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Defining Project Purchasing Activities

- Exemplified by the Purchasing Practices in Offshore Wind Farm Projects

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ABSTRACT

This paper sheds light on project purchasing activities by applying the existing bodies of organizational and project purchasing literature in the specific project context. The findings disclose that project purchasing activities in the studied context are characterized by project-specific traits and limited learning outcomes from one project to another. Furthermore, the study reveals the importance of a more holistic approach to project purchasing practices by focusing on the entire life cycle of a project. Managerially it helps selling companies to understand the peculiar buying phases and the timing related to it.

Key words: project, wind farm**,** purchasing, project life cycle
Track: Innovation: Exploring new challenges for Purchasing and Sourcing

INTRODUCTION

Purchasing as research area has reached a greater level of interest over the past years, and the recognition of this function has clearly moved from being administrative to become of greater strategic importance for the companies. In these terms the purchasing-related research has gained more focus within the fields of operations and supply chain management, as well as in supply networks. The context where purchasing activities are carried out is becoming more complex in nature, and the focus has changed from purchasing mere products and services to acquire entire and complex solutions (Lewis and Roehrich, 2009). This can be depicted in terms of more complicated supply chains and the emergence of a specific project economy that has resulted in the increasing amount of projects undertaken (Caldwell and Howard, 2011; Mickey et al., 2014).

However, purchasing as an acknowledged area in relation to projects that also can be considered as temporary networks (Dubois and Gadde, 2002) has only recently been recognized (Macbeth et al., 2012). This is also supported by an emerging research in relation to the more comprehensive understanding of the project purchasing activities (e.g. Ruparathna and Hewage, 2015; Lutz and Ellegaard, 2015). The project management literature deals extensively with the related problem of selecting appropriate suppliers for the project task (Martinsuo and Ahola, 2010; Ruuska et al., 2013; Rwelamila and Edries, 2007) and managing relationships with project suppliers (Eriksson and Westerberg, 2011; Ojansivu et al. 2013; Olsen et al., 2005; Söderlund, 2011). Therefore, the aim of this study is to shed light on purchasing activities undertaken in a specific project context by posing the following research question: *How can project-specific purchasing activities be defined?* To answer this research question, a qualitative empirical approach will be applied in the offshore wind farm project context.

By illuminating this research question the paper aims at contributing to the existing purchasing literature within the buying phases by adding contextual and theoretical elements from the field of project procurement management. Moreover, managerially the paper wishes to make companies more aware of the scope of the project purchasing activities and the importance of developing context-specific purchasing practices.

The paper is structured as follows. In the following section the literature review on purchasing activities will be conducted, followed by the methodology chapter. Thereafter the case context of offshore wind farm projects will described followed by the findings. Finally, discussion and managerial implications will be provided.

LITERATURE REVIEW ON PURCHASING ACTIVITIES

Organizational buying behavior (OBB) has been a recognized research area since the seminal works of Robinson et al. (1967), Webster and Wind (1972) and Sheth (1973). Their generic models aimed at providing a comprehensive view of organizational buying and allowing insight into the basic processes and structures of industrial buying behavior. There can also be identified a large body of OBB literature that focuses on different decision making processes in buying situations. There can be identified three focus areas that the OBB literature has focused on. These areas can be labeled as 1) identifying structural characteristics such as buying phases (Johnston and Lewin, 1996; Sheth, 1996; Bunn, 1993;

Sheth, 1973; Webster and Wind, 1972; Robinson et al., 1967) and 2) the structure of a buying group (Knight et al., 2005b; Johnston and Bonoma, 1981; Spekman and Stern, 1979; Webster and Wind, 1972; Robinson, Faris and Wind, 1967). The third area is related to the industrial network approach that focuses to a great extent on buyer-seller relationships (e.g. Håkansson and Snehota, 1995; Håkansson, 1982). In this study the main focus will be on identifying the structural characteristics, and therefore the emphasis will be on discovering the purchasing activities taking place in a project context.

The basic processes that are concerned with identifying the phases (or stages) in the OBB represent the sequence of activities taking place in an organizational buying situation. The original buy phases were introduced by Robinson et al. (1967) and included the following activities:

1. Recognition of need and general solution
2. Determination of characteristics and quantity
3. Description of characteristics and quantity
4. Search for and qualify sources
5. Acquire and analyse proposals
6. Evaluate proposals and select suppliers
7. Select order activities
8. Obtain feedback and evaluate performance

In the subsequent models presented by Webster and Wind (1972) and Sheth (1973) the byying sequences were also identified, and even though they included fewer phases (five and four, respectively) the elementary nature and sequence of activities remained the same. These generic buying phases have provided an accepted foundation in an OBB research, as e.g. can be identified in the works of Vyas and Woodside (1984), Möller (1985) and Johnston and Lewin (1996). New processes in terms of new techniques and technologies (Cannon and Perrault, 1999; Lewin and Donthu, 2005 have been introduced to aid organizations in the purchasing practices, but these processes can still be related to the generic buy phases. For example, internet-based ordering and tracking systems can be related to order activities and electronic data interchange to facilitate credit approval can be referred to supplier selection.

