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## Public e-procurement tools in European Union

### INTRODUCTION

Public procurement is the process by which public authorities, like government departments, local authorities, state-owned enterprises etc., purchase goods, services and works from both domestic and foreign companies (World Bank Group, 2016). There are even some sectors (e.g. transport, social care, health or education services) where public authorities are the principal buyers. Public procurement is the largest single marketplace in each country and in European Union its value in 2016 accounted for around 14% of EU GDP (about 1.9 trillion Euro) and the number of public buyers exceeded 250,000 (OECD, 2017).

Public procurement is regulated by law to assure that the best product or service is obtained and three basic rules are respected: transparency of actions, equal treatment and non-discrimination of potential suppliers. As it constitutes a significant amount of expenditure of every national government, public procurement can also generate business opportunities, promote innovation, and power economic growth.

One way of making the public procurement process simpler to participate, shorter, cheaper and more transparent is the introduction of electronic tools that can support almost all activities connected with public procurement. Most EU member countries have already introduced some of these tools. European Commission appreciates the advantages of e-procurement and insists on using it universally in all EU countries.

This paper is aimed at presenting the benefits of electronic procurement and the initiatives of the European Commission concerning this subject. Moreover, it describes how individual phases of e-procurement are used in selected member countries (including Poland).

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## SIZE OF PUBLIC PROCUREMENT

The value of public procurement varies across the countries. In 2015, the estimate of total public procurement expenditure on works, goods and services (excluding utilities) ranged from EUR 1 billion on Malta to EUR 461.7 billion in Germany. The size of public procurement can be presented as percentage of gross domestic product – in 2015 the percentage of GDP equaled 5.5% on Cyprus and 20% in the Netherlands (the average for European Union was 13.1%) (DG GROW G4, 2016).

For OECD countries public procurement was also considered as a share of total government expenditures and in 2015 for EU members it corresponded from 19.5% in Greece to about 44.5% in the Netherlands. The share of expenditures on central and sub-central government level in general government procurement also depends on the country. The highest level of sub-central government spending on procurement in 2013 was in Belgium and Spain (84%) and the lowest in Greece (22%) (OECD, 2015).

## ELECTRONIC PROCUREMENT

Electronic procurement “refers to the use of electronic communication and transaction processing by government institutions and other public sector organizations when buying supplies and services or tendering public works” (Buyse et al., 2015). This solution is intensively promoted by EU due to its many advantages (European Commission, 2016):

- significant savings for buyers and sellers,
- improvement of communication,
- reduction in errors,
- reduction of red-tape and administrative burdens,
- increased transparency,
- facilitation of the access of all enterprises (also small and medium enterprises) to public procurement markets.

Efficiency and cost-effectiveness are the primary objectives of public procurement. The usage of information and communication technologies can support those activities. E-procurement can also facilitate access to public tenders what leads to increased competition and decrease in administrative burdens. It can also improve transparency by making public authorities more accountable for purchased products and services.

It is commonly reported that the savings resulted from using e-procurement range between 5% and 20%. Savings at even 5% allow an EUR 100 billion cut back (World Bank Group, 2016).

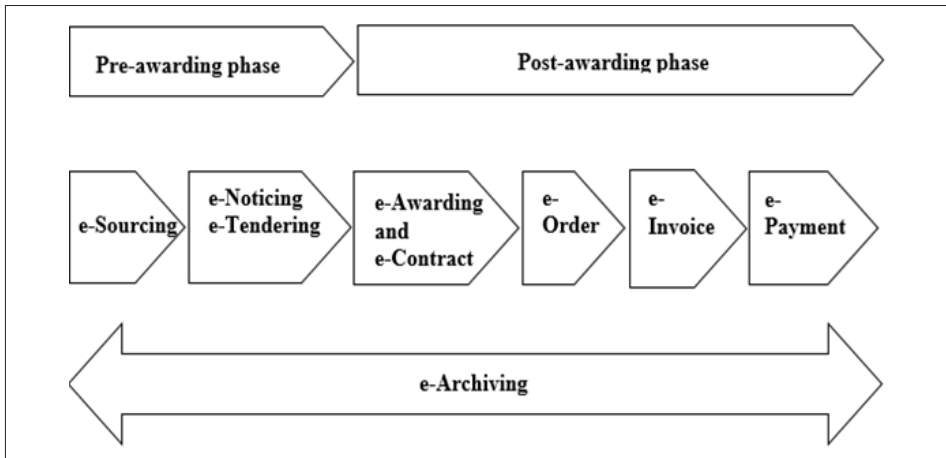
## PHASES OF THE ELECTRONIC PROCUREMENT PROCESS

