“Developments in the oil price”

How does performance measurement react?

Tom Heldens

The Hague, April 2009
“Developments in the oil price”

How does performance measurement react

Faculty of economics and business

Thesis MSc BA

Specialization Organisational & Management control

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Preface

Before you lies my thesis which is the result of a research performed during a six months internship at Deloitte. This research has been conducted to finalize my studies at the Faculty of Economics and Business Administration, specialization Organizational & Management Control at the University of Groningen.

I would like to thank several people for their support during the process of writing this thesis. First of all, I would like to thank my first supervisor Drs. A Smeenge for our cooperation during the writing of this thesis. I would also like to thank my supervisors at Deloitte David Janmaat, Hans Bootsma and Marko van Zwam for their support, feedback and advice during the project and the opportunity to work on my thesis at Deloitte. Finally I would like to thank my family, friends and girl friend for their support, advice and patience during the completion of my thesis.

With finishing this thesis my years as a student have come to an end. I Look back on these years with great pleasure but now the time has come for a new and exciting period in my life. Writing this thesis has been a valuable experience but nevertheless I am glad it is finished. Now I am looking forward to make a new step in life with the start of my professional career and benefitting from all the lessons learned during my time in Groningen.

Hopefully you will enjoy reading this thesis.

Yours sincerely,

Tom Heldens
The Hague, April 2009
Executive summary

The oil price has been through a remarkable development in recent years. Among others the fast growing economies of China and India were accompanied by an enormous grow in energy demand. This increase in energy demand caused the oil price to rise exponentially. The oil price reached its peak at $147.40 a barrel on July the third in 2008. The crisis on the financial markets forced the economy to go into a recession causing the oil price to drop drastically. The oil price proved to be extremely volatile and therefore had a significant impact on business. The question which arises is: how have organizations reacted to the oil price development and is in specific their performance measurement systems.

The objective of this research is provide insight in the direct and indirect effects on performance measurement systems within organizations whose results and primary processes are heavily affected by energy costs through the developments of the oil price. The main research question is:

To what extend has the emphasis of the performance measurement systems within large logistic service providers shifted due to the development of the oil prices in recent years in order to achieve organizational goals?

The paper starts off with describing the development of the oil price in recent years and a brief explanation on why it has developed in such a way. This is followed by a literature research on performance measurement in theory. Both chapters form the basis of the practical part of the research. Interviews were conducted at KLM, Stolt-Nielsen SA and additional interviews were conducted within Deloitte to examine the influence of the oil price development on performance measurement. KLM and Stolt-Nielsen SA both consume enormous quantities of fuel of which the price is directly influence by the oil price.

The conclusion is that fuel consumption is and always has been inherent to the business of KLM and Stolt-Nielsen SA. Therefore fuel costs have always played an essential role in their performance measurement systems. The fluctuating fuel costs formed a risk for both organizations and risk management become more important influencing performance measurement. The main tool used by risk management to reduce the exposure to oil price fluctuations is hedging. KLM and SNSA have an extensive hedging programme and the hedge ratio is one of their KPI’s. Fuel surcharges were introduced in order to pass on a part of the extra costs to the customer positively effecting the operating margin. Both organizations significantly invested in reducing fuel consumption. These measures should all eventually contribute in achieving organizational goals.
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Chapter 1: Introduction

1.1 Introduction

Energy and energy costs have been elaborately discussed for a considerable time now. Due to the development of the Chinese and Indian economy, the demand for energy has increased enormously the past few years. Research in renewable energy however has remained behind. The consequences of the continuing growing demand of energy can be seen in the news almost daily nowadays. Oil prices are breaking records frequently and analysts predict that the worst has yet to come. Fuel prices are not lagging behind and are also rising steadily. However developments in financial markets also had its affect on oil prices and forced it to decline. This is just a small sample of the countless examples we are confronted with every day. In short we can say that energy is getting expensive but also reacts on economic sentiments and therefore has a particular volatile character.

The rising costs have unmistakably had their effect on business, especially on organizations whose results and primary processes are heavily affected by energy costs through the developments of the oil price. Organizations have to make decisions on whether to pass on the rising costs to the customers or accept a decline in the profit margin. At several occasions the rising energy costs have led to profit warnings with all its consequences. Developments in the energy market clearly carry some risk, but opportunities also present themselves. Those organizations that react properly and timely have the possibility to create a strategic advantage compared to the competition. It remains to be seen whether strategic decisions made in the past to save costs, will remain to be lucrative in the future.

The first step is to explore the development of the oil price in the past few years and to determine what caused the remarkable changes. What are the risks involved when organizations do not considerately take measures to prevent the negative effects of the rising oil prices. What management control systems contribute to control these effects and if handled wisely turn the matter into a strategic advantage? How is the performance measured and what are the essential performance indicators? These questions provide a brief insight in the issues that will be dealt with. This research will focus on how large logistic service providers managed to cope with the issues mentioned above in the past few years.

1.2 Relevance

Due to the dissatisfaction on traditional performance measurement a lot of attention has been paid to designing, implementing and updating performance measurement systems. Traditional performance measurement was based on traditional cost accounting principles and therefore were
mainly financial. This resulted in encouraging a short term focus and a lack of a strategic focus. The “new” performance measurement systems had to be more balanced and multi-dimensional. (Bourne et al, 2000). Managing performance measurement systems is believed to contribute to the improvement of organizational performance. Successfully establishing a performance measurement system requires a lot of effort from the organization. Especially when operating in dynamic business environment the traditional performance measurement systems are inadequate and will not contribute to improved organizational performance (Waggoner et al, 1999).

In order for performance measurement systems to be able to contribute it is essential that they are relevant and appropriate to the organizational strategy and environment. As most organizations cope with a rapidly changing environment in which they compete, it is important they manage their performance measurement systems so that they will continue to provide relevant information to deal with the current issues (Kennerly & Neely, 2003). Several forces of which external influences is one, impact the evolution and change of the performance measurement system (Waggoner et al, 1999). The heavily volatile character of the oil price in the past few years is an external factor which has indisputably effected the performance of organizations. The exact influence of the oil price volatility on performance measurement systems will be the central theme within this research.
Chapter 2: Research design

2.1 Introduction
The following chapter describes the design of this thesis and the research method used to answer the research question. The main research question is split up in several sub-questions which also form the outline of the thesis. For a clear overview of the research a model at the end of this chapter is provided in which the structure of the thesis is illustrated.

2.2 Research objective
On the basis of the preceding the purpose for the graduate thesis reads as follows:

To provide insight in the direct and indirect effects on performance measurement systems within organizations whose results and primary processes are heavily affected by energy costs through the developments of the oil price.

2.3 Research question
The research question stated below should answer the purpose of the research mentioned above:

To what extend has the emphasis of the performance measurement systems within large logistic service providers shifted due to the development of the oil prices in recent years in order to achieve organizational goals?

2.4 Sub-questions

Development of the oil price, setting the scene
- How has the oil price evolved over the past three to five years?
- Have the developments of the oil price affected organizations whose results and primary processes are heavily affected by energy costs?

Literature
- What are performance measurement systems?
- What are important factors influencing the design and development of performance measurement systems?
- What are important requirements for performance measures and key performance indicators?
Practice

- To what extent do performance measurement systems contribute in controlling energy costs?
- To what extent has the performance measurement system changed due to the oil price development?
- To what extent have these changes contributed to more effectively achieving organizational goals?

Confrontation

- What are the differences in the approach of performance measurement systems between literature and practice?
- What is the cause of these differences?

2.5 Research method

This research will start with an exploration of the development in oil prices in the past few years and the effect it has had on organizations whose results and primary processes are heavily affected by energy costs. The purpose of this particular starting point is to establish a general perception on the developments in order to provide the necessary background information. It should clarify the issue at stake and the relevance of this research. A time span of approximately three to five years will be chosen. Besides a brief literature research an interview with Cyril Widdershoven, senior manager at Deloitte and a specialist in the oil sector, will be held to acquire the necessary information for this part of the research.

The second part of the research will form a literature study on performance management. For this purpose relevant literature available in this field of study and literature that has been discussed during the master course Organizational & Management Control will be used. Both scientific articles and books will be examined. The literature research is done in order to be able to form a theoretical framework. Key words for the literature study are: management control systems, performance measurement, performance measurement systems, (key) performance indicators, Balanced scorecard, EFQM Excellence Model, Value Based Management, and so on.

The theoretical framework described in the previous paragraph will form the starting point for further practical research. A choice has been made to limit the organizations to large logistic service providers and in particular KLM and Stolt-Nielsen S.A. (SNSA), both clients of Deloitte. The results and primary processes of this kind of organizations are heavily influenced by the developments on the oil market and are therefore expected to have extensive knowledge about the subject and
should be able to provide high quality data for the research. At first managers at different levels within the organization will be interviewed about how they used to measure the performances, in particular the performance concerning energy costs, at the beginning of the time span and what actions they took based on the results. Based on oil price charts different specific points in time will be chosen on which notable changes in oil price were distinguishable. Managers will be asked to what extend performance measurement systems have changed due to the changes in oil price and how these changes affected organizational results. From this we can deduct which specific changes within performance measurement systems have proven to be effective in controlling energy costs. Managers responsible for the design of the performance management system as well as managers who are responsible for making decisions based on output of the system should be able to provide interesting and accurate data and will be approached for interviews. The type of interview used for this research will be semi-structured interviews. This way the data needed for the research will be obtained and the possibility for obtaining extra relevant and interesting data is preserved.

After the data from the interviews are processed differences between literature and practice can be set out. As a result of these data a model could be created to set out the effects of the specific parts of performance measurement systems on controlling energy costs in large logistic service providers.

2.6 Thesis structure
The figure below is meant to provide the reader an overview on how the chapters in this thesis relate to one another to increase the readability of the thesis.

![Figure 1. Lay out thesis structure](image-url)
Chapter 3: Development of the oil price, setting the scene

3.1 Introduction

The purpose of this chapter is to provide a description of the development of the oil price and the effect it has had on organizations. At first the evolution of the oil price will be discussed. The description of oil price will be divided into three parts. The first part will examine the development of the oil price in the period before August 2008 with a focus on the last five years. The second part will deal with the oil bubble burst and cover the period August 2008 until now. The final part will attempt to provide a glimpse of the future and describe the outlook of the oil price developments. This chapter will end with a paragraph devoted to the effect the developments of the oil price has had on organizations in general. An interview with Cyril Widdershoven, senior manager at Deloitte and a specialist in the oil sector, formed the outline of this chapter and his input has been processed in the elaboration of this chapter.

3.2 Evolution of the oil price

You do not have to be a rocket scientist to be able to notice the remarkable developments the oil price has made in the past few years up until now. Prices climbed exponentially to a peak no one could ever have imagined a few years ago, only to subsequently free fall back down in just a couple of months. However to fully understand the forces and mechanisms behind these remarkable developments does take the necessary knowledge. The following paragraphs will deal with some of the issues relating to this phenomenon. Before discussing the forces driving the oil price it is necessary to have clarity in how the price has developed. This is best illustrated with a diagram shown in Figure 2 below.

Figure 2. Chart weekly average Brent Crude Oil Price in US$/barrel (source: LC LiveCharts.Co.UK 10-12-2008)
Figure 2 shows how the price of a barrel Brent Crude Oil (BC) has developed over the past four years. The BC is the biggest of the many classifications used for oil and therefore the price of a barrel BC forms a benchmark for pricing other oils. Since the price of other oils follow the movements of BC quite accurately this thesis will focus on the price of a barrel BC. Figure 2 clearly shows a noticeable increase in oil price the past few years with an even more remarkable decrease after reaching its peak at $147.40 a barrel on July the third in 2008. At that time analyst thought the oil price would continue to rise to $200. The impact the financial crisis would have on the oil price was not foreseen and caused the oil bubble to burst resulting in rapidly falling oil prices.

3.2.1 Looking back on the oil price development

In principle the basic economic rules apply to the oil market. This means that oil prices react to the demand and supply balance. When looking back on the demand side of the balance some important events occurred which have strongly augmented the demand for oil. A growing economy is usually accompanied by an increase in oil demand making oil prices rise at a steady pace. According to Cyril Widdershoven in an interview, oil demand predictions did not foresee the economic growth rate China and India would go through. These economies were growing much faster than predicted heavily affecting the demand in that region. Meanwhile oil producer Russia also started consuming more oil. This unforeseen increase in oil demand was driving oil prices up.

