



Compendium of Large Infrastructure Projects

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Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

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Abstract

The European Union (EU) procurement Directives play a key role in the development and implementation of any large infrastructure project. While the directives have developed over the last two decades or more, we suggest that their potential to enhance the effectiveness of project delivery is not yet fully realised. Through an analysis of projects across the EU, we identify three mutually dependent recommendations for the European Commission, namely: 1) to improve the training of both procurement and project management professionals in the selection and implementation of the procurement procedures; 2) to recognise procurement as playing a significant role in the overall design of the project organisation and its resulting long term capability; and 3) to strengthen the efforts to facilitate a more dynamic form of knowledge creation through the development of national and pan European communities of infrastructure organisations.

Executive summary

Large infrastructure projects play a key role in any economy. They are complex, uncertain and lengthy endeavours that throw up significant technical, commercial, political and regulatory challenges throughout their life cycle. One of the key components that can influence their overall success is how the contracting authority procures the services and knowledge of suppliers in an often barely liquid market, through the selection and implementation of an appropriate procurement procedure from the EU Directives.

The move from the 2004 4th generation to the 2014 5th generation Directives has allowed large infrastructure projects to have greater engagement between contracting authorities and the market. However, the potential of this change is yet to be fully realised and remains constrained by a number of factors, most notably the timing of the selection of the procurement procedure and by whom, the constraints of national or in some cases the integration of national frameworks, the trade-off decisions to be made at the front end of projects, and the fear of challenge to the procurement process itself.

Drawing on a study of procurement procedures in over 80 large infrastructure projects within the European Union, including in-depth semi-structured interviews with procurement professionals within eight of those projects, we identify three key mutually dependent recommendations for the European Commission:

1. Further training in the professionalism and technical know-how of the procurement procedures, both at a national and pan European level. This should equally be for both procurement and project management professionals, facilitating enhanced decision making in the early stages of project development;
2. A recognition that the procurement strategy, and the selected procurement procedure within that, play a key role in the design and development of the overall delivery strategy for the project, specifically in connecting the front-end development stage with the delivery stage. This can have a significant bearing on the overall capability of the project organisation and as such is likely to need innovation in the way that procurement processes are designed and implemented by the contracting authorities;

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3. There is an opportunity to enhance the use of the current directives and to develop the next generation through communities of practitioners and policy makers at both national and pan European level, evolving the knowledge needed to select the most appropriate procedures and design the processes needed to avoid challenge. The European Commission should strengthen the efforts to play a key role facilitating this more dynamic and evolving form of knowledge creation.

1. Introduction

The European Commission Directorate General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) has engaged University College London (UCL) to conduct a study on public procurement of large infrastructure projects in the European Union (EU) and countries of the European Economic Area (EEA). The study explores public procurement aspects in contracts for large infrastructure projects, with an emphasis on the issues and trends that were emerging in the selection of procurement procedures within particular delivery models. Identifying these issues and trends opened up an opportunity to consider the timing and integration of the selected procurement model and procurement procedure into the overall delivery model for large infrastructure projects. The study aims to provide and share information and inform future policy initiatives.

2. Methodology

The study has been carried out over three stepwise refined work package phases (WP1, WP2 and WP3), and the Commission has reviewed the findings at the end of each work package in order to optimise the following phase.

WP1 generated a list of 85 large-scale infrastructure projects of national or multi-national significance that fulfilled selection criteria covering project type and minimum size, location (geography), procurement delivery model. Projects were drawn from a wide sectorial spread in order to represent the broad spectrum of significant projects implemented across the EC and EEA within the last 10 years (2008 – 2018), procured using either public or public-private procurement delivery models. The underlying assumption regarding these two procurement models is as follows:

In public delivery, the public procurement process pertains to the award of separate contracts that correspond to different project phases (e.g. design, construction, maintenance, operation, etc.) and/or different scope of works (e.g. civil works, earthworks, electrical/mechanical installations, etc.). In such cases, public procurement corresponds to the process followed in order to tender and award any of these contracts to a contractor, often resulting in a situation where a client is

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managing a number of different contracts. In public-private delivery, the procurement process usually pertains to the award of a single contract under which various project phases and scope of works (and often project financing) are bundled together. In such cases, public-private procurement corresponds to the process followed in order to tender and award a single contract to a contractor, which in most cases encompasses a number of sub-contracts awarded by the main contractor to a number of different sub-contractors. Here, the focus of the analysis will be on the award of the single bundled contract and not on the sub-contracts that will be established between the main contractor and its sub-contractors. Regardless of procurement model utilised (and the number of contracts ultimately awarded under the public procurement model), the focus of this study lies only in the significant packages of work that make up the project.