The extent to which the sequences are included in a specific buying situation has traditionally been considered as being dependent on the nature of the buying situation and the product characteristics. In this context we can talk about th*e newnes*s of the buying task, i.e. a new task, modified rebuy or a straight rebuy (Robinson et al., 1967; Webster and Wind, 1972; Sheth, 1973), as well as th*e complexity and importanc*e of it (McQuiston, 1989; Bunn, 1993; Johnston and Lewin, 1996). Depending on the buying situation and the complexity of it, some phases can be jumped over or even repeated during the buying process.

Project purchasing activities

Projects are complex, temporary organisations that involve various project actors. Regarding offshore wind farms, as well as many other construction projects, there is a clear tendency towards a more diversified use of suppliers in pace with that project actors focus on their core activities and delegate the non-core activities to other partners.

When comparing the buying phases identified in the generic OBB literature, similar sequences can also be identified in the project purchasing literature. The PMBOK® Guide

focuses on the project purchasing as a peculiar management area and labels this as project procurement management. This approach describes the processes required to obtain products or services from outside of the project. The processes are identified as follows:

1. Planning Procurement Management
2. Conducting Procurements
3. Controlling Procurements
4. Closing Procurements

Planning procurements is concerned with, which products or services a project will need to procure from an external source. After that the project manager will determine the appropriate types of contracts that will need to be used on the project. It also includes reviewing the type of contract planned to be used with respect to mitigating risks, sometimes transferring risks to the seller. This calls for an enhanced coordination of project purchasing activities in order to deliver a successful project, both regarding time, quality and budget. There can be found several contribution in the literature arguing that purchasing in projects ought to be seen as a joint and a cooperative effort (Tracey and Neuhaus, 2013; Eriksson and Westerberg, 2011; Pesämaa et al., 2009; Ahola et al., 2012) Moreover, these contributions highlight the fact that purchasing strategies relying on inter-organisational relationships and joint efforts to deliver a project have shown to have a positive effect in the project outcome in terms meeting the time, quality and cost requirements.

Olsen et al. (2005) studied different procurement contracts and how different governance systems (incentives, authority and trust) affect the project outcome. They argue for the importance of multiplier use of governance mechanism that stimulates and enhances a common focus on joint goals. This means also that a strong focus on own individual project goals is likely to worsen the end-result of any project outcome in terms of e.g. delays and higher prices than budgeted

Pesämaa et al. (2009) suggest a cooperative model for procurement in projects that takes into account three interdependent constructs. These constructs – incentive-based compensation, limited bidding options and task-related, careful partner selection have a positive outcome for project results, but all three constructs must be present, however, in a unique sequential order to enhance cooperative procurement.

Conducting procurement the process of obtaining supplier responses, selecting a supplier, and awarding a contract. In relation to this the selection of the appropriate suppliers has shown to play a crucial role in projects. For example, Pesämaa et al. (2009, p. 558) discovered that *"invitation of a limited number of trustworthy and competent bidders, incentive-based compensation and careful partner selection based on task related attributes, enhances cooperation between clients and contractors"*.

The main difference between the buying sequences in the OBB-literature and project procurement approach is the control of project purchases. In the project procurement management this is emphasized by the following statement: "*This (controlling procurements) is the most time consuming of the procurement processes as far as the project management team is concerned as it covers monitoring the seller's performance against the terms specified in the contract*" *(Team FME, 2014; p. 29)*. The literature within project management focuses also on this aspect by referring to the 'performance-based contracting' (PBC) (Kleeman and Essig, 2013; Hypko et al., 2010).

Closing procurements finalizing open claims updating records to reflect final results and archiving this information for future use,

To sum up, the literature related to the buying phases provides a cornerstone for defining the purchasing activities undertaken in a given context. Both the OBB-approach and the project procurement management are concerned with finding the appropriate supplier(s) to fulfill a purchasing task. The major difference between these two approaches is the project procurement management's distinctive focus on controlling that the supplier delivers what is stated in the contract within the project's time limit.