On the supply side of the balance however the oil market contains various uncertain factors which make it difficult to make accurate projections. Some of the uncertain factors are unknown future events such as geopolitical factors, disruptions in the supply chain, environmental issues, technological innovations and OPEC behaviour are examples of the future events which make the supply side of the balance rather complex (Fattouh, 2007). Widdershoven also pointed out the effect of bringing down the regime in Iraq has had on oil supply as being one of the bigger oil producers. Since the American invasion in Iraq production levels declined in spite of high investments made by the Americans in the region. Also large hurricanes last year disrupted oil production in the Gulf of Mexico. These events have contributed to a sentiment of a threatening shortage. Due to the uncertainties on the supply side and the increasing demand oil prices have displayed a highly volatile character and gone up in the past few years.

The oil price reacts on fluctuations on the demand and supply balance in the short term. In the long term the rate of investments can influence the oil price. Investments made in oil production today result in actual production only ten years later. This means investments should be made far enough in advance otherwise oil supplies could be insufficient and thus raising prices (OPEC). Widdershoven states that one has to look back in order to understand the recent developments. When oil prices
dropped in 1998 to a low point of around ten dollars, oil producers heavily cut back on investments. After a while oil prices started to rise again and only later oil producers decided that the prices had risen enough to start investing more in production. Through the fact that it takes approximately ten years before investments pay off, these investment cut downs made in 1998 have resulted in a strong decreasing overproduction today, effecting the oil supply and price.

Lately the possible impact of the increasing number of speculators in the oil market has received a lot of attention by analysts. Thought was that the speculators and hedge funds were responsible for the sentiment on the oil market which resulted in an increasing volatility and a price increase (Fattouh, 2007). According to Widdershoven research has pointed out that the influence of hedge funds is existing but not as substantial as thought. The impact of speculation on oil prices is estimated at $18, which is less than initially thought. Comparing the $18 increase due to speculation the total increase of about $100 clarifies the fact that the influence of speculation is less significant than initially thought. Nevertheless speculation has definitely had an impact on the oil price development.

Widdershoven also pointed out the effect the developments of the euro dollar exchange rate has had on the oil price. Oil is traditionally priced in dollars and therefore linked the strength of the currency. Since a low in the end of 2005 the value of the dollar has been steadily decreasing compared to the euro until July this year. Thus the increase of oil price was partially a result of the depreciating value of the dollar compared to other currencies.

3.2.2 Oil bubble burst
A maybe even more remarkable event in the oil price development is the free fall the price has made after reaching its peak. Several factors have contributed to the collapsing oil price. Most of them are of course a direct result from the financial crisis. To be able to provide a complete and accurate image of how exactly the oil price has reacted to the financial crisis is difficult as the events are to recent but this paragraph will briefly deal with some of the factors.

According to Widdershoven the oil price is no longer based on the balance of demand and supply. If demand rises the oil price should rise roughly as much. Looking at the oil price one would normally conclude that the demand has dramatically dropped due to the financial crisis. However this does not correspond with the actual change in demand. There is no question of a decrease in demand but quoting Widdershoven a: “decrease in the growth of the demand”. It is true that the demand in the United States has declined in the past few months however the demand in China, India and Russia still is growing (OPEC, 2008a). Oil prices have been following the overall economic sentiment and
followed the trend on the stock market instead of reacting normally to the balance of demand and supply.

3.2.3 Looking forward on the oil price development

Despite the fact that oil demand predictions have been revised downwards due to the financial crisis, it will still continue to grow in the future. Figure 3 clearly shows predictions of the increase in the world oil demand and in particular the demand increase in China and the rest of Asia is remarkable.

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Figure 3. World oil demand outlook mb/d (source: OPEC world oil outlook 2008)

Recently the International Energy Agency (IEA) released the World Energy Outlook 2008. The IEA is an well-established organization and a energy advisor to the 28 member countries. Its main occupation is to conduct a broad program of energy research, data compilation, publications and public dissemination of the latest energy policy analysis and recommendations on good practices. Some of the prospects for oil consumption of IEA published in World Energy Outlook 2008 are listed below.

- “World oil demand is set to continue to expand through to 2030 on current trends, albeit more slowly than over the past two decades” (IEA, 2008)
- “Around three-quarters of the projected increase in oil demand worldwide comes from the transport sector – the sector least responsive, in the short term, to price changes” (IEA, 2008)
- “These oil demand projections, combined with our oil price assumptions, point to persistently high levels of spending on oil in both OECD and non-OECD countries” (IEA, 2008)
The figures shown in Figure 3 produced by OPEC together with the prospects made by IEA show that the demand for oil will continue to grow the following two decades. Economic conditions can cause the projections to be adjusted upward or downward but the general trend is up. Oil prices should normally follow this trend and continue to move up. Widdershoven predicts that as soon as the media start informing the public that the financial crisis is over and the economy is rising again oil prices will go up and follow the stock market once again.

3.3 The effect of oil price developments on organizations

The volatile nature of the oil price has caused fuel costs to rise significantly the past few years effecting numerous sectors. The transportation sector is an example where a significant part of organizational costs are directly related to developments of the oil price, which had a negative effect on the results. Rationally this increase in oil price could not be predicted leaving organizations largely unguarded. To fully pass on the increasing costs to customers was not an attractive option and in some cases not an option at all.

According to Widdershoven the strategic focus of many organizations took no account of such an increase in costs forcing them to react to the circumstances instead of being able to anticipate. Investments in fuel efficient airplanes and road vehicles are long term and based on predictions which did not take into account an exponential growth of the oil price. For example investing in a airplane which is 20% more fuel efficient than the types currently used will only be on the market in 20 to 25 years. Even then it can hardly compensate for a fuel price increase of 60%. This example illustrates the fact that the precautionary measures organizations made in the past were not sufficient to cope with recent developments. The investment decisions made were based on oil price prospects in which the oil price could rise to $45 in a worst case scenario. Afterwards one can conclude that those projections of the future were far too modest and nowhere near the actual oil price. This meant that investments made by organisations were insufficient to be able to cope with the situation and had no choice but to react.

The oil price developments actually did hurt organizations and did have a negative impact on their profit margins, however the picture outlined above should also be mitigated according to Widdershoven. Although prices did rise customers did not en masse cancel their flight and due to scale advantages costs could be reduced in other parts of the organization. Organizations can partially compensate a part of the extra costs, however a 60% increase for a period of three years is not an option.
Chapter 4: Theoretical framework

4.1 Introduction
In this chapter the concept of performance measurement (PM) will be examined. The goal of this chapter is to provide a clear insight in PM, which will form the foundation for chapter five where theoretical PM will be compared to PM in practice. At first a brief description of management control systems will be given as an introduction to PM. After the introduction a definition of PM and its background will be discussed to get acquainted with the concept. A few examples of performance measurement systems will be given to introduce the next paragraphs which will deal with the issues concerning the design and development of an effective and efficient performance measurement system. Key performance indicators form a crucial part of the PM on which a paragraph will be devoted to. This chapter will end with a paragraph discussing the influence of the changing environment on PM.

4.2 Management control systems
In order to prevent organizational failure and to increase the probability that organizations achieve their strategic objectives management control has become a critical function within organizations. Managers use control systems to ensure that the behaviour and decisions of the employees are in line with the organizational goals. All these systems together are commonly referred to as the management control systems (MCS). Designed properly a MCS should benefit the organization by increasing the probability that the organization will achieve its objectives (Merchant & Van der Stede, 2007). Simons (1990) states that the organizational strategy influences the choice of MCS within the organization but he also points out that MCS can be used to control emergent strategy. In other words MCS play an important and interactive role in achieving strategic objectives. Several forms of management control based on the object of control are distinguished. These forms of control are: action control, personal control, cultural control and results control. They apply to every MCS and occur in different combinations or alone depending on the situation (Merchant & Van der Stede, 2007). PM is part of results control, and therefore a short description of results control will be provided.

Commonly results control is used to control the behaviours of employees, in particular those with decision authority. It is a form of indirect control. Results control is a preventive-type of control and informs employees what is expected from them and encourages them to do their best to produce desired results. Often results controls are effective in addressing motivational problems (Merchant & Van der Stede, 2007). The implementation of results controls in organizations requires the following four steps (Merchant & Van der Stede, 2007):
Developments in the oil price

- Defining the performance dimensions
- Measuring performance on these dimensions
- Setting performance targets for employees
- Providing rewards

To evoke the desired behaviours results measures should be (1) precise, (2) objective, (3) timely and (4) understandable (Merchant & Van der Stede, 2007). In order for results control to be effective it should meet the following conditions (Merchant & Van der Stede, 2007):

- Organizations can determine what results are desired in the areas being controlled
- The employees whose behaviours are being controlled have significant influence on the results for which they are being held accountable for
- Organizations can measure the results effectively

Success and continuity of an organization depends on its performance. In order to see how well the organization is meeting its objectives managers use means of PM to keep track of the performance. Based on the outcome of PM managers decide which actions are necessary in order to guide the organization in the right direction. Therefore it’s essential that PM is effective, meets all requirements and keeps track of all important developments.

4.3 Performance measurement

In this paragraph the concept of PM will be defined and clarified. Neely et al (1995) provided the three following definitions of performance measurement, a performance measure and a performance measurement system:

- “Performance measurement can be defined as the process of quantifying the efficiency and effectiveness of action” (Neely et al, 1995).
- “A Performance measure can be defined as a metric used to quantify the efficiency and/or effectiveness of an action” (Neely et al, 1995).
- “A performance measurement system can be defined as the set of metrics used to quantify both the efficiency and effectiveness of actions” (Neely et al, 1995).

The terms efficiency and effectiveness are important in the definitions. It highlights the fact that there are internal as well as external reasons for taking specific actions and measuring the performance of these actions (Neely, 1995). Within organizations managers mainly use PM for two reasons. At first it is used to determine how the organization is performing compared to the objectives and if necessary to decide which adjustments have to be made. PM is also used to
influence the behaviour and actions of employees and to align them with the organizational strategy (Neely, 2005).

To further clarify the concept of PM it is also important to look at the key characteristics of PM. Franco-Santos et al (2007) looked at different definitions of PM and defined three key characteristics of business performance measurement (BPM). The key characteristics are the following:

- The *features* of a BPM system are properties or elements which make up the BPM system (Franco-Santos et al, 2007)
- The *roles* of a BPM system are the purposes or functions that are performed by the BPM system (Franco-Santos et al, 2007)
- The *processes* of a BPM system are the series of actions that combine together to constitute the BPM system (Franco-Santos et al, 2007)

Interest in performance measurement has increased significantly throughout the 1980s and early 1990s and still remains to be a subject of significant interest. Management interest is manifested through the large number of conferences dedicated on the subject and academic interest has manifested itself through a considerable number of papers on the topic (Bourne et al, 2000). Reason for the increasing interest in PM is the growing dissatisfaction with traditional performance measures, which are based on traditional cost accounting principles. These performance measures measure the past but are not adequate to predict the future (Neely, 1995). The narrow and unidimensional focus of traditional performance measurement is considered to be one of its key weaknesses (Neely et al, 2000). Performance measurement focused on financial measures will also bias choices of managers towards a short term emphasis and neglecting long term opportunities (Hayes & Abernethy, 1980). According to Eccles (1991) the shift from treating financial figures as the foundation for PM to treating them as one among a broader set of measures lied at the heart of a revolution and the improvement and development of non-financial performance measures.

Besides the fact that traditional performance measurement has been criticized for being solely focused on financial measures also the way performance measures are used by organizations have been criticized. One of the problems is that often measures are not linked to the organization’s strategy and that they use to many performance measures (Ittner & Larcker, 2003; Keegan et al, 1989). Performance measures should be derived from the organizational strategy, if the strategy changes performance measures should be evaluated and refined to be able to support the new strategy (Ittner & Larcker, 2003). Performance measures could otherwise prevent the implementation of the new strategy and meeting organizational objectives (Keegan et al, 1989). The number of performance measures organizations use are often too many and obsolete. After
strategic changes organizations neglect changing the existing measures and instead add new measures, creating meaningless measures which are redundant (Keegan et al, 1989).

All this interest and research in PM has resulted in a range of innovations in PM research and practice. As stated above there was a growing dissatisfaction with traditional performance measurement which resulted in the development and use of new performance measurement frameworks (Neely, 2005). To overcome some of the limitations of traditional performance measurement systems more emphasis was placed on “improved” financial measures and on more “forward looking” measures such as quality, customer satisfaction and market share (Eccles, 1991; Ittner & Larcker, 1998). Performance measurement systems had to be more balanced to satisfy the new requirements. In research as in practice this resulted in the dominance of the balanced scorecard developed by Bob Kaplan and David Norton (Neely, 2005).