Following review and agreement with the Commission, WP1 was reduced to a shortlist of 36 projects to be studied during the next phase, WP2. In WP2, the key procurement characteristics of these projects were sought from publicly available information sources. While it was expected that the various pre and post contract notices published during the course of project development would provide a significant source of the information required, this has not turned out as expected. A decision was therefore taken to revisit WP2 and directly enlist the support of the projects as part of an attempt to improve the quality of information discovered. All projects were individually contacted several times through official channels for additional information, however the response level from the WP2 projects was very poor. Following this, UCL and EC held a meeting in Brussels and maintained continuous exchange of views, from which a list of eleven (11) projects was agreed to be further explored in WP3. The proposed sample has been based on considerations of the characteristics of the projects shortlisted in WP2. The report has aimed to provide a good mix of procurement characteristics such as, geographical spread, sectors (and subsectors) of activity and project status (planned, on-going, completed, etc.).

In particular, the proposed sample for WP3 was based on a selection process developed to maximise four elements, namely: (i) sector diversity, (ii) geographical spread, (iii) delivery model diversity, and (iv) procurement status diversity. Eight (08) projects, of the eleven (11) identified, were investigated in detail with respect to their public procurement characteristics. One project informed that they could not dedicate the time to engage in this study, and the remaining two

projects did not reply. The method of investigation was semi-structured interviews, which were conducted predominantly either by phone or by Skype, and in-person.

Semi-structured interviews are used in a variety of research contexts particularly connected to scenarios where further exploration is necessary to capture nuanced information, such as lessons learned and/or areas where more guidance is needed and would be relevant for the future. It is a qualitative approach that allows for the engagement with multiple types of data that may emerge within the semi-structured environment. Interview questions aim to capture both real time and retrospective information, unpacking the rationale as well as the processes behind decision making. Semi-structured interviews are suitable for this project as they allow for a deeper immersion into the contextualised practices of the participants in relation to the procurement procedure followed and various issues encountered. They also allow the project team to draw out from participants new insights which emerge through the discussion and may be within or beyond the boundaries of previously collected and analysed data (Eisenhardt and Graebner, 2007)¹. The basic themes of the semi-structured interviews have been based on the Commission's requirements as stipulated in the Technical Specifications of this call and have been extended based on the team's own understanding of the breadth and depth of the topics to be explored. In order to enhance the robustness of the approach, interview questions were also informed by project-related materials previously collected and analysed. The full list of interview questions is presented in Appendix 1. The interview findings were analysed considering the above-mentioned documents, as well as potential new ones indicated by the interviewees.

¹ Eisenhardt, K. M., Graebner, M. E. (2007). Theory building from cases: opportunities and challenges. *Academy of Management Journal*, 50(1), 25–32.

3. Conclusions and policy recommendations

3.1 Introduction

The Procurement Directives have evolved, particularly between the 4th and 5th generation, to foster open, competitive and efficient markets that deliver greater benefits while at the same time ensuring that suppliers are treated equally and fairly through a regime based on the Treaty principles of transparency, non-discrimination, equal treatment and proportionality.

It is already noted (by the Commission) that procedural and systemic errors and weaknesses in public procurement systems coupled with the complexity and duration of public procurement procedures can contribute to suboptimal outcomes including cost and programme overruns. Therefore, as the reports highlights, the increasing use of competitive dialogue or competitive procedure with negotiations has to be accompanied by increased professionalism and stricter governance by contracting authorities in order to continue to maintain supplier confidence, mitigate reputational risk and avoid expensive and disruptive legal challenge. At the same time, we also highlight the opportunity that the evolution of the directives gives to exploring the wider role that the procurement approach can play in reducing uncertainty, providing more technical and commercially viable projects and also in contributing to developing more capable project delivery organisations. We noted that the types of decisions to be made by contracting authorities are very contextualised in nature, impacted by the interpretation of the directives through national regulations, however the European Commission may play a role in developing new knowledge to alleviate some of these challenges.

Large major infrastructure projects are often purchased in barely liquid markets with a limited number of suppliers having the necessary technical expertise and commercial heft, even as they sit under the spotlight of public opinion and face increasing pressure to deliver enhanced long-term value for money outcomes. This is particularly so when clients wish to limit their risk exposure by breaking up the project into smaller packages, even though by so doing, they become more exposed to technical and commercial risks associated with the increased interfaces that are then created between works packages.

3.2 Conclusions

At the heart of the ever-increasing pressures and inherent uncertainties faced by contracting authorities there lies a strategic choice. The procurement exercise and the selection of procedure can be perceived as a narrow choice for supplier selection, or as a key enabler for delivering increased whole of life value. Given the unique nature of major infrastructure projects, it is considered that powerful arguments could be made in support of either approach, where contracting authorities are perceived to have a stronger position and more leverage to shape the procurement landscape. Yet the overwhelming evidence from the study is that the narrow perspective (supplier selection only) pertains and that procedural complexity risk and costs militate against the wider view focused on increasing value. Anecdotal evidence also suggests that this is a view that is shared by clients and suppliers alike.

