

# Improving Purchasing process by using Strategic Sourcing at Saudi Electricity Company

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**Abstract:** Saudi Electricity Company one of the largest companies in medial east, with continuously growing of demand in each year, the company has had to expand project to serve millions of citizens, which led to an increase in financial burden of the company and request financial support from the government. Currently with the vision of the Kingdom of Saudi Arabia 2030 and with the reduction of government support for the company, it is become very necessary to changing the traditional way of buying policy to increase spending efficiency and rationalize consumption. In this paper, strategic sourcing approach is used for improving purchasing process. Strategic sourcing approach involves seven steps, there are identify saving opportunity, develop category profile, develop sourcing strategy, identify selection criteria and screen supplier's, management request for Proposal, develop and negotiate agreement and implement agreement. Strategic sourcing concerned with developing purchasing process in procurements department by reduction TCO for material instead of traditional procurements which looking to lowest price. Our aims are identifying to strategic category at SEC, identify the saving opportunity, reduction cost ownership for material, improving purchasing process and developing strategic relationship with key suppliers. After applying seven steps, we have determined the eleven strategic categories for Saudi Electricity Company. The study succeeded in achieving the first goal. The cost of ownership of the fuel additive for steam turbine was reduced by 48 % thus achieving a saving of SR 6 million and the consumed quantity decreased by 65% thus achieving a saving of (638,280) Liter. Also the total cost of ownership of the fuel additive for Gas turbine was reduced by 17 % thus achieving a saving of SR 10,800 million and the consumed quantity decreased by 67% thus achieving a saving of (3,172,379) Liter.

**Keywords:** Purchasing process, Strategic Sourcing, TCO, Saudi Electricity Company

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## I. INTRODUCTION

Saudi Electricity Company is one of the biggest companies in Kingdom and the Middle East. The establishment was in April 2000 as a Saudi joint stock company and the capital of the company was forty-one billion six hundred and sixty-five million nine hundred and thirty-eight thousand one hundred and fifty Saudi Riyals. The number of shares was divided into four billion one hundred and sixty-six million five hundred and ninety-three thousand, eight hundred and fifteen shares.

The government has direct ownership of 74.3% with also has indirect ownership 6.9% owned through Saudi Aramco. The remaining 18% are owned by the general public, whether individuals or investment institutions. SEC is one of Saudi Arabia's largest employers with a current staff of 37,769 of whom 89% are Saudi Nationals.

In 2000, the company completes merges all the Saudi consolidated electricity companies in the Central, Eastern, Western and Southern regions, and the ten companies operating in the north of the Kingdom. All electricity Operation managed by the General Electricity Corporation in one Saudi Company, under name the Saudi Electricity Company.

At the beginning of 2002, the Board of directors approved the new interim organizational structure, which was designed based on specialized activities including strategic business units (generation, transmission and distribution), joint activities and supporting services.

In the start of 2003, the new organizational structure was activated, and the second stage had been applied. In that stage, the sectors and departments were defined directly for each business line as well as the job descriptions were prepared and competition for all the organizational sectors.

In 2012, the National Grid Company was established, the company owned to Saudi Electricity Company. Its tasks and responsibilities include electricity transmission in the Kingdom of Saudi Arabia, the operation, control, and maintenance of the electrical grid.

Currently, there is intensive work to complete the restructuring project in line with the directions of board of directors to bring strategic partners of world-class has experience in the field of electricity power production and distribution.

The company has 48 power plants around the kingdom; divide into steam, gas, combined and diesel power plants with the production capacity 69.154 .MW.

Recently, SEC entered the renewable energy field through the implementation of the farsan project with a production capacity of up to 50KW. The project is successful and working with high efficiently, which encouraged the company to increase investment in renewable energy and make use of the resources available in Saudi Arabia. SEC has new initiatives to build new plants using wind and solar power to produce 300Mw. The plant will save about 25.5 million barrels of fuel in 25 years. In the past few years, the electricity production capacity has evolved, as illustrated in the chart below.

#### *Problem Statement*

Purchasing department is critical department at Saudi Electricity Company, because it's responsible to secure materials for the clients inside and outside the company according the 'five Rights of Purchasing', right quality, right quantity, right place, right time and right price.

Purchasing department in Saudi Electricity Company using decentralized procurement that means the purchasing department in each operational area has the authority to purchase items necessary as per their requirements. Operation areas were geographically distributed, there are four operational areas Central, western, Eastern and southern.

In 2017, the total amount of purchase orders was (3,788,801,969.13) S.R while the total amount of inventory was (5,510,085,719.48) S.R representing 13% of the company's capital and the inventory turnover ratio was 0.9 %.

By studying and analyzing that figures, we can conclude that large quantities of surplus materials are purchased, which have led to an increase in inventory value and caused a stagnant inventory, as shown by the very low stock turnover index. By benchmark with world class to measure turnover index considered very low, for example the turnover index in Korean electric company 14 times while in SEC less than one.

Currently with the vision of the Kingdom of Saudi Arabia 2030 and with the reduction of government support for the company, it is become very necessary to changing the traditional way of buying policy to increase spending efficiency and rationalize consumption.

In current situation the material price is changing from operational area to another, even though it is the same material and from the same supplier. Sometimes, the price change within the same operational area according to change the buyer.

There are many reasons lead to fluctuation in price for the same material. First reason back to the buyer whether he is qualified or not? Is he familiar with materials, knows previous prices and who supplied the material before?

The second reason the timing of tender, for example if there are urgent case the delivery period will be given priority regardless of price, also Prices of raw materials affect the final price of the product.

The third reason is the quantity, higher quantity gives to great opportunity to getting competitive prices, while the low quantity gives a chance for suppliers to increase price. The fourth reason is related to suppliers, are there enough suppliers to create competition? Are there qualified suppliers for material?

Finally, the type of supplier is a Manufacture, Agent or Trader?

For all these reasons there is high priority to change the current procurement methodology (traditional method) and replace it with strategic sourcing.

There are many ways to procurement saving but the strategic sourcing is the best practice in this field. In 2011, the Aberdeen Group, a leading business intelligence research company, made survey more than 150 procurements and sourcing executives, from nine countries and many diverse industries and found strategic sourcing is the number one focus of procurement worldwide.

Strategic sourcing technique was applied in the Southern California Edison (SCE) electric company and saved more than \$150 million per year.

#### *Research Objectives*

- Reduction cost ownership for material
- Improving the purchasing process
- Developing strategic relationship with key suppliers
- Applying the best practices in procurement field & sharing the knowledge inside the organization.

#### *Importance of the Research*

This research using strategic sourcing technique to developing purchasing process in procurements department by reduction cost ownership for material instead of traditional procurements which looking to lowest price. This research is consistent with the strategy of the company, which aims to rely on own resources in operating and financing future projects without need to government support. Therefore, is aligned with the government's vision 2030, which aims to reduce government support and push the government sector and semi government sectors towards self-reliance.

This research is concerned with raising the efficiency of spending and reducing financial waste, which leads to improving the financial position of the company.

According to (Russell and Thukkral, 2012), companies often spend sixty per cent of their income to purchase the goods and services. Reduction five per cent in the price of goods and services procured translate into thirty-seven per cent growths in company profitability.

#### *What is Strategic Sourcing?*

There is common mistake, many of people using terms procurement, purchasing and strategic sourcing as a one thing, while there is big difference between them. Procurement is part from supply chain which focuses on purchasing goods or services necessary for the final product. "The procurement process can be subdivided in two major sub-processes: a strategic and an operational one. The first sub-process is sourcing, it includes spend analysis, strategic sourcing and contract management. Strategic sourcing is focused on choosing the right sourcing strategies, suppliers' selection and the evaluation of suppliers' performance relative to the company's goals. The second sub process is purchasing, consisting of all activities from purchasing to payment" [Rafati & Poels, 2016].

Strategic sourcing is an organizational purchasing process which aim to developing, review and re-evaluates the procurements activities of a company. The difference between strategic sourcing and traditional purchasing is that, traditional purchasing is concerned with day-to-day activities such as issue purchase

orders or follow up delivery of materials while strategic sourcing concerned with strategic planning, agreements negotiation and increase outsourcing.

Traditional Purchasing – Involved requisition, soliciting bids, purchase order, shipping advice, invoice and payment, a process that was transactional in nature, or clerical in function. Getting the right quantity and quality of goods to the right place at the right time at a decent cost (Reference for Business, 2014).

Finding uniform definition for strategic sourcing is difficult, if we ask ten people about the definition of strategic sourcing, we will get ten different definitions.

Banfield (1999), define strategic sourcing as "It is a management process used to systematically assess purchasing requirements across a company and identify opportunities, both internal and external, for total cost reductions".

As well (Engel, 2004) states that "Strategic Sourcing is an organized and collaborative approach to leveraging targeted spend across locations with select suppliers that are best suited to create knowledge and value in the customer-supply interface".

"The collaborative and structured process of critically analyzing an organization's spending and using this information to make business decisions about acquiring commodities and services more effectively and efficiently" [Johnson,2005].

Strategic sourcing defined "as an institutional sourcing and supplier management process that continuously improves and re-evaluates the supply chain activities of the company. It is an iterative process that cuts cost and reduces risk, while building better relationships with fewer more critical suppliers" (GE Capital, 2012).

Strategic sourcing is a method of managing procurement processes for an organization in which the procedures, methods, and sources are constantly re-evaluated to optimize value to the organization. Strategic sourcing, which is considered a key aspect of supply chain management, involves elements such as examination of purchasing budgets [Singhal 2015].

"A method of managing procurement processes for an organization in which the procedures, methods, and sources are constantly re-evaluated to optimize value to the organization. Strategic sourcing, which is considered a key aspect of supply chain management, involves elements such as examination of purchasing budgets, the landscape of the supply market, negotiation with suppliers, and periodic assessments of supply transactions" [Business dictionary, 2016].

Total Cost of Ownership (TCO) is tool aim to help managers and companies to determine the direct cost and indirect cost to owner any product and considering all possible costs associated with sourcing a category from supplier and not just purchase price.

TCO defines "an estimate of the total costs of goods, services or construction over the whole of their life. It is a combination of the purchase price plus all other costs you will incur (direct or indirect) less any income you will receive" [Government Procurement Branch, 2013].

### *Importance of Strategic Sourcing*

Strategic sources are an essential element of change within the supply chain of an organization that leads to better financial gains. There are many reasons makes strategic sourcing is one of the best procurement practices. Its road map for future improvements because gives deeper details about the organization spend the classification of material whether strategic or non-strategic and define the main suppliers. The data collected helps us to explore and utilize opportunities and also help us to discover the problems and correct it. Also its strong relationships within the supply chain, Strategic sourcing aim to reducing cost, but necessary building a good relationship with key suppliers according Win-Win situation, this situation gives the buyer advantages to sharing the information with suppliers to identify opportunities that will significantly increase savings over time. Therefore, strategic sourcing a good reason for change, the

discovered data in strategic sourcing can be the starting for necessary and significant changes. Sometime the company must be change its strategy completely rather than continuous improvement. Depending on knowing the points which will lead to reduce the costs and which will be more effective in the long term. for example, using new technology or using appropriate technique like "just in time" which aim to stock the material in supplier warehouse instead of company warehouse and request material when needed.

Strategic sourcing is useful tools in risk management, as we know strategic sourcing required working closely with supplier which that allows exploring problem and quick treatment it. For example if supplier has problem in cash flow the main customer can be improve payment terms which allowance to customer with continues business. In case the financial problem huge the company must to look into alternative supplier, so that it's very important tools to avoiding risk. Finally, it's important for suppliers, in addition to buyers. for buyers the negotiating to getting lower unit price especially during purchasing high volume quantities lead to reduce the cost and that giving competitive advantage for company when goods are sold. For suppliers, strategic sourcing giving ability to supplier to sell their production and manage cash flow with outstanding performance. It's amazing approach for managing cost.

## II. LITERATURE REVIEW

"The term strategic sourcing was popularized through work with a variety of blue-chip companies by a number of consulting firms in the late 1980s and early to mid-1990s. This methodology has become the norm for procurement department in large, sophisticated companies such as fortune 500 companies. Strategic Sourcing is the process of developing channels of supply at the lowest total cost, not just the lowest purchase price. It expands upon traditional purchasing activities to embrace all activities within the procurement cycle, from specification to receipt and payment of goods and services" [Kerruish, 2016].

According to [Pandit and Marmanis, 2008] "spend analysis has its root of strategic sourcing" the started point was in 1980, by automotive companies such as Ford & GM when started to review and reduce their supply. Followed by several companies influenced by the success of Japanese companies in the field of automotive, but these attempts were on the tactical side did not upgrade to the strategic side.

In 1990, the focus was on indirect spend commodities. The idea was classified suppliers upon on aggregate spend, then select the key suppliers according some of criteria and eliminate the others. The relationship with key suppliers must be developed to become a strategic relationship [Pandit and Marmanis, 2008].

