RUNNING HEAD: BUSINESS TRANSFORMATION AND OPERATION COST OPTIMIZATION AT AEEC LLC

BUSINESS TRANSFORMATION AND OPERATION COST OPTIMIZATION AT AZERBAIJAN ENERGY ENGINEERING AND CONSULTING LLC

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I. Executive Summary

This paper analyzes the ways how to optimize the costs of engineering services in the case of Azerbaijan Energy Engineering and Consulting (AEEC) LLC and conducting relevant business transformation, innovation and value creation by studying relevant academic literature. AEEC LLC renders electric maintenance service for oil & gas companies including the State Oil Company of Azerbaijan Republic. The fall of oil prices have forced SOCAR and other oil & gas companies to reduce the volume of outsourced services which has ultimately affected AEEC.

In the line with the case described above, the consultation project was implemented with the following objectives:

- *Development of a new short-term corporate strategy implying a multi-sector operation (i.e. customer segmentation)*
- *Analyze historical labor and material costs to identify the potential for reduction and optimization*

The research methods used during the preparation of this business consultancy report are personal observations of AEEC's engineering activities, research of academic literature on operation cost optimization and business transformation, and interviews with AEEC representatives.

The primary data source is based on interviews with AEEC's founder, who is the client for this project, and AEEC staff. The interviews covered issues on managing engineering services, how these services are rendered, what costs are incurred during these services and the future outlook of the company with regard to engineering services.

The secondary data included AEEC's annual profit and loss statements, costs related to engineering services, organizational structure, and data from State Statistics Committee of Azerbaijan Republic.

The following qualitative models/concepts were applied for the research question:

- SWOT analysis
- VRIO analysis (inside-out)
- Porter's Five Forces (outside-in)
- Change Management
- Business Model Canvas

- Ansoff matrix
- Strategic Innovation
- Value chain, value shop and value network
- Least square regression

The mentioned tools and approaches were discussed with the client.

Various academic concepts on value chain, change management and least square regression were examined, and tools such as, SWOT, VRIO, Porter's Five Forces, Business Model Canvas and Ansoff Matrix were applied.

Based on a review of the cost optimization, innovation and business transformation, the following tasks were identified for AEEC's engineering services:

- *Reduction* of labor costs associated with engineering services – i.e. *value creation* for AEEC in terms of cost efficiency
- Offering *new engineering services* other than current
- *Customer segmentation* – i.e. new industries for operation

The following three scenarios that AEEC can consider for future activities were discussed with and recommended to the client:

I. *"Business as usual but with optimized services"* – AEEC continues to provide services to SOCAR and other current clients oil & gas sector based on *optimized* engineering services costs.

II. *"New industries for operation with optimized engineering services"* – AEEC provides services to potential clients in other sectors with regard to electric installations, such as automobile repair, railway and marine, but with cost efficient solutions.

III. *New services for the clients in the "traditional" sector and for potential new clients in other industries* – With the growing trend of energy efficiency and energy audit activities in Azerbaijan, AEEC can transform itself into an Energy Service Company (ESCO) providing services on energy conservation to large industrial customers. After gaining relevant experience, AEEC can extend the services to residential customers as well.

The above scenarios were incorporated into in a concrete short-term action plan to be implemented by a dedicated team in AEEC to be comprised of the AEEC founder, AEEC President, Head of Financial-Accounting Department and Lead Engineer.

The proposed short-run action plan for AEEC innovation and business transformation (September-December 2015 and Year 2016)

	2015	2016
	September	December
INTERNAL CONTEXT	• Conclude long-term fixed price contracts with material suppliers to ensure continuous material logistics to avoid material price increase • Optimize labor costs by reducing them by 30% • Develop new value-added services for SOCAR and other current clients, i.e. energy efficiency and energy audit	• Arrange training on electricity services for AEEC's engineers team on the following specialization: ▪ energy efficiency and audit ▪ electric maintenance in transport sector ▪ electric maintenance services in traditional electricity sector
EXTERNAL CONTEXT	• Continue the provision of traditional electricity maintenance services, to SOCAR and other current clients, in more cost-efficient way with regard to labor costs • Communicate with SOCAR and current clients on promotion on new value-added services of energy efficiency and audit	• Commence the thorough technical industry analysis on the following sectors for future involvement in electricity maintenance: ▪ Energy efficiency & audit ▪ Automobile repair services ▪ Maritime industry

Although providing relevant results, the project report had certain limitations. One of the client's requests was to analyze the potential of maritime and automobile industries from the point of electric maintenance services, as well the potential for energy efficiency and audit. This was done by the author only to a certain extent due to limited time and data on the subject. It was agreed with the client that this analysis will be continued with AEEC's own resources.

II. Rationale

The sustainability of service companies throughout the world is sensitive to the financial state of their long-term key clients. In harsh economic conditions, clients might request more cost-cutting procedures, which might ultimately affect the service companies. Academic literature has a vast amount of information on how service companies can cope with this circumstance, including, but not limited to, least square regression and new business strategy development. But these studies

are more of a generic character providing insights to all companies without sector differentiation and particular cases.

This paper analyzes ways of optimizing costs in the case of AEEC, which renders electric maintenance service for the State Oil Company of Azerbaijan Republic (SOCAR) (major client) and other clients, by studying the available literature on cost optimization and business transformation, innovation and value creation. The paper focuses only on the engineering services of AEEC.

III. Problem statement

The consulting project focuses on the engineering services of Azerbaijan Energy Engineering and Consulting LLC (AEEC), which is a private company having more than 15 years of experience in the energy sector in Azerbaijan. The company provides repair and construction services on transmission lines and substations for oil sector companies and mainly SOCAR. The company also provides consulting services to companies in the energy sector (see Appendix 9 for key information on AEEC – number of employees, turnover and organizational chart).

Historically, SOCAR, Azerbaijan's largest oil production company, has been the main source of revenue for AEEC in terms of engineering services. Although being an electrical maintenance service company, AEEC has specialized in providing engineering services to mainly oil sector companies including SOCAR. With the decline of oil prices, SOCAR and other oil & gas companies have started looking for ways of reducing costs and requiring more low-cost services from its vendors and contractors, which has consequently affected AEEC. This has forced AEEC management to think over the current business operations and services costs, and develop a new strategy for business transformation in order to diversify both its clientele base and its sector of operations. In other words, AEEC has set an objective to provide engineering services to various clients from various sectors without excluding SOCAR, based on more cost-efficient ways. *"I guess we will have to think about the non-oil sector of the economy, in other words, to diversify our client base in terms of sector, not to be "trapped" in challenging oil sector. On the other hand, maybe we will keep SOCAR and other oil companies in our portfolio by simply being more value and customer oriented, given our long-term collaboration with them?"* – Dr. Vilayat Valiyev, the founder of AEEC LLC (Please see Appendix 8 for detailed information on the interview with him).

The company's services include:

Engineering / Technical Services: AEEC's expertise in this area includes the construction of high-voltage substations and electricity transmission lines, installation of relevant electric equipment; installation, test, adjustment and repair of electrical equipment (electric generators and engines, transformers, commutation apparatus, measuring devices, high-voltage electricity transmission lines, relay protection and automation facilities etc.).

Consulting / Research Services: AEEC performs large-scope consulting & research activities such as, power sector development programs, regulatory issues, tariffs, social issues with regard to energy sector, macroeconomic analysis on power intensity; estimation of the exploitation of hydrocarbon resources; consulting and research services on strategic development, management, and government/private sector interfaces with regard to Azerbaijan's fuel and energy complex; macroeconomic modeling for projecting demand for energy resources; energy system planning; development of energy-related codes and regulations etc.

3.1. Research objective

Given the issue described above, the research objective is to apply research tools to formulate recommendations on how to increase profit in AEEC LLC by optimizing the costs of existing services and by broadening its clientele base through business transformation. The relevant analysis and suggested recommendations were continuously discussed with Dr. Vilayat Valiyev, the founder of AEEC and the client for this Business Consulting Project, and AEEC staff.

My personal goal with this project is to apply, from a practical point, the knowledge gained during the joint ADA/MSM EMBA course and come up with applicable solutions for a real business case. This research study is aimed at contributing to the operational growth and excellence of AEEC LLC.

3.2. Research questions and sub questions

The consulting project will examine the following research questions:

1. How can business transformation be conducted to ensure the sustainable operation of the company under new circumstances?
2. How can costs be optimized to ensure the least-cost services to SOCAR while maintaining an adequate level of profit?

The relevant sub-questions for research include:

1.1. Development of a new short-term corporate strategy – this strategy will be based on a business transformation road map for the company focusing on multi-sector rather than single-sector for its engineering services

2.1. Analyze historical service costs, including labor costs and material costs

IV. Research method

The research methods used during the preparation of this business consultancy report are personal observations of AEEC's engineering activities by the author, research of academic literature on operation cost optimization and business transformation, and interviews with AEEC representatives.

The primary data source is based on interviews with AEEC's founder Dr. Vilayat Valiyev, the client for this business consulting project, the current company president Ms. Antiga Gasimova, the Head of Finance-Accounting Mr. Urqand Karimov, and the Lead Engineer Mr. Bayram Mammadov. The interviews with the abovementioned cover issues on managing engineering services, how these services are rendered, what costs are incurred during these services, and the future outlook of the company with regard to engineering services, followed by the request on the data about AEEC. The detailed information on the interviews is provided in Appendix 8.

The secondary data includes:

- Data from State Statistics Committee of Azerbaijan Republic
- AEEC's annual profit and loss statements (summarized in Appendix 5)
- AEEC's organizational structure (Appendix 9)
- AEEC's labor and material costs (Appendix 7)

The following qualitative models/concepts were applied for the research question:

- SWOT analysis
- VRIO analysis (inside-out)
- Porter's Five Forces (outside-in)
- Change Management
- Business Model Canvas
- Ansoff matrix (market development, market penetration, product development, diversification)

- Strategic Innovation
- Value chain, value shop and value network
- Least square regression

The abovementioned tools and approaches were discussed with the client. The client requested these tools and approaches be applied and the results be discussed (see Appendix 8 for the details of interview).

V. Literature review

5.1. Literature review on cost optimization

Prior to discussing cost optimization, it is necessary to look at the cost concept itself. Cost is the money paid to input resources which are required to provide a certain level production or services. *"Accountant define cost as a resource sacrificed or forgone to achieve a specific objective. A cost (such as direct materials of advertising) is usually measured as the monetary amount that must be paid to acquire goods or services"* (Horngren C., Datar S. and Rajan M., Cost Accounting: A Managerial Emphasis, p. 26).

From an operational point and for the purpose of this study, the second step in cost issue is to define fixed and variable costs. According to Horngren C., Datar S. and Rajan M., *"A variable cost changes in total in proportion to changes made in related level of total activity or volume. A fixed cost remains unchanged in total for a given time period, despite wide changes in the related level of total activity or volume."* (Horngren C., Datar S. and Rajan M., Cost Accounting: A Managerial Emphasis, p. 30). The fixed and variable costs have similar definitions from an economic perspective (McGuian J., Moyer R., Harris F., Economics for Managers, p.281). In this regard, *office lease costs* seems the only fixed for the examined period (2010-2014) from the available cost data on AEEC (see Appendix 5), while all other costs are variable.