The main moment in the electronic procurement process is the contract award, hence two basic parts of electronic procurement process can be distinguished: pre-awarding phase and post-awarding phase (see Figure 1). The pre-awarding phase includes e-Sourcing, e-Noticing and e-Tendering activities described below (Buyse et al., 2015):

- e-Sourcing means all activities conducted by the contracting authority or entity aimed at the preparation of a call. Potential bidders should be contacted and informed to manifest interest or provide quotations. In some cases legal provisions allow the communication by electronic means.
- e-Noticing – calls for tenders are published in electronic format in the relevant Official Journal (e.g., Official Journal of the EU or other publication board). The access to tender documents and specifications should be provided electronically and in a non-discriminatory way. The same concerns prior information notices and contract award notices that should be published on the website.
- e-Tendering includes two sub-phases: e-Access and e-Submission. The first means electronic access to tender documents and specifications and making them available for download. Moreover, it provides the support for suppliers and contractors during the preparation of an offer (questions, clarifications). e-Submission is the submission of offers in electronic format to the contracting authority or entity. This offer should be received, accepted and processed in accordance with the legal requirements. The system can assure the capability of automatic validation of electronic tenders, so that suppliers can have immediate feedback to their bids.

Post-awarding phase includes e-Awarding and e-Contract, e-Order, e-Invoice and e-Payment activities described below (Buyse et al., 2015):

- e-Awarding – the electronic tenders received by the contracting authority or entity are opened and evaluated in accordance with legal regulations. The contract is awarded to the best bid and they can be evaluated in terms of the lowest price or economic advantages. e-Evaluation procedure described later can also be applied here.
- e-Contract – the contracting authority or entity and the winning tenderer use electronic means for conclusion, enactment and monitoring of a contract. It also enables the collation of bid history, monitoring of performance against mutually set service level agreements and key performance indicators. This subsystem can remind buyers about important activities such as the necessity of contract renewal.
- e-Order – the contracting authority or entity prepares an electronic order that is issued and accepted (also online) by the contractor.
- e-Invoicing – invoices in electronic format are prepared by the contractor and delivered to the contracting authority or entity. Next invoices are processed by the computer system of the receiver.
- e-Payment – contracting authorities or entities pay for the ordered goods, services or works using electronic methods.



**Figure 1. Phases of electronic public procurement**

Source: own work based on (Buyse et al., 2015).

The cross-phase – e-Archiving – should also be mentioned here as it contains all activities concerning online data archiving and assuring access to electronic documents. Moreover, in some cases additional elements are used to expand the possibilities of the e-procurement system. These can be as follows (Buyse et al., 2015):

- e-Attestation is a tool that allows suppliers to upload relevant information necessary for specific selections. Electronic means enable automation and monitoring of tenderers qualifications throughout the comparison and tendering process.
- e-Evaluation system can provide partial assistance in decision support or full automation of the assessment of tenders. Full automation is possible only when the assessment criteria are entirely quantitative and defined clearly.
- e-Auctions – auctioneers (public bodies) and bidders met each other in an electronic marketplace. The use of electronic auctions can dynamically support the receipt of improved tenders.
- e-Request – a request for proposal sent electronically. A public body interested in the procurement of goods solicits for business proposal from suppliers.
- e-Catalogue – an electronic document that contains information about products and services and their prices in a structured way. It facilitates e-Ordering and purchasing of products.

## DIRECTIVES AND INITIATIVES SUPPORTING E-PROCUREMENT

On 18 April 2016 new rules have been applied to the public procurement in EU member states. At the time, three directives on public procurement came into force and all countries must have adjusted their national legislation to meet these

directives (European Commission, 2016). Two of the directives that were introduced in April 2014 aim at making electronic procurement progressively mandatory in member countries. The first step was completed by April 2016 since when it is mandatory to send all notices for publication electronically (e-Notification) and to provide electronic access to tender documents (e-Access). The next step concerns electronic submission of offers (e-Submission) that became obligatory in March 2017 for central purchasing bodies (which are buying on behalf of other public buyers) and will be obligatory in September 2018 for all contracting authorities (European Commission, 2016).