Nishiguch (1994) defined the steps in a strategic sourcing process as:

1. Evaluate the current spending of company (what is size of bought, from where, at what is prices?).
2. Identify and evaluate the supply market (who offers what?).
3. Analysis of total cost (how much the goods or services cost?)
4. Determined of suitable suppliers.
5. Improvement of a sourcing strategy (where to purchase, considering demand and supply situations, to minimizing cost and risk).
6. Negotiation with suppliers (Regarding quality of products, service levels, prices, delivery period, Payment Terms, etc.).
7. Execution of new supply strategy.
8. Monitoring and assessment the results (Continuous improvement).

In 2000, after the great success for indirect spend category the concept expansion to include direct material, operational, maintenance and repair [Kirit and Marmanis, 2008].

In April 2001, The Gillette company started a Strategic Sourcing program aim to create valuable savings to company, fund research and development, and positively influence Gillette 's bottom line. The initiative includes both indirect and direct materials spend. The program used seven-step strategic sourcing methodology to selecting source and assessment suppliers depend on cost, quality and services provided.

Gillette realized that one of the most important principles of strategic resources is create competitive and diversity of supplier base. As a result, the company started a Supplier Diversity program in 2002 to motivate and development the relationships with eligible and qualified Minority and Women-owned Business Enterprises. By following Gillette's strategic source methodology, combining supplier diversity at each of the first three stages enabled the sourcing team to achieve diversity objectives in suppliers and contributed to a more efficient resource strategy.

The strategic sourcing initiative was successful, for sure, The Strategic Sourcing program of Gillette Company's has not only made major cost savings but has assisted and advanced Gillette's Supplier Diversity Initiative. Purchasing professionals can achieve diversity aims by combining these aims into the structure, methodology and strategies of strategic sourcing. The overall understanding of a category obtained through strategic sourcing facilitates teams considering, assessing and choosing MWBEs are competitive and can satisfy the internal customers. Strategic sources encourage procurement professionals to "cast the net wide" to create a new opportunity which opens the door for MWBE companies. In assessing each of the several sourcing strategies, procurement professionals can develop effectiveness by taking into c consideration MWBE opportunities and objectives. Finally, as Gillette has understood, there are MWBEs who can compete and supply goods and services on a global basis [Dolan and Fedele, 2004].

Another success story occurred for GlaxoSmithKline Company. The company is one of the leading companies in the world at pharmaceutical and healthcare. As the result for the increase of the competition in the industry the company started the strategic sourcing program in 2001 under name "sourcing group management" to increase the efficiency and effectiveness in the company. The global spend was £ 8.5 billion, after two years the program achieving unexpected saving. The saving was £ 800 million (10 percent of turnover). There were a several key factors contributed to the success of the program [Obrien, 2012].

"Strategic Sourcing from Low Cost Countries" was title for master thesis done by Eriksson in 2004; the aim of the thesis is built on the hypothesis: "many major Swedish manufacturing companies have the ambition to increase the share of purchased items from low cost countries". Four questions were defined to trying to reach for the optimum recommendations which help companies on how to reach these objectives, there are

1. What kind of resources, skills, capabilities and knowledge is required in the procurement departments?
2. What are the primary challenges, critical issues and success factors?
3. What are the procedures and how long it takes to complete sourcing process?
4. Which areas and what type of product categories are manufactured by manufacturers from low-cost countries, and why?

The researchers used survey as method to collect data. Survey was designed to examine the research questions a and directed towards purchasing managers working at the manufacturing industry in Sweden, the response was limited but gave indication of how companies within the industries involved pursue sourcing from low cost countries. The study concluded to identify success factors and key activities, which can be applied to develop current best practices approaches when sourcing from Low Cost Countries, additionally the study concluded that the use of sourcing from low-cost countries as a strategy plays a major and important role in reducing costs for manufacturing companies operating in Sweden.

The findings of the study are divided into two subgroups - general factors of success and critical activities in a low-cost country Procurement procedure. The general factors involve:

- Specialization, Global sourcing professionals must have a comprehensive understanding of the economic and commercial environment on low cost country sourcing.
- Experience, success requires experience, the time is critical factors on investment and developing the employees is very important issue for growth and improve any company at the same time is very expensive process and take a lot of time. Using people with experience in saves a lot of effort and time especially in saves a lot of effort and time especially in case sourcing from Low Cost Countries.

- Products, products more suitable for low-cost country sources because the cost of salaries is lower in these areas because of intensive labor. As a result, the lower cost of salary would affect the lower purchase price, which would compensate for the additional costs of product acquisition
- Supplier base, purpose to have as minimum number of suppliers as possible, preferably one or two. Fewer suppliers allowed by easy facilitate integration, collaboration, communication, and development of trust.

The Critical activities for successful low-cost country sourcing include Assess opportunities, identify potential suppliers, evaluate supplier, Negotiate & select final Suppliers, Design Contract & Finalize Agreements, Start-up Production and The Purchasing Process & Managing the Supplier Relationship.

In 2012, strategic sourcing process slimmed down into six processes [Payne, et al., 2012].

Folks (2013), publish research entitled "Strategic sourcing in the Army" The aim of research was examine how the USA Army is using strategic sourcing as an efficient process for obtaining the best total value for securing goods and services. The research examined whether strategic sourcing is meeting the needs of the organization and reduces redundancy in the purchase process. The result of research proved that the Strategic sourcing supports purchase process that meets government needs.

The research also showed that the army has adopted the idea of strategic sourcing, but the implementation was not ideal. The reason for the weakness of implementation may be lack of resources, lack of personal skill, no knowledge to prepare an opportunity assessment, difficult access to services due to fewer suppliers and lack of top management involvement [Folks, 2013].

A paper published in 2015 under name "Application of Strategic Sourcing Practice in Public and Private Sectors: Literature Review", the objective of this paper was to study the execution of strategic sourcing at the public sector. The paper study and assessment of strategic sourcing from the point of view of the private and public sectors, highlights on the similarities and differences about the methodology of each sector to strategic sourcing, also focusing on which strategic sourcing practices, characteristics, and components that have proved successful and which can be transferable from the private sector to the public sector; highlights on bureaucracies, organizational theories, and some major public-private differences in these structures. The study pointed out that these three main factors play an important role in determining whether public sector administrations Successful, or whether they can succeed, to adopt private sector practices [Yagoob and Ting, 2015].

Recently, many leading companies in the world have realized the importance of implementing strategic sourcing because of its importance in reducing costs, "Walmart" using strategic sourcing in retail of US based Giant of retail. "The result is lower costs for inventory storage, reduced transportation costs and products spend less time in transit" [Singhal 2015].

Van den Bossche (2017), publish a scientific research entitled "Strategic Sourcing Decision Making ". The research discussed the Paradigm shift from a tactical way of thinking (cost saving) to strategic way of thinking (value driven). The research objective developed two models, one for cost saving and one for value driven strategic sourcing decision making. Those models include different decision categories, questions, metrics and methods. The researcher describes how you can move from cost saving to value driven strategic sourcing decision. The research also applies a case study in Nokia to demonstrate the developed models and evaluate their correctness. The research result showed the difference between cost saving and value driven strategic sourcing decision making.

Value driven strategic sourcing decision making is a new concept and supports the company in achieving its long-term goal. "These models simplify understanding of the complex concept of strategic sourcing decision making by only using necessary components (decision categories, questions, metrics and methods). In addition, we performed a gap analysis to describe how to go from cost saving to value driven strategic sourcing decision making. Furthermore, we used a case study to demonstrate the models and evaluate their correctness in a real-world environment, namely in the strategic sourcing department in Nokia. The senior

managers found it easy to select the metrics they used for a certain decision, supported by the models. The company's focus in strategic sourcing decision making depends on the weights on cost and value determined by its customer segments. In Nokia's case, there will always exist a mix of both, cost saving and value driven strategic sourcing decision making." [Van den Bossche, 2017].

### III. METHODOLOGY

This research used qualitative research method because this kind of research aim to applying set of procedure, collect and analyze evidence and show findings to solve problem. Qualitative research gives us more focus and better understanding when study.

I believe that, for the research, the qualitative model is convenient approach. This kind of method gives us the opportunity to go a deeper when study the sourcing process at the purchasing department in Saudi Electricity Company.

After selected the research method, the next step is collecting data. In this research the primary data will be collected through interviews, the interview includes all the stakeholders. Stakeholder means any person, organization, social group, or society at large that has a stake in the business. The data will be collected also from company data bases such as material department web portal. The purpose of the interviews is to identify the problems therefore finding the research objectives and potential solutions. Another important source of information for this thesis was secondary data. This data was collected from internet-based searches. The data used will be from both primary and secondary sources. Primary sources are interviews, experiences of people from inside the Saudi electricity company and from the suppliers of company.

Finally, after collect data I will select the strategic sourcing model. There is essential elements process for each model in strategic sourcing. Some of books combined some phases or stages together like Jonathan Obrien in his book "Category Management in purchasing". The writer called these stages the five Is. (Obrien, 2012). They are Initiation, Insight, Innovation, Implementation and Improvement.

The strategic sourcing model which will be using in this research consists of seven stages.

The Each stage mentioned above include some tasks, I will give a more details and explanation of each stage.

#### *Identify Opportunity*

Opportunity Identification includes defining categories, evaluating savings opportunities for the categories and finally ranking the categories for strategic sourcing activity.

The objective of the process is to determine the categories, to which strategic sourcing process will be applied, define target savings and determine the timeframe for implementation.

#### *Develop Category Profile*

The first step to preparing category profile is determining the category scope or boundary of category. It's essentially stepping to giving more focus regarding what you want study. The boundaries are not limited on types or uses of category only but also include the geographical boundary to determine whether study the marketplace locally or internationally and include time boundary too especially if the category scope designed to provide sourcing strategy for defined specific time periods or particular season. For example, if the category to be studied is fuel additive, but the types of fuel additive and their uses are too many, so that the type and use of fuel must be determined. The scope of category for example becomes the fuel additive which used in power plants.

Category profile must be giving clear idea about the importance of category, the function of category, materials within the category, which materials most importance, the spend of category during past years, what is the components or raw material which necessary for manufacturing process, the main suppliers and main users for category.

This process involves the creation of a detailed category profile for each of the prioritized categories. The Develop Category Profile process consists of two major activities:

- Internal and External Analysis: study the purchasing procedure and industry analysis through analysis the key suppliers to evaluate supply market.
- Total Cost of Ownership: consider all possible costs associated with sourcing a category from a supplier, not only based on purchase price.

To doing internal analysis there are six points must be considered the first point is determining the best possible way to collecting data from End-user maybe using interview or survey in this step, the second is drawing Stakeholder mapping. The aim is determining the key players. Stakeholder mean any person has interesting or can added value or can be helping to achieving goals of project. To preparing a good stakeholder mapping first must make a list of all those related to the category or project. After knowing all the stakeholders, the next step doing stakeholder analysis. The analysis depends on two axis level of interest and power. According this analysis can be classifying the stakeholder into four groups.

The people in group A, must have least effort and do not waste time with them.

The people in group B, have high interest and low power its better to keep informed in a systematic and regular Manner.

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The people in group C, are important to keep them satisfied and don't ignore them to avoid any resistance maybe happening and effect on the project goals. It should be noted that the biggest failure of project is to resist change, especially if they have authority.

The people in group D, are key players it is important to try to engage group D and use it to influence and attract people in group C.

The third point is assessed the criticality of a category and determining the End-user requirements, this is necessary step to inform what the client need and what he wants from key suppliers associated by category. The end-user must be describing the requirements of product like specification, level of product clearly.

The fourth point is category spend analysis that mean, the spend patterns is identified and analysed the data. This step determines the volume of expenditure for the past years and identifies the key suppliers. By using Parito 80/20 Principle can be determine the top material in category. The Pareto principle, also called as the 80/20 rule, is a concept that says 80 per cent of spending is determined by 20 per cent of material. This gives us the opportunity to focus on a limited number of items in the category rather than focusing on the entire material in the category and this saves time and effort.

The fifth point is study and analysis pricing changing through the past years and identifying the root causes which lead to this change. Understanding the approach of suppliers pricing is help us in this situation. There are six types or model of pricing:

- i. Greed Pricing: in this kind of price supplier is full control of price and User has no choice, it must be buying, like purchase spear parts for specific machine from the original equipment manufacturer.
- ii. Value Pricing: the supplier tries to distinguish his product in such way rather than other competitors so that client will pay against of this difference.
- iii. Cost-Plus Pricing: the price paid is whatever the cost is plus a pre-agreed profit margin.

- iv. Budget Pricing: the customer determined specific amount to achieve project and supplier must be submitting his offering under this budget.
- v. Market of Pricing: the customer is full control regarding price and has the power in contrast suppliers and has many choices of sources is available and the price determined according market role.
- vi. Target Price: in this pricing model the buyer determined his need and wants and their specification and other requirements and informs the supplier price must be supplied for.

The last point is study total cost of ownership by another word, consider all cost associated with product lifecycle. The purchase process flow is used to estimate costs for each internal part of the TCO model.