The third step is to examine the cost function concept in a research context. *"A cost function is a mathematical description of how a cost changes with changes in the level of an activity relating to that cost"* (Horngren C., Datar S. and Rajan M., Cost Accounting: A Managerial Emphasis, p. 341). The cost function is required to conduct analysis on *profit maximization* concept, which is sometimes deemed as an alternative to *cost optimization* concept. In this regard, a helpful cost function is *least square regression method.* By concept, *regression analysis is a statistical method that measures the average amount of change in the dependent variable associated with a unit*

change in one or more independent variables (Horngren C., Datar S. and Rajan M., Cost Accounting: A Managerial Emphasis, p. 352). In AEEC's case, the dependent variable is revenue, while the independent variables are input costs of labor and material costs (see Appendices 7 and 8 for detailed info). The initial step is to calculate the coefficient of determination or the measure of goodness of fit. The coefficient of determination expressed as r^2 denotes the percentage of variation in dependent variable explained by the independent variable (Horngren C., Datar S. and Rajan M., Cost Accounting: A Managerial Emphasis, p. 367-374). The range of r^2 is from 0 to 1, and the r^2 of 0.3 or higher is adequate level to pass goodness-of-fit test. But as the goodness-of-fit test is not always reliable, it is advised to calculate the standard error of regression. The smaller the standard error of regression, the better to see the adequate relationship between dependent and independent variables. This is assumed for linear regression. In other words, the dependent variable changes with the lesser amount as per the change of independent variable, unlike in the case with linear regression. It is therefore possible to calculate the elasticity of the dependent variable with respect to independent variable, i.e. the percentage change in dependent variable for a percentage change in independent variable (Gujarati D., page 180-181).

Along with the mathematical tools of cost optimization, it is also important to differentiate between *cost optimization* and *cost cutting*. *"While cost cutting is solely focused on reducing expenditure, cost optimization is broader in scope. As well as cutting costs, cost optimization activities can include, for example, the reallocation of funds so that an investment in one area leads to an even greater saving in another area.*

It is important to recognize that, in fact, all cost cutting requires an investment. Even the simplest cost cut requires some level of analysis and human effort" (Khoury G., Innovative Cost Optimization. A Creative Approach to Finding New Cost Optimization Opportunities, p. 2).

From traditional microeconomic theory, profit maximization occurs when Marginal Revenues (MR) per unit of product/service sold is equal and higher than the Marginal Cost (MC) per unit of product/service. However, it is necessary to use more comprehensive tools, such as multiple regression for holistic research results. For research purposes, we will deem both profit maximization and cost optimization as having the same objective for this project.

In line with the use of mathematical concepts for profit maximization and cost optimization, it is essential to review the theoretical background on achieving them. A.Dey (10) identifies ten different approaches to achieve profit maximization:

- Innovation
- Brand image – not applicable to AEEC due to small company size
- Customization – Mass Customization – not applicable to AEEC as it is more product related
- Customer collaboration – This will be essential for AEEC as it has been historically receiving orders from SOCAR and has less collaboration initiatives (i.e. AEEC "passively" receives orders from SOCAR due to long-term proven confidence)
- Long tail effect – AEEC will develop new services other than traditional electrical maintenance to achieve this concept
- Operational excellence – AEEC needs to review its corporate management to effectively oversee business processes
- Outsourcing –AEEC may outsource the works, in which it is not competent, to third party firms to timely and properly meet customer requirements
- Value engineering – similar to a cost optimization approach
- Moving away from unprofitable customers – not applicable in AEEC's case
- Reducing quality – not applicable in AEEC's case

G.Khoury (20) suggests his approach for an *innovative cost optimization*:

- Establish objective of cost optimization
- Harvest ideas on cost optimization
- Classify defined ideas
- Filter ideas
- Detail ideas
- Develop plan on cost optimization
- Implement & review the developed plan

J.Way (40) proposes generic activities compared to other authors: *product differentiation*, *low price strategy*, *control cost*, and *maintain market share*.

Based on the above different views on cost optimization and profit maximization, we can come up with a set of suggested actions for AEEC's engineering services as follows:

- *Evaluate the optimization range for labor and material costs*
- *Apply cost optimization firstly to SOCAR-related contracts gradually shifting to other clients*

- *Control over service quality while implementing cost optimization.*

5.2. Literature review on innovation and business transformation

Innovation and business transformation concepts have been well discussed in academic literature.

D.Muzyka et al (26) describes business transformation as becoming "entrepreneurial corporation". *"Becoming an entrepreneurial corporation means becoming an opportunity-focused organization. Opportunity focus creates a more fluid organization, one which organizes and reorganizes around the opportunities being exploited"* (D.Muzyka et al, p. 12).

L.Faeste et al (14) describes the case of a German health insurance company which can be considered as a good example for service company transformation:

- A better client-service model
- Improved customer access
- Organization simplification

M.Fang (15) explains the business model innovation in a holistic approach which can be attributed to business transformation and innovation: *"Business model innovation includes customer interface innovation, enterprise core strategic reform, strategic resources regaining and restructuring and the optimization of the value network, all of which belong to the technology innovation, management innovation, market innovation and system innovation"* (Fang M., p.3). This theory has similarities with the concepts described by D.Muzyka and L.Faeste.

J. Ward and A.Uhl (39) discusses the results of an analysis of 13 business case studies in information technology by summarizing the eight methodology disciplines of business transformation management. They can be considered as useful concepts to be applied to other businesses as well:

- Strategy Management
- Value Management
- Risk Management
- Process Management
- Program and Project Management
- IT Management
- Organizational Change Management

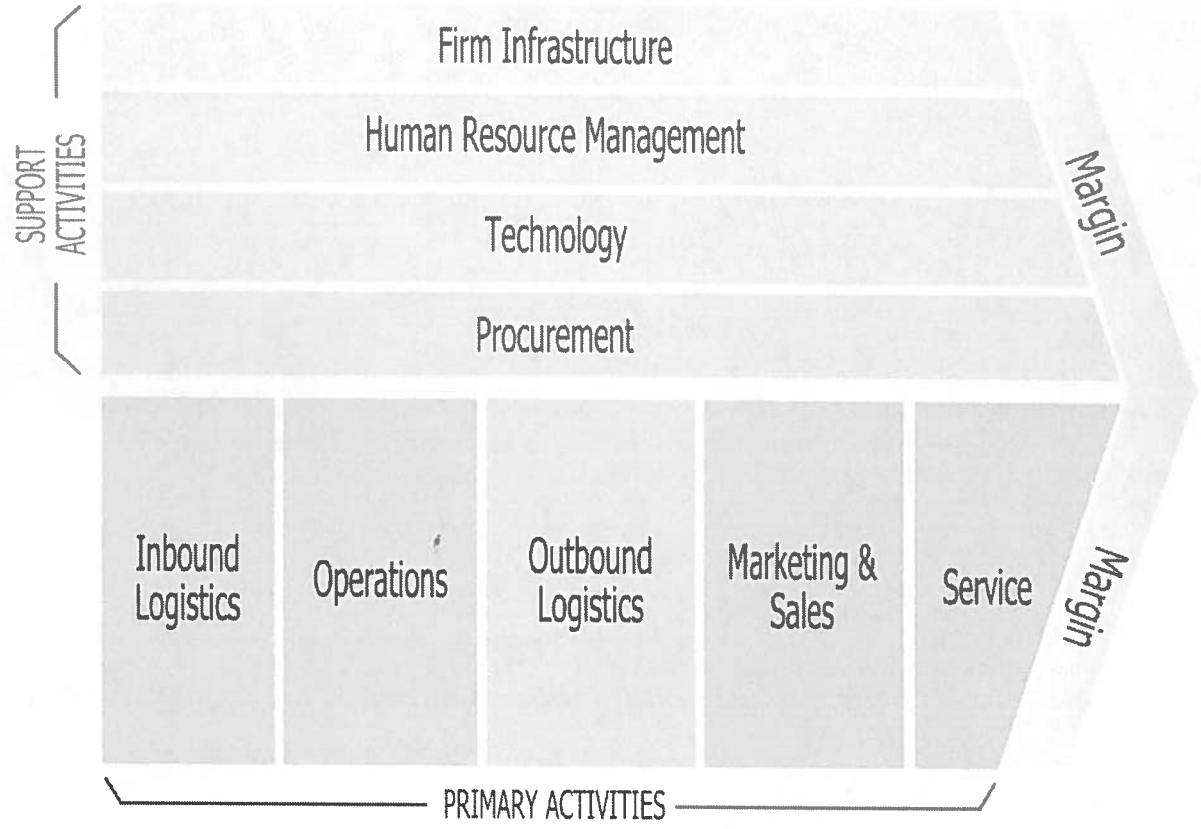
- Competence and Training Management.

C.Markides (22) defines innovation as some kind of *"breaking rule"* in the current market. But, *"how to break the rules depends on the business that the firm is in as well as the firm's strengths and weaknesses"* (C.Markides, p.3). Moreover, *"the first requirement for becoming a strategic innovator is to identify gaps before everybody else does"* (C.Markides, p.4). C.Markides further identifies five ways how to start strategic innovation:

- Redefine the business – *What business a company believes it is in determines who it sees as its customers, its competitors, its competitive advantage, and so on.*
- Redefine who the company's customers are
- Redefine what products and services the company will offer to its customers
- Redefine the way the company's current business is run
- Start the thinking process at different points – This envisages the continuous process of re-thinking the way of business and the approach to customers to meet their specific needs.

In any transformation or innovation process, *value* is central for companies to evaluate the progress. In this regard, it is useful to analyze the importance of value for customers using value configurations of *value chain*, *value shop* and *value network* models suggested by C.Stabell and O.Fjeldstad (36):

- Value chain – it is the model developed by Michael Porter and focuses on the chain of activities with regard to a company's main businesses. It shows how value is created from the inception of a product or service creation up to the sale phase. The scheme of value chain is as follows:



In the context of AEEC's engineering services, it is important to look at the *Inbound logistics* phase, which covers labor and material costs. From the value creation point, optimization of *labor* and *material costs* would increase the efficiency of services, thus creating value for customer by simply rendering the same services at a lower cost.

- Value shop – In this model, the company's objective is to solve the customer's problem. From AEEC's perspectives, its consulting services could be a focus to apply value shop. But since the project's goal was to analyze engineering service, it was agreed with the client not to cover consulting services.
- Value network – The firms of this model create value by facilitating networks among their customers via mediating technologies. This model is not reviewed in detail as AEEC do not belong to this category.

From the literature discussed above, the concepts contemplated by C.Markides, C.Stabell and O.Fjeldstad have been selected to be applied for suggesting a certain set of actions.

The concepts discussed above will also require some kind of *change* in AEEC in order to achieve the envisaged objectives. It is sometimes challenging to implement change in companies due to potential "resistance" and "misperception". To meet this challenge, AEEC management is advised to follow Kotter's eight steps of change management (Remme J. et al, page 140-142). These steps are also helpful in informing the staff on the need for change caused by *pressing external environment and competition* (please see Appendix 8 for detailed interview on the subject):

1. Establish a sense of urgency – informing the staff on the need for change given the challenging external environment
2. Creating the guiding coalition – making changes requires the forming of an effective intra-company team. As per the interviews with AEEC staff, the suggested team would comprise of the client (Dr. Vilayat Valiyev), President Ms. Antiga Qasimova, Head of Finance-Accounting Department Mr. Urqand Karimov and Lead Engineer Bayram Mammadov.
3. Developing a vision and strategy – New vision of diversified and cost efficient company will be developed to achieve the changes (i.e. diversification of sector of operation and potential cost optimization)
4. Communicate the change vision – The team will persistently communicate to all staff on the vision to in order to educate them
5. Empower broad based action – The team will also inspire others to actively participate in the change process
6. Generating short term wins – The expected increase in revenues during the change process will be used as "wins" to inspire others
7. Consolidating gains and producing more change – The team will review the set of actions on change to identify barriers and to work towards their elimination. It will also expand the scope of change-related activities for greater changes.
8. Anchoring new approaches in the culture – The team will develop a culture of change practice after successful change to apply in other changes.

VI. Data analysis and findings

6.1. Cost related analysis

With reference to the review of academic literature, we can now apply the regression tool. The overall objective is to determine the level of impact of labor and material costs on revenues. This would help to assess the potential for their reduction with revenues remaining constant. For this purpose, the monthly data revenues, labor and material costs are lined up in datasets (see Appendix 10). In terms of regression function, the monthly revenues are called as dependent variables of Y, and the labor and material costs are called as independent variables of X_1 and X_2. Let's make a hypothesis that labor costs could be cut by 30%.

