edler, J., Ruhland, S., Hafner, S., Rigby, J., Georghiou, L., Hommen, L., Rolfstam, M., Edquist, C., Tsipouri, L., Papadakou, M., (2005) "Innovation and Public Procurement. Review of Issues at Stake. European Commission: Brussels."
Available at: http://cordis.europa.eu/innovationpolicy/studies/full_study.pdf

Edler, J., Georghiou, L., Blind, K., Uyarra, E. (2012) "Evaluating the demand side: New challenges for evaluation", Research Evaluation, No. 21, 33-47

Edler, J. (2013) "Review of Policy Measures to Stimulate Private Demand for Innovation" MIoIR-NESTA: Manchester/London.
Available at: http://www.innovationpolicy.org.uk/share/12_Review%20of%20Policy%20Measures%20to%20Stimulate%20Private%20Demand%20for%20Innovation.%20Concepts%20and%20Effects.pdf

Edler, J., Uyarra, E. (2013) "Public Procurement of Innovation" Brown, L., Osborne, S. (Ed.), The Handbook of Innovation and Change in Public Sector Services, Edward Elgar: Cheltenham

Edler, J., Georghiou, L., Uyarra, E., Yeow, J. (2015) "The meaning and limitations of public procurement for innovation: a supplier's experience" Charles Edquist, Nicholas S. Vonortas, Jon Mikel ZabalaIturriagagoitia, Jakob Edler, editor(s). Public Procurement for Innovation. Cheltenham: Edward Elgar Publishing; 2015, 35-64

European Research Area and Innovation Committee (ERAC) (2015) "ERAC Opinion on Innovation Procurement" Brussels, 23 June 2015,
Available at: http://data.consilium.europa.eu/doc/document/ST-1209-2015-INIT/en/pdf

Garvayo, L, H. (2013) "Monitoring innovation public procurement: Evidence from public authorities in Spain", presentation in OCDE Workshop on Innovative Public Procurement 5th and 6th December, Paris

Georghiou, L., Edler, J., Uyarra, E., Yeow, J. (2014) "Public procurement as an innovation policy tool: choice, design and assessment."

Guerzoni, M, Raiteri, E., (2012) "Demand-side vs. supply-side technology policies: Hidden treatment and new empirical evidence on the policy mix", Research Policy, No. 44, vol. 3, 726-747

Hommen, L., Rolfstam, M., 2009. Public procurement and innovation: Towards a taxonomy. Journal of public procurement, No. 9, 17-56,
Available at: http://www.ippa.org/IPPC3/JoPP%209(1)/Art2_TowardsaTaxonomy.pdf

Kattel, R., Cepilovs, A., Drechsler, W., Kalvet, T., Lember, V., & Tõnurist, P. (2014). Can we measure public sector innovation? A literature review. LIPSE working paper No 2, available at www.lipse.org

Lember, V., Kalvet, T., Kattel, R. (2011) "Urban Competitiveness and Public Procurement for Innovation" Urban Studies, No. 48 (7), 1373-1395

Lember, V, Kalvet, T (2012) "Riigihanked ja innovatsioon: milleks kulutada 11 miljonit eurot päevas?" Riigikogu Toimetised, No. 26, 110-126.

Lember, V., R. Kattel, and T. Kalvet, eds. 2014. Public Procurement, Innovation and Policy: International Perspectives. Heidelberg: Springer

Lember, V., Kattel, R., Kalvet, T. (2015) "Quo vadis public procurement of innovation?", Innovation: The European Journal of Social Science Research,
Available at: http://dx.doi.org/10.1080/13511610.2015.1043245

Lember, V.; Kattel, R.; Tõnurist, P. (2016) "Public Administration, Technology and Administrative Capacity, *forthcoming*

Lenderink, B. (2015) "Development of a Measurement Instrument for Innovation Facilitating Procurement" University of Twente, Master Thesis, Civil Engineering & Management

OECD (2005) "Oslo Manual", available at: https://www.oecd.org/sti/inno/2367580.pdf