The next sections will study the project purchasing activities in a context of offshore wind farms. Therefore, to begin with he methodology is presented, followed by the description of the case context and the findings.

METHODOLOGY

For this study, an explorative research design within the context of offshore wind farm project networks was applied. As the objective was explorative, and aiming at uncovering the phenomena in-depth, where little knowledge exists in the extant literature, the qualitative study seemed an appropriate choice (Deshpande, 1983). Data collection for this study was carried out in two different areas and in two phases. In the first phase the unit of analysis was a specific topside from an offshore transformer station for a wind farm project, which had recently been completed, and the interviewed companies consisted of the project network of firms involved in manufacturing it. The project was anchored in the Danish section of the industry and Denmark has historically been a key location for both on- and offshore wind turbine production. This particular project network was selected as a case because the project owner and several other project participants had been central actors in this industry for some time, having built a track record through participating in many projects.

These key boundary spanners were involved in and possessed knowledge of project network exchanges and applied context-specific project purchasing activities. The interviewees were made account for the progression of the project from the very early beginning to the completion. As context-specific purchasing activities are sometimes difficult to account for, the respondents were first asked to describe the specific activities undertaken when carrying out the purchasing task. The broader industry experiences of these actors participating in multiple similar projects were also asked for, rather than keeping only to the initial transformer station project. Based on these in-depth accounts, it was possible to identify the purchasing activities in the purchasing context.

In the second phase of the data collection the area of operations and maintenance was chosen in order to obtain a more comprehensive understanding of the offshore wind farm context.
This part of the research was based on qualitative semi-structured interviews during the period of June 2014 - March 2015 with actors operating within operation and maintenance (O&M) activities (including service) in offshore wind farms. The overall unit of analysis was an offshore wind farm network, and due to the theoretical approach, also organizational and individual levels were included. In the beginning of the qualitative research a focus group interview was conducted with participants invited representing different roles in O&M activities in the studied context. The participants in the focus group interview revealed challenges and phenomena in a broad spectrum of offshore activities.

Eleven different companies working on offshore projects participated in the focus group interview and they were managers from various companies with different roles, e.g., a wind farm owner, a wind turbine producer, equipment suppliers, service providers on equipment and/or manpower. Five of the participants gave a short presentation on their view of the O&M challenges for reduction of LCOE. Afterwards the participants discussed challenges mutually. The focus group interview was transcribed for analysed for identifying the challenges for the reduction of LCOE (Eisenhardt, 1989; Charmaz, 2006; Yin, 2009).

The initial findings indicted that there were certain company types that became relevant to interview, and in these terms we used a snowball sampling to select further interviewees (Miles and Huberman, 1994) such industry actors as service providers offering manpower/ equipment, components and service providers offering transportation/ maintenance solutions employing ships, helicopters and jack ups were crucial actors. Also, capital partners such as venture- and capital associations seemed to play a role in relation to the O&M in offshore wind farms and this type of actors were included when conduction further interviews.

	Companies	**Number of companies**	**Number of interviews**	**Interviewees**
Phase I (January 2013 – July 2015	Project Owner	1	3	Senior Project Manager
	1st Tier Supplier	1	2	Project Manager
	2nd Tier Supplier	2	11	Sales Director, Senior Project Manager, Senior Purchasing Manager, QHSE Manager
	3rd Tier Supplier	2	3	Key Account Manager, Technical Specialist
Phase II (October 2014 – March 2015)	Wind Farm Owner	4	7	Site Manager, Logistics Manager, Development Manager
	Wind Turbine Producers (OEM)	3	3	O&M Manager
	Independent Service Providers	3	3	O&M Manager
	Logistics Suppliers	3	3	CEO, Logistics Manager
	Capital Partners	2	2	Pertner
	Industry Associations	2	2	CEO, Manager
	Total	**23**	**39**	

Table 1: The interviews conducted with the companies involved in the offshore wind farm projects

Based on the findings from the focus group interview, an interview guide was developed. The aim of the guide was twofold. On one hand it aimed to provide overall strategic structured

information on innovations to reduce LCOE in the offshore wind farms. On the other hand the themes in the interview guide aimed to disclose interviewees' own perceptions on, how reduce LCOE. The interview guide opened opportunities for the researchers to follow interesting new/ enhanced phenomena emerging through the interviews. The interview guide was send to the interviewees as a kind of agenda prior to the meeting.

20 semi-structured and open-ended interviews were conducted with actors carrying out O&M activities in offshore wind farms, including wind farm owners, wind turbine producers and small and medium sized enterprises (SMEs) operating as suppliers and service providers to O&M. We also interviewed industry organisations. These interviews were in-depth interviews related to the challenges and lessons learned for reduction of LCOE from activities related to different offshore farms.

