

Procurement Quality Research

Case: Foster Wheeler Energia Oy

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<p>Abstract</p> <p>The target of this thesis was to measure the quality of Foster Wheeler Energia Oy's procurement and to create an electronic questionnaire which can be used in quality measurements in future.</p> <p>Procurement quality research was carried out by electronic questionnaire, which was sent by e-mail to 96 selected Foster Wheeler Energia Oy's suppliers. The answering rate of the questionnaire was 50%. Based on the questionnaire the client organization got feedback from the suppliers point of view what areas should be developed as well as what areas are in a good condition in the procurement process.</p> <p>Foster Wheeler Energia Oy's quality research shows that procurement process is mainly in a good condition and buying is professional. According to the results of the questionnaire, communication and contract requirements as well as contract attachments shall be developed. Suppliers wish to have deeper cooperation and possibility to offer in a more versatile way their products.</p> <p>Based on the research client organization was able to measure procurement quality and got overall picture of in what direction procurement should be developed in the future. Electronic questionnaire enables carrying out corresponding quality research on a regularly basis.</p>			
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Tiivistelmä <p>Opinnäytetyön tarkoituksena oli mitata hankintatoimen laatua Foster Wheeler Energia Oy:ssä sekä luoda sähköinen kyselypohja tuleville hankintatoimen laatumittauksille.</p> <p>Hankintatoimen laatututkimus toteutettiin sähköisellä kyselyllä, joka lähetettiin e-maililla etukäteen 96:lle valituille Foster Wheeler Energia Oy:n alihankkijalle. Kyselyn vastausprosentti oli 50%. Kyselyn perusteella toimeksiantaja sai palautetta alihankkijoiden näkökulmasta mitkä osa-alueet vaativat kehittämistä.</p> <p>Foster Wheeler Energia Oy:n laatututkimus osoittaa, että hankintaprosessi on pääsääntöisesti hyvällä tasolla ja ostamista pidetään ammattimaisena. Kyselyn tulosten perusteella kommunikointia sekä sopimusten vaatimuksia ja liitteitä tulee edelleen kehittää. Alihankkijat toivovat myös syvempää yhteistyötä sekä mahdollisuutta tarjota monipuolisemmin tuotteitaan.</p> <p>Tutkimuksen perusteella toimeksiantaja sai mitattua hankintatoimen laatua sekä kokonaiskuvan siitä mihin suuntaan hankintatoimea tulisi kehittää. Sähköinen kyselylomake mahdollistaa vastaavien laatututkimusten tekemisen säännöllisin väliajoin.</p>			
Avainsanat ostaminen, hankintatoimi, toimitusketju, laatu, suorituskyvyn mittaaminen			

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ABBREVIATIONS

ABC	Activity-Based Costing
CFB	Circulating Fluid Bed
CIPS	Chartered Institute of Purchasing and Supply
ERP	Enterprise Resource Planning Software
FWEOY	Foster Wheeler Energia Oy
MC	Material Control System
PW	ProjectWise
SCM	Supply Chain Management
SPC	Statistical Process Control
TCO	Total Cost of Ownership
TQM	Total Quality Management

1 INTRODUCTION

Foster Wheeler AG is a global engineering and construction contractor and power equipment supplier. The company was originally established in 1884 and since 1927 the company is known as Foster Wheeler. Foster Wheeler bought Ahlstrom Oy's Power Boiler Business In 1995. The company is listed in NASDAQ (National Association of Securities Dealers Automated Quotation). (Foster Wheeler Energia Oy 2013)

Foster Wheeler is divided into two groups: Engineering & Construction (E&C) Group and The Global Power Group. E&C group is designing constructing processing facilities, for instance, for the upstream oil and gas, chemicals and power as well as pharmaceutical and health care industry. The Global Power Group is steam generating equipment supplier. It also supplies flue gas cleaning and auxiliary equipment for power stations and industrial markets. (Foster Wheeler Energia Oy 2013)

Foster Wheeler Energia Oy (FWEOY) has approximately 452 employees in Finland and it operates in Varkaus, Espoo and Kurikka. In Sweden there are approximately 38 employees, in Poland 430 employees, in Germany 43 and in Spain 451 employees. The number of employees in Poland and Spain also includes workshop personnel. All in all, Foster Wheeler Global Power Group has four workshops. Foster Wheeler Power Group America has workshop in Xinhui in China, Foster Wheeler Spain has workshop in Tarragona in Spain, Foster Wheeler Poland has workshop (Fakop) in Poland and Foster Wheeler Energia Oy owns half of Warkaus Works workshop in Finland. (Foster Wheeler Energia Oy 2013)

The Global Power Group's main products and services are:

- Steam generation,
- Environmental products,
- After market service,
- Auxiliary equipment and
- Plant operation and maintenance (O&M)

FWEOY has established its own values, which are determining the standards of behavior of each employee. The company's core values are:

- **Integrity:** behaving ethically, safely, honestly and lawfully.
- **Accountability:** working to clear and mutually accepted responsibilities.
- **High performance:** consistently meeting or exceeding expectations.

- **Valuing people:** treating people with respect and dignity
- **Teamwork:** working collaboratively towards common goals.

The main product of the steam generation equipment delivered by FWEYOY is circulating fluid bed (CFB). The development of CFB boilers started in the 1960's and in 1979 company's first CFB plant was to commercial operation. The world's first once-through supercritical CFB boiler was taken in commercial operation in Poland in 2009. Company has delivered approximately 375 CFB boiler plants by 2013 and there are approximately 36 boiler plants under construction. Most of the units are delivered to Asia. The advantage of the CFB boiler technology is a wide range of fuels which can be used. Nowadays, CFB boilers are able to burn, for instance, coal, waste coal, wood residue, gas, agricultural waste and petroleum coke. (Foster Wheeler Energia Oy 2013)

All the deliveries are done as projects. Each project has its own project team, which is lead by project manager. Project Manager is appointed by Director Project Manager. Project team is formed by Project Manager, Engineering Manager, Procurement Manager, Site Manager, Commissioning Manager and Project Control Manager. Project includes also other persons in different functions according to the project's need. (Foster Wheeler Energia Oy 2013)

FWEYOY does not manufacture the components, which means that all the needed parts and material are purchased globally from the suppliers. FWEYOY is also cooperating closely with its subsidiaries.

1.1 Purpose of the Study

This thesis work is concentrating on procurement department and its main procurement processes. The aim is to clarify how suppliers see current procurement process in the case company, get feedback how the main suppliers enhance FWEYOY procurement process, and find solutions how to improve procurement to be more effective. Based on the suppliers' feedback procurement is able to get lessons learned items to the buyers in order to improve procurement routines and processes.

This research is concentrating on the main procurement process, including inquiry, negotiation, purchasing decision, contract, and expediting phases. The target of the

research is to clarify how the main suppliers see procurement process and give possibility for the suppliers to give information on how to make procurement process more effective. The results of the questionnaire sent to suppliers shall be introduced to the procurement employees in the case company and utilized, for instance, in internal training and work instruction development. The other goal of this study is to create an electronic questionnaire, which can also be used as a measurement tool in future for procurement feedback.

The department has earlier implemented a Pre-Quality Research of supplier relationships. The latest Pre-Quality Study was carried out in 2010. The research was done by the external research company, Aroxy Oy. The department has also had a developing project concerning supply management. The result of the supply management project was a network handbook, and vendor audit process. Network handbook gives rules to the network on how to measure and evaluate the supply chain (Satu Henriksen e-mail 27.5.2013). This study is continuation to supplier management process and the case company's target to evaluate and develop its procurement activities.

2 PURCHASING

Purchasing has become essential part of many companies' strategies. Its' role in the value creation has been discussed in many research reports and procurement literature. Global markets have forced companies to evaluate their competitiveness and find new models to handle complicated international business requirements as well as to minimize the cost level to be competitive.

Procurement and supply chain management has crucial role in business success. Recent studies show that well organized buyer-supplier relationships create value and in that way give competitiveness to companies. Traditionally procurement was mainly interested in reducing purchasing prices. Nowadays, procurement professionals are keen on developing buyer-supplier relationships, creating long-term relationships and establishing win-win situations. When the supplier relationship is in balance both parties feeling that they benefits from each other, which leads to added value and competitiveness.

The development of purchasing has been remarkable during the last decades. The development and the status of purchasing function has affected the operational and strategy level of the purchasing. Supply management requires planned purchasing strategy in order to manage global networks and develop cooperation between parties. The following chapters introduce strategic levels of purchasing and basic purchasing processes, and ends to discussion about purchasing ethics in industrial and private sector purchasing.

2.1 Strategic Level of the Purchasing

Strategy determines the principles how a company is going to succeed. There are three main levels for strategy: corporate strategy, business unit strategy and operational strategy. Corporate strategy defines the objectives of a company. Business unit strategy specifies how a company ensures its competitive advantage. Business unit strategy may include for instance the determination of the company's products. The aim of the business unit strategy is to describe how businesses units maintain the competitiveness. The third strategic level, operational strategy, is more concrete than previous strategies. Operational strategy describes how function implements corporate and business unit strategies in practice. Each main function, such as procure-

ment, human resources, marketing and research and development, should have its own operational strategy. (Viitala & Jylhä 2008, 70-71)

Purchasing has a crucial role in achieving cost savings. This means that purchasing function should have its own operational strategy in line with the company's other strategies. Purchasing strategic objectives are, according to the Murphy Jr. and Wood (2011), the following issues:

- Supporting organizational goals and objectives
- Managing the purchasing process effectively
- Managing the supply base
- Developing strong relationships with other functional groups
- Supporting operational requirements

Procurement objectives are based on the assumption that procurement has essential and active role in the company. This means that the management sees procurement as one of the main factors of the competitiveness. On one hand, procurement may be an operative function, which is executing daily duties and is not responsible for supply management and value creating thought buyer-supplier relationship. In this case procurement strategy may be included in the corporate general strategy. (Murphy Jr. & Wood 116-117, 2011) All in all, strategy should be selected so that it gives competitive advantage. This requires the knowledge of company's weaknesses and strengths. (Baily et.al. 2005, 57)

Procurement strategy should, for instance, state what are the goals of procurement, what are the requirements of products or services, what are the requirements of the product during its life cycle, should company buy or produce it itself, should company purchase locally or globally, should there be one or more suppliers for one product or service category, how to manage contracts, should procurement concentrate on a few suppliers and develop relationships with them or shall procurement have active bidding competition, how the contracts are managed and what kind of production control system is needed. (Hankintatoimi, 2013)

Figure 1 shows how purchasing strategy and manufacturing strategy are located below the supply chain strategy and what issues purchasing strategy should involve.

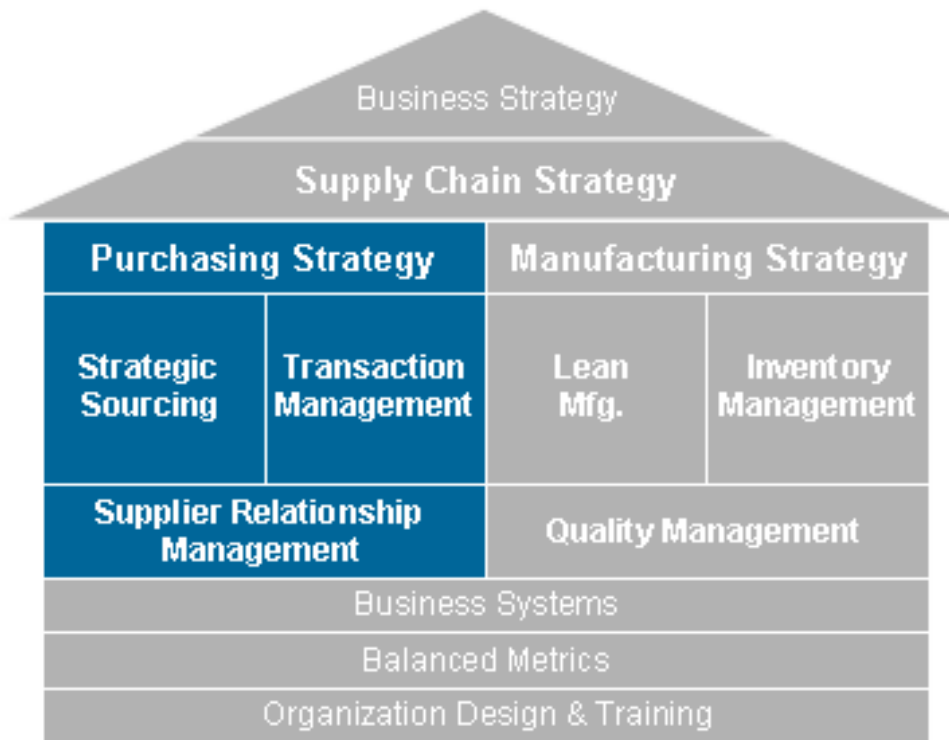


Figure 1. Purchasing Strategy (Strategic Supply Management Associates 2013)

2.2 Supply Management

Council of Supply Chain Management Professionals defines supply management as follows:

"Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies. Supply Chain Management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted above, as well as manufacturing operations, and it drives coordination of processes and ac-

tivities with and across marketing, sales, product design, finance and information technology." (Council of Supply Chain Management Professionals, 2013)

Shortly described supply management includes all activities, which are required to get the purchased item to the end customer. Supply chain management (SCM) has strategic cooperation between the parties inside the supply chain. The target of the supply management is to maximize the value and create competitive advantage. It should be noticed that the competition is not within the supply chain but between the different supply chains. Supply chain is not able to achieve added value if it is not cooperating and improving its operations together with all parties to be more effective and efficient. Martin Christopher emphasizes in his interview in *Logistiikka* magazine (2/2009) that in today's competitive business environment it is possible to succeed only when the company is concentrating on the core competence and it transfer rest of the operations to partners (Logistiikka 2/2009, 18-19)

The changed role of purchasing has also affected the supply management development. In the early phases purchasing function was only "buying", meaning that the purchasing function was concentrating on buying only needed products and services. The next step of the development of the purchasing was "procurement", which included also material flow. At this stage the price was not anymore the main criterion of the purchasing decision: delivery time became important and the purchasing quantities were increased in order to decrease the purchasing value. However, stocks must be kept in optimized level. The last step, "supply management" continues to increase the purchasing scope to reduce total costs. This requires cooperation with the supplier to be able to reduce costs related, for instance, administration and quality assurance and increase the cooperation concerning product and process development. (Axelsson et.al. 2005, 3-4)

There are different reasons which have affected above mentioned change in the purchasing. These reasons are, for instance, the specialization of organizations, which leads to the outsourcing of those activities which are not giving added value. Another reason comes from companies' strategies, which emphasize for instance total quality management and just-in-time thinking. (Axelsson et.al. 2005, 4-5)

The basic target of the SCM is to create value. Tools to create added value through supply chain may be:

- New product introduction,

- Premium pricing,
- Expanded offerings of value-added services,
- Customer loyalty,
- Expansion to new market segments,
- Leveraging opportunities created by external disturbance or disaster and
- Stronger supplier relationship.

