

MASTERS BY RESEARCH DISSERTATION

**The development of a strategic framework for South African explosives companies  
expanding business activities into Sub-Saharan Countries**

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## **DEDICATION**

I DEDICATE MY DISSERTATION TO THE LORD WITHOUT WHOM THIS DISSERTATION WOULD HAVE NEVER BEEN POSSIBLE.

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## **ABSTRACT**

The pressure on the current mining sector in South Africa has forced South African explosives companies to expand their activities into Sub-Saharan countries in order to sustain and grow their sales and profits.

The purpose of the research was to assess the efficiency of the existing strategic frameworks presented by the literature and deployed by the explosives companies expanding operations in Sub-Sahara and to understand if and how they need to be adapted to suit the explosives market. The research was thus guided by the following research questions:

How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations in Africa?

Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?

Why would it be necessary to include other key variables in existing strategic frameworks to develop an effective strategy for the explosives business?

How do other non-manageable variables such as politics, legal, cultural and administrative barriers impact on the shaping of the final strategy for South African explosives companies willing to expand their operations into Africa?

The research method followed was a single case study research approach leading to the conclusion that, despite developing different strategies by existing explosives suppliers, they performed well and showed growth in sales and profits. Notwithstanding their success, the investigation revealed that some challenges and specific aspects of the explosives market were not addressed by either the explosives companies' strategies or the main strategic frameworks described in the literature. Furthermore, the analysis identified external factors, such as commodity prices, which contributed more to the success of explosives companies than the strategies they implemented.

The results of the analysis described above led to the development of a strategic framework which included the elements of strategies used by explosives companies, relevant model elements from existing strategic frameworks, external factors (rival explanation) such as commodity prices and variables which take into account the challenges encountered by explosives companies in Sub-Saharan Africa as well as specific aspects of the explosives market.

It is believed that the strategic framework developed in the last section of the present research takes into account the particular aspects of the explosives market and empowers South African

explosives companies with a framework which addresses the specific aspects of the explosives markets to develop successful businesses in Sub-Saharan Africa.

# 1 INTRODUCTION

## 1.1 Research overview

### 1.1.1 Growth of the explosives market

The increase of prices of commodities, such as copper, gold and iron ore from 2009 to 2013, led to the growth of mining activities on the African continent. As a result, the consumption of commercial explosives, typically used for the mining of minerals, increased during the same period.

From 2009 (AECI, 2010) to 2013 (AECI, 2014), commercial explosives suppliers such as AEL Mining Services (AEL), a member of AECI Group and a leading supplier of explosives and associated products in Sub-Saharan countries, saw their sales increase by fifteen percent in revenue terms and five percent in sales quantity.

### 1.1.2 Pressure on the explosives market

During 2013, the prices of major commodities such as iron ore and copper dropped as a result of a slower than expected Chinese demand (Mining, 2013/03/01). Furthermore, the demand for gold decreased by eleven percent from 2012 to 2013 and by a further four percent from 2013 to 2014 (Driffield, Jones, & Crotty, 2013). The reduction in demand for gold and other commodities impacted negatively on the production of minerals, thus resulting in a reduction in explosives consumption (Arouri, Lahiani, & Nguyen, 2015).

In addition, following various industrial actions led by mine workers, the production of minerals dropped causing most mining companies, under pressure to reduce costs, to renegotiate commercial agreements with current explosives suppliers. The impact of the negotiations resulted in a drop of fifteen percent of AEL's profits in 2012 (Arouri et al., 2015).

According to government sources, the loss resulting from the industrial actions is estimated at 15.3 billion South African Rand for the whole mining sector (Mining, 2013/02/27) and 62 million Rand in loss of sales revenue for AEL (AECI, 2010).

### 1.1.3 Shareholder pressure

In order to overcome the above-mentioned losses in revenue, the shareholders of the two major explosives companies in South Africa, AEL and BME<sup>1</sup>, have asked them to pursue opportunities outside South Africa and turn to the Sub-Saharan region.

During 2013, AEL marked their intent to focus on Sub-Saharan explosives markets. The AEL CEO explained in a press release that AEL was seeking to increase sales by 1.57 billion South African Rand from 2014 to 2017 through the pursuit of opportunities outside the Republic of South Africa. Fifty percent of AEL sales are currently generated in Sub-Saharan countries. In order to reach their strategic objectives AEL will have to develop a strategy which will unlock further sales in Sub-Saharan Africa (AECI, 2014).

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<sup>1</sup> Bulk Mining Explosives, part of the OMNIA chemical group and second largest supplier in Sub-Saharan African

BME currently realizes about fifty percent of their total revenue from operations in Zambia, Mauritania, Sierra Leone, Liberia, Tanzania and Mali. BME also indicated its intent to achieve company growth targets through the expansion of activities outside South Africa (OMNIA, 2012).

#### **1.1.4 Research objective**

In order to meet their strategic objectives, AEL and BME will have to use a strategic framework adapted to the realities of Sub-Saharan Africa in order to deliver the growth expected by their respective shareholders, thus the purpose and focus of the present research is to:

1. Understand the limits of the current strategic frameworks when applied to the explosives business.
2. And concurrently develop a strategic framework that will be adapted to the objectives and needs of the South African explosives companies wanting to expand their activities outside of South Africa.

### **1.2 Problem Statement**

The pressure on domestic explosives markets is forcing South African explosives manufacturers to expand their activities into other African countries in order to meet profitability targets. The internationalization of their activities will create a need to develop an effective strategy which will take into account the differences and similarities between the domestic and the foreign market (Games, 2010).

#### **1.2.1 Research contribution to knowledge**

Much has been said about the development of global strategies for companies in developed or emerging countries willing to extend their domestic activities into other developed or emerging countries, but strategic management literature has not yet developed a framework which takes into account the complexity of the markets faced by South African explosives manufacturers in Sub-Saharan countries, thus the purpose of the present research.

#### **1.2.2 Explosives market complexity**

##### **1.2.2.1 Non-integrated regulations**

Sub-Saharan Africa is still far from political, economic and regulatory integration, due to different regional economic and political zoning, such as SADC (Southern African Development Community), Ecowas (Economic West African States) and others. Despite efforts in favour of economic integration with a regional currency, such as CFA Francs in Central and Western Africa (Dougueli, 2012), each African country has its own Explosives Act to address country-specific safety and security issues. Due to the growing concern over terrorism in West Africa (Waddington, 2014), the hub of main African gold mines, the production, storage, transport and consumption of commercial explosives, is often managed by the military, other state security bodies and national ministries of mines, depending on the country.

### **1.2.2.2 Complex market segmentation**

In addition, strategy development in the explosives industry must take into account the different mining methods, the size of the mining company, and the presence of a state-owned explosives manufacturer in the targeted country or the geographical origin of the mining company. These considerations increase the complexity of the strategy formation.

### **1.2.3 Limits of existing strategic frameworks**

In the late seventies, Porter developed a strategic framework based on the analysis of “5 market forces” on a given market and the way they shape strategy and explained that managers had the choice between “generic strategies” as detailed further in the Conceptual Framework section of the present document (M.E. Porter, 1998b). The fact that Porter’s strategic framework does not consider political and legal aspects as a market force which should shape a company’s strategy makes it inappropriate for strategy development in the explosives market, as these elements are essential to an explosives company’s establishment in a country. More recently, authors such as Ghemawat have challenged the globalization concept promoted by Friedman in non-academic circles (Friedman, 2006), highlighting that barriers between countries have not disappeared, hence the danger for companies to ignore the differences between home and foreign markets when defining strategies (Ghemawat, 2011). However, the present research highlights the limits of the Ghemawat “triple A strategies” (P. Ghemawat, 2007, Part 2: Strategies for Global Value Creation) and “CAGE” framework (Ghemawat, 2011, pp 55) when applied to the explosives market.

## **1.3 Purpose Statement**

The purpose of this research is to assess the efficiency of strategic frameworks currently applied by South African explosives companies when developing activities in Sub-Saharan Africa countries and, based on the assessment, then to develop a strategic framework which will include model elements that address the complexity of the explosives market in Sub-Saharan Africa.

The study is guided by the following core questions:

How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations into Africa?

Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?

Why would it be necessary to include other key variables in existing strategic frameworks to develop an effective strategy for the explosives business?

How do other variables, such as political, legal, cultural and administrative barriers, impact on the shaping of the final strategy for South African explosives companies willing to expand their operations in Africa?

#### **1.4 Definitions**

Accessories: Detonators, Boosters or detonating cord.

AEL: South African base explosives company, fully owned subsidiary of AECI limited.

BME: South African based Explosives Company, fully owned subsidiary company by OMNIA limited.

Blast holes: Holes drilled by the mines destined to be charged with explosives by explosives suppliers.

Explosives companies: Companies producing and selling commercial explosives based in South Africa.

Explosives: Bulk emulsion explosives, packaged explosives.

Mobile Manufacturing Units: Trucks destined to deliver bulk emulsion into blast holes.

Rise and fall: Price adjustment mechanism applied by explosives supplier to adjust the price of bulk emulsion prices based on the cost of ammonium nitrate and other costs components.

Sub-Sahara: African countries outside South Africa and South of the Sahara desert.

Value added projects: Projects initiated by explosives suppliers in collaboration with the mine in order to improve their productivity or reduce their costs.

## **2 LITERATURE REVIEW**

### **2.1 CONCEPTUAL FRAMEWORK**

In order to develop a strategic framework for South African companies operating in the commercial explosives sector willing to increase their activities in Sub-Sahara, the concepts of strategy, globalization and the explosives market need to be defined, based on the existing literature.

As the word “framework” will be used extensively in the present study, it is appropriate to define it within the context of the research based on the existing literature: “A framework identifies the relevant variables and the questions that the user must answer in order to develop a conclusion tailored to a particular industry or company”(Ghemawat, 2000 p. 55).

It is important to understand that the word “conclusion” in the present research describes the most appropriate strategy.

### **2.2 Strategic concept**

The study of the evolution of the concept allows a better understanding of strategy and links the literature to the objective of the present research.

### **2.3 Conceptual location**

Mintzberg locates strategy within its discipline by explaining that strategy, like all the other disciplines such economics, political science, has its core concept which is strategic management (Mintzberg, Ahlstrand, & Lampel, 2005). In other words, strategy is the central concept of the broader field of strategic management.

### **2.4 Presentation of the strategic evolution method**

Research conducted by Mintzberg led to the identification of different schools of thoughts on strategy (Mintzberg et al., 2005). The present section uses Mintzberg’s School of thoughts repartition for presentation purposes.

It is important to note though, that other authors use a different approach, for example, Ansoff claims to be a member of the “Design school” rather than the “Planning School” (Ansoff, 1991), as suggested by Mintzberg and more recently Kiechel presents strategy as a concept discovered and applied by consultants, such as Bruce Henderson from Boston Consulting Group, that was only later formalized by academics like Porter (Kiechel, 2010).

In the last heading of the present section a link between the concept of strategy and the research questions is clearly established.

### **2.5 From business policy to strategy**

According to Ghemawat, the intensity of competition on local and international markets led to the evolution from business policy, a discipline that emerged between the end of the nineteenth century and the beginning of the twentieth century at the Wharton Business School,

and Harvard Business School, to birth strategic management discipline. The focus on strategy was prompted by the increase of local and international competition during the fifties and sixties. Organizations felt the need to develop effective strategies to face unprecedented competition (Ghemawat, 2000).

## **2.6 Distinctive competencies**

Prior to Porter's research on the firm's competitive advantage (M.E. Porter, 1998a), developed later in the present section, Selznick identified the links between the competencies of an organization and its sector. He introduced the concept of "distinctive competencies" explaining that when companies face competition, they tend to develop "distinctive competences" to remain efficient (Selznick, 1957). According to Selznick, "distinctive competencies" result from the successful implementation of procedures, through a process called "institutionalization" (Selznick, 1949).

Di Maggio and Powell highlight the cultural limits of Selznick's approach arguing that he did not take into account the fact that the institutionalization of an organization is not a rational process but rather results from "cognitive" and "cultural" dimensions of all its members (Powell & DiMaggio, 1991).

The importance of the cultural dimension of strategy is furthermore developed in section 4 of the present research, as it is a key factor for the successful establishment of an explosives supplier in Sub-Saharan countries, as companies will have to recruit and develop a local workforce (Ricart, Enright, Ghemawat, Hart, & Khanna, 2004).

In addition, although the literature recommends that the company's management team is involved in the selection of the most appropriate and efficient market entry strategy mode, the fact that Selznick insists that top management will define procedures without the consultation of the different levels of the organization though the workers' representative will create a resistance towards any new procedures. This could have a fatal effect on safety where the worker must understand that the procedure has been developed for his own benefit.

Furthermore, Selznick highlighted the need to develop "distinctive competencies" but did not develop a framework to identify them.

## **2.7 Company strategy and organization structure**

After Selznick introduced the concept of "distinctive competencies" described in the previous paragraph, Chandler, an historian, established the relationship between company strategy and organization structure (Chandler, 1962). Through a detailed analysis of the history of American industrial and administrative innovations until 1960, he linked the company structure that could be centralized, decentralized, departmentalized to the company's strategy that could be focused on increasing production, geographical expansion, vertical integration or product diversification.

Selznick and Chandler's research impacted the emerging strategic management discipline and more specifically the Harvard Business School (Learned, Christensen, Andrews, & Guth, 1969).

Despite interesting insights into the relationship between organization and strategy, Chandler's work cannot be considered as practical as he does not address the issue of the formation of strategy nor did he suggest a framework to select the appropriate strategy, thus making his model difficult to apply to the explosives industry. Furthermore, critics such as Freedman explain that Chandler has simplified the relationship between structure and strategy by ignoring the complexity of decision making within an organisation (Freedman, 2013).

## **2.8 Andrews' SWOT analysis**

Through his well-known Strength, Weakness, Opportunity and Threats model, Andrews developed a framework that would lead managers to identify the strengths and weaknesses ("distinctive competence") of their organizations against the opportunities and threats of their business environment (Andrews, 1971).

### **2.8.1 Critics of the SWOT Analysis**

Despite the simplicity and popularity of the framework, some concerns arise when using it to develop strategy. One of the main underlining assumptions is that management has a perfect knowledge of the weaknesses and strengths of the company. However, assessing an environment could prove superficial as the managers might not be able to identify, in some cases, all the underlining weaknesses or strengths and would tend to base their strategies on obvious weaknesses and strengths (Mintzberg, 1990).

In addition, markets are in constant evolution; in a given environment a strength identified now might become a weakness when the environment later changes. In an evolving world such as the explosives market in Africa, the areas of focus changes rapidly due to regular political and economic changes.

Andrews' framework implies that the strategy formulation is performed by top executives and ignores some of the critical aspects of the formation of decision as well as the personality of the managers (Kiechel, 2010). Within the case of the present research, this could lead to a strategy that does not take into account the local conditions and inputs of middle and lower management located in other African countries facing different legislations and regulations.

## **2.9 Strategic planning**

During the same time period which Andrews developed his framework, another school of thought with a focus on strategic planning emerged led by Ansoff (Ansoff, 1965). Ansoff focused on strategic planning. The basic concept of the planning school is to elaborate further on the SWOT analysis by breaking it down into checklists for implementation purposes.

Ansoff inspired a large number of authors, amongst them George Steiner (Steiner, 1969), who defined the key steps of strategic planning as:

- Setting up of clear objectives.

- Attempt to predict the future through forecasts.
- Identification of weaknesses and strengths of a company through a thorough detailed internal audit.
- Strategies are assessed by using different accounting criteria.
- Operational stage, a detailed implementation is produced.
- The process is scheduled with precise deadlines.

Based on a survey, Steiner highlighted that the lack of clear objectives and management involvement in the planning process and the delegation of the implementation phase to the planning department, are the main causes of planning failure (Steiner & Schöllhammer, 1975).

With the implementation of strategy, the need to develop criteria to measure their efficiency grew. According to Simons, companies developing strategies for new markets will measure actual results against budgets and forecasts, whilst strategies for established markets would measure costs (Simons, 1987). In line with the present research, companies willing to develop activities outside their home base will rely initially on budgets when developing strategies and later during the course of the activity while monitoring, on a regular basis, actual costs against budgets.

### **2.9.1 Strategic planning critics**

Despite the success of strategic planning, critics disagree with Ansoff and Steiner's statement that research planning leads to the formation of strategy. According to Mintzberg, strategy is the capacity to transform internal and external learning into a vision and a direction which the business should follow. In a well-known article, Mintzberg explains that the planning process is a tool used in the strategy-making process and provides the necessary data and information in order to produce the best possible strategy, whereas it cannot lead to the formation of strategy on its own (Mintzberg, 1994).

### **2.10 Porter's approach to Strategy**

In the late seventies and early eighties, another school of thought called the "positioning school" appeared, led by Porter. Ansoff argued that Porter's work belonged to the planning school (Ansoff, 1991), nevertheless for the purpose of the present research, the positioning school is presented as a different school of thought, based on its influence amongst managers and academics (Mintzberg, 1991).

According to Porter, a company's strategy depends on the long term profitability of the sector and the company's level of profitability compared to the market standard (M.E. Porter, 1998b).

Furthermore, Porter explained that the level of profitability of an industry is determined by competitive forces; as a result he developed the 5 competitive forces framework that provides an assessment of the level of profitability of a sector through the assessment of the competitive forces within the industry.

The five competitive forces framework (threat of new entrants, bargaining power of buyers, threats of substitute products and services, bargaining power of suppliers) defines the long term attractiveness (profitability) of an industry.

Porter's selection of the five forces is based on their impact on the company's profitability. In addition, he argues that the political, regulatory and cultural aspects ("market forces") of a targeted market should not be a key focus when drawing a global strategy as they do not have any impact on the long term profitability of a company (M.E. Porter, 1998b).

Once companies determine the main forces of their market they can then apply the most appropriate strategy. Porter limits the number of strategies available to a set of "generic" strategies. He identifies two potential sources of competitive advantage, for a company: "low cost" and "differentiation" and these, combined with the "scope" of a business, lead to three possible "generic" strategies: "cost leadership, differentiation and focus" on a particular market segment (M.E. Porter, 1998a, p. 28 - 32).

Porter explains that the critical success factor of a strategy lies in the ability to choose and focus on one strategy at a time. He reckons that a mix of "generic" strategies leads to the failure of the strategy (M.E. Porter, 1998a).

### **2.10.1 Porter and the previous schools of thoughts**

Porter used elements of Andrews' "SWOT" analysis to assess the market and to allow companies to identify their "competitive advantage" as well as the planning methodology to develop his frameworks. One of Porter's contributions was the use of elements of the industrial economics discipline to assess markets. His work led to the definition of a set of strategies ("generic strategies") which managers could select from, based on the conditions of their markets.

### **2.10.2 Porter's critics**

Miller, through an empirical survey led on American companies, argues that companies pursuing a mix of "generic strategies" are more efficient than companies pursuing only one strategy, as suggested by Porter (Miller & Friesen, 1986). In another article, Miller illustrates this point with a case study of Caterpillar Inc. who focused exclusively on producing high technology earth moving equipment, thus becoming vulnerable to Japanese low cost producers (Miller, 1992).

Recent literature shows the impact of local regulations on the profitability of a company, especially in Africa, thus the limits of the "five forces" framework. A research showed that the profitability of South African companies willing to invest in Africa (Chabane, Roberts, & Goldstein, 2006) is affected by the non-integration of banking systems, customs duties and other local regulations. In the context of the present research, it is important to note that the lack of integration between countries from a logistic and legal standpoint led explosives companies to build at times similar plants in neighbouring countries, thus increasing the

investments and the running cost of the production facilities and reducing the companies' profits.

Porter's framework relies heavily on the assessment of industry and market data but ignores the behavioural and power aspects of the strategic formation process in an organization. As Quinn explains in an article on "logical instrumentalism concept", effective strategies are a combination of formal planning, the assessment of quantifiable data and the power behavioural factors of an organization (Quinn, 1978).

In addition, Porter's market analysis framework requires quantifiable data, as noted by Mintzberg, and can pose a problem in new markets or unknown foreign regions where market data is not always available. Thus Porter's approach is difficult to apply when developing a strategy for explosives markets in Africa where updated market information is not always available (Mintzberg et al., 2005).

### **2.11 Consultants approach to strategy**

In line with Porter's approach, Bruce Henderson built a matrix called the "BCG matrix" (Henderson, 1979). The objective of his matrix was to allow companies to select and focus on a portfolio of profitable activities. Similar to Porter's framework, the company strategy would be based on two criteria.

The first criterion is the market growth and the second is the firm's market share. The portfolio of activities pursued by a company is thus determined by the combination of the two parameters in a certain market leading to the following activities:

- In a high growth market and a high market share products and services are considered to be "Stars".
- In a low growth market and a high market share products and services are considered to be "Cash flow".
- In a low growth market and a low market share products and services are considered to be "Dogs".
- In a high growth market and a low market share products and services are considered to be "Problem child".

According to Henderson, the success of a company will depend on its capacity to establish a portfolio of product and services with different market shares and different growth rates as high growth markets require "cash" to grow ("star") thus, low growth market are used to generate "cash flow" (Kiechel, 2010, p. 64).

The concepts used by Henderson present certain similarities with Porter's framework. The key premise shared by both authors is that business strategy is shaped and formed by the analysis of the market through simple frameworks for Henderson and more complex ones for Porter, leading to the choice of "generic" actions or strategies (M.E. Porter, 1998a). The market share criteria identified by Henderson refers to a company's ability to differentiate from competition

and acquire a strategic position in a market whilst Henderson's growth criteria refers to Porter's analysis of the market.

The main difference between the two approaches is the level of detail; Henderson carried out limited empirical validation of his model whilst Porter focused on the empirical relationship between external market conditions and strategy.

Despite similarities with Porter, Henderson was criticized in academic circles for oversimplifying the concept of strategy (Freedman, 2013). Seeger argued that in certain market conditions, companies should promote "dogs" to keep competition outside the market. He used the example of a company called Clorox, a market leader in the low-growth laundry bleach market that introduced a specific product in the segment that could not reach a high market share, only to counter its competitor Procter & Gamble's introduction of a product called Wave. Clorox action prevented Procter & Gamble entering the market segment (Seeger, 1984).

### **2.12 Subjective approach of strategy**

The previous schools of thought concerning strategy adopted a deterministic point a view as the strategy is driven by markets, competition and other market linked factors. The present section describes another approach where the formation of strategy takes into account the cultural aspects of strategy hence, a more subjective definition of strategy. The following points will focus on the cognitive and cultural aspects of strategy as Section 4 and 5 of the present research will demonstrate their implication in the process of developing strategy for explosives companies entering Sub-Saharan countries. The entrepreneurial approach of strategy derived from the neo classic theory (Pigou, 1920; Schumpeter, 1947) are not covered by the present section as they fall under other disciplines such as economics and do not directly relate to the purpose of the present research.

Simon introduces the concept of cognition in the strategic process and explains further the impact of the psychology of the members of an organization and its influence on the process of decision making (Simon & Barnard, 1976). According to him, strategy formation is the equilibrium between personal motivation and organization, thus a proper assessment of an organization must be done from a psychological and sociological point of view. Despite the need to understand the cognitive aspect of decision making in organizations, the level of abstraction of the cognitive framework make them difficult to apply. Nevertheless, certain aspects of personality, such as attitude towards risks, are relevant and essential for a company willing to develop its activities internationally.

Lindblom in the late 50's focused on the actual decision making process in policy making. He explained that the most critical decisions made by administrators do not follow the logical pattern of assessment described by academics, but are rather based on the experience and past comparison of the administrator (Lindblom, 1959). Lindblom's field of study was political; Quinn took his research further and applied it to strategic management.

According to Quinn, strategy is formed through “logical incrementalism,” as described previously in the current research, with formal planning and assessment only being a portion of the process of strategy formation. The manager will use planning as a tool, but at the same time use past experience and personal knowledge to take into account external factors that could have an impact on the organization (Quinn, 1978).

Although Quinn and Lindblom mentioned the importance of politics in decision making, Pettigrew goes further (Pettigrew, 1977) and defines strategy formulation as a political decision making process within a context. Context is thus defined as history, organization culture, rate of change, stability of the organization, structure, leadership and internal political systems, though he emphasizes the critical role played by the latter. According to him, political behaviour is an individual or a subgroup of an organization arguing against the political sharing of resources (salaries, promotions, and opportunities, control of tasks, people, information and new areas of business). As in the previous approaches by Schumpeter, Lindblom and Quinn, it can be noticed that Pettigrew shares their point of view that the ultimate goal of an organization is more complex than maximizing profits as painted by the neo-classic economists hence, formulation of strategy is not a logical and rational process as it takes into account the different aspirations of individuals and subgroups. It can be argued that though politics is important in decision making, it can be considered as a component of the strategy formulation rather than the main driver.

The key premise of the cultural school is that the strategic process is linked to the perception of environment that heavily depends on the culture of the members of the organization. Strategy will thus result from a process of social interactions and the socialization process of the individual to acquire the organization culture and non-consciousness of behaving according to a culture (Mintzberg et al., 2005).

Barney explained that the culture of a company can be a source of competitive advantage (Barney, 1986). In addition, the strength of a company is linked to the capacity of its members to behave unconsciously in accordance with its culture on a regular basis without being able to explain why (G. Johnson, 1992). The limits of culture as a strategic framework is that it creates a strong resistance to change and can promote values such “organizational uniqueness” where being different is seen as an advantage (Mintzberg et al., 2005).

Miller explains that the choice of strategy from a company will be limited by its structure. Although Chandler established the relationship between structure and strategy (Chandler, 1962), when he linked centralization, decentralization, multidivisional and decentralized structures to strategies of expansion of volumes, geographical dispersion, vertical integration or product diversification; Miller goes further by linking company structure to the well-known “generic strategies” of Porter and demonstrates the relationship empirically by showing that the implementation of “generic” strategies is limited by the company structure (Miller & Friesen, 1986). In light of the present research, it is important to note that companies that want to develop activities abroad must ensure that their internal structure can follow their

expansion strategy. Furthermore, a company must understand that the home base structure can be suitable for international expansion in Europe but not for African countries.

### **2.13 Recent developments in strategy**

In line with Porter's methodology of developing strategic frameworks, Ghemawat has taken the concept of strategy further. Whilst Porter did not consider a company's organization and leadership as "forces", local regulations and culture, Ghemawat included them in his framework that allows the company to shape an effective strategy. Whilst Porter believed that companies should only choose one from a set of "generic strategies". As we saw previously, Ghemawat explains that successful companies will need to use a combination of strategies rather than a single strategy.

In addition, Ghemawat, without going to the extent of the subjective school of thoughts studied in the previous section, developed a framework (CAGE) that takes into account the cultural, geographic, administrative and economic dimension of a market (Ghemawat, 2011, pp 55).

#### **2.13.1 Generic strategies**

Ghemawat more recently broadened the concept of strategy by showing that an effective strategy will take into account the differences and similarities between countries and regions. An effective strategy will thus identify differences and manage them. His broader view of strategy led him to develop the "triple A" strategic framework for companies willing to establish a presence outside their domestic market as companies can choose from three strategies, "arbitrage", "aggregation" and "adaptation" depending on the market, region or country environments or use a combination of the strategies (P. Ghemawat, 2007, Part 2: Strategies for Global Value Creation).

#### **2.13.2 CAGE framework**

Ghemawat developed a framework CAGE (Culture, Administrative, Geography and Economy) that allows the identification of differences and similarities between countries. His framework is intended to support managers in shaping an international strategy. In other words, countries that present similarities based on the different dimensions of the CAGE framework are likely to do business together. He further explains the "law of distance" and shows that geographical distance between countries, language barriers, whether countries belong to the same trade bloc or not, the sharing of a similar currency, the levels of corruption and political stability, have a strong impact on the trade between countries (Ghemawat, 2011, pp. 55).

### **2.14 Globalization concept**

Globalization is a broad and commonly used concept in management literature. In this research the concept of globalization is used to describe companies that currently operate in a domestic market that is willing to establish operations or activities in another country or region. The choice of a global strategy is the prerequisite for a company to extend local activities to another region or country successfully.

The literature describes different approaches to the concept of global strategies but within each of them lies a different perception of global markets. Although different perspectives are described in the literature, there are two main perspectives that are relevant to our research.

#### **2.14.1 Friedman's influence**

Friedman explains in a non-academic book that the world has become borderless, with political and economic integration resulting in markets becoming closer to each other and physical borders disappearing. According to him, internet and other technologies have broken the barriers leading to international competition at all levels (Friedman, 2005). This view could lead companies to see global strategies as an extension of the company's local strategies. The lack of economic, political and regulatory integration in Africa shows though that borders still matter in the context of the present research.

#### **2.14.2 Ghemawat's approach to globalization**

On the other hand, Ghemawat demonstrates that the flow of trade between countries is overstated. He explains that the amount of international trade, accounts only for twenty three percent of global Gross Domestic Product, foreign direct investment represents only nine percent of total worldwide investments, only twenty percent of stock markets are owned by foreigners and only two percent of the total phone calls made in the world are international, thus, based on facts, Ghemawat concludes that the actual flow of international trade has been overstated. Ghemawat explains further that trade tends to be regional rather than global. He demonstrates through a survey that trade between French regions is five times higher than with other European Union countries, the same survey shows that the figure is five times for Germany, twenty-seven times for Brazil and twenty times for China. In addition, data shows that countries tend to do business with countries that have a similar culture and language. For instance trade between Portugal and Spain is one hundred and fifty times higher than between Spain and Japan (Ghemawat, 2011, pp. 25 - 33).