4.4 Performance measurement systems

In this paragraph some of the PMS that are commonly used in practice will be discussed briefly. The underlying principle behind these frameworks is to provide a solution for the problem of the traditional PMS which are based on traditional cost accounting principles. The authors of some of these frameworks state that measuring non-financial instead of financial measures is the key to success. They also point out that organizations should monitor the environment, because the environment also influences the performance of the organization. Besides examples of frameworks which have included non-financial performance measures, examples of frameworks will be provided which are focused on improving financial performance measures.

4.4.1 The Balanced scorecard

The balanced scorecard (BSc) is in essential a multi-dimensional approach to performance measurement and aims to link performance measurement to the organizational strategy. The framework integrates traditional financial performance measures with operational performance measures. The BSc is based on four perspectives (Kaplan & Norton, 1992):

- Financial perspective – How do we look to shareholders?
- Customer perspective – How do customers see us?
- Innovation and Learning perspective – Can we continue to improve and create value?
- Internal business perspective – What must we excel at?

The four perspectives of the BSc should form a balance between short and long term objectives, desired outcomes and the specific performance drivers to obtain those outcomes (Kaplan & Norton, 1996). The BSc also received some criticism since the introduction. The criticism mainly focuses on
the fact that it presumes a causal relation but is in fact a logical relation, it is static and the implementation is top-down (Nørreklit, 2000).

4.4.2 EFQM Excellence model
The European Foundation of Quality Excellence model (EFQM) originated from the Total Quality Management. It is a holistic framework meant to manage the continuous improvement within an organization. The framework consists of four elements of ‘results’ (employees, customers, environment and key performance indicators) and five elements of ‘enablers’ (leadership, employee commitment, strategy, resources and internal processes). Together the four elements of result should define the purpose of the organization while enablers are focused on methods for achieving those results. Although results as well as enablers are both important for the model the emphasis should be more on results. Therefore the framework should be used backwards (Sandbrook, 2001).

4.4.3 Value-based Management
Value-based management (VBM) is about creating a mindset which is based on embracing value maximization as the ultimate financial objective for an organization. The value of the organization is calculated by discounting its future cash flows. Only when capital investments generate returns that exceed the cost of capital value is created. Properly executed, it is an approach to management that aligns a company’s overall aspirations, analytical techniques, and management processes to focus management decision making on the key drivers of value. Non-financial goals are important but they should be carefully placed in line with financial circumstances. The four essential processes are: strategy development, short- and long-term target setting, developing action plans and budgets and finally linking and putting in place performance measurement and incentive systems (Koller, 1994).

4.4.4 Economic value added
Economic value added (EVA) is defined as adjusted operated income minus a capital charge. It assumes that actions made by managers only add economic value if the results exceed capital costs (Ittner & Larcker, 1998). Organizations have to carefully determine the participants and determine how incentives will be linked to EVA (Cagle, 2003). One of the main purposes of EVA is to create a culture within an organization which is focused on value creation. EVA is a useful framework for measuring performance but it is particularly weak in monitoring the means managers have adopted to achieve the objectives (Otley, 1999).

The frameworks described above are examples of PMS commonly used in practice. These frameworks have been designed to overcome some of the problems traditional PM has. Evidently these frameworks do not work under all circumstances and every framework has its benefits and
Developments in the oil price flaws. Therefore a lot of effort is put into designing a PMS which provides managers with tools to measure performance as good as possible. This way managers know what steps they should take to manage and steer the company into the right direction and meeting strategic objectives.

4.5 Performance measurement system design

To begin with, issues associated with the design of PMS will be focused on, rather than going into detail on specific measures. The framework shown in Figure 4 highlights the fact that there are different levels for examining performance measurement. These are the individual measures, the PMS as an entity and the relationship between the PMS and the environment which it operates in. The basic principle underlying the definitions and the framework is that performance measures have to be placed in the strategic context of the organization (Neely, 1995).

This figure is important as it illustrates the fact that a PMS has a number of constituent parts. The purpose of the individual measures is to quantify the efficiency and effectiveness of actions of the employees. These individual measures relate to dimensions like quality, time, costs and flexibility (Neely et al, 1995). All the individual measures together form a set of measures that combined determine the performance of an organization as a whole. Examples of commonly used PMS have been described in previous paragraph. In order for the PMS to work according to plan a supporting infrastructure is essential that enables data to be acquired, collated, sorted, analyzed, interpreted, and disseminated (Neely, 2002).

4.5.1 Key characteristics of PMS

Organizations need to identify the appropriate set of measures to determine the performance. All these measures together will eventually form a PMS which is applicable to the organization in question. When designing the PMS managers should take into account some key characteristics
which are essential for the functioning of the PMS. Neely (2002) identified a total of six characteristics which a PMS has to meet in order to be effective and efficient. The characteristics are briefly summarized below.

- “The set of measures used by an organization has to provide a “balanced” picture of the business. These measures should reflect financial and non-financial measures, internal and external measures, and efficiency and effectiveness measures” (Neely, 2002).
- “The populated framework of measures should provide a succinct overview of the organization’s performance” (Neely, 2002).
- “The frameworks implemented in the organizations should occupy a set of performance measures that are multi-dimensional” (Neely, 2002).
- “The framework has to be comprehensive and it should be possible to map all possible measures of an organization’s performance on to the framework and identify where there are omissions or where there is a need for greater focus” (Neely, 2002).
- “Performance measures should be integrated both across the organization’s functions and through its hierarchy, encouraging congruence of goals and actions” (Neely, 2002).
- “Within the framework results are a function of determinates. This demonstrates the need to measure results and the drivers of them so that the performance measurement system can provide data for monitoring past performance and planning future performance” (Neely, 2002).

4.5.2 PMS design process

The section above describes how a PMS should look like and how a PMS can be looked at. The next section will provide more detail on how a well functioning PMS is designed. Neely et al (2000) have summarized and categorized PMS design principles along a few dimensions of various authors which is shown in Table 1. These characteristics can help managers to answer the question which performance measures they should adopt.

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**Desirable characteristics of a performance measurement system design process**

Performance measures should be derived from the company’s strategy.
The purpose of each performance measure should be made explicit.
Data collection and methods of calculating the level of performance must be made clear.
Everyone (customers, employees and managers) should be involved in the selection of the measures.
The performance measures that are selected should take account of the organization.
The process should be easily revisable – measures should change as circumstances change.

Table 1. Desirable characteristics of a PMS design process (Neely et al, 2000)

The characteristics listed in Table 1 are essential in helping managers to appraise their PMS design and it provides them with useful guidelines which can help them with the design of a PMS that is suitable for their organization. Several authors (Eccles, 1991; Keegan et al, 1989; Ittner & Larcker, 1998) have emphasized the necessity of taking the organizational strategy into account when designing a PMS and therefore proper attention has to be paid to this characteristic because it is an essential one. Keegan et al (1989) state that the first step in deciding what to measure is to look at the strategy and determining the strategic objectives of the organization and decide how these can be translated into individual goals. The performance measures should be derived from those individual goals and together form the PMS.

In Figure 5 a detailed map produced by Neely et al (2000) shows ten essential phases in the process of designing a PMS. The organizational objectives play a key role in the process and sets the process in motion. Managers responsible for the design of the PMS can use this framework in order to create an effective and efficient PMS that meets all organizational requirements. This will result in a number of Key Performance Indicators (KPI) which can provide the managers with an accurate image of how an organization is performing at the moment and they may even predict future performance. The role of KPI’s will be discussed further on in this thesis.

Figure 5. PMS design process workbook (Neely et al, 2000)
4.5.3 Individual performance measures

When designing a PMS one of the key questions that has to be considered is how the individual performance measures which all together form the PMS should be designed. Performance measures which are poorly designed could result in employees manifesting undesirable behaviour. The method of calculating performance is essential in this case, because otherwise it could encourage employees acting unfavourable for the organization (Neely et al, 1997). The formula, which is the method of calculating performance, should be a part of the performance measure but other issues should also be considered. Table 2 shows a framework designed by Neely et al (1997) which help organizations designing good performance measures. It specifies what a performance measurement should consist of.

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<td>Notes and comments</td>
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Table 2. Performance measure record sheet (Neely et al, 1997)

The main issue when designing a performance measure is that is has to relate to the organization in order to be valuable (Neely et al, 1997). To ensure that the measures meet this requirement Neely et al (1997) summarized recommendations for the design of the performance measures. Table 2 is the result of those recommendations and provides the elements of a single measure. These elements clarify the exact purpose of the measure and how it has to be used to achieve its goal. This means that the actual performance is measured correctly which in turn should ensure that the behaviour and decisions of the employees are in line with the organizational goals.
4.5.4 Key Performance Indicators

Table 2 in previous paragraph deals with the specifications of a single performance measure. In practice many different measures are used but they are not equally important. Parmenter (2007) divides performance measures into three different groups. These are successively Key Result Indicators (KRIs), Performance Indicators (PIs) and KPIs. Figure 6 shows how these three indicators interact and are compared with each other. KRIs are measures which cover a longer period of time compared to KPIs. Reviewing KRI can be monitored on a monthly or quarterly basis and tell managers how they performed in perspective. According to Parmenter (2007) examples of KRIs are customer satisfaction, net profit before tax, customer profitability, employee satisfaction and return on capital employed. Complementary to the KPIs are numerous PIs on the organizational scorecard for divisions, teams and on an individual level and managers what to do. KPIs inform what has to be done to dramatically increase the organizational performance to meet its objectives (Parmenter, 2007).

Figure 6. Three types of performance measures (Parmenter, 2007)

Parmenter (2007) defines Key Performance Indicators (KPIs) as: “a set of measures focussing on those aspects of performance that are the most crucial for the continued success of an organization”. There can only be a few KPIs within a firm and all of them should be closely monitored. If top management fails to monitor KPI on a regular basis it could have a profound impact on the results of the organization. On a regular basis this means that they must be measured weekly, daily and sometimes even hourly (Parmenter, 2007). KPIs need to be measured timely in order to be relevant so that decisions can be made based on the actual and current situation. Parmenter (2007) defined seven characteristics a KPI should meet:

- They are non-financial measures (not expressed in dollars, yen, pounds, euro’s, etc.)
- They are measured frequently (e.g., daily or 24/7)
- They are acted upon regularly by the CEO and the top management team
Developments in the oil price

- Understanding of the measure and the corrective action required by all staff
- Responsibility for KPIs can be attributed to teams or individuals
- They have a significant impact on the organization (e.g., affects most of the core critical success factors and more than one BSC perspective)
- Positive results on KPIs affect other measures positively

Managers cannot focus on every detail equally because they lack time and capacity and therefore focus their attention to the most critical. This allows managers to attend to strategic uncertainties (Simons, 1990). Well formed KPIs can help those managers to direct their attention to the issues where it is most needed for the organization.

4.6 Performance measurement system development

The previous paragraph dealt with issues focused on the design of the PMS. Identifying which key objectives should be measured and the actual design of the measures were discussed. One of the important points was that deriving measures from the organizational strategy is essential in the design phase. The design of a PMS is only first the first phase of the process and this paragraph will deal with the subsequent. The phases following the design phase are the implementation of the performance measures and the use of the performance measures (Bourne et al, 2000). Neely et al (2000) state that the challenges managers face is not the design but the implementation of the designed performance measures.

Bourne et al (2000) define implementation as: “the phase in which systems and procedures are put in place to collect and process the data that enable the measurements to be made regularly”. In practice this could express itself as making sure that data is presented in such a way that it is meaningful, initiating procedures to gather missing data or other initiatives. The phase where performance measures are actually used is divided into two by Bourne et al (2000). The first part results from the fact that measures should be derived from the organizational strategy and therefore they should be used to measure the success of the strategy implementation. The second part, the output delivered by the measures, should be used to challenge strategic assumptions and test the validity (Bourne et al, 2000).

Organizations may be forced to make strategic changes because external factors has made it necessary. Performance measures should be derived from strategy and therefore it is important that they are also considered when the strategy is updated. When strategy has changed old performance measures could prevent the implementation of the new strategy through which the organization could fail to meet its objectives (Keegan et al, 1989). Due to these changes the PMS should be
updated if needed at the different levels in order to be up to date. Some examples are provided by Bourne et al (2000) based on the researches of other scholars:

- The performance measurement system should include an effective mechanism for reviewing and revising targets and standards (Bourne et al, 2000).
- The performance measurement system should include a process for developing individual measures as performance and circumstances change (Bourne et al, 2000).
- The performance measurement system should include a process for periodically reviewing and revising the complete set of measures in use. This should be done to coincide with changes in either the competitive environment or strategic direction (Bourne et al, 2000).
- The performance measurement system should be used to challenge the strategic assumptions (Bourne et al, 2000).