Customer loyalty is probably the most important tool, and the basis to create added value. The next step is to convert customer loyalty into revenue and to get positive customer sourcing decision by excellent service. (Lee & O'Marah 2011, 9-10)

Purchasing function needs to be proactive before it is able to manage supply chains. According to Iloranta & Pajunen-Muhonen (2008, 248) successful outsourcing requires:

- Understanding of the company's goals and targets,
- Strategic vision and plan,
- Right supplier selection,
- Clear and accurate contract,
- Open communication between the parties,
- Continuous management of the cooperation,
- Top management's support and
- Human resource management.

According to Calvinato and Kauffmann (1999) supply management implementation shall include four main goals: reduction of channel costs through logistics operations, increase of channel services, improving firm's and channel partner's revenue and improving channel satisfaction and loyalty (Calvinato & Kauffmann 1999, 151-152).

Loyalty seems to be connective issue in SCM. Supply chain won't be competitive if its parties are not committed to working towards common goals. Loyalty requires commonly agreed working methods and common understanding on why it is important to work together. The benefits of the cooperation have to be attainable in all levels in the supply chain. Figure 2 describes the basic areas of cooperation in order to achieve a good performance in supply chain.

Sourcing strategy of the company affects closely the supply management. Deep cooperation and long-term relationship with the suppliers lead to strategic sourcing de-

cisions and developed contracts between parties. One form of a deep relationship with a supplier is partnership sourcing. The basic idea of the partnering is to reduce costs and improve quality. Trust is basis of the partnership sourcing. This is also shown in the figure 2, which is describing the principal characteristics of partnership sourcing. (Baily et. al. 2005, 200-202)

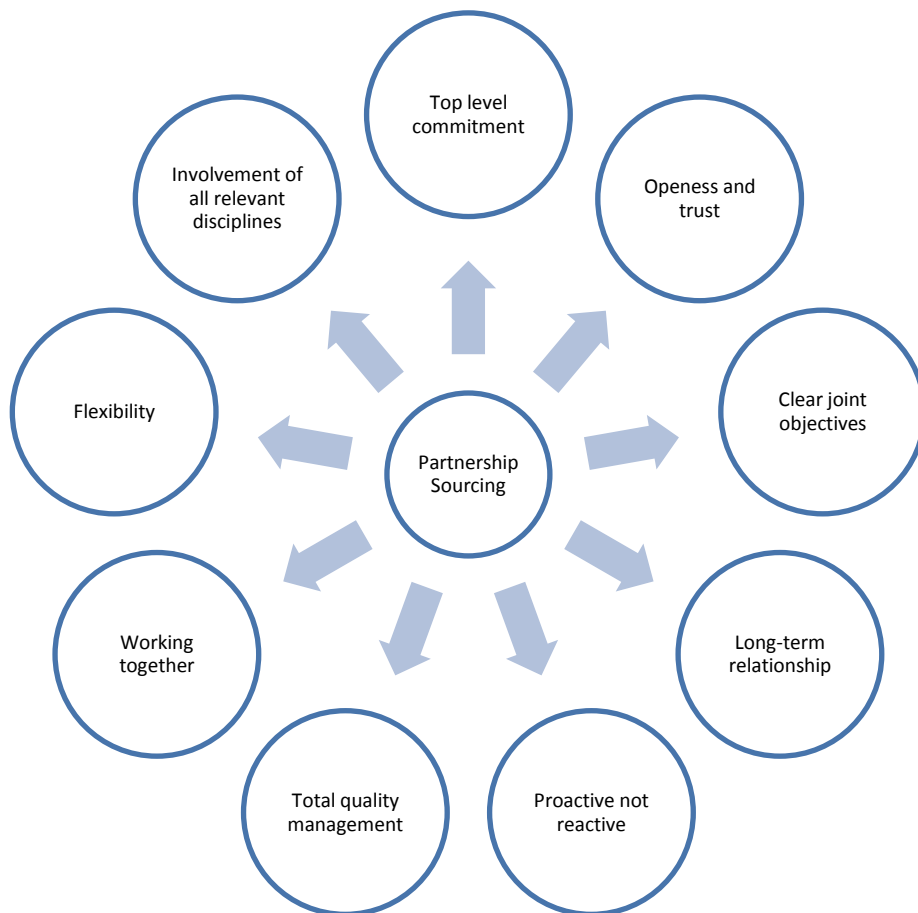


Figure 2. Characteristics related to partnership sourcing (Modified by Baily et. al. 2005, 201)

Outsourcing has become vital in companies' purchasing activities. The Chief Supply Chain Officer Report in 2011 shows that headquarters and design work are most likely kept in the home country but manufacturing and assembly sourcing are preferably done in non-home country. (Lee & O'Marah 2011, 13-14) The corresponding study done in 2012 stresses that the supply chain thinking is seen as a part of the company's strategy and a tool to increase business growth. Difficult market situation and

nature disasters happened in recent years, such as Japan's earthquake in 2011, have affected supply management. (Lee et.al. 2012, 14-28)

Nowadays, supply managers are finding new ways to get information about delivery interruptions and changes in supplier's operations. Digital communication tools, eCommerce, and for example social media, are seen to be helping tools in future. The cooperation between suppliers and strong relationships with them are the basis of future supply management. The strategic status of the SCM in companies requires talented professionals globally. Professionals need to be multi-skilled having, in addition to technical skills, sales and financial skills. Intellectual property and motivated professionals are essential source for the success in SCM. (Lee et.al. 212, 14-28)

3 PURCHASING PROCESS

Purchasing process depends on the type and nature of purchase. Some purchases are so called routine purchases, which do not require much resources and evaluation. On the one hand, there are critical and demanding purchases, which require accurate evaluation and supplier selection, complex contracts and close expediting phase.

3.1 Introduction to Purchasing Process

Figure 3 describes the traditional purchasing process, which starts from the determination of the need, and then continues to the inquiry stage and supplier selection. After supplier selection buyer places an order into the purchasing system, which starts an expediting process. The last step is payment of the invoice and performance evaluation. It is important to realize that development of purchasing is not only filling the order into the purchasing system and contract making. Purchasing process includes also, for instance, supplier selection and evaluation, communication between the buyer and supplier, follow-up process and market monitoring. Nowadays, most of the time spent in development procurement process is directed to the supplier management instead of feeding orders into the purchasing system. (Iloranta & Pajunen Muhonen 2008, 62)

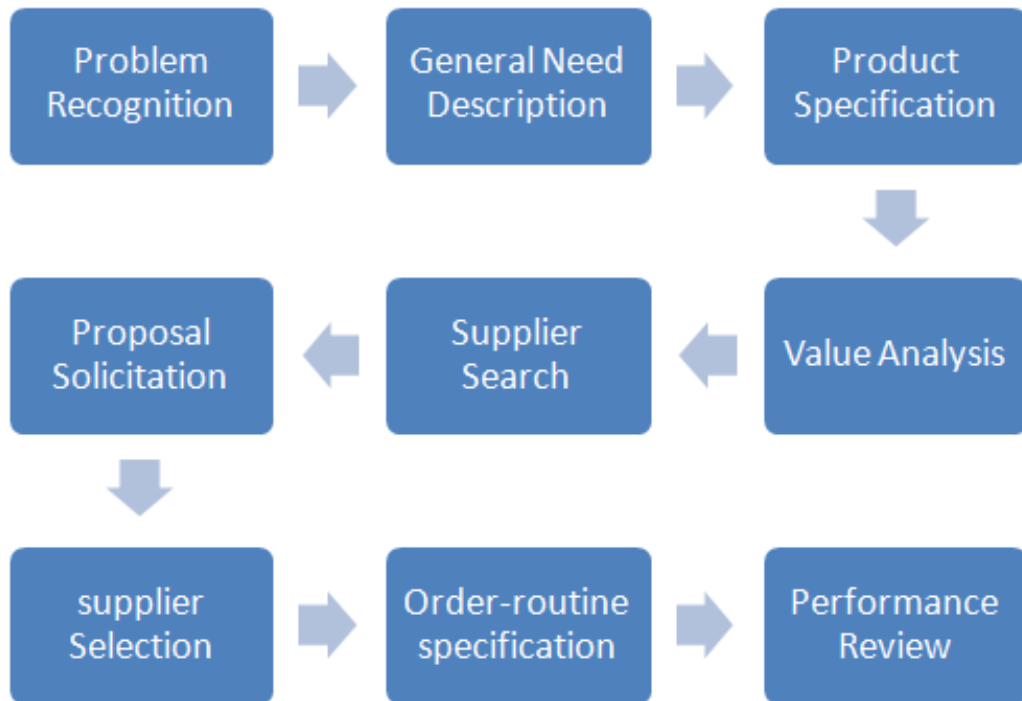


Figure 3. Principle of the purchasing process (Expertsmind 2013)

Based on previous chapter, we are able to divide procurement into two categories: proactive and reactive procurement. Reactive procurement is operative procurement, which is seen as a support function in a company. Reactive procurement concentrates on daily routines and supplier cooperation is minor, which means that the buyers stress the price. Proactive procurement has more strategic view to the procurement process. The cooperation between suppliers is deep and the total costs are evaluated regularly. Constant proactive procurement means also cooperating with other functions in the company and many times it is reporting to top management. (Iloranta & Pajunen Muhonen 2008, 62-64)

Next chapters introduce basic issues about the main purchasing processes and some tools to be used to develop processes.

3.1.1 Inquiry Phase

Bidding phase is the most common way to choose the best possible supplier. It is essential to check supplier's economical and technical capability before sending the inquiry. Company's own supplier evaluation records are important source to find pre-information about the suppliers. (Cavinato & Kauffman 1999, 528-529)

Inquiry or request for proposal shall be clear and include all the needed information required to create accurate proposal. According to Cavinato and Kauffman a good request for proposal should include detailed technical specification, drawings, description of the required work, list of required data, time schedule, instructions about the needed information required to the proposal, terms and conditions and all other information which is needed to create and send proposal to the purchaser. (Cavinato & Kauffman 1999, 530)

3.1.2 Supplier Selection

Supplier selection and evaluation has essential role in purchasing process when company has decided to outsource purchases. Supplier evaluation is a continuous process and the supplier information and experiences of the suppliers should be updated regularly.

Supplier selection shall be done at least in some level before each purchase. Low risk and simple purchases do not require massive supplier evaluation process but when the purchased item complicates the risk increases, too, and the selection process should be done more carefully. (Iloranta & Pajunen-Muhonen 2008, 261).

According to Iloranta & Pajunen-Muhonen suppliers are evaluated for two reasons: to find the best possible supplier and to develop supplier. (Iloranta & Pajunen-Muhonen 2008, 308). Evaluation of the suppliers is based on many different factors and it depends on the needed product or service type and, for instance, on the end user's needs and requirements. The supplier selection and evaluation is most often done based on many different sources. Many companies have their own records where to file information and feedback about the suppliers to be utilized in future. The result of supplier selection and evaluation is an approved supplier list, which can be used in inquiry phase. (Baily et.al. 2005, 371-372)

Nowadays many companies require valid quality system from their suppliers, or at least recorded description of their processes. Buyers also evaluate suppliers' ability to meet requirements, such as delivery times and required level of the design work. After sales services and available spare parts as well as warranty issues are important factors when buyers select appropriate suppliers from technical point of view. (Baily et.al. 2005, 371-372)

Supplier evaluation process contains four steps. (Iloranta & Pajunen-Muhonen 2008, 261-267). Firstly, purchaser creates a short list of suppliers. This means that the purchase filters the most suitable suppliers from the potential suppliers. Secondly, purchaser evaluates suppliers with more specific criteria, such as convenience of the solution, costs, advantages and risks and the conditions to cooperation, based on suppliers proposals. When the purchasing decision is done and the cooperation with the suppliers starts, purchaser evaluates suppliers' performance. The last level concerns long-term relationships. Purchaser evaluates how the suppliers achieve the areas which have been evaluated as development areas. In this stage the evaluation of the cooperation is also important area. (Iloranta & Pajunen-Muhonen 2008, 261-267).

The sources to evaluate suppliers can be different business reports, which give information about the supplier's financial situation and previous experiences of the supplier. Another way to investigate supplier is to arrange visit to suppliers' premises and benchmark supplier by its other customers. In some cases a new supplier may be asked to give some material samples or laboratory tests.

3.1.3 Proposal Evaluation

Proposal evaluation should be done carefully from technical and commercial point of view. In general, the evaluation is done together with the persons, who were involved in the inquiry phase. If the proposal does not meet the requirements, it should be returned back to the bidder with explanation why the proposal was not accepted in the evaluation. (Cavinato & Kauffman 1999, 536)

3.1.4 Negotiation Phase and Order Decision

In general, negotiations have three phases: pre-negotiation phase, actual meeting phase and post-negotiation phase. In the first phase the objectives for the negotiation are set, and the strategy is created. Meeting phase contains information sharing and it targets to achieve agreement which satisfies both parties. The last, post-negotiation phase is agreement implementation based on the meeting. Professional buyer confirms what the parties have decided before closing the meeting. It should be noticed that in some cases there are several negotiations before the parties are able to find solution. (Baily et.al. 2005, 231, 244) Written memo is a good addition to sum up and confirm agreed issues before contract making.