#### **2.14.3 International trade in Africa**

Within the context of the present research, it is important to understand the concept of trade between African countries and the impact of the lack of economical, regulatory, financial integration (Games 2010). As Ghemawat indicates, the idea of a global market has been overstated in the world and moreover in Africa (Pankaj Ghemawat, 2007).

#### **2.14.4 The impact of supply chain on trade within Africa**

Coulibaly and Fontagné show that trade between members of the West African Economic Monetary Fund (WAEMU) account only for three percent of the total regional Gross Domestic Product (Coulibaly & Fontagné, 2006). In their report, they explain through an empirical study that the regional low levels of interregional and intraregional trade are caused by the geography factor, distances and infrastructure, associated with the high transportation costs (Amjadi & Yeats, 1995). In addition, Limao and Venables explain that poor infrastructure increases transportation costs (Limao & Venables, 2001).

Clark, Dollar and Micco explain further that low port efficiencies will further increase the cost of transport (Clark, Dollar, & Micco, 2004), thus the status of the majority of ports in Africa and their lack of efficiency contributes to the increase of transport costs and reduces the level of trade between African countries.

### **2.15 Commercial Explosives market**

The objective of the present section is to show that the academic literature focus on the commercial explosives field is essentially technical with scarce references to the strategy applied by explosives companies to develop their activities in Africa. The rare mention of explosives in the academic literature is not specific to Sub-Sahara Africa and not sufficient to develop a strategic model, thus the purpose of the present research. In addition, the section will provide a brief overview of the explosives industry in Africa and describe AEL's dominant market position, thus providing the justification of the use of a single case study method with AEL representing the critical case (Yin, 2009).

#### **2.15.1 References to the explosives industry in the literature**

The field of commercial explosives has grown over the past years with the development of the mining and quarrying industry in Sub-Saharan Africa. The explosives manufacturers group their range of products in four main categories: packaged explosives, bulk emulsion, initiating systems, more commonly referred to as detonators and specialised explosives and detonators and accessories that are used for limited applications in quarrying or mining such as seismic blasting products (Guosheng, Jiang, & Kui, 2011).

Much has been said in the academic literature on the measurement of explosives performance (Esen, 2004) and the use of electronic detonator as a way to improve efficiency of the results of a blast compared to common pyrotechnics such as non-electric and electric detonators, fuse or detonating cord (Grobler, 2003).

In recent years, with the escalation of the threat of terrorism, the focus has shifted rather towards the development of detection devices for explosives largely used in airports, train stations and wherever security forces need to prevent access to people carrying explosives. In addition, similar techniques are being developed to detect explosives on land that was previously used by military forces (Engel et al., 2010).

In a recent article, Dawar explains that the competitive advantage of companies traditionally lay in their ability to source raw materials, production efficiencies, logistics, and innovation. He explains that in recent years the competitive advantage has shifted towards the ability of a company to change the buyer's perception, and its capacity to build "accumulative advantage". His article explains how Orica, an explosives manufacturer in Australia, managed to create an accumulative advantage by using data gathered through years of operating in the explosives industry to predict blasts results for the quarries supplying aggregates to construction projects. Based on this particular skill offered by Orica, quarries were prepared to pay a premium for explosives in order to be able to model and predict blasts results (size of rocks) through Orica's

models (Dawar, 2013). Dawar's example of competitive advantage cannot be applied to the mining industry in Africa as the quarries in Australia tend to blast in an homogeneous hard rock thus allowing an accurate prediction of blast results, whereas the mining extraction industry in Africa is exposed to different conditions related to the geology and the variety of minerals mined. In addition, with the drop in commodity prices, the mines in Africa are looking at value propositions from their suppliers that will reduce their extraction costs and increase their productivity. In such a context, logistics, sourcing and production efficiency are still key in establishing an efficient strategy.

### **2.15.2 Explosives industry overview**

It is important to note that the global explosives industry has been influenced by the Chinese demand of minerals (Wellington & Mason, 2014). As explained in the overview of the present document the increased demand of minerals, such as iron ore, has led to the exploration of large deposits in Guinea, Mauritania and Cameroon. In the event that the Chinese demand for mineral is reduced, the iron ore world prices will fall and the explosives demand will be reduced. On the other hand, Chinese explosives manufacturers, such as Master Blaster, have tried to penetrate the explosives market in South Africa, but at this stage they remain small players.

Since the supply chain being critical, as described in the previous section, explosives companies will have to overcome high transport costs, poor port efficiencies and infrastructure. Furthermore, purchasing raw materials is challenging as they originate from different countries; ammonium nitrate Russia and Norway, detonators South Africa and sometimes Europe, Boosters or from China.

### **2.15.3 Market analysis**

The explosives players in Africa are three South African companies (AEL, BME and Sasol) one Spanish company (Maxam), one Swedish/Australian company (Orica), one French company (EPC), one Indian company (Solar). In some countries where the government has decided to keep control on the production of explosives there are still state owned companies, such as Afridex in Democratic Republic of Congo or ONEX in Algeria.

Other explosives global manufacturers such as Austin (United States) and Enaex (Chile) have not shown interest in the African market and have rather focused their attention on European and North and South American explosives markets.

The administrative barriers are important as each African country has its own explosives legislation and no administrative integration exists from a regulatory point a view. The challenge for each explosives supplier is to adapt to the legislation of each country in which he operates.

#### **2.15.4 AEL's market position**

AEL is currently the leading supplier of explosives in Sub-Saharan Africa and is amongst the top four largest explosives companies in the world.

AEL's revenues outside of South Africa accounts for fifty percent (two hundred and eighty million United States Dollars) of its total sales and hold a dominant position with an estimated market share of seventy percent in Africa.

#### **African foot print**

AEL has eighty one operations outside of South Africa of which forty one are located in Africa, eleven bulk plants, two detonator plants and one packaged explosives plant outside South Africa. AEL currently employs one thousand people in Africa, outside South Africa. In 2013, AEL extended its competitive positive position with the signing of ten new supply contracts (AECI, 2014).

#### **2.15.5 Application of the CAGE framework to the explosives industry**

In the context of the present research, the CAGE framework will have to be expanded in order to explain and measure the attractiveness of potential markets for explosives companies. Currently the potential growth areas for South African explosives companies in Africa are West Africa and more particularly Guinea Conakry, host of one of the world's largest untapped iron ore project, Simandou (Bermúdez-Lugo, 2004), Central Africa with a focus on Democratic Republic of Congo (Cinyabuguma & Akitoby, 2004) and Morocco, the largest producer of phosphate in the world (Cherkaoui & Ben Ali, 2007) and Mauritania. It is interesting to notice that the area of focus of South African explosives companies do not obey the pattern set up by the CAGE framework (culture, language, administrative barriers, geography or economy).

In order to explain this occurrence, it is important to understand the explosives company market penetration model. In the majority of cases, an explosives company will establish operations in another country through the signing of a supply agreement with a mining company. As identified in the present research, mining companies tend to adjudicate supply contracts to countries with whom they have dealt either in another country or region. In other words, in order to apply Ghemawat's CAGE framework to the explosives industry in Africa, another dimension needs to be included, the presence of mining companies in two countries will favour the commercial explosive trade between the two countries, the signing between the explosives company and the mining house in another company, the local status of the explosives company in the country, mining conditions (local geology compared to home base geology) and mining methods used.

#### **2.16 Linking the conceptual framework to the present study**

The conceptual framework analysis of the strategic schools, globalization concept and the explosives market located the present research within the three concepts and established the link between the literature and the present research.

The next section identifies the links of each concept to the purpose of the present research questions and objectives.

### **2.16.1 Competition as an initiator of strategy**

The evolution from business policy to strategy due to the intensity of competition (Ghemawat, 2000) can be observed in the South African explosives companies. As explained in the overview, the South African companies are under pressure to develop new strategies to expand activities in other sub-Saharan countries in order to maintain profitability, following the recent crises of the South African mining industry, thus the framework developed will include analysis of the intensity level on the market.

### **2.16.2 Creating “distinctive competencies” through safety and security procedures**

According to Selznick “distinctive competencies” are developed through the implementation of procedures, through a process that he called “institutionalization” (Selznick, 1949). Despite a different context, a parallel can be established between the process of “institutionalization” and the explosives sector.

The potential hazards associated with the handling of explosives have led manufacturers, users and legislators to develop stringent manufacturing, transport, handling and storage procedures and regulations. These operations are governed by stringent procedures in order to guarantee the safety and security of its employees, production facilities, storage and transport facilities. One of the key challenges for explosives companies operating outside their domestic market is to transfer “distinctive operational competencies” through effective safety and security models. The operational “distinctive competencies” forms the basis of commercial advantages in the explosives industry.

Nevertheless, Selznick insists on the fact that management leads the full “institutionalization” process, whereas in the explosives industry, safety procedures are often based on concerns raised by the workers that are later formalized by managers. The process of “institutionalization” is actually initiated and managed by staff members and not executive management. This last aspects shows the limits of his model as the workers need to understand the safety process and buy into it.

### **2.16.3 The cultural challenge to transfer procedures to local subsidiaries**

As Powel and Di Maggio highlighted (Powell & DiMaggio, 1991), the challenge for South African explosives companies is to communicate safety procedures to local workers from a different cultural background procedures from South Africa’s head offices. An efficient framework will have to integrate this factor.

### **2.16.4 Andrews SWOT analysis**

Despite its critics, the SWOT framework can contribute to the development of a strategy for the explosives market provided managers located outside the head office can feed a database that

will shape the strategy. Their contribution will be to highlight local market conditions that need to be taken into account when drawing a company's global strategy.

#### **2.16.5 The importance of strategic planning**

Within the context of the present research, planning is a key element as, prior to entering a market, a company needs to perform a thorough market survey.

#### **2.16.6 Linking the present research to the Subjective approach of strategy**

Despite interesting insights given by the subjective schools, they cannot be integrated efficiently in a framework building approach as they do not describe practical aspects of the strategy formation. Nevertheless, the need for a "creative response" through innovation and the cultural dimensions of culture is integrated. The political aspect of decision making is not integrated in the strategic framework and the neo-classic approach of the rational entrepreneur wanting to maximize the profits of his organizations is assumed.

#### **2.16.7 The present research and Porter's frameworks**

As stated in the research questions, one of the objectives of the present research is to test the suitability of existing strategy frameworks to the explosives market. Porter's model will be tested through a case study as explained in the next section of the present research. Nevertheless, already some limits of his framework are highlighted below.

Miller's articles explain the limits of Porter's "generic strategies" (Miller, 1992). In order to gain market share in Africa, explosives companies will need to be able to supply products and services at the lowest prices (cost leadership) whilst they differentiate themselves from competition by supplying high quality products and technical services (differentiation) hence the need to apply mixed strategies. The establishment of mines in remote areas such as West Africa with few clients but with potentially high margins requires some particular attention (focus). In other words, the ability for explosives companies to establish successful operations in Africa is highly dependent on their capacity to combine different strategies. The concept of combining different generic strategies to form a strategy has been further developed by Ghemawat as he explains how Procter & Gamble and IBM successfully combined local and regional strategies (P. Ghemawat, 2007, Chapter 7: Playing the difference).

Porter's "Competitive forces" framework does not include political instability and culture as a competitive force. Nevertheless, there is a strong need for companies to understand local market information as it involves sending middle management on regular visits to targeted African countries, in order to understand local customers, regulations and logistics, such information needs to be integrated in the strategy.

#### **2.16.8 The triple "A" framework and the CAGE model**

In addition to Porter's framework, the objective of the present research is to show the need to broaden Ghemawat CAGE and triple "A" framework in order to apply them to the explosives market (Ghemawat, 2011).

The Triple A framework takes into account local conditions and which allows the company to apply a combination of strategies rather than a single one. The challenge of the present research is through the data collection process and the data analysis to identify its possible limits.

#### **2.16.9 Globalization concept**

The globalization concept applicable to the present research is limited to South African explosives companies willing to establish operations in Sub-Saharan countries.

#### **2.16.10 The explosives market**

The concept of explosives market has been restrained to Sub-Saharan explosives market penetrated by South African explosives companies.

#### **2.16.11 Development of a strategic framework**

Based on the research questions, the study tests the efficiency of Porter's strategic frameworks, ("five forces", and "generic strategies")," as well as Ghemawat's frameworks, "CAGE" and "Triple A" on the explosives market. Their limitations form the basis of the development of a framework adapted to South African explosives companies wanting to expand their activities other Sub-Saharan countries.

The following Research methodology section determines further the methodology used and how the results of the research can be generalized to the industry.

#### **2.16.12 Ghemawat's framework as a base model**

The present research has elected to use the "Triple A" strategies as the base for the development of a strategic framework for the explosives sector in Sub-Sahara. The choice is motivated by the fact that despite different generic strategies, Ghemawat (P. Ghemawat, 2007), unlike Porter (M.E. Porter, 1998b) recommends the use of a combination of them.

In addition, the CAGE framework takes into account the cultural dimensions of a market thus forces the company to consider local differences when drawing a strategy. These two arguments lead to the fact that both the "Triple A" and CAGE frameworks are the basis for the development of a specific strategic framework for South African explosives companies pursuing opportunities outside of South Africa.

The table below provides a consolidated summary of the different approaches to strategy that the existing literature provides and how they are linked to the present research. The link is established through the association of the concepts and the research questions of the present dissertation.

The consolidated table shows that the broadness of the concept of strategy as it impacts on different other disciplines such as the behaviour, and interactions of individuals, structure of organisations and environmental elements.

**Table 1: Conceptual framework consolidated table**

Strategy topic	Main authors	Comments	Link to research objectives	Related Research question
Distinctive competency	(Selznick 1957)	Each company develops specific competencies in order to be competitive on its market.	Identification of explosives companies competencies.	How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations into Africa?  Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?
SWOT Analysis	(Andrews 1971)	Assessment of the Situation, Weakness, Opportunity and Threats of a company.	Identification of explosives companies competencies and competitive environment.	
Consultancy approach	(Henderson 1979)	Development of a matrix (BCG) that determines the market environment and the strategy to be applied.	Identification of explosives companies competitive environment and linking it to a specific strategy.	
Company structure and strategy	(Chandler 1962)	Strategy can be centralised or decentralised, departmentalised or geographic or product depending on the company structure.	Linking company structure and strategy.	
Competitive strategy	(Porter 1998)	Porter determines the major forces that drive a specific market and how they lead to the application of generic strategies (Cost, differentiation and focus).	Linking competitive advantage, industry level of competition to generic strategies.	
Strategic planning	(Ansoff 1965)	Emphasis is made on planning of activities and forecasting of company indicators such as, but not limited to sales and profits.	Implementation of strategies and measure of efficiency.	
World 3.0	(Ghemawat 2007)	Market defined by the CAGE framework that leads to the application of three possible generic strategies aggregation, adaptation and arbitrage.	Identification of other variables that should be included in the strategic framework.	
Subjective approach to strategy	(Simon and Barnard 1976) (Lindbolm 1959) (Pettigrew 1977) (Barney 1986)	These authors recognise the impact of culture, internal politics and psychology on the choice of a strategy.	Impact of psychology, politics and culture on the determination of strategy.	How do other variables, such as political, legal, cultural and administrative barriers, impact on the shaping of the final strategy for South African explosives companies willing to expand their operations in Africa?

### **3 RESEARCH METHODOLOGY**

As stated in the study questions, the purpose of the present research is to develop, if proven necessary, a strategic framework applicable to South African explosives companies wanting to establish further activities in Sub-Saharan regions.

Therefore, the present section determines that the most suitable research method and research design is a single case study which guides the following steps of the data collection, analysis and findings of the study:

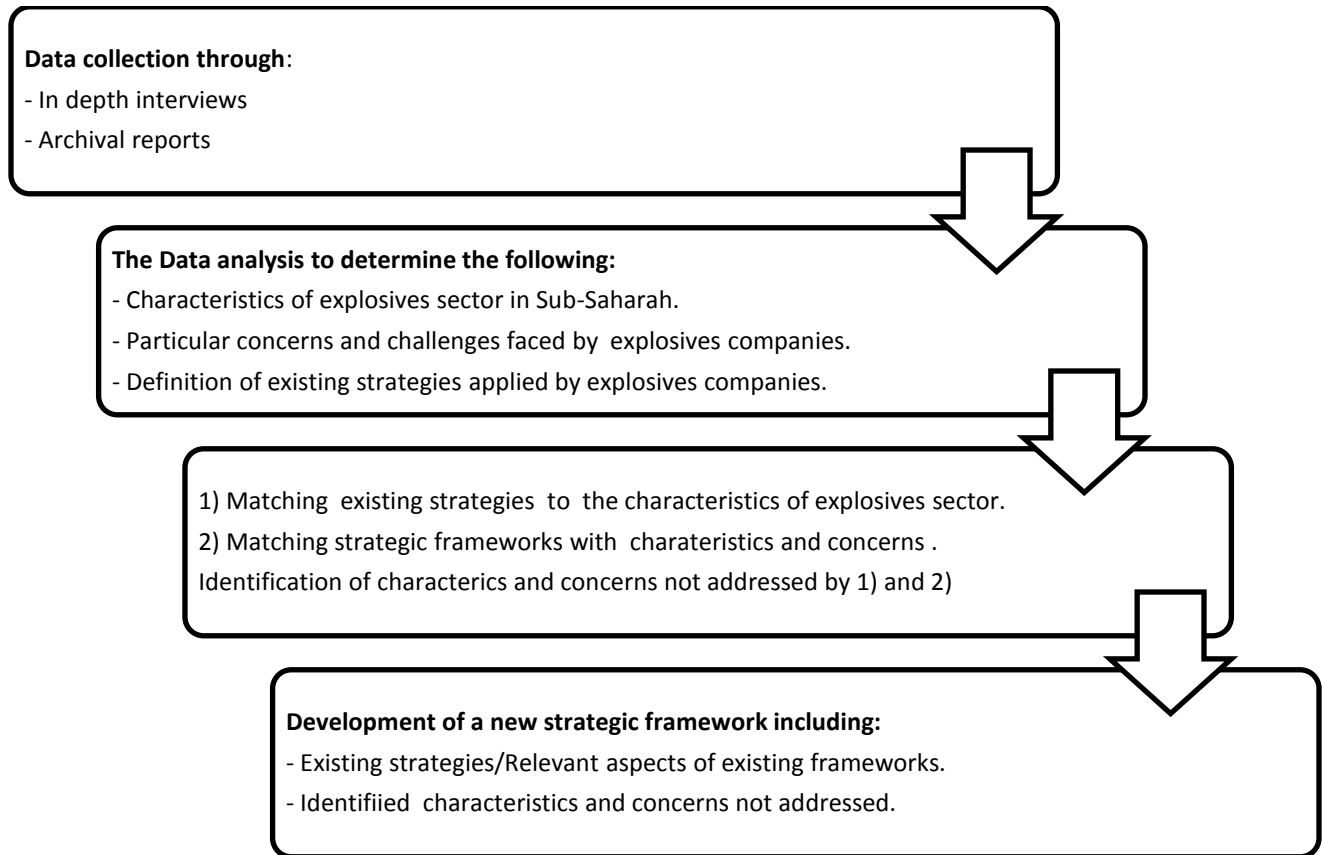
The first step of the research attempts to identify the challenges faced by explosives companies expanding their activities in Sub-Saharan regions and the particular aspects of the explosives sector in Sub-Sahara Africa.

The second stage of the research determines if the current strategic models applied by explosives companies address the challenges and aspects of the explosives sector in Sub-Saharan regions.

The third stage assesses whether existing strategic frameworks in the literature such as those developed by Ghemawat and Porter address these aspects and challenges.

The characteristics of the explosives market and the related concerns which are not addressed by the explosives companies' strategies and Porter and Ghemawat's frameworks form the basis of the development of a new strategic framework adapted to the explosives industry. The diagram below summarises the above mentioned steps and the process followed by the research in the development of a strategic framework.

**Figure 1: Development process of the development of a new strategic framework**



### **3.1 Research methodology/paradigm**

The research methodology has to do with the philosophy and refers to the paradigm underlining the research, whereas the research method relates to the rules and procedures used to analyse and collect the data (Blaxter, Hughes, & Tight, 2006).

#### **3.1.1 Research paradigm**

The choice of the research paradigm is based on two approaches:

- Definition of the research paradigm by using the literature as a base.
- Determining the research paradigm based on the research questions.

##### **3.1.1.1 Location of research paradigm based on literature**

The case study method is often located in the realism paradigm for three main reasons; (a) the case study focuses on a contemporary event or phenomenon (Yin, 1981), (b) Existence of certain subjective limitations such as the fact that the researcher is unable to grasp entirely the complexity of the world he operates in, (Tsoukas, 1989) and (c) the inductive theory process building, as the research moves from a particular unit to a general one (Yin, 2009).

### **3.1.1.2 Location of a research paradigm based on the research questions**

The first two research questions relate to a deductive approach as they lead to the testing of the study propositions (premises) of existing strategic frameworks. The last two research questions lead to an inductive approach as findings on a particular case lead to generalisation of the results to the general explosives industry through a framework applicable to explosives companies. The mix of the deductive and inductive approaches is recommended by the literature (Parkhe, 1993, p 252 - 256).

### **3.1.1.3 Research paradigm of the present research**

Despite the nature of the research questions as described in the previous paragraph, the paradigm of the present research is largely inductive, as the research progresses from a particular single case to the general development of a framework at industry level.

## **3.2 Research design**

The case study method is appropriate for strategic management research and has provided interesting insights and contributions to the development of the concept in the past (Doz, 2011).

The research method used in the present research is based on Yin's approach, and is best described as a single case embedded study using a descriptive, explanatory and exploratory approach (Yin, 2009).

### **3.2.1 Single case study instead of multiple case study**

The main sources of data collected are non-structured interviews and archival reports. The participants in the interview were all AEL employees.

As explained by the literature the use of the multiple case study method is conditioned by the capability to replicate the entire study in different cases. Although the data collection from the annual reports on BME's strategy provided interesting insights on the company's strategy, no interviews were conducted with BME's employees and, as a result, the single case method was adopted (Yin, 2009, pp. 54).

Following Yin's recommendation, the research design of the present study includes the following five components (Yin, 2009, pp. 27):

- Study questions
- The propositions
- The definition of the units of analysis.
- Logic linking data to proposition
- Interpretation of findings

### **3.2.2 Study questions**

The study questions, referred to as the research questions in the Problem Statement section of the present research have been defined as follows prior to the data collection:

How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations into Africa?

Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?

Why would it be necessary to include other key variables in existing strategic frameworks to develop an effective strategy for the explosives business?

How do other variables, such as political, legal, cultural and administrative barriers impact on the shaping of the final strategy for South African explosives companies willing to expand their operations into Africa?

As recommended by Yin, the above mentioned research questions guided the study (Yin, 2009) and uncovered the current strategies used by explosives companies, the efficiency and non-efficiencies of existing strategies, the particular aspects of explosives markets and the concerns of explosives companies dealing in Africa.

### **3.2.3 Study Propositions**

The study questions of the present research piloted the definition of the two study research propositions.

The two first research questions directed the design of Proposition 1:

Proposition 1: The present research evaluates the efficiency of the existing strategies applied by explosives companies to the explosives business in Sub-Saharan Africa;

The last two research questions led to the definition of Proposition 2:

Proposition 2: The aim of the present research is to identify the model elements which could enhance the efficiency of Porter and Ghemawat's frameworks, or, alternatively confirm that the current frameworks are adapted to the expansion of South African explosives companies in Africa.

As recommended by the literature, the two study premises described above were shaped by the research questions and guided the data collection and the data analysis process (Yin, 2009, pp. 130). A chain of evidence diagram linking the study proposition, family codes and study questions ensure that focus on the purpose of the research is maintained throughout the research.

### **3.2.4 Definition of units of analysis**

After defining the study questions and propositions, the other critical aspect of the research design is to determine the most suitable units of analysis (Yin, 2009).

The units of analysis of the present research are “embedded” in a general unit of analysis. The literature confirms that such a definition of units of analysis is appropriate for a single case study (Yin, 2009, p. 50). McClintock successfully adopted in a well-known article a similar approach in a study on the educational administration (McClintock, 1985).

In the context of the present research, the main unit of analysis is the organization (AEL) with the subunit of analysis being; AEL employees and products and services (technical support) offered to end users.

Porter and Ghemawat (Ghemawat, 2011; M.E. Porter, 1998a) performed a full industry analysis in order to develop the CAGE and Five forces frameworks (Ricart et al., 2004). Thus the contribution of the present research is to shift from industry level of analysis (Waddington, 2014), to company, employee services and product levels of analysis to gain further insights on how to improve the existing strategic frameworks.

### **3.2.5 Logic linking data to proposition**

The data collected is grouped by research questions, as recommended by the literature (Rubin, 1995) furthermore, during the data analysis process the evidence is used to test the validity of the two research propositions.

The “Explanation building” process establishes the link between the data and the study propositions. The conclusions of the data analysis therefore provide answers to the questions on the efficiency of AEL’s actual strategy, existing strategic frameworks and how they can be improved. (Yin, 2009, pp.142).

### **3.2.6 Interpretation of findings**

In addition, the other important element of the research design is the identification of possible rival explanations, thus the identification of external factors to the study which could explain the phenomenon observed (Piekkari, Welch, & Paavilainen, 2008).

The data on possible rival explanations, such as commodity prices, have been identified to enable the researcher to collect sufficient information on them during the data collection process (Boyatzis, 1998). Yin recommends that the identification of the rival explanation is included in the research design in order to allow such data collection (Yin, 2009).

### 3.3 General elements of the case study

The case study is explanatory, as an attempt has been made to assess the relevance of actual strategic frameworks and to identify their gaps; it is descriptive, as the actual performance of current models have been assessed and documented.

In addition, the case study carries an exploratory element inasmuch as the clear definition of the final strategic framework to be developed and the outcome of the research were not known a priori. Despite an impression, stated in the Problem Statement section, that the actual strategic framework is not adapted to the complexity of the explosives market, the results of the case study could have led to the following outcomes:

- Strategic frameworks used by explosives companies are adapted to the complexity of the explosives market in Sub-Saharan countries.
- Porter’s framework is well suited for the explosives market and local market conditions are not critical to the strategy formation.
- Ghemawat’s framework is not relevant to the explosives market.

### 3.4 Sampling strategy

#### 3.4.1 Critical case

The choice has been made to use the case of AEL, based on the fact that the company is the leading supplier of explosives in Sub-Saharan Africa with 7,434 million Rand worth of sales in 2013 (AECI, 2014) against 5,438 million Rand worth of sales for BME (J. P. Johnson, Lenartowicz, & Apud, 2006). There are three major explosives companies in South Africa, but only AEL and BME have established operations outside of Africa. The two companies are committed to pursue further their growth outside of South Africa.

Whilst BME has established operations outside of South Africa through several distribution sites, with each of them dedicated to a mining operation, AEL has developed regional production facilities as well as distribution sites dedicated to several mining operations. Table 2 shows the number of legal entities the top three explosives companies in South Africa have established on the African continent.

**Table 2: Major explosives companies in South Africa**

Company	Group	Legal Entities (excl. South Africa)
AEL	AECI	17
BME	OMNIA	13
Sasol Nitro	SASOL	0

The table above shows that AEL, with seventeen entities outside of South Africa (Southern, Western, Eastern and Central Africa) represents the “Critical industry case” within the niche sector of South African explosives companies wanting to establish operations outside of South Africa. The current research focuses on the niche sector which has a total population of two

companies: BME and AEL. As the case study is based on AEL, we can therefore assume that AEL is a representative sample of the total population of the niche sector under research.

As a result of its dominant market position in Africa, AEL meets all the conditions to test current strategic frameworks on South African companies willing to establish operations in other African countries, through a single case study. Yin explains that the single case method is largely justified when it represents a “critical case” in the testing of a formulated existing theory proposition and can lead to a “significant contribution to knowledge and theory building” (Yin, 2009, p. 47 - 48)

According to the literature, in contrast to surveys, the case study approach does not allow statistical generalization, where an inference is made from a sample to the total population (Fowler, 1988).

Nevertheless, the particular context of the present research shows that the dominant market position of AEL on the explosives sector, comparatively to BME and its established businesses in Africa, allows the use of the two generalization modes described below for the following reasons:

- Statistical generalization is allowed to some extent, based on the particular positioning of AEL in the sector of South African explosives companies.
- Analytical generalization; AEL’s dominant position on the market allows analytical generalization as the company represents the best case to test existing frameworks as well as the newly developed strategic framework developed in the present research.

### **3.5 Source of data**

Based on the research questions two types of data were collected:

- Primary data: interviews.
- Secondary data: archival documents such as annual reports and strategic presentations issued to the financial press.