After completing the internal analysis, the external analysis process is starting, there are some of action must be consider during process analysis, that actions will be describe and discuss by details below.

a) Identify industry framework: evaluate the complexity of supply market and study the competition in the industry and determine the power of supplier and buyer in market. The most common tool used in this case is Porter's five forces. Porter's five forces is a tool created by Michael Porter's in 1979 for studying competition of a business. It derives from industrial organization economics to explore five forces that set the competitive in a industry and measure the attractiveness or unattractiveness of industry in terms of profitability. The tool is very valuable in formulating organization's strategy as it discovers the points of strengths or weakness industry.

Power of buyer: buyers have more influence by using leverage to decrease cost, many factors helping to create power of buyer like limited number of buyers, purchase a large of quantities by buyers and buyer have the facility to shift supplier with minimum risk and cost.

Power of suppliers: the suppliers have high control about price and quality, there are number of factors participate in increase power of supplier like few numbers of manufacture or providers seem what happen in airplane manufacturing, the product is unique or has differentiated than other product.

New entrants to marketplace: how easy to new suppliers enter to the marketplace, Scope of complexity in filed and whether required high technology or specific government regulations.

Substitutes: is something used instead of product and giving the same performance or giving the similar function.

Competitive rivalry: there are some factors increase the competitive rivalry in marketplace like large number of competitors, marketplace is attracting to new supplier's entry and there are no barriers to new supplier entry.

b) Measure Industry Financials: To compare cost between manufactories or companies of the same industry; supplier performance is benchmarked and compared by measuring key industry ratios and studying the overall size and growth. this analysis gives us zoom in or more focus regarding labor cost, raw material cost, production capacity and upon this information may estimate the company profitability and will be useful during the negotiation phase.

Another benefit is providing a quick analysis on the financial health of a company. There are key elements of financial ratios that can be measuring to evaluate financial health of a company:

- ✓ Profitability: The most important element to determine the financial health of a company is profitability. The company can stay for a certain period without achieving profitability but in the long run it cannot. The most important indicator or metric to measure profitability is the profit margin. It is important during to calculate the profit margin that the focus is on the percentage of profit rather than the total amount realized. The company maybe achieved a profit in millions of riyals, but it only maybe represents 1% which means that any increase in prices of raw materials or workers' wages and marketplace competition maybe lead to loss.

- ✓ **Liquidity and Working Capital Management:** Liquidity is a main aspect in evaluating a company's financial health. Liquidity is the cash owned by the company or assets that can easily be converted to cash. Increase liquidity, the greater the margin of safety to cover the obligations. At the same time, increased liquidity may result in a reduction in profits as a result of not employing a large part of its funds. As with all liquidity measures, indicators that the company is barely able to make short-term payments may face financial problems in the medium and long term.
  - ✓ **Asset Utilization and Efficiency:** The primary objective of these ratios is to measure the effectiveness or efficiency of the company in using the financial resources or assets available to it in the production of goods and services.
  - ✓ **Solvency:** Solvency is the ability of a company to meet its long-term financial obligations, while the Liquidity is the ability of company to meet its short-term financial obligations.
- c) **Determine leading practices and new trends in industry:** bussines do not stay on one condition and are constantly changing as well as technology; the new technology contributes to the development of traditional ways, which reduces the total cost of the product, making it cheaper than before. Shift into new technologies is a great opportunity to getting huge saving especially if the shifting before other competitors. This is one of the most important reasons why it is necessary to work closely with key suppliers especially if these suppliers are manufacturers. A good example of the shift in technology is what happened in the cable industry, where copper was replaced by aluminum, which led to a significant drop in prices. in this step must be studying the Potential strategic levers which face the End Users, including creative solutions from leader manufacturers in the industry.
- d) **Evaluate Supplier Capabilities:** the products and services provided by suppliers are analyzed and the operational capabilities of the suppliers and their technical expertise are also analyzed. There are number of pivotal elements must be considered during assessment process:
- i. **Capacity:** The supplier must have the ability to respond to the requirements of the company which dealing with. Does the supplier have adequate resources such as equipment - workers - warehouse?
  - ii. **Quality:** The supplier must apply high quality standard and can be verified by the ISO certificate or the initiatives that has been applied like six sigma or lean manufacture.
  - iii. **Commitment:** deliver the materials on time and with competitive price,
  - iv. **Technical Support:** supplier must be contributing in solving problems which face the End-user and has ability to development new products.
  - v. **Communications:** Ease of communication with the supplier especially during crises and easy access to senior management.
  - vi. **Flexibility:** Ability to adapt to customer requirements and responsiveness.
- e) **Measure Supplier Financials:** measure supplier from commercial aspect , studying the changing of price through the past years for the same material and comparing the history of price changing with various suppliers, commodity cost structure will be analyzing too. Cost structure mean, studying the cost component which includes raw material, labor cost, Depreciation, Overhead, energy and other.
- f) **Identify supplier position of market:** One of the tools which useful in this field are portfolio analysis. The tool developed by Peter Kraljic (1993), aim to maximize potential profit impact power and reduce supply risk or difficulty of market. Over the years some amendments have been added to Kraljic matrix and some boxes names have been changed but the concept remains the same. Portfolio analysis which I will use is very common in purchasing community. The Portfolio analysis is matrix has two dimensions, on the x axis is degree of profit impact and on the y, axis is degree of market difficulty.

To using portfolio analysis in effective way there are three essential steps must be following, the first one is classification, the important note which must be considered her is the assessment should be to categories not for suppliers. All the factors associated by degree of market difficulty and degree of profit impact on category must be studying. Many of factors can be effect on degree of market difficulty like Ease or difficulty of switching suppliers, Number of suppliers who can supply this category, The degree of difficulty or complexity of the category, which requires working closely with the suppliers, The availability of the category in the market and determine if there is a shortage in the required quantities or there are limitations of production capacity. On the other axis there are several factors effect on degree of profit impact, for example, the spend of category relative to overall Organization's spend, the category influence on business growth and the quality of finish product. After studying all the factors can be easily determined the location of category inside the matrix, then working to identify and building sourcing strategy for long term and working to improve and support our position.

The second step is evaluating our strength position inside the marketplace, according on our position within the matrix we will assess our strength, if the category is in leverage that mean we have potential to useful from our position in marketplace to getting leverage because the market is easy, and we can easily switching suppliers if we not getting competitive price. In case the category is in strategic that mean the difficulty of market is high and the impact of profit too, this situation required more focus and working closely with the supplier according win to win situation because the power of buyer and supplier is equal. If the category is critical, the marketplace is difficult and not buying with high volume in this situation the supplier has the power more than buyer, there is no benefit to focusing on this category.

The third step is selecting the optimal strategic according the result which obtained from stage one and stage two. Three strategic suggested by Kraljic (1983) to applying in portfolio analysis are:

- Exploit: Take advantage of the current site to get leverage and maximize the strength in current position
- Balance: maintain the current position
- Diversity: try to shift your current position to better position.

More details and explanation will discuss in develop sourcing strategy.

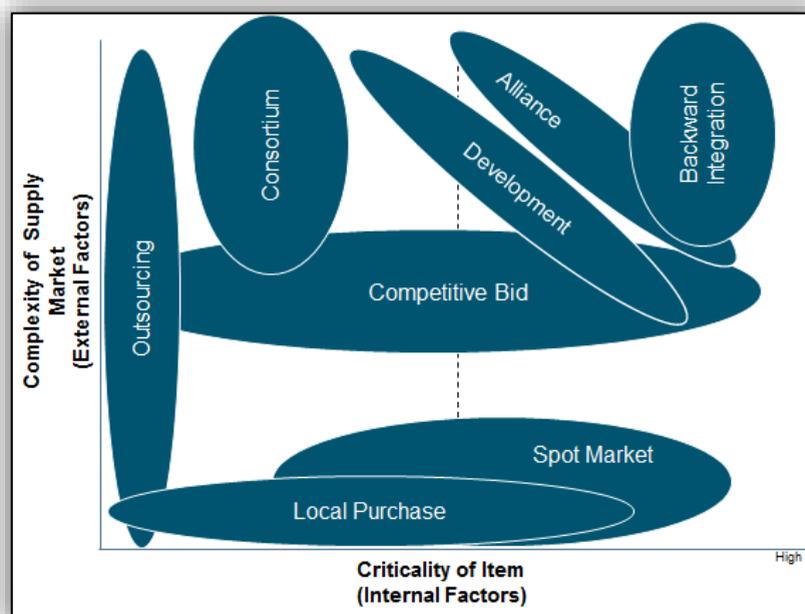


Fig 1 strategy procurement options

The aim of Sourcing Strategy development is determining the best strategy to appropriate with supply market. The inputs of understanding the current situation of the organization, industry analysis and the Total Cost of Ownership (TCO) model lead to formulating the categories strategy. The study of market complexity and criticality of the category already made in the second stage, led to the determination of the position of the category on complexity / criticality map. According to category position on these two dimensions, the choice of appropriate strategy becomes clearer to be applied in the long term.

Business units, Focus spend volume on limited suppliers, use ecommerce to increase procurement process efficiency and create long term agreements with key suppliers.

The integration of external supply strategy and internal change will identify savings levers. There are five potential saving opportunities should be to focus on and develop when integrating internal and external strategy to develop future sourcing strategy. Figure 2 showing set of saving.

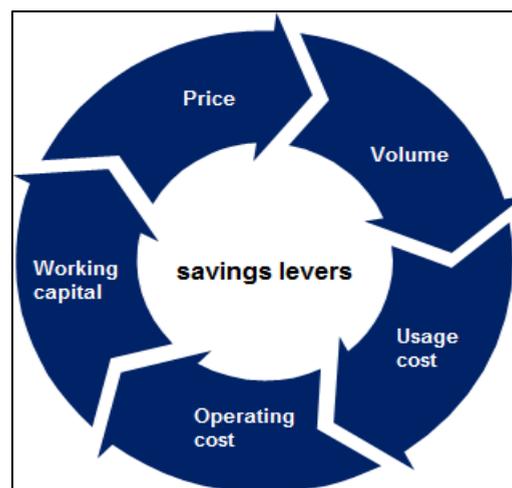


Fig 2 set of saving levers

### *Identify Selection Criteria and Screen Suppliers*

This is one of the most difficult steps in implementing strategic sources because they need detailed information about potential suppliers including the company's financial statements and often suppliers do not collaborate to provide financial data easily. The aim of this step is to identify potential suppliers, examination and selection of suppliers based on qualification criteria. If there are large number of potential suppliers must apply a multi-level approach to eliminate the inappropriate candidates and choose the qualified suppliers only.

Pre-qualification is the initial stage in supplier selection, its eliminate those suppliers who didn't meet the basic or minimum requirement which lead to saving time and effort because sending the RFI for hundreds of vendors take a lot of time and many of that vendors are trader or small company maybe hasn't the capability to participate in tender, also the good pre-qualification process maintains the credibility of the organization and helps it to perform its duties to customers by excluding non-reliable suppliers who are likely to fail or delay in supplying materials. The big mistake that many companies make is increasing the number of suppliers in order to improve the supply chain, but it often has the opposite effect, where many problems arise because of the weakness of the qualification process for suppliers which lead to a lot of cancelation for purchase orders.

There are two important elements in this step are how to identify potential suppliers? And how to search and selecting suppliers based on qualification criteria?

Identify potential suppliers will be based on the develop category profile which already done in stage two and external supply market in stage three. If the new suppliers have the minimum requirements and have meet the

organization requirements now pass to the second step which is develop request for information criteria (RFI). RFI Mean that the organization requesting from the new supplier to disclose specific information to identify and evaluate the supplier's capabilities by using set of criteria. This criteria different from company to another , Some companies have stringent qualification requirements such as SABIC ,Aramco and some have lower requirements than the Electricity Company and saline water conversion corporation. Upon the response of supplier to the required information he will be assessed.

