# ENDOGENOUS INSTITUTIONS FOR USER-PRODUCER INTERACTION IN PUBLIC PROCUREMENT OF INNOVATION

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**ABSTRACT**

Since the turn of the century European policy makers have been changing their focus in innovation policy from supply side measures to demand side measures and specifically on how public procurement can be used to stimulate innovation in the European Union. This is a response to increasing concern for how the European nations can maintain their competitive advantage and maintain their welfare in the globalized economy with ever aging populations. This paper is based on innovation theory and uses institutional focus to investigate public procurement of innovation. Recent work in this field has focused on endogenous institutions rather than exogenous and this paper deals with how endogenous institutions in the context of user-producer interaction influence public procurement of innovation. The preliminary results of the empirical studies cited in this paper suggest that the endogenous institutions in user-producer interaction need to be understood better in order to understand the institutional set up that enables public procurement of innovation.

## INTRODUCTION

The focus on public procurement of innovation as a tool to stimulate innovation has been growing in European Union policies and as a field of research. The interest of the European Council was made clear in the Lisbon strategy for growth and jobs in 2000 where innovation is claimed to be an essential link in order for the European Union:

> *"… to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion."*
> (European Parlament, 2000)

The underlying assumption is that innovation *"is a key element in national economic growth."* (Lundvall, 2010)

Early research into why public procurement of innovation was not being utilized more as a tool to stimulate innovation in the member states of the European Union focused on the idea that the EU directives were a prohibiting factor. Several different researchers (i.e. European Commission 2005, Rolfstam 2008) have shown that public procurement of innovation can take place in accordance with the directives and that they are not prohibiting it. In later years several researchers have turned their focus to endogenous institutions that govern public procurement of innovation. As innovation is an interactive process the endogenous institutions were seen as a possible source of the difference between success and failure in cases of public procurement of innovation. Rolfstam (2008) has shown that, at least in some cases, endogenous institutions can hinder public procurement of innovation. He researched a case where several different public organizations failed to conclude a public procurement of innovation as there was a mismatch in their institutional set up.

User-producer interaction in public procurement of innovation is based on communicating both user needs and technological opportunities and the participants in this interaction need a common code of communication to efficiently work together towards a common goal (Lundvall, 2010). User-producer interaction has three forms, exchange of products, exchange of information and cooperation (Lundvall, 1985), all these forms of interaction include interactive learning and are therefore influenced by institutions (Johnson, 2010). Understanding how different endogenous institutions in user-producer interaction influence the outcome of public procurement of

innovation is therefore important and a step in building up an institutional set up that facilitates success. This paper sets out to contribute to this understanding. The research question can be formulated as: How do endogenous institutions help or hinder user-producer interaction in public procurement of innovation? The empirical material consists of two case studies of public procurement.

## FRAMEWORK OF REFERENCE

In 2002 the European Council stated that in order to achieve the goals in the Lisbon agenda a stronger action was needed in Europe. The suggested action included setting the target for public and private research and innovation spending at 3% of gross domestic product (GDP) by 2010 (European Commission 2002). An independent expert group headed by Luke Georghiou, working for the European Council identified public procurement as an effective tool to stimulate private sector R&D and innovation by creating a demand for innovative products. Georghiou et al. claimed that lack of private sector R&D was one of the factors where the European countries should do better in order to achieve the levels of innovation needed to secure high quality public service in Europe (European Commission, 2003a). The Union responded in 2003 by including public procurement of innovation in the European Commission Research Investment Action Plan as one of the methods to stimulate innovation (European Commission, 2003b).

Sins 2003 the EU has repeatedly encouraged the member states to implement public procurement of innovation in order to realize the goals from Lisbon and Barcelona of raising private sector R&D. Several of these include models, best practice advice and principles of how to realize public procurement of innovation in accordance with the EU directives (Edler, et al, 2005, CBI innovation brief 2007, Edler and Georghiou, 2007, Hommen and Rolfstam, 2009). One of those reports is from an independent expert group chaired by Mr. Esko Aho that presents a strategy and necessary steps to create an innovative Europe in order to support a sustainable growth. Aho et al. lists 5 reasons for why EU needs to step up in innovation; productivity in the EU continues to fall further behind the levels of USA, application of information and communication technology is to slow and far behind USA, EU is losing out as large firms globalize their R&D, Europe's lock-in in unmodernized traditional sectors and under-investing in service R&D, and aging population that will decrease the working population at the same time as the dependency ratio is rising sharply.