In Figure 7 a framework designed by Bourne et al (2000) is presented in which the phases of developing a PMS is outlined. One of the functions of the model is to illustrate how the phases are ordered. The framework also proposes a method to update the PMS. This method consists of four processes which are important to secure the health and validity of the PMS. These processes are: reviewing targets, developing measures, reviewing measures and challenging strategy. These processes are useful in guiding the evolution of the PMS in the desired direction and preventing it from diverging from strategy (Bourne et al, 2000).
4.8 Influence of changing environment on PMS design

The last paragraph of this chapter will deal with some issues influencing the design of a PMS. One of these factors is the changing environment. The environment is not static and organizations should be prepared to deal with those changes. According to Kennerly & Neely (2002): “a lot of consideration is being given to what should be measured today, but little attention is being paid to the question of what should be measured tomorrow. Measurement systems should be dynamic. They have to be modified as circumstances change”. Performance measurement systems should reflect the context of the organization. There are a number of factors that facilitate the change of PMS and some of them inhibit change. Kennerely & Neely (2002) divided the enabling factors into four different categories, which should help organizations to overcome difficulties during the evolution of PMS:

- **Process** – existence of a process for reviewing, modifying and deploying measures.
- **People** – the availability of the required skills to use, reflect on, modify and deploy measures.
- **Systems** – the availability of flexible systems that enable the collection analysis and reporting of appropriate data.
- **Culture** – the existence of a measurement culture within the organisation ensuring that the value of measurement, and importance of maintaining relevant and appropriate measures, are appreciated.
The evolution of a PMS has to pass through a number of phases to be effective (Kennerley & Neely, 2002). These phases are successively reflection, modification and deployment. Reflection will help managers to identify the inappropriate elements of the PMS and where changes have to be made. The PMS subsequently has to be modified and deployed to manage the performance of the organisation (Kennerley & Neely, 2003). The evolutionary cycle shown in Figure 8 illustrates the entire framework.

Figure 8. Framework of factors affecting the evolution of PMS (Kennerley & Neely, 2002)

As Figure 8 shows each of the elements of a PMS are important and have to be managed in the evolution process. Reflection on the appropriateness of all these elements should be the starting point of the evolutionary cycle of the PMS. Reflection on the individual measures should provide insight in the effectiveness of the measures. The framework presented in Table 2 can be a useful tool in this phase. In order to discover if the right things are being measured the entire set of performance measures has to be reflected. Finally reflection on the supporting infrastructure is necessary to identify if the system used by the organisation is working properly (Kennerley & Neely, 2003).

There are several reasons why organizations should consider the enabling factors mentioned above in order to have a PMS which is able to change and evolve itself if necessary. According to Waggoner et al (1999) there are several forces influencing the development of a PMS which are categorized in four categories: internal influences, external influences, process issues and transformational issues. Figure 9 illustrates how these forces influence the development of the PMS. PMS should be dynamic and evolve over time in order to meet the changing expectations.
4.9 Summary

The goal of this chapter was to provide a clear insight in PM and form a theoretical framework which will be used as the foundation for the next chapter. This chapter has dealt with several issues which are essential when establishing a effective PMS, based on a study in scientific literature. The main aspects of PM discussed in the paragraphs above will be briefly summarized and subsequently be presented in a model. This way the most important findings of PM will be clearly illustrated and form the base of the next chapter.

There are a number of aspects which are important when establishing a efficient and effective PMS. The terms efficiency and effectiveness are important as they highlight the fact that there are internal as well as external reasons for taking specific actions and measuring the performance of these actions. Key characteristics can help the organization with the identification of an appropriate set of measures to accurately assess their performance. Before designing the individual measures it is important to know what is expected of the PMS. In order to make sure that the PMS will actually contribute the organization the PMS should be derived from the strategy, which is probably the most important step in the design process. With this knowledge it is important to design the individual performance measures and the KPI’s. If done accurately the behaviour and decisions of employees will be in line with the organizational goals. Once a PMS has been designed it is important that the PMS is frequently reviewed as the competitive environment or strategic direction can change. The PMS should be modified to meet the new requirements caused by internal or external triggers. Factors enabling the development of the PMS through time should be included in
the PMS itself. In Figure 10 the findings of this chapter have been briefly summarized and presented in a model for a clear overview.

Figure 10. Model chapter 4
Chapter 5: Case studies at oil consuming organizations

5.1 Introduction
The previous two chapters have dealt with issues concerning the oil price development and the principles for designing an effective performance measurement system. Based on the previous two chapters the purpose of this chapter is to provide an answer to the three sub questions related to the practical part of this thesis mentioned in chapter two. The goal of this chapter is to provide insight on how the oil price development has influenced performance measurement in practice in the past few years. The research has limited its focus on large logistic service providers and in particular KLM and Stolt-Nielsen S.A. (SNSA). The reason that KLM and SNSA have been chosen is based on the fact that both organizations consume large quantities of fuel through which they have extensive knowledge on this issue.

A number of in depth and semi-structured interviews with people at different levels and divisions within Deloitte were conducted together with interviews at KLM and SNSA. The interviewees were selected based on their function, background, knowledge and experience on specific projects. The information obtained from the interviews was partially general information on the subject and more detailed information on KLM and SNSA. The questions raised during the interviews were based on the previous two chapters. The interview outline is included in Appendix I. On top of the interviews several business documents produced by Deloitte and annual reports of KLM and SNSA were used because they contained valuable existing information. The sources mentioned above provided the necessary information to examine the impact of the oil price development on the performance measurement system. A time span of approximately four to five years has been chosen, covering the period of 2004/2005 to date.

5.2 Control of energy costs with PMS
The previous chapter clearly states that the basic principle underlying the design of an effective PMS, should be the organizational strategy. The strategy should be the starting point for designing a PMS and for this reason it is necessary to identify to what extent the organizational strategy was initially focussed on controlling the energy costs and how this has evolved in the past few years. The outcome of the interviews and annual reports reveals that fuel costs, which are directly related to the oil price, have been an important issue for quite a while. Organizations whose fuel costs form a large percentage of their total costs have been paying attention to the effect these costs have on the results for quite some time. The way this has been translated into their strategy can be found in the financial component of the strategy. Fuel costs have a direct impact on the organizational results and for this reason they are an important part of the financial strategy. Both KLM and SNSA mention
in their strategy statement the will for profitable growth and creating value for shareholders. An analysis of the annual reports shows that the focus of the financial strategy of KLM and SNSA has not gone through any severe changes in the past few years. In order to measure how the organization is performing and if strategic goals are achieved financial performance measures are used.

Besides the obvious financial reason to control energy costs there is a second reason why organizations have increasingly been paying more and more attention to fuel consumption. The interviewees all pointed out that corporate social responsibility has increasingly gained importance and influence on the strategic policy of organizations over time. Having a “green” image is something which a lot of organizations now a days have recognized as an essential part of business. Due to this fact KLM and SNSA have increased their focus on this matter in the past few years which has also been incorporated into their strategy. The annual reports of KLM and SNSA clearly show the fact that corporate social responsibility increasingly gained importance over the past few years and became a fundamental part of the strategy. This trend has been upcoming for quite a while but recently has gained more importance and moved up on the agenda. By reducing fuel consumption organizations can cut costs on one side and on the other side comply with their green strategy by reducing CO₂ emissions. Performance measures provide the necessary information to the organization on how it performed in a particular period on fuel consumption compared to budget. Briefly summarized organizations have two strategic reasons for wanting to control their energy costs. One is financial and the other is to improve and maintain a sustainable image.

As reported above, there are strategic reasons for willing to control energy costs. However interviews also show the necessary nuances. Some of the interviewees stated that due to the fact that the rising oil price was accompanied by economic growth organizations did not have a “sense of urgency” in controlling energy costs. During the years the economy was growing organizations where more concerned about facilitating growth instead of making drastic cutbacks on their energy costs. The economic growth also made it possible to pass on the extra costs through fuel surcharges and adding a proviso in the contracts. With the ability to pass on the surplus of fuel costs organizations have the opportunity to maintain the desired profit margin and perform according to plan. However now the economy is in a recession the picture described above is not applicable anymore. Due to the economic recession organizations are forced to make cost cutbacks and cannot so easily pass on fuel surcharges to customers anymore. On the other hand oil prices have also dropped through which the situation has entirely changed again.

An interview revealed that controlling and reducing energy costs is not so much a matter of the organizational will but a matter of having the possibility to do so. Fuel is a commodity necessary to
operate and whose price is almost entirely determined by the oil price. Oil price is a variable which organizations cannot influence and therefore they are vulnerable to its volatility. In order to continue operating they are forced to purchase fuel for the price set at that moment. Because fuel price is not a variable which can be influenced, organizations focus their attention to controlling the risks of the volatile fuel price. Within KLM and SNSA risk management was made responsible for making sure that energy costs were kept in control within the meaning of preventing excesses.

Interview results revealed that from a strategic point of view there has always been a need to control energy costs. However to what extend energy costs have received attention has changed over the years. A survey conducted by Deloitte states that in the past few years increasing energy costs, due to oil price developments, were a challenge energy consumers have been forced to cope with. Energy management is vital for organizations who are heavily affected by the highly volatile energy costs. As a result the focus on managing energy costs has increased (Deloitte, 2008). Within organizations this has been translated more specifically into risk management in the form of market risk or commodity risk. Interviews and annual reports show that organizations have recognized energy costs as a risk with increasing importance. The rising energy costs in particular form a risk when facing difficulties with passing on these rising costs to the customers. For this reason energy risks have been integrated in the risk management strategy and have received more and more attention in the past few years. The exact consequences of this change will be elaborated further on.

Interview results show that fuel costs have traditionally formed a significant part of the total operating costs for KLM and SNSA. Over the years, as the oil price kept rising, the portion fuel costs formed compared to the total costs only kept on growing through which it became one of the most important. Both KLM and SNSA therefore closely monitor how the organization performs on fuel costs. For this purpose mainly financial performance indicators were used to measure how KLM and SNSA performed on this matter. The purpose of the performance indicators is to measure the effectiveness and efficiency of actions concerning fuel costs and actions which are indirect related to these costs. The following paragraph will further elaborate on the performance measures related to control energy costs used by KLM and SNSA.

5.3 Development of PMS

After having established the fact that there is a strategic need for KLM and SNSA to control fuel costs the next step was to identify the performance indicators related to the fuel costs. In this paragraph the most important measures to control fuel costs used by KLM and SNSA will be described. At first a sketch of how these organizations have been dealing with these issues a few years ago will be provided. Based on this sketch the changes made throughout the years will be described and
clarified by which a clear overview is created on the development of the PMS. This will be done based on interviews held at KLM and SNSA, business documents and annual reports.

Interview results revealed that fuel prices, if not acted upon adequately, form a risk for KLM and SNSA due to its volatile character. Because fuel costs form a significant part of the total costs of these two organizations the consequences of not adequately managing these costs would be severe. The increasing fuel costs were recognized as a risk that should be managed. Risk management of both KLM and SNSA have been taking fuel costs into account for years. The fact that fuel prices somewhat unexpectedly increased exponentially caused top management to increase their focus on this matter within risk management. The frequency of reporting to the top management has gone up with the level of fuel costs relative to the total revenues of the organization. The same applies for the accuracy of reporting on which has also increased. With a focus on risk management KLM and SNSA want to anticipate on changes in the oil market in order to preserve financial results.

5.3.1 KLM

An interview revealed that KLM has been focusing on two main areas to control the effects of increasing fuel costs due to the oil price developments in the past few years. At first on operational level fuel consumption is being closely monitored. KLM has taken several measures in order to reduce fuel consumption in the past few years. Secondly KLM has actively been occupied with stabilizing fuel costs through hedging. As part of risk management KLM has been hedging fuel costs so that the price KLM pays for fuel is partially predetermined. Both ways of controlling and minimizing the negative effects of fuel costs have been implemented many years ago but have evolved over the years. How KLM measures its performance on controlling the fuel costs is described below.

One of the key performance indicators of KLM is the adjusted operating margin. Operating margin is calculated by dividing the operating profit by the operating revenues. The adjusted operating margin shows what percentage of the revenue is left over after paying the variable costs and adjusted for the accounting impact of the different methods of fleet financing. Fuel costs are variable costs which have a direct impact on the operating profit and hence on the operating margin. It is clear that if fuel costs cannot be compensated they will have a negative effect on the operating margin. A few years ago KLM introduced fuel surcharge in response to the rising fuel costs. With a fixed surcharge on European flights and on intercontinental flights KLM can compensate the cost increase in order to maintain the desired operating margin. This key performance indicator has been used by KLM during all the years relevant for this research and the foundation has not been changed due to the rising
fuel costs. KLM has changed the system which is responsible for providing an important part of the information needed to calculate the operating margin.