Ortiz, M,. P. (2012) "Success stories in Spanish Innovation Procurement", presentation, Madrid, 2. October 2012

Ruttan, V. W. 2006. Is War Necessary for Economic Growth? Military Procurement and Technology Development. New York: Oxford University Press

Rolfstam, M. 2012. "An Institutional Approach to Research on Public Procurement of Innovation." Innovation: The European Journal of Social Science Research 25 (3): 303–321

Rolfstam, M. (2015) "Measuring effects of public procurement of innovation", XIX IRSPM Conference, University of Birmingham, UK, 30 March - 1 April 2015

SEES / Oxford Research. (2011) Final Evaluation of the Lead Market Initiative, Final Report July 2011, available at: ec.europa.eu/DocsRoom/documents/5627/attachments/1/translations/en/renditions/native

Uyarra, E. (2012) "Review of Measures in Support of Public Procurement of Innovation", Manchester Institute of Innovation Research

Uyarra, E., Edler, J., Garcia-Estevez, J., Georghiou, L., Yeow, J., (2014) "Barriers to innovation through public procurement: A supplier perspective", Technovation, No. 34, 631–645

VTT (2013) "Procu-Inno Surveys to Companies and Public Sector". Unpublished mimeo

Annex 1. Consulting experts

1) Max Rolfstam (Associate Professor, Aalborg University, Denmark / Lund University, Sweden), e-mail, 6 June 2016

2) Jakob Edler (Professor of Innovation Policy and Strategy, the University of Manchester, United Kingdom), 7 June 2016

3) Gustavo Piga (Professor of Political Economy, University of Rome Tor Vergata, Italy), e-mail, 10 June 2016.

4) Elriva Uyarra (Senior Lecturer, the University of Manchester, United Kingdom), e-mail, 12 June 2016

5) Miguel Ortiz (IPP Coordinator, CDTI, Spain), e-mail, 15 June 2016

6) Valentine Bouissieres (Project Manager, Direction des Achats de l'Etat, France), 20 June; 6 July 2016

7) Annie Stalberg (Director of Division of Policy Control, The National Agency for Public Procurement, Sweden), e-mail, 20 June 2016

8) Lieve Bos (Policy officer pre-commercial procurement (PCP) & public procurement of innovation solutions (PPI), European Commission), e-mail, 23 June 2016

9) Mieke Hozen (Rijkswaterstaat, Secretary of the Executive Board, Holland), e-mail, 24 June 2016

10) Jon Mikel Zabala (Lecturer, Deusto Business School, Spain), e-mail

11) Charles Edquist (Professor, Lund University, Sweden), e-mail

12) John Rigby (Senior Research Fellow, the University of Manchester, United Kingdom), e-mail

Annex 2. Interviewed experts

1) Dan Hodges (Head of Economics and Evidence, Innovate UK, United Kingdom), telephone interview, 13 June 2016

2) Ville Valovirta (Senior scientist, VTT, Finland), Skype interview, 16 June 2016

3) Bart Lendenrink (PhD student in University of Twente, Holland), Skype interview, 20 June 2016

4) Joop Halman (Professor of Innovation and Risk Management, University of Twente, Holland), Skype interview, 20 June 2016

5) Eva Buchinger (Scientist, AIT Austrian Institute of Technology, Austria), Skype interview, 24 June 2016

6) Susanne Kurz (Project manager, KOINNO, Germany), Skype interview, 24 June 2016

7) Marlene Grauer (Manager of International Projects, BME, Germany), Skype interview, 24 June 2016

8) Floris den Boer (Senior Advisor of Public Procurement, PIANOo, Holland), Skype interview, 27 June 2016

9) Johan Lundström (Innovation procurement specialist, The National Agency for Public Procurement, Sweden), Skype interview, 27 June 2016