Preparation is an essential part of the negotiation process. The time to be used for preparation depends on purchased items, and how important they are for the project or organization. Three major issues are described, which should be considered before actual negotiations. First, buyer should clarify the target of the negotiations. There may be need to negotiate low price or remarkable discount on the price, certain delivery time or changes in the cooperation. The second issue is to value the "wants", which means that the buyer should clarify what point has a higher priority and what point has the lowest priority. The last point, according to Baily et.al. (2005, 233-234) is to clarify entry and exit points. In general, the entry point is the bid and the exit point is the point where buyer should "walk away". Entry point should be decided already in the preparation phase. (Baily et.al. 2005, 233-234)

Purchasing negotiations include both purchasing and selling aspects: buyer is trying to achieve the best possible outcome from technical and commercial point of view and seller is trying to sell his products or services in favorable terms and conditions. The result of the negotiations is the price. There may be different tactics to negotiate about the price: in some cases buyer may express what the demand price level is and in some cases negotiators describe their needs and then buyer and seller start to negotiate about the actual price. Cultural aspects also affect how the price shall be discussed. Finnish way to go straight down to business may not be valued in another culture. (Iloranta & Pajunen-Muhonen 2008, 285-287, 292)

According to Iloranta & Pajunen-Muhonen the authority relationship between the negotiators and the companies affect the starting point of the negotiations as well. It is noticed that the status or preconception of the opposite person affects the negotia-

tions. For instance, the height of the person, dressing or educational level may affect the negotiations and give other side more powerful status. It should also be noticed that professional buyer is able to create attractive purchasing, which increases seller's activity. (Iloranta & Pajunen-Muhonen 2008, 287-291)

3.1.5 Contract

Contracts determine how the purchased item should be delivered and what happens if delivery doesn't meet the contract requirements. To be able to make contracts buyers should be aware of the legislation related to purchasing. However, there are issues which are not covered by law and in some cases there are only established legal practices. It is essential to know terms of delivery, such as Incoterms, because they determine, for example, transfer of ownership and liability for damage. There are also general purchasing terms and conditions and company specific terms and conditions, which can be used in contracts. International contracts require knowledge of local legislation and the help of local jurist may be desirable. (Iloranta & Pajunen-Muhonen 2008, 305-309).

There are various types of contracts depending of purchase type and for instance the level of buyer-supplier relationship. There may be different contract types for the design, manufacturing and equipment purchases. The contract may also be different depending on the pricing type. (Cavinato & Kauffman, 533-534) Well established procurement system has its own contract templates for different kind of purchases (Iloranta & Pajunen-Muhonen 2008, 308).

3.2 Quality of Purchasing

Quality is essential part of procurement, and it is closely connected to the supplier cooperation and contract management. Quality can be simplified defined to a meet customer expectations. There are several measurement tools to control how the expectations meet the requirements, and when those expectations are reduced. In order to achieve the best possible quality, all departments inside the company as well as the cooperation with the suppliers, should be in close contact. There may be separate quality function, which is responsible for, for instance, product quality assurance,

quality planning, supplier quality control, quality testing, training and maintenance, and developing the company's quality system. (Cavinato & Kauffman 1999, 554-556)

Purchasing quality shall also be evaluated and measured. Quality tools, used to measure procurement process, are partly the same as quality tools used in supplier's quality evaluation. Procurement performance measurement is studied more in the next chapter.

Commonly used quality tools are, based on Cavinato & Kauffman (1999, 557-575):

- ISO 9001,
- The Balanced Scorecard,
- Business Process Reengineering,
- Total Quality Management (TQM),
- Quality Circles,
- Benchmarking and
- Statistical Process Control.

ISO 9001 is a generally noticed quality monitoring standard, which gives guidance and tools to achieve quality requirements and monitor quality process of the company. ISO 9000 standard family consists of several sub-standards, which concentrate on terminology, requirements and for instance audit requirements. (International Organization for Standardization, 2013)

To be able to achieve ISO 9001 standard company has to fulfill determined criteria in every required function. The processes should be described in separate quality assurance manual and processes are audited by internal and external auditors on regularly basis. ISO 9001 standard is quite an easy way to evaluate supplier's level of quality issues. In many cases purchasers require ISO 9001 standard or at least evidence that supplier has documented description of its processes. (Cavinato & Kauffman 1999, 557-560)

Business Process Reengineering aims at redesigning business processes so that the company achieves improvements to the important measurement areas like quality and service. The improvement of new type of technologies to be a strategic tool is an essential part of the Business Process Reengineering. (Cavinato & Kauffman 1999, 565)

Balanced Scorecard has introduced by Kaplan and Norton. Originally balanced scorecard was created as performance measurement tool but during the years meaning has been extended to cover strategic planning and management system. Balance scorecard has four basic items: finance, customers, internal processes and development. (Cavinato & Kauffman 1999 , 563-565)

Total Quality Management (TQM) concentrates on the quality system and the processes in order to improve the effectiveness of company and customer satisfaction. TQM encourages whole supply chain to involve the quality process. (Baily et.al. 2005, 110) The target of the TQM is to reduce waste activities at every stage and get competitive advantage by continuous improvement. (Anvari et.al. 2011, 1587)

Japanese invented quality circle method in the 1960's. Quality circle is a group of employees who evaluate problems together. The willingness to take actions from top management is crucial for the quality circle. Especially in manufacturing companies quality circles are a good way to handle quality problems and commit employees to high quality performance. (Cavinato & Kauffman 1999, 572-573)

Benchmarking means that company evaluates itself against others, usually against the best-in-class companies (Iloranta & Pajunen-Muhonen 2008, 489-490). Target of benchmarking is to achieve better performance. However, it is important to remember that benchmarking is learning and copying from each other and sometimes benchmarked practices are not given any benefits to the company. (Iloranta & Pajunen-Muhonen 2008, 489-490)

Statistical Process Control (SPC) in one of the key areas of quality management. The main idea of SPC is to monitor manufacturing parameters, which help in giving an understanding of what manufacturing areas are working well and what should be corrected. The output of the SPC is a control chart, which shows possible variations of the process. (Cavinato & Kauffman 1999, 574-575)

3.3 Performance Management

The main target of supply management is to make all partners profitable (Cavinato and Kauffmann 1999, 163). Performance measurement should evaluate how the function achieves its strategic goals and give information on how the processes are working and what areas need to be developed. Performance measurement helps to find trends in the process when it is done on regularly basis. (Iloranta & Pajunen-Muhonen 2008, 435, 445)

Figure 4 describes how the need of performance measurement changes during the development of purchasing. Shortly, when purchasing is seen only as a clerical aspect, the performance measurement has a low status. When purchasing function gets more responsibility to negotiate contracts, and is expected to reduce costs, the meaning of the performance measurement increases. (Baily et.al. 2005, 395-396)

Concrete measurement areas may be cost saving measurements and effectiveness of the clerical work. The next development stage is towards strategic purchasing, which means that the status of the purchasing function grows and total acquisition costs are measured. Final stage has important strategic weight and the overall strategic effectiveness is measured as well as, for instance, supply chain effectiveness and improvements. (Baily et.al. 2005, 395-396)

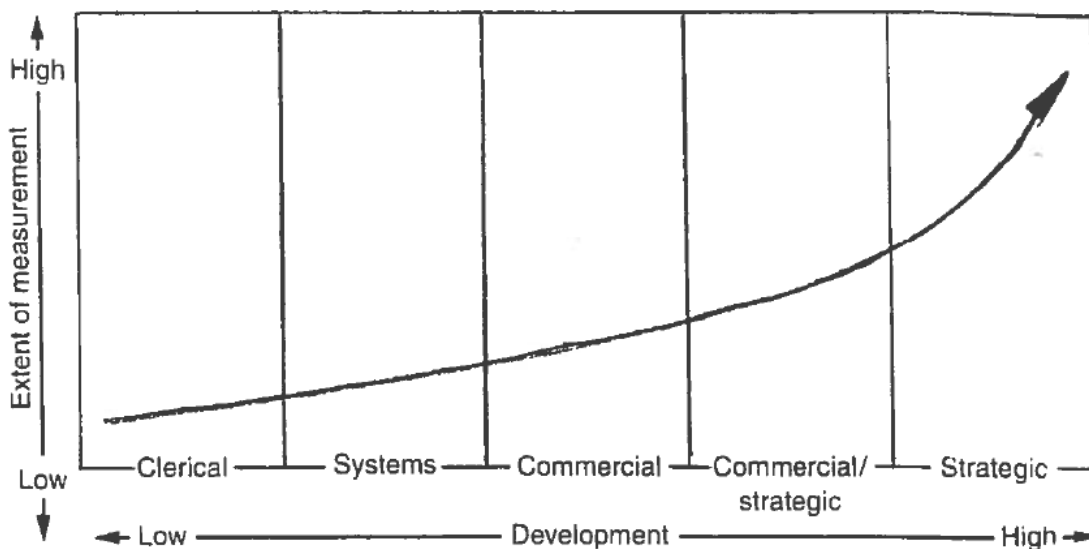


Figure 4. Purchasing development and performance measurement. (Baily et.al. 2005, 395)

There are three basic types of the performance metrics: Strategic performance metrics, tactical metrics and operational metrics. Strategic metrics measure the total supply chain cycle time, order lead times, supplied lead time against industry norm, level of supplier's defect-free deliveries, delivery lead time and delivery performance. Tactical metrics measure purchase order cycle time, suppliers' ability to respond to quality problems, suppliers cost saving initiatives and delivery reliability. The operational metrics concentrate on total inventory supplier rejection rate, quality of delivery documentation and quality of delivery performance. (Baily et.al. 2008, 421-422)

Performance measurement may also be divided into qualitative and quantitative groups. Quantitative measurement uses different accountable values and numbers whereas qualitative measurement emphasizes service and quality and it involves subjective point of views. Quantitative metrics are easier to analyze compared to qualitative metrics, which always contain some amount of subjective viewpoints. (Jones & Oliver 2006, 146)

Recently, researchers have been dividing performance tools into traditional and future tools. It has been realized that in some cases traditional measurement tools are not relevant to measure the strategic level of purchasing and supply chain effectiveness. Traditional performance measuring concentrates on purchasing cost reduction, delivery performance, inventory, conformance to quality requirements and for example profit. Future measurement tools emphasize total costs through the supply chain, supply chain information availability, activity-based measures, total supply chain inventory levels and for example electronic commerce. (Axelsson et.al. 2005, 193-196)

All in all, many companies are realizing that the individual company measurement does not give enough information on how the company is achieving its targets. Focus should be in the total supply chain performance. The tools used in performance measurement need to be developed furthermore and the decisions, which tools shall be used shall be done carefully. (Axelsson et.al. 2005, 193-196)

According to Iloranta & Pajunen-Muhonen (2008, 451-452) it is essential that performance measurement metrics meets the measurement targets. Measurement process has to be clear and easy to execute. Performance measurement metrics should be chosen so that they are able to support the targets and the measurement results shall be analyzed on a regularly basis. Company has to define who will be responsible for the implementation of the performance management and to whom the results shall be

reported. It is also important to define target value or critical limit value where to compare the results. It is recommended that performance measurement is done in long-term and short term basis. (Iloranta & Pajunen-Muhonen 2008, 451-452)

According to Baily et.al. (2005, 396) there are seven basic performance measurement areas in purchasing. These areas are:

- Operational purchasing,
- Co-ordination with other functions,
- Purchasing organization and system,
- Budget performance,
- Creative performance,
- Policy development and
- Planning and forecasting.

Operational purchasing has five subareas, which are quality, quantity, timing, price and operational costs, which are also traditional supplier measurement areas. Co-ordination is quite complicated to measure, and one way to handle this area is to measure the number of complaints from other functions. The number of panic purchases also describes the level of cooperation between the different internal functions. Purchasing organization and system is evaluating the procedures used in the procurement, and evaluates the possible lacks in the purchasing process. One part of creative performance is to evaluate suppliers and develop supplier relationships. (Baily et.al. 2008, 429-430)

Policy development is crucial area of purchasing performance management. This step contains important strategic decisions like make-or buys decision, the degree of centralization and working with the suppliers towards just in time strategy. The last point, planning and forecasting, is concentrating on the long-term and short-term plans and the procurement role in the plans. It should be noticed that the plans have to be matched in reality and they are covering all the needed areas. (Baily et.al. 2008, 429-430)

Supplier performance measurement becomes an important part of procurement when the company is outsourcing its purchases. Suppliers are measured for supplier selection purposes in basic purchases and, on the other hand, for advanced supplier selection concerning the critical purchases and key suppliers.

The most common supplier performance measurement metrics are delivery, quality, service and price and costing. In practice, delivery can be measured by the percentage of received items specified in the contract and quality, for instance, by the rejects rates of manufacturing items. Service is more complicated to measure due to the subjective point of views. However, service may be measured by the after-sales service and the respond time for the complaints. Pricing and costing can be measured by the market position and cost breakdown. (Jones & Oliver 2006, 111)

Supplier performance can be executed by:

- System and information tools,
- Performance measurement and accreditation tools and management and
- Theoretical and support tools

Company's own software tools or different general ERP (Enterprise Resource Planning Software) software gives tools to performance measurement. ERP's include a lot of information about the suppliers and the basic data information about the purchases, which can be utilized. Accreditation tools and management can involve, for instance, vendor rating system, pre-award assessment system and performance history done by benchmarking. Theoretical and supporting tools mean general evaluation and analyzing tools like, SWOT analysis and Pareto analysis. These tools help buyers to make decisions to select suppliers. In addition to above, planned visits to the suppliers' premises are a good measurement tool by the trained employees. Supplier visits also strengthen the cooperation between the parties. (Jones & Oliver 2006, 143-145)

Most of the performance metrics are not comprehensive and they have lacks. Developing of the metrics is a continuous process and new viewpoints are keenly searched. Axelsson et.al. (2005, 197-199) have described five new performance measurement areas, which concern the whole supply chain and support management accounting. These areas are: balance scorecard, open book accounting, total cost ownership (TCO), activity-based costing (ABC) and value analysis and target cost management. Balanced scorecard is used to targeting the factors, which management decides to be followed-up in future. Balanced scorecard is also important quality metric, which is stated in the chapter 3.2. Open book accounting emphasis open cost structure between buyer and supplier. Activities are analyzed together and there is a will to discuss the cost structure. TCO defines all the costs related to product lifecycle, not only based on the purchase price. (Axelsson et.al. 2005, 197-199)

In ABC method the product's indirect costs are added into the product. This means that for example supplier analyses and supply market analysis take into account the product's price. The last area, value analysis and target cost management, is divided in two areas. In value analyses point of view the products is evaluated based on their functionality or performance and the target is to find the lower-cost alternative based on the costs calculated by evaluated attributes. Target costing has a clear settled cost, which shall be achieved in quality and functionality point of view. (Axelsson et.al. 2005, 197-199)

3.4 Purchasing Ethics

When procurement has been changed as a professional purchasing function the ethical issues have become a very essential issue. According to Cavinato and Kauffman (1999) there are several points, which should be noticed in purchasing ethics. First, buyers should protect their employer ethically. Buyers should be able to work so that it brings best possible solution to his employer. All confidential information should be kept safe. The second important point is that suppliers shall be treated in the same level and the purchasing process should be open and fair. Third point is professional buying. (Cavinato & Kauffman 1999, 378-379) Professional buyer develops his professionalism, and he is able to follow up ethical standards. (Institute of Purchasing & Supply 1999, 3)

According to the Chartered Institute of Purchasing and Supply (CIPS), buyer should understand the operations of the supplier and help supplier to develop, guide and improve suppliers when necessary. (Institute of Purchasing & Supply 1999, 3) Fourth major point is the person himself. Each buyer has his own personality and professionalism. It is extremely important that he is able to understand the meaning of ethics and he is able to behave ethically in all above mentioned levels. (Cavinato & Kauffman 1999, 378-379)

International purchasing has its own special features in the ethical point of view. Simplified, the same ethical rules are also used in international purchasing. However, there are some issues, which should be taken into account when we are doing business in another country and culture. There are, for instance, cultural habits which should be examined carefully beforehand as well are local laws and regulations (Ca-

vinato & Kauffman 1999, 398-401). Professional buyers are aware of corruption and they should be able to tolerate it.