An independent expert group headed by dr. Aho suggests some changes that need to be implemented to raise levels of innovation in EU and which sectors to focus on. The report suggests a pact based on creating a market for R&D and innovation, supplying necessary resources and increased structural mobility (Aho, Cornu, Georghiou and Subirá, 2006). A communication from the Commission to the European Council in 2006 further emphasizes the problems that the European nations are facing in stimulating innovation. It claims that there is a lack of conversion from innovation into products and patents that lead to jobs, that there are many small innovative start-up firms in Europe but few of those grow into globally successful companies and that in some sectors, such as financial services and distributive trades, innovation has failed to bring productivity gains (European Commission 2006).

Public procurement of innovation has become a focus point in the last few years but it is by no means a recent idea. Several empirical studies in the 1970s investigated the connection between public procurement and innovation and they found that over longer time periods demand side stimulation of innovation through public procurement to be more effective than supply side R&D subsidiaries (Edler and Georghiou, 2007). Results of a 2005 innovation survey done in the UK by the Confederation of British Industries (CBI), states similarly that demand pull through public procurement of innovation is much more effective in stimulating innovation than supply push methods, though important (CBI innovation brief, 2006). The recognition of the effectiveness of demand side innovation stimulation has regrettably not resulted in systematic use of public procurement of innovation. Edler and Georghiou (2007) claim that this potentially major driver of innovation has not been recognized in government policies that have focused on supply side stimulation. The emphasis on supply side measures rather than demand side innovation stimuli was also pointed out by Rothwell back in 1981 when he compared the innovation policies of 6 industrial countries (Canada, Japan, The Netherlands, Sweden UK and USA). Rothwell found that all these countries focus on supply side measures (technical or financial), most place some emphasis on SME's, and only 3 countries (Canada, the Netherlands and USA) recognize demand as an important tool to stimulate innovation (Rothwell, 1981).

Current development is both on EU level and in individual member states as many of them have innovation policies that include public procurement of innovation under development or have recently developed such policies. Countries that have already incorporated public procurement of innovation into their innovation policies include UK, the Netherlands and Germany (Rolfstam, 2009). Georghiou and Cave state that several of the EU member states are developing methods of public procurement of innovation that show the benefits of a systematic approach. They find that a key to success in public procurement of innovation as a system are trained professionals that can play the role of intelligent customers and have understanding of technological trends and markets and can specify functional requirements and evaluate offers in terms of whole-life cost (European Commission, 2005).

## PUBLIC PROCUREMENT

Public procurement of innovation has been recognized to be an important tool in stimulating and directing innovation and procurement decisions will influence innovation even if governments have no specific innovation policy of doing so (Dalpé, DeBresson and Xiaoping, 1992). Governments wield a lot of purchasing power through their spending on works, goods and services which can be used to stimulate innovation. Average total expenditure on works, goods and services in countries in the European Union is

over 17% (17.23% in 2008 rising from 16.37% in 2004) of total GDP and the total expenditure in the EU27 in 2008 was 2.155,48 billion Euros (European Commission, 2010).

Edquist and Hommen (2000, p.5) define public procurement of innovation as being something that...

> *"…occurs when a public agency acts to purchase, or place an order for, a product – service, good, or system – that does not yet exist, but which could (probably) be developed within a reasonable period of time, based on additional or new innovative work by the organization(s) undertaking to produce, supply, and sell the product being purchased."*

This definition includes both public procurement of innovative goods and pre-commercial procurement of R&D services.