Annex 3. Competence centres for innovation procurement in Austria

- BMWFW – Federal Ministry of Science, Research and Economy (Political Responsibility & Financing)
- BMVIT – Federal Ministry for Transport, Innovation and Technology (Political Responsibility & Financing)
- AIT – Austrian Institute of Technology (Scientific Advice & Monitoring)
- FFG – Austrian Research Promotion Agency (PPPI Service Partner focusing on pre-commercial procurement)
- BBG – Austrian Federal Procurement Agency (hosts the PPPI Service Centre as an overall support facility)
- AWS – Austrian Federal Promotional Bank (PPPI Service Partner focusing on commercial procurement)
- BIG – Austrian Federal Real Estate Company (PPPI Service Partner focusing on the buildings sector)
- GSV – Austrian Association for Transport and Infrastructure (PPPI Service Partner focusing on the transport sector)
- EA – Austrian Energy Agency (PPPI Service Partner focusing on the energy sector)
- WKO – Austrian Economic Chambers (PPPI Service Partner focusing on the exchange with the industry)
- Procurement Expert Conference of the Provinces (PPPI Service Partner focusing on the exchange with the provincial governments)
- PPPI Steering Group (operative responsibility)
- PPPI Council (strategic responsibility)

Annex 4. Results of the online survey

From the contracting authorities:

1. Have you procured research and development activities? (yes/no)
   (For example: basic research, application research, testing and development.)
2. Was the procured solution new for all market participants? (yes/no)
   (For example: the Defence Forces procured a blocking device for the activation signal of explosives set off by radio.)
3. Was the procured solution new for the contracting authority or most market participants? (yes/no)
   (For example: ELMO programme, the state procured the network for charging electric cars.)
4. Were the processes provided by the procured solution novel for the institution? (yes/no)
   (For example: the use of IT solutions in new areas.
   The procurement of the traffic flow control and planning system for Tallinn harbour.)

If the answers to all questions above have been "no" then no further questions are asked.

5. To what extent were you aware of solutions available on the market before the procurement?
   (completely/to a certain extent/to a small extent)
6. Did the procurement involve intellectual property? (yes/no)
   If yes, then how did intellectual property rights get divided? (written response)
7. How did the procured solution influence the quality of public service?
   (Improved significantly/improved slightly/degraded slightly/degraded significantly)
8. How did the procured item influence the quality of work within the institution?
   (Improved significantly/improved slightly/did not change/degraded slightly/degraded significantly)
9. What incited you to procure the novel solution? (longer answer)
   (For example: There was no solution to the problem on the market.)
10. Was this procurement significantly different from other procurements at the institution? (yes/no)
    If yes, how?
11. How did the proceedings for the procurement progress? (longer answer)

From the tenderers:

1. Have you tendered research and development activities? (yes/no)
   (For example: basic research, application research, testing and development)
2. Was the tendered solution new for all market participants? (yes/no)
   (The Defence Forces procured a blocking device for the activation signal of explosives set off by radio.)
3. Was the procured solution new for the tenderer or most of the market? (yes/no)
   (For example: ELMO programme, the state procured the network for charging electric cars.)
4. Did the tender involve processes which were new for the company? (yes/no)
   (For example: the production lines of the plant had to be significantly updated to complete the tender.)

If the answers to all questions above have been "no" then no further questions are asked.

5. Did the procurement involve intellectual property? (yes/no)
   If yes, then how did intellectual property rights get divided? (written response)
6. Have you been able to sell the tendered solution to other clients as well? (yes/no)
7. Was the tender significantly different from other tenders of the company? (yes/no)
   If yes, how?
8. What incited you to tender the novel solution? (longer answer)