#### **3.5.1 Sampling method within the case study**

In depth interviews were conducted by the researcher as defined in the next section “Interviews” with AEL Executives, product managers based in South Africa and senior managers based in the regions where the company has an established presence. The selection criteria for the interviewees were based on the following criteria:

- The respondent had to have been involved in either the conception or the application of AEL strategy in Sub Saharan Africa.
- The respondent had to have been involved in Sub Saharan sales.
- The respondent had to have been involved in the construction of plants and other production facilities in Sub Saharan Africa.

The respondents are described in the table below.

**Table 3 Respondents and profile**

<b>Position</b>	<b>Work focus</b>	<b>Site</b>	<b>Role</b>	<b>Status</b>
Managing Director Central Africa	Senior Manager	AEL Head office	Manager responsible for Central Africa business unit.	Completed
Managing Director North East Africa	Senior Manager	AEL Head office	Manager responsible for East and North Africa business unit.	Completed
Managing Director North West Africa	Senior Manager	AEL Head office	Manager responsible for North West Africa business unit.	Completed
Managing Director DRC	Senior Manager	AEL Head office	Manager responsible for DRC business unit.	Completed
Regional Manager Burkina Faso	Manager	AEL Head office	In charge of operations in North West Africa	Completed
Business Development Manager	Senior Manager	AEL Head office	In charge of business development in Central Africa.	Completed
Product Manager detonators	Detonator	AEL Head office	Liaison between the market and the plant for detonators	Completed
Logistic Officer	Senior Manager	AEL Head office	In charge of exports administration.	Completed
Business Manager	Senior Manager	Teleconference	Responsible for developing activities in West Africa	Completed
Operations Manager	Senior Manager	Teleconference	Manager responsible for North West Africa	Completed

### **3.6 Data collection**

Patton recommends the triangulation of the data from difference sources of evidence such as in depth interviews and archival reports, in order to improve the external validity of the findings and allow the generalisation of the conclusions (Patton, 2002).

The present research applies Patton's recommendation by collecting data from archival reports and non-structured interviews thus triangulating the data from different sources of evidence (Yin, 2011, Chapter 9).

Yin suggests that the most suitable sources of evidence for the case study research method are interviews, archival reports or direct observation (Yin, 2009, p. 102 - 114). However, the choice has been made to focus on interviews and archival reports due to the location of the different AEL operations around Africa.

### **3.6.1 Interviews**

#### **3.6.1.1 Focused interviews applied to research**

Based on the fact that the present research is explanatory, the financial resources and time are available to the investigator, the research topic is complex and most participants have a good knowledge of the subject. The literature recommends the use of in-depth interviews (Yin, 2011).

##### **3.6.1.1.1 Interview approach**

The present research follows Rubin's advice as the interviewer did not use a set of fixed questions in order to make possible the probing of the respondents (Rubin, 1995).

The interview is conducted in a conversational mode during which the investigator listens carefully whilst asking the respondents for facts, opinions on events and personal insights. The interview can occur in multiple sittings (Yin, 2011).

The respondent is free to suggest the intervention of other people within the organization in order to provide further information on specific topics (Yin, 2009).

##### **3.6.1.1.2 Interview method**

The Research Questions and Case Study Protocol questions kept the interviewer focused on the objective of the research during the interview. The Case Study Protocol is attached in the appendices of the present document (Yin, 2009, p. 102).

##### **3.6.1.1.3 Interview questions and research questions**

The questions addressed to the respondents are designed in order to provide sufficient data to answer the research questions of the present dissertation.

It is important to note that the questions served as guidelines as the interviewer asked further probing questions to gain insights from each respondent.

**Research Question 1:** How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to establish operations in Sub-Saharan?

**Questions related to Research question 1:**

What is AEL strategy?

What are AEL Objectives?

Is AEL strategy efficient?

Is the strategy applied in practice?

What are AEL Objectives?

**Research question 2:** Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?

**Questions related to Research question 2:**

What challenges AEL seems to be facing?

Do these challenges have a financial implication?

**Research Question 3:** Why would it be necessary to include other key variables in existing strategic framework to develop an effective strategy for the explosives business?

**Questions related to Research question 3:**

Does the strategy address the challenges?

How to improve the current strategy?

**Research question 4:** How do other variables, such as political, legal, cultural and administrative barriers, impact on the shaping of the final strategy for South African explosives companies willing to expand their operations in Africa?

**Questions related to Research question 1:**

Is AEL facing political issues, culture difference and local administration barriers in Sub-Saharan countries and is there impact?

Further details on the questions are enclosed in the Case Study Protocol (APPENDIX A: CASE STUDY PROTOCOL).

#### **3.6.1.1.4 Risks management of in depth interview method**

Yin (2009) explains that during in-depth interviews, the respondent will become an informant as he could suggest the collection of other sources of evidence or the interview of other respondents, thus increasing the dependence of the interviewer on him. It is important to note though that during the interview process the interviewees did not suggest alternative sources of evidence or the use of alternative data. As recommended by the literature the risk of the investigator becoming dependent on the respondent was balanced by an alternative source of evidence.

The interviews were recorded with the consent of the respondents.

#### **3.6.2 Case study protocol**

Rubin recommends that an interview schedule is not appropriate as the interview mode should be conversational, as explained in the previous section (Rubin, 1995). Consequentially, based on suggestion, the questions were guided by the Research questions as well as the case study protocol questions (Yin, 2009).

#### **3.6.3 Archival reports**

- Financial statements
- Annual reports AECL (AEL)
- Analyst reports OMNIA (BME)

As discussed earlier in “3.4.1 Sampling strategy paragraph” AEL is the “single case” hence the collection of information on BME through annual reports is carried out in order to understand further the type of strategy applied by explosives companies in Sub-Saharan, and to corroborate the information collected from interviews of AEL employees and AECL’s annual reports.

#### **3.6.4 Summary of Source of information**

The table below summarises the source of information of the case study.

**Table 4: Source of information**

<b>Data source</b>	<b>Location</b>	<b>Communication</b>
Interview	South Africa	The researcher met respondents at semi-annual strategic meetings in South Africa and during country visits.
	Mali	
	Ghana	
	Lubumbashi	
	Tanzania	
	Zimbabwe	
	Mali	
	Lubumbashi	
	Tanzania	
	Zimbabwe	
Archival documents	Company intranet	The researcher had access remotely to the different sources of information.
	Company website	
	Internet	

### **3.7 Data analysis**

This section presents the data analysis strategy as well as the analytical method used to analyse the data.

#### **3.7.1 Data analysis plan**

The literature recommends four possible approaches to analyse the data.

The first approach is described by Yin as the “theoretical propositions” and relies on the study propositions which led to the decision to conduct a case study research. This approach links the study proposition to the data in order to ascertain their validity (Yin, 2009, p. 130). This approach is appropriate to the present research study as the propositions were defined prior to the collection of data.

According to Yin’s typology, the data collected and analysed will help evaluate the effectiveness of the two following propositions:

**Proposition 1:** The present research evaluates the efficiency of the existing strategies applied by explosives companies to the explosives business in Sub-Saharan Africa;

**Proposition 2:** The aim of the present research is to identify the model elements which could enhance the efficiency of Porter and Ghemawat’s frameworks or alternatively confirm that the current frameworks are adapted to the expansion of South African explosives companies in Africa.

The second possible approach described in the literature is the development by the researcher of a descriptive framework to classify and present the data. This method is appropriate when the data collected is large and that neither the research questions nor any propositions were set out prior to the data collection (Yin, 2009, pp. 131). This strategy is not appropriate to the present research as the study propositions and questions were set out prior to the collection of the data and formed the basis of the development of a case study protocol.

The third approach recommended by the literature is the use of quantitative and qualitative data (Yin, 2011, pp. 132). This approach was applied by the present research as quantitative data from annual reports, profits, as well as commodity prices which were used to substantiate the findings collected from interviews.

The fourth approach described by the literature is the identification of rival explanations. In such a case the research will identify an external factor in the case study that could explain an occurrence (Yin, 2011, pp. 133).

The table below shows a summary of the data analysis strategies applied to the present research.

**Table 5: Analytical method**

<b>Analytical Approach</b>	<b>Summary</b>	<b>Applicable to present research</b>
Theoretical propositions	Evidence to test validity of propositions	Applied by present research.
Case description	Development of descriptive framework.	Not applicable to present research.
Use of quantitative and qualitative data	Evidence will come from interviews and from quantitative information such as profits, sales, revenues and commodity prices.	Applied by present research.
Identification of rival explanations.	Identification of external factors that could explain a phenomenon.	Applied by present research.

### **3.7.2 Analytic techniques**

In most instances, it is recommended that the choice of the analytical techniques is derived from the nature of the research questions. Research questions such as “why” and “how” emphasize the desire to identify causal links and explanations of a particular phenomenon. Yin refers to this technique as “explanation building” (Yin, 2009). In the case of the present research, it is important to identify and explain the reasons of the shortfall of current strategic models when applied to the development of strategies in the explosives market within the context of the present research.

The explanations of the impact and non-impact of variables included or excluded from current models leads to the development of a new framework; in addition, the data analysis strategy (“rival explanation”) described in the previous section allows for the identification of other model elements to be included in the new framework.

### **3.7.3 Data coding and categorisation**

It is recommended to make use of computer assisted tools to code and categorize the data collected (Boyatzis, 1998). Based on this recommendation, an analytical process for categorization and coding was developed and family codes were defined to regroup the data in categories in order to apply the appropriate analytical strategies of “Linking data to proposition” and the assessment of the likelihood of “Rival explanations” as described in the Data analysis section of the present document.

#### **3.7.3.1 Analytical grouping process per source of evidence**

A specific process was established to regroup and classify the information the data collected from interviews. As explained by Boyatzis (1998), the use of codes and categorization is appropriate when preparing data collected from interviews for analysis .

Thus the information collected from unstructured interviews followed the process described below:

1. All the interviews were audio recorded. The information recorded was transcribed in a summary interview report (the documents are attached to the present research).
2. The interview notes were coded using Atlas ti. Software and using the code families defined in the next section - Definition of codes and family codes.
3. Family codes were used to group the data based on the codes in order to test the study proposition as per the elected analysis strategy.

The information collected from archival reports followed a similar process:

1. Archival reports information notes were regrouped in a document (APPENDIX E).
2. Notes were coded using Atlas ti. Software and using the code families defined in the next section 3.7.3.2 Definition of codes and family codes.
3. Family codes were used to group the data based on the codes in order to test the study proposition as per the elected analysis strategy.

Numerical information collected from archival reports and other sources, such as commodity prices and other information were tabulated in order to allow basic qualitative analysis.

### **3.7.3.2 Definition of codes and family codes**

The definition of the first set of codes allowed the grouping of the textual data based on words belonging to the existing frameworks described in the Conceptual Framework of section 2 of the present document. The subsequent codes made further groupings into further groups possible.

The following code families have been set up in order to categorise and analyse the data:

Generic strategies: Categorization of all information related to Porter's "Generic strategies" and "5 Forces model".

Triple A : Categorization of all information related to Ghemawat's strategic frameworks "Triple A" and "CAGE".

Actual strategies: Categorization of all information related to the strategy applied by AEL.

Local environment: Categorization of all information linked to administrative, cultural and any other local condition challenge encountered in Sub-Saharan Africa.

Investment: Categorization of information linked to the investment of South African based explosives company into Sub-Saharan countries.

Challenges: Categorization of challenges encountered when doing business in Sub-Saharan countries.

Market: Categorization of all the specific aspects of the explosives business in Sub-Saharan countries.

Profitability: Categorization of the different measures of efficiency of the existing and future strategies.

Other parameters: Categorization of other aspects of the market and environment which should be included or taken into account when developing a strategic framework.

It is important to note that the categories follow the objective of the research question as they allowed the data to be categorised so as to answer the question posed by the current research.

In order to increase the rigor of the data analysis process the research made use of the “Atlas ti” software (Paulus & Lester, 2015). The software regrouped the data under the codes and subsequent codes, as summarized above, and provided the necessary information on the occurrence of a code, for example, and especially assisted in the linking of the information gathered from the multiple sources of data. The grouping of the data based on the above mentioned family codes with the Atlas ti reports are attached to the present research (APPENDIX F).

Once the information was provided by the software, the presentation of the data by research question confirmed that the data collected answered the research questions (Yin, 2009, p. 128).

### **3.8 Definition of moderator variables**

The present research measures the efficiency of a strategy by its impact on sales and profits, thus an efficient strategy results in higher profits or sales. As recommended by the literature it is important to define a moderator variable when the relationship between two variables (profits/sales and strategy) could depend on a third variable (Baron & Kenny, 1986).

In the case of the present research the growth in profit or sales can result from the change in other variables than the company strategy. Thus the following variables are defined as moderator variables: the exchange rate between the South African rand and the United States Dollar can be considered as a moderator variable as it can impact on the level of profits or sales, as explosives companies’ trade in United States Dollar currency in Sub Saharan Africa and later consolidate financial results in South African Rands.

In addition, the world prices of commodities are considered as moderator variable as regardless of the strategy applied, when the price of a commodity increases the extraction of such a commodity increases thus resulting in higher.

The present dissertation assesses the impact of the commodity prices and thus includes it in the final developed framework, however the influence of exchange rates have not been assessed as it could form the basis of a future research.

### **3.9 Limitations**

The potential limitations of the research are outlined below.

The research is performed on a single case study, identified as the “critical case” due to the nature of the explosives business in South Africa, where only two companies are willing to establish operations outside South Africa. Nevertheless, the framework would have to be adapted if applied to companies that do not have operations yet in Africa.

The researcher is an employee of AEL, and despite all efforts to avoid potential bias, it could have an impact on the analysis and interpretation of the data and conclusion.

Despite AEL representing a large portion of the explosives market, the newly developed framework would have to be adapted to medium and small explosives companies wanting to start operations in Sub-Saharan Africa.

Although the researcher interviewed a large panel of respondents, it is important to note that the total number of AEL employees is three thousand and that only a portion of the ones involved in the African operations were interviewed.

On one hand, AEL’s strategy is determined by two sources of data: interviews and archival reports. On the other hand, BME’s strategy definition is based on data collected in archival reports as no interview with BME employees is done, thus the results from AEL and BME do not have the same level of validity.

The study focuses on data supplied by AEL and BME. As only scarce information is available from other explosives companies, this could limit the result of the study to the particular context of AEL and BME.

The data was collected in regions where AEL has operations. It is therefore important to understand that within each region, some national cultural differences could appear that have not been taken into account in the present research.

The external validity of the case was limited by the fact that the study was not replicated on other cases.

### **3.10 Validity and reliability**

Yin’s adaptation of “the natural science model”, to the case study method, as discussed in section 3.1.1 Research paradigm of the present document is applied in order to ensure the validity and reliability of the present research method (Yin, 2009, p 41 - 45).

### **3.10.1 Construct validity and plan to increase validity**

Yin advises increasing construct validity by defining clearly the phenomenon the research will study through clear concepts and to identify the measures which will match the concepts.

The present dissertation assessed strategic frameworks as defined in the Conceptual Framework Section of the present section by measuring their efficiency.

The construct validity was increased by the use of multiple sources of evidence (interview and archival reports) to achieve the triangulation by sources of data (Yin, 2009).

In order to further increase validity, the present research triangulated the data from a theoretical point of view; the data was observed under the umbrella of the three theoretical concepts, "Five forces", the Triple A" and "CAGE" framework and from different source data, as explained in the previous paragraph. Yin explains that introducing different perspectives of triangulation into the research increases the validity of the case study method (Yin, 2009, p. 116). This method is further explained by Patton (Patton, 2002).

### **3.10.2 Internal validity**

According to Yin, when using the case study methodology, the internal validity is mainly a concern for explanatory case studies with the possible presence of a factor not mentioned in the case study that could better explain the phenomenon (Yin, 2009, p 42).

In order to increase the validity, the present research follows Yin's recommendation by relying on three out of the four analytical approaches to the data analysis he recommends, namely, the theoretical proposition, the rival explanation strategy approach of the present document and the use of qualitative and data as well as a limited use of quantitative data analysis through the study of trends as described in the section 3.7.1 Data analysis (Yin, 2009, p 133 - 135).

### **3.10.3 External validity**

The external validity of a case study is linked to a potential generalization of the findings. As discussed in the section Critical case , when explaining the choice of a single case, the external validity of the present research was increased by using "analytical generalization" with an element of "statistical generalization", as the single case used has been defined as the "critical cases" (Yin, 2009, p 33).

Despite the fact that a single case study was used, external validity was achieved by replicating the case in different sub units.

### **3.10.4 Reliability**

The reliability concept has to do with the fact that if another researcher conducted the tests he would achieve the same results (Leedy & Ormrod, 2001). Reliability was achieved by a detailed protocol and the development of a case study database (Yin, 2009).

### **3.11 Ethical consideration**

The main source of evidence being the interviewing of AEL employees, the researcher has obtained prior approval to perform the current research.

In addition, an informed consent was sought from each participant who participated in the interviews as well as the approval of the Ethical Committee.

### **3.12 Chain of evidence**

As described in the present section, efforts have been made to maintain a “chain of evidence” from the research design (research questions to the study proposition), the case study database, the data collection (Protocol) and categorization (setting up of code families to categorise the data collected) and data analysis, so as to ensure that throughout the process the questions guiding the research were answered (Yin, 2009, pp 122).

The table below provides details on the chain of evidence implementation through the research process.

**Table 6: Chain of evidence**

<b>Study proposition</b>	<b>Research Questions</b>	<b>Family codes</b>	<b>Research method</b>
<p><b>Proposition 1:</b> The present research evaluates the efficiency of the existing strategies applied by explosives companies to the explosives business in Sub-Saharan Africa;</p>	<p>How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations in Africa?</p> <p>Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?</p>	<p><b>Actual strategies:</b> Categorization of all information related to the strategy applied by AEL and BME</p> <p><b>Profitability:</b> Categorization of the different measures of efficiency of the existing and future strategies.</p> <p><b>Generic strategies:</b> Categorization of all information related to Porter’s “Generic strategies” and “5 Forces model”.</p> <p><b>Triple A:</b> Categorization of all information related to Ghemawat’s strategic frameworks “Triple A” and “CAGE”.</p>	<p><b><u>Research design</u></b></p> <p>Linking proposition to data</p> <p>Analysis per units of analysis (Detonators and emulsion)</p> <p><b><u>Data analysis strategy</u></b></p> <p>Linking data to the propositions</p> <p><b><u>Analytical techniques</u></b></p> <p>Data coding (Atlas ti)</p>

Study proposition	Research Questions	Family codes	Research method
<p><b>Proposition 2:</b> The aim of the present research is to identify the model elements that could enhance the efficiency of Porter and Ghemawat’s frameworks or alternatively confirm that the current frameworks are adapted to the expansion of South African explosives companies in Africa.</p>	<p>Why would it be necessary to include other key variables in existing strategic framework to develop an effective strategy for the explosives business?</p> <p>How do other variables such as politics, legal, culture and administrative barriers impact on the shaping of the final strategy for South African explosives companies willing to expand their operations in Africa?</p>	<p><b>Local environment:</b> Categorization of all information linked to Administrative, cultural and any other local condition challenge encountered in Sub-Saharan Africa.</p> <p><b>Investment:</b> Categorization of information linked to the investment of South African based explosives company into Sub-Saharan countries.</p> <p><b>Challenges:</b> Categorization of challenges encountered when doing business in Sub-Saharan countries.</p> <p><b>Market:</b> Categorization of all the specific aspects of the explosives business in Sub-Saharan countries.</p> <p><b>Other parameters:</b> Categorization of other aspects of the market and environment which should be included or taken into account when developing a strategic framework.</p>	<p><b><u>Research design</u></b></p> <p>Linking proposition to data</p> <p>Analysis per units of analysis (Detonators and emulsion)</p> <p><b><u>Data analysis strategy</u></b></p> <p>Linking data to the propositions</p> <p><b>Identification of rival explanation</b> (Other parameters/Market)</p> <p><b><u>Analytical techniques</u></b></p> <p>Data coding (Atlas ti)</p>

### **3.13 Research Methodology conclusion**

The case study method focuses on identifying the aspects of existing frameworks and their efficiencies for South African explosives companies willing to extend their activities into Africa. The idea was to identify variables which needed to be added to the two models developed by Porter and Ghemawat and to come up with a new framework which can be generalised to the South African explosives industry.

It is important to note that a single case analysis was performed, with embedded units of analysis such as products and services supplied by AEL. The result can be generalised, as AEL has been identified as the “critical industry case”, due to its dominant position in the South African explosives industry.

In addition, generalization was enforced by the triangulation of the different data sources.

The table below summarises the research method framework developed for the purposes of the present research.

### 3.14 Methodology Framework

**Table 7: Research design**

Criteria	Description	Comments
Research Design	<i>Research questions</i>	<p>How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations in Africa?</p> <p>Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?</p> <p>Why would it be necessary to include other key variables in existing strategic framework to develop an effective strategy for the explosives business?</p> <p>How do other variables such as politics, legal, culture and administrative barriers impact on the shaping of the final strategy for South African explosives companies willing to expand their operations in Africa?</p>
	<i>Study Propositions</i>	<p><b>Proposition 1:</b> The present research will evaluate the adaptability of the well-known Porter’s five forces strategic framework and Ghemawat more recent CAGE framework and his three generic strategies framework as presented in the Conceptual Framework section of the present document, to explosives business in Sub-Saharan Africa;</p> <p><b>Proposition 2:</b> The aim of the present research is to identify the model elements that could enhance the efficiency of the above mentioned frameworks or alternatively confirm that the current frameworks are adapted to the expansion of South African explosives companies in Africa.</p>
	<i>Definition of units of analysis:</i>	<p>Main unit of analysis: Organization (AEL) with the subunit of analysis being;</p> <p>Sub unit of analysis (Embedded units of analysis): AEL employees, products and services (technical support).</p>
	<i>Logic linking data to proposition</i>	<p>The “Explanation building” process will establish the link between the data and the study propositions. The conclusions of the data analysis will therefore provide answers to the questions on the efficiency of AEL’s actual strategy and existing strategic frameworks and how they can be improved.</p>
	<i>Interpretation of findings</i>	<p>In addition, the other important element of the research design is the identification of possible rival explanation, thus the identification of external factors to the study which could explain the phenomenon observed</p>

**Table 8: Research Design**

Criteria	Description	Comments
<b>Data collection</b>	<i>Source of data</i>	Primary data: interviews. Secondary data: Archival documents such as annual reports and strategic presentations issued to the financial press.
	<i>Sampling method within the case study</i>	AEL Executives, product managers based in South Africa and senior manager based in the regions where the company has an established presence.
	<i>In depth interview</i>	The interview is conducted in a conversational mode with the investigator listening carefully whilst asking respondents for facts, opinions on events and personal insights. The interview can occur in multiple sittings
	<i>Case study protocol</i>	The questions will be guided by the Research questions and the case study protocol questions
<b>Data analysis</b>	Data analysis strategy	Theoretical propositions
		Use of quantitative and qualitative data
		Identification of rival explanations.
	Analytical techniques	Explanation building

**Table 9: Validity and reliability strategies**

Criteria	Description	Comments
<b>Validity and reliability strategies</b>	Construct validity	Multiple sources of evidence and Triangulation
	Internal validity	Use of analytical strategies
	External validity	Analytical generalisation
	Reliability	Case study protocol

## 4 PRESENTATION OF FINDINGS AND ANALYSIS OF RESULTS

The purpose of the previous section was to define the research method for the presentation and analysis of the evidence to reach the objectives of the research stated in the Chapter 1.

The present chapter applies the research framework (3.13 Methodology framework) to present and analyse the evidence thus the format applied is a “single-case narrative study” report format with tabular and graphic representations. (Yin, 2009 , pp. 172 - 173).

### 4.1 Presentation of evidence

The table below shows the procedures developed in the previous chapter applied during the data collection process.

**Table 10: Application of methodology framework “Data collection”**

Criteria	Description	Comments
<b>Data collection</b>	<i>Source of data</i>	Primary data: Non structured interviews Secondary data: Annual reports AECI (2000 to 2014), parent company of AEL. OMNIA (2002 to 2014), parent company of BME. Average Gold prices (2002 to 2014) Average copper prices (2005 to 2014)
	<i>Sampling method within case study</i>	A total of ten interviews were completed in order to gain insights into AEL’s strategy. The respondents are all involved in the strategy of AEL from different perspective: operational, commercial, logistics, production, management and technical.
	<i>In depth interview</i>	Insights on the different aspects of AEL’s strategy.
	<i>Case study protocol</i>	The data collection and interviews were based on the case study protocol attached to the present research.

#### 4.1.1 Evidence presentation process

In order to facilitate the analysis, the information collected from interviews and archival reports is grouped under the case study questions’ headings. The interviews were conducted in a conversational mode thus only the main questions, guided by the case study protocol, addressed to the respondents are summarised for presentation purposes. Similarly, the evidence collected from the annual reports is grouped by research question.

#### **4.1.2 Data collection presentation and triangulation**

The triangulation per source of data process is achieved by grouping information from different sources of evidence, interviews and annual reports, under a single research question (J. P. Johnson et al., 2006). Besides, the presentation of data by research questions confirms that the relevant data collected answers the research questions.

#### **4.1.3 Presentation of evidence**

A detailed transcript of the interviews is attached in APPENDIX B of the present document. However a summary of the presentation of the data is outlined below.

Research question 1: How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations in Africa?

The data sourced relating to this particular research question is used to define AEL strategy and to provide an indication of BME strategy.

Therefore, the information related to AEL's objectives, strategy, the efficiency of AEL strategy, the formulation and the application of the strategy is gathered under this study question.

Research question 2: Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?

This study question regroups the data concerning the problems faced by AEL when operating in Sub-Saharan. The data placed under this heading forms the basis of the identification of the challenges, concerns and particular aspects of the explosives industry in Sub-Sahara.

Research Question 3: Why would it be necessary to include other key variables in existing strategic frameworks to develop an effective strategy for the explosives business?

Under this research question are grouped the information concerning the ability of AEL strategy to meet the challenges and concerns specified in the Research question 2 and how the strategy needs to be improved to meet such challenges and concerns.

Research Question 4: How do other variables, such as politics, legal, cultural and administrative barriers, impact on the shaping of the final strategy for South African explosives companies willing to expand their operations into Africa?

Under this study question, all the information related to the cultural, political and administrative concerns expressed in interviews and in the annual reports is grouped.

It is found, though, that the evidence from interviews and annual reports related to the Research question 3 is often the same as that collected for Research question 4.

#### 4.1.4 Data collection and rival explanation

Furthermore, basic quantitative data collected on AEL and BME revenue, AEL profit, copper prices, gold prices, CAGE framework and “connectedness indices” is displayed in the present section. The quantitative evidence makes the identification of rival explanation during the data analysis phase possible.

#### 4.2 Data analysis

The present section applies the data analysis process defined in “3.7 Data analysis” to the study the information collected. The process applied is displayed in the table below.

**Table 11: Data analysis framework**

Criteria	Description	Comments
Data analysis	Data analysis approach	Theoretical propositions
		Quantitative and qualitative data
	Analytical technique	Identification of rival explanations by analysis of Quantitative data. Explanation building

Based on the process described above (Table 10: Data analysis framework), the data analysis sequence is divided into two steps; the first step is the testing of the validity of the study propositions, the second step focuses on the identification of the rival explanation by a further analysis of qualitative and quantitative information.

The explanation building technique is applied extensively throughout the data analysis procedure, it is nonetheless mostly applied in the rival explanation section to ascertain the impact of external factors of the study (Yin, 2009).

The results and findings of the assessment of both propositions and the definition of the rival explanations lead to the development of a suitable strategic framework which addresses the challenges, the concerns and the particular aspects of the explosives market in Sub- Sahara.

The data is grouped by using the following method defined in the 3. Research methodology section:

1. Definition of codes
2. Coding of the interview transcripts and annual report notes
3. Grouping of data using the relevant family code.

#### **4.2.1 Linking the data presentation to the data analysis**

Following the recommendation of the literature, the link between the research questions and the study propositions is demonstrated in the chain of evidence table presented in the previous chapter (Table 7: Chain of evidence).

As a result, data presented by research questions in the “4.1.3 Presentation of evidence”, is further grouped to assess the validity of the two study propositions, thus ensuring the link between the presentation of the findings and the analysis of data.

#### **4.2.2 Measuring the efficiency of current strategies**

AECI (2008) explains the importance of evaluating the performance of a strategy by determining beforehand a set of measurable criteria.

Therefore, in the present research, efforts are made to determine the efficiency of a strategy by its capability to address the particular aspects of the explosives industry in Sub-Saharan countries and the challenges and concerns encountered by explosives companies operating in Sub-Saharan regions. The issues neither addressed by AEL strategy nor by strategic frameworks such as Porter and Ghemawat’s form part of the model elements to be included in the final framework developed in the following chapter on the “Development of a new framework”.

Following M. E. Porter (2008)’s recommendation that the evaluation of a company strategy can be done by the analysis of information contained in annual company reports, the efficiency of the strategy is assessed primarily by the evolution of the following parameters:

- AEL revenues in Sub-Sahara
- AEL profits in Sub-Sahara
- BME sales in Sub-Sahara

The following secondary criteria measures further the efficiency of the strategy:

- Market share
- Signing of new contracts
- Extension of current supply agreements
- Sales of electronic detonators

AEL and BME report their annual results in South African Rand, hence it is important to note that in Sub-Saharan markets, actual revenues and profits are earned in United State Dollar currency. A brief analysis of the impact of exchange rates on revenues reported in South African Rand is discussed later in the research when uncovering potential rival explanations.