The lack of innovation friendly market and the fragmentation over national borders is a major barrier for company investment in R&D in Europe and public procurement of innovation can be used to remedy this (Aho, Cornu, Georghiou and Subirá, 2006). Dalpé, DeBresson and Xiaoping (1992) argue that the importance of public demand for innovation includes that governments are important customers for high technology, especially in sectors such as healthcare, defence and communication and that in some cases cost considerations are secondary to performance when social or political goals are at stake. This makes governments important as first users of innovations. The role of a first user is not only that to express a need for innovative solutions but also to participate in final product adjustments. Dalpé, DeBresson and Xiaoping (1992) investigated the scope of public procurement of innovation in Canada and found that the public sector was found to be the first user of 25% of innovations with hospitals, electrical energy, deafens, federal administration, railway transport and telephone systems as primary users. The importance of public procurement differs greatly between sectors and is of major importance to relatively few.

Hommen and Rolfstam (2009) claim, that both literature and research on public procurement of innovation have mostly viewed the process as transactions that are evaluated from the standpoint of the public procurer as a buyer. They claim that this looks past the variety and change in the interaction between users and producers and another approach is needed. Hommen and Rolfstam suggest a taxonomy that can be used to better understand different types of public procurement and the user-producer interaction that takes place in public procurement of innovation. The taxonomy is based on the two main dimensions of interaction and evolution of the market and related sub-dimensions.

## REGIONAL SYSTEMS OF INNOVATION

According to Cooke (1998) the concept of Regional systems of innovation is a relatively new one, only developing sins 1992 and had its origin in research on national systems of innovation (NSI) and the findings that there was no single identifiable model of NSI and that researching the systems part was difficult on national level.

Cooke (2004) claims that the interest for regional systems of innovation (RSI) in Europe was driven by the idea that it offered solutions to problems such as the fact that even though excellent research and publication were carried out in Europe they were not being exploited commercially, and even worse, they were being used as a foundation for innovation in other countries, mainly USA. A second problem that RSI was seen as a possible remedy for was that the majority of innovations that were exploited were in market failure in advanced business services.

Lundvall (2010, p.13) defines systems of innovation this way;

> *"The narrow definition would include organisations and institutions involved in searching and exploring... The broad definition...includes all parts and aspects of the economic structure and the institutional set up affecting learning as well as searching and exploring..."*

The broad definition includes public procurement of innovation as a part of innovation systems as it will affect learning, searching and exploring of new innovative solutions for needs. Lundvall also stresses the importance of knowledge as "the most fundamental resource in the modern economy" and that it follows that learning is the most important process. He claims that learning is predominantly an interaction between people in a social system and can therefore only be understood through studying the institutional and cultural context in which it takes place. Elements in a system of innovation can both reinforce each other or block processes of learning and innovation.

Systems of innovation, national or regional, are fundamentally constructed of two elements; the structure of production i.e. the industrial set up and dynamics of the production in the area and the institutional set-up that includes the socioeconomic and political institutions that influence the technological and production processes (Borrás, 2004).

As public procurement of innovation is a part of innovation systems it is important to understand the circumstances that support innovation i.e. when the elements of the system of innovation reinforce each other and also when they act as a hindrance to innovation.

## INSTITUTIONS

Research focusing on why public procurement of innovation is not utilized more as a tool to stimulate innovation have focused on different aspects of the institutions that govern public procurement, both exogenous and endogenous (Rolfstam 2007 and 2009, Edler et al. 2005). A research done by the Confederation of British Industry form 2006 points out different problems that UK firms find to be barriers in their dealings with public procurers, it states that the firms in the survey find that the government does not do a good job of public procurement of innovation, including that they are too risk averse, lacking in procurement skills, do not foster innovation and that current procedure threatens the intellectual property of the firms (CBI innovation brief, 2006).

The following definition for procurement of innovation is from an expert report for the European Commission (2005, p.5) headed by Georghiou and Cave.