KLM implemented a system called FuelPlus in 2007, which replaced the older system called BIS. FuelPlus was introduced mainly because BIS was outdated and did not meet new requirements. The supply management function in particular was not adequate in the old BIS system. Management needed a system that could provide information faster, more accurately and reliably to support the entire fuel management process. An overview of the functionality of FuelPlus is provided in Appendix II. FuelPlus is an organization wide system, it connects all the departments who have a responsibility in the fuel process. The fact that all information concerning fuel is up to date, accurate and available for all relevant departments helps management make better decisions. The controlling department can compare the planned fuel consumption and costs to actual data. This way they can create variance reports which can clarify reasons for deviations. With detailed information on consumption and fuel price the controlling department is able to generate accurate reports. An example is the calculation of route profitability for which precise data on fuel consumption and costs per flight are available. With this information the performance of fuel saving actions can be accurately measured by the operations department. The FuelPlus system also contributes to hedging due to the improved data the fuel purchasing department receives.

Another key performance indicator used by KLM is the return on capital employed, which is a relevant indicator for an industry which makes large investments. This measure compares the earnings with capital invested in the organization. Just as the adjusted operating margin, the return on capital employed has also been used by KLM during all relevant years of the research. In the past few years KLM has adapted its strategy for the fleet. High oil prices, a favorable dollar and some environmental considerations have accelerated managements thought on renewing the fleet. To achieve greater energy efficiency and substantial fuel cost savings KLM has speeded up investments in modern aircrafts which are more fuel efficient. The investment made in a modern and fuel efficient fleet was substantial but with a rising oil price the investment should pay off rapidly due to fuel cost savings. This decision made at the top directly influences the return on capital employed. The accelerated investments made in a more fuel efficient fleet has a negative effect on the KPI as capital employed increases. However savings on fuel costs should compensate the negative effect of the investment.

Hedging has become an important aspect of KLM’s strategy and a tool for risk management. Risk management is the responsibility of the risk management committee (RMC) specially formed by KLM. The aim of KLM’s risk management and the goal of the RMC is to reduce the exposure to
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certain risks for example to contain earnings volatility. The RMC meets every three months to review the reports on fuel risk and to decide on the hedging to be implemented. At the quarterly meeting the RMC makes decisions on targets for hedging ratios, the time periods for the targets and they also the specific types of hedging instruments are prioritized. The cash management and fuel purchasing departments formalize and implement the decisions made by the RMC. The fuel purchasing department is responsible for the policy on fuel hedging. The fuel purchasing department makes up a weekly report for the executive management.

The aim of the hedge strategy is to reduce KLM’s exposure to the oil price and therefore to maintain budgeted profit margins. Instruments used for hedging are futures, swaps and options. These instruments are not for trading or speculation purposes. Hedging is not the core business and is only be used to minimize exposure. However hedging has a sound effect on the organizational results and therefore has become an important part of the organization. Using the forward curve KLM makes a prediction on oil price developments in the future and bases its hedge strategy on these predictions. The results of KLM depend on the accuracy of these predictions. Looking back at the oil price developments, the rising oil price had a positive influence on KLM’s results and the heavily declining oil price negatively influenced the results. Hedging can reduce exposure to the volatile oil price, however hedging can also turn out wrong. The volatility of the oil price can have a positive effect on the organization as well as a negative effect when hedging.

5.3.2 Stolt-Nielsen S.A.

The interview at SNSA revealed that the increase in operating costs due to rising oil prices has been an issue which the organization has been coping with for several years now. Fuel costs have historically been the largest portion of variable expenses in SNSA’s shipping business and because of that fluctuations in fuel prices have a large impact on performance. In order to deal with this issue SNSA has taken several measures to control the effect of rising fuel costs. At first SNSA tries to pass on fuel price fluctuations to their customers in contracts. Secondly SNSA uses fuel hedge contracts to lock in a part of the fuel price for a portion of future fuel requirements. The last measure SNSA has taken to control fuel costs is to reduce fuel consumption on operational level. These three main focus areas will be further elaborated.

The most important measure for SNSA to control the effects of the increasing fuel costs are the fuel surcharges clauses in contracts. These clauses make it possible to pass on the extra costs to the customers. For calculating the fuel surcharge SNSA uses a predetermined reference price for fuel which is negotiated and established in the contract. The surcharge is variable based on the route and the distance which has to be travelled. If fuel prices rise above the negotiated reference price the
extra costs are passed on to the customer. On the other hand this also means that if fuel prices drop below the reference price SNSA refunds the difference to their customers. This system works as a hedge for SNSA as the risks of the fluctuating fuel prices are passed on to the customers. The system has been accepted by the customers, mainly by the large customers, and has become standard throughout the industry. Nowadays this system has been implemented in approximately seventy percent of the contracts and covers about fifty percent of fuel consumption. With fuel prices having dropped customers wanted to renegotiate reference price in their contracts downwards. This effected the amount of surcharges SNSA receives. A performance measure related to the fuel surcharges is the true freight revenue. The true freight revenue makes a distinction between the freight revenues and the revenues for fuel surcharges. The extent to which SNSA was able to pass on these fuel costs increases had a direct impact on the SNSA’s gross profit margin one of the key performance indicators. In order to maintain the desired profit margins it is essential that SNSA has the ability to pass on the fuel costs increases to their customers. The focus on fuel surcharges has therefore increased over the years.

Besides the surcharges which are used as a hedge system SNSA also used paper hedges, such as swaps, to lock in the fuel price. The focus of hedging is on controlling the risk of fuel price fluctuations and to provide a form of certainty, hedging does not have a speculative purpose. SNSA used to maintain a fixed hedge position using among other swap contracts. Top management of SNSA was responsible for determining and monitoring the hedge position of SNSA. The fixed hedge position made it possible to prepare budgets in which fuel costs were included. However, due to the increasing volatility of fuel prices and especially the fall of the fuel price, SNSA decided not to maintain a fixed hedge position anymore. Top management chose for a target hedge position instead of a fixed hedge position. The target hedge position provides more flexibility for SNSA but makes it difficult to prepare accurate budgets. SNSA recently stopped using swaps to hedge against fuel price fluctuations. Nowadays SNSA only uses the fuel surcharges system described above to hedge itself against the effects of the fluctuating fuel price. The hedge position of SNSA is a performance indicator which is closely monitored by the top management.

As previously established fuel prices can heavily influence SNSA’s performance. Because of this influence on performance SNSA decided to adjust their performance indicators used to monitor operational performance. The performance indicators are adjusted in a way that the impact of fuel price is eliminated. This way the performance indicators can provide insight in the true results of management decisions and actions. The performance indicators now measure how managers
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actually performed on operational level. Management is now actually being reviewed on things they can control.

On operational level SNSA has taken several measures to control fuel costs. In 2005 SNSA initiated an energy management research project intended to find ways to reduce fuel consumption. Results of the research have identified a number of both practical and innovative solutions. These practical and innovative solutions are necessary because the tankers cannot be replaced with models which are a lot more fuel efficient. Tankers are already designed in such a way that there is very little room for improving fuel efficiency. This means that SNSA does not heavily invest in renewing their fleet because there is no economic return on these investments. One of the practical solutions SNSA has implemented is operational fuel purchasing, which means that the amount, the quality and price of the fuel purchased are being closely monitored to make better economic decisions.

Besides the financial aspect of reducing fuel consumption the environmental aspect is also gaining importance. The customers of SNSA want to improve their green image and therefore also demand from SNSA to reduce fuel consumption and CO₂ emissions. Besides reducing fuel consumption SNSA has the option to chose for a different kind of fuel. There are different kinds of fuel on the market with different qualities and some of them are better for the environment because CO₂ emissions are lower. Higher quality fuels which are less harmful for the environment are more expensive compared to other fuels. The fuel costs will increase if SNSA decides to use the higher quality fuels having a negative effect on operating margins. From an economic point of view the decision to use these more expensive fuels would be wrong. However customers value the fact that transportations are being done with environmentally better fuels which is a competitive advantage.

5.3.3 General developments

Besides the specific developments of the performance measurement system within KLM and SNSA some general developments on the issue were also discussed during the interviews. One of the issues discussed during a interview is the fact that performance measurement traditionally looks back at the performance of the preceding period. Because of this "rear-view mirror" characteristic of traditional performance measurement organizations can in principle only look back at how environmental changes effected the performance. Nowadays the emphasis of performance measurement requirements has shifted towards a more predictive character. Through performance measurement organizations want to obtain better insight in its future performance. An important part of this requirement is scenario planning where multiple scenario's are set out and examined. The more extreme scenario’s are also being considered regarding to fuel prices because of the oil price developments. In the context of this research management wants to know what the effect on
Developments in the oil price will be when oil prices increase or decrease with a certain percentage. With these performance projections they can make plans for each specific scenario and be able to anticipate instead of being forced to react. Data from traditional performance measurement are vital for predicting performance as accurate as possible.

Another trend which recurred several times in the interviews is the increasing importance of risk management. Risk management has influenced performance measurement and become more integrated and aligned during the past few years. The underlying thought of risk management having an increasing importance and influencing performance measurement is to create a form of certainty in achieving organizational goals by knowing what the impact of a particular event will have on future performance. Risk management complements performance management by “looking forward”, and the information provided by performance measurement is essential for effective risk management. Both performance measurement and risk management are essential and should complement each other in order to have the best results. In Appendix III a figure is provided in which the cooperation between performance measurement and risk management is visually displayed.

Organizations strive to control the effects of changes in the environment have on results and in this particular case the oil price volatility. The high volatility of the oil price we have witnessed in the past few years had a strong impact on the results. For this reason the oil price volatility has been identified as a risk of which organizations should take into account.

5.4 Results
In the previous paragraphs the decisions and actions made by KLM and SNSA in order to deal with fluctuating fuel prices have been described. Also the strategic reasons for these actions have been provided. Based on the interview results and the information gathered from the annual reports there are some noticeable aspects which should be highlighted. At first fuel costs have been an important issue for organizations whose results are influenced by the fluctuations of the oil price. In order to cope with the effects of the fuel price fluctuations the actions of organizations resulted in three main components. The first component is the focus on reducing fuel consumption and thus fuel costs on operational level. Both KLM and SNSA have effectively invested in reducing fuel consumption. The second main component is hedging against the risks of the fluctuating fuel prices. Although KLM and SNSA both have different hedging methods the idea behind the hedging strategy for both organizations is the same, which is minimizing risks. The last component is passing on the costs to the customers by adding fuel surcharges to the price. The difference between KLM and SNSA is that the first uses a fixed surcharge and the latter uses a variable surcharge.
The three main components briefly described above have been used by KLM and SNSA during all relevant years for the research. However as fuel prices rapidly increased over the years, having a greater impact on organizational performance, the focus on controlling these costs changed. More and more attention from top management was aimed at dealing with problems concerning the fluctuating fuel prices. Top management demanded more frequent, more adequate and complete information to base their decisions on. According to Kretsch in the interview the actions and decisions made related to fuel prices are a matter of competitive choice instead of a competitive advantage. The measures taken have effectively helped the organizations in reaching their goals when fuel prices were increasing. Now fuel prices dropped and the economy is in a recession organizations have to re-evaluate and make changes if necessary.
Chapter 6: Confrontation

6.1 Introduction
The theoretical research on performance measurement in chapter four formed the basis for conducting the case studies and practical research described in chapter five. This chapter will describe how the findings on performance measurement in practice correspond with the theoretical background on performance measurement. The goal of this chapter is to highlight the similarities and the deviations found during the research. After having described these similarities and differences we will look at the causes of these deviations in order to explain why they occur.

6.2 Similarities and deviations in practice and theory
At the beginning of chapter four a weakness of performance measurement mentioned was that performance measurement looks back as it measures past performance and is not adequate to predict future performance (Neely, 1995). Several interviews revealed that this weakness is also an important issue regarding fuel prices. Fuel is an important cost for both KLM and SNSA which influences their performance. The unpredictability and volatility of the fuel price is a risk that organizations should and have considered because it could negatively influence performance. Risk management has increased its focus on risks related to the volatility of fuel prices. One of the effective tools used by risk management is hedging. Using swaps, futures, options and variable surcharges KLM and SNSA have hedged themselves against the risks of fluctuating fuel prices. Hedging strongly improves the insight KLM and SNSA have on future fuel costs and therefore they can also better predict future performance. Hedging provides them a form of certainty on which the organizations can base their actions and decisions on. The weakness of performance measurement found in the literature, that it can only look back, has been partially solved in practice by risk management and in particular hedging.