The validity of the data is augmented by the triangulation of the data sourced from interviews as the measure of the efficiency of the strategies applied by existing explosives suppliers

operating in Sub-Sahara are determined by two sources of evidence namely, interviews and annual reports.

### **4.2.3 Theoretical proposition analysis strategy**

The assessment of the first proposition is the first stage of the confirmation of a gap in knowledge in the literature.

#### **4.2.3.1 Evaluation of Proposition 1**

Proposition 1: The present research evaluates the efficiency of the existing strategies applied by explosives companies to the explosives business in Sub-Saharan Africa;

The first step of the testing of this proposition is the definition of the actual strategies applied by AEL and BME.

The second step of the evaluation of the validity of the first proposition is the definition of challenges and concerns encountered by explosives companies operating in the Sub-Saharan explosives market. It is important to note that the concerns, challenges and particular aspects of the explosives market have an impact on the profits, revenues or market position of a company thus their importance when developing a strategy. The source of the data used to determine these elements are archival reports and interview transcripts.

##### **4.2.3.1.1 Defining AEL and BME strategies**

The first level of questions, included in the present Case Study Protocol, (APPENDICES A of the present document), enable the interviewer to clearly determine the objectives and strategy of AEL. In addition, the analysis of the annual reports provides further insights on AEL strategy thus allowing the triangulation of evidence collected through interviews with the second source of data (archival reports) as recommended by Yin (Yin, 2009) .

##### **4.2.3.1.2 Method used to define existing strategies**

The literature describes two schools of thought regarding the definition of the strategic concept. The first group describes strategy as a plan to realise a company's intent or vision. In such a case, the management of a company focuses on developing detailed implementation plans. This school of thought is defined in Chapter 2 of the present research and is commonly referred to as the planning School. Ansoff is the key figure of this school of thought. In such a case, a company's strategy is seen as a plan to reach the company's intentions (Objectives) (Ansoff, 1977).

The other school of thought defines strategy as a pattern that a company must follow to realise its vision (intent). In such a case the strategy is not predefined, but evolves with time according to the personalities of the managers and its environment (Mintzberg et al., 2005).

The analysis of both schools of thought shows that a company’s strategy can be defined as the means to reach an organization’s objectives or intentions. Nonetheless, both approaches differ concerning the development of strategy within an organisation; Ansoff sees strategy as the development of detailed plans and models, whereas Mintzberg views a company’s strategy development rather as the result of the perception of the market by the managers and the personality of the management team in an organisation.

Hence, the definition of strategy lies between both approaches as strategy needs to be detailed and at the same time flexible enough to adapt to the personality of the management of a company as well the operating environment.

Thus, in order to define the strategies of both AEL and BME in Sub-Sahara, it has been decided to use the combination of the two schools of thoughts; defining the objectives of the company as well as the plan or the pattern of actions in place to achieve those objectives.

**4.2.3.1.3 Definition of existing strategies**

The analysis of the data collected and presented in Annexure B of the present research allows the definition of the objectives of AEL and BME as displayed in the table below.

**Table 12 Definition of AEL and BME objectives**

<b>AEL Objectives</b>	<b>BME Objectives</b>
Clear financial targets	Clear financial targets
Maintain existing contracts and pursue new opportunities for growth	Maintain existing contracts and pursue new opportunities for growth
Grow sales in Sub-Sahara	Grow sales in Sub-Sahara
Development in French and Portuguese speaking countries	Key areas of focus (West Africa and Central Africa)
Reduce supply chain costs (Transport costs and cost effective sources of raw materials)	Reduce supply chain costs (Transport costs and cost effective sources of raw materials)
Value added services to customers	Value added services to customers

The analysis of the table above shows similarities between AEL and BME objectives from a point of view of financial objectives, growth of sales, renewal of supply agreements, supply chain cost reduction focus and services to customers. However, the criterion of area focus differs; AEL emphasises the language culture as the focus criterion, whereas BME insists on the geographic location of potential customers.

**4.2.3.1.4 Strategies**

The comparison of BME and AEL strategies in the table below, further confirms the existence of common grounds between the two companies’ strategies, as highlighted in Table 12. There is a common drive to improve customer productivity through the implementation of value adding projects, to focus on the sale of technologically advanced products such as electronic

detonators, the establishment of partnerships with mining houses and to reduce supply chain costs.

Although it is important to note, as discussed earlier, that AEL’s strategy is more detailed than BME’s, as the information is collected from two sources of data: interviews and annual reports, whereas only one source of data was collected on BME in the form of archival reports (archival reports). As a result, BME’s strategy is not described in as much detail as AEL; however, the table below shows that that the information collected on BME confirms the evidence collected on AEL.

**Table 13: Existing strategies**

<b>AEL Strategy</b>	<b>BME Strategy</b>
Growth of productivity of current assets: Production facilities supply a region and not a specific country nor a customer.	Production facilities in each country
Regional growth through hubs	
Transfer expertise from AEL South Africa to local hubs	
Establishment of global partnerships with mines	Follow mining companies’ expansion in Sub-Saharan.
Provide value added services	Value added services
Reduce Supply chain costs	Reduce Supply chain costs
Technology improvement	Development of electronic detonators
Maintain a tight control on costs	
Investment strategy	
Dedicate resource to develop (Central and West Africa)	

The respondents indicated, however, that AEL strategy is evolving with time towards the points described below:

- Full chemical offering: Product ranges are extended beyond explosives and hubs in Africa to be involved in the future with sales of chemicals.
- The hub model has evolved: the model has evolved to take into account the new company objectives.
- Decentralisation of growth strategy: Growth and business development will be handled by the hubs.
- Develop partnerships with mines: AEL have decided to create alliances with mining houses in order to roll out supply agreements established in South Africa to operations in Sub-Saharan.

Despite some similarities, the analysis of the strategies applied by each company shows a fundamental difference in terms of method of establishment of operations; AEL favours a regional development through hubs, whereas BME would favour the establishment of production facilities per country (P. Ghemawat, 2007).

#### **4.2.3.1.5 Conditions of Sub-Saharan explosives environment**

This section highlights the particular conditions faced by explosives companies operating in Sub-Saharan regions:

- Challenges: Issues identified by the respondents, such as local regulations, culture and language barriers, which need to be addressed so as to ensure the success of the venture (Ham, Kim, & Boyce, 2005).
- Concerns: these are issues which negatively affect the performance of the company that need to be measured and addressed in order to ensure the success of the strategy pursued (Paixão Casaca & Marlow, 2005).
- Aspect of explosives market: These are particular aspects of the explosives market which are essential to take into account as they characterise important specific traits of the explosives markets (OMNIA, 2009).

Furthermore, the efficiency of AEL's existing strategies and frameworks in the literature such as those of Porter and Ghemawat, are determined by the way they can overcome these market conditions (Ghemawat & Altman, November 2014).

#### **4.2.3.1.6 Aspects of explosives market**

##### *Aspect 1: Building of facilities on customer sites*

Explosives companies increase their sales mainly by the signing of supply contracts with a specific mine. Once the contract is signed the explosives supplier builds either production facilities for bulk emulsion on site, the main product, or storage facilities. In such a case, BME systematically builds production facilities (OMNIA, 2010) on each site, AEL would rather build plants regionally and erect rudimentary storage facilities on site (P. Ghemawat, 2007). Both methods have pros and cons; however, the sharing of production facilities seemingly improves the return on investment.

Explosives stores have to be built for the storage of detonators and other accessories. The detonators are typically produced and assembled in South Africa in the case of BME or, in the case of AEL, components are produced in South Africa, although the final product is assembled in West African and Central African hubs. Thus, there is an element of exporting from South Africa for detonators and local or regional production for bulk emulsion (P. Ghemawat, 2007).

##### *Aspect 2: Building of facilities prior to earning revenues*

There is a high cost involved in the building of production facilities; in 2007 AEL invested 42 million South African Rand for the building of two plants in Zambia and Democratic Republic of Congo but sales from these investments only occurred the following year (AECI, 2008, 2009).

The critical aspect is that in order to grow their business in Sub-Saharan countries, explosives companies must be able to raise sufficient funds from their mother company to invest and to survive financially during the establishment stage, as cash is spent and no revenue earned.

As described in the previous paragraph, the key element of the investment is the risk associated. AEL is not prepared to commit capital without a signed agreement, whereas BME is less risk adverse and is prepared to commit capital investment prior to the signing of a supply agreement (Respondent 3).

*Aspect 3: Sales of explosives linked to commodity market*

In addition, the explosives market is strongly linked to the demand of commodities. The price of commodities affects the decision to invest in the exploration and development of a mine. The main commodities driving the explosives industry in Sub-Sahara are gold, cobalt, copper and iron ore. Typically, when the prices of commodities go down, the sales of explosives are negatively impacted (AECI, 2012; OMNIA, 2011).

*Aspect 4: Mines want suppliers to add value*

Respondent 5 highlights that mines are under pressure to produce more at reduced costs. In addition to products, BME and AEL offer value added services to increase the productivity of the mines. These have clearly expressed the need for a supplier capable of offering quality products at cost-effective prices, while being able to provide at the same onsite technical support with a dedicated mining engineer on site at times.

*Aspect 5: Reliability of supply despite remoteness of sites*

Mines are often located in remote areas and the ability to deploy people and equipment and supply products in such areas is critical (Respondent 1).

*Aspect 6: The first mover effect impact on price*

The other key aspect is the first mover effect. The initial company that establishes itself in an area benefits from the first mover advantage (Frynas, Mellahi, & Pigman, 2006), however, after the end of the initial contract term, generally 3 to 5 years, competitors are invited to tender and in some instances the initial supplier loses their position or are forced to reduce his prices (Respondent 1 and 2).

*Aspect 7: Contract adjustments are performed quarterly*

In the majority of contract agreements, prices are adjusted per quarter; thus, explosives often suffer losses during a quarter before the prices are adjusted (OMNIA, 2008).

*Aspect 8: Differentiation sought through value added projects*

Explosives companies seek differentiation, especially through the initiative of projects that improve the productivity of the customers or reduce their costs. These initiatives are called value added projects (OMNIA, 2010). Customers are actually insisting that explosives suppliers offer value added projects (OMNIA, 2013).

*Aspect 9: The cost and availability of raw materials is essential*

The cost and availability of ammonium nitrate and emulsifier are critical to the pricing of emulsion, thus intense research is made to reduce the costs of these materials (OMNIA Annual Report 2012).

*Aspect 10: Manufacture of own delivery trucks*

The emulsion is transferred in the blast holes by Mobile Manufacturing Units (MMU). The trucks are manufactured on special orders and can take up to 15 months to deliver. AEL and BME have developed an internal capability to build them in-house (OMNIA, 2014).

*Aspect 11: Remoteness and accessibility of sites*

The development of infrastructure is essential to the supply of explosives to remote areas, as mines develop in remote areas through the establishment of new railways and the construction of roads as well as the upgrade of ports, as mentioned in the annual report OMNIA (2014) and by Respondent 1.

**4.2.3.1.7 Challenges to achieving this strategy**

The explosives companies operating in Sub-Saharan Africa face certain challenges. The definition of these challenges is essentially based on data collected during the different interviews.

It is important to note though, that only the difficulties faced by explosives companies operating in Sub-Saharan countries which have resulted in either loss of revenues or market shares have been regrouped in the present section.

*Challenge 1: Product quality is critical*

The quality of the products is essential, especially for products imported from South Africa. As mentioned previously in the present research, poor quality products result in an important loss of revenue for the mine. In such cases, the explosives company has to replace at its own cost, the product and in some instances compensate the mine for a portion of the loss in production. However, with increasing demand and mechanised production of accessories the quality of products is a challenge (Respondent 5).

*Challenge 2: Understanding of local regulations*

The appropriate understanding of local customs regulation is a challenge as they differ from one region to another (Respondent 1). In South Africa, ammonium nitrate is classified as an explosive (South Africa explosives Act), whereas in West Africa, for instance, the product is classified as fertilizer. The classification has a financial impact as declaring ammonium nitrate as explosives will attract the payment of 8% duties customs duties on the value of the material and the product has to be escorted by the police, whereas declaring ammonium nitrate as fertilizer results in a payment of 2.5% duties and no escort of the convoy on site. Using the appropriate classification has a serious impact on the profits generated. However, the tariffs and customs duties are written in the local language and require the appropriate

interpretation. In Tanzania, AEL was fined by the customs department for not using the appropriate classification (Respondent 3).

In addition to customs regulation understanding, it is important to know the tax regulations in the country in which the explosives company has established its operation. Non-compliance to local tax regulations can result in penalties from the tax authorities. Thus, explosives companies will need to manage the complexity of establishing local businesses. As an example, in Nigeria and Zimbabwe explosives companies are required to partner with a local manufacturer (Respondent 8).

Explosives companies are faced with explosives regulations which tend to evolve with the security situation. West African explosives regulations were highly influenced by the political unrest in Mali (Respondent 1).

#### *Challenge 3: Management of exchange rates losses and gains*

Operating with different currencies is a challenge as the explosives sales outside of South Africa are invoiced in local currency and converted to United States Dollars to pay for raw materials from South Africa in South African Rand or from Europe in Euros. The amount of cross currency transactions often results in either exchange rates gains or losses (Respondent 8).

#### *Challenge 4: Understanding local labour laws*

Explosives companies are required to employ local workforce, thus the need to adapt to the requirements of the local labour laws. In the past, AEL has been taken to court for the dismissal of employees, resulting in penalties to be paid (Respondent 3).

#### *Challenging 5: Reduce the cost of supply chain*

As mentioned earlier, the remoteness of destination sites and the diversity of the products shipped constitute a major challenge as explosives companies are required to supply equipment, products and services in remote areas of Africa. In order to be cost effective, shipments are consolidated on chartered vessels or despatched using liner services (AECI Annual Report 2008). Respondent 4 indicated that AEL has a different strategy, according to the classification of products. As an example, 1.4s (United States Class 1 Classification - Explosives) packaging is shipped by airfreight whilst other products from the same United Classification are shipped by sea or road (Paixão Casaca & Marlow, 2005). The shipments are typically multimodal as they involve different means of transport for one delivery (Ham et al., 2005):

#### West Africa and East Africa

- Train/truck from plant to port of departure (Cape Town or Durban)
- Sea from Durban to West Africa/East Africa (Tema and Takoradi for shipments to Ghana or Dakar for shipments to Burkina Faso)

- Road from port to site

#### Central Africa

- Road from AEL plant in South Africa to Katanga province, distance estimated at 2158 km and to Zambia 1998 km.

Lead times are between 2 to 5 months prior to delivery, thus requiring accurate understanding of logistics routes and planning accuracy. The length of the delivery cycle has an impact as choices of supplier are often based on delivery capability. It is important to note that the non-optimisation of the supply has led to a drop from 9.3% to 6.8% of margins for AEL in 2011 (AECL, 2012).

#### *Challenge 5: Provide technical support despite technical skill shortage*

Explosives companies are under pressure to provide technical services through value added services to its clients. The competition on the market has increased, thus the technical requirements and the complexity of the technology involved such as software, new products and projects involved have increased, resulting in the need for qualified technicians and engineers to service the mines in remote areas (Respondent 3). In order to meet such a demand, the explosives companies have to train and retain qualified local people with, at times, no practical mining experience. The scarce availability of human resources leads to the employment of expensive expatriate workforce that is not always prepared to live outside of South Africa, Australia or even Europe. The mining industry is facing a shortage of qualified manpower (OMNIA, 2009) .

#### *Challenge 6: Understanding the complexity of local explosives legislations*

As discussed, explosives regulations are very different from one country to another. The non-compliance to local legislation is a serious issue as it can result in penalties and prosecution of the company's management. As a result, the explosives companies need to manage the relationship with local authorities in order to anticipate changes and differences in legislation (Respondent 1).

#### *Challenge 7: Development of language skills*

Explosives companies are focusing their attention on predominantly French speaking countries such as Burkina Faso, Mauritania or even Democratic Republic of Congo. However, in order to be able to adapt to local conditions, explosives companies need to develop language skills.

#### *Challenge 8: Trade of commercial explosives during the African unrest*

Due to the increase in terrorism and the political unrest in certain regions of Africa, commercial explosives are perceived as a threat and to some extent explosives companies need to reassure local authorities of the safety and security measures in place.

#### 4.2.3.1.8 Concerns

##### *Concern 1: No global deal signed with mining houses*

Respondent 3 indicates that AEL is not successful in signing global agreements covering different regions of the African continent with mining companies. Such contracts would allow the roll out of existing supply agreements in South Africa to Sub-Saharan regions.

At present, AEL still has to participate in tender adjudications for the majority of new projects in Sub-Saharan countries. In addition, there is a strong feeling amongst the respondents that the management of global contracts is in conflict with the management of the local entity.

##### *Concern 2: Potential business loss due to non-establishment of hub*

Respondent 6 highlighted that AEL failed to establish a presence in some markets over the past years, as a result of its investment policy. The establishment of an entity and production facilities is conditional to the signing of a supply agreement with a customer. This is a concern as BME is willing to commit resources and capital in countries prior to the signing of a supply contract with a client. This has led to AEL losing business opportunities to BME in Mauritania and in some West African countries.

Respondent 3 added that the hub system should be more dynamic as the decision making for the establishment of a hub takes time and can result in a loss of an opportunity for AEL. As an example, the erection of a plant in Burkina Faso was completed only in 2013; however the level of production justified the investment in production facilities since 2012. AEL is vulnerable as competition is prepared to put assets on the ground before the signing of agreements and in most cases have a shorter decision making process.

##### *Concern 3: Detailed plan to be formulated prior to market entry*

Respondents 1 and 6 stressed the need for a detailed study of the market conditions and moreover the local constraints that often can delay the process, as well as the establishment of new operations in a country, from that point of view, the current strategy does not seem to address this concern.

##### *Concern 4: Being the first mover is a concern*

Respondents 1 and 2 note that the first mover advantage could result in negative consequences for the retention of the contract as AEL is perceived as having taken advantage of high prices in the initial period. In Mali and Guinea, despite the fact that AEL was the first on the market, BME have managed to establish operations in country.

##### *Concern 5: Growth from AEL South Africa has not materialised*

Respondent 3 mention that AEL expansion seems to be efficient when growing from an existing regional hub to another country within the same region; AEL DR Congo expanded from AEL Zambia and AEL Ghana was the springboard for the development of AEL operations in Burkina Faso. However, expansion into new territories from South Africa does not seem efficient as AEL has found it difficult to set up new operations in Cameroon or Angola for instance.

#### *Concern 6: AEL performance is linked to commodity market*

Respondent 3 says that AEL's performance is linked to the world prices of commodities as sales dropped in West Africa since the decrease of gold price in September 2013; as a result AEL is not growing according to forecast in 2013 and 2014. However, countries like Burkina Faso have managed to retain their customers. AEL's business remains highly dependent on gold prices as well as copper, as no major contract has been won in the iron ore sector. AEL needs to develop a value proposition to supply to iron ore mines and implement market segmentation by minerals.

#### **4.2.3.1.9 Measure of efficiency of actual strategy**

A summary of the data collected in the interviews related to the efficiency of AEL strategy is presented in this section, however further details and comments on the efficiency of AEL and BME strategy sourced from annual reports are enclosed in ANNEXURE E of the present research.

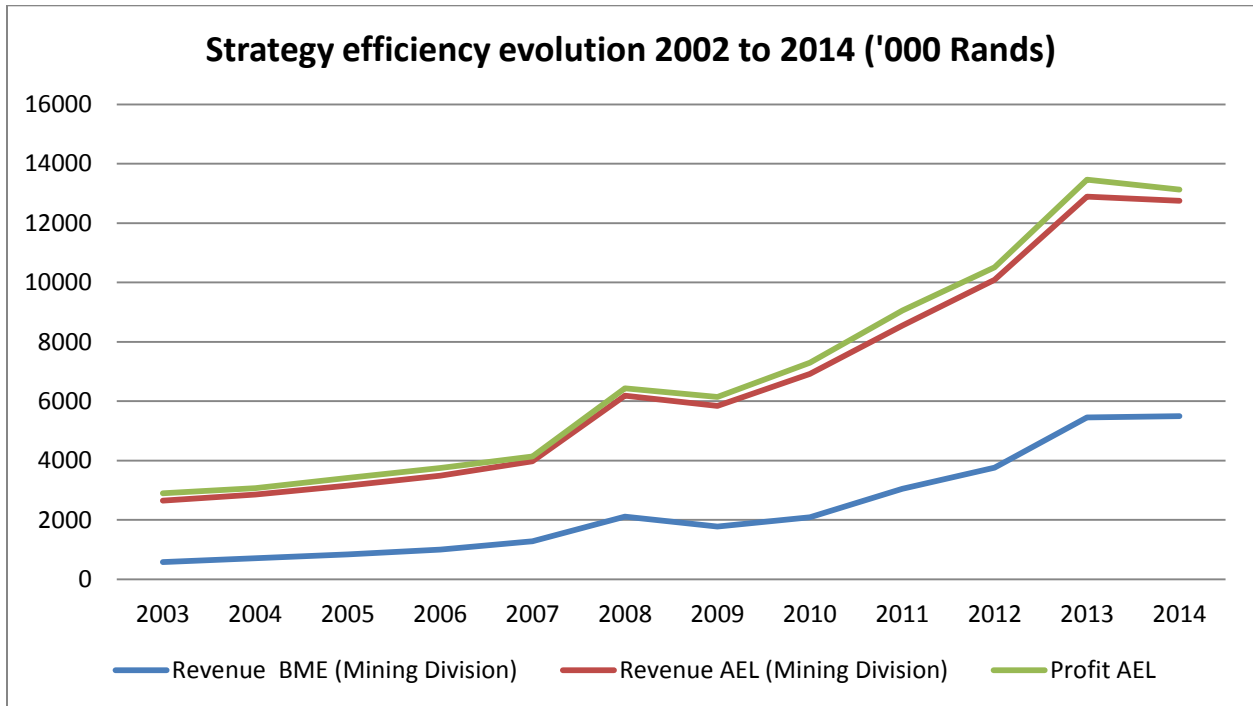
#### **4.2.3.1.10 Efficiency analysis through revenues and profits AEL and BME**

After defining AEL and BME's strategy through interviews and annual reports analysis the present section assesses the efficiency of AEL strategy as defined in the Measuring efficiency of current strategies section of the present research.

The graph below shows the evolution of sales, profits and assets from 2002 to 2014. The information is sourced from AEL and BME annual reports.

The chart shows that sales of BME and AEL increased at a higher rate from 2009 to 2013, however the growth halted in 2014; thus the first conclusion seems to be that from a revenue and profit perspective BME and AEL strategies are efficient, despite some concerns raised in the previous section. The data presented in the table below has been collected from AEL and BME annual reports from 2002 to 2013.

**Figure 2: AEL and BME strategy efficiency analysis**



**Conclusion**

Despite valid concerns expressed by respondents and annual reports, the analysis of quantitative data such as profits, turnover, alongside qualitative data, as recommended by the literature, confirms the efficiency of existing strategies employed by AEL and BME (Yin, 2009, pp. 32).

However, it is important to note that despite the overall impression of efficiency, some respondents brought to the attention of the interviewer concerns that were not addressed by either AEL or BME strategies. The purpose of the next section is to determine if such concerns are taken into account by existing frameworks such as those of Porter and Ghemawat.

**4.2.3.2 Evaluation of Proposition 2**

Proposition 2: The aim of the present research is to identify the model elements which could enhance the efficiency of Porter and Ghemawat’s frameworks or alternatively confirm that the current frameworks are adapted to the expansion of South African explosives companies in Africa.

Following the definition of existing strategies and the conditions of the explosives market, the second step of the analysis focuses on the assessment of the second proposition in order to identify how the existing strategic frameworks and strategies used by explosives suppliers can

be enhanced to respond to the concerns, challenges and aspects of the explosives market in Sub-Sahara identified in the previous section.

#### **4.2.3.2.1 Elements of Porter or Ghemawat's framework**

This section focuses on the Porter and Ghemawat's frameworks definition and how they address the traits of the explosives market, challenges and concerns. The analysis demonstrates that the explosives market's conditions are dissimilar to the industries that led to the development of Ghemawat's (P. Ghemawat, 2007) or Porter's (Michael E. Porter, 1980)'s strategic frameworks, thus such models need to be adapted to address the requirements of the explosives sector.

Following the definition of AEL and BME strategies, this section evaluates whether they respond effectively to the challenges, particular aspects of the explosives market, and concerns of the explosives sector in Sub-Saharan regions.

The first step of the analysis defines Porter and Ghemawat's framework. The second step of the analysis assesses if these concerns are answered by Porter and Ghemawat's framework and existing strategies.

#### **4.2.3.2.2 The limits of Ghemawat strategic framework**

Ghemawat's framework is divided in two components; the CAGE framework (Ghemawat, 2011) and the generic strategies (P. Ghemawat, 2007).

##### *CAGE framework*

The purpose of the CAGE framework is to measure the distance between two countries by scoring the different criteria below:

##### **Cultural distance**

- Languages
- Ethnic difference
- Religion
- National work system
- Different values norms

##### **Administrative distance**

- Lack of colonial ties
- Lack of shared regional trading bloc
- Different legal system
- Lack of common currency

- Political hostility
- Transfer of profit to home base

### **Geographic distance**

- Physical distance
- Lack of border
- Different climates
- Different time zones

### **Economic distance**

- Differences in consumer income
- Availability of human resources
- Financial resources
- Natural resources
- Intermediate inputs
- Infrastructure
- Supplier distribution structure
- Economic size
- Lower per capita income
- Low level of monetization

Ghemawat uses the above mentioned framework to show that the level of international trade between countries and the level of globalisation is overstated by the literature (Pankaj Ghemawat, 2007). Countries tend to do business within the same geographical region or with nations sharing the same culture or even language. As an example, Ghemawat demonstrates it through a study of trade between the United States and Canada, China and Europe. His study reveals that the intensity of trade between United States and Canada is higher than with China and Europe (Ghemawat, 2011, pp. 45).

### *Generic strategies*

The application of the CAGE framework leads to the choice of a set of generic strategies described below:

**Adaptation:** A company decides to establish operations in another country. The legal entity and production facility will be dedicated to the specific country (Ghemawat, 2011, Chapter 4).

**Aggregation:** A company elects to establish an entity in a region (a hub). The hub is constituted by a legal entity, other administration services as well as production facilities that will service an entire region (Ghemawat, 2011, Chapter 5).

Arbitrage: In such a case, the company decides to trade in a region to take advantage of the lower costs of production in its home country compared to the targeted country (Ghemawat, 2011, Chapter 6).

**Table 14: Generic strategies linked to BME and AEL**

<i>Ghemawat's framework</i>	
<b>AEL</b>	<b>BME</b>
The key element of AEL's strategy linked to the Ghemawat's framework is the aggregation, where the company intends to grow through the creation of regional hubs in Africa. Entities within a same hub tend to share production facilities, logistic services and other administrative services.	BME strategy is rather to establish separate entities in different markets and to treat each country separately with production facilities and other services deployed in each country resulting in more plants than AEL servicing fewer customers.

*Testing of the CAGE model*

South African explosives when expanding their activities in Sub-Saharan regions face a different cultural, geographic, and economic environment to that of their home base.

The table below shows the application of the CAGE framework to Burkina Faso and the distance between South Africa and Burkina from a cultural, administrative, geographic and economic perspective. Nevertheless, AEL committed capital and human resource in the country and made Burkina Faso the focus points of its strategy in North West Africa (AECI, 2014). The answer "Yes" means that there is a difference, "No" the existence of similarities.

**Table 15: CAGE model Burkina Faso**

<b>Criteria</b>	<b>Burkina Faso vs. South Africa</b>
<b>Cultural distance</b>	
Languages	Yes
Ethnic difference	Yes
Religion	No
National work system	Yes
Different values norms	Yes
<b>Administrative distance</b>	
Lack of colonial ties	Yes
Lack of shared regional trading bloc	Yes
Different legal system	Yes
Lack of common currency	Yes
Political hostility	Yes
Transfer of profit to home base	Under specific conditions
<b>Geographic distance</b>	
Physical distance	YES
Lack of border	YES
Different climates	YES
Different time zones	No
<b>Economic distance</b>	
Differences in consumer income	YES
Availability of human resources	YES
Financial resources	YES
Natural resources	YES
Intermediate inputs	YES
Infrastructure	YES
Supplier distribution structure	YES
Economic size	YES
Lower per capita income	YES
Low level of monetization	YES

In addition, the connectedness index developed by Ghemawat, which measures a country's involvement in global trade , indicates that Burkina Faso has a low connectedness index of 23 and is ranked 128 in the world in 2013 whilst South Africa has a connectedness index of 54 and

is ranked 54 in the world in 2013 , however BME and AEL, two South African companies have committed investment in Burkina Faso (Ghemawat & Altman, November 2014).

Furthermore, the analysis of the connectedness index presented by Ghemawat and Altman (November 2014) shows that the countries where AEL has decided to establish operations have a very low connectedness index; Burkina Faso is ranked 138 out of total of 140 countries or Zambia is ranked 129. Regardless of this aspect, AEL decided to focus on these areas, based on their potential mining growth, which shows that the CAGE frameworks and the connectedness analysis are not adapted to the explosives sector and would have to be adapted to be used effectively in the explosives industry.