> *"Procurement for innovation' - that is the purchase of goods and services that do not yet exist, or need to be improved and hence require research and innovation to meet the*

*specified user needs."*

Public procurement takes place as an interaction between the public procurer and supplier(s) that have a solution to the problem, or need, of the procurer. Rolfstam has pointed out that this interaction is bound by institutions and that when investigating why public procurement of innovation is not being implemented more, it can be helpful to use and institutional approach. Rolfstam claims that even though research has indicated that public procurement of innovation can be a useful tool in stimulating innovation the literature on the subject does not deal with what kind of an institutional set up is innovation friendly and that more research is needed in this area (Rolfstam, 2009). Institutions have been defined in different terms; North (1990, p.3) offers this definition;

> *"...institutions are the rules of the game in a society ... that shape human interaction."*

Traditionally much of the research on institutions has viewed them as constraints on organizational behaviour. The new institutionalism, taking shape in recent years, has focus on the field level, organisations work both in competitive and cooperative exchanges the attention is on the structure of relations and formulation of logic (Powell, 2007). Institutions can also function as assets, Rolfstam (2009) states that institutions, both exogenous and endogenous, exist to reduce uncertainty and that they act as cognitive shortcuts as they relieve people from mentally working out a solution to every problem, every time it occurs. He claims that social systems would not be able to accumulate knowledge or have meaningful communication without institutions and could therefore not sustain innovation. Johnson (2010) has a similar viewpoint as he claims that institutions provide the stability that is needed so that change, also technical change, can take place. He claims that institutions are even important for radical innovations as they provide the habits, formal and informal rules of engineering and scientific work that frees up time to do creative thinking. Routines in dealing with innovative work also help in dealing with major technological decisions.

The viewpoint of the new institutionalism is helpful when investigating the influence of institutions on public procurement of innovation as it is important to investigate both the competitive and cooperative exchanges in the process. Lundvall claims that institutions do not only provide economic agents with guideposts for action but that they help economic systems to survive the uncertainty and risk that is included in economic life characterised by innovative activity (Lundvall, 2010). The way institutions influence change is through their influence on learning, it is not possible to communicate, think or act in any field of knowledge without being influenced by the institutional set up (Johnson, 2010).

Drawing on North´s definition of institutions as the "rules of the game" Coriat and Weinstein (2002, p.283) distinguish between a type 1 and type 2 institutions, which will for the purpose of this research be referred to as exogenous and endogenous institutions respectively. Exogenous institutions (type 1) are *"based on criteria of authority and enforcement posed on all the agents"* typically these institutions are formal laws that cannot be waived. Endogenous institutions (type 2) are *"private collective agreements between groups of agents"* these institutions are typically the rules that individuals enter into on their own accord such as contracts they decide to sign and customs they follow.

The exogenous institutions in public procurement of innovation in the EU countries are the EU Public Procurement Directives 2004/17/EC and 2004/18/EC. The directives require that a public procurer advertises new contracts on EU level that all bids have to be evaluated on pre-published criteria and that the procurer provides information on the decision that is made (European Commission, Public Procurement Legislation, 2004). Any investigation into why public procurement of innovation is not being implemented more from an institutional view point includes understanding how applying to the directives influences public procurement of innovation (Rolfstam, 2009).

Research has shown that public procurement of innovation is possible to achieve within the boundaries laid out by the EU directives. In an independent experts report done for the European Commission Georghiou and Cave claim that; *"The gains from procurement for innovation can be realised within the new European directives for public procurement."* (European Commission, 2005, p.5) They go on and point out areas where these gains can be realized, including dialog between customer and supplier that can be used to structure the procurement process and include technical dialogues in preparation for tenders, the possibility of utilizing functional or performance-based specifications in tenders that allows for different solutions from the suppliers and the possibilities of transferring intellectual property to suppliers.

Different bodies of the EU have also published several papers with guidelines for how public procurement of innovation can be carried out in accordance with the directives. These include a paper on pre-commercial procurement that sets forth a stage model of how pre-commercial procurement can be done without counting as state aid, securing risk-benefit sharing between a public procurer and supplier, competitive development and separation of the R&D phase from deployment of commercial volume of the end products (European Commission 2007a). Another example is a 10 step guide on how to secure innovative public procurement within the parameters set by the directives (European Commission, 2007b). This list also includes a report done by Edler et al (2005) for the Fraunhofer institute for the European Commission that identifies 5 stages in the procurement cycle and draws lessons from the 9 cases about implications for public procurement of innovation for each stage.