Another important directive for electronic procurement was the Directive on e-Invoicing in public procurement that came into force in May 2016. It concerned mandatory reception and processing of electronic invoices using the new common European standard obligatory for all contracting authorities and entities. This solution should help eliminate barriers for cross-border public procurement and ensure better functioning of the single market. Member states have time until November 2018 to implement this directive in central authorities and one additional year to adopt it at regional and local level (European Commission, 2016). Automation of data processing should result in a significant reduction of operational costs for authorities and for supplying companies. The main problem is the lack of a single common European standard of e-invoice. To counteract this situation, a project called “Pan European Public Procurement On-Line” (PEPPOL) was founded in 2008 by the European Commission (Bausà, 2017).

The new rules of public procurement adopted in April 2016 have also introduced a new type of self-declaration for bidders. The European Single Procurement Document (ESPD) helps companies prove that they fulfil the exclusion and selection criteria of a tender which means a significant simplification of the access to cross-border tendering opportunities. The standard documents will only have to be provided by the winning tenderer and from October 2018 only the electronic form of ESPD will be accepted. The new rules should simplify public procurement procedures and make them more flexible. This will benefit public purchasers and businesses, particularly small and medium enterprises.

#### SITUATION IN MEMBER COUNTRIES

The level of implementation of electronic procurement is diverse in member states, which is caused by different local regulations. In some countries, regulations concerning the particular phases of e-procurement had been applied before the Directives came into force. Interestingly enough, functionalities related to the beginning of the purchasing process were provided in most of the investigated countries. On the other hand, functionalities connected with the end of the procurement cycle (except for the notification of award) were implemented

in a smaller number of e-procurement systems in member countries. Moreover, most of them were not mandatory. Detailed questionnaire research covering the usage of electronic public procurement in different countries was conducted by OECD in 2014 and 2016. In 2014 there were several countries (Italy, Finland, Sweden) in which all functionalities were provided in e-procurement system (but not all of them were mandatory). Hungary, France, United Kingdom, Poland and Spain were the members with the lowest number of mandatory functionalities (only three) (OECD, 2015).

Functionalities can be provided by a central national e-procurement system as well as by e-procurement systems of specific procuring entities (see Table 1).

**Table 1. Functionalities provided in e-procurement systems in selected member states in 2016**

	Announcing tenders	Provision of tender documents	E-submission of bids	E-reverse auctions	Notification of award	E-submission of invoices	Online catalogue
Austria	C S	C S	C S	S	C	C	S
Belgium	C	C	C	C	C	S	C
Denmark	C S	S	C S	S	C S	C S	
Estonia	C S	C S	C	C	C	S	
Finland	C	C	C	C	C	C	S
Germany	C S	C S	C S		C S		
Greece	C	C	C	C	C		
Hungary	C	C			C		
Ireland	C	C	C		C		
Italy	C S	C S	C S	S	C S	C	C
Latvia	C S	C S	C		C S		
Lithuania	C	C	C	C	C	C	S
Netherlands	C	C	C		C		C
Poland	C	S		C	C		C
Portugal	C	C	C	C	C		C
Slovakia	C	C	C	C	C		
Slovenia	C	C		C	C	C	C
Spain	C	C	C		C	C	C
Sweden	S	S	S	S	S	S	
United Kingdom	C	S	S	S	C	S	S

C – in the national central e-procurement system.

S – in e-procurement systems of some specific procuring entities.

Source: own work based on (OECD, 2017).

All countries surveyed in 2016 with the exception of Sweden had implemented national central e-procurement systems, but they covered different functionalities. In all countries it was possible to use those systems to announce tenders and to notify contract awards. Most investigated countries also provided tender documents in a national e-procurement system, only Denmark, Poland, United Kingdom and obviously Sweden did it in systems of specific procuring entities. All functionalities were accessible only in six countries (Austria, Belgium, Finland, Italy, Lithuania, United Kingdom). None of the central systems in member countries provided all functionalities; however, in seven countries the system covered as many as six of them (Belgium, Finland, Italy, Lithuania, Portugal, Slovenia, Spain) (OECD, 2017).