Have contracting authorities historically adopted a ‘defensive position’ in their choice of procurement procedure for public works? Several interviewees appear to suggest that increased dialogue at tender stage could help to mitigate not just procurement but post contract delivery issues – strategic pricing, cost and programme overruns, adversarial relationships, poor client satisfaction etc. However, driven by the perceived increased risk of legal challenge and the constraints of ‘National Law’, a more transactional approach characterised by the minimum of negotiations with tenderers and thus the open or restricted procedure appears still to be a default choice. The reported risk and impact of legal challenge might increase with the extent of commitment and of resources required to bid for increasingly large, technically demanding infrastructure works contracts.

Therefore, it is unsurprising that a safe first choice appears to dominate the thinking of clients, even if this choice is counter-intuitive. The adoption of a more relational approach could offer increased flexibility when faced with lengthy procurement durations, a high risk of unforeseen developments and difficulties in procedural matters and the reality of incomplete contracts when attempting to describe ex-ante the requirements for such challenging undertakings. It remains to be seen if the flexible approach taken by the latest 2014 Directives will result in the wider adoption of competitive dialogue or competitive procedure with negotiations, which offers more opportunity for contextual inquiry, collective ingenuity and innovation, and ultimately contribute

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directly to attainment of improved long-term project outcomes. Invariably, however, it is recognised that increased efficiency and effectiveness at procurement cannot overcome the shortcomings of a poorly understood and ill-defined business need.

The study has confirmed that the choice of procedure for contracts procured under the 4th generation 2004 directives has been broadly in-line with expectations. In the case of the UK based projects where the contracting authority is established as a Utility, the overwhelming choice is negotiated procedure as allowed for under the Utilities Directive. In this context, the client is more knowledgeable about its specific requirements, preserves the opportunity for flexibility and to elicit supplier innovation in narrow areas following a call for tenders. For the projects that fall under the general Procurement Directive, the likely benefits that could arise from increased supplier dialogue appear to be subsumed by compliance related concerns and perception of the likely risks of legal action. The overriding preference is a more transactional procurement exercise based around open or restricted procedures, with minimal dialogue with the bidders. Competitive procedure is rarely ever used even though there is the distinct possibility of a more effective procurement might result (if not necessarily a more efficient process).

Many large infrastructure projects involve more than just “off the shelf” requirements, and it is on balance accepted that increased dialogue with bidders is likely to contribute to more effective procurement. All indications are that there should be an increased use of competitive dialogue and the competitive procedure with negotiations or the innovation partnership in specific cases as allowed for under the flexible regime provided by the 5th generation 2014 directive. However, the need to comply with national regulations and the increased procedural governance on the part of procurement teams, stimulate the narrow and defensive legal positions adopted by risk adverse contracting authorities. Better training at an operational level and increased support at a strategic level will be required if the wider benefits of the flexible regime under the 2014 Directives are to be widely used.

It is notable that while contracting authorities undertake various processes to optimise the packaging of works contracts, the choice of procurement procedure appears to be a given within the organisational context. There is no indication to suggest that the procurement procedure has any direct bearing on the evolution of the overall project delivery strategy.

Even though the procurement directives are harmonised at EU level, there remains a significant degree of flexibility afforded under national regulatory frameworks. Localism is therefore likely to continue to remain an issue concerning the governance of projects, not just within national boundaries, but more specifically those that span national boundaries in the future.

The voluntary ex-ante assessment tool is a key commitment from the Commission to support EU wide implementation of the procurement directives. Awareness of it and reference to it was poor to non-existent within projects interviewed, even allowing that most of the projects were procured before the existence of the tool. The perception of respondents is that it will struggle to provide sufficient support in overcoming the dilemmas between EU and local regulatory frameworks and doubts remain whether it can successfully mitigate exposure to future legal challenge. These two areas appear to be where practitioners' greatest concerns lie. An ideal tool would provide greater support and, if possible, certainty in these areas.

3.3 Policy recommendations

We identify three key policy recommendations, which are summarised below and supported by the following narrative.

In light of the limitations in the take up of more procurement procedures involving greater dialogue with the market, improved training of procurement professionals, which also results in improved process governance, would start to address tactical and operational short comings and mitigate procurement execution risk. This should in turn lead to improved confidence at a strategic level and ultimately a more efficient and innovative engagement with, and response from, the market. Recognising the contextualised nature of the types of decisions that need to be made, this training should incorporate the EU directives and their interpretation into the regulatory frameworks at a national level. Where projects transcend national boundaries, such training should be considered in the early stages of the project and include representatives from all nationalities involved.