In addition, during the interviews performed, the respondents were asked to rank on a scale of 1 to 5 the relevance of the different criteria of the CAGE model (1 irrelevant to the explosives market in Sub-Saharan Africa and 5 being relevant to the explosives market in Sub-Saharan Africa).

The total responses are averaged by criterion. All criteria with an average above 3 are classified as relevant to the explosives industry in Sub-Saharan Africa. Table 8 provides details on the relevant components of the framework.

The analysis reveals that out of the twenty four components in the CAGE framework only fifteen are relevant to the explosives industry and amongst the fifteen some still need to be adapted to be applicable to the explosives industry.

**Table 16: Relevant component of CAGE model**

<b>Description</b>	<b>Average relevance</b>
<b><i>Cultural distance</i></b>	
Languages	3.72
Different values norms	3.61
National work system	3.33
Different values norms	3.61
<b><i>Administrative distance</i></b>	
Different legal system	3.78
Lack of common currency	3.33
Political hostility	3.33
Transfer of profit to home base	3.78
<b><i>Geographic distance</i></b>	
Physical distance	3.06
<b><i>Economic distance</i></b>	
Availability of human resources	3.83
Financial resources	3.17
Natural resources	4.08
Infrastructure	4.11
Supplier distribution structure	3.44
Economic size	3.28

The test of the CAGE model, the Connectedness index shows that the these models are not adapted to the explosives market in Sub-Saharan countries, however the generic strategies can be applied by explosives companies.

#### **4.2.3.2.3 The Limits of Porter's framework**

A similar analysis was performed on Porter's framework. As discussed in "2.9 Porter's approach to strategy", the strategy of a company is based on the "five competitive forces" that determine the level of profitability of an industry (M.E. Porter, 1998b, Chapter 1: Structural Analysis of Industries).

The firm's "Competitive advantage" is either based on its capacity to differentiate its products or services or to produce them at lower cost than its competitors within an industry is determined by the analysis of the primary activities of the company's "value chain" (M.E. Porter, 1998a, Chapter 2: Value Chain and Competitive Advantage).

The choice of the firm's "generic strategy" either cost, differentiation or focus (M.E. Porter, 1998b, Chapter 2: Generic Competitive Strategies) will depend on the "competitive forces" in the industry and the "Competitive advantage" of the firm.

The three main components of Porter's framework namely: the analysis of the market via the five competitive forces framework, the identification of companies value chain and three generic strategies are detailed below (M.E. Porter, 1998b).

##### *Five forces framework*

- Rivalry amongst existing competition
- Bargaining power of suppliers
- Bargaining power of buyers
- Threat of substitute products
- Threat of new entrants

##### *Generic strategies*

- Strategy that will seek differentiation
- Strategy that will seek cost leadership
- Focus strategy, the strategy will focus on a particular market segment.

**Table 17: Linking Porter and existing strategies**

<b>Porter's framework</b>	
<b>AEL</b>	<b>BME</b>
AEL is looking at differentiating its services through the offer of value added services, technology improvement through the promotion of electronic detonators. In addition, AEL's mentions the intent to reduce cost in order to seek leadership.	The elements of Porter's framework are very similar to AEL's; differentiation through value added services, increase product range with new products.
AEL focuses as well at sourcing raw materials at the lowest possible costs, it is important to note that Porter considers the negotiating power with suppliers as a force.	Focus on the reduction of the costs of sourcing products.

The respondents were not specifically asked to rate the five Forces, however based on the interview results and the analysis of the Annual Reports for both AEL and BME, the following elements of the Five Forces framework prove to be relevant to the explosives market in Sub-Saharan:

- Rivalry amongst existing competition: Respondents in the interview mentioned the intense competition between AEL and BME.
- Bargaining power of suppliers: Respondents mentioned the importance for AEL and BME to negotiate cheaper sources of raw material and reduce the existing supply chain costs.

The other elements of the Five Forces framework are not relevant to the explosives market in Sub-Saharan Africa.

Furthermore, Porter defines the concept of the "value chain" of a company composed three components (M.E. Porter, 1998a, Chapter 2):

"Primary activities":

- "Inbound logistics": Supply, storage and managements of input materials.
- "Outbound logistics": Activities linked to the supply and distribution to the customer.
- Marketing and sales: Activities linked to sale and promotion of the product.
- Service: Activities related to after sales activities.

In addition Porter defines “support activities”:

- Procurement activities
- Technology development
- Human resource management
- Company infrastructure

And “quality assurance” activity that ensure the quality of the services and products.

The combination of the three above mentioned activities constitute the value chain of a company. The determination of a company’s value chain leads to the determination of its strategy.

The analysis of the different components of Porter’s framework shows that some aspects of the framework are relevant, such as the intensity of the competition and the purchasing power of the purchasers in the “Five forces” framework. The elements of the value chain which are relevant are inbound and outbound logistics, marketing and sales, as well as service. The concern though is that critical elements for the explosives business, such as technology development, company infrastructure and quality assurance do not form part of the primary activities of a company. Thus, in order to use Porter’s framework for the explosives, some elements should be considered as a “primary activity”.

In addition, Porter’s five forces framework gives a static picture of the market and does not allow the prediction of change, which is a concern as the explosives market is in constant mutation with new regulations, fluctuations in commodity prices for example (Kiechel, 2010). Furthermore, Porter’s framework is difficult to apply as it requires data on the industry which is not always available in Africa and he gives very scarce indication on the implementation process of the generic strategies (Freedman, 2013).

#### *Evaluation of Ghemawat and Porter’s framework*

The tables below list the challenges, concerns and specific aspects of the explosives market in order to identify the criteria that are addressed by either Ghemawat, Porter and existing strategies.

**Table 18: Challenges faced by explosives companies**

<b>Challenges</b>	<b>AEL Strategy</b>	<b>BME Strategy</b>	<b>Porter</b>	<b>Ghemawat</b>
Product quality is essential to avoid the high cost of replacement of damaged production and compensation to customers.	Detonators produced regionally  Bulk produced regionally	Detonator produced in South Africa  Production facilities in each country	Issue addressed by Porter, however this is not a primary activity for Porter .(M.E. Porter, 1998a)	Issue not addressed by Ghemawat framework
Understanding of local regulations including taxes and customs.	Establishment of Regional hubs closer to the market - Adaptation (Ghemawat)	Establishment of entities in each target country -	Issue not addressed by Porter's strategy	Adaptation and Aggregation addresses the issue.(P. Ghemawat, 2007)
Management of exchange losses/gains	Issue not addressed by strategy	Issue not addressed by strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework
Determination of the most effective logistic route depending on the type of product to ship	AEL has logistic strategy as explained by a respondent.	Intent to rationalise supply chain.	Issue addressed by Porter as a primary activity of the company (M.E. Porter, 1998a)but does not address specific aspects of the explosives business.	Adaptation and Aggregation addresses the issue (P. Ghemawat, 2007).
Understanding of local labour rules	Not mentioned in strategy	Not mentioned in strategy	Issue not addressed by Porter's framework	Adaptation will allow the understanding of local administration condition(P. Ghemawat, 2007).
Development of local technical skills	Not mentioned in strategy	Not mentioned in strategy	Issue not addressed by Porter's framework.	Issue not addressed by Ghemawat framework.

**Table 19: Concerns faced by explosives companies**

<b>Concerns</b>	<b>AEL Strategy</b>	<b>BME Strategy</b>	<b>Porter</b>	<b>Ghemawat</b>
No global deal has been establish with a mining house	Issue addressed in AEL strategy.	Issue addressed in BME strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework
Delays in establishing a hub could result in loss of business.	Issue nit addressed in AEL strategy	Issue not addressed in BME strategy	Issue not addressed by Porter's framework	Ghemawat triple A framework(P. Ghemawat, 2007) does not deal specifically with this concern.
No plan is formulated prior to market entry,	Issue addressed in AEL strategy.	Issue addressed in BME strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework
The first mover advantage could be a concern	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework
Expansion from South Africa difficult to achieve, expansion from existing hub is a success.	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Issue not addressed by Porter's framework	Ghemawat triple A framework does not deal specifically with this concern.
AEL's performance is linked to the evolution of prices of commodities.	Not mentioned in strategy	Not mentioned in strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework

**Table 20: Aspects of explosives markets**

<b>Aspects of explosives market</b>	<b>AEL Strategy</b>	<b>BME Strategy</b>	<b>Porter</b>	<b>Ghemawat</b>
Logistics and transport concerns	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat's framework
Establishment of equipment and facilities at customer sites	No specific reference on timing	No specific reference on timing	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat's framework
Supply of accessories centralised or regionalised	Issue addressed in AEL strategy.	Issue addressed in BME strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework
Facilities are built prior to earning revenue from the contract	Not mentioned in strategy	Not mentioned in strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework
The need to invest with or without a contract.	Not mentioned in strategy	Not mentioned in strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework
The sales of explosives are affected by the price of commodities.	Not mentioned in strategy	Not mentioned in strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat framework

<b>Aspects of explosives market</b>	<b>AEL Strategy</b>	<b>BME Strategy</b>	<b>Porter</b>	<b>Ghemawat</b>
Mine want explosives supplier to add value to their operations	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Issue addressed by Porter's framework with reference to differentiation (Michael E. Porter, 1980).	Issue not addressed by Ghemawat's framework
Reliability of supply is essential due to the remoteness of sites	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Outbound logistics addressed as a primary focus by Porter (M.E. Porter, 1998a)	Issue not addressed by Ghemawat's framework
In the majority of contract prices the margins are adjusted per quarter thus explosives often suffer losses during a quarter before the prices are adjusted. (OMNIA Annual Report 2008).	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat's framework
Differentiation is sought through value added projects.	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Issue addressed by Porter's framework with reference to differentiation(M.E. Porter, 1998a)	Issue not addressed by Ghemawat's framework
The cost and availability of ammonium nitrate and emulsifier are critical to the pricing of emulsion thus intense research is made to reduce the costs of these materials (OMNIA Annual Report 2012).	Issue addressed in AEL strategy.	Issue addressed in AEL strategy	Issue addressed by Porter's framework in five forces framework (M.E. Porter, 1998a)	Issue addressed by Ghemawat's framework. (Ghemawat, 2011)
Manufacturing of own delivery trucks	Issue not addressed in AEL strategy.	Issue addressed in BME strategy	Issue not addressed by Porter's framework	Issue not addressed by Ghemawat's framework

Despite the tables above showing that not all concerns and aspects of explosives market and challenges are addressed by AEL or BME strategy, the important point as well is that none of the key concerns/challenges/aspects of the explosives market is addressed by either BME or AEL strategies, or by Porter and Ghemawat's models. This point shows the existence of critically important knowledge gaps:

- The challenges encountered by explosives companies in Sub-Saharan are not addressed by strategies adopted by both BME and AEL.
- Porter and Ghemawat's frameworks do not address the gaps of existing BME and AEL strategies.
- There is a need to adapt current frameworks with the necessary variables to meet the needs of explosives companies wanting to establish operations in Sub-Saharan countries.

These three points show the need to include these variables in the frameworks in order use them for South African explosives companies wanting to expand their operations in Sub-Sahara.

#### **4.2.4 Rival explanation**

This section focuses on the identification of possible rival explanations of facts observed, e.g. a sudden increase in sales or profits during a given period could be caused by an external reason such as the evolution of commodity prices rather than a change in strategy. Such patterns are identified through the analysis of profits, revenues, assets compared to commodity prices. The literature recommends as an analytical strategy to mix qualitative and quantitative data to improve the validity of the results (Yin, 2009).

##### **4.2.4.1 Analytical approach**

As explained in Chapter 3, the method used to test the presence of rival explanations which could explain the success or failures of BME and AEL strategy will be the use of the "pattern matching" analytical method as described by Yin (Yin, 2009pp. 140). Yin recommends that the independent variables are used to test predicted outcomes. The predicted outcomes should be formulated by a proposition which will be tested (Yin, 2009). In the case of the present research, the proposition is tested:

"The success or failure of a strategy is based on its strategy."

The above mentioned proposition was tested by matching the profits and sales of AEL and BME from 2000 to 2014 to independent variables such as gold, copper and exchange rates over the same period.

The pattern matching analytical strategy allows the present section assessment of the possibility of the presence of other model elements that could explain the evolution of the sales of explosives.

#### **4.2.4.2 *Testing of the rival explanation proposition***

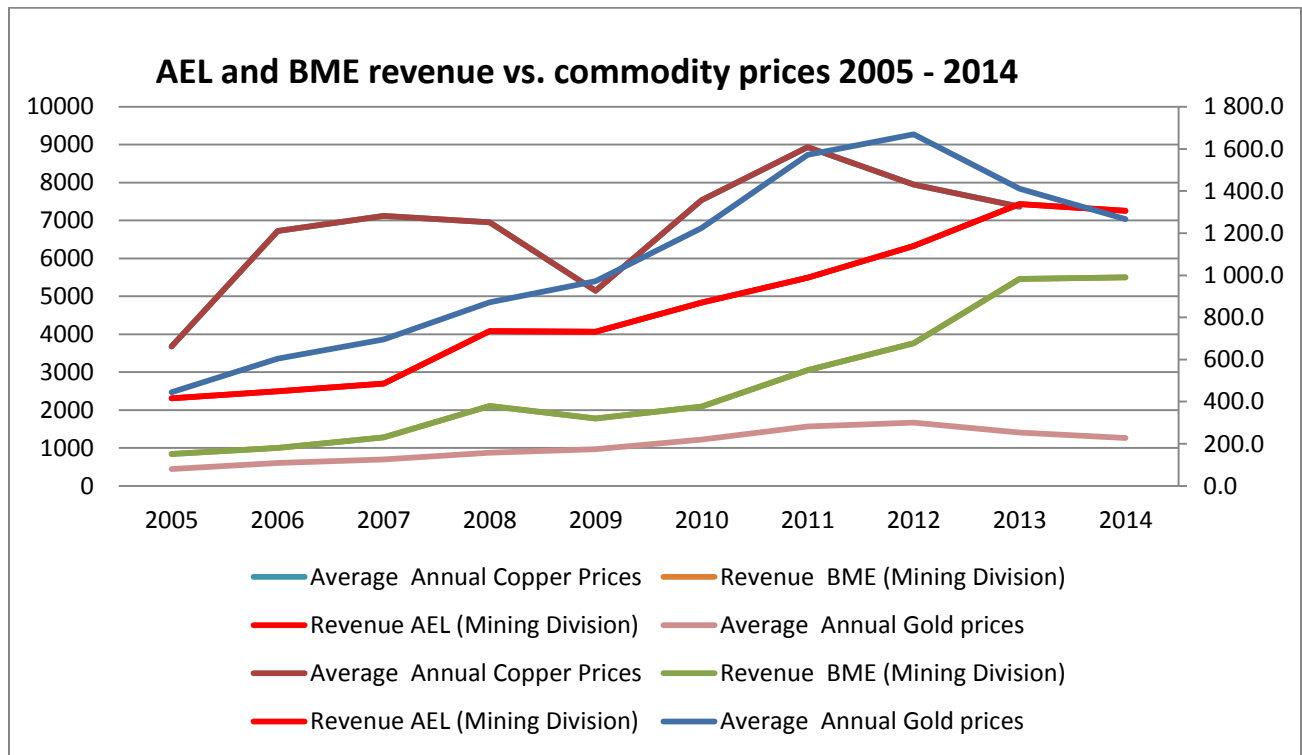
The previous sections established that the current AEL and BME strategies do not address the concerns, challenges and some aspects of the explosives market in Sub-Saharan Africa which should have resulted in a drop in sales and profits as the measure of a strategy is its profitability (Michael E. Porter, 1996).

However, by performing a triangulation analysis by source of data, as suggested in the Research Methodology chapter of the present research and the literature (Yin, 2009), it is noticed that the majority of respondents confirm that AEL strategy is successful and identically, in the AECI Annual Reports from 2009 to 2013, AEL reported growth in sales and profits from one year to the next.

Furthermore, the analysis of sales and profits in Sub-Sahara sourced from AECI Annual Reports from 2002 to 2013 and OMNIA Annual Reports 2002 to 2013 show a growth of revenues from 2009 to 2013 for AEL and BME.

The growth of sales and profits, despite establishing that key issues are not addressed by actual strategies, shows that the increase in sales and profit can be caused by other variables ( "rival explanation") (Yin, 2009). The analysis of the evolution of world prices show that sales and profits tend to increase or decrease with the evolution of commodity prices.

Figure 3: Evolution of sales 2005 - 2014

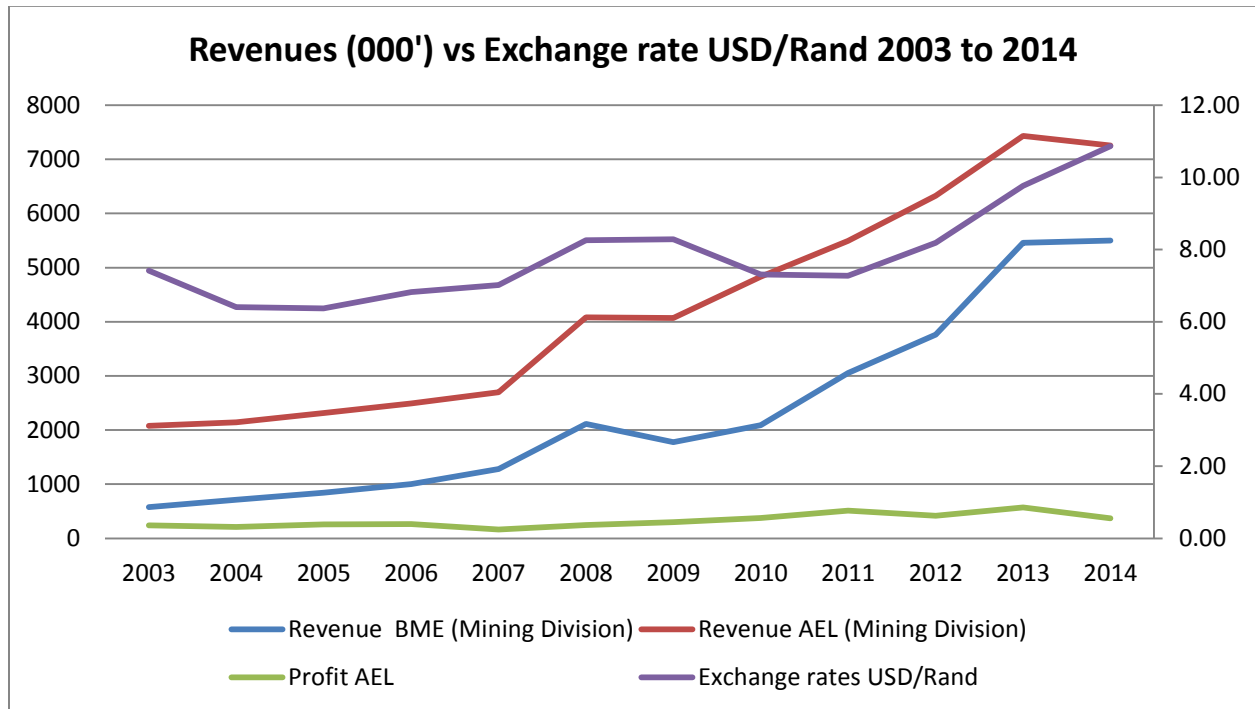


From 2005 to 2012, the independent variables of gold and copper match the pattern of sales and profits of AEL and BME. However, in 2013, the price of gold and copper dropped, however the sales of AEL and BME increased.

Therefore the analysis of the pattern of the data from 2005 to 2012 shows that the evolution of sales and profits match the pattern of sales, thus commodity prices can be considered as a rival explanation of sales in terms of the efficiency of a strategy. However in 2013, commodity prices dropped and sales of BME and AEL increased further, showing that there is an element of strategy that has an impact on sales and profits.

Thus, based on the above, the rival explanation proposition is not valid from 2005 to 2012. The success of an explosives company is highly dependent on the evolution of commodity prices and not only on its internal strategy, but the fact that sales continued to increase despite the drop in commodities, price could be caused by another explanation, as the United States dollars to the South African rand exchange rate continued to grow during the year 2014, thus possibly enhancing the results of AEL and BME, despite a drop in sales and explosives demand. This point is illustrated by the chart below.

Figure 4: Evolution of sales including USD/ZAR exchange



#### 4.2.4.2.1 Conclusion on evaluation of second proposition

The analysis identified specific aspects of the explosives market and challenges faced by explosives markets that are not addressed by AEL and BME strategies and Porter and Ghemawat's frameworks.

The challenges and the specific aspect of the explosives market will have to be included in a strategic framework in order to be used efficiently by explosives companies operating in Sub-Saharan.

## **5 Development of a new framework**

The present chapter focuses on the development of a new strategic framework adapted to the explosives sector in Sub-Saharan countries.

### **5.1.1 Method used to develop a new strategic framework**

The previous section defined BME and AEL strategies and reveals the existence of a potential rival explanation that could explain the success of AEL and BME since 2009, despite the proven limits of their existing strategies.

In addition, the evaluation of the study's proposition indicates that Porter and Ghemawat's strategic frameworks do not address all the specific aspects of the explosives market conditions gathered from the analysis of evidence collected from interviews and annual reports.

The above mentioned remarks lead to the development of a framework which takes into account AEL and BME current strategies, the rival explanations, the concerns and challenges, the specific conditions of the explosives business.

The inclusion of these variables in the existing AEL and BME strategies allows the development of a strategic framework applicable to explosives companies willing to expand their activities in Sub-Sahara.

The basis of the newly developed framework is the CAGE model with its generic strategies defined by Ghemawat (P. Ghemawat, 2007). The choice of Ghemawat's framework instead of Porter's (M.E. Porter, 1998a) is due to the fact that the CAGE framework recognises culture, languages and administrative barriers as a component of strategies (Ghemawat, 2011). In addition, Porter recommends the use of only one strategy (M.E. Porter, 1998a).

Based on that, the framework adapted to the realities of the explosives business in Sub-Sahara is an updated version of Ghemawat's framework. The update of his framework is performed in three steps.

### **5.1.2 Update of the CAGE framework**

The first step of the process is to modify the CAGE framework to enable it to measure accurately the distance between South Africa and Sub-Saharan countries.

The modification of the CAGE framework follows the following sequence:

- Phase 1: Identification of the elements of the CAGE framework adapted to the explosives industry in Sub-Sahara.
- Phase 2: Inclusion of the elements of existing strategies in the CAGE framework.

- Phase 3: Add concerns, challenges and specific aspects of explosives markets in the CAGE framework.

#### 5.1.2.1 Phase 1: Elements of Porter and Ghemawat relevant to the explosives business

The identification of the CAGE variables relevant to the explosives market was explained in “Table 14: CAGE model Burkina Faso” in the previous chapter as the table below was developed in “4.2.3.2.2 The limits of Ghemawat strategic framework”.

**Table 21: Relevant component of CAGE model**

Description	Average relevance
<b><i>Cultural distance</i></b>	
Languages	3.72
Different values norms	3.61
National work system	3.33
<b><i>Administrative distance</i></b>	
Different legal system	3.78
Lack of common currency	3.33
Political hostility	3.33
Transfer of profit to home base	3.78
<b><i>Geographic distance</i></b>	
Physical distance	3.06
<b><i>Economic distance</i></b>	
Availability of human resources	3.83
Financial resources	3.17
Natural resources	4.08
Infrastructure	4.11
Supplier distribution structure	3.44
Economic size	3.28

##### 5.1.2.1.1 The elements of the “Five forces” frameworks are the following:

- Rivalry between existing competition: Respondents in the interview mentioned the intense competition between AEL and BME.
- Bargaining power of suppliers: Respondents mentioned the importance for AEL and BME to negotiate cheaper sources of raw material and reduce the existing supply chain cost.

**Table 22: Adapting CAGE framework and five forces to the explosives industry**

	<b>Cultural distance</b>	<b>Administrative distance</b>	<b>Geographic Distance</b>	<b>Economic Distance</b>
<b>Elements of Ghemawat relevant to the explosives business</b>	<p>Languages</p> <p>Different values norms</p> <p>National work system</p>	<p>Different legal system</p> <p>Lack of common currency</p> <p>Political hostility</p> <p>Transfer of profit to home base</p>	<p>Physical distance</p>	<p>Availability of finance for new projects: Need to provide investment upfront</p> <p>Natural resources: Grow sales to mines.</p> <p>Infrastructure</p> <p>Supplier distribution structure</p> <p>Economic size</p>
<b>Elements of Porter relevant to the explosives business</b>	<p>Rivalry amongst existing competition: Respondents in the interview mentioned the intense competition between AEL and BME.</p>		<p>Bargaining power of suppliers: Respondents mentioned the importance for AEL and BME to negotiate cheaper sources of raw material and reduce the existing supply chain costs.</p>	<p>Bargaining power of suppliers: Respondents mentioned the importance for AEL and BME to negotiate cheaper sources of raw material and reduce the existing supply chain costs.</p>

### **5.1.2.2 Phase 2: Adapting CAGE framework to existing strategies**

In Chapter 4, the key elements of the strategies applied by explosives companies are defined. In order to adapt the CAGE framework to the explosives industry, these features need to be included in the adapted CAGE framework.

The paragraphs below show how they are included in the CAGE headings; Cultural distance, Geographic distance, and Economic distance.

#### **Cultural distance**

- Customers require technical services: Explosives suppliers required to provide technical services
- Customer loyalty: Establishment of global partnerships with mines
- Contract management: Need to maintain current supply contracts with existing customers
- Customers want innovative products: Technology improvement
- Product range: Explosives company ability to provide full product range

#### **Geographic distance**

- Reduce supply chain costs

#### **Economic distance**

- Availability of finance for new projects: Need to provide investment up-front
- Market prices are low: Need to maintain a tight control on costs.
- Investment requirements: Need to improve productivity of current assets to minimise capital investment.
- Natural resources: Grow sales to mines.
- Availability of local resources: Training of local resources to provide technical resources.

### **5.1.2.3 Phase 3: Elements not taken into account by BME and AEL strategy**

The concerns, challenges and specific aspects not taken into account by the BME and AEL strategy are described below and then classified using the CAGE model.

The model elements likely to shape the final strategy have been regrouped in the following categories:

- Sourcing of product
- Capital capability
- Customer strategy
- Commodity management
- Administrative environment
- Service strategy
- Price management

### **Sourcing of product**

The literature recognises the importance of product quality when trading internationally (Battini, Faccio, Persona, & Sgarbossa, 2012) thus, due to the nature of the product, it is essential for explosives companies to avoid the high cost of replacement of damaged production and compensation to customers.

It has been observed, as well, that there is a trend for mines to include in the supply of agreements penalties payable in the event of a poor blast linked to the quality of the explosives or detonator supplied. These penalties can reach up to ten million South African Rand, thus it is critical that the necessary quality and process checks are performed at the production facilities. Tse and Tan explain the damage in terms of penalties and loss of business that product recalls have caused companies worldwide attempting to expand their activities abroad (Tse & Tan, 2012).

### **Logistics and transport concerns**

The cost and availability of ammonium nitrate and emulsifier are critical to the pricing of emulsion, thus intense research is made to reduce the costs of sourcing such materials (OMNIA, 2013).

### **Capital capability**

The establishment of equipment and facilities at customer sites requires the explosives company to have sufficient funds to invest during the construction without earning revenues from the client.

### **Customer strategy**

No global deal has been established with a mining house.

Although the first mover seems to be an advantage in the early stage of the market penetration (Driffield et al., 2013), AEL often fails to retain the contract after the initial contract terms.

### **Local environment**

No plan is formulated prior to market entry. Prior to establishment of operations the following needs to be done:

- Understanding of local labour rules
- Development of local language skills
- Development of local technical skills
- Understand the complexity of local explosives regulations.

### **Service strategy**

Mines want the explosives supplier to add value to their operations thus differentiation is sought through value added projects by explosives suppliers.

### **Price management**

In the majority of contract prices, the margins are adjusted per quarter, thus explosives often suffer losses during a quarter before the prices are adjusted (OMNIA, 2009). However, these price adjustments need to be managed in order to minimise the impact of these quarterly adjustments (Chiu, Choi, & Tang, 2011).

### **Manufacturing of own delivery trucks**

AEL and BME supply their bulk emulsion products to the customer in mobile manufacturing units (trucks), these trucks have a typical lead time of 15 months. In order to reduce the mobilisation process, AEL and BME have decided to manufacture such trucks internally.

### **Economic environment**

AEL's performance is linked to the evolution of prices of commodities and the sales of explosives are affected by the price of commodities.

Management of exchange rate gains and losses as AEL and BME will earn revenues in United State Dollars and report results in South African Rand, thus the exchange rate risk will have to be managed.

### **Sourcing of products**

It is essential that the supply chain of the different sources of products and raw materials are optimised in order to ensure cost effective prices to the customer and acceptable levels of productivity. It is important to note though, that the costs of commercial explosives increased due to the recent security issues in West Africa and the rise of terrorist groups such as Boko Haram, as a result the authorities have taken strict measures for the transport and storage of explosives (Okpaga, Chijioke, & Eme, 2012).