Nowadays, supply chains may be very long, which means that the chain can involve partners over four countries who all have their own specific practices. To avoid difficulties, it is essential to examine local practices and talk about the unfamiliar issues before purchasing operation in new country (Cavinato & Kauffman 1999, 398-401)

Social responsibility is an important issue when we are discussing the ethical behavior in business. Especially in international purchasing buyers should be aware of the social responsibilities and take time to evaluate suppliers and the supply chains. Ethical issues are also a crucial part of the vendor approval process. CIPS has integrated social responsibility in Ethical Business Practices. Social responsibility takes care, among other things, of that labor is not forced to do the work, labor contracts shall be easy to read and employer shall give help to read labor contracts, labor gets wages which meet, at least, national legal requirements or are in line with industry benchmarks, working time shall meet regulations, suppliers shall follow national laws, health and safety policies shall be executed, children shall not be employed and discrimination in all levels shall not be approved. (Institute of Purchasing & Supply 1999, 7-8)

In addition to social responsibility, which is described earlier in this chapter, companies focus also on environmental responsibility. The monitoring of carbon footprint, energy usage and pollution level is an important evaluation factor in supply chain. Many end customers demand a strict environmental limit, which reflects into the whole supply chain. (Lee et.al. 2012, 29-35)

Issues above may sound axiomatic in western countries but in international purchasing buyers may face inappropriate ethical behavior. It is extremely important the buyers are trained to understand ethical issues and procurement process involves also ethical evaluation of the suppliers. This is emphasized especially in the vendor evaluation process.

Recent study shows that social responsibility and environmental issues are taken seriously in the companies. Companies are requiring very tight social responsibility and environmental program from their suppliers, and if there are any defaults purchasers are giving more easily warnings, and even ending the cooperation with the

supplier. Reason for the strict ethical behavior monitoring is that the purchasers are achieving many benefits through good ethical reputation and positive customer image. Most significant benefits are reduced violations of government regulations and laws, supplier relationship improvement, customer satisfaction improvement, operating cost reduction and new or improved sales opportunities. (Lee et.al. 2012, 29-35)

4 PROCUREMENT PROCESS IN FOSTER WHEELER ENERGIA OY

Foster Wheeler Energia Oy has a centralized purchasing organization. All purchases are done into the company's purchasing system by procurement personnel. Literature divides purchasing into traditionally centralized and decentralized purchasing. Centralized purchasing means that the purchases are managed by a central purchasing group. This forms a coherent and powerful buying group. One disadvantage of the centralized purchasing is that it is not able to meet local needs as much as decentralized local buying. (Axelsson et.al. 2005, 98-102)

Decentralized purchasing contains many purchasing departments within the organization. Most of the purchases are managed by individual business units. This means that, for instance, human resources and engineering are doing their own purchases. In decentralized purchasing company has no coordinated purchasing management, which may cause the lack of information about the total costs and, on the one hand, buyers may not be able to negotiate about the synergies. In addition to centralized and decentralized purchasing there are so called hybrid structures, which may combine the levels of centralized and decentralized systems. Hybrid structures are: coordinated purchasing, centre-led purchasing and federal purchasing. (Axelsson et.al. 2005, 98-102)

Centralized purchasing may be in some cases quite heavy to run but it helps to follow up total costs and gives power to negotiate price discounts for bigger purchase packages. When all the costs are recorded the evaluation of the costs is also easier and the buying will stay in professional level utilizing existing contracts.

Case company is using at the moment Lean purchasing system. Invoices are handled electronically in RONDO system and transferred into the Lean. Company started significant software project in 2012, which will also affect the purchasing system. Material Control System, MC, is a web based system used to follow up deliveries at Site. Site employees are using the system to accept the delivery and store the purchased items. Suppliers have also access into the MC to create packing lists. The information about the deliveries is transferred into the Lean overnight. ProjectWise (PW) is a system used to archive documents. For instance, contracts are archived into the specified folders in electronic format into the PW and linked into the Lean. The system has its own folders for each project and departments. Many design suppliers have

access to the system, for instance, to return design works. System can be restricted for different user groups.

Purchases are done according to the separate purchasing work instructions, which describe how the order and contracts are approved, signed and, for instance, when the bidding process has to be started and how to implement change management. The work instructions are archived into the PowerWheel, which is a common management system used in FWEYOY. PowerWheel contains instructions divided by functions, which are introduced in figure 5. The access to the PowerWheel system is from company's Intranet and all employees have right to use PowerWheel.

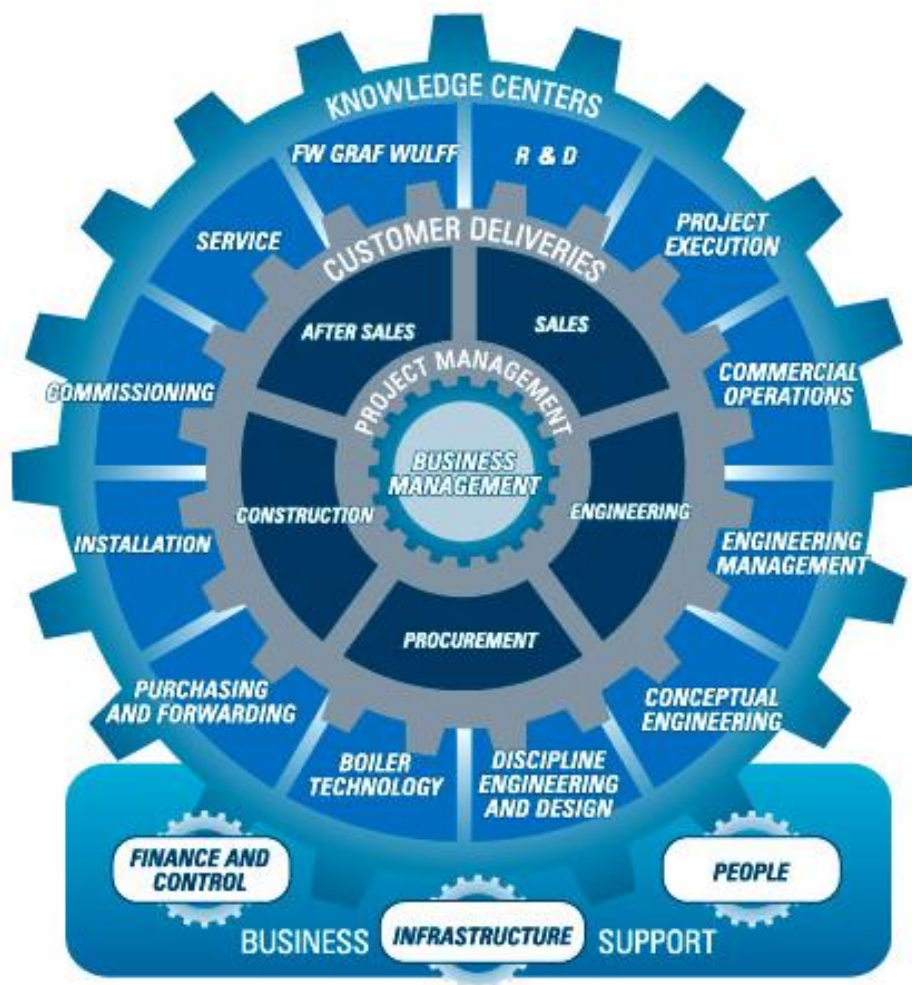


Figure 5. PowerWheel Management System (Foster Wheeler Energia Oy Intranet 2013)

Case company has its own work processes for the project purchases and overhead purchases. Overhead purchases also utilize annual order system to be able to decrease the amount of hours spend into the overhead purchases and in that way to make purchasing more effective.

Foster Wheeler Energia Oy has separate purchasing strategy, which was created in 2011 based on Supply Management project. Purchasing strategy is divided into two sections. First section emphasizes cooperation between Foster Wheeler Energia Oy Power Group's units to be competitive in global markets. Procurement is also cooperating actively with its internal interfaces. The second section of the case company's purchasing strategy stresses networking with the suppliers and strategic partnerships. The challenges for the purchasing are today's market situation and the delays in investment decisions. The market situation has forced company to cooperate together with its other units to achieve competitive advantage. It is also essential to find new sourcing partners from the new market areas, which requires capacity for sourcing. (Minna Kortelainen, Interview 7 May 2013).

At the moment purchasing strategy is separate from FWEYOY strategy and it is not found in PowerWheel. According to Director Procurement Minna Kortelainen it is aimed at to get purchasing strategy to be part of the FWEYOY strategy during the next years (Minna Kortelainen, Interview 7 May 2013).

4.1 Procurement Organization

Foster Wheeler Energia Oy's organization chart is introduced in figure 6. FWEYOY procurement department has approximately 32 employees. Procurement department consists of both buyers and expediting and shipping professionals. Procurement department is lead by Director Procurement. Purchasing group, which consists of new boiler, and service sector Buyers, and Senior Buyers, is led by Procurement Manager. Altogether, organization has approximately 13 Buyers and Senior Buyers.

Project Procurement and Subcontract Management groups include approximately seven procurement managers. This section includes also pressure parts materials and fabrication sourcing. Expediting and shipping group is lead by Logistics Manager and the group consists of seven Logistics Coordinators and Senior Logistics Coordinators.

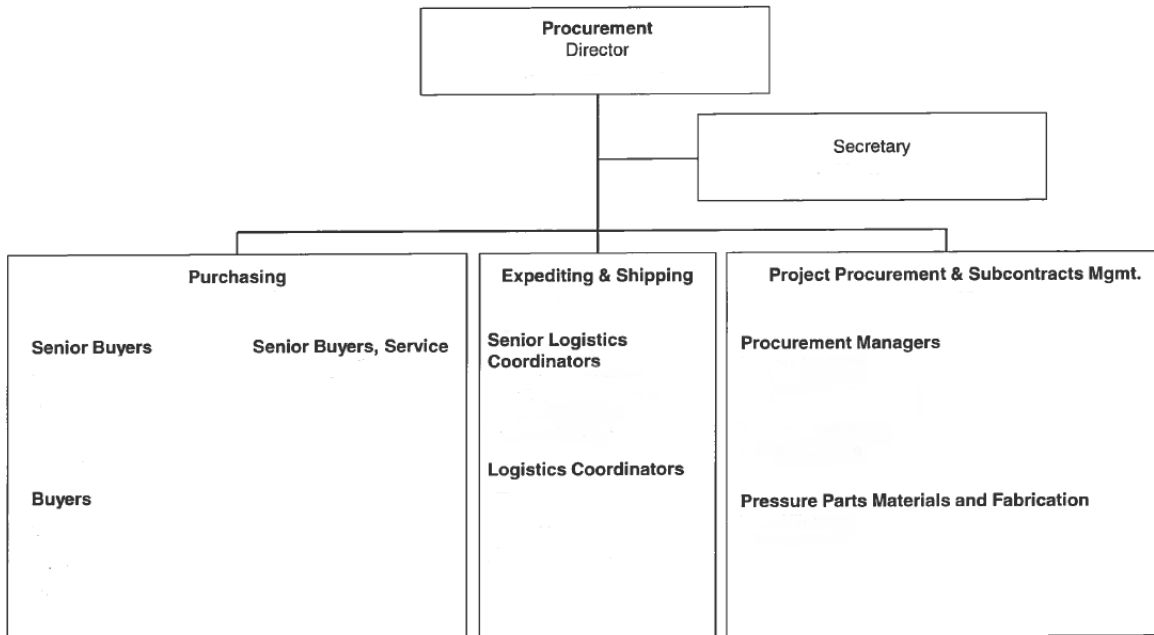


Figure 6. Foster Wheeler Energia Oy Procurement organization (Foster Wheeler 2013)

Each execution project has named procurement manager and buyer who are mainly responsible of the purchases needed in the project. Each project has also named logistics coordinator or senior logistics coordinator. Procurement manager and logistics manager are involved the project already in the selling phase.

4.2 Purchasing Process in Foster Wheeler Energia Oy

Purchasing process in the case company is largely following general industrial purchasing process. International procurement in EU area and outside the EU brings its own challenges to the purchasing. Projects contain a lot of different purchases from the small equipment to the large and complicated components, which require wide professionalism from the employees. International contracts require knowledge about

local legislation and business habits. Close cooperation with support functions such as law department and tax professionals is essential to success in purchasing in international environment. It is also important to find local reliable connections to help to make contracts with local suppliers.