Endogenous institutions that influence public procurement of innovation have been found to be a possible source of hindrance in some cases. Rolfstam (2009) has researched the effect of endogenous institutions in public procurement through 3 case studies representing both success and failure with regards to public procurement of innovation. He finds that reasons for failure in public procurement for innovations can, at least in some cases, be caused by institutions such as endogenous mismatch among stakeholders, lack

of technology champions, organized scepticism and so on. Rolfstam claims that instead of fighting for changing procurement law efforts should be made to improve the institutional set up.

## USER-PRODUCER INTERACTION

Theory of institutional economics traditionally identifies three generic functions for institutions in the economy; to reduce uncertainty as they provide the economic actors with rules, norms and traditions of how to act in given situations, they manage conflict and cooperation between actors and they provide incentives (North, 1990). This makes institutions important in research of user-producer interaction in the process of public procurement of innovation as this interaction includes all these functions. Processes of public procurement of innovation as well as pre-commercial procurement include competition between firms as they compete for being awarded the contract with the public procurer, it includes cooperation between the procurer and supplier and possibly between suppliers and the process includes incentives. Institutions also play a major role in the innovation process (Borrás, 2004).

When viewing innovation from the perspective of user-producer perspective Lundvall (1985, p.5) has defined innovation as; "*… the result of collisions between technical opportunity and user needs.*" He states that this implies that innovation units do need information about user needs as well as of technical opportunities.

Public demand for innovation has both a quantitative and a qualitative side as pointed out by Gregersen (2010). She argues the quantitative aspect is a centre aspect of research into how public procurement can be used to stimulate innovation. It is not only central as an incentive for private firms to invest in R&D but also in infant industries and in maintaining strong home markets. The qualitative aspect of public demand for innovation focuses on user participation. Lundvall (2010) has stated that the interaction between users and producers is at the heart of product innovation and will therefore be affected by the structure of production and the institutional set up. This happens at different levels, user-producer relationships are defined by the structure of production, the institutional form of these relationships is a reflection on the characteristics of the process of innovation, the rate and direction of innovation is affected by the institutional set up and the relationships are shaped by both distance in culture and geographical distance.

The interaction between user and producer takes place at all levels of public procurement of innovation from the discovery and statement of need through the purchasing process, innovation and product development, final product adjustments and finally after sale evaluation (Dalpé, DeBresson and Xiaoping, 1992) Urban and von Hippel (1988) emphasise the importance of the user not only as a source of the need the producer aims to fulfil but also as a source of input regarding possible solutions to that need. They claim that users are in some cases the actual developers of solutions such as in the case of scientific instruments where 82% of the products on the market were found to be developed by the users. Urban and von Hippel define lead users to be buyers of a novel or enhanced product, process or service and that;

> - *"Lead users face needs that will be general in a marketplace – but face them months or years before the bulk of that marketplace encounters them, and*
> - *Lead users are positioned to benefit significantly by obtaining a solution to those needs.*"
>
> (Urban and von Hippel, 1988, p.569)

One of the fundamental ideas of public procurement of innovations is that the public procurer, and or user, can take on the role of lead user and in that way influenced the process of innovation. Dalpé, DeBresson and Xiaoping (1992) found that in Canada the government is the first user of 25% of all innovations in some sectors. Lundvall (1985) states that even though the level of cooperation will vary there will be at least some level of cooperation between the user and producer in most innovation projects. He claims that this will increase the level of risk perceived by the user as he is not only purchasing a product with uncertain properties, with uncertain outcome he is also depending on the producer.(1994) Related to this is the finding made by Dalpé that an important factor in public procurement of innovation is the technical capacity of the user. Users with high technological capacity and that are innovative, force suppliers to innovate they are better at communicating their needs to the suppliers in a meaningful way and have the technical capacity to support the innovation.