We firstly apply a multiple regression analysis in Excel. The coefficient of determination is low (0.06) indicating low correlation between Y and X_1 and X_2. Moreover, the p value is only adequate for X_2 (i.e. 0.05). The coefficients for both variables are positive indicating that the quantitative increase of the variables would increase the dependent variable.

The very low level (6%) dependence of revenues on labor costs on monthly basis suggests that the assessment of labor costs impact with the given time series of revenues doesn't seem logical. As seen from the chart, the given time series of revenues has a trend of deviation from the median and is not consistent with relevant labor input almost every month. The outliers observed mostly at yearends "detriment" the normal distribution per time series, and cannot reveal the impact of the labor input made on monthly basis.

This case is also due to nature of rendering engineering services. AEEC's engineering team renders services on continuous basis based on periodically concluded contracts. While services are rendered in one month, the documentation of implemented works is done in subsequent months. Moreover, the formal handover per client facilities is completed mostly at yearend periods. This has resulted in so-called "distorted" data on revenues (i.e. outliers) observed in relevant trend chart (see Appendix 10).

Given the low-level volatility for labor costs in the given monthly series, it would be more logical to evenly divide the total annual amount of revenues per month to properly assess the impact of labor costs.

To this regard, the total revenues per each year is therefore divided evenly in monthly time series. This would help to show the impact of labor costs on monthly basis. While the monthly labor costs fluctuate only to a certain extent, the annual amounts of labor costs fluctuate to a larger

extent. Such series of data enables to trace the relations. It should be noted that revenues change in correlation with material costs. The material costs cannot be therefore reduced.

The overall coefficient of determination and p value for multiple regression are adequate now (0.86 and 0.001 respectively), although individual p values for X_1 and X_2 are not acceptable (see Appendix 10). The results also reveals the negative coefficient for labor costs (-0.44), while positive for material costs. The relevant equation showing the relations between Y and X_1 and X_2 is as follows:

$$Y=16291.2-0.44X_1+1.896\,X_2$$

As it seems from the dataset, the increase of aggregate labor costs starting from 2010 created a "grounding" for revenue increase for the period up to 2013. However, the labor costs increase in 2014 didn't result in corresponding revenue increase. The potential labor cost reduction should be therefore applied to year 2014 as it was the latest salary base. So, we conduct regression analysis for this year revenues and labor costs. The analysis shows very 1 for coefficient of determination, but p value is undefined and coefficient is zero. We cannot therefore make a reasonable judgement.

The next step is to calculate the values of Y based on above equation. Let's call it Y_1. Then we reduce the monthly labor costs for 2014 by 30% (i.e. reverting to our initial hypothesis) and re-calculate Y again. Let's call it Y_2. Finally, we calculate the percentage change between Y_1 and Y_2 to see the impact of labor cost cut. The results are shown in Appendix 10.

The results reveal no percentage change between Y_1 and Y_2, except the values for the year 2014. The revenues seem increasing for the year 2014. Thus, we can conclude that the reduction of labor costs by 30% for the year 2014 is possible.

6.2. Business transformation, innovation and value creation related analysis

From the literature review on transformation, innovation and value creation, the concepts contemplated by C.Markides, C.Stabell and O.Fjeldstad can be applied to answer the research question on achieving sustainable operation. Thus, *value creation* and *customer diversification* can be regarded as the central point for drawing final practical conclusions by applying analytical tools.

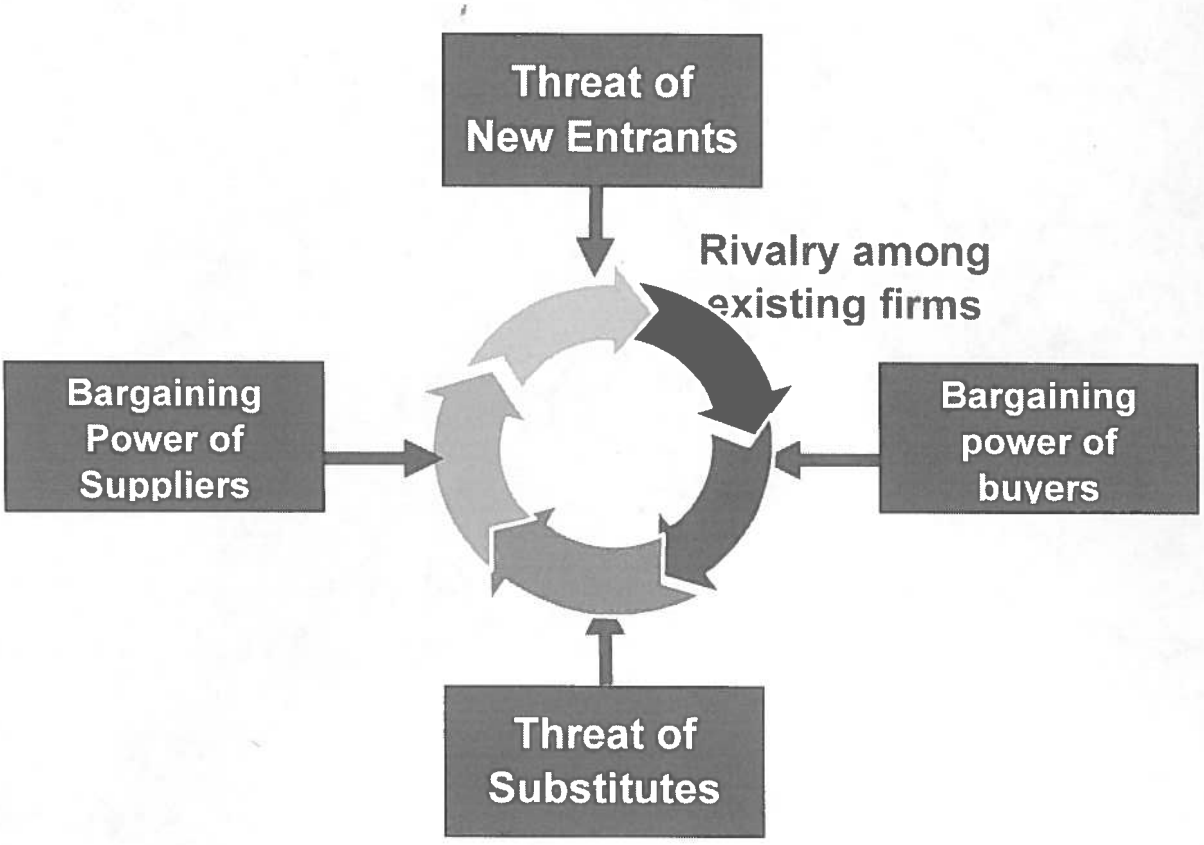
In this view, the analytical tools will implement the following set of suggested *tasks* for AEEC's engineering services, prior to making final conclusions and recommendations:

- *Review the current engineering services offered to clients – should AEEC be focused on traditional engineering service, or offer additional services that could bring more value to*

its customers? In cases where there is a need for additional services, do AEEC's staff possess the necessary knowledge and skills to render those services?

- *Review the current clientele base of AEEC – the key point here is not to renew AEEC's current clients, but rather to diversify the client base. In other words, it is important to retain current clients and gain new clients by offering engineering services in sectors other than oil sectors. Finally, the communication and interaction with clients will be intensified with more concentration of specific customer needs.*
- *Develop a short-term road map to implement business transformation.*

The first tool is "Five Forces Model" developed by Michael Porter for industry level analysis (Porter, M. 1998, *Competitive Strategy.* New York: Free Press, pp. 3-5.).



FIVE FORCES	DESCRIPTION
Rivalry among existing firms	• Existing competitors, such as Qafqaz Energo Service, are competing to capture larger market share in SOCAR's electricity services contracts. Additionally, Azenco JSC and other electricity services already have significant share in non-oil sectors
Threat of new entrants	• With the cost optimization policy at all state institutions and companies, companies such as Azenco JC traditionally engaged in non-oil industries may switch to the oil sector due to large international projects and sustainable revenues
Bargaining power of suppliers	• The devaluation of the Azerbaijani Manat against the US Dollar by 35% in February 2015 has resulted in price increases for certain imported electrical goods and materials used by AEEC for its maintenance services. This might enable suppliers to "dictate" their pricing "rules"
Bargaining power of buyers	• SOCAR and other companies operating in the oil sector have started reducing costs due to volatile oil prices that affected their revenues. • Although the oil sector made an essential contribution to Azerbaijan's GDP during the oil revenues boom of 2006-2012, the non-oil sector has been growing steadily since 2012 (see Appendix 6)[1] in line with Government of Azerbaijan economic diversification policy. The non-oil sector has thus become a new niche for electricity service companies, which have traditionally relied on the "high profit "oil sector.
Threat of substitutes	• New electric maintenance service providers may emerge in the market providing services to oil and non-oil sector clients. Moreover, AEEC's current oil sector clients (SOCAR, Bahar Energy, etc.) may establish an internal subsidiary or unit to be engaged in electric maintenance services for its own facilities for cost reduction purposes.

In conclusion, from the perspective of *value creation*, AEEC should focus on the *optimization of its engineering services costs* to be competitive and sustainable for both oil and non-oil sector clients.

The second important tool is SWOT (Strengths, Weaknesses, Opportunities and Threats) (Manketelow, J and the Mind Tools Team, SWOT Analysis. Discover New Opportunities, Manage and Eliminate Threats).

[1] Source: State Statistics Committee of Azerbaijan Republic

INTERNAL	**STRENGTHS** • Long-term industry experience in providing repair services to electricity supply facilities of oil & gas industry companies • Availability of skilled labor force, equipment and machinery to handle client orders	**WEAKNESSES** • Dependence, to the greatest extent, on oil & gas industry clients • Lack of well-defined cost strategy that would enable cost optimization
EXTERNAL	**OPPORTUNITIES** • Growing market for electrical repair services in non-oil sectors, such as power, transport and energy efficiency • Large international oil & gas and transport/logistics projects, creating market opportunities	**THREATS** • Volatile oil prices that have forced oil companies to reduce funds for outsourced services • Volatile prices of electric equipment and materials exposed to exchange rate fluctuations • Competitors which have good market positions in other industries, along with oil & gas industry, for electricity facilities repair services

In conclusion of SWOT analysis, AEEC should focus on *customer segmentation*, i.e. operation in sectors other than the oil & gas sector.

The third useful tool is the VRIO framework. It is an abbreviation of four questions (Valuable, Rarity, Imitability, and Organization) used to analyze the competitive potential of a firm:

"…

1. *The Question of Value – Does a resource enable the firm to exploit an environmental opportunity and/or neutralize an environmental threat?*
2. *The Question of Rarity. Is a resource currently controlled by only a small number of competing firms?*
3. *The Question of Imitability. Do firms without a resource face a cost disadvantage in obtaining or developing it?*
4. *The Question of Organization. Are a firm's other policies and procedures organized to support the exploitation of its valuable, rare and costly-to-imitate resources?...*"

(Barney, Jay B and Hesterly, William S. Strategic Management and Competitive Advantage: Concepts and Cases. 2012 Pearson Education, Inc.)

As discussed in the introductory part of this report, AEEC is experienced in handling of electrical equipment repair and installation at oil fields for oil & gas companies with a cost-effective approach. From this perspective, the following competencies and resources have been selected for AEEC for VRIO analysis:

Competency	**Valuable?**	**Rare?**	**Difficult to imitate?**	**Supported by organization?**	**Conclusion**
Labor force for engineering service	Yes	No	No	Yes	Competitive parity
Equipment and tools	Yes	No	No	Yes	Competitive parity
The way of rendering services	Yes	Yes	No	Yes	Temporary competitive advantage

It can be concluded that the current business model of AEEC is the *Temporary Competitive Advantage*, in terms of both internal and external environments. However, energy service companies in Azerbaijan are biased towards not being innovative due to a lack of demand for innovation. Nevertheless, the decline in oil prices has forced both oil & gas companies and energy service companies to think about innovation. Thus, the current business model will be a short-term advantage, and AEEC will need to offer *new services* to be competitive, i.e. *innovation* in its business.