**Table 23: Update of CAGE framework with existing strategies**

	<b>Cultural distance</b>	<b>Administrative distance</b>	<b>Geographic Distance</b>	<b>Economic Distance</b>
<b>Elements of the existing AEL and BME strategy</b>	<p>Customers require technical services: Explosives suppliers required to provide technical services</p> <p>Customer loyalty: Establishment of global partnerships with mines</p> <p>Contract management: Need to maintain current supply contracts with existing customers</p> <p>Customers want innovative products: Technology improvement</p> <p>Product range: Explosives company ability to provide full product range</p>		<p>Reduce supply chain costs</p>	<p>Market prices are low: Need to maintain a tight control on costs</p> <p>Investment requirements: Need to improve productivity of current assets to minimise capital investment.</p> <p>Availability of local resources: Training of local resources to provide technical resources.</p>

**5.1.2.4 Final adapted CAGE framework**

The table below shows the updated CAGE framework adapted to the Explosives industry.

**Table 24: Updated CAGE framework**

Cultural distance	Administrative distance	Geographic distance	Economic distance
<p>Mines want explosives supplier to add value to their operations</p> <p>Differentiation is sought through value added projects.</p> <p>Product quality is essential to avoid the high cost of replacement of damaged production and compensation to customers.</p> <p>No global deal has been establish with a mining house</p> <p>The first mover advantage could be a concern</p>	<p>Administrative environment</p> <p>Understanding of local labour rules</p> <p>Development of local language skills</p> <p>Development of local technical skills</p> <p>Understand the complexity of local explosives regulations.</p>	<p>Determination of the most effective logistic route depending on the type of product to ship, Logistics and transport concerns</p> <p>Reliability of supply is essential due to the remoteness of sites</p> <p>The cost and availability of ammonium nitrate and emulsifier are critical to the pricing of emulsion thus intense research is made to reduce the costs of these materials</p>	<p>Capital capability</p> <p>Price management</p> <p>Commodity management</p> <p>Delays in establishing hubs</p> <p>Establishment of equipment and facilities at customer sites: Facilities are built prior to earning revenue from the contract.</p> <p>The need to invest with or without a contract</p> <p>Manufacturing of own delivery trucks</p>

The final CAGE framework adapted to the South African companies wanting to establish operations in Sub-Saharan Africa is developed using the following sequence:

1. Elements of AEL and BME strategy
2. Elements of existing frameworks relevant to the explosives industry
3. Inclusion of rival explanations
4. Inclusion of concerns, specific aspects of explosives market not taken into account by either existing explosives companies or existing strategic frameworks.

The table above shows the “CAGE “adapted to the explosives market. The framework includes model elements of “CAGE”, Ghemawat, and Five Forces, relevant to the explosives

industry in Sub-Saharan Africa. In addition, the specific aspects of the explosives market, the challenges and concerns faced by explosives companies in Sub-Saharan Africa were taken into account. This new adapted version of the CAGE model is the basis of the choice of a strategy for South African explosives companies wanting to expand their activities in Sub-Saharan Africa.

#### **5.1.2.5 Generic Strategies**

In the previous sections, it was explained that Porter and Ghemawat developed generic strategies to be applied by companies, based on the analysis of the market using either the “Five Forces” framework developed by Porter, or the CAGE framework developed by Ghemawat.

As the initial “CAGE” and “Five Forces” are meant to analyse the markets and lead to the choice of a strategy, thus by modifying the bases of the assessment of the market through a newly developed framework, it is necessary to adapt the generic strategies to the “CAGE” and “Five Forces” frameworks as well.

The list below shows the different generic strategies that are available to the explosives strategies. The six strategies from Porter and Ghemawat are still available though:

- Adaptation Strategy: Establishment of a presence in each country (Ghemawat)
- Aggregation: Establishment of a presence in a region (Ghemawat)
- Differentiation: Companies are seeking to differentiate themselves from competition by either technical services, product innovation or value added projects (Porter)
- Cost: Companies are seeking an advantage over their competitors by reducing the cost of manufacture or improving productivity, reduce supply chain costs and minimize the administrative costs (duties, escorts of products) (Porter)
- Focus: Focus on potential niche markets, such as electronic detonators that are regarded as low volumes and high margins, or develop specific product application for specific minerals mined, such as gold, iron ore or copper (Porter)
- Customer alliances: Development of relationship at head office level with mining house e.g. Rio Tinto, AngloGold Ashanti, Glencore Xstrata, Kinross, BHP as an example and sign global agreements with them to ensure that as they expand their activity in Sub-Saharan Africa explosives supplier are given preference
- Commodity diversification: Explosives Company to determine a portfolio of minerals that will be the focus of the company (Rival Explanation)
- Commodity focus: The explosives companies can decide to focus on a specific commodity in a specific market.

The table below shows how AEL and BME could apply a combination of generic strategies, however, their strategies will have to evolve and include a “Customer alliances” and “Commodity strategy”.

The table below describes the strategy of both companies and how they need to evolve in the future.

**Table 25: Strategy evolution AEL and BME**

Explosives company	Current strategy				Strategy evolution	
AEL	Aggregation	Differentiation	Cost	Focus	Customer alliance	<p>Commodity diversification: Explosives Company will determine a portfolio of minerals that will be the focus of the company.</p> <p>Commodity focus: The explosives companies can decide to focus on a specific commodity in a specific market.</p>
BME	Adaptation	Differentiation	Cost	Focus	Customer alliance	<p>Commodity strategy</p> <p>Commodity diversification: Explosives Company will determine a portfolio of minerals that will be the focus of the company.</p> <p>Commodity focus: The explosives companies can decide to focus on a specific commodity in a specific market.</p>

## **6 Conclusion**

The present chapter discusses the findings which have been gathered and analysed through the data collection and the analysis of data, as well as the final result.

### **6.1 The explosives market**

In view of the slowdown of the mining industry in 2012 in South Africa, South African explosives companies were forced to expand their activities outside South Africa in Sub-Saharan Africa in order to maintain their levels of sales and profits.

The above mentioned issues combined with the increase of the price of commodities from 2010 to 2012 for gold and from 2009 to 2011 for copper, led South African explosives companies to pursue further opportunities on Sub-Saharan explosives markets, thus the need to develop efficient strategies to expand their activities outside of South Africa.

### **6.2 The knowledge gap**

The need for the development of an expansion strategy into the continent highlighted a possible knowledge gap as most of the frameworks were developed and tested in different industries but not in the commercial explosives market.

### **6.3 Conceptual framework**

The literature review section explored the existing models and frameworks and defined the concepts of strategy, globalisation and the explosives market as well. In order to assess the adaptability of existing frameworks on the explosives market, two frameworks were tested, the five forces framework (M.E. Porter, 1998b) and the CAGE framework (Ghemawat, 2011) with their associated generic strategies. The research acknowledged the pertinence of the more subjective strategic approaches; however, they were not taken into account as the majority of their authors did not develop practical frameworks.

### **6.4 Methodology**

It was decided to use the single case study as the research method to collect, present and analyse the data. The choice of the single case research method is based on the fact that AEL has a dominant position in the African market with an estimated market share of 57% of sales in 2013 and seventeen operating sites outside South Africa against thirteen sites for BME, AEL represents the “critical case” and, in such circumstances, the results can be generalised to the rest of the industry. Despite the use of the single case study research method, data was collected on BME via OMINIA annual reports in order to determine some elements of BME strategy. The data collected on BME provided further grounds for the generalisation of results.

However, the design remained single case and not multiple case, as interviews could not be performed on BME employees.

The research design focused on the definition of the research questions, the study questions the definition of the units of analysis, the linking of the data to the propositions and the “criteria to interpret the findings” (Yin, 2009).

The two main sources of data were non-structured interviews and annual reports from AECL and OMNIA. As recommended by the literature, the data was coded to allow in-depth analysis.

In addition, the strategy to analyse the data was conducted through the linking of the data to the study propositions, the use of qualitative and quantitative data and the identification of rival explanations.

## **6.5 Presentation of findings**

The data has been grouped by research questions to ensure that the data collection answered the different study questions that led to the present research; annual reports, interview summary and other information were grouped per study questions though the quantitative data such as sales revenues, profits, CAGE interview results, commodity process, and connectedness index are presented separately. The presentation by research question facilitated further analysis.

## **6.6 Data analysis**

The analysis of the data was done through the testing of the two propositions that led to the present research.

### **6.6.1 Evaluation of AEL and BME strategy and Porter and Ghemawat’s frameworks**

The analysis of the propositions led to the evaluation of existing strategies applied by AEL and BME and the measurement of their efficiency. According to the criteria used to measure the efficiency, AEL and BME strategies seemed to be efficient, despite using two different strategic approaches.

Further analysis highlighted the elements of Porter and Ghemawat’s strategy which were applicable to the explosives market in Sub-Saharan Africa. The objective of the analysis was achieved through the establishment of the links between existing strategies applied by AEL and BME and Ghemawat and Porter’s frameworks.

The major element of AEL’s strategy linked to Ghemawat’s framework is the aggregation strategy; where the company intends to grow through the creation of regional hubs in Africa. Entities within a same hub tend to share production facilities, logistic services and other administrative services.

On the other hand, Porter's framework seems to have influenced AEL, as the company pursues two generic strategies Porter advises companies to follow; differentiation of its services through the offer of value added services, technology improvement, promotion of electronic detonators, and the focus on reducing the costs of production and fixed costs.

Regarding the five forces framework, AEL focuses on the sourcing of raw materials at the lowest possible costs, it is important to note that Porter considers the negotiating power with suppliers as a force.

On the other hand, Ghemawat's framework has influenced BME strategy, as they establish separate entities in different markets and treat each country as a separate entity with dedicated production facilities on customer sites and services.

The elements of Porter's services present in BME strategy are very similar to AEL as they focus on the differentiation through value added projects and the reduction of the cost of production.

The elements of Porter's framework are very similar to AEL, differentiation through value added services and increase of the product range with new products.

The next section focuses on the testing of the second proposition that determines how the model elements are included in the existing framework to make them applicable to the explosives market.

## **6.6.2 Aspects and challenges of the explosives market**

The analysis established the nature of the explosives markets, the concerns of the respondents and the challenges they face in order to assess whether the actual strategies and strategic framework address them.

### **6.6.2.1 Aspects of the explosives market**

The first stage of the analysis led to the following aspects of the explosives market:

Explosives companies, due to the nature of the areas they supply explosives to, are highly dependent on the costs of transport and raw material. As a result, there is a need to optimise the cost of supply of raw materials and their transport.

Explosives companies increase their sales mainly by the signing of supply contracts with a specific mine. Once the contract is signed, the explosives supplier builds production facilities for bulk emulsion on site and storage facilities for the other associated products.

The complexity of the supply chain of detonators as they are produced and assembled in South Africa in the case of BME, or in the case of AEL, detonators are produced in South Africa but assembled in Western and Central African hubs. Thus, there is a mixture of exporting from

South Africa for detonators and local or regional production for emulsion (AECI Annual Report 2008)

There is a high cost involved for building of production facilities; in 2007, AEL invested 42 million South African Rand for the building of two plants in Zambia and Democratic Republic of Congo (AECI, 2009). Sales from these investments only occurred the following year (AECI, 2010).

The key element of the investment is the risk associated; capital expenditure needs to be committed before revenues are earned from sales.

The consumption of explosives is strongly depended on the demand for commodities as the price of commodities, affects the decision to invest in the exploration and development of a mine.

Competition is essentially based on the costs of products. However, as mines are under pressure to produce more at reduced rates, BME and AEL offer, in addition to products, value added services to increase the productivity of the mines.

Mines have expressed clearly the need for a supplier capable of offering quality products at cost effective prices while able to provide onsite technical support at the same time with a dedicated mining engineer at times.

Poor quality products heavily affect the production cycle of a mine hence product quality is a critical factor in the choice of a supplier.

Mines are located often in remote areas and the ability to deploy people and equipment and supply products in such areas is critical.

The company which establishes itself in an area benefits from the first mover advantage., However, after the end of the initial contract term, generally 3 to 5 years, the competitor is invited for the tender and prices tend to be reduced and in some instances, the initial supplier loses his position, or in most cases, this results in prices dropping.

AEL and BME are confronted with the lack of uniformity in explosives legislations.

In the majority of contract agreements, prices are adjusted per quarter, hence explosives often suffer losses during a quarter before the prices are adjusted.

The cost and availability of ammonium nitrate and emulsifier are critical to the pricing of emulsion; therefore, intense research is made to reduce the costs of these materials.

The emulsion is transferred in the blast holes by Mobile Manufacturing Units (MMU). The trucks are manufactured on special orders and can take up to 15 months to deliver. AEL and BME have developed an internal capability to build them in-house.

The development of infrastructure is essential to the supply of explosives to remote areas, as mines develop in remote areas through the establishment of new railways and the construction of roads, as well as the upgrade of ports.

#### **6.6.2.2 Challenges faced by explosives companies**

The second step of the analysis of the data led to the identification of the challenges faced by explosives companies in Sub-Saharan Africa. It is important to note that all the challenges have a financial impact if they are not addressed, though the financial impacts of these challenges have not been calculated in the present research.

The quality of the products is essential, especially the quality of products and components imported from South Africa. As mentioned previously, poor quality products result in an important loss of revenue for the mine and AEL and, in some instances, the mines will force the explosives companies to replace the product and compensate the mine for the loss in production.

The appropriate understanding of local customs regulations is a challenge as they differ from one region to another and from one product to another. The appropriate classification of a product is essential as a mistake could result in financial losses through the payment of penalties.

The understanding of tax regulations in the country, in which the explosives company has established its operation, is critical as the non-compliance to local tax regulations can result in penalties from the local tax authorities. Hence the explosives companies will need to manage the complexity in establishing local businesses.

Operating with different currencies is a challenge as the sale of explosives outside of South Africa are invoiced in local currency and converted to United States Dollars to pay for raw materials from South Africa in South African Rand or from Europe in Euros. It is important to note that the present research recognises the possible impact of the exchange rates, however further research is needed to assess the impact on the strategy of South African explosives companies operating in Sub-Saharan countries.

Explosives companies are required to employ local workforce, thus the need to adapt to the requirements of the local labour regulations.

As mentioned earlier, the remoteness of destination sites and the diversity of the products shipped constitute a major challenge as explosives companies are required to supply

equipment, products and services in remote parts of Africa. In order to be cost effective, there is a need to determine a clear supply chain strategy per country and products.

Explosives companies are under pressure to provide technical services through value added services to their clients, thus the need to develop the necessary software tools and the training of technical resources to be able to meet such a requirement.

Explosives regulations, as discussed, are very different from one country to another. The non-compliance to local legislation is a serious issue, as it can result in penalties and prosecution of the company's management. As a result, the explosives companies will need to manage the relationship with local authorities in order to anticipate changes and differences in legislations.

AEL and BME have decided to focus on French speaking countries, thus there is a need for them to develop language skills as well as a further understanding of the cultural differences.

Corporate governance remains a concern and this has prevented AEL from growing in countries like Mauritania or Angola.

Due to the increase in terrorism and political unrest in certain regions of Africa, commercial explosives are perceived as a threat and to some extent, explosives companies need to reassure local authorities of the safety and security measures in place.

### **6.6.2.3 Conclusion on data analysis**

The analysis of the data has identified specific aspects of the explosives market and challenges faced by the explosives markets that are not addressed by AEL and BME strategies and Porter and Ghemawat's frameworks.

The challenges and the specific aspect of the explosives market have to be included in a strategic framework in order to be used efficiently by explosives companies operating in Sub-Saharan.

### **6.6.2.4 Rival explanations**

The triangulation analysis by source of data, as suggested in the Research Methodology chapter of the present research and the literature (Yin, 2009), confirmed that AEL strategy is successful.

Furthermore, the analysis of sales and profits in Sub-Saharan sourced from AECI Annual Reports from 2002 to 2013 and OMNIA Annual Reports 2002 to 2013 show a growth of revenues from 2009 to 2013 for both AEL and BME.

The observed growth of sales and profits despite challenges and specific aspects not addressed by existing strategies can be caused by other external variables to the study ("rival

explanation”) (Yin, 2009). The analysis of the evolution of world prices shows that sales and profits tend to increase or decrease with the evolution of commodity prices.

The success of an explosives company is highly dependent on the evolution of commodity prices and not only on its internal strategy but the fact that sales continued to increase despite the drop in commodities shows the fact that the strategic factor still needs to be taken into account. However, the continued success in 2014 could be due to the depreciation of the South African rand versus United States dollar. A further quantitative analysis could assess its impact.

## **6.7 Development of new strategic framework**

This section led to the development of a framework which is suited to South African companies willing to expand their activities in Sub-Saharan countries.

### **6.7.1 Evaluation of existing strategies and frameworks**

The first step of the development of the strategy is to assess whether the existing strategies used by AEL and BME address the specific aspects of the explosives market as well as the concerns and challenges identified in the data analysis process. All issues not addressed are included in the final framework.

The second step is the similar assessment of Porter and Ghemawat’s frameworks and their capacity to address the specific aspects of the explosives market as well as the concerns and challenges identified in the data analysis process. All issues not addressed are included in the final framework.

The third step of the process of development of a new framework led to the assessment of the CAGE framework (Ghemawat, 2011) through the analysis of the interview results. The analysis identified the elements of the CAGE model which were relevant to the explosives sector in Sub-Saharan.

The three steps of the development of a strategic framework show the following:

- The challenges faced by explosives companies in Sub-Saharan Africa are not addressed by strategies adopted by both BME and AEL.
- Porter and Ghemawat’s frameworks do not address the gaps of existing BME and AEL strategies.
- There is a need to adapt current frameworks with the necessary variables to meet the needs of explosives companies wanting to establish operations in Sub-Saharan countries.

These three points show the need to include these variables in the frameworks in order to use them for South African explosives companies wanting to expand their operations in Sub-Saharan.

## **6.7.2 Final framework**

The table below shows the adaptation of the CAGE framework to the explosives industry.

### **6.7.2.1 Adapting the CAGE model**

The table below displays the CAGE framework adapted to the explosives industry in Sub-Saharan.

**Table 26: Adapted CAGE model**

	<b>Cultural distance</b>	<b>Administrative distance</b>	<b>Geographic Distance</b>	<b>Economic Distance</b>
<b>Elements of the existing AEL and BME strategy</b>	<p>Customers require technical services: Explosives suppliers required to provide technical services</p> <p>Customer loyalty: Establishment of global partnerships with mines</p> <p>Contract management: Need to maintain current supply contracts with existing customers</p> <p>Customers want innovative products: Technology improvement</p> <p>Product range: Explosives company ability to provide full product range</p>		Reduce supply chain costs	<p>Market prices are low: Need to maintain a tight control on costs</p> <p>Investment requirements: Need to improve productivity of current assets to minimise capital investment.</p> <p>Availability of local resources: Training of local resources to provide technical resources.</p>

	<b>Cultural distance</b>	<b>Administrative distance</b>	<b>Geographic Distance</b>	<b>Economic Distance</b>
<b>Elements of Ghemawat relevant to the explosives business</b>	<p>Languages</p> <p>Different values norms</p> <p>National work system</p>	<p>Different legal system</p> <p>Lack of common currency</p> <p>Political hostility</p> <p>Transfer of profit to home base</p>	<p>Physical distance</p> <p>Economic distance</p> <p>Availability of local resources: Training of local resources to provide technical resources.</p>	<p>Availability of finance for new projects: Need to provide investment upfront</p> <p>Natural resources: Grow sales to mines.</p> <p>Infrastructure</p> <p>Supplier distribution structure</p> <p>Economic size</p>
<b>Elements of Porter relevant to the explosives business</b>	<p>Rivalry amongst existing competition: Respondents in the interview mentioned the intense competition between AEL and BME.</p>		<p>Bargaining power of suppliers: Respondents mentioned the importance for AEL and BME to negotiate cheaper sources of raw material and reduce the existing supply chain costs.</p>	<p>Bargaining power of suppliers: Respondents mentioned the importance for AEL and BME to negotiate cheaper sources of raw material and reduce the existing supply chain costs.</p>

	<b>Cultural distance</b>	<b>Administrative distance</b>	<b>Geographic Distance</b>	<b>Economic Distance</b>
<b>Elements not taken into account by BME and AEL strategy</b>	<p>Mine want explosives supplier to add value to their operations</p> <p>Differentiation is sought through value added projects.</p> <p>Product quality is essential to avoid the high cost of replacement of damaged production and compensation to customers.</p> <p>No global deal has been establish with a mining house</p> <p>The first mover advantage could be a concern</p>	<p>Understanding of local labour rules</p> <p>Development of local language skills</p> <p>Development of local technical skills</p> <p>Understand the complexity of local explosives regulations.</p>	<p>Determination of the most effective logistic route depending on the type of product to ship,</p> <p>Reliability of supply is essential due to the remoteness of sites</p> <p>The cost and availability of ammonium nitrate and emulsifier are critical to the pricing of emulsion thus intense research is made to reduce the costs of these materials</p> <p>Regional presence of potential customers. (E.g. customers located in a two neighbouring country)</p>	<p>Capital capability</p> <p>Price management</p> <p>Commodity management</p> <p>Delays in establishing hubs</p> <p>Establishment of equipment and facilities at customer sites: Facilities are built prior to earning revenue from the contract.</p> <p>The need to invest with or without a contract</p> <p>Manufacturing of own delivery trucks.</p>

### **6.7.2.2 Generic strategies**

The list below shows the different generic strategies that are available to the explosives strategies. The six strategies from Porter and Ghemawat available are,

- Adaptation Strategy: Establishment of a presence in each country (Ghemawat)
- Aggregation: Establishment of a presence in a region (Ghemawat)
- Differentiation: Companies are seeking to differentiate themselves from competition by either technical services, product innovation or value added projects (Porter)
- Cost: Companies are seeking an advantage over their competitors by reducing the cost of manufacturing or improving productivity, reducing supply chain costs and minimising the administrative costs (duties, escorts of products) (Porter)
- Focus: Focus on potential niche markets, such as electronic detonators regarded as low volumes and high margins, or develop specific product applications for specific minerals mined such as gold, iron ore or copper (Porter)
- Customer alliances: Development of relationships at head office level with mining houses e.g. Rio Tinto, AngloGold Ashanti, Glencore Xstrata, Kinross, BHP as an example, and sign global agreements with them to ensure that as they expand their activity in Sub-Sahara, explosives supplier are given preference.
- Commodity diversification: Explosives companies will determine a portfolio of minerals that will be the focus of the company (Rival Explanation)
- Commodity focus: Explosives companies can decide to focus on a specific commodity in a specific market.

AEL and BME can apply a combination of the above mentioned strategies, however their strategies will have to evolve and include a “Customer alliances” and “Commodity strategy”.

### **6.8 Contribution to knowledge**

The present research has highlighted a gap in the application of the well-known strategic frameworks to the explosives sector in Sub-Saharan countries. As discussed in the Conceptual Framework section, the literature on commercial explosives focuses on technical and security aspects, however not much has been said on the strategic aspect of the sector.

The present research demonstrated the complexity and uniqueness of the explosives market, thus justifying the need to update existing strategic framework models and the development of a new strategic framework.

The choice of the research method and the design of the case study emphasised the importance of maintaining a chain of evidence throughout the collection of data, presentation of results and analysis.

The approach of the present research was determinist as subjective aspects of the strategy were not taken into account, especially the ones related to the process of decision making.

### **6.8.1 Practical implications of the research**

The present study intends to provide South African explosives companies wanting to expand their activities in Sub-Sahara with a practical framework that can assist them in developing their activities in Sub-Saharan countries.

The application of the modified CAGE model will allow them to assess different aspects of the market directly related to their activity and at the same time to choose from a wider range of strategies to be applied in particular environments.

The framework intends to provide explosives companies with a tool that will allow them to plan better their entry in the explosives market.

### **6.9 Future research**

The present dissertation has led to the development of a strategic framework for explosives companies wanting to expand their activities in Sub-Saharan countries. However, some aspects were not covered totally by the present research and could be the source of future research.

#### **6.9.1 Risk analysis**

The present research identified the different challenges that the explosives companies could face, however the financial costs of these challenges as well as their impact on revenues and market share have not been assessed by the present research. The financial evaluation of the impact of such challenges could form part of a risk assessment process or model to evaluate the risks associated with pursuing activities abroad.

#### **6.9.2 Exchange rate impact**

As explained in Chapter 4, explosives companies' trade in United State Dollars in Sub-Saharan countries and report their results in South African Rands. In addition, the financial transactions linked to the sourcing of certain raw materials are performed in either United State Dollars or other currencies.

The impact on the sales and profits needs to be assessed as well as the development of a model to minimise Forex losses and gains.

#### **6.9.3 Correlation analysis commodity prices and revenues**

During the research, commodity prices were identified as a possible rival explanation to the success or failure of the explosives companies, a quantitative research on the correlation of the variables could provide further insights and could lead to the development of models.

#### **6.9.4 Contractual mining services**

Although the research focused on the explosives market, the study could be extended as well to other mining contractors such as drilling companies, mining contractors or chemical suppliers.

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## **APPENDIX A: CASE STUDY PROTOCOL**

The main purpose of the present case study protocol is to serve as a guide with rules and procedures and will rule the data collection process. It is important to understand that the present protocol questions are not addressed to the respondents but serve as reminders to the investigator in order for him to not lose focus on the research objectives when collecting information through different sources of evidence such as in-depth interviews, review of internal information or archival records (Yin, 2009).

As suggested by Yin, the present protocol will provide an overview of the case study project, describe the field procedures, the key questions that will guide the collection of data and the strategy chosen to analyse the data (Yin, 2009). Yin suggests that the case study protocol should include an outline of the final case study report (Yin, 2009), but it has been decided not to include an outline report in the current protocol as it could lead the investigator to have a biased view of the nature of information to be collected resulting in the collection of data that would not highlight the possible existence of rival explanations of a certain situation.

### **Research questions**

The research questions as stated in the Problem Statement of the present research will be guiding the process of data collection.

How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to expand operations in Africa?

Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?

Why would it be necessary to include other key variables in existing strategic framework to develop an effective strategy for the explosives business?

How do other variables such as politics, legal, culture and administrative barriers impact on the shaping of the final strategy for South African explosives companies willing to expand their operations in Africa?

## 1. Overview of the case study project

### 1.1. Project background

The purpose of the present research will be to develop a strategic framework for South African explosives companies willing to expand their activities in Sub-Saharan countries. The project is being sponsored by AEL Mining Services, leading explosives manufacturer in Sub-Saharan Africa.

The underlining propositions to be assessed in line with the context of the present research are:

Discover the current strategic frameworks applied.

Establish the link between the current strategy been applied and the “Triple A” and CAGE frameworks (Ghemawat, 2011) and the “Five forces” framework (M.E. Porter, 1979).

Determine if the existing framework is efficient to deliver the growth of activities in Sub-Sahara.

Based on the above propositions identify how the current frameworks could be enhanced with addition of new model elements.

### 1.2. Case Selection rational

It has been decided to perform a single case study on AEL Mining Services (AEL), based on the fact that the company is the leading supplier of explosives in Sub-Saharan Africa with 6,253 million Rand of sales in 2012 (Chiu et al., 2011) against 4,379 million Rand of sales for BME (Okpaga et al., 2012).

With twelve entities outside of South Africa (Southern, Western, Eastern and Central Africa) AEL represents the “Critical industry case” within the niche sector of South African explosives companies possessing subsidiaries in Sub-Sahara and willing to establish further operations outside of South Africa. The current research will focus on the niche sector constituted by two companies: BME and AEL. As the case study will be based on AEL we can thus assume that AEL Mining Services is a representative sample of the total population (two companies) of the niche sector under research.” (Yin, 2009, p. 47 - 48)

## 2. Field procedure

In order to ensure that the data collections will provide the necessary information to address the research questions, it is important that all practical aspects are carefully

planned. The challenge of the data collection within the present research is the location of the different information as well as the respondents.

## 2.1 Sites to be visited and nature of respondents

A specific field schedule has been developed for primary and secondary data as defined in the “Sampling and case selection” section of the present document.

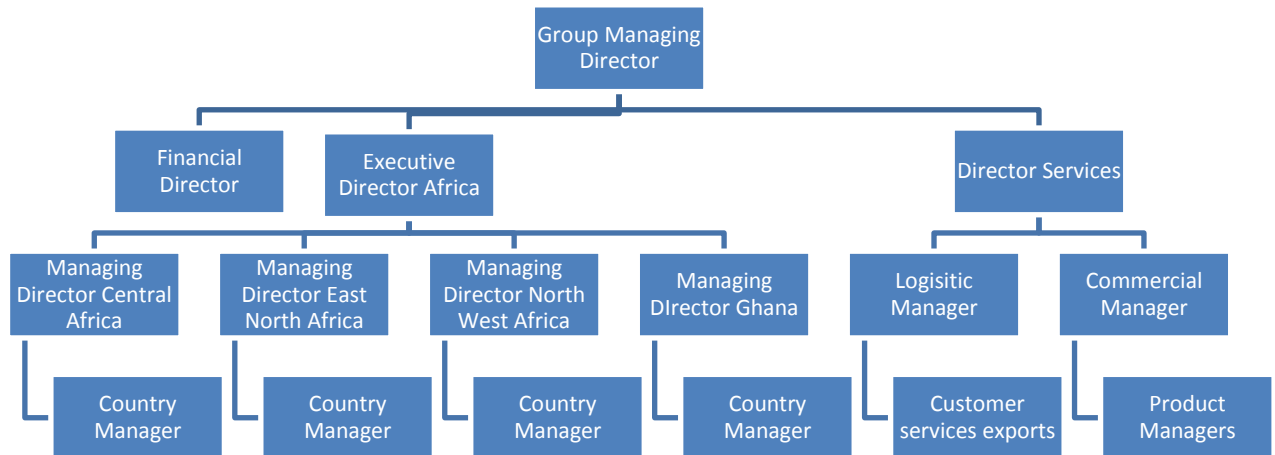
### 2.1.1 Organization of Interviews

Interviews were organised during December 2014 and January 2015. The table below summarises the interviews that were completed.