Annex 5. Innovation procurements carried out in 2015

Reference number	*Part of name of procurement*	*Contracting authority*	*Tenderer*
170084	Developing electronic means of assessment and method for digital competence in middle and secondary school	Ministry of Education and Research	University of Tartu
167344	Developing renewable energy solution for Ruhnu	Eesti Energia Aktsiaselts	Bakeri OÜ
163084	Style book and technological solution vision of the new self-service environment of the Tax and Customs Board	Tax and Customs Board	Osaühing Icefire
158563	Maintenance and development service of the traffic surveillance information system	Ministry of Economic Affairs and Communications	Brightspark OÜ
160818	Creating the online environment of Estonian manor schools	Museum of Estonian Architecture	osaühing Wiseman Interactive
166411	Software development of the balance sheet management system	Elering AS	Piksel OÜ
160618	Ordering the software development and maintenance service of the e-receipt portal	Aktsiaselts Eesti Post	OÜ TripleDev
159220	Analysis and concept of intra-institutional service, distribution centre of Copernicus satellite data	Ministry of Economic Affairs and Communications	AS PricewaterhouseCoopers Advisors
164688	Ordering the software solution of the register of waste managers, incl. hosting and maintenance	Tallinn Environmental Board	OÜ Geodata Arendus
167058	Analysis, development and maintenance of the new programme of the State Road Register	Road Administration	AS Reach-U
159067	GIS112 development and maintenance works	IT and development centre of the Ministry of the Interior	Aktsiaselts Datel
166780	Development of the e-customs information system of the Tax and Customs Boars (paper-free customs control)	IT centre of the Ministry of Finance	Osaühing Icefire
168688	Creating the integrated water solution of MS Dynamics NAV	Aktsiaselts Saku Maja	Aktsiaselts Fujitsu Estonia
166938	Idea competition for online digital study materials to support studying Estonian as a second language in middle school	Ministry of Education and Research	Osaühing HEVAMI
162538	Designing the comprehensive solution of PVT panels and replacement with vacuum pipe collector based solution	Tallinn University of Technology – Toivo Piik	OÜ Hilaris Küttesüsteemid
166010	Purchasing software development works and developing resource	IT and development centre of the Ministry of the Interior	Cybernetica AS
158663	Development and maintenance of the database information system (ALIS)	IT and development centre of the Ministry of the Interior	Infobuild Estonia OÜ

Reference number	*Part of name of procurement*	*Contracting authority*	*Tenderer*
163136	Maintenance and development of information systems on the basis of the framework contract	Government Office	Mekaia OÜ
160128	Development and maintenance of public online environments of Omniva	Aktsiaselts Eesti Post	OK Interactive OÜ
162530	Development works of the central system of the health information system	Estonian E-health Foundation	Osaühing Affecto Estonia
165558	Information system of Enterprise Estonia planning, budgeting and project management, additional development works 2015-2	Enterprise Estonia	osaühing Resta
166010	Purchasing software development works and developing resource	IT and development centre of the Ministry of the Interior	Cybernetica AS
158637	Ordering maintenance and development service for software of the Estonian Research Information System	Ministry of Education and Research	AS Finestmedia
161983	Maintenance and development service of the air safety surveillance information system	Ministry of Economic Affairs and Communications	Aktsiaselts Datel
161456	Building and installation of the Smart City demo centre exposition	Smart City Lab	Foundation Ahhaa Science Centre
168250	Energy efficiency analysis of the Sanatoorium Tervis AS facility complex and developing measures for energy efficiency	aktsiaselts Sanatoorium Tervis	Tallinn University of Technology
163283	Creating the digital warehouse of the museum information system MuIS	Ministry of Culture	Aktsiaselts Datel
165777	Software development and maintenance service	State Forest Management Centre (RMK)	AS Reach-U
165276	Ordering mobile apps for ERR radios	Estonian Public Broadcasting	Mobi Lab OÜ
166010	Purchasing software development works and developing resource	IT and development centre of the Ministry of the Interior	Cybernetica AS
168675	Purchase and installation of LED street lamps based on solar power	Tori Rural Municipality	OÜ ProLED Group
167489	Procurement for software development service for completing the development of the Estonian Internet Foundation register system	Estonian Internet Foundation	OÜ PerfectLine
165558	Information system of Enterprise Estonia planning, budgeting and project management, additional development works 2015-2	Enterprise Estonia	osaühing Resta
168455	Development and maintenance service of the intranet of Tallinn city official institutions	Tallinn City Office	Osaühing Net Group
160702	Maintenance and development works of the Tallinn city financial information system component SAP Bank Bridge	Tallinn City Office	Osaühing WiseSoft
160666	Creation of the EMSUKA archive database and maintenance interface	Institute of the Estonian Language	BitWeb OÜ