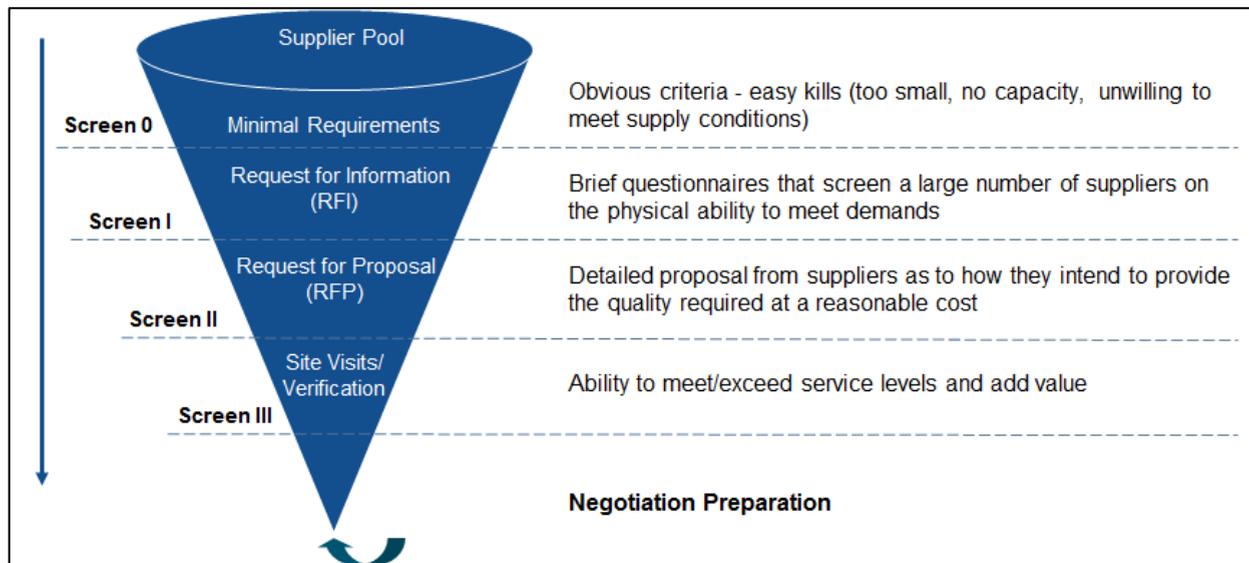


Fig 3 Selection Factor Screening

There aren't fixed criteria of evaluation but there are common criteria requesting in all qualification process, divided into six main criteria and each criterion has key factors, they are

- 1- Financial include capital, annual revenue, assets, liquidity and working capital and Solvency.
- 2- Quality: Does the vendor have ISO certificate, does the vendor have Product testing process? Dose the vendor have total quality management program?
- 3- Service / Responsiveness: Availability to solving problem which face end-user, the lead time required to manufacture process, commitment regarding on-time delivery to customer? How much average percentage performance?
- 4- Continuous Improvement: Continues improvement program (six sigma – lean manufacture), Have specific initiative regarding (production- quality- cost reduction), Training and Development program for employees.
- 5- Manufacture Capability: Capacity of production, availability of labors and equipment to measure expansion in future, Is there maintenance program (preventative – predictive – corrective)?
- 6- Experience and Customer care; Top three customer and percentage of revenue from each customer, measure customer satisfaction and flexibility and quick response to customer need.

Each criterion is given weight according to its importance to the organization. Depend on supplier response to RFI. Scores are given against each criterion then the final decision will be taken based on overall RFI score.

#### *Management Request for Proposal*

The most common terminology used for tendering is request for proposal (RFP) and request for quotation (RFQ). Choosing the right terminology depends on the nature of the request. For example, if we want to buy specific parts from manufacture and we know exactly our requirement in this case the use of RFQ is preferred while if we have general idea regarding our requirement and we need more ideas or suggestion from supplier

in this case RFP is preferred. The objective of conduct RFP is to develop and execute Request for proposal (RFPs), and score the supplier responses according to a complete set of evaluation criteria, based on total cost of ownership and other aspects.

There are key elements must be taking into account during tendering process.

1. Specification: the specification must be clear and easy to understand include all the details like manufacture name, model, part number, quantity etc.
2. The closing date or deadline for response.
3. How to submit response.
4. Determine who is responsible for receiving and answering suppliers' questions
5. Determine the evaluation criteria that will be applied.
6. If there is a need to submit any documents, you must mention (Zakat, insurance certificate etc.).

The major activity in conduct Request for Proposal is developing the RFP selection model. That means giving weighted criteria to be used in template model to calculate total score for possible suppliers during the selection process. The proposed model which will be used in this thesis depend on five aspects. They are total cost of ownership, technical aspect, logistical aspects, services aspects and other aspects. Each aspect consists of number of criteria, Scores are determined for each criterion and weighted scores are calculated for various suppliers and final decision will be taken according who has the highest score.

The working way of template model as following:

Team which responsible about technical evaluation determine weight for each aspect from 0% to 100%, the weighted for total cost of ownership weight must be not less than 80% and not exceed than 85%. Offers of each supplier scored according to the defined criteria on a scale from 1-5. The weighted score per supplier calculated. Supplier who has highest weighted score selected temporary. Traditional tender selects the supplier based on predefined criteria like lowest price or minimum delivery period etc. The strategic sourcing methodology delays supplier selection beyond the negotiation stage if the targeted price not achieve.

#### *Develop and Negotiate Agreement*

The process to prepare a negotiation case and conduct fact-based negotiations with the suppliers, to reach the desired outcome, by another word how to manage negation process?

After receipt of quotations and evaluation of the offers technically and commercially if the prices are achieving the target, there is no need for the negotiation process and if not achieved then the negotiation process begins.

The actual cost of the materials has been studied in advance and the financial statements of the suppliers have been studied and their profit margin is known. All of this makes us to start the negotiation process based on facts.

Negotiation is a process of talks between two or more parties to solve a problem or reach a certain settlement that satisfies all parties.

In order to reach a desirable result, it may be useful to follow a structured approach to negotiation. For example, in a work situation a meeting may need to be arranged in which all parties involved can come together.

The process of negotiation includes the following stages:

1. Preparation: This phase involves locating the negotiation time, level of attendance and discussion topics. It is also necessary to assign a time-frame for each topic. Also, in this stage must be list individual and organizational interests, needs, concerns, hopes and fears. Saudi Electricity Company interesting to reduce unit price, reduce inventory risk and reduce overall internal holding costs. Supplier interest to reduce internal

production / logistics costs, maintain profit margins, more business, strengthening current relationship and increase market.

2. Discussion: during this phase, each side whether they are individuals or team raise the issue as they see it, through their realizing and evaluating of the situation.

It may sometimes useful to record the important points during the discussion stage and take notes especially in case the needed of further clarification. It is also significant to ensure that the attendance has the authority to decide

3. Clarifying Goals: both of sides must consider goals, interests and viewpoints for the other party and clarified the disagreement and trying to deal with it.

Often through this clarification, becomes easy to list factors and order them according to priority, and establish common ground between the parties. Clarification is backbone of negotiation process, without it without it will be occur misunderstandings which may cause problems and barriers to reach a valuable result.

4. Win to win situation: We must work at this stage to consider the interests of both parties without there being a winner and a loser. Both sides must feel that they have gained positive thing during process of negotiation and their goals and an interest has been taken into consideration.

5. Agreement: agreement can be achieved when each party understanding the other and has been considered their viewpoints and interests. Any agreement must be clear to know both of sides what has been decided.

6. Implementing the terms of the agreement shall be ratified and each party shall undertake to fulfill its obligations.

#### *Implement Agreement*

The process to prepare and finalize a sourcing strategy implementation plan, based on the negotiated business agreements and the category sourcing strategy.

The last step in strategic sourcing methodology is contract. Contract is an obligation between two or more parties to perform a act. Contract must be including:

- A detailed description of the responsibilities of each party in the contract
- Clarification of penalties toward for breach of contract
- A formal definition of what will be provided and how it will be presented, as well as key dimensions which describe the natural of the relationship and how it works.

There are essential components to make the contract valid and binding for both parties:

1. Legal capacity: the legal capacity is an essential element of any contract. In the sense that Contracting Parties are aware and understand what they agree to in the contract.
2. Offer: To start the contract, one party must be submitting offer to the other. The offer should be clear and determined the terms and conditions as well as involve the quantity, price, delivery period and required quality.
3. Acceptance: Once the terms of the contracts are done, the other can be accept or reject the offer.
4. Consideration: The exchange of something of value to both parties and should benefit the parties.
5. Legality: Legality is the last element to valid contract. If one of the parties to the contract is doing illegal action, then the contract becomes void and unenforceable.

There are different documents used to establish various form of contract. The most common form using in purchasing environment:

- Purchase order: is a simple form of contract is a commercial document issued by buyer and send to the seller include the price, quantity, description of item and delivery period.
- Agreement: it is document used with suppliers include the prices, quantity, description of item and delivery period, it seems like purchase order but the main difference is that the agreements determine by a time period of one year or more and sometimes the agreement is binding on the supplier and optional for the company as is the case with the Saudi Electricity Company. The optional agreement means the company is entitled to do the contract or to cancel it.
- Memorandum of understanding: A document that expresses mutual accord on an issue between two or more parties.
- Non-disclosure agreement: A secret agreement between two or more parties specifying the confidential or knowledge material that the parties wish to share with each other for specific purposes, but which wish to restrict public use.
- Formal contract: A legal document clarifying all the aspects approved by all parties and explaining the relationship between them.

#### IV. DATA COLLECTION

This section is showing the applying strategic sourcing methodology in Saudi Electricity Company and explains how the data collected.

The primary data will be collected through interviews; the interview included all the stakeholders. Also, the data were collected from company data bases such as material department web portal. The main problem during the collected data from material web portal was the classification of commodity. The catalogue department classified the material according type of item (mechanical, electrical, chemical ...etc.).

This classification can't useful during applying strategic sourcing methodology, it was necessary to classify the materials in a different way in order to make better use of the data.

##### *Commodity classification*

The first step is re-classifying commodity using the United Nations Standard Products and Services Code (UNSPSC) as guideline.

UNSPSC is industry standard schema, is an efficient, accurate and flexible classification system for achieving company-wide visibility of spend analysis.

It is five levels hierarchical classifications. According (UNSPSC), the materials in Saudi Electricity Company categorized into five levels:

- Direct strategic materials
- Direct Non-strategic materials
- Maintenance, repair and operations (MRO)
- Non-Direct Materials
- NOT Assigned

##### *Determining category*

It is five levels hierarchical classifications. According (UNSPSC), the materials in

Strategic sourcing requires segmentation material into category. The aim of this step is to identify and implementation the optimum sourcing strategic for that category.

First, spend analysis must be segmentation into direct strategic materials, direct Non-strategic materials, MRO materials, non-direct Materials and not assigned.

Second, applying Pareto principle which says 80 per cent of spends come from 20 per cent of material.

Third, determining categories according to supplier's base, which mean the materials which supplied from a specific group of suppliers shall be considered as one category even if their nature or uses are different or there is no link between them. For example, if the cables and transformers are supplied by the same suppliers, they are considered one category.

### *Spend Analysis*

Spend analysis a prerequisite for strategic sourcing because “you can't manage what you can't measure”. It's a process to identify, gathering, categorizing and analysing the organization spend data aim to reducing purchasing cost and increase efficiency. By another word spend analysis is a process to review and showing historical purchasing data of an organization to provide us by the answer for the following questions:

What is spend associated for each cost centre at an organization?

What are the top commodities in an organization?

How much the volume spends for each commodity?

Who are the strategic suppliers?

How much an organization spends with strategic suppliers?

How much an organization spends with unqualified suppliers?

Spend Cube is the start point to successful spend analysis process, it is giving us overview about an organization spend; also help us to choose the right start point.

Spend cube is part of spend analysis that analyzes data by dividing it into three axes represent Commodity (What the organization buying), Cost Center (for which department?), and Supplier (Who are the suppliers we buy from?).

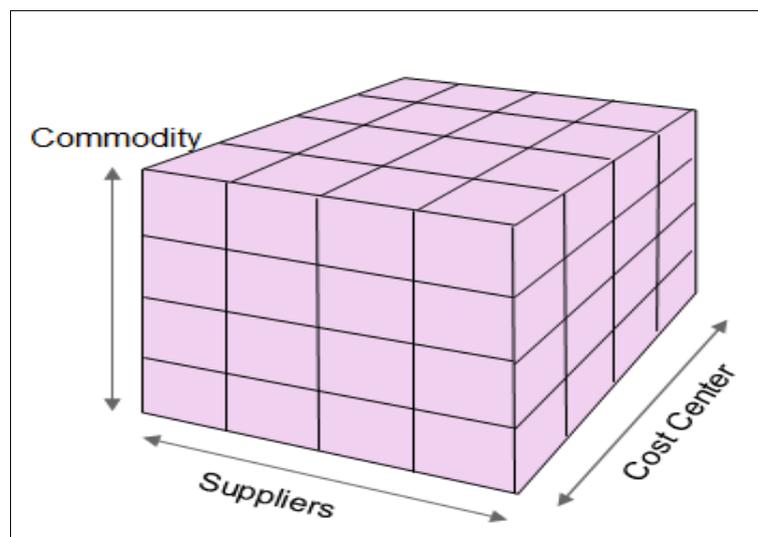


Fig 4 Spend Cube

### *Importance of spends analysis*

Spend analysis is baseline for strategic sourcing initiative; it gives overview for the decision maker about aggregate spend of an organization that lead to identify the cost reduction opportunity for direct or non-direct commodities. Also help us to Rationalizing supplier base which lead to increase the efficiency of supply

chain and reduce the prices by consolidation and volume purchasing. Therefore, it is a significant tool to measure the performance between different geographical units for any organization.

#### *Spend analysis in Saudi Electricity Company*

Spend of strategic categories covered 83% of the total spends.