<b>Position</b>	<b>Work focus</b>	<b>Site</b>	<b>Role</b>	<b>Status</b>
Managing Director Central Africa	Senior Manager	AEL Head office	Manager responsible for Central Africa business unit.	Completed
Managing Director North East Africa	Senior Manager	AEL Head office	Manager responsible for East and North Africa business unit.	Completed
Managing Director North West Africa	Senior Manager	AEL Head office	Manager responsible for North West Africa business unit.	Completed
Managing Director DRC	Senior Manager	AEL Head office	Manager responsible for DRC business unit.	Completed
Regional Manager Burkina Faso	Manager	AEL Head office	In charge of operations in North West Africa	Completed
Business Development Manager	Senior Manager	AEL Head office	In charge of business development in Central Africa.	Completed
Product Manager detonators	Detonator	AEL Head office	Liaison between the market and the plant for detonators	Completed
Logistic Officer	Senior Manager	AEL Head office	In charge of exports administration.	Completed
Business Manager	Senior Manager	Teleconference	Responsible for developing activities in West Africa	Completed
Operations Manager	Senior Manager		Manager responsible for North West Africa	Completed

### 2.1.2 Organization

The diagram below shows the organization of AEL and the relationship between the different people that will be interviewed. It is important that the investigator keeps the organogram in mind in order to seek further insights from executives and at the same time corroborate information and insights with Senior management.



### 2.1.3 Practical arrangements

The author of the present research had access to the head office facilities, such as quiet rooms, photocopiers and printers if necessary. Connectivity to the internet was available as well. Sufficient paper and writing utensils were available as well as personal computers and audio recorders.

Due to the nature of the interviews as explained in the literature the respondent could direct the investigator towards other sources of evidence (Yin, 2009). In such a case arrangements were made to collect the information and to mail it to the investigator.

### 2.1.4 Other sources of evidence

In order to collect evidence such as internal documents and archival reports, a note of request was sent to the person within the organization that has the information during the month of September 2014. The evidence was ready for collection during the week of December 2014 or sent electronically by e-mail when possible.

## 2.2 Evidence to be collected

Different sources of evidence will be collected in order to allow the corroboration of data from different sources of evidence.

The main source of evidence will be in depth interviews with interviews organized with executive and Senior managers from AEL that are part of involved in the implementation of AEL's activities outside of South Africa.

It is expected that from in depth interviews facts, opinions and insights on the nature and efficiency of the current the strategy in order to link them to existing frameworks will be gathered. The interview of the executives will help get an insight of the strategy formation process whilst middle management interviews will reveal more the challenges faced during the strategy implementation phase.

The second source of evidence will be reports and minutes of strategic meetings. The reports will provide details on the strategy formulation and the problems that could have been encountered when implementing the strategy. The reports will be a good source of information in order to understand the possible delays in achieving the goals and the nature of the problems encountered during the implementation phase. The data collected in reports will be corroborated with interviews and archival reports.

The third source of evidence will be the collection of information through the analysis of archival reports. The main focus will be the analysis of financial and strategic reports in order to determine the impact of the strategy on costs and market share. The investigator will focus on information such as sales evolution, profitability and market share evolution.

### 3. Case study questions

The case study questions, unlike a survey questionnaire, are directed to the investigator and not the respondent. The purpose of such questions is to maintain the investigator's focus on the type of data that needs to be collected and to explain the relevance and the reason of the data collected. Yin divides the type of questions in five different categories but only the first two levels are relevant to a single case study research method. The first level of questions are questions that are intended to gather facts from different sources of evidence, Yin describes them as the "verbal line of enquiry" whilst the second level is the investigator's "mental line of enquiry", these questions should lead to the underlining information I need from the sources of evidence (Yin, 2009, p. 87).

The list below determines the type of questions that will be guiding the data collection process and the source of evidence that is likely to answer to the question.

#### Questions Level 1:

What is AEL's current strategy for Africa?

- In depth interview
- Internal reports and minutes of meetings

How is AEL performing in Sub-Sahara Africa?

- In depth interview
- Monthly African subsidiaries reports
- Internal reports
- Financial reports

What are the main objectives of AEL in Sub-Saharan countries outside of South Africa?

- In depth interviews
- Strategic meeting minutes
- Internal memos
- Annual report

What is AEL the sales, market share and profit evolution in Sub-Saharan countries outside of South Africa?

- In depth interviews
- Monthly African subsidiaries reports.

What challenges AEL is facing when doing business in Sub-Saharan countries?

- In depth interviews
- Strategic meeting reviews
- Meeting minutes
- Internal mails

What is the financial impact of AEL concerns in Sub-Saharan Africa?

- In depth interviews
- Monthly African subsidiaries reports
- Annual report

How could AEL overcome such challenges?

- In depth interviews
- Strategic meeting reviews

What elements would you take into account to reformulate the current strategy?

## Level 2 Questions

Does AEL have a clearly formulated strategy for Sub-Saharan Africa?

- In depth interview
- Internal reports and minutes of meetings

Is the formulated strategy applied in practice?

- In depth interview
- Minutes of meetings

What are the key model elements of the strategic framework AEL uses?

- Strategic review meeting
- In depth interview

How efficient is the current strategy?

- In depth interviews
- Monthly African subsidiaries reports
- Annual report

Is there a need to improve the current strategic framework?

- In depth interviews
- Monthly African subsidiaries reports
- Annual report

What concerns should be taken into account to improve current strategic framework?

- In depth interview
- Minutes of meeting
- Internal communication

How are political issues, culture difference and local administration barriers in other Sub-Saharan countries and what is there impact?

- In depth interview
- Monthly African subsidiaries reports
- Internal reports
- Financial reports

#### 4. Data analysis strategy

Yin describes four methods for analysing the data. Based on the fact that the case study is led by Research questions it has been decided that the data will be classified based by research question. Nevertheless, the theoretical proposition classification will be combined with the rival explanation strategy, where each occurrence such as increase in market share, financial results a rival explanation beyond strategic frameworks will be sought. This could be price of commodities, political context, legislation changes and other explanations that will be found in the sources of evidence.

## **APPENDIX B: DATA PRESENTATION**

The respondents have been numbered from 1 to 10 for presentation purposes. The data is grouped by research question.

### **Research Question 1: How effective are actual strategic frameworks for the development of an African strategy for South African explosives companies willing to establish operations in Sub-Saharan?**

Data sourced from Interviews

BK What is AEL strategy?

No.1 AEL tends to follow existing mining companies from South Africa to other Sub-Saharan areas in the search of business opportunities. As soon as there is an opening, AEL will register a company, resource the business, build plants and distribution sites. AEL will try and establish itself as a prime mover in order to be able to lead the pricing. The strategy will be to penetrate the markets from an existing hub in the region. As an example the business in the Democratic Republic of Congo was set up from Zambia where a base has. A similar method was applied in West Africa where AEL expanded from a base in Ghana to the establishment of operations in Burkina Faso and Mali.

No.2 AEL's strategy is to establish hubs to benefit from Africa's continuous growth. AEL's priority is to maintain current customer base and grow African business further. The strategy seems to be applied in West Africa, Central Africa and East Africa. Amongst the criteria to determine the countries to be included in a hub is the logistic connectivity. As an example, despite the fact that Angola is close to Zambia or even to the Democratic Republic of Congo, all explosives requirements will be sourced from South Africa. Nevertheless, further criteria are considered as well when establishing a hub such as but not limited to, road links, communication channels and common markets (SADC or Ecowas).

No.3 AEL strategy is to retain existing customers by meeting their needs and establishing strategic hubs, although it has been noted that hub strategy seems to be losing its emphasis in AEL with time.

AEL is seeking to expand operations into new territories. The company is currently holding its positions in Democratic Republic of Congo and Zambia where the majority of mines extract copper.

AEL is seeking as well to expand activities in Mozambique and in West Africa with attempts to follow mining companies that seem to be active in those areas. AEL sees South Africa as a springboard to expand into Sub-Saharan as a result of the stagnant market in South Africa.

No.4 Under pressure to improve logistics efficiencies, AEL has developed a logistic strategy based on the consolidation of shipments and the tight management of shipping schedules. The freight mode is determined by the destination of the cargo; East Africa sea freight, West Africa sea freight and Central Africa road transport.

In addition, AEL has developed a different strategy according to the classification of products. E.g. 1.4s, United Nations classification (Battini et al., 2012), packaged type products are by airfreight whilst other class 1, United Nations classification, (Battini et al., 2012) products are shipped by sea or road.

No.5 AEL strategy is to use knowledge and technology developed on the South African market as a competitive advantage to pursue business opportunities in Sub-Sahara. The transfer of knowledge and technology is done through the establishment and resourcing of hubs located in strategic areas in Africa.

No.6 AEL 'strategy is to provide quality products and services to Sub-Saharan markets, and to manage tightly the associated costs such as logistics, fixed costs, raw material and the costs of establishing operations in Sub-Sahara.

No.7 AEL's strategy is to keep the leadership and expand further business in French and Portuguese speaking in Sub-Sahara countries.

In order to achieve such an expansion AEL intends to differentiate its products and services by supplying innovative products such as electronic detonators and provide technical support that can add value to its customer's operations.

AEL strategy is evolving towards a combination of mineral and geographical segmentation.

AEL has appointed a business development function in each entity in order to increase the market knowledge as well as the regulatory environment.

AEL is performing poorly in SA however AEL intends to grow Sub-Sahara from a volume perspective.

No.8: AEL strategy will focus on the development of particular territories such as Equatorial Guinea, Republic of Congo and Cameroon.

AEL is focusing as well on the establishment of a hub in Mauritania (Iron ore deposits) around iron ore (Mauritania) and Angola.

No.10 AELs strategy for Sub-Sahara is under the umbrella of the Group's strategy of growth through increased market share, higher revenues and margins and lower fixed and input costs.

This is encapsulated in the long term vision (Vision 2017) and has materialised in a business optimisation project over the last 2 years to improve the efficiency of various cost centres in the company.

The Company has wanted to improve its position in the rankings of major suppliers by moving into the top 3 by revenue which it has done.

Comparing AEL to its major competitors including Orica, Maxam, Dyno Nobel, Sasol and BME, AELs EBIT is the lowest of all and Vision 2017 will strive to change it.

Africa specifically is broken into a number of businesses and each will have its own strategy, which would align with the Company strategy, but influenced by unique circumstances in the regions.

BK: What are AEL Objectives?

No.1 The objectives are not clear, however the general strategy seems to be to grow the business.

No.2 The objectives in the mid 90's was to establish hubs in Africa, the second phase is for other AEI (AEL's parent company) to use current hubs to sell mining chemicals in Sub-Sahara. The current hubs have been restructured to manage explosives and chemicals supply.

The other clear objective is to maintain current customer base and grow business further.

No.4 In order to ensure the supply of cost effective products, AEL objective is to obtain the best shipping rates by cargo consolidation and to meet the customer requirements by the development of adapted shipping schedules.

AEL target is to ensure that all orders placed are met in volumes and delivery time at 80%.

No.5 AEL objective is to understand further the different aspects of explosives markets in Sub-Sahara, by identifying the customer needs and requirements through the establishment customers of partnerships with key clients and by engaging in alliances with suppliers.

The collaboration with mines should lead to the development of value added projects. In addition, AEL will need to understand local legislations further as well as the competitive environment and benchmark to competition sourcing and logistics. AEL will base differentiation on service differentiation and product through the development and sales of new innovative products such as electronic detonators.

No.6 The objective of AEL Group is to reach double digit trading profit to sales ratio and Sub-Saharan sales and operation are expected to contribute to this objective by remaining the market leader in Sub-Sahara.

It is important for the future that AEL keeps its leading role on the market as failing to do so would allow competitors such as BME or Maxam to enter the market. This happened in Mali, as despite AEL initial leading position established in 2004, in 2014, Maxam and BME have managed to establish operations in Mali.

No.10 AEL's objective is to maintain market share and capture growth to improve revenues and margins as well as profit.

BK: Is AEL strategy efficient?

No.1 The first mover advantage has impacted negatively the renewal of existing supply agreements as during contract negotiations, existing clients insist on supply agreements to be renewed at lower prices. As a result, often AEL has to reduce its prices and is seen as having overcharged prices during the initial contract period.

The strategy does not seem to be clearly formulated and the key questions seem to be when to establish the hub and when to expand from the hub.

The strategy is efficient when expanding from an existing regional base (hub) however market penetration is an issue when implementation of activities is done from AEL South Africa as for example, AEL is finding it difficult to establish operation.

AEL tends to acquire an initial high market share due to the first mover advantage; however with new entrants on the market, AEL's market share tends to decrease over time. As a result, in Ghana, Burkina Faso, and Zambia, after an initial period of growth, sales have decreased due to competition. Despite the growing interest of explosives companies in the Sub-Saharan market, AEL's strategy remains efficient to respond to competition as the capital requirements its business model are low and can thus respond to new demands from mines.

No.2 AEL's strategy has been a success as despite BME's, Orica and Sasol intention to follow the African growth AEL still has been able to maintain a substantial advantage in terms of sales into Africa. Revenue has grown as well as market share.

However due to first mover advantage in Central, West and East Africa resulting in market shares of 100% in late nineties, AEL has seen its margins erode over the years. However AEL still holds a dominant position Sub-Sahara and based on African success AEL will replicate the same strategy in South America. As a result, market shares are maintained and revenues are growing with a high percentage of sales coming from Sub-Sahara.

Competition has attempted to copy AEL by establishing plants in different countries; BME has established plants and companies in different countries such as Mauritania and Mali. However those countries are independent and the model does not seem to be as efficient as AEL. Sasol rather exports directly through agents and has failed to grow in Sub-Sahara.

No3 AEL has performed well, but has not been successful in sectors like copper and has not won a contract in the iron ore sector. AEL will need to develop a value proposition to supply to iron ore mines. Perhaps enforce more a market segmentation by minerals.

AEL sales have been stagnant in 2013 due to the drop in gold price by September 2013. Most of the mines have dropped there off take thus AEL has not grown according to forecast in 2013 and 2014 as a result. However countries like Burkina Faso in 2013 and 2014 AEL has managed to maintain existing business.

No.4 AEL logistics strategy is working as regular shipments are sent outside South Africa. AEL is doing well as shipments out of South Africa have increased.

No.5 AEL is currently performing well in Africa. Sales seem to be growing.

No.6 AEL is vulnerable as competition is prepared to put assets on the ground before the signing of agreements whereas AEL would rather wait for the signing of contracts before committing capital.

No.7 Volumes seem to be growing in Africa unlike South Africa.

No.8 Margins seem to be increasing in Africa.

Volumes seem to be doing well.

No.9 AEL is currently performing well in Africa, as sales seem to be growing.

No.10 2014 was a difficult year for AEL as a whole including Africa. Africa was aided to some extent by weak exchange rates that narrowed the gap between budget and actual in ZAR, but in USD the gap is even bigger. A number of actors have influenced this including the gold prices (most of the customers in West Africa, North West Africa and North East Africa are gold mining companies). It is difficult to agree price increases when customer's profits are eroded by low gold prices.

Exchange rates of local currencies against a strengthening USD have also resulted in significant losses of inventory valuations, pension fund valuations, to name just 2.

Overall though, despite the difficult trading conditions, I believe that AEL has done well in areas within its control such as variable costs (surfactants) which have delivered higher margins, fixed cost management (including manpower reductions) to budget. However, ratios are negatively affected by the lower sales.

I think that in general terms, market share has remained steady, exploration and new gold mining projects have scaled back or been put on hold so market growth itself has been stymied.

Mines have also cut back on production which has had a direct impact on the volumes and revenue, and the size of the market has also changed slightly.

No.3 The hub strategy was driven by previous Group Managing Director.

The Model seems to be more a financial model without long term benefits. Framework is set around financial targets. Decisions made based on the basis of returns and project viability.

No.8 AEL's strategy is globally efficient it depends on the people implementing it.

BK: Is the strategy clearly formulated?

No.1 The strategy does not seem to be formulated clearly as it seems to be describing broad objectives.

No.4 Yes the strategy is clearly formulated. The strategy is formulated around the grouping of shipment and the type of shipments based on the area of focus.

No5. The strategy is not shared and has not been communicated clearly to everybody.

The strategy seems to be applied however it lacks leadership as performances are not measured against it.

Difficult to measure as it is not formulated no measures are in place to measure progress. The strategy is not efficient as there is a fire fighting attitude.

No.6 AEL's strategy is clear but not specific to Africa. The strategy is not applied as there is no anticipation of situation and the company tends to react to problems and seems to be unable to identify them.

No.7 AEL has a group strategy but it is not specific to Africa.

The strategy is applied in practice as a new structure is in the process of being implemented.

No.8 The strategy is formulated however the implementation is left to the business managers in Sub-Sahara, however, the company has two annual strategic reviews to monitor it's the results and progress of the strategy throughout the group.

No.9 The strategy is not shared and has not been communicated clearly to everybody.

The strategy seems to be applied however it lacks leadership as performances are not measured against it.

Difficult to measure as it is not formulated no measures are in place to measure progress. The strategy is not efficient as there is a fighter fighting attitude.

AEL does not address these issues but rather reacts to them.

No.10 As outlined above the overall strategy is aligned with the group strategy. The group has also moved from centralised services to shared services in the executive portfolios. This still needs to be set up and prove its ability to succeed.

BK: Is the strategy applied in practice?

No.1 As it is not formulated clearly to a certain extent is not applied clearly. However each business endeavours to follow the broad strategy lines described by head office.

#### **Data sourced from Annual reports AEL**

It is important to note that the annual reports of a calendar year are published the following year in March thus for example the annual report 2008 will describe the activities of the calendar year 2007.

BK: What is AEL strategy?

#### ***Annual Report 2008***

AEL marked its intent to break into new markets by offering electronic detonators in place of non-electric and non-electric detonators. However, the cost of electronic detonators is typically three to four times the cost of a normal detonator thus the need to demonstrate clear benefits to customers.

During the year 2007, AEL invested in the upgrade of its shock tube plant in South Africa in anticipation of future potential increase in demand (Pp.38 and pp.41).

### **Annual Report 2009**

During the year AEL focused on key aspects of the supply chain by investigating strategies to reduce the costs of transport despite the poor continental infrastructure and explored cheaper sources of raw materials (Pp. 53)

Following investments in plants in different locations of Sub-Sahara and South Africa, AEL redefined its strategy during 2008 and as a result focused on the increase of productivity levels of existing assets through the improvement of the production processes and the pursuit of further sales. (Pp. 48)

### **Annual report 2013**

Following the sales growth in the gold mining sector in West Africa in 2011, in 2012 AEL built production facilities in Burkina Faso, country with large ore reserves and operating mines, in Egypt, and additional capital investment was performed in the Democratic Republic of Congo. These plants were expected to be operational by 2013 following year (pp. 45). Further investments were done on existing customer sites in order to maintain existing contract agreements with customers (Pp. 58) and in South Africa on the detonator plant in order to meet increased sales prospects in Sub-Sahara (Pp. 58).

BK: What are AEL Objectives?

### **Annual report 2012**

During the year AEL reformulated its vision, by focusing on four strategic pillars; “globally competitive cost base, world-class technology, value-adding customer-centric service, and excellence and professionalism in all areas of activity. Growth is achieved organically and via acquisitions.” Pp.15

BK: Is AEL strategy efficient?

### **Annual Report 2008**

In 2007, Sales increased because of the signing of new contracts in the Democratic Republic of Congo and Zambia resulting in further capital investments of 42 million Rands in production facilities in both countries. (Pp. 40)

During the year AEL sales grew as well in East and West Africa operations (pp38) due improved sales in in Ghana and Burkina Faso, resulting as well in further investment for AEL in a second bulk emulsion plant at Tarkwa mine (owned by Goldfields). During the year, first sales were recorded in Burkina Faso (pp.40).

Furthermore during the year AEL increased sales of electronic detonators. It is important to note that electronic detonators are perceived by customers as an innovative product due to its performance and its impact on the productivity of mines in comparison to conventional products such as electric and non-electric detonators.

### **Annual report 2009**

During 2008, AEL reported growth in Sub-Saharan sales (pp. 49), the growth came from Central African operations (Democratic Republic of Congo and Zambia) due to the increase of demand of explosives from cobalt and copper producers, such as the Lumwana project in Zambia (Pp. 53.)

### **Annual report 2010**

The year was marked by Lower prices of copper resulting in less sales of explosives in Central Africa pp. 48.

Exports from South Africa to Sub-Sahara countries were affected by a stronger rand to the United State Dollar rate (pp. 48). The stronger South African Rand meant that South African products were more expensive in United State Dollar terms than the previous year due to the strengthening of the South African currency.

### **Annual Report 2011**

AEL Group sales volumes (South Africa and Sub-Sahara) increased by 13%, due to higher than expected sales in Sub-Sahara. Furthermore, the Financial Presentation Report 2011 stated that foreign sales accounted for 39% during the year as sales outside of South Africa increased significantly. (Financial presentation 2011 pp. 12)

### **2012 Financial results presentation**

Growth in sales was achieved during the year in West Africa's gold mining sector. The business in Central Africa grew steadily as a result of good demand for copper. The performance in East Africa, where some market share was lost, was less buoyant. (Pp. 5 Financial Results presentation)

AEL Group total sales increased during the year due to the increase in sales in Sub-Sahara and Indonesia. However, despite the improved sales the margins dropped to 6.8% from 9.3% in 2011.

### **Annual report 2013**

The drop in sales did not result from the sales in Sub-Sahara as new supply contracts were signed (pp.58) but rather from the industrial relationship tension in South Africa and an increase in the prices of raw materials and shipping costs.

### **Annual report 2014**

During the year, AEL benefited from a weakening South African Rand against the United States Dollar thus the sales improved as the prices of AEL products were cheaper in United States Dollar terms. The effect was significant as 50% of the revenues of AEL are generated outside of South Africa. (Pp. 42.)

The further signing of supply agreements resulted in a growth of sales of 5.4%. New plants were commissioned in Burkina Faso and in Egypt.

### **Data sourced from Annual reports BME**

#### **BK: What are BME Objectives?**

Annual report 2008

BME's objective is to provide its customers with value adding services in addition to products. BME has developed sophisticated software to allow the mine to optimise blasting techniques. In order to provide such a service BME faces the challenge to overcome the skill shortage (Pp.14).

### **Annual report 2009**

BME is currently present in thirteen different countries (Pp.7). During the year the prices of copper dropped, however BME anticipates an increase in gold prices from 2010 to 2012.

### **Annual report 2012**

BME is keen to establish strategic alliances with existing and potential customers engaged in unlocking Africa's vast mineral resources. (Pp.79)

BME wants to benefit from increased demand from customers to enhance safety and productivity through the application of technical expertise in advanced blasting, with the support of AXXIS™ electronic delay detonators and advanced blasting software such as BlastMap™ and AxxiSoft™.

## **Annual report 2012**

Strategy and Objectives (Only clearly stated from 2012)

BME strategy will be to continue to focus on opportunities in the mining sector in South Africa, the rest of southern Africa and West Africa the objective being to maintain current supply agreements and to pursue new business opportunities in the above mentioned regions. (Pp.76)

Protea Mining Chemicals will use BME position in Africa to develop further its sales beyond southern Africa to the rest of Africa.

BME will focus on safety as a top priority and on remaining a dedicated customer-focused organisation that creates value for customers through advanced technical support and quality, reliable and accurate products and software. BME continues to provide strong on-site technical support to customers, who benefit from class-leading blast results from the accuracy of AXXIS™ electronic delay detonators combined with AxxiSoft™ blasting software.

## **Annual report 2012**

In order to achieve its objectives, BME intends to develop and train its people to enable and empower them with the expertise to provide and develop specialised products and services to customers.

## **Annual report 2013**

BME's focused during the year on the development of its people is by improving training statistics throughout its operations. The action was supported by the establishment of the BME Surface Training Centre, which was accredited by the MQA (Mine Qualifications Authority) to support safety and technical training.

## **Annual report 2013**

Company Strategy

OMNIA is committed to delivering and possibly exceeding its target for this five year planning cycle of a compound 8% real growth rate in profit through the commissioning of the new nitric acid complex in March 2012, the expansion of the Mining division's activities in Africa (Explosives contribution to group strategy), the expansion of BME's product range (Explosives contribution to group strategy) (pp.36)

BME will continue to focus on opportunities in the mining sector in South Africa, the rest of southern Africa and West Africa.

Safety remains a top priority as a moral obligation to our people and their families. It is the only sustainable way to conduct our business

BK: Is BME strategy efficient?

### **Annual report 2008**

During the first six months of the year the price of gold increased by 9.5%, during the same period platinum price increased as well by 47% and copper reached a record high of 8000 United States Dollars per ton (Pp. 4 and Pp, 9). The increase in the price of copper and other metals were due to an increase in demand of metals from China and India (Pp. 9)

The increase in commodity prices resulted in an increase in sales in West Africa, where most of the mining is based on the extraction of gold like in Mauritania where BME has a contract with a gold mine (Kinross) and copper mine (First Quantum) and in Zambia where BME supplies copper mines.

BME saw its margins affected by the increase of costs of raw materials, however as the contracts were signed at the beginning of the year, price adjustments could not be secured until the last quarter of the year. However, these adjustments will ensure that margins are restored for the following year. The following year's margins will be enhanced by the renegotiation of supply agreements for raw materials as well as the transport costs.

During the year BME experienced success in selling electronic detonators; "The benefits of using EDDs lie in their accuracy and their computerised blast design, which enables better control of vibrations, fly rock, air blast and noise, as well as promoting pit wall stability, significantly containing rock movement and enhancing fragment control, leading to less ore dilution. EDDs have significant safety advantages over conventional electric and pyrotechnic detonators." (Pp. 22)

### **Annual report 2010**

BME sales during the year dropped. In order to maintain sales BME had to reduce prices. BME financial situation was impacted negatively by a strong South African Rand versus the United State Dollar. The global economic recession reduced the demand for commodities thus reducing the demand of explosives. (Pp. 34).

## **Annual report 2011**

During the year the commodity prices recovered compared to 2009 thus BME sales volumes increased by 13% as a result of an increase in commodity prices during the year (Pp. 47 to 48).

The improvement in commodity prices and an aggressive strategy in Sub-Sahara resulted in the renewal of existing supply agreements and the award of new contracts. (Pp. 48)

## **Annual report 2013**

### Performance

BME experienced an exceptional year with good volume growth following the continued global recovery in most mining commodity sectors. As a result, during the year, BME continued to grow in South Africa and the rest of Africa through retaining its existing customers and renewing contracts, while also being awarded numerous new contracts.

The surface mining sector in southern and West Africa was exceptionally rewarding in the second half of the year, with several major customers substantially increasing their production.

## **Annual report 2013**

### Market conditions pp. 75 - 76

During the year there was a strong demand in mining commodity and mineral markets throughout Africa. The increased demand for mining commodities led to the increase of mining activity in Sub-Sahara, mainly in brownfield expansion rather than new greenfield operations. The volumes increased by 24%, as a result of improved sales in Sub-Sahara and more specifically Central Africa.

During the second half of the year, several large customers substantially increased their production as well as their off take of electronic detonators increased (EDD).

Safety statistics improved significantly as a result of increased focus on training and management controls during the year.

Raw material costs were reduced due to the development of its own emulsifier range throughout the rest of Africa's manufacturing facilities thus reducing the cost of producing bulk emulsion explosives.

The weaker South African rand supported the export business and foreign earnings, however margins were affected by raw material costs, as high ammonia price increased BME variable costs and leading to sales price increase.

The softening of uranium prices causing closure or deferral of some mines and projects and the South African underground mining market shrunk mainly due to increased strike activity, putting marginal mines under severe pressure.

Key innovations (Pp.76 -77)

BME widened the distribution of its own Viper™ and Hornet™ booster range to surface and underground mines across Africa.

BME's own developed emulsifier range was rolled out to all our emulsion manufacturing plants in Africa.

Substantial progress was made with further developing emulsion explosives technology for various surface and underground applications.

BME continued with its well established practice of adding used oil into the manufacturing of emulsion, which generates significant environmental and economic benefits.

BME has increased its in-house capacity to build emulsion and heavy ANFO delivery vehicles that are used in BME's operations throughout Africa to deliver down-the-hole product to the mine sites.