One of the key findings from the theory of chapter four was that performance measures need to be derived from the organization’s strategy (Ittner & Larker, 2003; Keegan et al, 1989). Performance measures should be linked to the strategy, if strategy changes the measures should be evaluated and refined in order to be able to support the new strategy. Performance measures could otherwise prevent the successful implementation of the new strategy and prevent the organization in meeting its objectives (Keegan et al, 1989). Research in the annual reports and interviews revealed that there are two main strategic reasons for organizations to measure how they perform on controlling fuel costs and fuel consumption. The first reason is financial, both KLM and SNSA mention in their strategy the desire for profitable growth and maximizing shareholder value. The second reason is the increasing importance of corporate social responsibility which has been an strong upcoming trend in
the last decade. In this case the environmental effects of fuel consumption and CO₂ emission which are necessary for doing business are relevant. Organizations focus on reducing fuel consumption to improve their image on corporate social responsibility.

From a strategic point of view there is a need to measure the performance on fuel costs and consumption. This means that theoretically performance measures should be linked to these parts of strategy to support it. In practice the performance measure derived from the financial part of strategy for both KLM and SNSA, in which fuel costs play an important role, is the operating margin. The operating margin provides information to the managers on how the organization is performing in a financial point of view. Fuel costs are one of the largest operational costs. If an increase in fuel costs due to rising oil prices is not compensated through an increase in revenues this will be noticeable in the operating margin. In this case the operating margin will decrease and this information is passed on to the managers. This performance measure reacts to the fluctuations of the fuel price and measures how the organization performs financially and if operations contribute in achieving strategic goals.

Another performance indicator derived from the financial strategy found in practice at KLM and SNSA is the hedge ratio. The hedge ratio means that a certain percentage of fuel consumption is hedged for a certain price minimizing the effect of the fluctuating fuel price. The fluctuating fuel price forms a financial risk for KLM and SNSA. In order to protect themselves from a negative influence on financial results both organizations use hedging to minimize their exposure. Although KLM and SNSA use different methods to hedge themselves the principle remains the same. Hedging has become an important part of the actions taken by KLM in order to meet the objectives of the financial strategy. When fuel prices were rising hedging contributed positively to the financial results. With fuel prices dropping drastically hedging negatively influenced the results. KLM uses instruments as swaps, futures and options to hedge fuel consumption. SNSA also used swaps to hedge a part of their exposure to fuel price. However the main hedge instrument SNSA uses is the variable surcharge for fuel. With a fixed reference price in the contracts the risk of fuel price fluctuations is passed on to the customers. Using these hedge instruments KLM and SNSA create a desired hedge ratio which is accurately monitored by top management.

Efforts by both KLM and SNSA have been done in order to reduce fuel consumption and increase the fuel efficiency. Reasons for these efforts are reducing fuel costs and increasing their corporate social responsibility image. During this research no clear performance measures were found related to fuel consumption or fuel efficiency. Interviews revealed that fuel consumption is being monitored and that significant investments have been made in order to reduce fuel consumption. However no
specific performance measures were mentioned during the interviews. Based on theory KLM and SNSA should both employ a performance measure which indicates how they are performing on fuel consumption. Probably both organizations use performance measures in which fuel consumption is incorporated or directly affected by fuel consumption. The operating margin is an example of a performance measure which is influenced by fuel consumption but which does not directly indicate performance on fuel consumption. Another example at KLM is the return on capital employed. This performance measure is on one side influenced by investments made to realize a decrease in fuel consumption. On the other side the decrease in fuel consumption should have a positive effect on the return influencing the outcome of return on capital employed. In this case practice deviates from theory since there are no specific performance measures which measure performance on fuel consumption.

An important part of chapter four is the development of performance measurement system. Kennerly and Neely (2002) stated that if circumstances changed the PMS should be modified, the PMS should be dynamic. External influences could trigger strategic changes through which performance measures should be updated or replaced (Keegan et al, 1989; Bourne et al 2000). In this research it was assumed that the rising fuel price due to the oil price developments was an external factor which could have triggered changes in strategy and performance measurements. Interviews revealed that in the past few years the rising fuel prices have been playing an important role in organizations. However the rising fuel prices have not resulted in organizations adapting their strategy. The main reason was and still is that fuel is a necessary commodity to be able to continue to operate and that the price for this commodity, even if the price is rising, has to be paid. Issues related to fuel prices have been receiving more attention from top management but have not caused strategic changes. As a result there has been no strategic reason to change the PMS. The performance measures described above all have in common that they are influenced by fuel price. Throughout the years considered within this research the performance measure have not gone through any real changes.

Bourne et al (2000) stated that the output delivered by the measures should be used to challenge strategic assumptions and test the validity. Fuel costs have had an increasing impact throughout the years on the output generated from the performance measures described above. In theory the performance measures should have been used to challenge the strategy. In practice there has been no strategic change based on the output of the performance measures. Interviews revealed that fuel costs have been receiving an increasing amount of attention from top level but no real strategic changes have been made.
6.3 Causes of deviations

When comparing performance measurement in theory to performance measurement in practice in relation to the oil price developments some remarkable findings were found during this research. One of them is the increasing role of risk management throughout the years. Fuel costs have always been an issue for organizations whose results and primary processes are heavily affected by energy costs through the developments of the oil price. For that reason performance measurement was initially designed to take these costs into account. The fuel costs fluctuations have not caused organizations to change their PMS. Fuel costs have not so much triggered changes in performance measurement but have increased the importance of risk management within the organizations. The interviews clearly pointed out that fluctuating fuel prices form a risk as it can negatively influence performance. The primary tool applied by risk management in order to minimize the negative effects of fuel costs is hedging.

Results revealed no real deviations between practice and theory caused by fluctuating fuel prices. The main reason for this is the fact that fuel costs always have been and will continue to be an important issue for organizations as KLM and SNSA. Therefore fuel costs were already incorporated into their strategy through which to change the strategy. This also meant that performance measurement has been initially designed to take full costs into account. The unpredicted oil price increase followed by a dramatic fall has not changed the organizations point of view on performance measurement. Small adaptations have been made to performance measurement as the impact of fuel prices on results increased, but the basic principle has not changed.
Chapter 7: Conclusion and discussion

7.1 Introduction

This research was based on the central question formulated in chapter two, which will be answered in this chapter. This research consists of a literature study on performance measurement and a practical research on the oil price development and performance measurement in practice to provide an answer to the sub-questions. These sub-questions formed the basis of the previous four chapters and the findings of these chapters form the input for the main conclusion. The last paragraph of this chapter will discuss the limitations of this research and provide recommendations for future research.

7.2 Conclusions

The main research question formulated at the beginning of this research reads as follows:

To what extend has the emphasis of the performance measurement systems within large logistic service providers shifted due to the development of the oil prices in recent years in order to achieve organizational goals?

This research started out with describing how the oil price has developed in the past few years and examining the forces behind the “remarkable” development. The fact that oil prices were rising in the past few years until the summer of last year on itself was not so remarkable, however the way the oil price increased was. The main issue was that no one could foresee the enormous price fluctuations leaving most organizations unguarded. According to Widdershoven oil demand predictions did not foresee the economic growth rate China and India would go through and the impact the economic recession on the oil price could also not be predicted. The oil price fluctuation therefore had a significant impact on organizational results. This was especially the case for organizations which consume large quantities of oil or products derived from oil such as fuel. In the context of this research these organizations are KLM and Stolt-Nielsen S.A..

The second part of this research was focussed on performance measurement in theory. Extensive literature research formed the basis of the fourth chapter in which the relevant parts of performance measurement have been described. There are a number of aspects which are important when designing and developing an efficient and effective PMS. An important step in establishing a PMS that will actually contribute the organization is that the PMS should be derived from the strategy. The organizational strategy should be the starting point for the design of the individual performance measures and KPI’s which together form the PMS. Once the PMS has been designed it is important that the PMS is frequently reviewed as the competitive environment or
strategic direction can change. The PMS should be modified to meet the new requirements caused by internal or external triggers. In the context of this research the development of the oil price is the external trigger.

In the fifth chapter case studies have been conducted in order to see if the developments in the oil price have influenced the PMS at KLM and SNSA. Interview results revealed that the oil price has always played an important role in both organizations as fuel costs form a significant part of the total costs. Therefore there has always been a strategic reason to control these costs. For this reason the PMS at KLM and SNSA have always taken fuel costs into account. The increasing volatility of the fuel price formed a risk for both organizations through which risk management became more important. The extensive hedging programs KLM and SNSA are essential in order to reduce their exposure to the oil price. Fuel surcharges and reducing fuel consumption by operating more efficiently are the two other main components to control fuel costs. Both organizations have made significant investments to reduce fuel consumption. In general organizations require a systems with a more predictive character instead of the traditional “rear-view mirror” function of PMS.

In chapter six when confronting performance measurement in theory with performance measurement in practice in the context of oil price two performance indicators were highlighted in this research. These are the operating margin and the hedge ratio. On the one hand the operating margin provides managers insight in how the organization has performed financially. The operating margin is a performance measure that reacts to the fluctuations of the fuel price. On the other hand the hedge ratio can provide more insight in how will perform. The hedge ratio means that a certain percentage of fuel consumption is hedged for a certain price minimizing the effect of the fluctuating fuel price and thus it provides more certainty for future performance.

As final answer to the main question it can be concluded that the developments in the oil price have influenced performance measurement within large logistic service providers. First, it has always been a part of KLM’s and SNSA’s strategy to control fuel costs, which react to the oil price, either for financial reasons or for sustainability reasons. Fuel consumption is and always has been inherent to the business of KLM and SNSA. Therefore fuel costs have always played an essential role in the PMS. However due to the increasing volatility of the oil price of the past few years the effect fuel costs had on performance also significantly increased. The fluctuating fuel costs formed a risk due to which risk management becoming more important and influencing performance measurement. The main tool used by risk management to reduce the exposure to oil price fluctuations is hedging. KLM and SNSA have an extensive hedging programme and the hedge ratio is one of their KPI’s. The focus on controlling fuel costs has always been present in the PMS of these organizations, however as the
impact of fuel costs on the overall result increased so did the attention of top management. Top management demanded more frequent and more accurate information regarding these costs. Despite the fact that organizations have increasingly been paying more attention to controlling fuel costs eventually the oil price market is something organizations cannot control. This meant that the extra costs had to be passed on to the customers through surcharges.

7.3 Discussion

This research has led to a conclusion. There is however another aspects which has not lead to the conclusion but from a completeness point of view still deserves some attention. One of the important tools used to control fuel costs was hedging. During the time the oil price was rising exponentially hedging significantly contributed in achieving organizational goals. Analysts were predicting that the oil price would continue to rise to a price of $200 a barrel. At that time hedging seemed the right thing to do. Despite the fact that the sole purpose of hedging is to minimize the exposure to the oil price and has no speculative purposes SNSA and in particular KLM significantly increased their profits through hedging. However when suddenly the economy came into a recession and oil prices drastically started dropping the downside of hedging became painfully clear. This raises questions to the effectiveness of having hedge ratios as a KPI.

7.4 Limitations and further research

Although this research has produced some interesting findings some limitations to the used research methods and the results have to be discussed. The first and probably the most important limitation of this study is the scale. For gathering data interviews were held at only two large logistic service providers, KLM and SNSA, which have been included in the research. Although this was a conscious choice to limit the scale of the research to two organizations it does mean that the results of this research cannot be generalized. This research should be seen as a preliminary study.

A second limitation is the number of people interviewed at KLM and SNSA. It proved to be hard to find managers willing to cooperate. The initial idea was to interview several managers within KLM and SNSA, due to a lack of time only one manager at both organizations have been interviewed. This problem has partially been solved by interviewing several experienced managers within Deloitte. These managers were able to provide valuable information, however their point of view was limited to an external view on the large logistic service providers. Several annual reports have also been examined to gather more additional data.

There are several opportunities for further research. It has become clear that the development of oil price has influenced performance measurement within KLM and SNSA. Despite the fact that results
showed similarities some differences were also found. In order to study to what extent the oil price developments have truly influenced performance measurement the scale of this research should be broadened. Besides the number of organizations included in further research also the size of organizations could be changed. The design, implementation and development of a PMS demands a significant investment in both time and money which smaller organizations can not so easily afford. It is very likely that smaller organizations have a totally different view on the problem and have acted differently.