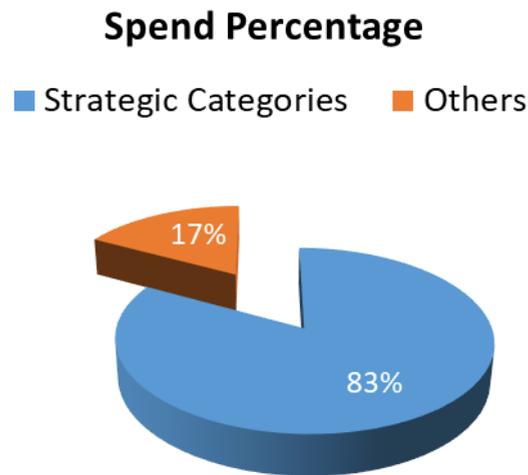


Fig 5 Total spend categories

Choosing one strategy category from eleven strategy categories is not an easy process. Some criteria have been developed for application in the selection process. The first criterion is the importance of the category to the business of the Organization and whether delays in the delivery of the materials lead to disruption of business within the organization or caused loss in profit or dissatisfaction customers. The second criterion is potential savings; I mean if there is a chance of savings in one category more than the other categories, this give it a priority to start with it instead of starting with another category.

The third is easy of implementation, include two dimensions:

How easy it would be to effect the change within the organization? If the change can be rolled out quickly, with little or no resistance from the internal stockholders or user, then it is an easy change.

How easy the marketplace is? This is often referred to as market difficulty and is about the ease with which you can source something within the marketplace. the best test that can be applied is to consider how easy it is to switch suppliers.

By depend on previous criteria decided to select fuel additive category.

#### *Strategic sourcing in Saudi Electricity Company*

The strategic model consists of seven main elements covering the internal and external activities of the Organization. The concept of each step has been explained previously in the methodology section; in this section the application will be practical for all seven steps.

#### *Identify Opportunity*

Identify opportunity is the first step, there are two basic elements must be done in this step. The first element is Validate Category Tree by another word the Existing Category hierarchy is validated to ensure that it is consistent with the existing internal and external industry and supplier market conditions. Figure 6 showing the Category Tree.

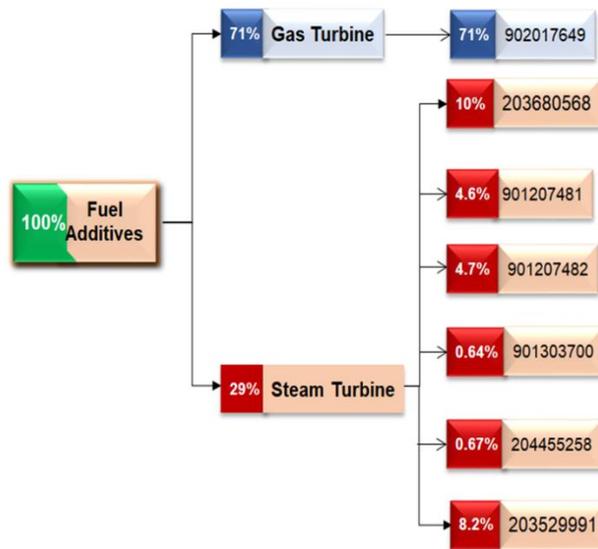


Fig 6 Category Tree

The second element is Update Category Tree if there are any changes to the existing material classification hierarchy happened.

*Develop Category Profile*

The Saudi electricity company has three major types of power plants, gas turbine, steam turbine and Combined-cycle power plant which using booth steam and gas turbine to generate electricity. The previous types of power plants use the crude oil or heavy oil. As a consequence of combustion and depending on the kind of fuel and high temperatures , vanadium, and other metals like sulfates and alumina silicates will form hard residue, also sometimes sticky deposits will be appear as result for unburnt carbon and sulfur . This leads to reduced heat-transfer, damage to turbine blades and blockage of flue gas paths.

Small amount of the sulfur which exist in the fuel will be oxidized and react with water vapor. This will lead to type of corrosion appear on Air-heaters, stacks and ducting. Also Low quality Crude oils and heavy fuel oils can produce high levels of ash which caused emissions and an environmental pollution.



Fig 7 Slagging inside the boiler

Fuel additives raise the melting point of vanadium and other metals like potassium and sodium. Thus lead to preventing the formation of solid deposits within boilers. Furthermore Fuel additives isolate all condensing SO<sub>3</sub>, which lead to decrease the temperature of gas during exit and increases efficiency. For that, the engineers in power plants using fuel additive for the following reason:

- improve heat transfer
- decrease emission from unburned carbon
- minimize maintenance intervals
- corrosion protection

By the asked experts in SEC shows us that the lower the quality of the product the greater the consumption of the additive and affected the turbine efficiency.

i. Map Procurement Flow: aim to represent workflow of procurement process as exist in real.

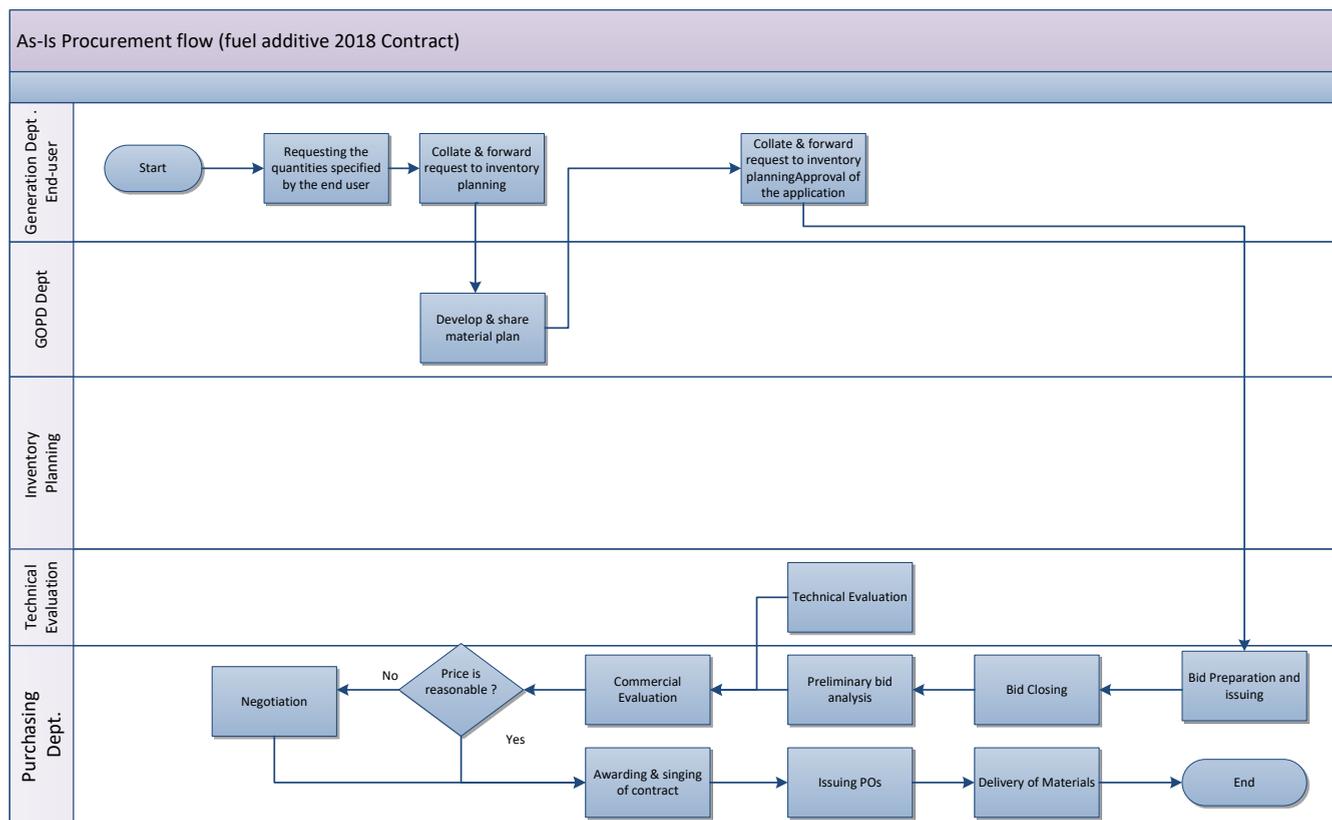


Fig 8 procurement Map – Fuel Additives

The noted from procurement map that, the Inventory planning does not have any role in determining quantities or reviewing the quantities required. the end-user is who performs this function so that each plant determine its needs and send it to the purchases department directly, thus losing the company the opportunity to consolidate different orders to increase the quantities and thus get discounts and savings In price because the relationship between the quantity and price is reverse relationship meaning that whenever the higher quantities, the lower price.

ii. Evaluate Category importance and assess End User values: Help us to understand the specifications required and accepted by the end-user and this is especially useful when proposing an amendment on the product or provide alternatives to the product.

Depending on map procurement flow and evaluating category importance assess End User values can be determined and drawing Stakeholder analysis for the category as shown in Fig 9.

iii. Conduct Spend Analysis: Analysis of spending and knowledge of demand in previous years. Therefore, the size of demand for the coming years can be predicted.

The spend analysis for our category showed us the following information:

- ✓ The total spend of category during interval 2012-2017 is 366,432,977.73 S.R
- ✓ 71% of the overall spend coming from Item no ( 902017649)
- ✓ In 2016, high number of POs were raised for fuel additives due to higher budget received and hence the PO spend for the subsequent year 2017 significantly low

Region	Sum of Value SAR	Sum of Quantity litter
6510	152,783,737.15	10,216,838.00
6520	76,701,792.51	6,159,181.00
6530	10,999,585.25	718,102.00
6540	20,378,101.82	1,373,542.00
<b>TOTAL</b>	<b>260,863,216.73</b>	<b>18,467,663.00</b>

One of the most important benefits of spending analysis is knowing the key suppliers. By analyzing spending we can figure out our most important suppliers in the group and thus develop the relationship to become a strategic relationship.

The figure 9 shown the four top vendor and their spend. Top four vendors represent 71% -97% of the overall category spend exception in year 2017 significantly low, because new competitors entry to category and some of supplier like supplier kanoo doesn't win any POs in the last three years.

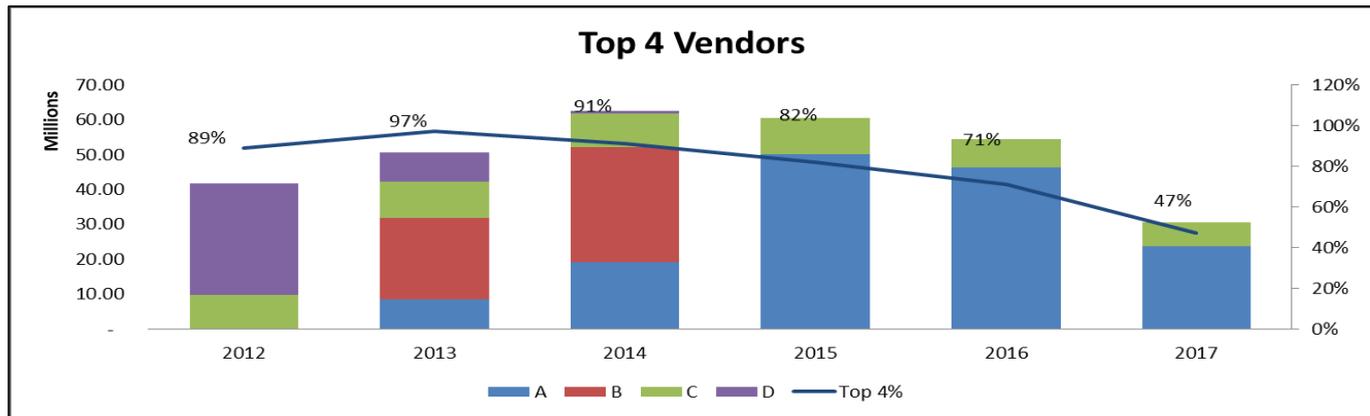


Fig 9 Top four vendors in category

In the time period 2012-16, top 4 vendors always accounted for greater than 70% of spend. Overall these four vendors represent 82% of the overall spend for the four years combined. Top 6 out of 9 vendors represent 95% of spend.

iv. Conduct Pricing Analysis: Pricing drivers and metrics are identified and analyzed.

Since 2012, unit price has been decreasing for fuel additive (902017649) owing to increased competition for the item. The price analysis showed that. The price analysis was done for top three suppliers in category.