The third tool is Business Model Canvas (27). We can apply it to illustrate AEEC's current engineering services as below:

Business Model Canvas for AEEC's engineering services (current business model)

Key partners	Key activities	Key resources	Value Propositions	Customer Relationships	Customer Segments	Channels	Cost structure	Revenue Streams
Equipment & material suppliers	Providing construction and maintenance services to oil & gas companies regarding lines and substations	Skilled engineering team; Vehicles and tools	Specific maintenance & construction services to electrical substations and lines supplying electricity to oil wells	Dedicated service to clients	Oil & gas companies	Direct communication with engineering teams of oil & gas companies	Variable costs: - Labor costs (5-20%) - Material costs (40-50%) - Fuel costs & vehicle maintenance costs Fixed costs- office lease costs	Payment as per milestones of work

As mentioned in earlier paragraphs, AEEC's engineering services comprise mainly of labor and material costs. So, the optimization of these costs would be an effective way in terms of *value creation* for clients only for the *current business model* of engineering services.

The discussed three tools (Five Forces, SWOT and Business Model Canvas for current engineering services) suggest very crucial points on AEEC's further operation of engineering services. That is, AEEC's engineering service will be *temporarily effective* in retaining current and gaining new clients, even though they will be o*ptimized.* Thus, it should offer *new services* in current and potential other industries.

One potential area that AEEC is interested in, as per discussion with the client, is *energy efficiency and energy audit ("One interesting trend we are observing now is energy efficiency and energy audit. I guess our business consulting project outcomes will consider this a growing area as well"- Dr. Vilayat Valiyev, the founder of AEEC).* Although having rich fossil fuels, Azerbaijan still lags behind developed countries in terms of efficiency of energy use. *Azerbaijan has one of the highest energy intensities in Eastern Europe, indicating a low level of energy efficiency. Contributing factors include outdated technology, inefficient equipment, limited pollution control mechanisms, inadequate waste management, and the poor quality of raw materials*[2]. Appendices 1 and 2 illustrate the energy consumption and intensities trends for 2008-2013[3]. Furthermore, "Azerbaijan 2020: Look into the Future" Concept of Development (1) approved by the President of Azerbaijan Republic in 2012 sets forth the need for efficient use of energy resources, which requires state companies to focus on energy efficiency ("Azerbaijan 2020: Look into the Future" Concept of Development, page 9).

The Azerbaijani government has defined clear targets for economic growth. Economic growth will increase energy demand, in other words, result in more energy consumption. Therefore, there is significant potential for energy efficiency in both the industrial and household sectors of Azerbaijan. For instance, annual cost savings could be approximately 55.8 million USD just from efficient lighting in the residential, commercial/industrial and outdoor sectors[2].

Another aspect that was witnessed during the application of the three tools above was the sustainability of the current industry in the sphere of operation of AEEC – i.e. the oil & gas industry. Oil & gas and the overall mining industry have constituted a very high proportion of the GDP of Azerbaijan over the last ten years. However, it has been experiencing a downward trend since 2012 due to the increasing share of non-oil GDP (see Appendix 3) since the country has become much more focused on the diversification of the economy. Unlike the mining industry, the

[2]addis.unep.org/projectdatabases/00943/project_general_info
[3]Source: State Statistics Committee of Azerbaijan Republic

	Existing services	New services
	MARKET PENETRATION (current services to SOCAR)	**SERVICE DEVELOPMENT (new services for existing clients)**
Existing industrial sectors	• Current market is limited mainly to SOCAR (**96%**) and to some extent, other companies (**4%**) (see Appendix 4) • AEEC's current services covers the repair and maintenance of electric substations and transmission lines, as well as inspection and laboratory services for electric facilities	• AEEC can provide energy efficiency and energy audit services for SOCAR and other existing companies • AEEC retains existing clients (SOCAR and others)
New industrial sectors	**MARKET DEVELOPMENT (new industrial sectors and current services)**	**DIVERSIFICATION (new industrial sectors and new services)**
	• AEEC can provide services to various sectors (automobile, railway and marine industries), rather than oil & gas only • AEEC retains the current services covering the repair and maintenance of electric substations and transmission lines, as well	• AEEC can provide services to various sectors (automobile, railway and marine industries) • AEEC retains the current services covering the repair and maintenance of electric substations and transmission lines,

[4] http://mot.gov.az/az/content/443#.VX7mYJMxW4Q

	inspection and laboratory services for electric facilities	as well inspection and laboratory services for electric facilities • AEEC can provide new service of energy efficiency and energy audit

Summarizing the findings of all tools on cost optimization, business transformation and value creation, the following list of areas for AEEC's attention have been identified following joint discussion with the client and AEEC team:

- *Reduction* of labor costs associated with engineering services – i.e. *value creation* for AEEC in terms of cost efficiency
- Offering *new engineering services* other than current
- *Customer segmentation* – i.e. new industries for operation

VII. Conclusions and recommendations

Using the findings in the previous section, the following three recommended scenarios that AEEC can consider for future activities have been discussed with and recommended to the client (see Appendix 8 for relevant interview with the client on scenarios):

I. *"Business as usual but with optimized services"* – AEEC continues to provide services to SOCAR and other current clients in the oil & gas sector based on *optimized* engineering services costs. It would be useful to keep them in the pool of clients due to their existing long-term relationships and to their significant financial resources. However, these types of clients will not be core as previously.

II. *"New industries for operation with optimized engineering services"* – AEEC provides services to potential clients in other sectors with regard to electric installations works, such as automobile repair, railway and marine, but with optimized costs.

III. *New services for the clients in the "traditional" sector and for potential new clients in other industries* – With the growing trend towards energy efficiency and energy audit activities in Azerbaijan, AEEC can transform itself into an Energy Service Company

(ESCO) providing services on energy conservation to large industrial customers. Additionally, after gaining relevant experience, AEEC can extend these services to residential customers.

The second and third scenarios fall well into the concepts proposed by C. Markides.

The above scenarios can be summarized in a concrete short-term action plan. The suggested AEEC team for implementing the plan will comprise of the Company Founder, Company President, Head of Financial-Accounting Department and Lead Engineer. The expected roles of each of the team members are as follows:

- Lead Engineer:
  (1) Arrange the training on electricity services for AEEC's engineering team in the following specializations:
    - energy efficiency and audit
    - electrical maintenance in the transport sector
    - electrical maintenance services in the traditional electricity sector
  (2) Conduct technical industry analysis on energy efficiency & audit, automobile repair services and maritime industry to assess the potential demand and focus on potential clients
  (3) Continue rendering engineering services to current clients with optimized costs

- Head of Financial-Accounting Department:
  (1) Conclude long-term fixed price contracts with material suppliers to ensure continuous material logistics and avoiding material price increase
  (2) Optimize labor costs reducing them by 30%

- President of AEEC:
  (1) Promote and communicate to the management of current and future clients the details of new services of energy efficiency and audit
  (2) Communicate to AEEC staff the need for change – i.e. rendering new services of energy efficiency and audit

- Founder of AEEC – overall supervision and guidance during the implementation of the short-term plan

The proposed short-run action plan for AEEC innovation and business transformation (September-December 2015 and Year 2016)

	2015 (September)	2016 (December)
INTERNAL CONTEXT	• Conclude long-term fixed price contracts with material suppliers to ensure continuous material logistics to avoid material price increase • Optimize labor costs by reducing them by 30% • Develop new value-added services for SOCAR and other current clients, i.e. energy efficiency and energy audit	• Arrange training on electricity services for AEEC's engineers team on the following specialization: ▪ energy efficiency and audit ▪ electric maintenance in transport sector ▪ electric maintenance services in traditional electricity sector
EXTERNAL CONTEXT	• Continue the provision of traditional electricity maintenance services, to SOCAR and other current clients, in more cost-efficient way with regard to labor costs • Communicate with SOCAR and current clients on promotion on new value-added services of energy efficiency and audit	• Commence the thorough technical industry analysis on the following sectors for future involvement in electricity maintenance: ▪ Energy efficiency & audit ▪ Automobile repair services ▪ Maritime industry

While the above action plan presents concrete actions for the short-term, it is also recommended to have some long term insight up to 2020. In the long-run, AEEC is advised to explore new innovation opportunities, such as smart grids, other than energy efficiency and audit.

VIII. Limitations of this project report

This study has made an attempt to cover the issues on how to transform a business model of an energy service company operating in the energy sector of Azerbaijan and how to reduce its operating costs as required by challenges of external environments. It has, to some extent, dealt with cost optimization and business model change in the case of one particular company and proposed specific recommendations as per the case.

However, the project report preparation process had certain limitations. One of the client's requests was to analyze the potential of maritime and automobile industries from the point of

electrical maintenance services, as well the potential for energy efficiency and audit. This was done by the author only to a limited extent due to limited data on the subject. It was agreed with the client that this analysis will be continued by AEEC itself.

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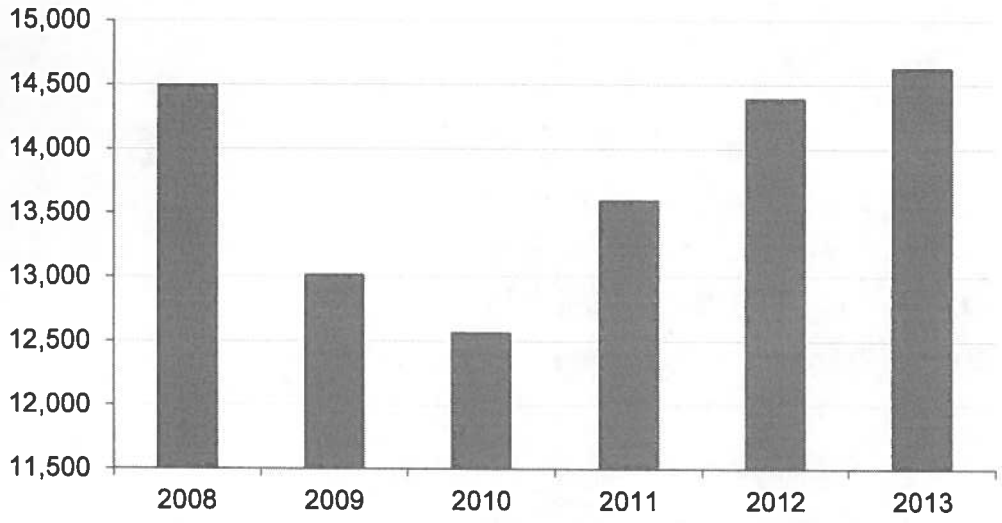
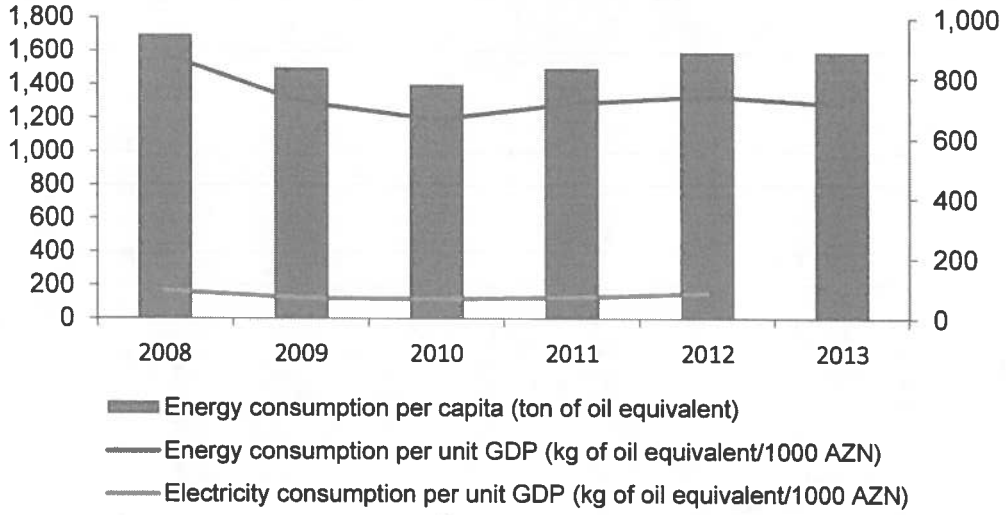
X. Appendices