International transactions require also large knowledge to handle deliveries. Import and export operations are quite simplified in the EU area but when the company is working outside the EU requirements may vary a lot. Deliveries shall be planned carefully beforehand and active communication is crucial with different agents. Poorly planned transactions may cause remarkable costs for the company. (Baily et. al 2005, 296-298)

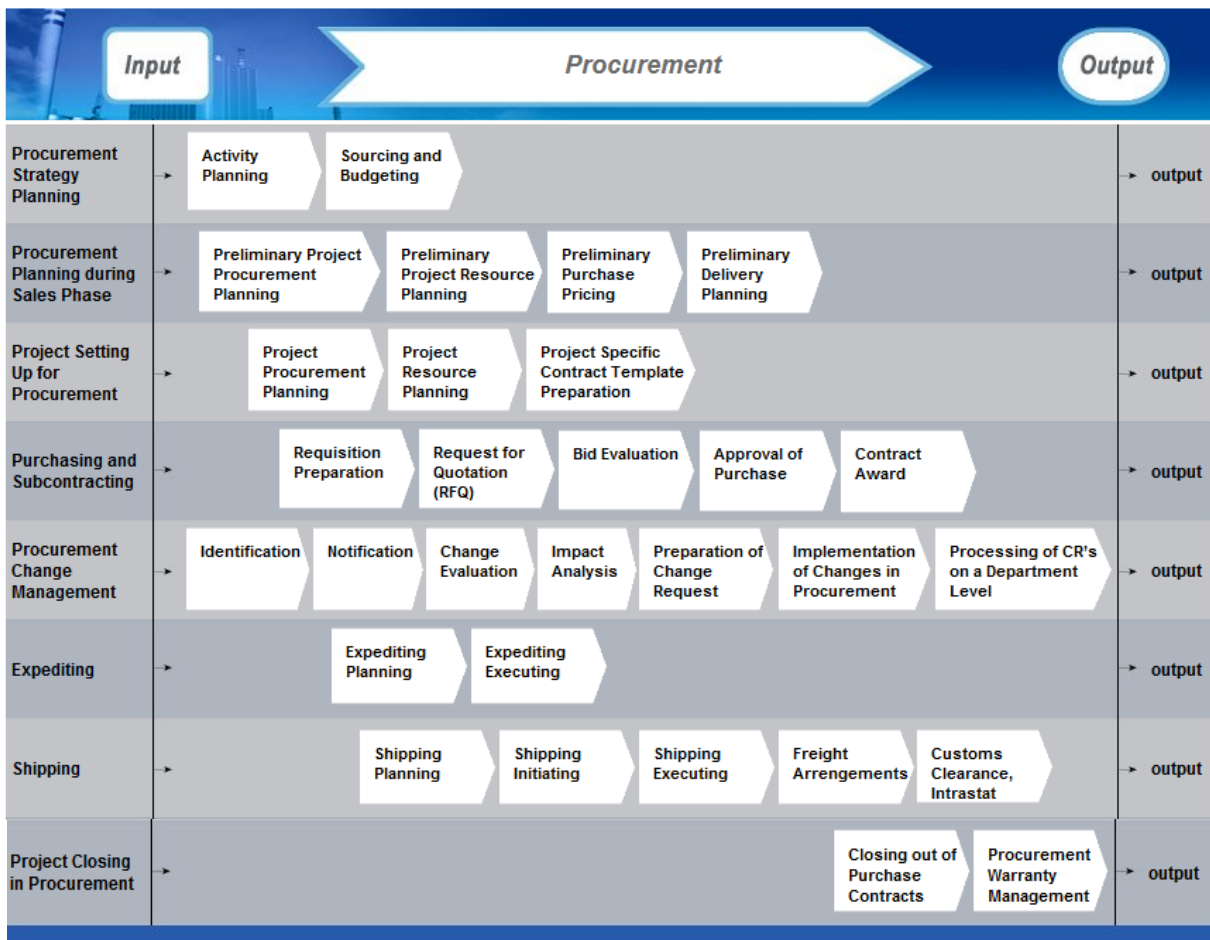


Figure 7. Procurement process at Foster Wheeler Energia Oy

FWEYOY's purchasing process is introduced in figure 7. The process starts from the sales phase of the project. Firstly, procurement prepares strategic plans for the sales project and finds the best possible sourcing resources. The next step is to create preliminary procurement plan, create preliminary plan about the project resources and purchase pricing. In this phase preliminary delivery plan is also created. When the sales project turns into the execution phase, procurement plans and resource plans are created based on the preliminary plans. Each project has specific templates, which are used in the purchase orders and contracts. These templates are created in project setting up for procurement phase together with other functions. (Foster Wheeler Energia Oy Intranet 2013)

The next step of the purchasing process is purchasing and subcontracting. In this phase the purchasing orders and purchase contracts are done based on purchasing workplan or separate initiations coming outside of procurement department. Based on the initiation procurement sends requisitions to the suppliers. After receiving the proposals procurement is responsible for making commercial bid tabulation and engi-

neer technical bid tabulation. Bid tabulations shall be approved according to the work instructions, and after approval procurement is able to create purchase order and purchase contract. During the bid evaluation phase procurement negotiations are done with the selected suppliers in cooperation with other functions. Based on the negotiations and possible new bidding phase procurement shall make purchasing decision and make contract with the suppliers. Output of the purchasing and subcontracting phase is approved contract. (Foster Wheeler Energia Oy Intranet 2013)

Change management starts from the identification. The process continues with careful evaluation of the change impacts, impact analyses and informing other project team members. When the change has evaluated the change request shall be done and handled by each necessary function. Procurement is responsible for transferring approved changes into the purchasing system and handle changes with the supplier. (Foster Wheeler Energia Oy Intranet 2013)

Expediting process consists of two areas: expediting planning and expediting execution. The output of the expediting is on time delivery. Expediting is divided into five stages depending on how critical the purchase is. Levels 0-2 are in-house expediting stages, which are mainly done from the office via telephone and e-mail. Levels 3-5 are source expediting, which require visits, quality inspection and shop expediting together with other functions. Procurement manager shall estimate the amount of the visits, special requirements for expediting and the total costs of the expediting visits in the sales phase of the project. In the project phase expediting requires regularly base follow up with the project team. (Foster Wheeler Energia Oy Intranet 2013)

Shipping procedure includes, among to other issues, preparing of packing, marking and shipping instructions, handling project deliveries from the supplier to the project Site on time, co-ordination of material deliveries from suppliers to manufacturing places, asking freight offer, make freight orders and cooperating with different forwarding agents, customs authorities. In addition, shipping process includes preparation of export, import and Intrastat statistic documentation. The output of the shipping procedure is proof of delivery. (Foster Wheeler Energia Oy Intranet 2013)

The main purchases for the projects are done based on the procurement workplan, which covers all the major purchases. Procurement workplan is also a tool to follow up progress of the procurement process. However, each project has numbers of other purchases which are not named in the procurement work plan. These purchases

are done based on the inquiry coming outside of the procurement department. Typically, engineering sends initiation to the buyer for some equipment and the buyer shall send inquiry for the supplier to get valid proposal. In some cases buyers are able to use valid annual order price lists. (Foster Wheeler Energia Oy Intranet 2013)

4.3 Purchasing Instructions

Foster Wheeler Energia Oy has created common work instructions for its operations. Work instructions have to be followed up and audited regularly by internal and external auditors. Instructions should be updated when the purchasing process changes and every one in a while department arranges work instruction training for its employees.

Procurement work instructions for project purchases cover the following areas:

- Procurement Planning During Sales Phase,
- Project Setting Up for Procurement,
- Purchasing and Subcontracting,
- Procurement Change Management,
- Expediting,
- Shipping and
- Project Closing in Procurement

For service and overhead purchases company has its own work instructions, which cover:

- Procurement Strategy Planning,
- Project Setting Up for procurement,
- Purchasing and Subcontracting,
- Procurement Change Management,
- Claim Management Procedure and
- Shipping

4.4 Overhead Purchases

Overhead purchases cover, for instance, facility services, office supplies, patents, financial services, insurances and ICT purchases. Many of the overhead purchases are essential for the basic operation of the business, like electricity, insurances and cleaning and occupational health services. Many of these purchases are also quite expensive, which means that procurement has important role in evaluating the cost level. The rest of the overhead purchases are done based on the functions needs, such as training, specific standards or capacity purchases. Usually overhead purchases are already budgeted into the functions own operational budgets.

Overhead purchases rarely give any commercial advantage. In that sense the purchasing process is monitored carefully, and the case company has developed overhead purchases to be effective and efficient. Cooperation between different functions is essential to be able to achieve purchasing requisition in the right format and containing all the needed information for the purchase order. Case company is also affects overhead purchases by using annual orders. This reduces remarkably the purchase order amount done into the purchasing system and in that way reduces operational costs.

4.5 Contract Types

The used contract types are described in the procurement work instructions. Work instructions determine the contract level for different type of purchases. Company has created standard purchase templates and they are archived into the PW. All projects have their own specific terms and conditions coming from the main contract between FWEYOY and Client, and which are added into the contracts. In general, procurement manager shall create his own project purchasing templates for project purposes based on the standard contracts. Case company has its own general terms and conditions for purchasing, which are used if purchaser has not agreed other terms to be used with the supplier.

The main contract types in FWEYOY are:

- Annual order,
- Annual contract and recall,
- Purchase order,

- Purchase contract,
- Subcontract,
- Design contract and
- Partnership agreement

Annual orders are done on yearly basis and mainly for the overhead costs. Annual orders have year estimate for the costs, and the invoices are directed straight to the annual order. These types of orders help in improving the effectiveness of the procurement process and saving operational costs. An example of this type of order is annual order for the small supply store for delivering small equipment or cleaning services and patents.

Annual contract is a frame agreement, which determines delivery term, price and confidential issues between the parties. The annual contract includes also price list, which is updated most often on yearly basis. In some cases annual contract can be valid for several years, too. The work or equipment shall be ordered by recall, which refers to the terms agreed in the annual contract. In other words, annual orders simplify the ordering process by the agreed terms and conditions. Many design companies use this type of contracts and the companies which have certain components in their own warehouses and the delivery time is relatively short.

Orders are made based on the proposals and it determines the terms and conditions related to the delivery and pricing. Purchase order may be lite, which is used commonly in overhead purchases. In some cases, especially in project deliveries, order may contain very detailed instructions and terms and conditions. The basic order contains at least invoicing instructions and the general terms and conditions for the purchasing or general terms such as KSE 1995 or NL09. If there are any changes to the order, for example new items or delivery time changes, orders are revised.

Purchase contract is a onetime contract for some delivery. Purchase contract is quite large and it covers, for instance, the scope of supply, terms of payment and delivery terms, technical specifications, delay penalties, force majeure-clause, warranty specifications and performance guarantees. Contract may also involve options, which can be added into the contract afterwards. All the changes shall be done via change order. Usually, purchase contract is an output of the negotiations.

Subcontracts involve erection work. Subcontracts may also be involving material and equipment which is erected. Case company has several subcontract templates which are used depending on the type of and value of subcontracted work. Changes for subcontracts are made via Subcontract Change Procedure (SCR). SCR describes what issues affect the change and what commercial actions are required. SCR is made by subcontractor or, for instance, site manager or site supervisor. SCR shall be approved according to work instructions. When SCR is approved buyer shall make change order to the purchasing system. (Foster Wheeler Energia Oy Intranet 2013)

Design contracts are made for large design scopes. The contract determines the scope of supply, terms of payment, required documents and sanctions related to the delivery schedule. The payment can be done based on the hour estimation or dimensions like agreed pipe meters. The price of the contract may also be fixed for the scope of supply. Payment terms can be negotiated based on the agreed milestones, approved progress reporting or lump-sum payment. All the changes during the execution phase are handled via change orders.

Partnership agreements are made between the parties, which have close long-term cooperation. FWEOY has created several partnership agreements with its strategic partners. Partnering is also a tool to develop together procedures and components to be more cost effective for the project, which brings added value for the both parties. Partnership agreement is shorter than purchase contract and it is determining the basic principles of pricing, capacity, quoting procedure and purchasing contract content.

5 PROCUREMENT QUALITY RESEARCH

Research questionnaire was sent to 96 selected suppliers, which included 18 technical design companies and 78 material and equipment suppliers. The suppliers were both domestic and international.

The problems related to the questionnaire were the program technical factors. The major problem was that program showed all the respondents. The research was confidential, and it was extremely important that suppliers were not able to see each other's answers. The problems were solved together with Foster Wheeler Energia Oy's IT-department and program supplier. The solution for the problem was to create own e-mail account for each answerer and call them to the questionnaire by individual link. This slowed the sending process of the questionnaire but enabled the confidentiality of the research.

The covering letter was sent by e-mail, which contained all the needed information to be able to log in to the questionnaire. Due to the delay of the questionnaire sending the answering time was relatively short, only one week. The respond time was continued by three days based on some suppliers' wishes. Two reminder messages were sent to the answerers.

5.1 Background

Foster Wheeler Energia Oy has studied its supplier relations several times in the last years. Researches have been done by separate research company, which has sent questions to the selected suppliers and analyzed the results. The latest Pre-Quality Study was carried out in 2010. The questionnaire of the Pre-Quality Study was very large, and it was divided into two groups: productive suppliers and design suppliers. The evaluation of the Pre-Quality Research was done based on these supplier groups.

The company had a need to evaluate its procurement process in 2013. The case company was also willing to develop an electronic questionnaire, which could be used as a model for different future researches done for Foster Wheeler Energia Oy procurement department. The target of FWEOY is to measure procurement quality on regular basis.

5.2 Research Methods

The research was a qualitative case research, which was done for the case company purposes. The aim of the questionnaire was to achieve a good understanding of the FWEQY's procurement process from the suppliers' point of view, and create an electronic questionnaire to be quality measurement tool, which could be used in future to measure procurement quality.

Research was carried out by theoretical and empirical research. The first part of the theoretical research of the thesis work was done based on the literature concerning procurement processes and the strategic level of the purchasing. The second part of the theory was concentrating on the case company's purchasing processes based on the case company's working instructions. The empirical part of the research was carried out by structured questionnaire, which was sent to main suppliers of the case company.

Supplier Selection

Supplier selection was done based on the purchasing volume during the years 2011 and 2012, and the current project purchasing needs. The purchase orders and purchase contract were transferred from the purchasing system to excel. Researcher selected the main design, material and equipment suppliers into their own groups and by the purchasing year. Suppliers, who were used only in non-project purchases, were left out from the selection. The lists were sorted to ascending order based on the euro value. Case company evaluated the list and added some suppliers, which were not used in previous years but were actively involved in current projects. Some of the suppliers were taken off from the selection in order to keep the number of the suppliers below 100.

Questionnaire

The questionnaire was created in Microsoft SharePoint 365 software, which is a web based document sharing program. The program enables to create different questionnaires internal and external parties as well as share documents and, for instance, use program as a social media inside the company (Microsoft 2013). The link to the questionnaire was sent by e-mail with user name and password. The target of the elec-

tronic questionnaire was to be as easy to use as possible. The questionnaire contained 21 questions and one additional comments section. Altogether questionnaire had 22 sections, which included 19 structured and three open questions.

Questions were concentrating on the main procurement processes and they were created together with the commissionaire. The target was to measure only the basic purchasing processes. It was aimed at keeping the number of questions in reasonable level in order to achieve a good answering rate and, on the other hand, responds which are analyzed by the suppliers. Open comments wanted to have widely.

Questionnaire was divided into six sections. First section was measuring how an important customer Foster Wheeler Energia Oy is for the suppliers. The section included two structured questions and one open question. The second section contained four structured questions concerning inquiry phase of the project. Third question group was concentrating on contract phase, and it had seven structured questions. Fourth section was "Contract management and cooperation" and it had five structured question. The last section included three open questions. First question was how FWEYOY's procurement process had developed during the past years and the second open question was asking what issues should be developed further. The last open section was for additional comments.

Questions and covering letter were done in English and in Finnish, and they were sent by e-mail. The same covering letter was also in the first page of the questionnaire. Target was to create a simple electronic questionnaire which won't take much time to answer.