By interviewing actors from the main companies in the offshore wind farm project context high validity of the results was achieved. In total, 39 interviews with actors in 23 different companies (see table 1) were conducted during the period January 2013 to March 2015. The interviews lasted between 30 and 120 minutes and they were recorded and transcribed.

OFFSHORE WIND FARMS

Offshore wind farms produce electricity from the renewable source wind and the farms consist of a varying number (typically between 20 and 175) of wind turbines, and a transformer platform. The power is transmitted from the offshore platform to an existing onshore substation, to allow the power to be distributed through the power grid to end consumers.

Offshore wind farms are built through complex construction projects, and each wind farm is unique due to weather conditions, different sea fundaments and the wind farms' varying distance to the coast. Developing an offshore wind project is characterized by a varying number of actors involved and a large number of interfacing issues need to be resolved at all stages of the development process, i.e. from the initial idea to the time when the turbines are installed and in operation. An expected lifetime for an offshore wind farm is between 20-25 years.

Despite the renewable forms of energy production winning terrain, the offshore wind farms are under pressure to reduce the levelized cost of energy (LCOE) in order to consider offshore wind energy as a competitive alternative for the non-renewable energy sources. Hence, despite the general trend towards the 'greening' of the energy production, many governments are hesitant when planning new farms. This means that in some occasions constructing the planned offshore wind farms have been postponed or even cancelled.

The description above indicates that actors involved in an offshore wind farm network are obliged to cope with constant changes. A fundamental challenge is the fact that as offshore wind farm is a unique construction project, it makes it difficult to collect and transfer knowledge from one wind farm to another. Moreover, as erecting offshore wind farms are both long lasting and discontinuous processes, each project is considered as new and starts always from the scratch.

The ever-changing context of wind farms combined with the constant pressure on constructing and running less costly farms makes the actors call for more standardized solutions and integrated processes, still well-knowing that constant adaptations are required. As a consequence, the companies in this relatively young industry continuously face new demands for technological product and process solutions.

The main objective of the O&M activities is to ensure that the turbines run as smoothly as possible and have a high yield in terms of electricity production. Therefore, balancing between a scheduled, preventive and unscheduled service gains more focus. In this context the more robust construct of the turbines, potentially equipped with parallel components, combined with sufficient data of the performance of the wind turbines might pave the path for more reliable wind farms. However, due to the relatively young age of the industry and unknown weather factors the learning curve is still in its early stage. Furthermore, lack of collaboration among industry actors hampers also the development.

FINDINGS

11 project purchasing activities were identified to take place in an offshore wind farm project. Table 2 below presents the activities and compares them with the purchasing activities described in the OBB and PPM literatures. All in all it seemed that project purchasing was every time considered as a new task, even though all offshore wind farms consist of the same basic elements, i.e. wind turbines, cables and a transformer platform. However, the fundamental challenge is the fact that as offshore wind farm is a unique construction project, it makes it difficult to collect and transfer knowledge from one wind farm to another. Moreover, as erecting offshore wind farms are both long lasting and discontinuous processes and technology may have developed remarkably between the projects. The following citations from interviewees illustrate this situation.

It is difficult to transfer knowledge from one wind farm to another. They are simply too different (Electricity producer).

It's crazy that they seem to destroy everything after a project has been closed. Seriously, the same company was interested in our logistics solutions like in the previous project, but they did not have any documentation left.. So, they called us and asked for a copy (Logistics supplier).

Every time you start a new project a new project organizations are established and new harbour facilities are built. And after the project has been closed, everything is dismissed (Site manager).

When comparing the activities identified with the theoretical concepts, we can observe that the sequences are identifiable in the offshore context, but in relation to the OBB categorization, the phases do not follow chronologically. In the studied case this can be seen in terms of trying to mobilize the suppliers even before the actual specification had been created. When comparing the identified activities with the PPM phases, we can notice that even though the sequences are identifiable and follow chronologically each other, the case-specific activities provide a more nuanced picture of the activities undertaken in the studied context. For example, 'conducting procurement' stretches from pre-qualifying the suppliers