Reference number	*Part of name of procurement*	*Contracting authority*	*Tenderer*
168542	Creation of the odour penetration electronic detection system in Muuga area	osaühing Estonian Environmental Research Centre	Comon Invent B.V
160595	Hosting, maintenance and development of non-profit activity information system	Tallinn City Office	AKTSIASELTS HELMES
160343	Developing the environmental education portal and replacing content management software	The Environmental Board	OÜ Web Expert
160478	Development and maintenance services of the Health Insurance Fund website	Estonian Health Insurance Fund	OÜ Web Expert
162440	Ordering additional development works for the spatial planning information system (RPIS)	AKTSIASELTS ANDMEVARA	OSAÜHING R-SÜSTEEMID
168773	Analysis of developing digital channels of the Estonian Museum of Art	Art Museum of Estonia	Stagnation OÜ
160326	Ordering development works of the Tartu city website	Tartu City Government	OÜ Web Expert
166634	Development of the electronic work plan of the National Opera	National Opera "Estonia"	I-Smith Baltic Osaühing
163024	Creation of the new website of Tallinn Health Care College	Tallinn Health Care College	OÜ Web Expert
164819	Creation of the new website of Tallinn Health Care College	Tallinn Health Care College	OÜ Web Expert
163816	Creation of the new website of Tallinn Health Care College	Tallinn Health Care College	OÜ Web Expert
160949	Software developments in Python	Centre of Registers and Information Systems	OSAÜHING INVERSION SOFTWARE
169535	Additional developments and improvements in the application portal of the Patent Board (teenused.epa.ee)	Centre of Registers and Information Systems	Osaühing Net Group
160984	Development works of the software of emergency mobile workplace	Estonian E-health Foundation	ThinkLab OÜ
163642	Improving assessment method of Estonian cross-border statistics with the help of mobile positioning	Bank of Estonia	OÜ POSITIUM LBS
167405	Developing the data collection portal	Bank of Estonia	Osaühing Aktors
161292	Development and maintenance of TKIS software	Estonian Unemployment Insurance Fund	AS Finestmedia
161484	Optimising the work processes of address data system, improving the proceedings application and In-ADS (ADS)	Land Board	Aktsiaselts Datel
160736	Development contract for online services based on Xforms 2015	Information of System Authority	Osaühing Aktors
167382	Ordering the homepage development for the Environmental Investment Centre (KIK)	Foundation Environmental Investment Centre	#N/A
169136	Continued development and maintenance works of the application eKredEx	Sihtasutus KredEx	UPTIME OÜ

Reference number	*Part of name of procurement*	*Contracting authority*	*Tenderer*
160738	Information system of foreign projects	Tallinn City Office	AKTSIASELTS HELMES
161365	Database of universal supports	Tallinn City Office	Aktsiaselts SPIN TEK
160531	Additions to hydrography softwares HIS and AHIS	Maritime Administration	OSAÜHING R-SÜSTEEMID
166833	Additions to the application Nutimeri	Maritime Administration	Osaühing ALPHAGIS
166132	Load tests and scientific analyses for the old Särevere bridge and hydroinsulating concrete	Road Administration	Tallinn University of Technology
163950	Development works of the Tallinn land information system	Tallinn Urban Planning Department	AA Arendus Osaühing
169503	Development works of SAP FIORI of the Estonian Health Insurance Fund	Estonian Health Insurance Fund	Derpity OÜ
159897	Provision of IT development service to road register programme Tiit	Tallinn Municipal Engineering Services Department	OSAÜHING PENTE TARKVARA
163767	Supply and development of GIS standard software	aktsiaselts VÕRU VESI	Osaühing DBVISTA
169379	Creating, implementing and maintenance of user management system software (registration and authentication)	Consortium of Estonian Libraries Network	Mindworks Industries osaühing
165040	Developing and implementing a software solution	NPO Rakuravi	Osaühing Net Group
163136	Maintenance and development works of information systems on the basis of the framework contract	Government Office	Mekaia OÜ
168422	Developments necessary for conducting REGREL in the address data system	Land Board	Aktsiaselts Datel
157277	Framework procurement for developing the state information system management system (RIHA)	Information of System Authority	Girf OÜ
165153	Creating the national access point e-SENS	Information of System Authority	osaühing DEGEETIA
168457	Secure e-mail exchange system (preliminary analysis)	Information of System Authority	Tallinn University of Technology
161839	Developing the interfacing software for hospital information system ESTER 3.4 and booking environment Aeg Arstile	OÜ Celsius Healthcare	aktsiaselts Gennet Lab
160559	Additions to measuring and hydrographic data processing programmes RAN and AEGIR	Maritime Administration	OSAÜHING R-SÜSTEEMID
169353	Determining waste residue in compost mixes with development and validation of method	Tallinn University of Technology	University of Tartu