Limitations

The major restrictive issue was very tight time schedule and the delay in SharePoint 365 user name. Sending the questionnaire was delayed by over a month due to the program. Sending the questionnaire took also more time than estimated because researcher had to make personalized e-mail with personal link to the questionnaire for each supplier. IT person supported the research by individual user names and passwords to the suppliers and helped in technical issues related to SharePoint.

Another limitation for time schedule was researcher's time. Researcher was working full time and the research was done mainly in her own time and on the side of main work tasks.

Research Ethics

Questionnaire was confidential and all the answers were generalized. Client company got the summary of the results in PowerPoint format. The notes, research results and other documents related to this thesis work are archived by the researcher for five years and they are available only for the researcher. Thesis has also taken into account the confidential information of the case company.

6 RESEARCH RESULTS

The answering rate for questionnaire was 50%. Approximately 46% of the equipment and material suppliers and around 44% of the design suppliers responded to the questionnaire.

First two questions in the questionnaire were analyzing Foster Wheeler Energia Oy's status from the suppliers' point of view. Most of the answerers classified Foster Wheeler Energia Oy to be their important customer. Over 60% of the respondents strongly agreed that FWE OY is important customer for them and 25% of the respondents agreed with the statement. Around 4% strongly disagreed with and 4% disagreed the statement.

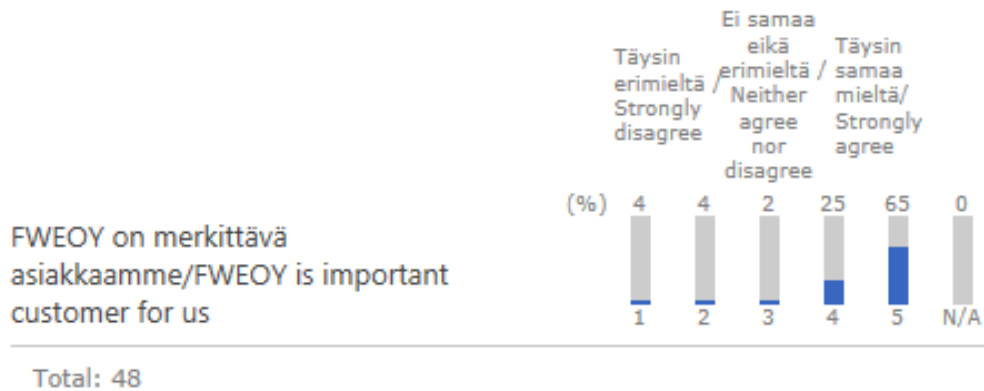


Figure 8. Suppliers opinions to the argument "FWE OY is important customer for us"

Around 30% of the respondents agreed with that FWE OY is their strategic partner and 33% of the respondents strongly agreed the statement. There were 8% who strongly disagreed that Foster Wheeler Energia Oy is their strategic partner and 6% of the respondents disagreed with the statement.

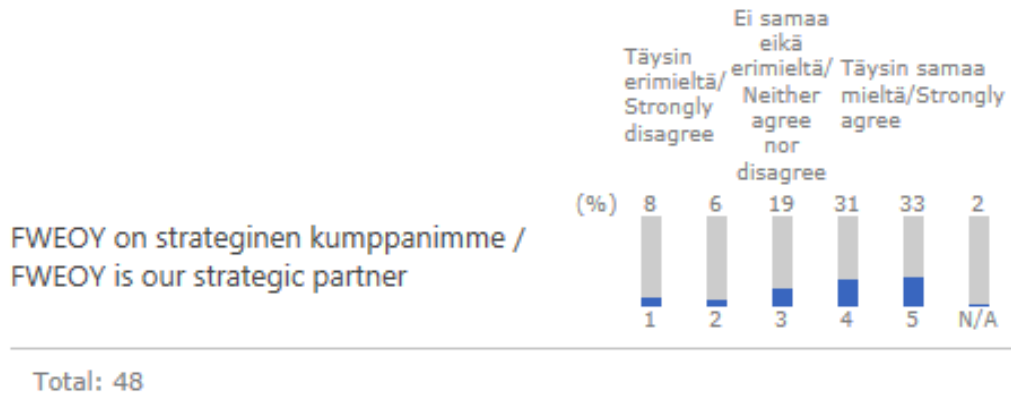


Figure 9. Suppliers opinions to the argument ” FWEOY is our strategic partner”

Third question was open question asking what kind of cooperation supplier is willing to have with Foster Wheeler Energia Oy. The open question got 33 responses. Many of the respondents would like to have wider scope than nowadays and they are willing to offer their other products for the projects. Suppliers want to have closer cooperation and continuity for the cooperation.

Many suppliers would like to have deeper cooperation level towards partnership and strategic partnering. Suppliers commented that they should have pre-information about the possible new projects in order to organize their own capacity more accurately. Some equipment suppliers would like to be involved more in equipment decisions and help to choose right components to the projects. Suppliers are also willing to offer their products more widely.

Fourth question started the inquiry section of the questionnaire. Over 50% of the respondents agreed and 25% strongly agreed that FWEOY gives enough time to prepare quotation. 15% of the respondents have neutral ”neither agree nor disagree” opinion of the quotation preparation time.

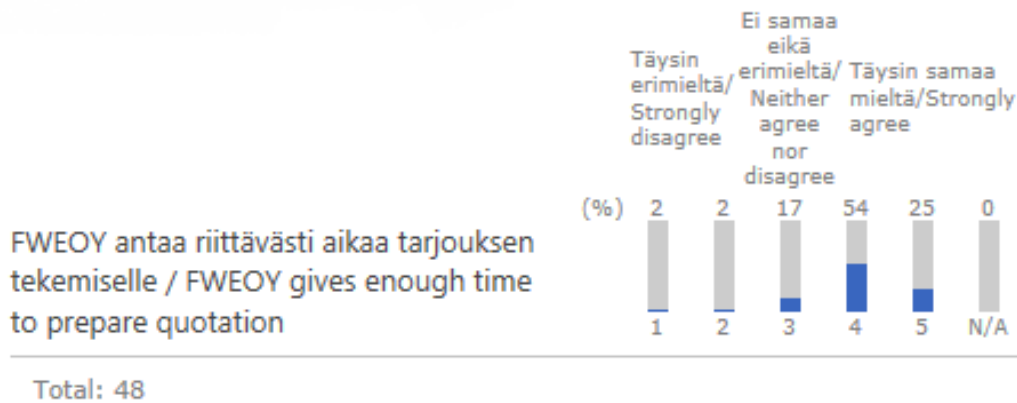


Figure 10. Suppliers opinions to the argument " FWEQY gives enough time to prepare quotation"

Fifth question was if the inquiry material contains enough initial material to prepare quotation. Around 6% of the respondents disagreed that FWEQY gives enough information to prepare accurate quotation. Almost 45% of the respondents agreed that the company gives enough time to prepare quotation and around 20% neither agreed nor disagreed with the statement.

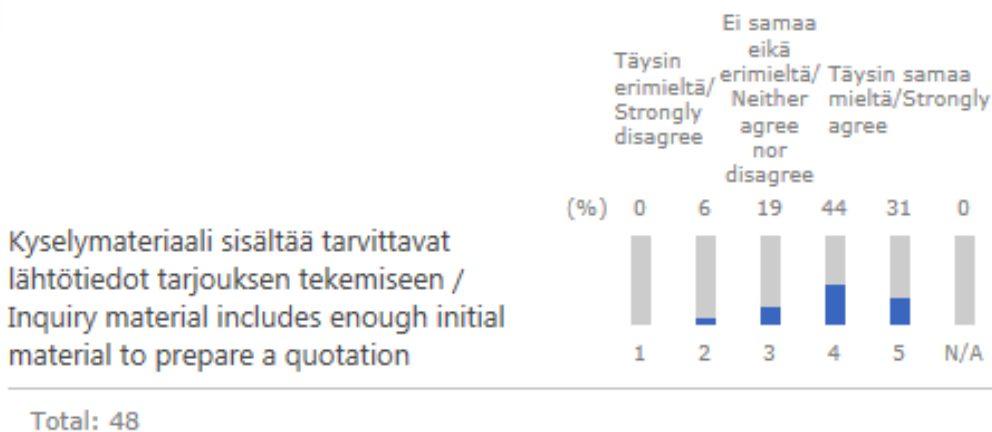


Figure 12. Suppliers opinions to the argument "Inquiry material includes enough initial material to prepare a quotation"

Over 20% strongly agreed and almost 60% agreed that the delivery requirements are realistic. 17% have neutral opinion of the statement and 2% of the respondents disagreed that the delivery requirement are realistic.

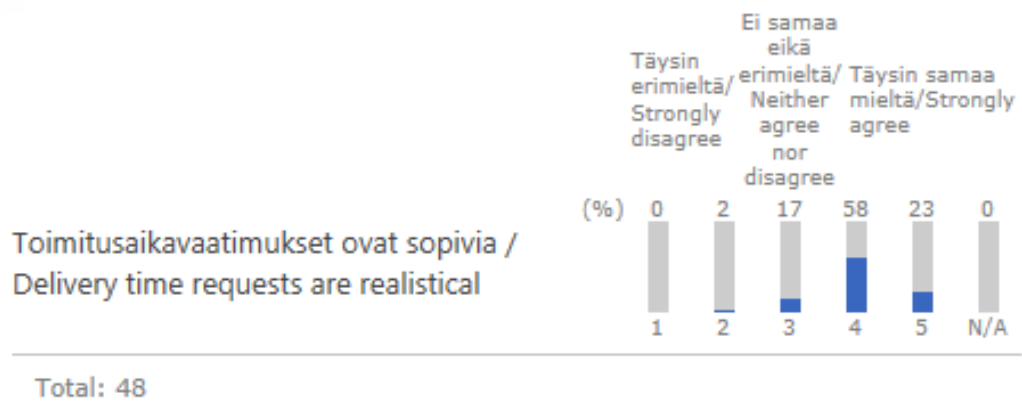


Figure 11. Suppliers opinions to the argument "Delivery time request are realistical"

The results of seventh questions show that over 50% agreed with the statement that FWEYOY gives enough information about the purchasing schedule, and over 20% of the respondents strongly agreed with the statement. However, 4% of the respondents disagreed that they get enough information about the purchasing schedule.

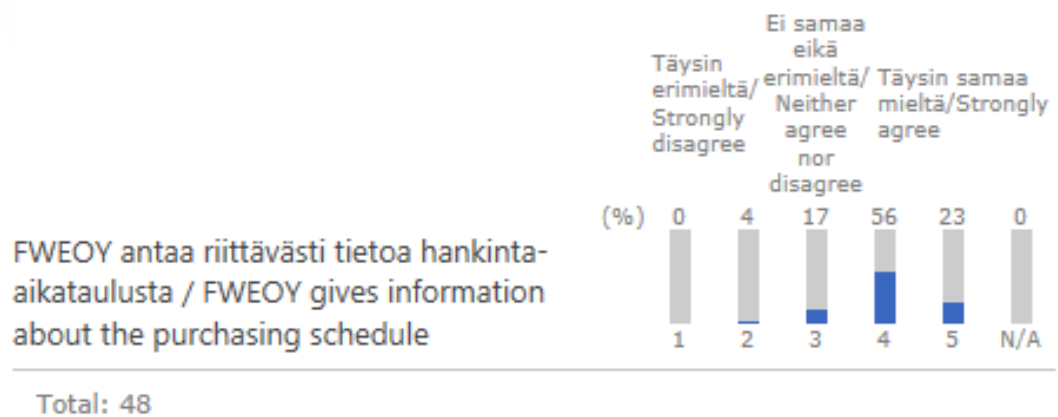


Figure 13. Suppliers opinions to the argument "FWEYOY gives information about the purchasing schedule"

Questions eight to fourteen handled contract phase. Most of the respondents think that FWEYOY's contract negotiations are well prepared. 27% of the respondents strongly agreed and 46% agreed with the statement. Only 2% of the respondents disagreed that the negotiations are well prepared and 4% responded that the question is not applicable for them

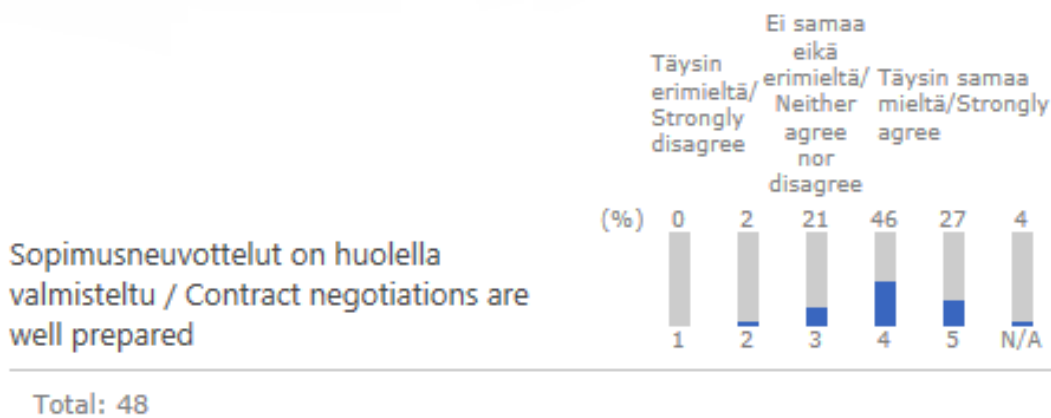


Figure 14. Suppliers opinions to the argument ” Contract negotiations are well prepared”

The ninth question was handling about the content of the contracts. 4% of the respondents strongly disagreed and 19% disagreed that FWEYOY’s purchasing contracts are easy to understand. Over 30% of the respondents agreed that it is easy to understand the purchasing contracts, and 12% of the respondents strongly disagreed.