A working group report written for the European Commission in 2006 deals with how public procurer in the member states of the European Union can within the framework of the directives take on the role of a first user (the report uses the phrase first user in similar fashion as Urban and von Hippel have defined a lead-user) through both public procurement of innovation and pre-commercial procurement. The authors emphasise the importance of sharing of both risk and benefits between the public procurer and the supplier in this process (European Commission, 2006).

## PROCUREMENT CASES

This research includes the study of two cases and interviews with experts in public procurement of innovation which is to be carried out in October – December 2010. The first case (case 1) deals with procurement of self service postal kiosk in Denmark and the second case (case 2) an attempt to sell energy saving light bulbs for streetlights to the municipality of Søderborg in southern Denmark. 6 stakeholders that have participated in the two procurement cases will be interviewed. Interviewees include procurers, project managers, engineers and managers.

Case 1 was selected because it is a case of innovation that was initiated by the buyer and carried out by a supplier in order to fulfil a need from the public buyer and that can be described as a successful public procurement of innovation. Case 2 was selected because it is a case of a firm carrying out an innovation and then attempting to sell it to a public buyer to fulfil a need expressed by the buyer and that can be described as unsuccessful. The two cases give different insights into buyer-supplier interaction during the procurement process and the importance of endogenous institutions in the process.

The cases in the research have been chosen based on the perceived informational richness they offer. With a focus on institutional barriers for innovation, cases that will be chosen may make out either examples of successful public procurement of innovation and/or less successful cases. The research is explanatory, dealing with how endogenous institutions influence the communication between the procurer and the supplier in public procurement of innovation emphasizing the role of communicating need for innovation and in that way influences the outcome of the process.

## GATHERING OF DATA

To increase the reliability of the research a case study protocol was developed before the data was gathered (Yin, 2009). The interviews will be semi-structured so that even though an interview guide with topics and questions will be used it should only be seen as a guideline for the topics that should be covered during the interview. The purpose of these interviews is to gain an understanding of the reality of the interviewee and it is important to have a balance between the control of the interviewer, which has the purpose of securing that the necessary topics are covered in the interview, and a flexibility that allows the interviewee to set forth his/her opinions and information (Darmer, 1996). Transcripts of interview recordings and preliminary case reports will be delivered to interviewees to increase the internal validity (Yin, 2009). Data will also be collected through documentation such as tender material, correspondence and reports. Relying on different sources of data will increase the internal validity of the research (Yin, 2009).

## PRELIMENARY RESULTS

### CASE 1

Case 1 deals with how Post Denmark A/S purchased a self service postal kiosk. Post Denmark was at the time a limited company where 75% of the stock was owned by the State of Denmark (Post Danmark, 2010) and the company therefore, had to apply to the current legislative set-up for public procurement, i.e. the EU Public Procurement Directives 2004/17/EC and 2004/18/EC. The project started in 2005 when Post Denmark approached aCon A/S with ideas on developing a self service postal unit and is still running as final delivery has not taken place. The requirement specifications in the tender called for a self service postal unit where customers could handle all transactions that take place in a smaller post office. The unit should be able to measure and weigh letters and parcels for domestic and foreign destinations and calculate the postage. The customer should be able to pay the postage with a credit card and receive all the necessary stamps, labels and stickers as well as a receipt. The unit should also allow the customer to keep track of the letter or parcel (track & trace). At this time there were no available solutions on the market that could deliver all the aspects that Post Danmark required from the unit. The innovation is in combining all the factors in one unit and in the user friendly software that was created by aCon.

The procurement process was in three steps, two steps of pre-commercial procurement and a procurement phase with an EU tender call issued in 2008. The two pre-commercial steps included development and writing of requirements specifications in 2005 and a pilot program in 2006 that included delivery of 6 self service postal units. These two steps did not go to tender as the amount of the contract signed with aCon was under the threshold limit of the EU directives. When the tender went out in 2008 five companies committed a proposal. Two of the proposals were excluded early on as they did not fulfil the requirements specifications and negotiations with the remaining companies lead to a contract between Post Danmark and aCon being signed in February 2009. aCon delivered 30 self service units to Post Danmark in 2009 the contract also included that aCon should deliver up to 500 units in 2010 but Post Danmark has not ordered any units this year.