Project purchasing activity	Description	Relation to the OBB	Relation to the PPM
Searching for new suppliers	Enlarging the existing supply base to provide access to additional supplier resources	Search for and qualify sources	Planning procurement
New project charter communication	Making suppliers aware of up-coming projects to enable their future resource mobilization		
Charm tour	Ensuring that the preferred suppliers will attend pre-qualification		
Tender material consulting	Mobilizing knowledge, to form the strongest possible tender material, which also appeals to key suppliers	Recognition of need and general solution	
Supplier pre-qualification	Ensuring that suppliers can actually allocate sufficient and appropriate resources for the project and participate in the tender	Search and qualify sources	Conducting procurement
Tender clarification meetings	Harmonization of the tender material – a basis for selecting the suppliers for the project	Acquire and analyse proposals	
1st Round Negotiation	Mutual operational adjustments between the project owner and suppliers	Evaluate proposals and select suppliers	
2nd Round Negotiation	Final negotiation round characterized by traditional price negotiations leading to "*Best And Final Offer*" (BAFO) from suppliers		
Monitoring supplier production	Ensuring that the selected suppliers channel their resources into the project according to the agreement	Obtain feedback and evaluate performance	Controlling procurement
On-going project meetings	Coordinating the flow of productive resources into the project execution		
Post-project evaluation	Mutual feedback on the project to harvest project knowledge from suppliers – and simultaneously attract interest for future projects		Closing procurement

Table 2: The identified project purchasing activities

to tender-clarifying meetings and two rounds of negotiations until the final supplier has been selected and the contract has been signed. The amount of activities is likely to reinforce the importance of contracts in projects.

Below the identified activities are described in detail.

Searching for new suppliers

I identified several activities under the PPM label 'planning procurement' that actually took place before project tendering and realisation. In an attempt to ensure a sufficient supplier base for the project, the project owner had developed activities searching for new capable suppliers. Given the nature of the industry, with occasional lack of suppliers with sufficient qualifications, it was necessary for the project owner almost on a continuous basis to search for new potential suppliers. The aim was to discover new suppliers, which was necessary to reach a certain critical mass for the pre-qualification process. In the studied case, the project owner's purchasing department was responsible for this activity, first consisting of a thorough internet search and visiting existing supplier databases. Moreover, part of the activities consisted of visiting identified potential suppliers. In these supplier visits, the project owner checked the resources and capabilities of potential suppliers, and made inquiries with supplier employees with the purpose of determining if they could be potential suppliers. Discovering a new potential supplier could also be a result of a particular supplier's own, pro-active contact to the project owner. For example, the project owner mentioned how some former shipyards, which aimed at diversifying their activities towards offshore wind-turbine construction, contacted them. This type of pro-active contact could result in a project owner's visit at a potential supplier's site.

New Project Charter Communication

Establishing a new offshore wind farm is a project with a long time span. A new planned project can be announced several years ahead, and at the time of writing, many European projects are scheduled in terms of a year 2020 plan that aim at increasing the amount of electricity produced through renewable sources, like wind energy. However, despite these plans, a new offshore wind farm in the Danish region can only be realized, if there is an official project acceptance from the Danish Ministry of Climate. As recent development have been characterized by postponements of some of the planned new wind farms, the former optimistic industry climate has been replaced by more sceptical suppliers that are compelled to carefully plan their activities and allocate their resources both within and outside the offshore context. In relation to this more uncertain project climate, it was essential for the project owner to provide the potential suppliers with homogeneous and accurate information about up-coming projects, allowing them to take these into consideration. This was done mainly through electronic newsletters that were circulated on a frequent basis. Suppliers were motivated to visit the project owners' and other relevant actors' internet sites to gain information on new projects. Questions from suppliers were collected over a certain period of time and answered via a public internet site. Moreover, project owners used industry specific fairs and conferences to engage potential suppliers and inform regarding new projects.

Charm Tours

These activities were on one hand concerned with warranting that those suppliers with former offshore project experience and former good project relationships with the project owner became aware and focussed on the up-coming project. These visits at supplier facilities were

similar to supplier searching, but the visits were at the facilities of established, experienced and capable suppliers with a good track record. The aim was to attract suppliers' attention, motivate, and inform; in other words to charm the suppliers, which was the exact term used by several interviewees. It was a face-to-face visit at capable suppliers, with particular bundles of offshore specialized resources in order to make sure that they would later attend the tender and commit these resources to the up-coming project. But in addition, it was also used to mobilize knowledge resources from these capable suppliers to strengthen project ideas and early product development. Finally, it was also an information-gathering visit for competitive purposes, as it enabled the project owner to collect information regarding other customers' projects that the particular supplier would also be interested in and considering for the future.