The initial idea behind this study originated in summer of 2008 and thus before the economic recession and the fall of the oil price. The drastic fall of the oil price was an unexpected event shedding a whole new light on the problem. This research has tried as far as possible to included this in the results. However, the fall of the oil price is too recent to be able to accurately study the effects it has had on performance measurement. It could be interesting to take this event into account in further research as this event could demand a whole new approach of organizations to deal with the fuel price problem.
References

Articles and books

Business documents and annual reports

- Deloitte (2008), *Energy Management Survey 2007: A study on how the major Dutch energy consumers manage their energy exposures*, Amsterdam, The Netherlands

Websites

- LiveCharts (2008), [http://www.livecharts.co.uk/daily_charts/daily_charts.php](http://www.livecharts.co.uk/daily_charts/daily_charts.php), 10 December

Interviews

- Widdershoven, C., Director, Deloitte, semi structured interview on oil price developments, 14-11-2008
- Hoppenbrouwers, J., Director, Deloitte, semi structured interview on the influence of oil price development on performance measurement systems, 20-1-2009
- Graaf, R., Senior Manager, Deloitte, semi structured interview on the influence of oil price development on performance measurement systems, 25-1-2009
- Balhuizen, O. & Estoppey, T., Director & Senior Consultant, Deloitte, semi structured interview on the influence of oil price development on performance measurement systems, 30-1-2009
- Lurks, W.J., Manager Fuel Contracts Offshore KLM, semi structured interview on the influence of oil price development on performance measurement systems within KLM, 10-2-2009
– Bommel, P., Partner / Global Industry Leader, Deloitte, semi structured interview on the influence of oil price development on performance measurement systems, 16-02-2009

Appendixes

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Appendix I

Interview outline

Introduction

As part of my graduation project I am currently working on a thesis research at Deloitte ERS. My research is focused on the performance measurement systems of organizations whose results are highly dependent on the development of the oil price. The goal of my research is to examine the influence of developments in the oil price, the past three to five years, on the performance measurement system of organizations. The first part of my thesis, a theoretical research on performance measurement, forms the basis for further research in practice. As part of the practical research I will be conducting some interviews in order to see to what extent developments in the oil price have resulted in actual changes in performance measurement systems within organizations. The interviews will be semi-structured and will take approximately one hour.

Practical section of thesis

The goal of the interviews is to gain insight in the development and use of the performance measurement systems within the organizations, in order to provide an answer on the thesis’ sub-questions mentioned below.

- To what extent do performance measurement systems contribute in controlling energy costs?
- How was the performance measurement system designed prior to the development of the oil price in the past few years?
- Has the development of the oil price influenced the design of performance measurement systems?
- What changes in the performance measurement system have been made due to the development of oil prices?
- To what extent have these changes contributed to more effectively achieving organizational goals?

Required (in advance)

All performance measure record sheets of performance measures of which the purpose is to control energy costs and have been used in the past five years, if possible.
Developments in the oil price

Record sheet should contain, if available, the following information: Title, Purpose, Relates to, Target, Formula, Frequency of measurement, Frequency of review, Who measures, Source of data, Who owns the measure, Source of data, Who owns the measure, What do they do, Who acts on the data, What do they do, Notes and comments.

Interview Questions

Strategy

- To what extent was the organizational strategy focused on controlling energy costs five years ago?
- How has the strategic focus on controlling energy costs evolved in the past few years?
- To what extent are changes in the strategic focus on controlling energy costs a result of developments in the oil price?
- How is the organizational strategy focused on controlling energy costs now?

Individual performance measures

Based on performance measure record sheet.

- Which specific performance measures of the performance measurement system have been used to control energy costs prior to the oil price development (three to five years ago)?
- To what extent were these performance measures successful in controlling energy costs?
- Which changes have been made to the performance measurement system the past few years to control energy costs?
- To what extent have these changes contributed to improving the controllability of energy costs?
- To what extent are the performance measures derived from the organizational strategy?
- Are the purposes of the measures clear?
- Is the data collection and methods of calculating the level of performance clear?
- Who are involved in the selection of the measures?
- To what extent is there the possibility to adapt measures as circumstances change?

Performance measurement system

To what extent have changes in the organizational strategy / oil price development effected the following characteristics of the PMS?

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1 Energy costs in the context of the entire interview are all costs related to oil and in particular fuel costs.
“Developments in the oil price”

- The measures provide a balanced picture of the organization?
- The measures provide a brief and accurate overview of the organization?
- The set of performance measures are multi-dimensional?
- The measures are comprehensive on the organizational performance?
- The measures are integrated across the organization’s functions and through its hierarchy?
- Results as well as determinants are monitored?

Key performance indicators

- What were the KPI’s related to energy costs five years ago?
- In what way have the KPI’s related to energy costs evolved over past few years and to what extend are changes a result of oil price developments?
- What are the KPI’s related to energy costs nowadays?
- To what extend did / do the KPI’s meet the requirements mentioned below?
- They are non-financial measures (not expressed in dollars, yen, pounds, euro’s, etc.)
- They are measured frequently (e.g., daily or 24/7)
- They are acted upon regularly by the CEO and the top management team
- Understanding of the measure and the corrective action required by all staff
- Responsibility for KPIs can be attributed to teams or individuals
- They have a significant impact on the organization (e.g., affects most of the core critical success factors and more than one BSC perspective)

Influence on performance measurement system development

- To what extend do internal and external factors, process and transformational issues influence the development of performance measures?

Additional information

- Are there any other relevant issues related to the influence of the oil price on performance measurement which have not been discussed?
Appendix II

Overview functionality of the FuelPlus system

Source: The Importance of Fuel Management Systems, Article by Klaus-Peter Warnke, extracted from Armbrust Jet Fuel Report, November 2006
Appendix III

GRA framework

Source: Presentation Deloitte
Appendix IV

Interview Roland Graaf, Senior Manager RA, Deloitte Core Audit, 25-01-2009;

Due to the unexpected increase of the oil price, organizations have moved certain investments forward. Investments in fuel saving measures in the context of cutting costs have been moved forward. The investments are related to the fleet of KLM for example. Aircrafts with high fuel consumption will be depreciated faster and replaced with new aircrafts with a lower fuel consumption.

Moving forward these investments has also partially to do with the sustainable image that organizations want to achieve. There is a positive relationship between the degree of sustainability and the organizational results. Investing in a green image has a positive effect on results on the long run. An example of an initiative at KLM is a CO2 surcharge. With this surcharge passengers can “buy of” the CO2 emissions. Depending on the way you look at it, the passenger is offered the possibility to fly “green”.

Better controlling and more efficiently handling fuel has an advantage on two fronts. At first fuel is an important cost factor and therefore has a direct effect on the financial results. Improved systems in this area will contribute to control and improve financial results. Nowadays being sustainability and green are concepts which have increasingly received attention from organizations. Reducing fossil fuel consumption and CO2 emissions will gain importance as a green image will have a positive effect on the continuity and performance of organizations.

The routes offered by KLM should be looked at and reconsidered. A flight to a certain destination which initially went twice a day should be reconsidered. Due to the higher fuel prices and thus higher costs the occupancy rate must be reconsidered. Flights could be combined due to this, other flights could be cancelled. Cancelling flights because of the low occupancy rate will force customers to go to the competition. A strategic choice will have to be made: to fly despite of the low occupancy rate or to cancel the flight and risking customers flying with another organization.

The design, development and implementation of performance measurement systems have not been adapted acute due to the developments in the oil market. The reason is that the design and development of a system requires a large investment in time and money. The way current systems are being used has changed. The systems are being used more frequent than before. Data from the system is used more often and the importance has also increased significantly. The system has acquired a more prominent role.
A year and a half ago KLM has introduced the FuelPlus system. The purpose of this system is to more accurately monitor fuel consumption. The system is able to accurately monitor the entire fuel trajectory. Differences and exceptions can be recognised sooner making it possible to react faster. The implementation of this system is not directly related to the oil price developments. The system uses before FuelPlus was outdated and did not meet requirements. KLM always had a system to monitor fuel costs but now it has been improved. A technical default on an airplane is recognised sooner because consumption is being monitored more accurately.

KLM has an very aggressive hedging program to hedge itself from risks as the fluctuating fuel price. This means that KLM has long term contracts in which agreements have been made on fuel price. This provides KLM the possibility to anticipate on fuel price fluctuations instead of reacting. To support KLM’s hedge program it is essential to have accurate forecasts on the oil market. In KLM’s opinion $80 is a fair price for a barrel crude oil and has aimed its hedging program to this price. Currently this is above the price on the oil market. The development of the oil price could not be predicted and because of strategic choices made in the past KLM is forced to do damage control. By buying and selling large quantities of fuel KLM tries to gain short term profits and slightly influence the fuel price.

The frequency of measuring the KPI’s related to fuel costs has increased significantly. Data has to be more accurate and monitored more often. Due to heavy price fluctuations fuel related issues gained a higher priority even though they were always important. The question remains if this trend will continue when the oil market stabilizes. Than can be concluded if organizations have learned or will fall back in old habits.
Appendix V

Interview Jurgen Hoppenbrouwers, Director, Deloitte Consulting, 20-01-2009:

In the transportation sector fuel costs form about 30% of the total costs and thus they are a significant cost for those companies. Personnel costs, which also form a significant part of the organizational costs, are reasonably predictable and stable in comparison to fuel costs which have been increasingly fluctuating recently.

Previously fuel costs were not included in the contracts, nowadays organizations have inserted fuel clauses in their contracts in order to minimize the risks of fluctuating fuel prices. As long as the fuel price stays beneath a predetermined reference price no extra costs are charged to the customer. If the fuel price rises above the reference price the extra costs are charged to the customer.

PMS traditionally looks back at the performance of the previous period. Nowadays the emphasis of PMS has shifted towards a more predictive and forward looking character. Scenario planning has become an important aspect where organizations prepare different plans for several scenarios. The more extreme scenarios are also considered.

Historical data obtained from PMS is important for creating the different scenarios.

Scenario planning is used to test the sensitivity of the different business units and to examine how these business units will react to certain changes (oil price development). At different oil prices the organization can examine the different options they have within their supply chain. The distribution structure, a central warehouse against several warehouses and the distribution channels are some of the aspects which can be considered.

An agreement on fixed prices provides a certain security. However fixed prices can have a positive or a negative impact on results with the fluctuating oil prices.

Reducing fuel consumption has an positive effect on several areas. Not only is it profitable due to the decrease in fuel costs it also has a positive effect on the “green image” of the organization and its CSR policy.

Large fuel consumers have negotiated a fixed discount. For example, they get a 10ct discount at the gas station. These discounts decreases the fuel costs however it does not protect them from the effects of oil price fluctuations. When fuel prices rise the fuel costs go up despite of the negotiated discount.
Another way to save fuel/transport costs is to try to influence the behaviour of the customer. Customers increasingly order often and in small quantities. By stimulating the customer to order large quantities at once less transportation is needed. An example is the AH where batches are delivered daily, instead of large quantities at once. The total amount within the supply chain remains equal but transportation is done more efficiently.

How truck drivers behave on the road has a large impact on fuel consumption and therefore it should be monitored. The time of transportation can be adjusted by making delivery arrangements with customers to be able to avoid traffic jams. Deliveries could be done at night.

Technological improvements can also contribute to reducing fuel consumption. In most cases no one knows when these innovations will be on the market (navigation system which leads trucks around traffic jams).

Long term scenario planning is essential and all possible developments and outcomes are considered. On short term organizations look at the possibilities they have under the present circumstances to get the best possible results.

Organizations are aware of the effects of extreme oil price fluctuations and can also insure themselves against the negative effect.

PMS will continue to focus on more predictive qualities. Nowadays it is too much focused on reviewing past performance through which organizations are forced to react instead of anticipating on certain developments. Organizations are looking for ways to integrate these predictive systems into their current environment.
Appendix VI

Interview Oscar Balhuizen, Director & Tjalf Estoppey, Senior Consultant, Deloitte Financial Advisory Services, 30-01-2009:

Within organizations the influence of oil price is not so much noticeable in the performance measurement systems but in the risk management systems. However organizations devote very little attention to the management of risks related to the development of the oil price. They are simply not interested, there is no sense of urgency. Price increases due to higher energy costs could be passed on to the customers.

The influence of oil price on the organizational results have been on the agenda of large organizations as KLM and SNSA for quite some time. In recent years no changes have been made to the systems based on the developments in the oil price.

Organizations do very little to control performance related to energy prices/fuel costs. This can be noticed in the performance measurement systems of the organization. The performance measurement systems have not been changed due to influences related to the development of oil price in the past few years.