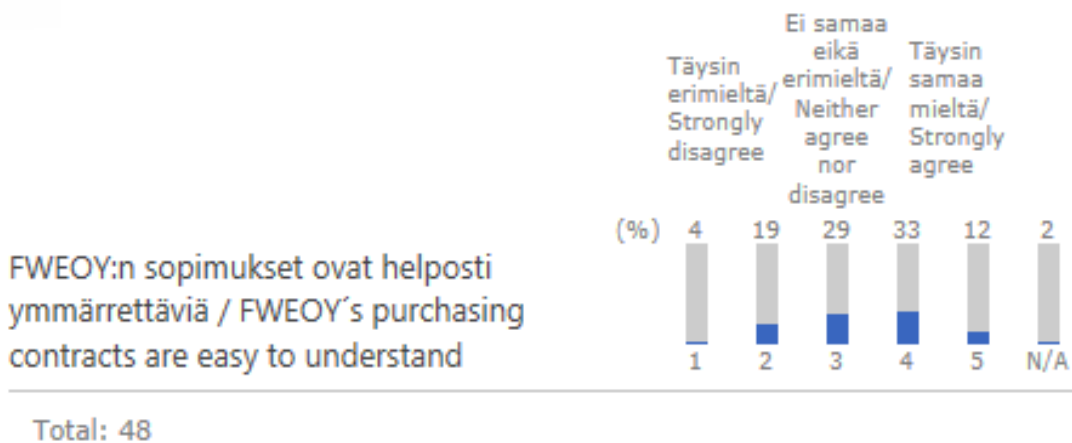


Figure 15. Suppliers opinions to the argument ” FWEYOY purchasing contracts are easy to understand”

Tenth question is asking if FWEYOY's purchasing contract attachments are relevant and clear. 17% of the respondents disagreed with the statement and 2% of the respondents strongly disagreed with the statement. Around 40% of respondents "agree" and 12% "strongly agree". Almost 30% gave neutral answer "neither agree nor disagree"

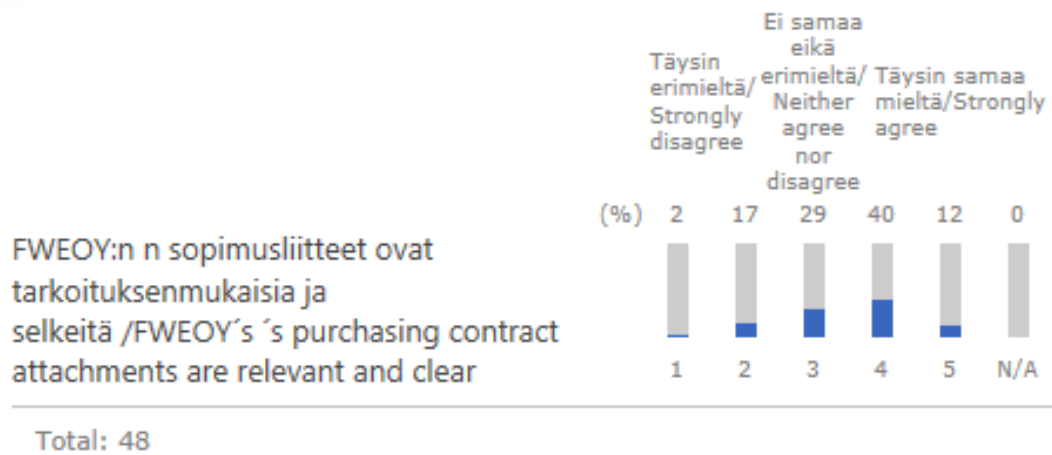


Figure 16. Suppliers opinions to the argument "FWEYOY purchasing contract attachments are relevant and clear"

Approximately 40% agreed with that orders are sent in time compared to delivery time and 31% strongly agreed the statement. However, there were 8% who disagreed that the orders are sent in time and 2% of the respondents strongly disagreed with the statement. Almost 20% of the respondents gave neutral opinion "neither agree nor disagree".

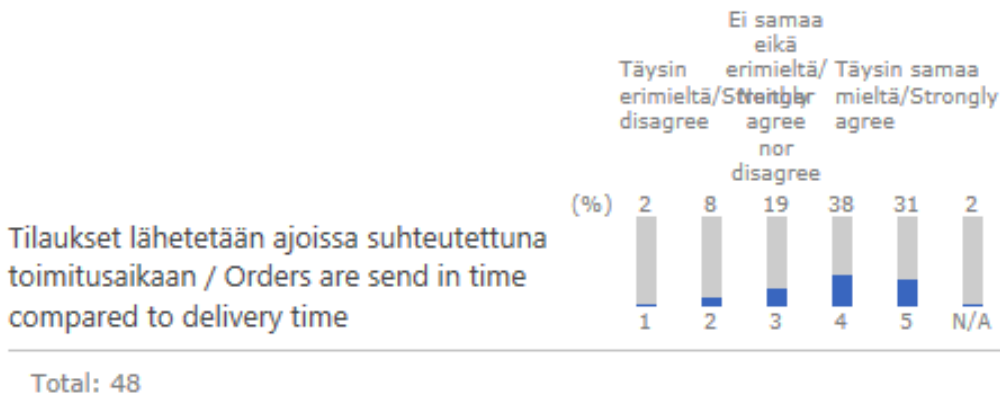


Figure 17. Suppliers opinions to the argument "Orders are send in time compared to delivery time"

Twelfth question concentrated on giving feedback. About 25% of the answerers disagreed that FWEYOY is giving constructive feedback about the quality and price after purchasing decision. Around 2% of the answerers strongly disagreed the statement and 25% neither agree nor disagree with the statement. 35% agree and 12% of the responds strongly agree that FWEYOY gives constructive feedback about the purchasing decisions.

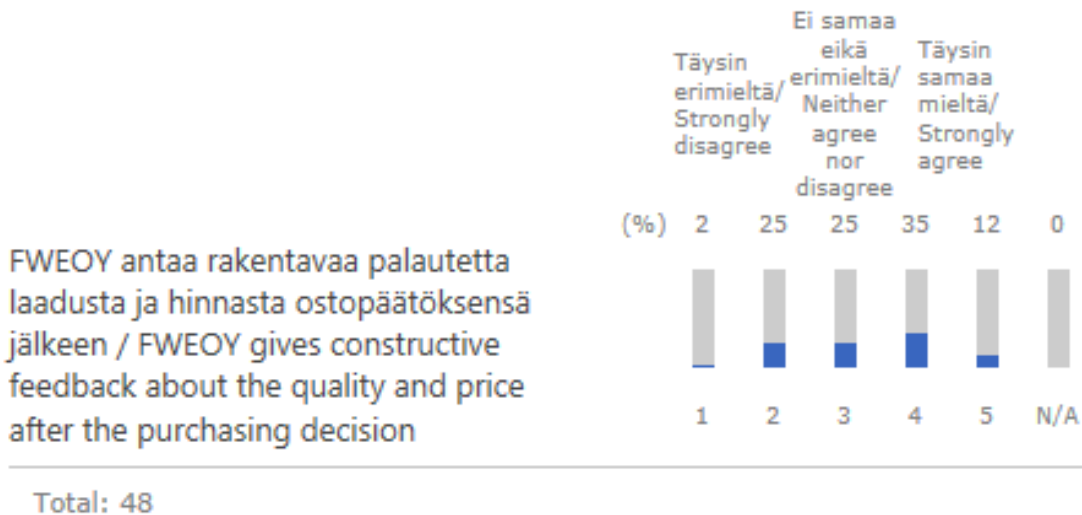


Figure 18. Suppliers opinions to the argument "FWEYOY gives constructive feedback about the quality and price after purchasing decision"

About 40% of the respondents agreed that FWEYOY's deliveries are well organized and 8% strongly agreed that the deliveries are well organized. The question was not applicable for 29% of the respondents.

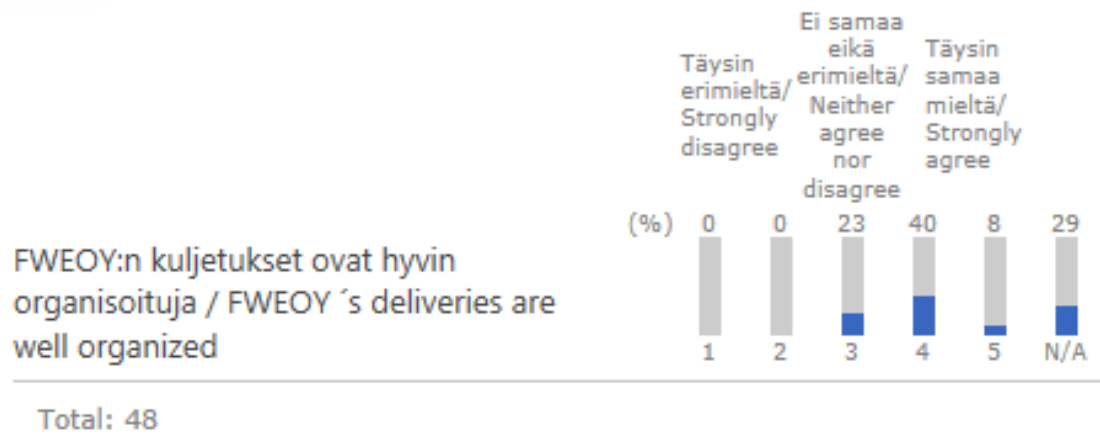


Figure 19. Suppliers opinions to the argument "FWEYOY's deliveries are well organized"

Questions number 14 measures how well the respondents know FWEYOY's General Terms and Conditions for Purchasing. About 2% strongly disagreed that General Terms and Conditions of the Purchasing are familiar for them and over 10% disagreed with the statement. 12% of the respondents neither agree nor disagree with the statement, and around 50% of the respondents agreed with the statement. "Strongly agree" respond gave altogether about 20%.

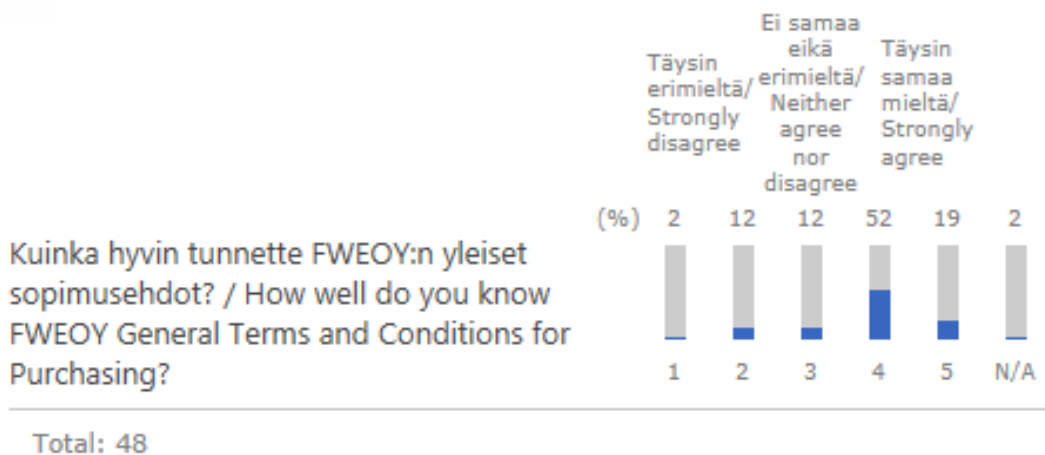


Figure 20. Suppliers opinions to the question "How well do you know FWEYOY General Terms and Conditions for Purchasing?"

Around 50% of the respondents strongly agreed that the communication with FWEYOY’s procurement persons works well. 35% of the respondents agreed with the statement and 10% gave neutral “neither agree nor disagree” answer.

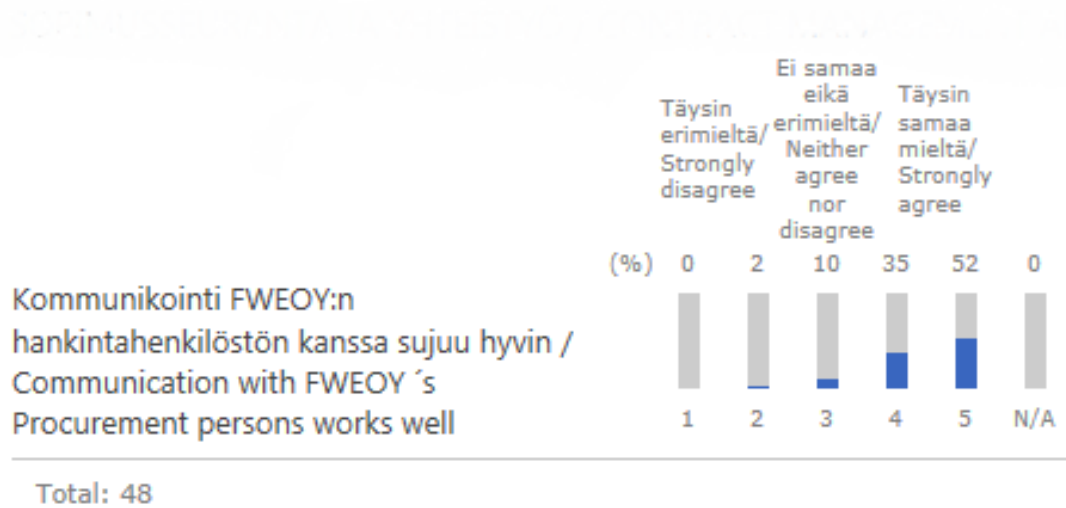


Figure 21. Suppliers opinions to the argument “Communication with FWEYOY’s Procurement persons works well”

Around 40% of the respondents agreed that the change management is well organized and almost 20% of the respondents strongly agreed with the statement. “Disagree” reply gave 8% of the respondents and for 12% of the respondents the question was not applicable.

17th question measured justification of the claims sent by FWEYOY. Half of the respondents agreed that the claims sent by FWEYOY are justified and almost 20% of the respondents strongly agreed with the statement. However, there were 2% who disagreed with the statement and approximately 20% who neither agree nor disagreed with the statement.