Tender Material Consulting

It can be an overwhelming task for a supplier to make a tender for a project. Making a tender is a resource-demanding task, and typically tender material consists of both commercial and technical specifications and can amount to 200 pages. One respondent explained that tendering could involve between 10-15 persons and last 6 to 8 weeks. Therefore, it was essential that a project owner prepared tender material that was appealing and as precise as possible. For that purpose, the project owner consulted identified actors in various supplier organizations with experience in offshore projects and/or relevant knowledge about system specifications. Selected suppliers were asked to provide their opinion on different product, system, and process solutions, and to what extent they could realistically be implemented according to specific project criteria. This input was then used to prepare the tender material. As such, the tender material consulting activities served to mobilize critical and scarce knowledge resources from suppliers. In addition, the consulting activities enabled the project owner to prepare a tender material that appealed to these same key suppliers.

Supplier Pre-Qualification

In order to be considered as supplier to the offshore projects, the higher tier suppliers are obliged to become pre-qualified. This entails meeting specific project requirements, like experience, relevant certificates, and a sufficient economical robustness to finalize the project. Supplier pre-qualification is a highly formalized and standardized activity in any offshore wind farm project. The project owner used specific databases to pre-qualify their suppliers for each specific offshore wind turbine project. Industry specific databases like Achilles and Sellihca are judged relatively quick to use compared with an EU based qualification system. A certain critical mass of pre-qualified suppliers was a necessity for realising a project. On the other hand, pre-qualifying too many suppliers was not realistic and fair, and it was likely to lessen the motivation of a supplier to make a tender, as chances for winning the contract were reduced since only one supplier would be awarded the final project contract. Those suppliers that were qualified, but not selected received a letter that indicated they were not invited to give a tender.

Tender Clarification Meetings

Pre-qualified suppliers received tender material from the project owner and were granted typically several months to finish their tender. After the deadline, suppliers that submitted a tender were invited to a tender clarification meeting, where the entire tender material was

carefully reviewed. On this occasion, both the project owner and suppliers could ask clarifying questions regarding the material.After this meeting, suppliers were asked to modify their tender. Sometimes the project owner experienced that suppliers making a tender would withdraw after a tender clarification meeting. One reason for withdrawal could be a sudden lack of capacity, as the supplier had decided to participate in another project. Other times, withdrawal could be caused by an increased awareness of the immense project complexity and a resulting doubt to be able to participate in the project. On the basis of the knowledge acquired in the tender clarification meetings, the suppliers submitted their binding tenders that provided a harmonized basis for selecting suppliers for a specific project task.

First and Second Round Negotiations

Suppliers, whose binding tenders were evaluated to be the most suitable ones, were selected for negotiations, carried out in two main rounds. The parties seeking to reach mutual agreement on the project work processes characterized the first round. For example, the project owner would have particular wishes, regarding how certain activities ought to be carried out, while the supplier argued for solutions they had experienced as more suitable in previous offshore assignments. In other words, the first round was characterized by mutual give-and-take negotiations, where the code of work for the given project was determined.

Second round negotiations contained the specific price negotiations. Finalising this second round, suppliers were asked to come up with their "*Best And Final Offer*" (BAFO). First and second round negotiation activities could be distinguished from each other, by the first being a problem solving knowledge exchange exercise mostly mastered by engineering employees, while the second was more similar to traditional price negotiations, and carried out by purchasing employees. The following citations illustrate the activities taking place under negotiations:

Monitoring Supplier Production

Typically, offshore wind farm projects must follow the international standards for the construction industry (known as FIDIC, The International Federation of Consulting Engineers). These standards and rules provide the basis for project execution activities, of which two types could be observed from the data – supplier monitoring and project meetings. Since suppliers are acquainted with the fact that the project owners follow FIDIC, they know that they will be monitored during project execution on a frequent basis. Monitoring project execution via control visits at supplier premises was caused by the need to ensure that suppliers' deliveries met project requirements regarding quality, documentation, and the typically tight time table. For example, the project owner mentioned a monitoring episode, where they visited a subcontractor that was participating for the first time in an offshore project. This visit revealed that the subcontractor, which was used to working in the ship building industry, had underestimated time consumption for a welding process for an offshore construction, and was therefore struggling with meeting the tight time schedule. Interestingly, the data revealed that monitoring attained a quite massive scale in this context, with the project owner frequently having more employees at supplier premises for extended periods of time. Monitoring could also be the result of a project meeting. During the site monitoring the suppliers were also informed about the issues discussed in the project meetings.

On-going Project Meetings

The project owner had developed a activities for facilitating project meetings to coordinate the on-going work at the project construction. These meetings occurred frequently during the entire execution process, but with the highest frequency during the early stages, e.g. every second week. The objective of these meetings was to discuss how the project execution was progressing, as well as the challenges and amendments that appeared. A typical challenge in this project context was weather conditions that could compel changes in the timetable. Another unexpected challenge could be changed undersea conditions, requiring suppliers to carry out structural foundation changes, leading to changed production processes and schedules. Otherwise, the project meetings were quite similar to the on-going coordination meetings known from traditional project industries, such as construction.