Some countries reported significant savings achieved after implementation of some e-procurement solutions. For example, in Denmark since 2005, all contracting entities from the public sector have only accepted electronic invoices. It affects approximately 15 million invoices a year and saves the public 100 million Euro each year. In Austria the centralization of purchases for federal authorities and usage of e-procurement functionalities resulted in 20% yearly savings, while the costs of system maintenance were lower than 3% of savings (World Bank Group, 2016).

## CURRENT SITUATION IN POLAND

In Poland, the Public Procurement Office, an independent unit within the Polish government, coordinates the public procurement system. Moreover, it prepares draft legislation on public procurement, verifies the conformity of conducted procedures and makes electronic tools available (Buyse et al., 2015).

Paper documents are still perceived as supreme in Polish tenders and the e-procurement infrastructure is fragmented and its services are limited. Some e-services are available but provided on separate platforms. It is obligatory to submit e-notifications of all tenders that exceed a defined value in the Public Procurement Bulletin or in TED. Tender documents are made available on the website of procuring entities or in e-procurement systems of some sectoral procuring entities. E-access is mandatory for open tender procedures, dynamic purchase and e-auction (Buyse et al., 2015). The Public Procurement Office has set up three platforms: for electronic auctions, electronic bidding and electronic catalogues. They are free of charge, yet not popular among the purchasing entities and the number of proceedings is very low (e.g., in 2016 the value of electronic biddings amounted to ca. 0.05% of the total sum of all contracts) (Urząd Zamówień Publicznych, 2017).

To fulfil the expectations of the EU directive, the Public Procurement Office has been working on a computer system that will cost about EUR 4.7 mln.

The system, named “e-Zamówienia” (e-Orders), is expected to support buyers throughout all phases of the procurement process. Each buyer will have an individual profile to be able to publish all necessary information, the announcements will be standardized and fulfilled automatically where possible. Moreover, the system will enable the annual reports to be generated automatically. On the other hand, the use of the European Single Procurement Document described above will reduce costs of tenders preparation, especially as the system will import data from appropriate registers. The main advantages of the planned system are: cost reduction and increase in the transparency of tenders (Wikariak, 2015). The new platform should be ready in the first quarter of 2020 and will include the following modules (Kardas, 2017):

- Central repository of data,
- Public Procurement Bulletin,
- Monitoring and analytic,
- Electronic auctions and bidding,
- eSender,
- Module for the acquisition and protection of tenders/proposals before the date of opening.

The new platform should ensure: easy access to the information regarding proceedings, standardization of information formats, reduction of time (and costs) necessary for the preparation of required documents, easy reporting. The main goals of the new system include: better quality of the documentation prepared and shorter time of the preparation, efficient monitoring of the public procurement market, support of the contracting authority or entity in fulfilling the duty of electronic proceedings of orders (Kardas, 2017).

## CONCLUSION

Mandatory use of full e-procurement is a condition of developing a single public procurement market and will cause an increase of cross-border trade. The expected results of this digital revolution include the cutting of red tape (especially in respect of the necessity of submitting hard copies by the authority’s deadline) and making procurement processes more efficient and business-friendly. However, its success also depends on the effective enforcement of new legislation in EU member countries and on whether the 250,000 public buyers are really ready for its application.

Small and medium enterprises can be among the main beneficiaries of the new solution. Their involvement in public procurement can become facilitated as they will gain easier access to tender procedures, also internationally. Admittedly, they might be discouraged by the necessity of putting extra effort and bearing the additional costs of training. However, the European Commission and govern-



ments of member states can be expected to promote electronic procurement idea among companies (especially among SME) also in case of contracts below the threshold.