Appendix 1. The volume of total energy supply in Azerbaijan (thousand tons of oil equivalent)

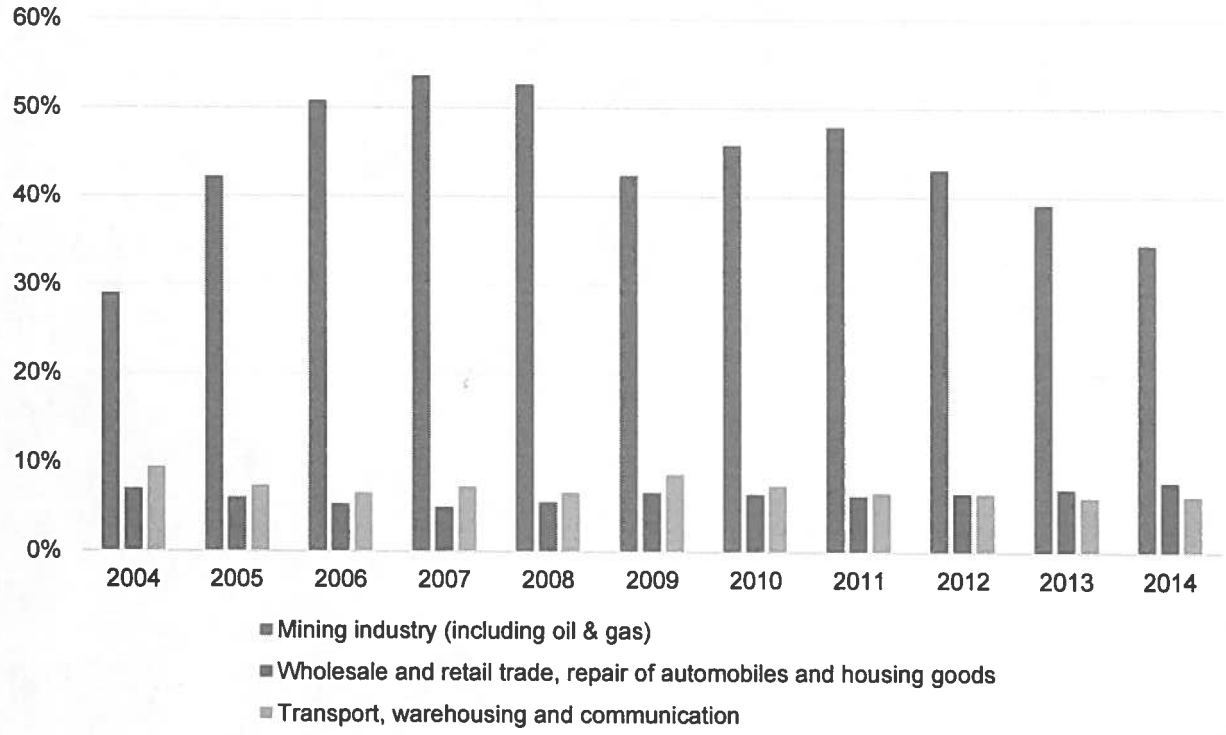


Appendix 2. Energy consumption intensity in Azerbaijan[5]

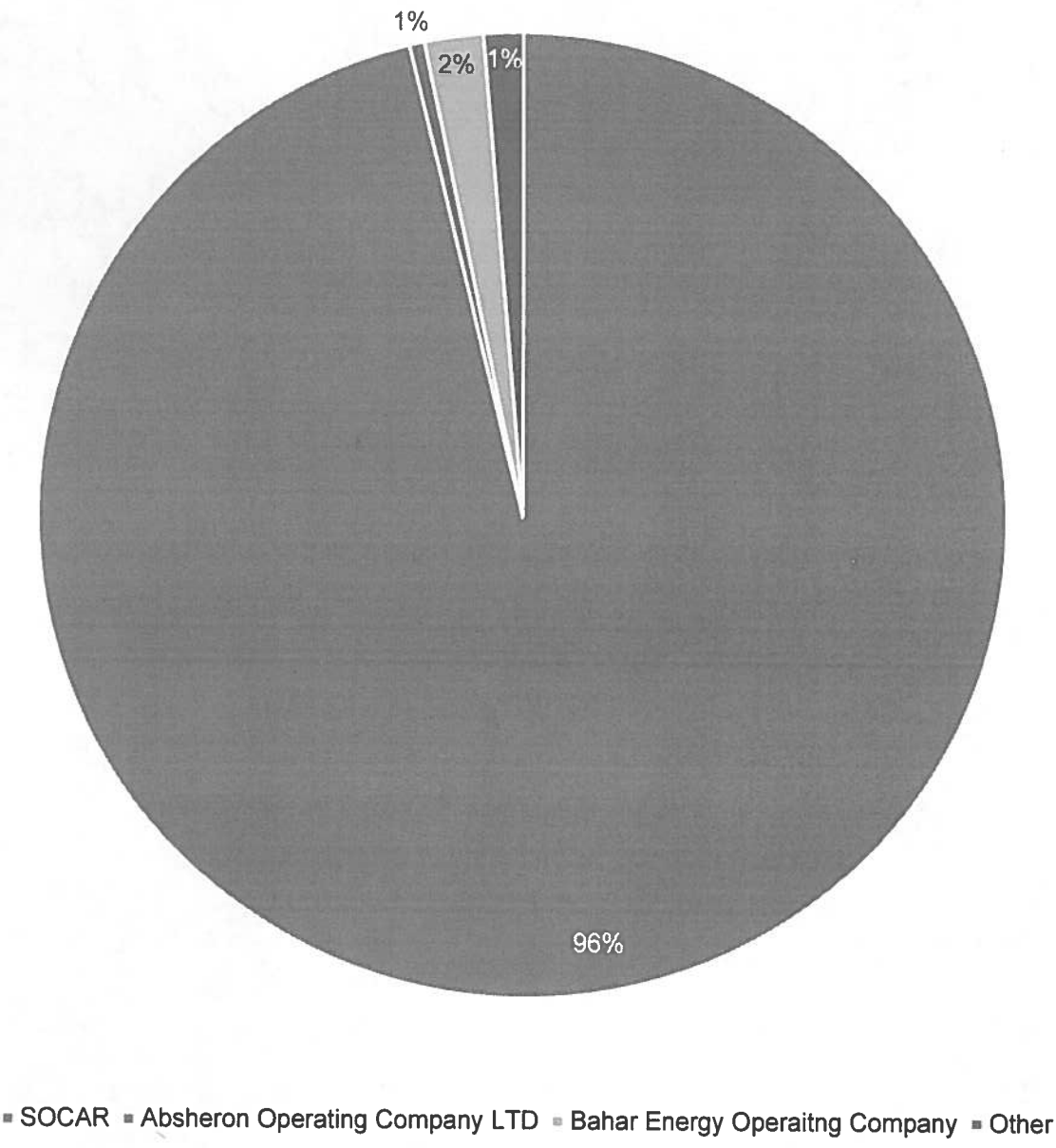


[5]Note: USD/AZN exchange rate as of 07.08.2015 is 1 USD=1.0497 AZN (Source: Central Bank of Azerbaijan Republic, www.cbar.az).

Appendix 3. The share of the mining industry, repair of automobiles and transport/communication in Azerbaijan's GDP in the last ten years (in percentage)



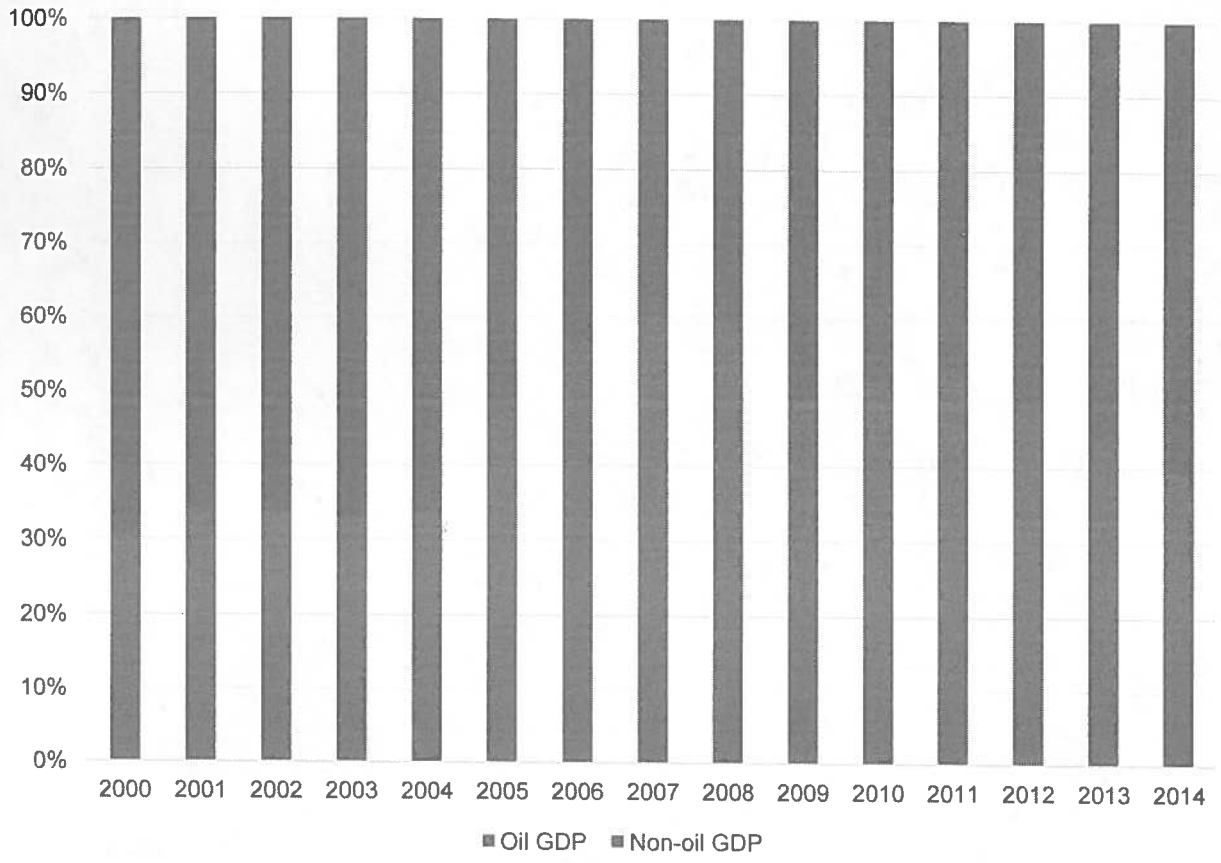
Appendix 4. Breakdown of AEEC clients as per contract share (as of 2014)



Appendix 5. Profit and Loss Statement for AEEC (consolidated on the reports provided by AEEC in Azeri)