We would also argue that the knowledge of the procurement procedures should extend beyond the procurement professionals to include project management professionals. As we have noted in the report, the front end of the project plays an important role in its overall development and we identified the opportunity for the procurement process to be considered as a tool to better connect

the front end of the project with its execution stage. Based on previous research, we argued that this has the potential to develop more capable project organisations through better integration of the supply chain with the contracting authority². Developing the knowledge of project management professionals in the procurement procedures and having the procurement professionals engaged with them in the earlier stages of the project would facilitate this.

We have recognised the challenges of the commercial trade-off between earlier market engagement and the development of the technical solution, as well as the long-term impact this can have on the relationship between the contracting parties. As we have highlighted in the report, the selection of the procurement procedure and its timing plays a key role in this. While large infrastructure projects often seek market innovations to identify novel technical solutions and mitigate time and budgetary constraints, previous research and the findings from this study suggest that there is a need for contracting authorities to also be innovative in the way they design and implement procurement processes resulting from the chosen procurement procedure. How can we expect just one side of the contracting parties to be innovative and not the other? In this regard, we strengthen the need for the training of both procurement and project professionals described above, but we also recommend that the European Commission strength the efforts and resources to play a key role in facilitating the sharing of existing and the development of new knowledge.

Here, we draw on our observations and experiences of the UK market which has seen the development of an Infrastructure Client Working Group, made up of key clients from both government, quasi government and private infrastructure organisation. Through such a forum, in conjunction with other national professional bodies, there has been extensive knowledge sharing from one project to the next, movement of common resources within and between projects, the development of a number of industry reports and influence in the development of the Government's industrial strategy. Alongside other initiatives, this has seen the development of what is termed 'project ecology' in the UK, specifically in and around London, which has seen a number of major infrastructure projects being undertaken over the last two decades (i.e. High

² Denicol, J., Davies, A., Krystallis, I. (2020). What Are the Causes and Cures of Poor Megaproject Performance? A Systematic Literature Review and Research Agenda. *Project Management Journal*. doi:10.1177/8756972819896113.

Speed 1; Heathrow Terminal 5; London 2012 Olympics; Thames Tideway tunnel, Crossrail; High Speed 2).

In addition to the ex-ante assessment mechanism, what role could the Commission play in developing such dynamic knowledge communities within and across national boundaries within the EU? How might they influence the knowledge and application of procurement procedures? Might such knowledge communities, supported by the European Commission, lead to the development of the next generation of directives? Might this result in a more active use of the flexibilities of this 6th generation of directives and see them playing a wider role in the overall delivery model of the project, facilitating the balance between flexibility and uncertainty, between technical and commercial decision making, while at the same time minimising the fear and concern over challenge to process? For this to happen, it is both the contracting authorities and the market that need to innovate and that need the continuous evolution of knowledge and capability and that, we would argue, can only happen if the European Commission plays a key role in facilitating and developing those knowledge ecologies with the support of national institutions.

We summarise the above into three key policy recommendations:

Policy recommendation 1: *Further training in the professionalism and technical know-how of the procurement procedures, both at a national and pan European level. This should equally be for both procurement and project management professionals, facilitating enhanced decision making in the early stages of project development.*

Policy recommendation 2: *A recognition that the procurement strategy and the selected procurement procedure within that, play a key role in the design and development of the overall delivery strategy for the project, specifically in connecting the front-end development stage with the delivery stage. This can have a significant bearing on the overall capability of the project organisation and as such is likely to need innovation in the way that procurement processes are designed and implemented by the contracting authorities.*

Policy recommendation 3: *There is an opportunity to enhance the use of the current directives and to develop the next generation through communities of practitioners and policy makers at both national and pan European level, evolving the knowledge needed to select the most appropriate procedures and design the processes needed to avoid challenge. The European Commission should further strengthen the efforts to play a key role facilitating this more dynamic and evolving form of knowledge creation.*

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Appendix 1

Interview questions

Through our search we have identified that you used a specific procurement procedure under the EU Directive:

1. What factors influenced your decision of selecting that particular approach?
2. What stage in the project life cycle did you make the decision?
 - 2a) How did the decision influence your delivery approach?
3. What issues or problems did you encounter in executing that procurement procedure?
 - 3a) What solutions did you design to solve those problems?
4. What are the main lessons learned that could inform future projects?
 - 4a) What parts of the procurement process would contracting authorities benefit of more assistance?
5. What are emerging trends in procurement in your perception?
6. What is your level of awareness regarding the existence and usefulness of the Voluntary ex-ante assessment mechanism tool?

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