The systems have not been adapted in recent years, however the degree of importance and the amount of attention paid to oil price related issues have. Information monitored more often and more accurate. Large organizations have had a hedge strategy for quite some time to hedge against the risks of volatile commodity prices. The hedge position has been closely monitored by top management in the past few years, however no changes have been made to the systems providing information.

Through the fact that oil price has dropped dramatically in the past six months the amount of attention paid to the hedge strategy has decreased. The hedge strategy remains important but is does not receive as much attention from top management as before. As soon as the oil price starts to rise again so will the attention of top management.

The increasing oil price was accompanied by an economic growth. During these years organizations devoted very little attention to cutting costs but instead were examining growth options. In times of economic downturn, organizations will look at the options they have to cut back on costs. In the current economic conditions energy/fuel costs will receive more attention than in the period up to a half year ago.
The required margin on products/services is much more important to organizations than acquiring a cost advantage in cutting back on oil-related raw materials. While the increase in fuel costs could be passed on to customers, there was no need for these cuts as the margins were maintained. There were no changes at strategic level because controlling fuel costs was not a priority.

Risks were hedged by hedge programs and clauses in contracts. But as long as the customer continued to pay and competitors did not perform better, there was no sense of urgency in controlling fuel costs.

The story which is brought out by organizations is mainly caused by the increasing importance of having a “green” image and rather than to cut costs. Organizations state in their annual reports the will to reduce fuel consumption to gain a green image as their stakeholders find it important. Also the reduction of CO2 emissions is important. There is a large discrepancy between the green story brought out and the investments actually made by the same organizations. The marketing aspects is more important than the cost saving aspect.

No strategic changes were made because margins were maintained and hedge programs covered a large portion of the exposure. In the current economic situation cost savings related to fuel will rise on the agenda of top management.

Perhaps there is a difference between large organizations were a large portion of the fuel exposure is hedged and smaller organizations which have no hedge strategy. Hedging is part of the core business of large organizations. Smaller organizations probably pay a lot more attention to cost savings on fuel due to a lack in hedge strategy and the incapability to pass on the cost increase to the customers. Example: Dutch transportation companies.
Appendix VII

Interview William Lurks, Manager Fuel Contracts Offshore, KLM, 10-02-2009:

Despite that Air France – KLM is one organization (one annual report) they do operate independently from each other. Both are responsible for their own results. This also means that KLM is responsible for carrying out its fuel policy.

When purchasing fuel three aspects are important. These are quality, availability and price. For jet fuel there is a standard for quality which has to be met. The price is set through contracts. Producers of jet fuel offer their products at a certain price and based on the data KLM chooses for the best option or a combination of options.

The price of a barrel of crude oil is the basis for the price of jet fuel, because of this there is a clear correlation between the price of a barrel of crude oil and jet fuel. On Platts the benchmark price of jet fuel is provided daily. KLM uses this benchmark price when determining purchase contracts. The price eventually paid by KLM is the benchmark price from Platts with a mark-up. The mark-up rate is determined by transportation costs and storage costs and such. The mark-up rate can be negotiated, the Platts price is determined and cannot be negotiated. The Platts price is a variable which cannot be influenced by KLM, by sharp negotiations a margin can be gained on the mark-up rate.

No one can predict how the oil price will develop in the future, through which it is very hard to make accurate budgets. KLM uses the forward curve from Platts where the oil price is determined for the coming period based on derivatives. This curve shows the expected trend of the oil price for the coming years. The actual price can deviate significantly from the curve due to certain events that effect the oil price. The operations department is responsible for the budget and is independent from the fuel purchase department.

Operations department is responsible for monitoring fuel consumption and tries to cut costs by keeping consumption as low as possible. Management has no influence on the Platts price, the price is nonnegotiable but is a given which has to be accepted. The only possibility is to be as efficient with fuel as possible. Investments in more fuel efficient airplanes is the most important option KLM has. KLM also has several systems which facilitate fuel efficient flying. From the ground KLM monitors fuel consumption and the flight plan, based on data from live whether charts the flight plan can be adjusted during the flight so save fuel. The amount of fuel which goes into the airplane is accurately measured in order to prevent that the airplane is to heavy and therefore consumes more. These are small things the operations department can do which eventually add up.
Fuel costs used to be 12% of the total costs, nowadays fuel costs are around 25%. KLM has introduced fuel surcharges to cope with rising fuel costs.

KLM replaced its system responsible for monitoring fuel consumption and invoices. The old system (BIS, Brandstof Informatie Systeem) has been replaced by the FuelPlus system developed by Lufthansa. Managers want clear and accurate insight in the actual costs. The lack of a supply chain module in the BIS system forced management to decide to replace the system. FuelPlus links the different functions together through which there is a clear insight in the actual situation. Operations is central within the system and is linked to the other functions through FuelPlus. The functions are: operations, accounting, hedging, controlling, supply management, purchasing and company planning. The reason why BIS was replaced was that it did not meet all requirements. KLM wanted to have a better insight in the entire fuel chain (lack of supply chain in BIS) The rising oil price was not the reason for introducing the new system. Before introducing FuelPlus KLM in cooperation with other airline companies tried to design a new system themselves called JetA.com. Eventually KLM had to aboard this project after the entire industry collapsed after 9/11 and the system became too expensive. FuelPlus also has a usergroup in which users discuss the system with each other in order to adjust the system. Based on these usergroup meetings new applications and restrictions can be discussed.

Fuel purchase has changed in 2000 at KLM. KLM does not by its fuel from the market by directly at the refinery. This is centralised at Amsterdam where the purchase department is situated. KLM cooperates with Shell in order to gain economies of scale.

Through hedging KLM tries to get a “fixed price” in order to minimize the risks. Hedging has become an important part of KLM. Deals are made with banks to hedge the risks on the financial results. KLM must be careful that hedging does not become speculation. Hedging is not a part of the core business and it should only be used to hedge against risks. A rising oil price has a positive effect on the hedge results and a falling oil price a negative.

XMAP is a system which will be introduced the first of April to better monitor hedging. Hedging has become an important part of strategy. During the hedging process KLM has a scope of four years and an certain amount of fuel is hedged. By not fully being hedged KLM maintains some space to react on movements on the oil market. Hedging is important to protect oneself from heavily fluctuating oil prices. It not wise to be hedged for 100% because you lose the possibility to react. Because of this oil price fluctuations remain noticeable.
Hedging has become an important part of KLM and has changed during the years. A lot of attention has been paid in order to facilitate and improve hedging. From top management attention for hedging has significantly increased. Now hedging has become so important that the result of KLM almost entirely dependent on the results of hedging. The hedging and fuel purchase department report and advise top management bases on predictions. With this information strategy can be formulated at the top.

When hedging one should also look at credit exposure. When the oil price was rapidly increasing KLM had to make sure banks were able to pay, now it is just the opposite. KLM benchmarks its hedge position compared to the completion.

KLM tries to work on its green image in several ways. Reducing fuel consumption is one of the options but the fact remains that flying is not “green” and will not become “green” in the near future. Therefore KLM tries to contribute to the environment on other fronts.
Appendix VIII

Interview Steven Kretsch, Director Planning & Projects Department, Stolt-Nielsen, 23-02-2009:

Fuel costs nowadays form 55% of the variable transportation costs and therefore are an important part of the total cost of SNSA.

To a large extent the rising fuel costs are offset by charging fuel surcharges to customers. In order to calculate the surcharge SNSA uses a predetermined reference price which is specified in the contracts. If fuel costs rise above the established reference price the additional costs are charged to the customer, however if fuel costs drop below the reference price the difference is (sometimes, nowadays) paid back. This works as a hedge system because the risk of fluctuating fuel prices are passed on to the Customer.

50% of the fuel consumption volume is covered by the hedge system described above. Most customers (mainly the “larger customers”) have accepted this system which has become standard in the industry. Competition uses similar methods in order to pass on the fuel costs to their customers. Smaller customers have been more difficult in accepting this system. Nowadays the fuel surcharge clause has been incorporated in 70% of the contracts.

The surcharge is determined on the basis of the route (distance) the ship must sail. The surcharge is not fixed but variable. Through this shorter routes can be more economic than the longer routes.

For internal reporting the true freight revenue is essential, for which SNSA uses the reference price determined in the contracts. Some customers find that the reference price is to high after the fall of the oil price. The following example shows how SNSA deals with this situation. De reference price is adjusted downward through which the surcharge also decreases, however the freight revenues increase. The total amount does not change. SNSA closely monitors the fifty that changes place.

1000 freight 100 surcharge
1050 freight 50 surcharge

Swaps are (were) also used to hedge against the impact of fluctuating fuel prices.

On operational level a lot is done in order to reduce fuel consumption to cut costs. Some of the innovative examples are: looking at whether maps and currents, new kinds of paints on the hull of the ship, polishing the propeller more often, installing a kite, ect.
Developments in the oil price

Monitoring the hedge position is one of the performance indicators used by SNSA. SNSA used to have a fixed hedge position, nowadays SNSA uses a target hedge position. The top of the organization is responsible for monitoring and determining the hedge position. A fixed hedge position is more useful during the budgeting process. Due to the heavy fluctuations in the oil price SNSA does not use a fixed hedge position anymore. The way that SNSA is hedged has also been adapted in recent years. SNSA does not use “paper hedges” anymore. Nowadays the only system SNSA uses to hedge itself against oil price fluctuations are the surcharges in the contracts.

Revenue – voyage expenses (mainly fuel costs)

The performance indicator used by SNSA to monitor how the organization performs on operational level has been adjusted to eliminate the influence of fuel prices. Through this the insight that management has on the consequences of their decisions has increased. Fuel is essential in order to be able to operate and because of this fuel price has to be paid. SNSA cannot influence fuel price despite the impact it has on the total performance of SNSA. By eliminating the effect of fuel costs on the performance top management increases its insight in the performance and can more accurately review operational decisions.

Within SNSA hedging is focussed on controlling the risks related to the fluctuating oil price and to offer a form of security. Hedging has no speculative purposes.

Besides the financial aspect the environmental aspect has been gaining importance on fuel consumption in recent years. Customers have become more critical towards CO2 emissions for their transport. It is important that SNSA responds to this trend.

Nowadays SNSA has increasingly been monitoring the amount of fuel purchased and where it purchases its fuel (operational fuel pricing). In order to get an optimal balance in the amount of fuel against the amount of freight on board the ship. The more fuel is loaded on board the less capacity is left over for freight. Fuel price varies by location and because of this a margin on fuel price can be obtained. The same goes for fuel quality. SNSA examines the amount of energy the different kinds of fuel contain against their prices. An example is a fuel which is 5% more expensive but contains 7% more energy through which it is more economic. Accurately monitoring fuel purchases can lead to less fuel purchases and fuelling more economically. SNSA wants to prevent emergency fuelling because of the extra costs. It is essential to avoid frequent fuelling. The fuel market is transparent making operational fuel pricing possible.

In recent years SNSA has not heavily invested in a more fuel efficient fleet. There is no economic value added to invest in this. The investments would be much higher than the costs savings which
could be accomplished from a more fuel efficient fleet. This is caused by the fact that ships are already very fuel efficient because 99% of the time they sail at a constant speed. A 5% increase in fuel efficiency would be a lot. No profit can be obtained by sailing faster as the fuel costs would increase more that the revenues.

New kinds of fuel are being examined. Not because these are more economic but because they are better for the environment. These new fuel can contribute to SNSA’s green image.

How an organization deals with the problems related to fuel is a matter of competitive choice instead of a competitive advantage. Fuel is necessary to operate and the price will have to be paid. The choice organizations have to make is how they want to hedge against the volatility of the oil price.
Appendix IX

Interview Peter Bommel, Partner/Global industry Leader, Energy & Utilities, Core Audit Deloitte, 16-02-2009;

Risk management has become a increasingly more important part of daily business. Performance measurement is increasingly influenced by risk management within the various organizations.

Risk management is increasingly being implemented top down. Top management makes a selection of the most important key controls and implements these top down. Number of key controls is decreasing in order to get the organization leaner and meaner.

Oil price has become a risk with increasing importance in the past few years due to the increasing volatility. Therefore is important to pay more and better attention to the effects of fluctuating oil price.

Oil consumers can hedge themselves from the effects of the fluctuating oil price by hedging and long term contracts. The price is fixed for the coming years in order to gain stability.

For oil producers the current economic condition offers opportunities despite of the low oil price. Not only oil prices are low but also the price for materials needed to drill for oil are low. Because of high oil prices in the past few years oil producers have a lot of cash which they can invest. Mergers and acquisitions are also possible.

(referral to Deloitte presentation, Appendix III )