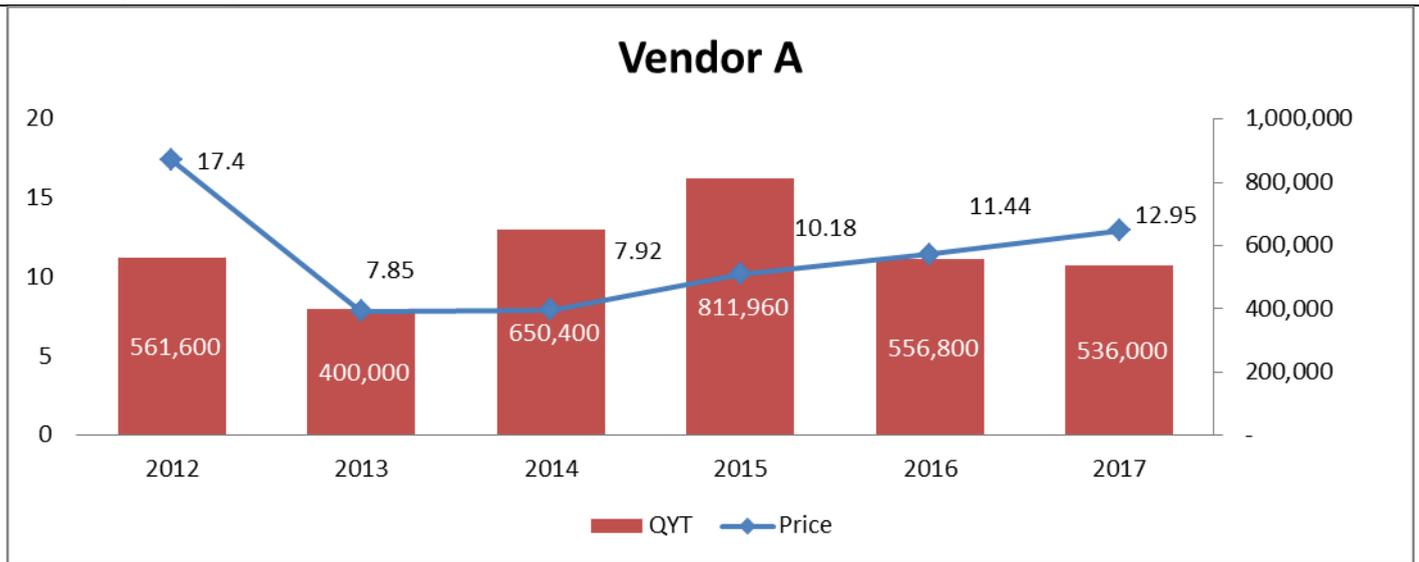


Fig. 10 Unit price cost / Liter for supplier

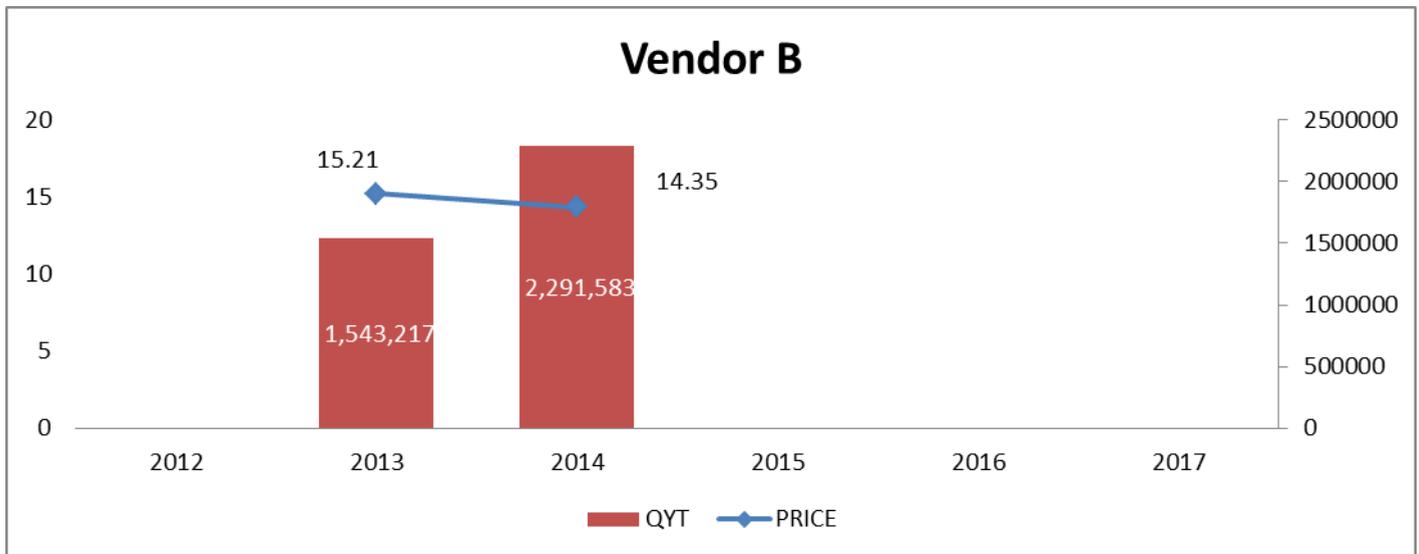


Fig. 11 Unit price cost / Liter for supplier

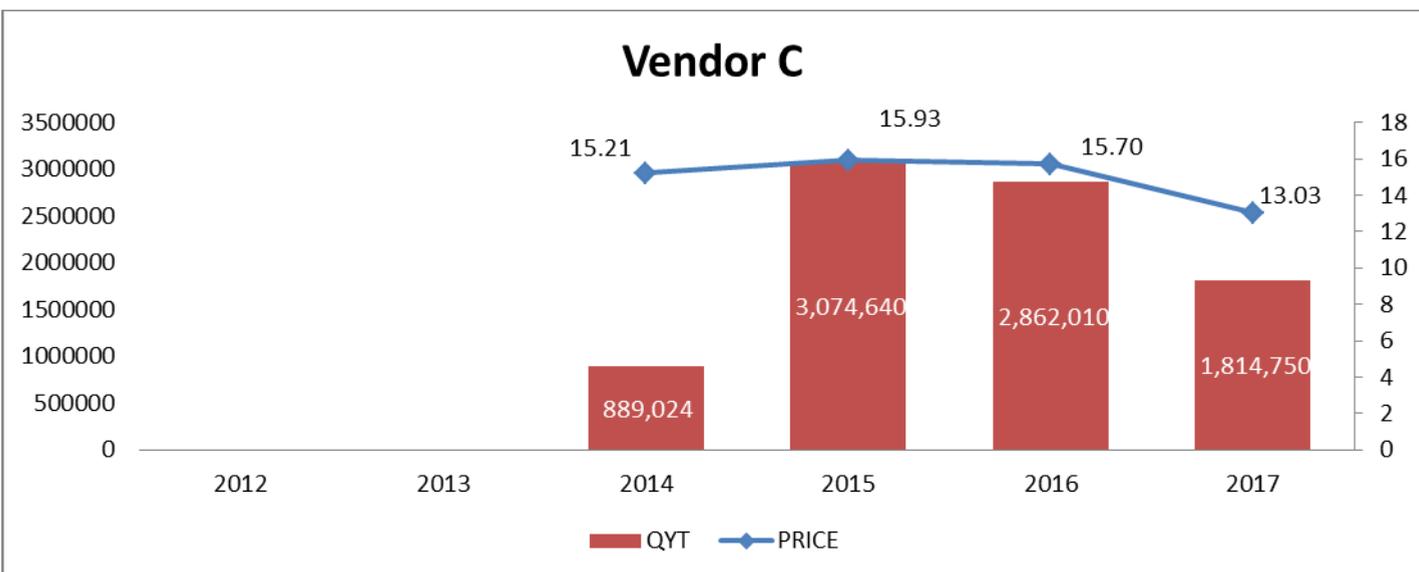


Fig 12 Unit price cost / Liter for supplier

The noted from the price analysis there is no strong relationship between price and quantity, as known whenever increase quantity the price will be decrease this is common sense in business but that not happened, by review the price analysis we found sometimes that the prices declined despite the lower the quantity. This is illogical but gives us an indication that quantity is not basic elements in determining the price for suppliers.

v. Understand Total Cost of Ownership: All relevant lifecycle costs are considered. Only one item was studied from the category (902017649) to calculate total cost of ownership.

There is some activity must be study and analysis to identify the total cost for any product like purchase price. Procurement Services and Material Handling costs considered 2% and 7 % of the purchase price as per service level agreement (SLA) in Saudi Electricity Company. Installation costs considered 5%.

The second major activity at The Develop Category Profile is external analysis. It involves six sub-processes as discussed earlier.

i. Determine Industry Structure: The supply market complexity is assessed by describing competition and understanding the supplier or buyer power in the market. We analyze industry structure and supply market complexity using Porter’s five forces model.

Porter's Five Forces Framework is a tool for analyzing competition of a business. It draws from industrial organization economics to derive five forces that determine the competitive intensity and, therefore, the attractiveness (or lack of it) of an industry in terms of its profitability. The tool is very useful in formulating firm's strategy as it reveals how powerful each of the five key forces is in a industry.

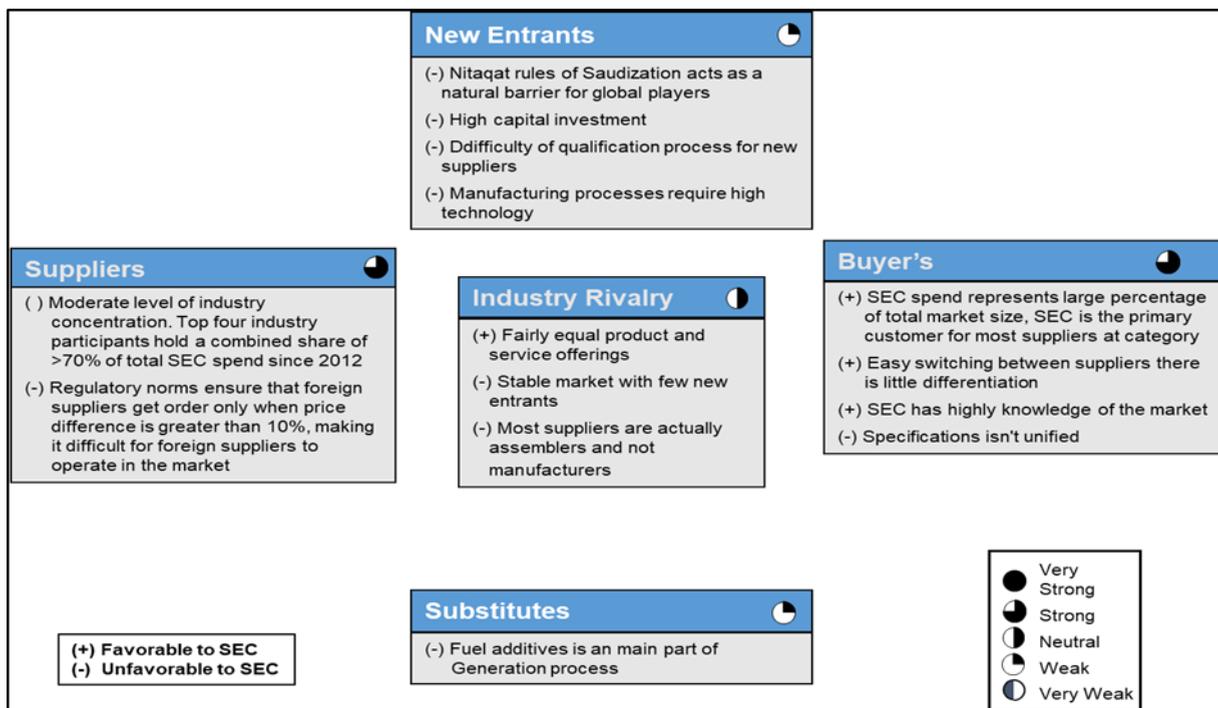


Fig 13 Porter’s five force

Owing to high power of supplier and low power of new entrants and substitutes, overall market complexity is moderately high.

ii. Measure Industry Financials: Vendor performance is benchmarked by assessment main industry ratios and analyzing the overall size and growth. The industry cost structure showing the major components cost of the industry which lead to identifying on potential strategic levers, therefore using to compare between

companies of the same industry, helpful tools useful during the negotiation phase and provide a quick analysis on the financial health of a company.

Saudi Arabian fuel additives market is expected to slow-down at 4% till 2024 because the growth of electricity consumption in the Kingdom is likely to slow by 2% furthermore the SEC has started to enhance the reliance on clean electric power and implementing projects to raise the generation capacity of the combined cycle with solar energy in addition to the production of electricity from sources Renewable energy power and utilize wind power. Another reason supports that expectation, the Saline water Conversion Corporation (SWCC) one of the main buyers for fuel additives, recently started building new plants based on R.O technology rather than Steam, this shifting in technology lead to reduction consumption for fuel additives.