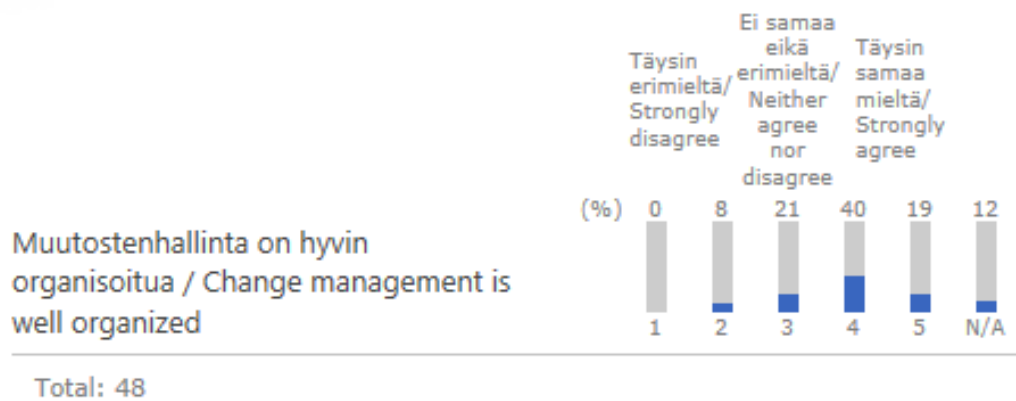


Figure 22. Suppliers opinions to the argument "Change management is well organized"

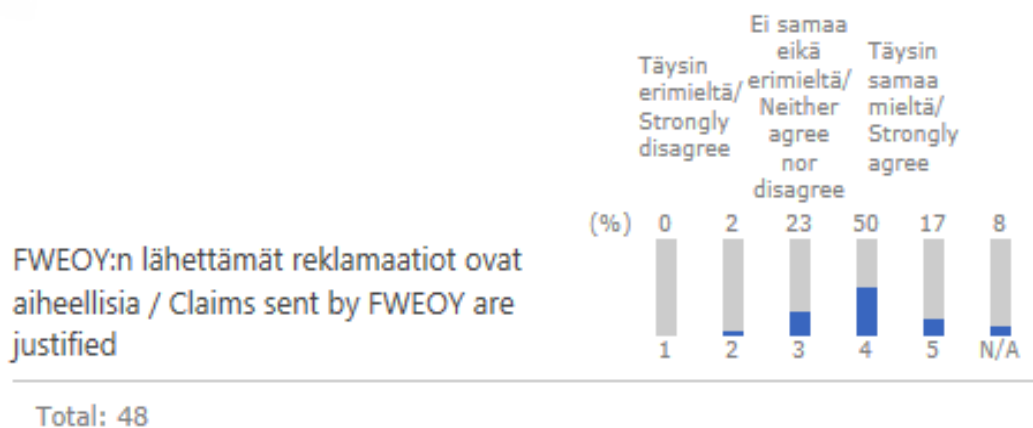


Figure 23. Suppliers opinions to the argument "Claims sent by FWEEOY are justified"

Over 60% of the respondents strongly agreed that the co-operation with FWEEOY has long-term goals and 27% of the respondents agreed with the statement. However, there were 2% of the respondents who strongly disagreed, and 2% who disagreed the statement. Around 6% gave neutral opinion of the statement.

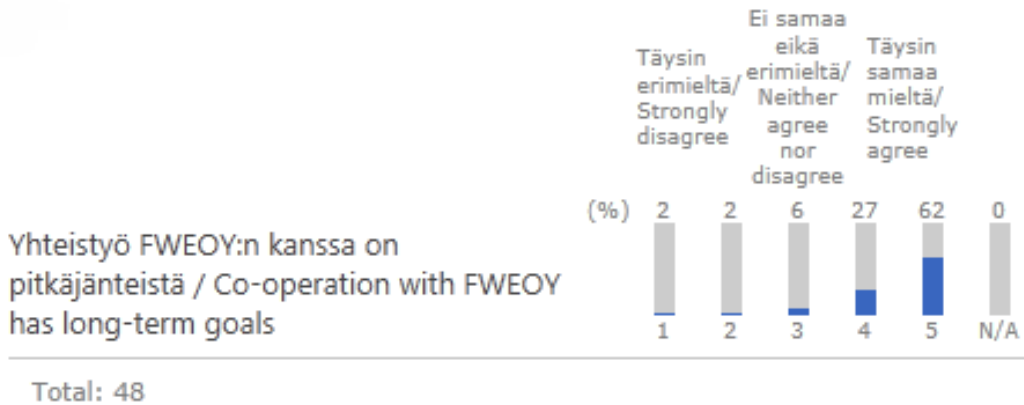


Figure 24. Suppliers opinions to the argument "Co-operation with FWEEOY has long-term goals"

The last statement of the structured questions was "I am satisfied with Foster Wheeler Energia Oy's Procurement". About 50% of the respondents agreed, and 38% strongly agreed with the statement. The rest of the respondents gave "neither agree nor disagree" opinion.

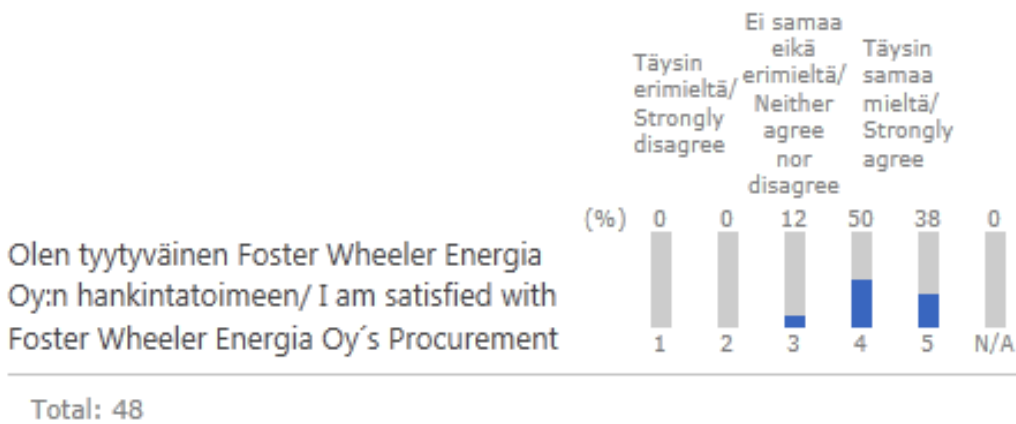


Figure 25. Suppliers opinions to the argument "I am satisfied with Foster Wheeler Energia Oy's Procurement"

20th question was an open question. The suppliers were forced to answer the question before they were able to transfer into the next question. Many of the answerers thought that the procurement works at the same level as previous years or there have been some positive improvements in procurement process. Suppliers

think that recalls are coming too late from suppliers point of view. Some suppliers thought that FWEYOY's procurement has stepped backwards due to the requirements and bureaucracy.

One supplier thinks that the bureaucracy has increased during the past years, which has also affected to the suppliers. Many of the respondents stress that the contracts are extremely complicated and in some cases too heavy compared to the purchased issue. Suppliers have difficulties to accept terms and conditions used in contracts, and they wish that buyers would have more flexibility to negotiate about the terms and conditions. Some supplier was wishing that order specifies its requirements more accurately.

Contract attachments are heavy to suppliers, as well as documentation requirements. There are also the same failures in the design documents, which are repeated in many projects. Recalls and revisions are sent too late to the suppliers. However, some suppliers think that the order timing has improved in recent years. Some suppliers are also wishing that the case company would have electronic order confirmation.

Inquiries got both positive and negative feedback. Some suppliers think that the inquiries have become more accurate and have clear format. Some suppliers think that inquiries should be asked also for other items which supplier is able to offer.

Suppliers need to have more deeper communication about the coming projects and feedback about the reasons why contract has been lost. Some suppliers think that FWEYOY procurement should communicate more via telephone with the suppliers. In some cases the respondents to the suppliers take too much time, which makes the proposal making process more difficult. Some supplier would like to go back in the time when buyers were concentrated on certain equipment, and the buyer had more specific technical knowledge. It was also suggested that FWEYOY could arrange regular communication meeting to discuss the situation about the sales project and execution project as well as other concerns.

Some suppliers would like to have more clarity to the purchasing strategy and they would like to be more involving cooperation planning together. Suppliers also emphasized open cooperation and long-term relationships. One supplier reminded about the networking project and asked why FWEYOY is competing all purchases even if they have created cooperation network.

In open comments section several suppliers stressed that the Material Control system is too difficult and the packing list creation takes too much time. Delivery documents and packing lists are in some cases too complicated to handle by suppliers. FWEQY's international professionalism is shown to the suppliers and the performance is very organized. Negotiations are well prepared and fair. Many think that the procurement process in FWEQY is in a good level and the development has been positive during the past years.

7 CONCLUSIONS

The results of the research show that the quality of the procurement process in FWEYOY has stayed mainly at the same level during the past two years. However, structured questions and open comments show that the procurement has some areas, which need to be developed further.

The main development issues are the acceleration of the communication, giving feedback and complicated contracts. The first two issues, communication and giving feedback, require mainly FWEYOY's internal training and the change of purchasing routines. It is obvious that the suppliers need clear feedback about their proposals and equipment or work quality to be able to develop their operations to meet FWEYOY's expectations. A good way to give straight feedback is after purchasing decision and separately during the vendor evaluation process done on yearly basis.

Contractual issues got many opinions in the questionnaire. Many think that the contracts are too large and complicated, and the terms and conditions are not acceptable. Heavy attachments are also difficult to suppliers. Procurement has updated its standard contract templates during the spring 2013. The target was to simplify the structure of the contracts. However, many contract requirements reflect the requirements, which FWEYOY have for its end customers. A perfect contract is impossible to make. Both parties should be keen to be flexible and be able to design the requirements to meet the essential requirements from project's point of view.

The main problem related to the attachments is that the information given in the negotiations and contract phase may not transfer the right person in the seller's organization. It is essential to stress in negotiations that the operating persons contact straight the named persons in the contract in order to be able to get detailed information.

One supplier was asking electronic order confirmation from FWEYOY. Company has many excel sheets and the processes require information input manually. It would be recommended to transfer towards electronic information sharing and utilize more electronic procurement possibilities. Current way to evaluate proposals is time-consuming, and sometimes it is difficult to match proposals into the bid evaluation blanket. In future, procurement could move on to the electronic bidding. e-Auctions

could also be valuable in purchases, which have clear scope of supply. This would release capacity to the strategic purchasing, supply management and sourcing.

Open comments show that many suppliers are willing to deeper the relationship towards partnering. They also wait to the new movement of the network project. It seems that many suppliers thought supply management project is useful for them, and they are willing to continue the development. However, FWEOY should have named resources to continue the process. Active strategic level supplier networking requires much time to develop the relationships and measure the performance. It is also vital that procurement persons at the case company are aware of the status of networking and suppliers performance changes.

An internal development issue is to connect purchasing strategy to the company strategy and get employees to be familiar with purchasing strategy. It is important that purchasing strategy, together with other operational unit strategies, is available for employees in company's intranet.

7.1 Evaluation of the Research

The questionnaire gave a good understanding of the present situation of the FWEOY's procurement. Procurement has its own expectations on how suppliers are seen the process and the questionnaire gave objective and measured feedback about the process. Questionnaire is also a good possibility to suppliers to give valuable feedback to the FWEOY procurement. It is important to remember that the results and conclusions made based on the results can not be generalized. The results describe the situation in case companies and other company may have different procurement quality problems.

Answers to the research questions were achieved, and the case company got issues to be discussed internally. The electronic questionnaire has now been created and it is possible to utilize the same user codes in future. This thesis was kind of pilot testing of the program and company's own procurement quality research. Many improvements can be done based on this research. The sending process can be simplified by excel macros next time, which helps and accelerates the sending process. The questions can be modified and changed to fit the current procurement focuses.

In future, it is recommended to measure quality of expediting and shipping process in its own questionnaire. It would also be valuable to measure procurement quality in certain projects or by purchase categories to achieve more accurate knowledge of the purchasing. However, future researches carried out by case company require named capacity to carry out the supplier selection, questionnaire creation and sending as well as result evaluation.

7.2 Author's Own Reflectations on the Thesis

Procurement Quality Research was continuation to my first BBA thesis work carried out in 2007. Previous thesis was evaluating supplier relationships in FWEQY procurement department. This time the theoretical part was concentrating on strategic level of the purchasing and the questions of quality and ethics. The target was to go deeper in the purchasing management.

Subjective knowledge of the procurement has increased during the past six years, which I have worked in purchasing. For that reason the deeper understanding of the procurement and especially the development of procurement process and supplier networking have become interesting areas. The research also shows that those areas need more attention nowadays. Personally I now had more subjective assumptions about the purchasing process, and sometimes it was difficult to find an objective view of the processes.

It was a great pleasure to realize that many suppliers were keen to answer to the questionnaire and ask more answering time due to work trips. This proves that the main suppliers value purchasing performance measurement and are willing to give their opinions to develop the processes. This also strengthens the idea that procurement quality research shall be done on a regular basis. In future, I suggest that the summary of the results shall be sent to the respondents.

Case company's procurement department gave valuable support and opinions to the thesis. It was also important to get support for IT department related to SharePoint program.

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FWEQY on merkittävä asiakkaamme
FWEQY is important customer for us

FWEQY on strateginen kumppanimme
FWEQY is our strategic partner

Millaista yhteistyötä haluaisitte FWEQY:n kanssa?
What kind of cooperation you would like to have with FWEQY?

KYSELYVAIHE INQUIRY PHASE

FWEQY antaa riittävästi aikaa tarjouksen tekemiselle
FWEQY gives enough time to prepare quotation

Kyselymateriaali sisältää tarvittavat lähtötiedot tarjouksen tekemiseen
Inquiry material includes enough initial material to prepare a quotation

Toimitusaikavaatimukset ovat sopivia
Delivery time requests are realistic

FWEQY antaa riittävästi tietoa hankinta-aikataulusta
FWEQY gives information about the purchasing schedule

SOPIMUSVAIHE CONTRACT PHASE

Sopimusneuvottelut on huolella valmisteltu
Contract negotiations are well prepared

FWEQY:n sopimukset ovat helposti ymmärrettäviä
FWEQY's purchasing contracts are easy to understand

FWEEOY:n n sopimusliitteet ovat tarkoituksenmukaisia ja selkeitä
FWEEOY's purchasing contract attachments are relevant and clear

Tilaukset lähetetään ajoissa suhteutettuna toimitusaikaan
Orders are send in time compared to delivery time

FWEEOY antaa rakentavaa palautetta laadusta ja hinnasta ostopäätöksensä jälkeen
FWEEOY gives constructive feedback about the quality and price after the purchasing decision

FWEEOY:n kuljetukset ovat hyvin organisoituja
FWEEOY's deliveries are well organized

Kuinka hyvin tunnette FWEEOY:n yleiset sopimusehdot?
How well do you know FWEEOY General Terms and Conditions for Purchasing?

SOPIMUSSEURANTA JA YHTEISTYÖ CONTRACT MANAGEMENT AND COOPERATION

Kommunikointi FWEEOY:n hankintahenkilöstön kanssa sujuu hyvin
Communication with FWEEOY's Procurement persons works well

Muutostenhallinta on hyvin organisoitua
Change management is well organized

FWEEOY:n lähettämät reklamaatiot ovat aiheellisia
Claims sent by FWEEOY are justified

Yhteistyö FWEEOY:n kanssa on pitkäjänteistä
Co-operation with FWEEOY has long-term goals

Olen tyytyväinen Foster Wheeler Energia Oy:n hankintatoimeen
I am satisfied with Foster Wheeler Energia Oy's Procurement

Kuinka kuvailisitte FWEOPY:n hankintatoimen kehittyneen viimeisen kahden vuoden aikana?

How would you describe the development of the FWEOPY 's procurement process during the past two years?

Mitkä asiat vaativat kehittämistoimenpiteitä?

What issues need to be developed?

Lisäkommentit

Additional comments