## REFERENCES

- Bausà, O. (2017). 2017 roadmap of e-invoicing in a nutshell. Downloaded from: <http://www.thepayers.com/expert-opinion/2017-roadmap-of-e-invoicing-in-a-nutshell/767278> (2018.05.02).
- Buyse, A., Dewynngaert, N., Loozen, N., Lopez Potes, M., Simons, G., Ziemyte, A. (2015). *e-Procurement Uptake. Final Report*. PwC EU Services.
- DG GROW G4 (2016). *Public Procurement Indicators 2015*. European Commission.
- European Commission (2016). *e-procurement*. Downloaded from: [https://ec.europa.eu/growth/single-market/public-procurement/e-procurement\\_en](https://ec.europa.eu/growth/single-market/public-procurement/e-procurement_en) (2018.04.27).
- Kardas, B. (2017). *Zaprezentowano założenia projektu „e-Zamówienia – elektroniczne zamówienia publiczne”*. Downloaded from: <http://www.zamowienia-publiczne.lex.pl/zaprezentowano-zalozenia-projektu-e-zamowienia-elektroniczne-zamowienia-publiczne> (11.05.2018).
- OECD (2015). Size of public procurement. In: *Government at a Glance 2015* (p. 135–145). Paris: OECD Publishing. DOI: 10.1787/gov\_glance-2015-en.
- OECD (2017). Size of public procurement. In: *Government at a Glance 2017* (p. 171–183). Paris: OECD Publishing. DOI: 10.1787/gov\_glance-2017-en.
- Urząd Zamówień Publicznych (2017). *Sprawozdanie Prezesa Urzędu Zamówień Publicznych o funkcjonowaniu systemu zamówień publicznych w 2016 r.* Warszawa.
- Wikariak, S. (2015). Przetarg na e-Zamówienia bez unijnego dofinansowania. Zabrakło projektu. *Gazeta Prawna*, 211.
- World Bank Group (2016). *Benchmarking Public Procurement 2017. Assessing Public Procurement Regulatory Systems in 180 Economies*. Washington.

## Summary

The main objective of this paper is to describe public procurement electronic solutions promoted by the European Union and to analyse the usage of these tools in different member countries. The economic importance of the purchase of works, goods and services made by public authorities is outstanding mainly because of their very high value. The EU directives tend to ensure the transparency, efficiency and effectiveness of the procurement market and show electronic tools as a very useful and innovative solution. They can be implemented in pre-award and post-award phases of the procurement process with the main benefit of making participation simpler for businesses (especially for SMEs) and management simpler for the public authorities. This paper lists key EU policy documents concerning the topic of e-procurement. It discusses tools that can be implemented throughout individual phases of the procurement process as well as the additional elements that are used to expand the possibilities of the e-procurement system. The application of electronic procurement that varies across the member countries is also described. The functionalities are provided by

a central national e-procurement systems and also by e-procurement systems of specific procuring entities. In Poland some e-services are available, but provided on separate platforms. New platform, that link together most of the services, should be ready in 2020.

*Keywords:* public procurement, electronic procurement, e-invoice.

## **Rozwiązania elektroniczne stosowane w zamówieniach publicznych w Unii Europejskiej**

### *Streszczenie*

Celem publikacji jest analiza promowanych przez Unię Europejską elektronicznych rozwiązań, które mogą być stosowane w zamówieniach publicznych oraz zbadanie poziomu ich wykorzystania w poszczególnych krajach członkowskich. Zakupy robót budowlanych, dostaw i usług dokonywane w ramach zamówień publicznych mają ogromne znaczenie ekonomiczne wynikające przede wszystkim z ich wysokiej wartości. Jednym z celów dyrektyw unijnych jest zapewnienie realizacji zamówień publicznych w sposób skuteczny i przejrzysty. Rozwiązania elektroniczne mogą być wykorzystywane zarówno przed przyznaniem kontraktu, jak i w późniejszych etapach. Najważniejszymi korzyściami z ich stosowania jest uproszczenie zasad uczestniczenia w postępowaniach (co ważne jest szczególnie dla firm z sektora MŚP) oraz łatwiejsze zarządzania postępowaniami przez instytucje zamawiające. W publikacji zaprezentowano główne dokumenty UE dotyczące elektronicznej realizacji zamówień publicznych. Omówiono także rozwiązania elektroniczne, jakie można wykorzystać na poszczególnych etapach procesu realizacji zamówienia, a także narzędzia, które uzupełniają możliwości systemu. Kolejnym krokiem była analiza wykorzystania poszczególnych rozwiązań w krajach członkowskich (zarówno na poziomie centralnym, jak i jednostek zajmujących się zamówieniami publicznymi). W Polsce niektóre z tych rozwiązań są dostępne, ale obsługują je oddzielne systemy – zintegrowana platforma ma być oddana do użytku w 2020 roku.

*Słowa kluczowe:* zamówienia publiczne, rozwiązania elektroniczne, faktura elektroniczna.

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