Preliminary results from this case indicate that the origin of the need for an innovative solution influences the buyer-supplier interaction in public procurement of innovation. The initial need for a self service post kiosk came from a department within Post Danmark which initiated the cooperation with aCon on developing the requirement specifications. During this stage in the process there was cooperation between the buyer and supplier and interactive learning took place. In the second stage, the pilot project, the supplier needed interaction with other departments within Post Danmark that had not been a part of defining the initial need which influenced the communication between them partially because the departments have different goals and the institutional mach between the supplier and buyer was not the same when interacting with different departments of Post Danmark. The results also indicate areas of mismatch of endogenous institutions between the buyer and supplier organizations centring around; difference in the goals the process is to achieve, the difference in size and complexity of the organizations and difference in understanding of the time frame of the project.

### CASE 2

The second case deals with an attempt by the small entrepreneur firm Design Peak to sell intelligent LED base light bulbs for street lights to the municipality of Sønderborg in Southern Denmark. The project started in 2009 when Design Peak approached the mayor of Sønderborg with an idea of creating a light bulb that would lead to considerable savings in electricity used for lighting footpaths and bike lanes in the municipality. At that time Sønderborg was participating in different projects that had the purpose of saving energy for both environmental reasons as well as cost savings. In 2010 Design Peak and Sønderborg started a trial where intelligent LED light bulbs were tested in street lights in the city. The test has proven to be a success, never the less the municipality has no plans for going on to a pilot project or a purchase.

The innovation is based on saving energy both through using LED technology and by using motion sensors to control the amount of light given by the street lamps and in that way save considerably on the electricity used. The idea is that when no one is about the bulb only has a dim light of 10% of its capacity and only lights up with full strength when there is a movement in the proximity. An added benefit of using LED technology for the light bulbs is that it increases security as the bulb

will keep on emitting light even if some of the LED´s fail.

This is a case of unsuccessful attempt of a supplier offering a solution to a public buyer for a problem that had been realized by the buyer. The importance for this research is not that Sønderborg has chosen not to go further than offering the supplier the opportunity of using their streetlights for testing the product. The importance lies in the fact that this case is an example of an interaction between a buyer and supplier when the purchasing process is initiated by the supplier. This case is an example of how a public organisation responds when a supplier initiates contact offering an innovative solution to a recognized problem namely the need to save electricity. Preliminary results indicate that it can be important in user-producer interaction of public procurement who initiates the process as institutional barriers may, in some cases, hinder procurement of innovative products when the supplier initiates the procurement process. This aspect will need further analysis of the data from both the cases.

## DISCUSSION

The two cases differ in the context of the procurement process and in the level of user-producer interaction that took place (Dalpé, DeBresson and Xiaoping, 1992). In case 1 the interaction was initiated by the procurer, Post Danmark. The interaction included different stages from analysing the need through to the procurement of the product that had been developed through participatory innovation. In case 2 the interaction was initiated by the supplier and the interaction was limited to the procurement stage as the supplier had developed the product prior to the first contact with the public procurer.

In case 1, even if it was a successful in the sense that both the pre-commercial stages and the final procurement took place, different potential institutional barriers to user-producer interaction were identified. These potential barriers appear at the level of endogenous institutions and are related to difference in the goals that the buyer and the supplier are aiming for, the complexity of the organizational structure of the public organization and the difference in the urgency of the project.

Case 2 was an unsuccessful attempt where the public buyer declined the offer of being a lead user for an innovative product the offered potentially a significant benefits by solving his need for an energy saving lighting solution (Urban and von Hippel, 1988). Data from both the cases indicates that there are potential institutional barriers for a public procurement of innovation in the cases where the supplier initiates the procurement process. Most of these barriers are on the level of endogenous institutions.

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