Azerbaijan Manat	**2010**	**2011**	**2012**	**2013**	**2014**
REVENUES					
Total revenues from services	**895,651.3**	**1,020,650.6**	**722,907.0**	**1,078,918.3**	**638,670.3**
EXPENDITURES					
Cost of services, including:	*688,720.0*	*705,911.1*	*530,892.4*	*846,938.8*	*529,698.4*
Salaries and related payments	*71,440.7*	*78,260.0*	*104,108.6*	*116,663.6*	*131,883.3*
Payments to Social Fund	*17,860.2*	*17,217.2*	*22,903.9*	*29,165.9*	*32,970.8*
Raw materials	*399,886.4*	*386,278.8*	*249,782.7*	*488,062.4*	*294,000.0*
Lease costs	*10,800.0*	*10,800.0*	*10,800.0*	*10,800.0*	*10,800.0*
Local and international travel costs	*69,248.1*	*73,428.5*	*62,204.7*	*93,756.7*	*29,875.5*
Electricity costs	*630.0*	*896.1*	*943.0*	*1,651.0*	*896.4*
Fuel costs	*19,638.7*	*28,158.2*	*11,501.9*	*18,945.8*	*12,615.0*
Water and sewerage costs	*354.3*	*577.1*	*481.0*	*483.6*	*364.0*
Telecommunication costs	*5,911.4*	*6,839.7*	*5,871.2*	*4,402.4*	*4,750.6*
Bank service charges	*3,628.7*	*4,798.0*	*4,453.1*	*3,375.9*	*3,052.7*
Other costs associated with services	*89,321.5*	*98,657.5*	*57,842.2*	*79,631.4*	*8,490.0*
Bank interest payments	*10,204.7*	*5,248.5*	*825.0*	*672.0*	*1,926.4*
Research & development costs		*26,486.4*			
Depreciation, including:	*42,058.3*	*37,106.3*	*42,265.3*	*28,176.6*	*21,257.5*
Depreciation on machinery & equipment	*19,175.6*	*14,381.7*	*12,421.3*	*9,315.9*	*6,987.0*
Depreciation on vehicles	*22,882.8*	*22,724.6*	*24,480.9*	*18,360.7*	*13,770.5*
Amortization of intangible assets			*500.0*	*500.0*	*500.0*
Value of submitted fixed assets			*4,863.1*		
Maintenance costs, including:	*3,785.2*	*4,119.4*	*4,325.1*	*3,693.1*	*3,349.9*
Maintenance on machinery & equipment	*1,725.8*	*1,847.9*	*1,973.6*	*1,587.6*	*1,397.4*
Maintenance on vehicles	*2,059.4*	*2,271.6*	*2,351.5*	*2,105.5*	*1,952.5*
Insurance costs				*2,874.0*	*2,012.8*
Other costs	*48,505.2*	*82,762.0*	*41,983.8*	*66,718.0*	
Taxes, including:	*1,047.1*	*880.3*	*760.4*	*657.4*	*594.5*
Property tax	*671.1*	*503.4*	*383.5*	*307.5*	*244.5*
Road tax	*375.9*	*376.9*	*376.9*	*349.9*	*349.9*
Total for expenditures	**794,320.5**	**862,513.9**	**621,051.9**	**949,729.8**	**558,839.4**
Profit before tax	**101,330.8**	**158,136.6**	**101,855.1**	**129,188.4**	**79,830.9**
Corporate tax (20%)	**20,266.16**	**31,627.3**	**20,371.02**	**25,837.69**	**15,966.18**

Appendix 6. Oil sector vs. Non-oil sector share of GDP



Appendix 7. AEEC's monthly labor and material costs for the last five years (Azerbaijan Manat)

		January	February	March	April	May	June	July	August	September	October	November	December
2010	Labor	3,275	3,249	6,015	6,736	6,288	6,454	6,703	6,689	6,448	6,688	6,454	6,442
	Material	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324
2011	Labor	6,301	6,059	5,885	6,625	6,653	6,945	6,962	6,880	6,090	6,079	7,066	6,726
	Material	32,190	32,190	32,190	32,190	32,190	32,190	32,190	32,190	32,190	32,190	32,190	32,190
2012	Labor	7,188	6,749	7,308	7,235	7,130	7,163	9,887	10,306	10,749	9,952	10,002	10,439
	Material	20,815	20,815	20,815	20,815	20,815	20,815	20,815	20,815	20,815	20,815	20,815	20,815
2013	Labor	9,772	9,286	9,730	9,933	9,918	9,893	9,772	9,670	9,332	9,830	9,815	9,652
	Material	40,672	40,672	40,672	40,672	40,672	40,672	40,672	40,672	40,672	40,672	40,672	40,672
2014	Labor	9,451	10,835	10,985	10,979	11,055	11,697	11,254	11,316	11,357	11,318	11,077	10,559
	Material	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500

Appendix 8. Description of the interviews held with AEEC representatives

1. Interview with Dr. Vilayat Valiyev, the founder of AEEC LLC and the client for BCP

The interviews were held on May 2, 9, 16 and 23, June 6, 13, 20 and 27, and July 4, 11, 18 and 25. The interviews were held from 11 am to 2 pm on the mentioned dates. The following strategic-level questions were asked and feedback was provided. The operation-level questions were asked to other interviewees:

- *Please provide some short background information about AEEC LLC*

AEEC was established in June 2005 on the basis of Shems Energy LLC. Shems Energy LLC was established in 1998 with the merger of engineering firms «Mehri-2" (established in 1994) and RW Engineering and Consulting LLC (established in 1996). With about 17 years of experience, AEEC has been providing high quality engineering and consulting services in Azerbaijan's energy sector. The company performs engineering services on the installation, testing and adjustment of electrical equipment in the facilities of electric power supply of such leading companies of the country, as the State Oil Company of Azerbaijan Republic (SOCAR).

AEEC's clientele base of engineering services includes SOCAR, "Absheron" Operating Company, "Bahar Energy" Operating Company, "Gulf Driling Supply FZE" etc. The Company is currently supplying services for these clients.

AEEC has also implemented consulting services on the development of proposals for the economical and rational use of energy; the use of alternative and renewable sources of energy; restructuring issues natural gas, electricity and district heating; efficient, reliable and sustainable operation, management and technical development of electric, gas and heating utility companies. The company has rendered consulting services for local and international companies and institutions, such as World Bank, Asian development Bank, European Bank for Reconstruction and Development, USAID and BP.

AEEC possesses a certificate from Azerbaijan State Energy Control Authority for operation of mobile electric laboratories

The main directions of consulting services include:

- Rational and economic use of energy, audits of energy consumption;
- Assessment of need in energy resources, development of proposals on the rational organization of production, transmission, distribution and consumption of energy, advisory on regional energy market formation;
- Engineering and consulting services for all stages of mastering and the rational use of conventional energy resources (including hydrocarbon reserves). This also includes corporate improvement and business re-engineering (management, process improvement, business automation) for energy utility companies;
- Consulting services on the use of renewable (alternative) energy sources (wind, solar, biomass);
- Consulting services and expertise on the preparation of feasibility studies of investment programs and projects to attract capital;
- Consulting services on the restructuring and efficient organization of the fuel and energy complex;
- Consulting services to improve the regulatory base of the fuel and energy sector;
- Engineering and consulting services for the preparation of engineering and technical personnel and improvement of their professional skills for the relevant structures of the fuel and energy complex.

The main directions of engineering services include:

- Calculation of short circuit and overload during electricity transmission and relevant installation and commissioning of facilities and equipment for the instant, sensitive, selective and reliable relay protections and automation systems;
- Inspection of existing high-voltage electrical facilities and equipment and relay protection systems installed on these equipment;
- Engineering services in open and closed type distribution facilities at 6-110 kV substations;
- Engineering services at transformers of 6-35 kV voltage; oil, vacuum and gas-insulated circuit breakers; different switching devices; lighting systems; electric engines; in diesel and gas generators;
- Electricity engineering services at power supply systems of oil & gas fields;
- Installation and testing of power cables;
- Construction, repair and adjustment of overhead transmission lines, accumulator batteries and switching devices;
- Installation and repair of electrical measuring instruments in cabinets and switchboards.

- *Please provide information on the ownership structure of AEEC LLC*
  "The sole and 100% ownership of AEEC LLC belongs to me."

- *What are AEEC's mission and objectives from business perspectives?*
  "AEEC's mission statement is "Towards Efficient and Reliable Energy". The message behind the statement is that the ultimate goal of AEEC's engineering services is to make sure that client has uninterrupted power supply to its facilities with the most efficient supply scheme.
  AEECs objective is to become a leading energy engineering and consulting service company both within Azerbaijan and outside."

- *Does AEEC have any short or long-term plan? If so, please provide details. What are the expectations in terms of AEEC's future operations?*
  "Unfortunately, AEEC doesn't have any short or long-term plan. While the consulting services are subject to occasional opportunities, the engineering services have had a continuous path throughout AEEC's history. And the major problem with the lack of strategy or future planning was related to the major client – SOCAR. SOCAR has historically ordered our services, and we believed that this would be sustainable. We certainly have other clients as well, but they do not maintain such a large share of engineering services as SOCAR. AEEC's *competitive strength* and proven trustworthiness as a reliable service provider lies in long-term successful cooperation with SOCAR, since it has rendered services on *timely* and *effective* way.
  However, with the oil price drop we feel that SOCAR may reduce orders, and might even want to have its own subsidiary or internal division to handle electrical services as a result of *cost-saving efforts* in SOCAR. This has forced us to think about how we can become *more cost-efficient* so as not to lose SOCAR, our largest client.
  But another reservation we have is the *concentration* on SOCAR and other oil sector clients (e.g. Bahar Energy Operating Company and Absheron Operating Company). Should we keep relying on them? I guess we need to think about the non-oil sector of the economy, in other words, *to diversify our client base in terms of sector*, not be "trapped" in the

challenging oil sector. One interesting trend we are observing now is energy efficiency and energy audit. I guess our project outcomes will be considering this growing area as well. We will develop capacities for our staff to provide energy efficiency and energy audit services. I would request you check other industries, such as the automobile and maritime industries for AEEC's potential involvement. Let's discuss this further when you have the information.
On the other hand, maybe we will keep SOCAR and other oil companies in our portfolio by simply being more *value and customer oriented*, given our long-term collaboration with them?"

- *It seems we have identified the key problem for AEEC – a need to change the current "status quo" in terms of clients. I guess the next step will be the application of relevant theoretical tools to find a solution. Such tools could be SWOT analysis, VRIO framework, Porter's Five Forces, Business Model Canvas and Ansoff Matrix. As a brief introduction, these tools can be summarized as:*
    - *SWOT (Strengths, Weaknesses, Opportunities, Threats) – tool to assess the company's external and internal strengths and weaknesses to prepare a plan of action*
    - *Porter's Five Forces – tool to assess the company's position in terms of the competition in the relevant industry and prepare a strategy*
    - *VRIO framework – tool to assess the company's resources to identify the level of competitiveness this resource enjoys.*
    - *Business Model Canvas – tool to document the existing business of the company and make change activities based on it, if necessary*
    - *Ansoff Matrix – tool to devise strategies for future growth*
    - *Strategic Innovation – approach proposed by C.Markides focusing on three elements: who (customers), what (products or services offered to customers) and how (the way products or services offered)*
    - *Value chain, value shop and value network models analyzed by C.Stabell and O.Fjeldstad – the core idea of this approach is to increase value for customers.*

  "Let's apply these tools and we can then discuss the results".

- *As discussed earlier during the inception phase of our project, it is also important to achieve operation cost optimization. I guess we also need to apply some theoretical tools to check the possibility for this. One such tool could be least square regression given two independent variables of labor and material costs.*
  "Let's apply the tool and we can then discuss the results. I think you should talk to the Head of Financial-Accounting Department on the issue, too".

- *The regression analysis revealed some elation between revenue and labor and material costs. It is also interesting to see that the labor costs were the highest in 2014, albeit the revenues were down in the same year. However, I have calculated the revenues based on the equation compiled from the coefficients for labor and material costs found from regression analysis results. As mentioned by the Head of Finance-Economic Department, it is feasible to reduce the labor costs by 30%. Taking this as a hypothesis, I re-calculated revenues based on the labor costs reduced by 30%. Finally, I found the percentage change*

between the initial revenues and the revenues after labor cost reduction. Basically, the labor costs can be reduced by 30% from the year 2014 level.
"That is good that we can optimize labor costs. However, we have to keep in mind that AEEC's engineering services for electrical maintenance in oil & gas sector is a temporary advantage, and we need to have some non-cost actions to be competitive".
Then such actions would be business transformation, innovation and value creation.

- *Dr. Valiyev, it seems our joint business consulting project outcomes are three potential scenarios as discussed. These are "Business as usual – current engineering services for existing clients", "Current engineering services within new industries of operation (new clients)" and "New services for both current and potential future customers". New services includes energy efficiency and energy audit. The second and third scenarios imply customer segmentation and business transformation, namely transformation from traditional engineering services in construction and repair to new services in energy efficiency and audit. These are for the short-term future. What about operations in the long-run? AEEC will need other innovations for the long-term future, which could be for instance, smart grid technologies.*
  "That's clear for the second and third scenarios. My suggestion is to keep the first scenario to ensure multi streams of revenue. As far the smart grid, AEEC needs to identify the market demand for it in Azerbaijan".