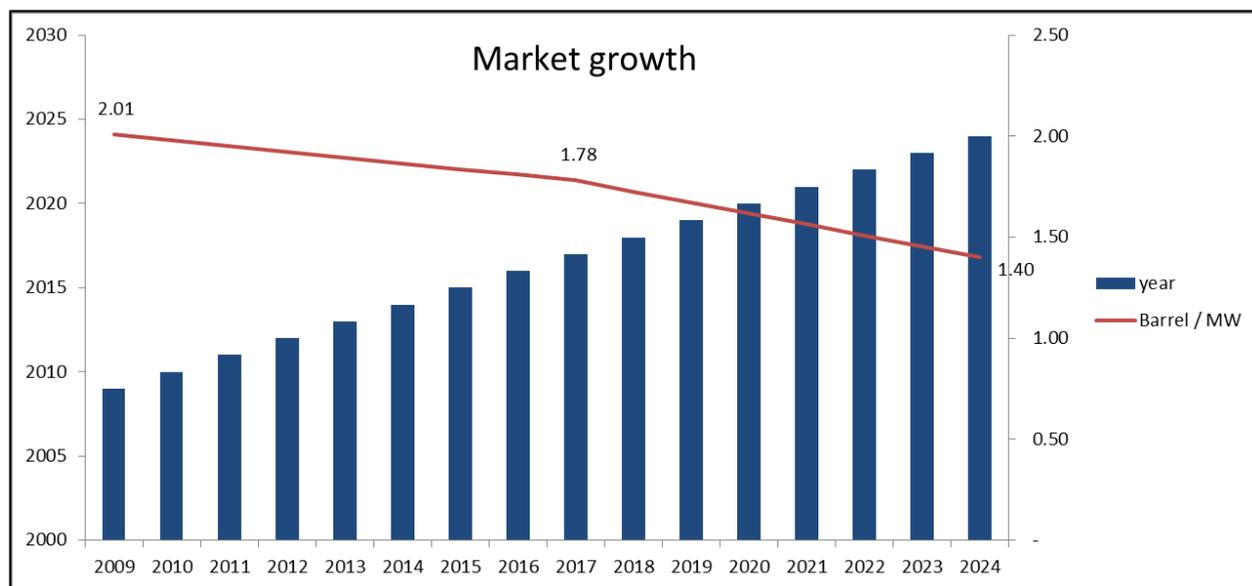


Fig 14 Market growth for Fuel additives

*Category Strategy for fuel additives*

To developing long term sourcing strategy for category, the external supply market strategy must be determined. There are two important points must be considered. The first one is determining Position of category based on market complexity and criticality of category and second one is evaluating alternatives strategic for the category. Therefore, should be determine and define category baseline to calculating savings. In this project the baseline will be prices which getting in 2017.

I will focus on a set of sourcing saving levers in order to maximize economic value out of the sourcing process for fuel additives. After studying the category deeply and developing the category profile, the proposed strategy will be based on three main aspects as following:

1- Commercial aspects: there are some suggestion should be applying in this aspect. It’s necessary doing some internal tactical change for commercial aspect example increase scope of contract to obtain on volume advantage. So that the contract (Agreement) will cover all plants at SEC especially for unified items (90201649) and increase agreement period to three years instead of two years to be more attractive for suppliers.

Expansion supply base to increase competition by added new suppliers, Non-disclosure of allocation strategy and offered prices to enhance negotiation effectiveness, changing in negotiation strategy for example conduct multiple rounds rather than one round and explore ways of reducing quantities consumption.

2- Technological aspects: optimize quality specification by requesting higher quality which help us to increase productivity, durability and availability for turbine. standardized, don't restrict for specific product or manufacturer. Develop technical evaluation process by adding new factor to TCO model.

3- Logistics aspects: Improvement of planning process to allow suppliers to decrease inventories and lead times. Using just in time (JIT) principles to using suppliers' warehouse rather than SEC warehouse which lead to decrease holding cost and operation cost at SEC warehouse.

*Identify Selection Criteria and Screen Suppliers*

The vendor's affairs department at SEC is responsible for registering the new suppliers. There are general requirements requesting from the proposed suppliers include information about infrastructure & human resource like Organizational Chart of the Company and indicate the number of employees in each functional group e.g. Procurement, Design, Production, Quality Assurance/Control, Sales etc. therefore include manufacturing facilities/capabilities , this requirements allows to suppliers only to participate and supply general items but for strategic items and critical items as fuel additives there are extra qualification process required. For example, before accepting any new product, the power plant required the supplier to pass "trial testing". During shutdown period, the power plant giving to supplier one unit to experiment his new product for specific period to see how well it works.

The pre-qualification for manufactures and suppliers aim to protect the hot gas path components from the corrosive and fouling effects of the impurities present in various fuel types, to assess fuel additive performance in increasing combustion efficiency and reduce rate of power degradation, therefore to identify the optimal dosage rate, as well as to assess corrosion and erosion rate. There is some parameter must be monitored during trial testing period like dosing rate of fuel additive, fuel additive consumption, fuel flow, inspection of gas path components after trial testing period...etc.

The trial testing period starting from (~03-06 Months) for short term or one complete cycle (16000 hours for Alstom unit or 12000 hours for GE unit) as long term.

The flowchart explains the qualification process at SEC.

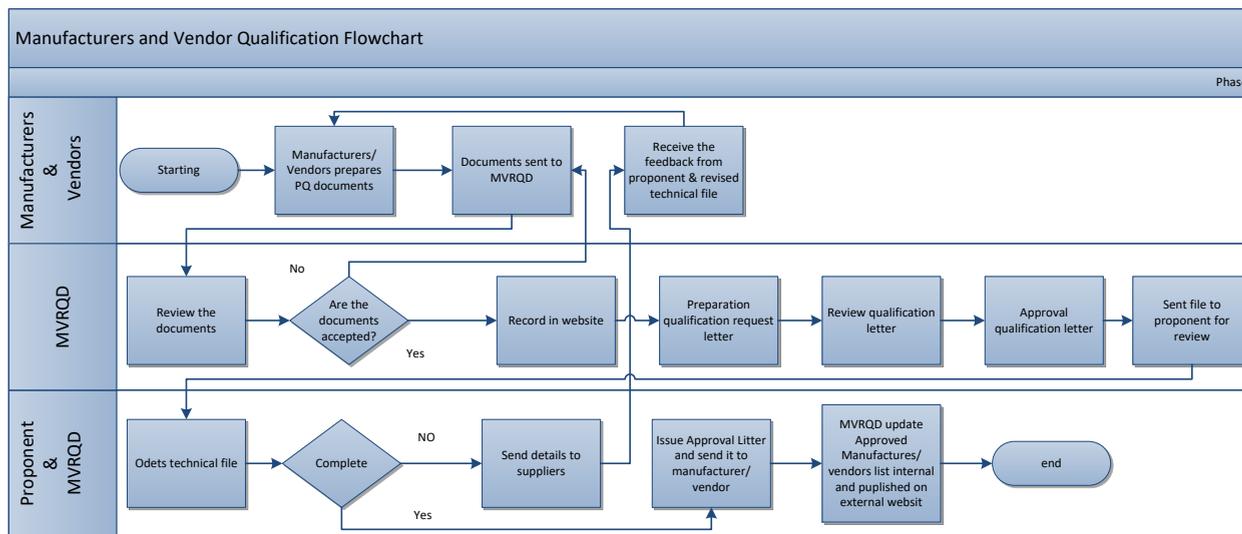


Fig 15 Qualification Process at SEC

Another function for the vendor's affairs department at SEC is vendor assessment. Vendor's performance subject to continuous evaluation by SEC through different criteria, one of the most important criteria is the delivery, to ensure that all vendors work with SEC committed to deliver the materials on time. Vendor affairs division and Logistics division works on this and generate their reports for this purpose. The other

criteria involve On-time delivery, Overall delivery, E-Bidding Response Number of claims, and TWASOL (POs Messages) Response.

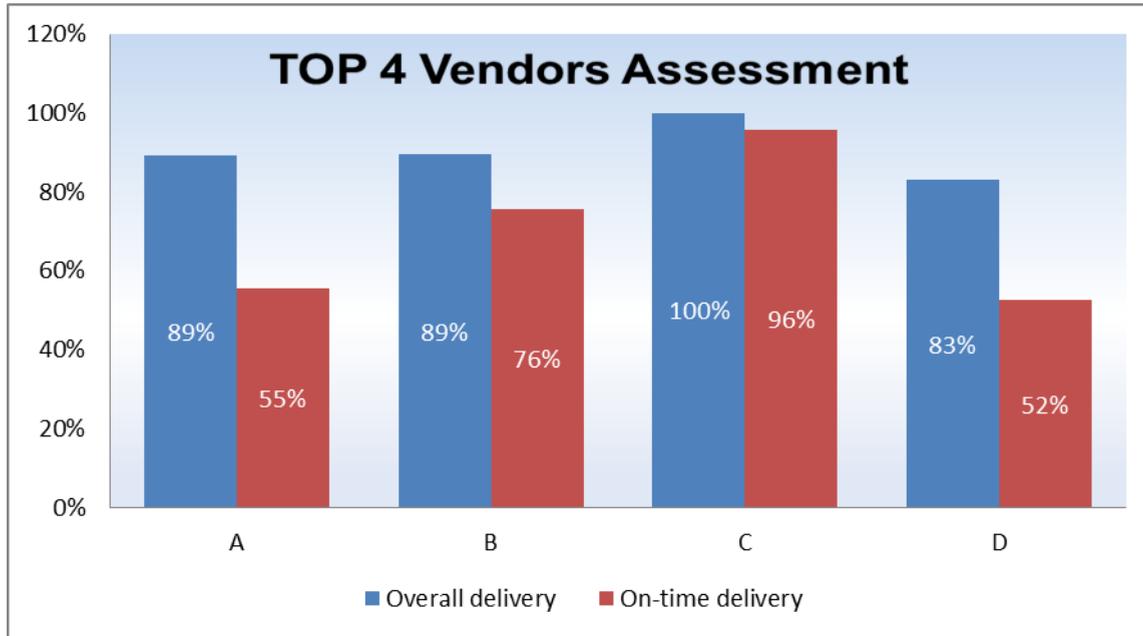


Fig 16 Vendors Assessment, Source: Logistics Division

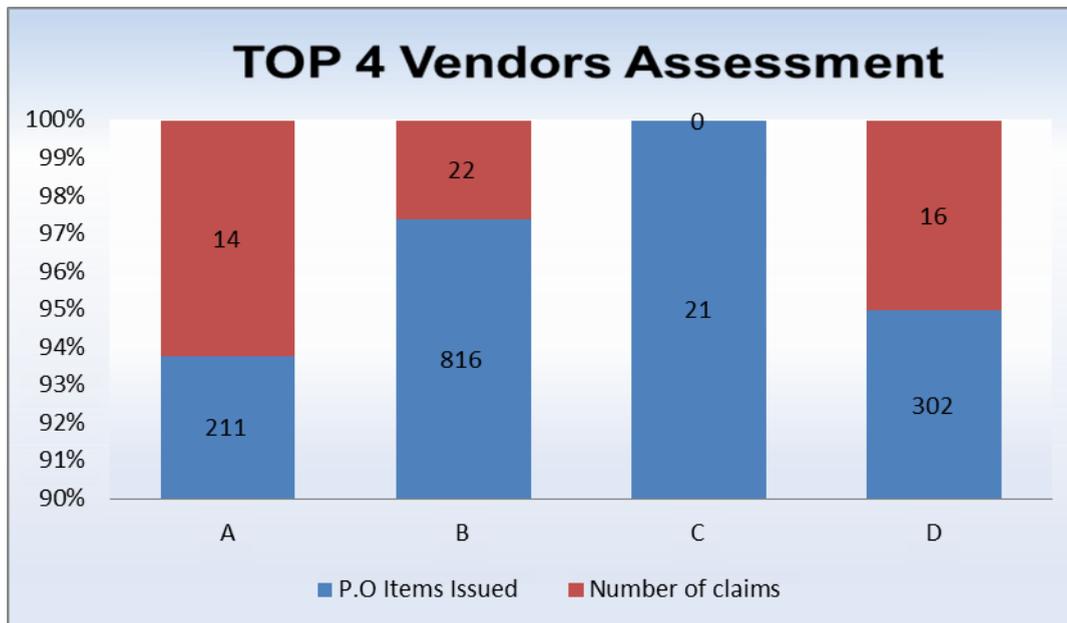


Fig 17 Vendors Assessment, Source Vendor Affaires Division

In this case, only we have limited number of suppliers and we don't need to registration new suppliers so it's not necessary applying screening and selecting suppliers filter while still we need to test the potential supplier. There are three key performance indicators selected to identify potential suppliers. The first is net profit margin. Net profit margin is the ratio of net profits to revenues for a company or business segment. Net profit margin is one of the most important indicators of a business's financial health. It can give a more accurate view of how profitable a business is than its cash flow, and by tracking increases and decreases in its net profit margin also allow to compare in profitability between two or more company even if there is different in size.

The second indicator is the current ratio that measures a company's ability to pay short-term and long-term obligations. Current ratio is the ratio of current assets to current liability. In general, companies would aim at maintaining the current ratio of at least one to ensure that the value of their current assets covers at least the amount of their short-term liabilities while the ratio is higher than 1, this gives a positive indication of the strength of the company financially.

The third indicator is inventory turnover ratio, is a ratio showing how many times a company's inventory is sold and replaced over a period. The higher the inventory turnover the better it is and gives an indication of the company's ability to meet customers' demands. Mathematically, is calculating the ratio of sales to inventory.

#### *Management Request for Proposal*

Management request for quotation passed through two phases, the first phase was internal, included reviewed the specifications which must be clear and easy to understand and include all the necessary details. Therefore, was determined who is responsible for receiving and answering suppliers' questions, determined the team who responsible for technical evaluation and determined the closing date or deadline for response.

The second phase was with sharing with qualified suppliers, explained to them how to submit response, which documents we need to submit with offers and explained to them the evaluation criteria that will be applied.