creating an innovative estonia

Previously published in "Innovation Studies":

1/2002 Competence Centre Programme Estonia. Feasibility Study

2/2002 Innovation in Estonian Enterprises 1998–2000
Saadaval eesti- ja ingliskeelsena

3/2003 Business Incubation: Review of Current Situation and Guidelines for Government Intervention in Estonia

4/2003 Optimising the Design and Delivery of Innovation Policy in Estonia: an Evaluation of Policy Instruments for Intensifying Business Innovation

5/2004 Access of Enterprises to Venture Financing in Estonia: Feasibility Study of Government Support Scheme

6/2006 Evaluation of the Design and Implementation of Estonian RTDI Policy: Implications for Policy Planning

7/2007 Innovation in Estonian Enterprises 2002–2004
Saadaval eesti- ja ingliskeelsena

8/2007 Impact Evaluation of Spinno Programme in 2001–2006

9/2007 Innovation Staff Recruitment Programme Feasibility Study

10/2007 Evaluation of Estonian RTDI Policy Mix

11/2008 Ettevõtete tehnoloogiainvesteeringu teostatavuse analüüsi lõppraport

12/2008 Mid-Term Evaluation of the Competence Centre Programme

13/2010 Estonian Biotechnology Programme.
Feasibility study for an Estonian Biotechnology Programme

14/2010 Eesti ettevõtete uued võimalused – ärimudelid, avatud innovatsioon ja riigi valikud

15/2011 Feasibility Study for an Estonian Materials Technology Programme

16/2011 Innovaatiline tegevus ettevõtetes aastatel 2006–2008

17/2011 Evaluation Framework for Innovation and Enterprise Support Policies in Estonia

18/2012 The Role of Green ICT in Enabling Smart Growth in Estonia

19/2012 Peer-Review of the Estonian Research and Innovation System. Steady Progress Towards Knowledge Society

20/2012 Energiatehnoloogia programmi vahehindamine. Aruanne

21/2012 Ettevõtlus- ja innovatsioonipoliitika vahehindamine

22/2012 Maa kaugseire ja satelliitnavigatsioon – rakendused, kasutusvõimalused ning mõju Eestis

23/2014 Teostatavusuuring innovatsioonipoliitika nõudluspoole meetmete väljatöötamiseks ja rakendamiseks Eestis

24/2015 Eesti ettevõtete uuendusmeelsus ja innovatsiooni toetamise võimalused

25/2015 Eesti biotehnoloogia programmi mõjuanalüüs

"Innovation Studies" series consists of research publications, reports and evaluation studies on Estonian innovation system and policy.

Innovation Studies can be downloaded in PDF format from the website of Ministry of Economic Affairs and Communications for Estonia http://www.mkm.ee/innovatsiooniuuringud/

ISBN 978-9949-9752-3-5 (pdf)
ISSN 1406-8958