- *These activities certainly require changes. Given the potential changes after this consulting project, is AEEC staff ready for them? How would they react?*
  "Certainly, any change is not always perceived well. I think what would be the solution is the *potential involvement of both management and staff in the action plan implying changes*. This would instill confidence and make them a part of these changes. Moreover, we need some kind of action plan to incorporate concluded scenarios and define roles of the team to lead these changes"
  Good point. In this context, we will implement change using the steps suggested by J.Kotter. The change team will include AEEC President, Head of Financial-Accounting Department, Lead Engineer and me.

2. Interview with Ms. Antiga Qasimova, President of AEEC LLC and Lead Engineer Ms. Bayram Mammadov

The interviews were held on June 6, 13, 20 and 27, and July 4 and 11. The interviews were held from 2 pm to 4 pm on the mentioned dates. The following operation-level questions were asked and feedback was provided:

- *Please describe in detail how AEEC conducts business with regard to engineering services*

The question was answered by B.Mammadov. "SOCAR has historically been the major client of AEEC. Typically, engineering services at SOCAR's facilities are implemented in the following order, and this approach is also used for other clients:

- SOCAR's subsidiary makes a request to AEEC with regard to the need for engineering services at its electrical facilities (substations, power lines, and the power supply equipment for oil & gas wells). The need might be the construction and installation of equipment, tuning and adjustment works, or the repair of damaged equipment and/or rehabilitation works after an emergency case

- AEEC's engineering team led by Mr. B.Mammadov conducts a site trip to relevant the facility together with engineers of the client, and makes field observations to assess the technical requirements
- Upon returning to AEEC's office, the engineering team commences the estimation of required engineering works, and prepares the draft cost estimate together with the Accountant and Warehouse Manager (i.e. to check the availability of materials)
- The draft cost estimate is then discussed with the engineers of the client, and the final cost estimate is prepared jointly, and agreed
- The service contract is prepared and submitted to the client for further processing, with the final cost estimate attached."

- *Pease briefly describe the roles and functions of AEEC's departments*

The question was answered by the AEEC president – "The Department for Engineering Services implements AEEC's engineering works, while the Department for Consulting Services implements consulting services. The Warehouse provides services to the engineering functions. The Financial-Accounting Department serves both the Departments for Engineering and Consulting Services, and manages the financial and accounting duties of the company. The Company President manages the day-to-day activities, and all departments report to the President."

3. Interview with Mr. Urqand Karimov, Head of Finance-Accounting Department of AEEC LLC

The interviews were held on June 13 and July 4. The interviews were held from 4 pm to 5 pm on the mentioned dates. The following operation-level questions were asked and feedback was provided:

- *Please provide information on AEEC's clients for the last five years, including the volume of engineering services and labor and material costs*
  - SOCAR
  - Azfen Joint Venture
  - Absheron Operating Company LTD
  - Bahar Energy Operating Company
  - The Ministry of Defense Industry of Azerbaijan Republic
- *What types of costs does AEEC's engineering service include during the rendering of this service?*

The typical costs incurred as per engineering services are labor, material and fuel costs. Labor and material costs constitute the majority share of the engineering services costs. Note: please see Appendices 7 on cost details and the table below for aggregate monthly data on revenues.

Month	**Azerbaijan Manat**
January 2010	307.9
February 2010	16,140.8
March 2010	60,091.1
April 2010	60,155.0
May 2010	124,091.0
June 2010	62,947.6
July2010	95,301.6
August 2010	80,024.0
September 2010	58,876.9

October 2010	97,420.9
November 2010	70,214.2
December 2010	169,744.2
January 2011	1,849.0
February 2011	12,206.1
March 2011	489.3
April 2011	97,076.4
May 2011	92,167.5
June 2011	86,545.8
July 2011	87,484.2
August 2011	3,731.2
September 2011	84,513.5
October 2011	108,937.5
November 2011	111,569.3
December 2011	179,289.4
January 2012	179,146.6
February 2012	3,644.5
March 2012	18,438.6
April 2012	20,442.0
May 2012	3,234.0
June 2012	77,274.5
July 2012	15,724.2
August 2012	87,026.8
September 2012	48,055.5
October 2012	109,715.1
November 2012	74,510.4
December 2012	79,905.3
January 2013	63,512.4
February 2013	32,154.9
March 2013	44,599.2
April 2013	89,787.8
May 2013	76,860.1
June 2013	93,759.7
July 2013	88,644.8
August 2013	11,345.4
September 2013	327,895.7
October 2013	100,662.1
November 2013	98,175.0
December 2013	90,860.2
January 2014	72,903.2
February 2014	81,922.4
March 2014	8,649.3
April 2014	10,799.5
May 2014	101,070.3

June 2014	45,181.0
July 2014	51,721.4
August 2014	24,741.6
September 2014	43,980.6
October 2014	45,215.8
November 2014	83,475.0
December 2014	35,588.4

- *To be more competitive, AEEC will be reviewing its costs associated with engineering services. I guess the focus will be on labor and material costs. It seems they constitute the larger part of engineering service costs. We may apply some theoretical tools to check it.*

"That's correct. Our intuitive opinion is that labor costs can be reduced by about 30%. Let's check and then discuss the results."

- *Please provide available annual reports or financial statements of AEEC for the last five years.*

The profit and loss statements of AEEC in Azerbaijani (reported to tax authorities) were provided by the Accountant. Note: please see Appendix 5 for the consolidated table in English.

Appendix 9. Key information about AEEC and organizational chart

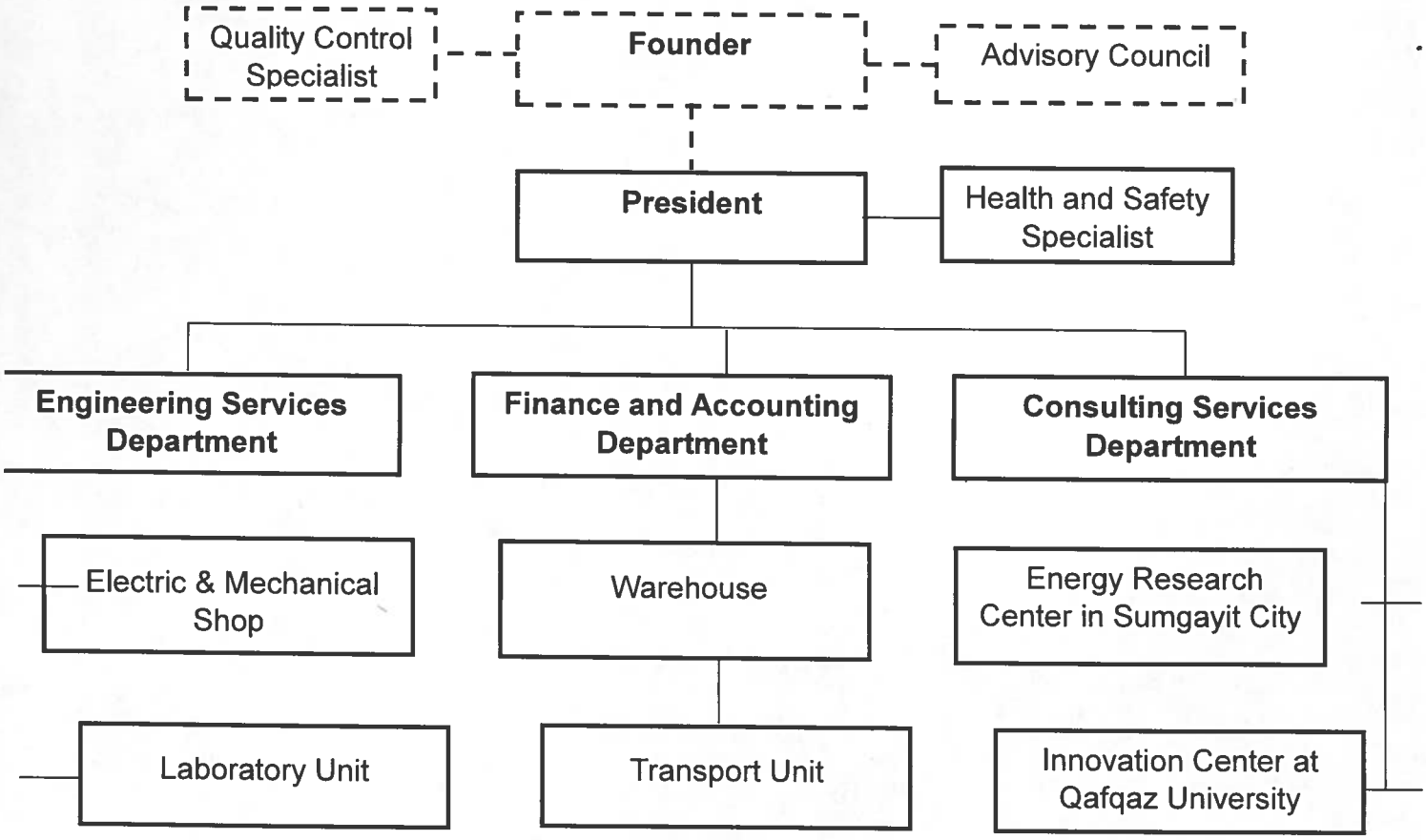
I. Number of employees – 28 persons (as of June 2015)

- Administrative staff – 10
- Engineers and electricians – 18

II. Annual revenues:

Azerbaijan Manat	2010	2011	2012	2013	2014
REVENUES	895,651.3	1,020,650.6	722,907.0	1,078,918.3	638,670.3

Organizational Chart of Azerbaijan Energy Engineering and Consulting



Appendix 10. The results of regression analysis

The initial dataset for revenues, labor and material costs

Note: all costs are in Azerbaijan Manat

Period	Revenues Y	Labor X1	Material costs X2
January 2010	307.9	3275.0	33,323.9
February 2010	16,140.8	3,248.6	33,323.9
March 2010	60,091.1	6,014.7	33,323.9
April 2010	60,155.0	6,735.9	33,323.9
May 2010	124,091.0	6,288.2	33,323.9
June 2010	62,947.6	6,454.2	33,323.9
July2010	95,301.6	6,702.7	33,323.9
August 2010	80,024.0	6,689.2	33,323.9
September 2010	58,876.9	6,448.0	33,323.9
October 2010	97,420.9	6,688.4	33,323.9
November 2010	70,214.2	6,453.9	33,323.9
December 2010	169,744.2	6,442.0	33,323.9
January 2011	1,849.0	6,300.6	32,189.9
February 2011	12,206.1	6,059.3	32,189.9
March 2011	489.3	5,884.7	32,189.9
April 2011	97,076.4	6,624.7	32,189.9
May 2011	92,167.5	6,653.2	32,189.9
June 2011	86,545.8	6,944.7	32,189.9
July 2011	87,484.2	6,961.7	32,189.9
August 2011	3,731.2	6,880.4	32,189.9
September 2011	84,513.5	6,089.8	32,189.9
October 2011	108,937.5	6,078.6	32,189.9
November 2011	111,569.3	7,066.5	32,189.9
December 2011	179,289.4	6,725.9	32,189.9
January 2012	179,146.6	7,188.5	20,815.2
February 2012	3,644.5	6,748.9	20,815.2
March 2012	18,438.6	7,307.9	20,815.2
April 2012	20,442.0	7,234.7	20,815.2
May 2012	3,234.0	7,130.2	20,815.2
June 2012	77,274.5	7,163.4	20,815.2
July 2012	15,724.2	9,886.8	20,815.2
August 2012	87,026.8	10,305.6	20,815.2
September 2012	48,055.5	10,749.1	20,815.2
October 2012	109,715.1	9,951.8	20,815.2
November 2012	74,510.4	10,002.4	20,815.2
December 2012	79,905.3	10,439.3	20,815.2
January 2013	63,512.4	9,772.4	40,671.9