As explained earlier, the proposed model which will be used in this project depend on five aspects. They are total cost of ownership, technical aspect, logistical aspects, services aspects and other aspects. Additionally, to previous criteria I added new factor called "injection rate". The injection rate is variable from product to another, this factor helps us to calculating total cost ownership by easier method as well as help us to identify the right quantity for agreement.

Each supplier must be submitting injection rate with his offer, the injection rate already calculated on trial test during pre-qualification process for new product.

After meeting with suppliers and explaining the technical evaluation method, written approval was received from them indicating that they understood the technical evaluation method to prevent misunderstandings or any problems maybe will be appearing in future.

People are often afraid to change what they are used to, as a new initiative that was difficult to convince the end user to implement the initiative at all power plants or sign an agreement covering the Kingdom, so that I suggested to starting by one power plant as a pilot project, if the going well, then we can expand. The selection took place the Shuaiba power plant, and I decide the starting will be by the steam turbine power plant as first phase. The selection process isn't haphazard, considered the ease of implementation and minimizes risk. Shuaiba power plant has 41% from western region production in 2017 (36.11 GWH) and 17% from SEC production in 2017. The choice of steam power plant instead of gas is due to the presence of more suppliers qualified to supply this type of fuel additive and also the presence of a number of local suppliers have stock in warehouses, which facilitates the coverage in case shortage to avoid risks.

The final stage of the tendering process is selecting supplier. Traditional methodology selects the supplier based on predefined criteria like lowest price or minimum delivery period etc. The strategic sourcing methodology delays supplier selection beyond the negotiation stage.

#### *Develop and Negotiate Agreement*

After receipt quotations and evaluation of the offers technically and commercially if the prices are achieving the target, there is no need for the negotiation process and if not achieved then the negotiation process begins.

The actual cost of the materials has been studied in advance and the financial statements of the suppliers have been studied and their profit margin is known. All of this makes us to start the negotiation process based on facts.

Traditional negotiation is usually depending on haggling, which lead to in compromises. This type of negotiation is a common approach which aim to resulting in compromise but in many cases is ineffective. Often each party enters negotiations only with their own positions without regard to the interests of the other party. Usually this type of negotiation focuses on one issue, often price. The outcomes impacted by charisma and style of negotiator and its ability to persuade. The bargaining can have undesired and negative outcomes for example lead to train the behavior of suppliers to artificially increase prices and reduce it later, therefore reduces the supplier's interest in account-based pricing and reduces the supplier's interest in innovation, research and development. It is worth mentioning that the results of this type of negotiations decrease over time.

Unfortunately, the negotiation processes in SEC follow the traditional negotiation; the buyer lacks analytical support. For example, when preparing for the negotiation process, the buyer only reviews the previous price and the estimated value of the requisition then compare it with the current price, and the amount of discount depends on what the supplier offers.

The right way of negotiating is a complete method to realize sustainable business relationships; it different than the traditional negotiating processes and concentrated on achieving the best short- and long-term outcomes.

My strategy to negotiation is built on seven elements are:

1. Interests: includes the needs and wants, concerns, objectives, hopes, fears that drive parties to negotiate. The negotiation results must be satisfying the parties' interests
2. Options: relate to explore potential ways to fulfill interests through agreement with the other parties.
3. Legitimacy: It means to obtain a fair or reasonable agreement that satisfies all the parties according win to win situation depending on fact based which already done includes external analysis, internal analysis and supplier analysis.
4. Alternatives: relates preparing a contingency plan or explore other choices in case of a failure of the current negotiation.
5. Commitments: relates to declarations about what a party will or won't do, to prevention misunderstanding in future must be statements clear and specific include time and place.
6. Communication: relates to select the right way to deliver the message, which include determine who will communicate, with whom, when and how.
7. Responsibility: relates to determine the relationship between negotiation team and describe the function role for team members.

#### *Implement Agreement*

There are two types of agreements at SEC .Optional agreement and commitment agreement. In the optional agreement, the company is not obliged to implement the agreement, but the purchase according to the need of the materials while the supplier must abide by the implementation of the agreement.

The agreement which applied in this thesis is optional agreement for SEC and commitment for the supplier. The agreement period two years and allows to increase quantity by 20%.

**V. RESULT AND DISCUSSION**

The study succeeded in achieving the first goal. The cost of ownership of the fuel additive for steam turbine was reduced by 48 % thus achieving a saving of SR 6 million and the consumed quantity decreased by 65% thus achieving a saving of (638,280) Liter. To calculate the financial saving, it was assumed that 2017 is the base line (Traditional Method). The table below shows the saving details.

Table 5 Comparison between the Traditional Method and the TCO Method

	Traditional Method							TCO Method	
Vendor	Basic Demand	COST SR/Liter	Total Cost/Basic Quantity	Injection L/Hr	Injection/Day	No of units /plant	COST (SR/DAY)	Agreement QYT	Total
A	1,051,200	13.09	13,760,208	11	264	3	3,455.76	578,160	7,568,114
B	1,051,200	17.06	17,933,472	7	168	3	2,866.08	367,920	6,276,715
C	1,051,200	12.38	13,013,856	15	360	3	4,456.80	788,400	9,760,392
D	1,051,200	11.83	12,435,696	11	264	3	3,123.12	578,160	6,839,633
E	1,051,200	11.68	12,278,016	19	456	3	5,326.08	998,640	11,664,115
F	1,051,200	24.64	25,901,568	9.5	228	3	5,617.92	499,320	12,303,245
G	1,051,200	17.16	18,038,592	11	264	3	4,530.24	578,160	9,921,226
H	1,051,200	26.57	27,930,384	11	264	3	7,014.48	578,160	15,361,711
I	1,051,200	19.8	20,813,760	-	-	3	-	-	-

After the amazing success achieved in the steam turbine agreement, the same methodology was applied to the unified item (902017649) agreement is covering all gas turbine units in the Kingdom; but the injection rate is various from unit to another due to manufacturer specification. So that we added new factor showing the percentage of magnesium consideration for each product, then we can calculate the right quantity.

The cost of ownership of the fuel additive for Gas turbine was reduced by 17 % thus achieving a saving of SR 10,800 million and the consumed quantity decreased by 67% thus achieving a saving of (3,172,379) Liter. To calculate the financial saving, it was assumed that 2017 is the base line.

Through the study we propose to improve the purchases process in the Saudi Electricity Company the following:

- 1- To be the category leader is responsible for planning the requirement of the material rather than the inventory section.
- 2- Non-attendance of suppliers when tenders are opened
- 3- Technical offers are sent only for technical evaluation and commercial offers are not sent to prevent prices from being disclosed.
- 4- The result of the tender shall not be announced even if completion

The third objective in this research is developing strategic relationship with key suppliers. The main question here why focusses on supplier relationships?

First, if we have a solid and strong relationship with our suppliers, we can deliver the best of our organization. These strong relationships will naturally affect the price, quality and performance.

Table 6 Saving Details for Gas Turbine

Vendor	QYT	% Magnesium Consideration	COST /Liter	Injection Rate L/Hr	Injection/Day	COST /DAY	Total
A	4,700,000	11	12.48	6.05	145.2	1,812.10	58,656,000
B	4,700,000	11	13.87	3.85	92.4	1,281.59	65,189,000
C	4,700,000	11	13.94	8.8	211.2	2,944.13	65,518,000
D	4,700,000	11	14.5	24.2	580.8	8,421.60	68,150,000
E	4,700,000	11	15.58	4.67	112.08	1,746.21	73,226,000
F	4,700,000	11	16.38	6.6	158.4	2,594.59	76,986,000
G	4,700,000	11	16.63	4.89	117.36	1,951.70	78,161,000
I	1,527,621	28	34.15	2.22	53.28	1,819.51	52,168,257

Strong supplier relationships support open communication and great cooperation, provide opportunities to negotiate a better price, improve overall product quality and drive for better performance. By sharing goals and road maps we will provide the supplier with a clear vision of what is important to our organization. The study we propose to improve the purchases process in the Saudi Electricity Company the following:

It is very important before starting any step towards strengthening partnership with key suppliers to meet with them face to face and listen to their problems and suggestions.

Through the meeting with suppliers, four factors must be considered to enhance the partnership with the main suppliers of Saudi Electricity Company:

- 1- Payment: There is nothing that cripples a relationship quicker than not paying your bills on time. All major suppliers suffer from delay in payments. Although it was agreed to pay after thirty days of delivery of materials as per Saudi electricity payment conditions but in fact the delay is up to three months and more. To solve this issue, the researcher suggests that key suppliers be treated as a special case in payments. Payment must be made to them on time even if the company has to delay payments to other suppliers.
- 2- Build the Relationship: Telephone and e-mail communications are often the traditional means of communication with suppliers. But we must break this pattern of the relationship and claim more by visiting the suppliers in their factories and inviting them to the events of the company and notify them that they are partners in the success achieved. To support this trend, I suggest that an annual event of suppliers be held to honor distinguished suppliers.
- 3- Reasonable lead time: Choosing and managing a suitable "lead time," or the time between you placing an order and receiving. Many suppliers suffer from the fact that SEC is surprised by new applications that have not been agreed upon and expect a quick response from the supplier, regardless of the supplier's situation and considering that the production lines are busy with requests from other customers.
- 4- Keep them in touch: Informing suppliers of the company's future plans and their current problems emphasizes the sense of cooperation between you and your supplier.

The fourth objective in the research is applying the best practices in procurement field & sharing the knowledge inside the organization. The first part of the objective was achieved by applying the strategic sourcing methodology to the panel's category. As for the transfer of knowledge within the organization, it is suggested that training courses be held in all operational areas of the organization, explaining the methodology to them and answering their questions and queries.

The expecting saving by applying strategic sourcing methodology range between 2 to 25% of total spends. [Pandit and Marmanis,2008].

The current study was able to obtain average savings of 56%, by comparing the result to the previous measurements I think its acceptable result while I believe that more savings would have been possible had some other strategies been applied.

For example, if the tendering for steam turbine and gas turbine were put together as one single tender will be larger competition by the suppliers because there would be one chance for each supplier and would be more careful to offer the best price to win the tender but split them into two tenders that give them more flexibility to maneuver in prices and even if they lose a tender, win in others.

The second strategy is e-Auction (Reverse Auctions): An e-auction or electronic auction is a form of electronic business where several suppliers bid for the same buyer's order. An e-auction the buyer invites suppliers to submit their offer in portal; everyone can see prices without knowing who they are. The supplier who will offer the lowest price is the winner. The Saudi Electricity Company rejected this proposal because it was difficult to implement and recommended to negotiating with suppliers by the conventional way.

## VI. CONCLUSIONS

To be sure, Strategic Sourcing Initiative in Saudi company has not only produced significant cost savings but has enabled and advanced relationship between Saudi Electricity Company's and key Suppliers. This initiative has enabled the re-classification of materials according to the latest scientific methods and classified the materials into a strategic and non-strategic.

I highly recommend applying the strategic purchasing methodology to all strategic categories that have been categorized in this research and I am sure that the financial savings will be very large. I also recommend creating strategic sourcing department at the Saudi Electricity Company, which would be directly linked with the Finance Department and not related to the materials and contracts sector to prevent duplication of work and to give greater autonomy to the division.

In order to create an attractive environment for suppliers, the focus should be on building the best relationships with the suppliers and the commitment to payment dues in time. Also should be informed the suppliers about the future plans of the company until the objectives of the parties are achieved according to win- win situation.

## VII. RECOMMENDATIONS

Through the study, I propose to improve the purchases process in the Saudi Electricity Company the following:

1. To be the category leader is responsible for planning the requirement of the material rather than the inventory section.
2. Non-attendance of suppliers when tenders are opened
3. Technical offers are sent only for technical evaluation and commercial offers are not sent to prevent prices from being disclosed.
4. The result of the tender shall not be announced even if completion.

The third objective in this research is developing strategic relationship with key suppliers. The main question here why focusses on supplier relationships?

First, if we have a solid and strong relationship with our suppliers, we can deliver the best of our organization. These strong relationships will naturally affect the price, quality and performance.

Strong supplier relationships support open communication and great cooperation, provide opportunities to negotiate a better price, improve overall product quality and drive for better performance. By sharing goals and road maps we will provide the supplier with a clear vision of what is important to our organization. The study we propose to improve the purchases process in the Saudi Electricity Company the following:

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4. **Keep them in touch:** Informing suppliers of the company's future and their current problems emphasizes the sense of cooperation between you and your supplier.

The fourth objective in the research is applying the best practices in procurement field & sharing the knowledge inside the organization. The first part of the objective was achieved by applying the strategic sourcing methodology to the fuel additive category. As for the transfer of knowledge within the organization, it is suggested that training courses be held in all operational areas of the organization, explaining the methodology to them and answering their questions and queries.

**Conflict of interest:** The authors declare that they have no conflict of interest.

**Ethical statement:** The authors declare that they have followed ethical responsibilities

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This volume is dedicated to Late Sh. Ram Singh Phanden, father of Dr. Rakesh Kumar Phanden.