Post-project Evaluation

Post-project evaluation was a relatively new activity for the interviewed project owner. As the number of offshore wind farm projects was increasing, it had been realized by the project owner that information gathering on the results of the projects was important, including details on how the project had actually been carried out. Moreover, even though every offshore wind farm project was considered somewhat unique, the increasing awareness of reducing project costs had created a need for collecting and exchanging experiences. For example, after the most recent North-European offshore wind farm project, the project owner had formalized this activity and offered every first tier supplier an evaluation meeting. During these meetings, the project owner was eager to benefit from supplier knowledge by gathering learning points to assist them when planning the next projects. Moreover, these meetings provided project partners with a possibility to officially finish collaboration in the specific project and start preparing for future projects, even though they could be somewhat undefined at that stage. In other words, these evaluation meetings also allowed the project owner to begin already at this very early stage mobilizing critical supplier resources for future projects.

DISCUSSION: EXTENDING THE PROJECT PURCHASING PHASES

The identified project purchasing activities can to a large extend be aligned with the buy phases identified in the
OBB and in the PPM literature. However, the interviews with the actors involved in the operation and maintenance phase disclosed some relevant issues to be taken into consideration. This view expands the prevailing models for purchasing activities.

It is obvious that purchasing activities undertaken in a project context are determined by a strict project timetable. In this context the time factor was understood in terms of finishing the installation phase so that the wind farm was ready to produce electricity. However, as also stated earlier, offshore wind farms are projects with a relatively long time span, i.e. 20-25 years after which they will be dismantled. This aspect did not seem to occupy the respondents that were involved in the installation phase. This argument can be further affirmed by returning to the activity labeled as ‘post-project evaluation’. Not only is this activity relatively new in the studied context, but it is also used to evaluate a project organization’s efficiency in carrying out the project. Moreover, in the studied context post-project evaluation can be rather considered as a part of buyer-supplier relationship management.

The interviews with actors within the O&M activities revealed the importance of defining a specification that takes into consideration the fact that offshore wind farms are expected to generate electricity for 20-25 years. An electricity provider indicted this in the following way:

Everything that can break down offshore will break down.

This aspect of O&M as a feedback mechanism to purchasing activities in the development and installation phase refers to the concept of life cycle costing (LCC) (Woodward, 1997; White and Ostwald, 1976). LCC is defined as an economic evaluation process that can assist in deciding between alternative investments by comparing all of the significant differential costs of ownership over a given time period (Johnson, 1990). In the project context it is recognized as a relevant area and is also winning terrain (e.g. Tysseland, 2008; Eriksson and Westerberg, 2011). At the same time it seems to be a complex issue to deal with, as stated by Ruparathna and Hewage (2015: p. 1).

Ad hoc statistics show that modern initiatives such as sustainability, life-cycle costing, and standardization are getting integrated with procurement. However, there is no unified view in the construction industry on procurement as a project process

In the studied context the life-cycle costing view was highly affected by the fact that the offshore wind farms are under pressure to reduce the levelized cost of energy (LCOE). It seemed that this reduction was in many cases understood as a price reduction of the solutions provided. A site manager and a wind farm owner stated this by saying:

Previously, suppliers visited me on a regular basis and told about new products and solutions. But they don't do it anymore. Any do you know why? It's because all this smart purchasers have just one main aim: to reduce the price and to get a good deal. This means we get product in worse quality and might have difficulties in finding suppliers willing to deliver (Site manager).

At the moment all the suppliers are under pressure, because we have to reduce the price, This applies to all of us, subcontractors, fundaments, cables, wind turbine manufacturers etc. Everybody is under pressure, and if it is so, then it must be the name of the game (Wind farm owner).

Despite the present somewhat short-term thinking in relation to the purchasing activities in the offshore project, there is clear tendency to consider this in a more holistic way. This is disclosed in the citations below:

…"Instead, let os sit down and figure out where it is realistic to give price pressure.. We have to look into the technology part, and the way we build these things (Wind farm owner).

The big actors are in the process of looking into the whole cost structure of the wind farms… They have been in the business for 10-15 years now, and it is necessary to start considering the overall costs. We should not compromise on quality, because it makes it far too expensive to run the parks (Wind farm owner).

We will soon introduce our first wind turbine that has been constructed on the basis of our experiences in operation and maintenance in offshore wind farms (Wind turbine manufacturer).