February 2013	32,154.9	9,285.6	40,671.9
March 2013	44,599.2	9,730.0	40,671.9
April 2013	89,787.8	9,933.5	40,671.9
May 2013	76,860.1	9,917.9	40,671.9
June 2013	93,759.7	9,893.4	40,671.9
July 2013	88,644.8	9,772.4	40,671.9
August 2013	11,345.4	9,669.6	40,671.9
September 2013	327,895.7	9,332.1	40,671.9
October 2013	100,662.1	9,830.0	40,671.9
November 2013	98,175.0	9,815.0	40,671.9
December 2013	90,860.2	9,651.7	40,671.9
January 2014	72,903.2	9,450.6	24,500.0
February 2014	81,922.4	10,835.3	24,500.0
March 2014	8,649.3	10,985.1	24,500.0
April 2014	10,799.5	10,979.2	24,500.0
May 2014	101,070.3	11,054.9	24,500.0
June 2014	45,181.0	11,697.4	24,500.0
July 2014	51,721.4	11,254.2	24,500.0
August 2014	24,741.6	11,315.7	24,500.0
September 2014	43,980.6	11,356.5	24,500.0
October 2014	45,215.8	11,317.7	24,500.0
November 2014	83,475.0	11,077.4	24,500.0
December 2014	35,588.4	10,559.1	24,500.0

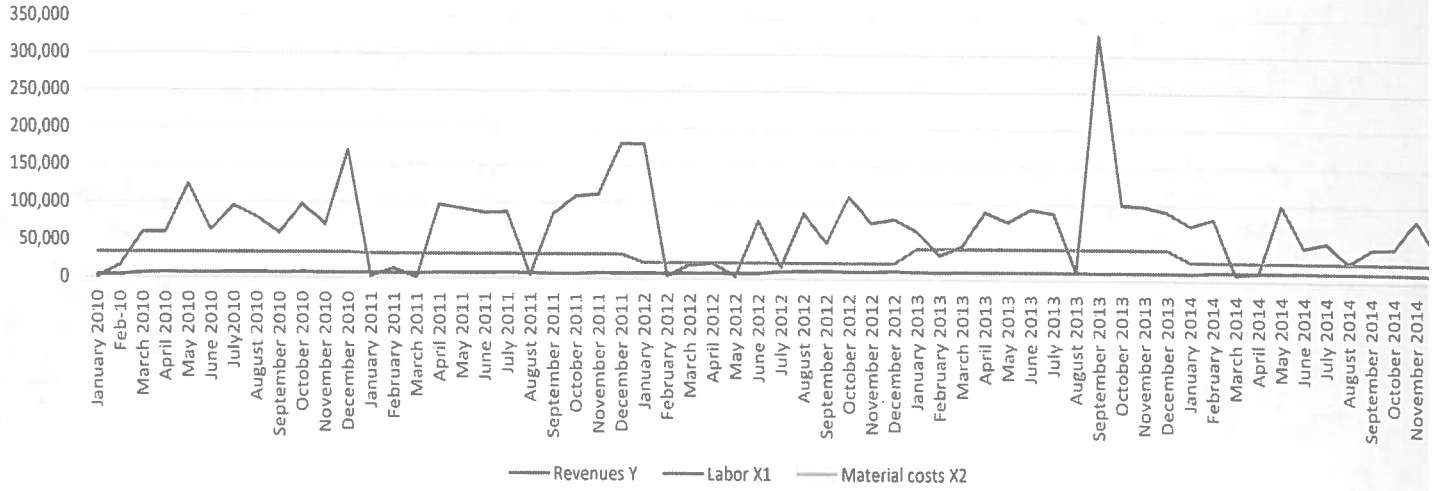
Regression analysis results for original monthly data series

Regression Statistics	
Multiple R	0.257525
R Square	0.066319
Adjusted R Square	0.033558
Standard Error	53980.41
Observations	60

Total	59	1.78E+11

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-8056.07	46270.98	-0.17411	0.862399	-100712	84599.98	-100712	84599.98
X Variable 1	1.936844	3.35683	0.576986	0.566221	-4.78509	8.658781	-4.78509	8.658781
X Variable 2	2.041942	1.018736	2.004389	0.049788	0.001959	4.081925	0.001959	4.081925

The trend of monthly revenues, labor and material costs



Regression analysis results for adjusted monthly data series (i.e. equal monthly revenues)

Regression Statistics	
Multiple R	0.928671
R Square	0.862431
Adjusted R Square	0.857604
Standard Error	5517.508
Observations	60

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	16291.22	4729.503	3.444596	0.001079	6820.558601	25761.89	6820.558601	25761.89016
X Variable 1	-0.44406	0.343112	-1.2942	0.200816	-1.131125641	0.243015	-1.131125641	0.243014999
X Variable 2	1.896235	0.104128	18.21059	1.98E-25	1.687722394	2.104749	1.687722394	2.104748546

Regression analysis results for only year 2014 indicators

Regression Statistics	
Multiple R	1
R Square	1
Adjusted R Square	1
Standard Error	0
Observations	12

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	50437.38	0	65535	#NUM!	50437.38	50437.38	50437.38	50437.38
X Variable 1	0	0	65535	#NUM!	0	0	0	0

Analysis on re-calculated Y_1, Y_2 and percentage change after 30% labor cost cut for the year 2014

Period	Revenues Y (equally divided by months)	Labor X1	Material costs X2	Reduced labor costs by 30% for 2014	Y1	Y2	Percentage change between Y2 and Y1
January 2010	74,609.6	3275.0	33,323.9	3,275.0	78,026.8	78,026.8	0%
Feb-10	74,609.6	3,248.6	33,323.9	3,248.6	78,038.6	78,038.6	0%
March 2010	74,609.6	6,014.7	33,323.9	6,014.7	76,810.3	76,810.3	0%
April 2010	74,609.6	6,735.9	33,323.9	6,735.9	76,490.0	76,490.0	0%
May 2010	74,609.6	6,288.2	33,323.9	6,288.2	76,688.8	76,688.8	0%
June 2010	74,609.6	6,454.2	33,323.9	6,454.2	76,615.1	76,615.1	0%
July2010	74,609.6	6,702.7	33,323.9	6,702.7	76,504.7	76,504.7	0%
August 2010	74,609.6	6,689.2	33,323.9	6,689.2	76,510.7	76,510.7	0%
September 2010	74,609.6	6,448.0	33,323.9	6,448.0	76,617.9	76,617.9	0%
October 2010	74,609.6	6,688.4	33,323.9	6,688.4	76,511.1	76,511.1	0%
November 2010	74,609.6	6,453.9	33,323.9	6,453.9	76,615.2	76,615.2	0%
December 2010	74,609.6	6,442.0	33,323.9	6,442.0	76,620.5	76,620.5	0%
January 2011	72,154.9	6,300.6	32,189.9	6,300.6	74,533.0	74,533.0	0%
February 2011	72,154.9	6,059.3	32,189.9	6,059.3	74,640.2	74,640.2	0%
March 2011	72,154.9	5,884.7	32,189.9	5,884.7	74,717.7	74,717.7	0%
April 2011	72,154.9	6,624.7	32,189.9	6,624.7	74,389.1	74,389.1	0%
May 2011	72,154.9	6,653.2	32,189.9	6,653.2	74,376.5	74,376.5	0%
June 2011	72,154.9	6,944.7	32,189.9	6,944.7	74,247.0	74,247.0	0%
July 2011	72,154.9	6,961.7	32,189.9	6,961.7	74,239.5	74,239.5	0%
August 2011	72,154.9	6,880.4	32,189.9	6,880.4	74,275.6	74,275.6	0%
September 2011	72,154.9	6,089.8	32,189.9	6,089.8	74,626.7	74,626.7	0%
October 2011	72,154.9	6,078.6	32,189.9	6,078.6	74,631.6	74,631.6	0%
November 2011	72,154.9	7,066.5	32,189.9	7,066.5	74,193.0	74,193.0	0%
December 2011	72,154.9	6,725.9	32,189.9	6,725.9	74,344.2	74,344.2	0%
January 2012	59,759.8	7,188.5	20,815.2	7,188.5	52,569.7	52,569.7	0%
February 2012	59,759.8	6,748.9	20,815.2	6,748.9	52,764.9	52,764.9	0%
March 2012	59,759.8	7,307.9	20,815.2	7,307.9	52,516.7	52,516.7	0%
April 2012	59,759.8	7,234.7	20,815.2	7,234.7	52,549.2	52,549.2	0%
May 2012	59,759.8	7,130.2	20,815.2	7,130.2	52,595.6	52,595.6	0%
June 2012	59,759.8	7,163.4	20,815.2	7,163.4	52,580.8	52,580.8	0%

July 2012	59,759.8	9,886.8	20,815.2	9,886.8	51,371.5	51,371.5	0%
August 2012	59,759.8	10,305.6	20,815.2	10,305.6	51,185.6	51,185.6	0%
September 2012	59,759.8	10,749.1	20,815.2	10,749.1	50,988.6	50,988.6	0%
October 2012	59,759.8	9,951.8	20,815.2	9,951.8	51,342.7	51,342.7	0%
November 2012	59,759.8	10,002.4	20,815.2	10,002.4	51,320.2	51,320.2	0%
December 2012	59,759.8	10,439.3	20,815.2	10,439.3	51,126.2	51,126.2	0%
January 2013	93,188.1	9,772.4	40,671.9	9,772.4	89,075.2	89,075.2	0%
February 2013	93,188.1	9,285.6	40,671.9	9,285.6	89,291.3	89,291.3	0%
March 2013	93,188.1	9,730.0	40,671.9	9,730.0	89,094.0	89,094.0	0%
April 2013	93,188.1	9,933.5	40,671.9	9,933.5	89,003.6	89,003.6	0%
May 2013	93,188.1	9,917.9	40,671.9	9,917.9	89,010.6	89,010.6	0%
June 2013	93,188.1	9,893.4	40,671.9	9,893.4	89,021.4	89,021.4	0%
July 2013	93,188.1	9,772.4	40,671.9	9,772.4	89,075.1	89,075.1	0%
August 2013	93,188.1	9,669.6	40,671.9	9,669.6	89,120.8	89,120.8	0%
September 2013	93,188.1	9,332.1	40,671.9	9,332.1	89,270.7	89,270.7	0%
October 2013	93,188.1	9,830.0	40,671.9	9,830.0	89,049.6	89,049.6	0%
November 2013	93,188.1	9,815.0	40,671.9	9,815.0	89,056.2	89,056.2	0%
December 2013	93,188.1	9,651.7	40,671.9	9,651.7	89,128.7	89,128.7	0%
January 2014	50,437.4	9,450.6	24,500.0	6,615.4	58,552.4	59,811.4	2%
February 2014	50,437.4	10,835.3	24,500.0	7,584.7	57,937.5	59,381.0	2%
March 2014	50,437.4	10,985.1	24,500.0	7,689.6	57,871.0	59,334.4	3%
April 2014	50,437.4	10,979.2	24,500.0	7,685.5	57,873.6	59,336.2	3%
May 2014	50,437.4	11,054.9	24,500.0	7,738.4	57,840.0	59,312.7	3%
June 2014	50,437.4	11,697.4	24,500.0	8,188.2	57,554.7	59,113.0	3%
July 2014	50,437.4	11,254.2	24,500.0	7,878.0	57,751.5	59,250.7	3%
August 2014	50,437.4	11,315.7	24,500.0	7,921.0	57,724.2	59,231.6	3%
September 2014	50,437.4	11,356.5	24,500.0	7,949.6	57,706.1	59,218.9	3%
October 2014	50,437.4	11,317.7	24,500.0	7,922.4	57,723.3	59,231.0	3%
November 2014	50,437.4	11,077.4	24,500.0	7,754.2	57,830.0	59,305.7	3%
December 2014	50,437.4	10,559.1	24,500.0	7,391.4	58,060.2	59,466.8	2%