The provided citations reinforce the fact that defining specifications for project purchases is difficult. Not only it is difficult to collect learning points from one project to another, because the project are so different from one another, but the challenging business environment with constant requirements for reducing LCOE and the urge to establish a renewable alternative for the energy production hampers the actors from carrying out project purchasing activities that consider the whole life cycle of an offshore wind farm. Therefore, the following Figure 1 is presented to emphasize the limited learning from one project to another and from O&M to project purchasing. At the same time Figure 1 visualizes the importance of considering project purchasing activities in a larger perspective.

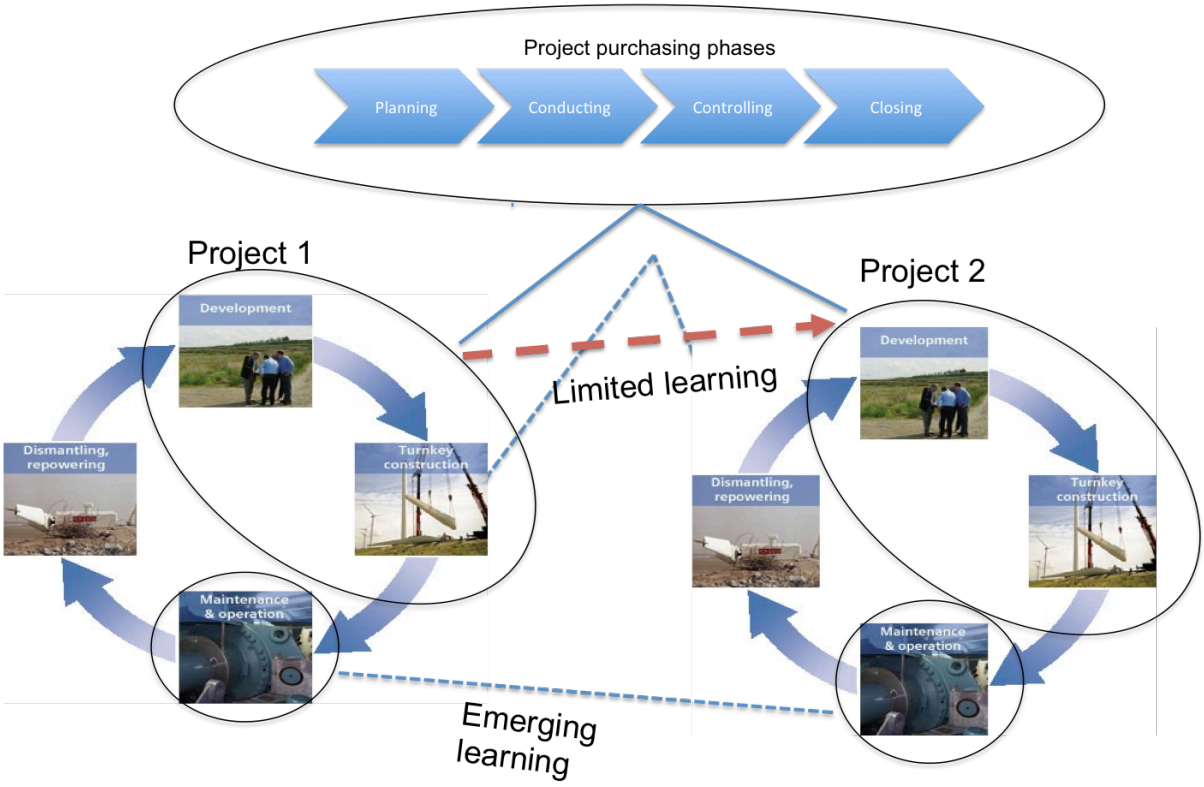

Figure 1: An extended view of project purchasing activities

CONCLUSIONS

The aim of this paper has been to shed light on the project purchasing activities by attempting to answer the following research question: How can project-purchasing activities be defined?

There were identified 11 purchasing activities in the project context. When comparing the activities identified with the theoretical concepts, we can observe that the sequences are identifiable in the offshore context, but in relation to the OBB categorization, the phases do not follow chronologically. Furthermore, when comparing the identified activities with the

PPM phases, we can notice that even though the sequences are identifiable and follow chronologically each other, the case- specific activities provide a more nuanced picture of the activities undertaken in the studied context.

An interesting finding was to discover the importance of purchasing over the whole project life cycle. In the studied context that purchasing decisions made seemed to apply to the specific installation phase, while in the operation phase the actors were faced by challenges because of the short-term way of considering purchasing.

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