The underground mining sector remained under pricing pressure, especially in initiating systems. BME's growth in this sector was hampered by numerous strikes at customer sites.

Annual report 2014

BME experienced a good year with good volume growth despite a cautious mining industry and reduced mining activity in a number of sectors, especially gold. The surface mining sector in southern Africa remained strong, but a reduction in demand was experienced at some operations in West Africa.

Exceptionally high rainfall in southern and West Africa affected mine production more than usual in the second half of FY2014.

## **Research question 2: Why aspects of current strategic frameworks do not apply to the commercial explosives business in Africa?**

In order to answer to this research question, all answers related to the particular challenges faced by AEL in Sub-Sahara are regrouped under this research question.

Data sourced from Interviews

### **BK: What challenges AEL seems to be facing?**

No.1 The logistics requirements and shipping regulations such as escort requirements and other regulations are different from one country to another. The costs are not homogeneous and are often difficult to understand and anticipate.

AEL needs to develop the skills to manage the relationship between AEL and authorities and understand the “local way of doing business”.

In some circumstances, AEL would need to have a local representative in each area.

Language and cultural barriers is a challenge and would require the training of expatriates in the local languages.

No.2 AEL needs to understand the complexity of the establishment of a local business. In Nigeria AEL had to partner with a local manufacturer, in Zimbabwe there is a constraint of partnering with a local partner as well.

There is local corruption Angola, DR Congo and to an extent Mauritania.

Lack of availability of local mining skills in East Africa, compared to Ghana and Zambia thus the need to send expatriates.

The establishment of factories increase the overheads costs. Management of the tax regimes, Difficulties in obtaining work permits.

Building of sites and plants is a challenge as there are low skilled personnel available. AEL largely depends on the mine for the deployment; a pre study needs to be performed on available resources in country. This has a big impact on costs.

No.3 People challenge; need to develop local engineers and retain competent engineers. There is a need as well for the development of local skills, and a pool of competent people in a pipeline, language skills, and local management.

Capital availability; AEL capital expenditure approval system is long. AEL's model is to wait for a signed contract for capital to be approved approval as BME works differently.

AEL must understand better all aspects of local legislation.

No.4 Delays at the port of entries at peak periods. (E.g. South African border with Zimbabwe).

Differences in legislations from one country to another e.g. requirements for import permits differ from one country to another.

No.5 AEL is facing the following challenges

1) Quality issues could cause loss of business and money.

2) Complexity of Logistic routes.

3) Distance to customers

4) Differences in banking systems.

No.6 AEL faces the challenges of local regulations; loss of skills in West Africa to competition, AEL needs to develop as well language skills to adapt to markets. AEL's offering unable to meet drilling needs as the focus seems only to be on blasting.

No.7 Explosives are perceived as a threat. Supply is an issue as result of poor infrastructure as cost of explosives are high due to supply chain.

No.7 As AEL strategy evolves towards a global key account strategy where strategic agreements are established from head office with key accounts (Mining companies) potential conflict could arise between AEL headquarters and the management established in hubs.

No.8 There is a need for a deeper understanding of the license to operate.

Educate local authorities to new products. Need to understand legislation before hand (e.g. tax). Improve language skills.

Impact of tax issues are high as well as understanding local legislation.

No.10 Not all countries have proper frameworks in place for the explosives business and this often results in delays and authoritarian approach to 'statutory' management. Security is a concern in the North African regions with the presence of known so called terrorist organisations. Large areas of the MENA region are politically unstable with on-going regional conflicts, such as Syria, Iraq, Yemen, Libya, Palestine and Israel, Sudan, Central Africa, Nigeria, Mali and Nigeria. Banking systems restricting movement of earnings offshore is also challenging. Competing with European suppliers with shorter lead times, and shorter distances is difficult.

Business cultures are often different to western business cultures where the payments for 'services' is acceptable and part of culture, where in modern environments it is frowned upon and outside of good corporate governance.

Infrastructure and transport are other area where significant challenges exist. Sourcing is currently a challenge as a result of agreements signed with suppliers at a higher level.

**BK Do these challenges have a financial implication?**

No.2 Yes all these issues have a financial implication.

No.3 Yes the challenges have a financial impact. Mozambique delays of 8 months and Tanzania fined for customs classifications.

AEL's strategy is to maintain current business however the aspect of growing current customer base is left to the Head of the hub to grow.

No.4 Yes they do have financial implications.

No.5 The above mentioned challenges have a financial impact if not managed properly; Example Loss of business due to late delivery.

No.6 These measures challenges if not managed will result in financial losses and business losses as well.

No.7 The challenges have a financial impact on AEL.

No.8 Yes the strategy is formulated however the implementation is left to the business managers and the company has two annual strategic reviews.

No.9 The above mentioned challenges have a financial impact if not managed properly; Example Loss of business due to late delivery.

No.10 These conflicts generally only impact on AEL if customers are affected by these conflicts. The restrictions on movement of cash offshore do not cause financial loss of any sort in the subsidiaries but the impact on cash for capital expenditure is felt from AEL Mauritius.

Data sourced from Annual report AEL

**BK: What challenges AEL seems to be facing?**

### **Annual report 2013**

The drop in sales did not result from the sales in Sub-Sahara as new supply contracts were signed (pp.58) but rather from the industrial relationship tension in South Africa and an increase in the prices of raw materials and shipping costs.

### **Annual Report 2009**

During the year AEL focused on key aspects of its supply chain thus investigating strategies to reduce the costs of transport despite the poor continental infrastructure and the exploration of cheaper sources of raw materials (Pp. 53)

### **Annual report 2010**

The year was marked by Lower prices of copper resulting in less sales of explosives in Central Africa pp. 48.

Exports from South Africa to Sub-Sahara countries were affected as well by a stronger rand to the United State Dollar rate (pp. 48). The stronger South African Rand meant that South African products were more expensive in United State Dollar terms than the previous due to the strengthening of the South African currency.

Source data from Annual reports BME

**BK: What challenges BME seems to be facing?**

### **Annual report 2008**

BME saw its margins affected by the increase of costs of raw materials, however as the contracts were signed at the beginning of the year, price adjustments could not be secured until the last quarter of the year. However, these adjustments will ensure that margins are restored for the following year. The following year's margins will be enhanced by the renegotiation of supply agreements for raw materials as well as the transport costs.

### **Annual report 2010**

BME sales during the year dropped. In order to maintain sales BME had to reduce prices. BME financial situation was impacted negatively by a strong South African Rand versus the United State Dollar. The global economic recession reduced the demand for commodities thus reducing the demand of explosives. (Pp. 34).

## **Annual Report 2013**

Significant new product and process developments, supported by strong in-field technical and operational resources, have catalysed new industry thinking.

Further provision of skills and on-site reagent dosing technology will have to be developed in line with the trend of smaller reagent plant footprints, in-line dosing systems and reduced water consumption.

## **Annual report 2014**

Future strategy pp. 79

Growth experienced in Africa mining is expected to continue, but at lower rates than the past two years. Mining activity will also intensify through increased stripping ratios as mines become deeper.

Growing competitor activity is expected to put pressure on volume growth and operating margins.

Key macro and performance drivers affecting the Outlook Global demand for commodities

Infrastructure development in Africa improving the accessibility of mines to railway and ports

The development of new gold mines in West and east Africa, and the resurgence in demand for copper from the central African copper belt will provide further growth avenues.

## **Research Question 3 Why would it be necessary to include other key variables in existing strategic framework to develop an effective strategy for the explosives business?**

Under this research question, will be regrouped data related to the way AEL strategy addresses the challenges regrouped under the previous study question and the data related to how AEL strategy can be improved.

Data sourced from Interviews

### **BK Does the strategy address the challenges?**

No.5 AEL strategy does not address these issues but rather reacts to them.

No.1 The hub strategy addresses partially these concerns although some pre work needs to be done in order to discover local competences, service maintenance availability. From a logistics point a view there is a need to find in country logistics routes. Such skills need to be included in the structure in order to be able to understand the issues.

No.2 The current strategy has been efficient however has proved its limits in Angola, Mauritania because of ethics and corporate governance issues.

No.4 The strategy addresses the concerns. But is currently been improved as AEL is currently lobbying to lift restriction on class 1 products. However this already been put in place. Main customer been AEL subs there is clear understanding of the import procedures and process and grouping is been processed.

No.10 Business optimisation is complete and delivering results to the bottom line. Some of the uncertainty with regard to job security is fading.

One area of weakness is the strategic decision to source detonators within an agreement that excludes the North African and European business regions. No substitute source has been contracted resulting high prices from ruthless suppliers.

Non-traditional mining houses to which AEL has not been previously exposed are also entering the African market and bringing with it suppliers with whom it has global contracts or contracts outside of Africa. Like AEL entered Africa on the back of its migrating customers, so too are competitors doing the same. It is therefore imperative that relationships are built at executive level before cascading down on the ground.

**BK: How to improve the current strategy?**

No.1 AEL's strategy should focus on building relationships with mining houses, enhance its capacity to deploy faster in new markets, formulation of a clear plan that takes into account the challenges anticipate change and not react to it.

AEL should have a plan for to anticipate these issues upfront as they impact on the activities in new markets.

No.2 AEL needs to anticipate challenges beforehand in order to have a plan in place before moving in a new territory.

No.3 The hub system should be more dynamic as the decision for a spoke to become a hub could take time and could result in a loss of an opportunity for AEL. Example the setup of plant construction only happened in 2013.

AEL should transform spokes in hubs diligently.

The strategy addresses the challenges faced by the market, as the hubs are responsible for the implementation of the strategy.

Business development should be able to identify issues before. The strategy could be improved if it was developed in subsidiaries and not from a South African perspective. There should be a framework to develop beforehand issues to be addressed before hand.

No.6 The strategy should include a provision to service underground mines. AEL should develop a clear assessment for each country of the level of risk, regulation and prospective partners. AEL needs to have a deep understanding of its competitors and the work should be done prior to the establishment of hubs. AEL should assess these aspects prior to the establishment of operations.

No.8 These concerns should be anticipated.

No.10 I think that with restructuring and the completion of the business optimisation the strategy is in place for the next 3 years, however, local conditions may require adjustments in the individual portfolios. Diversification with respect to customer markets e.g. gold, copper, iron ore, coal, and diamonds can only take place in the subs if the diversified customer base exists.

Sourcing and supply chain. It is no good decentralizing supply if alternate sources are not put in place and this has what has happened largely over the last 18 months in businesses north of the equator.

In order to grow, AEL must have the skilled resources to expand. This means carrying and growing resources in excess of needs of the day so that rapid deployment of assets is matched with rapid deployment of available skills without impacting on the existing customer base.

How do other variables such as politics, legal, culture and administrative barriers impact on the shaping of the final strategy for South African explosives companies willing to expand their operations in Africa?

Interview

**BK: Is AEL facing political issues, culture difference and local administration barriers in Sub-Saharan countries and is there impact?**

No.10 In general, I don't think AEL faces any more political issues than anyone else, but the levels of bureaucracy and frustration are part and parcel of doing business in Africa. In some cases, many persons in positions of influence lack the skills, urgency, knowledge or framework to facilitate the process.

Differences in business, social and political cultures are touched on earlier, but again, these are entrenched. One needs to understand the environment in which it wants to operate and act accordingly.

Africa is increasingly attractive for its vast unexplored potential for mineral resources. African governments are increasingly aware of this and attempting, rightfully so, to secure a larger slice of the rewards for the development of its people, its infrastructure and services. In some cases, investors are discouraged from entering a market and the potential to grow AELs business is impacted.

No.1 The logistics requirements and shipping regulations such as escort requirements and other regulations are different from one country to another. The costs are not homogeneous and are often difficult to understand and anticipate.

AEL needs to develop the skills to manage the relationship between AEL and authorities and understand the "local way of doing business".

In some circumstances, AEL would need to have a local representative in each area.

Language and cultural barriers is a challenge and would require the training of expatriates in the local languages.

No.2 AEL needs to understand the complexity of the establishment of a local business. In Nigeria AEL had to partner with a local manufacturer, in Zimbabwe there is a constraint of partnering with a local partner as well.

There is local corruption Angola, DR Congo and to an extent Mauritania.

Lack of availability of local mining skills in East Africa, compared to Ghana and Zambia thus the need to send expatriates.

Management of the tax regimes, Difficulties in obtaining work permits.

No.3 Need to develop language skills, and local management.

AEL must understand better all aspects of local legislation.

No.4 Delays at the port of entries at peak periods. (E.g. South African border with Zimbabwe).

Differences in legislations from one country to another e.g. requirements for import permits differ from one country to another.

No.6 AEL faces the challenges of local regulations; AEL needs to develop as well language skills to adapt to markets.

No.8 There is a need for a deeper understanding of the license to operate.

Educate local authorities to new products. Need to understand legislation before hand (e.g. tax). Improve language skills.

Impact of tax issues are high as well as understanding local legislation.

## APPENDIX C: QUANTITATIVE DATA

Revenues, profit and Asset evolution (Source Annual reports AEL and BME from 2003 to 2013) as well information on commodity prices, CAGE framework and results of connectedness have been regrouped in the present subsection.

The table below summarises the annual revenues, profits, assets of AEL and BME from year 2002 to year 2013.

Description	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Average Annual Gold prices	436	436	513	632	834	870	1088	1406	1531	1658	1205
World gold demand (ounces)	N/A	N/A	N/A	N/A	3052	3124	3097	3110	3773	3653	4184
Revenue BME (Mining Division)	577	715	841	1001	1281	2111	1776	2092	3051	3765	5458
Revenue AEL (Mining Division)	2076	2140	2314	2492	2698	4079	4070	4832	5494	6327	7434
Profit AEL	241	212	257	261	163	248	298	378	510	417	572
Assets AEL	244	257	284	446	618	826	828	1062	1440	2080	2604

### Commodity analysis

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Average Annual Gold prices	436	436	513	632	834	870	1088	1406	1531	1658	1205
World gold demand (ounces)	0	3052	3124	3097	3110	3773	3653	4184	4702	4589	4080
Average Annual Copper Prices	N/A	N/A	3679	6722	7118	6955	5150	7535	8935	7950	7365

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Average Annual Gold prices	436	436	513	632	834	870	1088	1406	1531	1658	1205	1 266.4
World gold demand (ounces)	0	3052	3124	3097	3110	3773	3653	4184	4702	4589	4087	3923
Average Annual Copper Prices	N/A	N/A	3679	6722	7118	6955	5150	7535	8935	7950	7365	
Exchange rate	7.42	6.41	6.37	6.82	7.02	8.26	8.28	7.31	7.28	8.19	9.77	10.87

Source: [metalprice.com](http://metalprice.com) and [www.gold.org](http://www.gold.org)

## APPENDIX D: CONNECTEDNESS INDEX

Global Connectedness Scores and Ranks, 2005-2013 (*Pankaj Ghemawat and Steven A. Altman, "DHL Global Connectedness Index 2014," Deutsche Post DHL, November 2014*)

Country	Global Connectedness Score (0-100)								
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Angola	39	36	38	39	40	34	35	38	38
Burkina Faso	7	8	13	17	13	15	20	20	23
Burundi	7	9	3	5	7	5	7	9	15
Cameroon	23	22	24	29	27	31	33	31	29
Canada	53	55	55	56	56	56	57	56	56
Congo, Republic	38	40	41	41	46	51	51	51	51
Cote d'Ivoire	30	31	33	36	38	39	39	43	43
France	72	73	73	72	71	69	69	69	69
Gabon	32	38	37	43	45	45	40	46	43
Ghana	43	44	44	45	47	48	51	51	50
Kenya	34	29	32	30	30	32	34	36	34

Mali	19	19	23	23	25	25	23	24	27
Malta	67	69	68	67	68	69	67	65	62
Mauritius	44	44	47	45	51	54	54	54	52
Morocco	41	42	48	49	48	50	50	51	49
Mozambique	14	16	17	19	21	21	30	33	37
Netherlands	88	88	89	88	88	88	90	89	89
Niger	12	14	8	17	22	23	20	23	19
Nigeria	47	48	46	49	49	49	55	56	56
South Africa	48	52	53	54	48	47	52	53	51
Uganda	18	20	22	24	25	24	26	27	25
Zambia	17	15	19	18	17	19	22	24	23
Zimbabwe	21	19	28	30	26	29	29	27	25

## **APPENDIX E: NOTES ON ANNUAL REPORTS AND INTERVIEWS**

### **AEL Strategy**

Thus the definition of AEL strategy is based on the definition of strategy and performed in two steps:

- Company objectives
- Strategy to reach objectives
- Objectives
- Creation of value for customers

The annual reports indicate clearly AEL's intention to be a dedicated customer-focused organisation that creates value for customers through advanced technical support and quality, reliable and accurate products and software.

### **Profitability objective**

The majority of respondents indicate that AEL's intent is to grow. Moreover, one respondent specifies that the objective of AEL is to increase the profit to sales ratio to a double digit percentage. The company hopes that the Sub-Saharan contributes significantly to this goal this is confirmed by Respondent 6 quotes: "The objective of AEL is a double digit trading profit to sales by 2017 and Africa is part of the global company achievement."

### **Maintain existing contracts and pursue new opportunities for growth**

Respondent 3, 6 and 9 indicate that the objective of AEL is to maintain the current customer base. Furthermore Respondents 1, 2, 3, 5, 6, and 9 indicate that AEL's intent is to increase current customer base by developing activities in new territories. Respondent 3 indicated that AEL would focus on specific countries like Mauritania and Angola and seeks a breakthrough with companies extracting iron ore located in Mauritania. Respondent 7 indicates that the expansion strategy has led to the appointment of Business Development Managers in each region.

The global objective as cited by a respondent is for AEL to double the size its sales by 2020 as indicated by Respondent 7. AEL's clear intent of growing the current African business further is confirmed in the AEI annual report (Wellington & Mason, 2014, pp. 49).

### **Maintain a leading role as base of growth**

The majority of Respondents indicate as well that it is AEL's intent to remain the leading supplier in Sub-Sahara through the expansion of actual customer base and the by maintaining its leading position on the market.

Development in French and Portuguese speaking countries

Respondents 3, 7 and 8 indicate that AEL's priority in Sub-Sahara is to expand in French and Portuguese speaking countries such as Mozambique, Angola, Mauritania Guinea and other Portuguese and French speaking countries.

Reduce supply chain costs (Transport costs and cost effective sources of raw materials)

The objective of AEL is the reduction of logistics costs and the identification of more efficient sources of raw materials. This objective is highlighted by the respondent 1 and 6 as well as in the AECI quote AEL to "focus on logistics and new channels to improve and maintain efficiencies in existing markets" (Wellington & Mason, 2014, pp. 53).

## **Strategy AEL**

### **Growth of productivity of current assets**

AEL African strategy is to grow the business through the increase in productivity of existing assets. (Wellington & Mason, 2014, pp. 48)

Regional growth through hubs

Respondents 2, 3 and 8 explain that to meet growth objectives, AEL split its Sub-Saharan activities in regional hubs (hubs) in Central, West and East Africa to favour regional growth.

Furthermore, Respondent 2 explains that the regions (hubs) are established based on logistic, language connectivity and based on the fact countries belong to the same regional body such as SADC in Southern Africa or Ecowas in West Africa. This approach is used to establish the North West African francophone hub.

Respondent 3 indicates that it is AEL intent to establish a hub in Mauritania to benefit from the opportunities presented by iron ore companies in Angola.

### **Transfer expertise from AEL South Africa to local hubs**

Respondent 5 explain that AEL strategy is to seize growth opportunities in Africa by transferring knowledge acquired in South Africa to the hubs outside of South Africa. The transfer is done through the training and the development of the local workforce on technical software, new products and services.

### **Establishment of global partnerships with mines**

Respondents 2, 3, 5 and 7 highlight AEL intends to grow with the customers and establish collaboration with mines. As a result, AEL uses existing contract agreements with mining companies in South Africa as leverage to establish contractual ties with their entities or sister companies based in Sub-Saharan.

The main example cited during the interviews is Exxaro, one of the largest South African based diversified minerals group with operations in South Africa, Botswana, Republic of Congo. AEL established a relationship with Exxaro in South Africa and later on, started supplying its operation in Republic of Congo. AEL is given preference to supply Exxaro project in Republic of Congo as a result of the relationship AEL established with Exxaro in South Africa.

#### **Provide value added services**

Respondent 5 indicate that AEL needs to retain existing customers through the implementation of value added projects, through the provision of technical and commercial recommendations to existing customers in order to improve their productivity or reduce their costs (AECI, 2012, pp.15)

#### **Reduce Supply chain costs**

Respondent 4 indicated that AEL intends to benchmark current sources of raw materials and logistics costs against to identify potential opportunities of cost savings and at the same time a clear supply chain seems in place to send products and raw materials from AEL South Africa to the different hubs (AECI, 2012, pp. 15).

#### **Technology improvement**

Respondent 5 mentions that AEL's growth is achieved through the continued development of world class technology and the quality products and services to its customers.

#### **Maintain a tight control on costs**

The respondents note a high emphasis on keeping costs down by exercising controls on expenses.

#### **Investment strategy**

Respondent 3 describes AEL investment model: AEL's strategy is to wait for the signing of a contract to establish operations (plants, sites, trucks and people) in a particular area and to commit resources

#### **Dedicate resource to develop (Central and West Africa)**

Respondent 7 noted that AEL intends to achieve growth by increasing business development activity in Central and West Africa.

### **Evolution of AEL Strategy**

Respondents during the interviews mention that AEL strategy seems to be evolving in the following direction:

#### **Full chemical offering**

Respondent 2 stated that AEL objective is to maintain current customer base and grow business further. AEL seeks to increase offering by associating sales of chemical products with explosives in its Sub-Saharan hubs. As a result the current subsidiaries have been reorganized to manage explosives and chemicals supply.

#### **Evolving hub model has evolved**

Respondent 3 indicate that the hub concept seems to be part of a larger strategy and does not seem to be the only strategy like in the previous decade.

#### **Decentralisation of growth strategy**

Respondent 7 indicate that AEL's strategy is to maintain current business; however the aspect of growing current customer base is left to the Head of the hub to grow. (Decentralisation of strategy)

AEL appoints a business development function in each entity in order to increase the market knowledge as well as the regulatory environment.

#### **Develop partnerships with mines**

Respondent 5, stresses the need to understand the market further in order to understand further market, customer needs, to grow with the customers and establish collaboration with mines, and develop value added projects.

Although the majority of the respondent are aware that the main objective for AEL is to retain existing business in Sub-Saharan countries and to further grow the strategy very few are able to outline the strategy clearly.

Two respondents said that the strategy is not clearly formulated thus each manager of the hub is responsible for the implementation of the strategy in its region and one respondent adds when probed by the interviewer that the strategy does not seem to be formulated clearly as it seems to describe very broad objectives.

## **Remarks on AEL Strategy**

However, there is a general consensus amongst the respondents that the overall objectives are clear (growth and retention of existing customers) and that the financial objectives are clearly defined by AEL head office in South Africa.

In addition, the outline of AEL global strategy is communicated however the detailed strategy for Africa is described in broad terms and allows the managers of each entity to adapt the global strategy to their particular environment.

A clear effort is made to apply the strategy in practice as a new structure is in the process of being implemented.

Although, some concerns are expressed on the formulation of the strategy, as a respondent mentions the objectives seem to be very broad thus the AEL global strategy is not applied consistently in Sub-Saharan.

## **BME Strategy**

As described earlier, BME strategy is defined by the analysis of the latest annual reports published by BME. The same method used to determine AEL's objectives and strategy is applied to BME the difference though with AEL is the data is obtained only from one source thus the conclusions can only be used to provide insights on BME strategy.

## **Objectives**

### **Capture Africa's growth**

Africa economic growth in 2008 despite the worldwide crisis, has lead BME to focus on growing its African Business (OMNIA, 2011, pp. 7).

### **Key areas of focus (West Africa and Central Africa)**

BME continues to focus on opportunities in the mining sector in South Africa, the rest of southern Africa and West Africa.(AECI, 2009)

### **Safety is a priority**

Safety remains a top priority due to the moral obligation to our people and their families and it being the only sustainable way to conduct our business.

### **Increase profits by 8% in five years**

BME is committed to deliver and possibly exceed its target for this five year planning cycle of a compound 8% real growth rate in profits (AECI, 2009, pp.26).

## **Strategy BME**

### **Grow product range**

BME's intends to expand current product range through the building of new plants for the production of detonators. (Explosives contribution to group strategy)(AECl, 2009, pp. 26)

### **Maintain current business**

Maintain current customers and increase sales as they expand their activities.(AECl, 2009, pp. 76)

### **Grow sales**

Grow sales through the signing of new contracts with new customers (AECl, 2009, pp. 79).

### **Value added services to customers**

BME intends to increase sales to customers by improving their productivity through the application of technical expertise in advanced blasting, with the support of AXXIS™ electronic delay detonators and advanced blasting software such as BlastMap™ and AxxiSoft™.(OMNIA, 2012, pp. 26).

### **Training of technical people**

BME focuses on the development and the training of human resources to empower them with the expertise to provide and develop specialised products and services to the customers (OMNIA, 2012, pp. 79) as explained in the following quote.

"We established the BME Surface Training Centre, accredited by the MQA (Mine Qualifications Authority) to provide safety and technical training. Our focus on developing our people is evidenced by improved training statistics throughout our operations." (OMNIA, 2012)

### **Measure of efficiency of actual strategy**

After defining AEL and BME strategy through interview and annual reports analysis the present section assesses the efficiency of AEL strategy as defined in "Measuring the efficiency of current strategies" section of the present section.

### **AEL strategy efficiency**

#### **Concerns**

Respondent 3 indicates that AEL is not successful in signing global agreements covering different regions of the African continent with mining companies. Such contracts would allow the roll out of existing supply agreements in South Africa to Sub-Saharan regions.

At present, AEL still has to participate in tender processes for the majority of new projects in Sub-Sahara. In addition, there is a strong feeling amongst the respondents that the management of global contracts is in conflict with the management of local entity.

Respondent 6 highlighted that AEL failed to establish a presence in some markets over the past years, as a result of its investment policy. The establishment of an entity and production facilities is conditional to the signing of a supply agreement with a customer. This is a concern as BME is willing to commit resources and capital in countries prior to the signing of a supply contract with a client. This has led to AEL losing business opportunities to BME in Mauritania and in some West African countries.

Respondent 3 added that the hub system should be more dynamic as the decision making for the establishment of a hub takes time and can result in a loss of an opportunity for AEL. As an example the erection of a plant in Burkina Faso was completed only in 2013, however the level of production justified the investment in production facilities since 2012. AEL is vulnerable as competition is prepared to put assets on the ground before the signing of agreements and in most cases have a shorter decision making process.

Respondent 1 and 6, stressed the need for a detailed study of the market conditions and moreover the local constraints that often can delay the process as well of establishing new operations in a country, from that point a view the current strategy does not seem to address this concern.

Respondent 1 and 2 note that the first mover advantage could result in negative consequences for the retention of the contract as AEL is perceived as having taken advantage of high prices in the initial period. In Mali and Guinea despite the fact that AEL was the first on the market, BME have managed to establish operations in country.

Respondent 3 mention that AEL expansion seems to be efficient when growing from an existing regional hub to another country within the same region; AEL DR Congo expanded from AEL Zambia and AEL Ghana was the springboard for the development of AEL operations in Burkina Faso. However, expansion into new territories from South Africa does not seem efficient as AEL has found it difficult to set up new operations in Cameroon or Angola for instance.

Respondent 3 says that AEL's performance appears to be linked to the world prices of commodities as sales drop in West Africa since the decrease in the gold price from September 2013; as a result of most mines drop there explosives consumption. AEL is not growing according to forecast in 2013 and 2014 as a result. However countries like Burkina Faso have managed to retain their customers. AEL's business remains highly dependent on gold prices as well as copper as no major contract has been won in the iron ore sector. AEL needs to develop a value proposition to supply to iron ore mines and implement market segmentation by minerals.

Respondent 6 indicates as well, that the strategy could be improved if it was developed in subs and not from a South African perspective.

AEL should develop a clear assessment for each country of the level of risk, regulation and prospective partners. AEL needs to have a deep understanding of its competitors and the work should be done prior to the establishment of hubs.

### **Efficient aspects of AEL's strategy**

Respondent 2 indicates that AEL's strategy is successful as despite BME's intend to follow the African growth and Orica and Sasol slow starts. AEL still holds a substantial from a sales perspective.

Initially due to first mover advantage AEL's market share was 100% (OMNIA, 2008), however since the entrance of other suppliers AEL's market share has dropped. AEL still holds a dominant position in Sub-Saharan countries.

Following success of strategy in Africa, AEL replicates the same strategy in South America. Opposition attempts to copy AEL by establishing plants in different countries. BME establish plants and companies in different countries such as Mauritania and Mali. However those countries are independent and the model does not seem to be as efficient as AEL. Sasol rather exports directly through representatives.

Efficiency analysis through revenues and profits AEL and BME

## **APPENDIX F: GROUPING OF DATA PER CODE (using ATLAS.ti software)**

### **Family codes**

- Family codes:
- Local environment
- Investment
- Challenges
- Market
- Profitability
- Other parameters

## 1. Code Family: Local environment

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Created: 2015-01-08 20:00:39 (Super)  
Codes (6): [Administrative constraints] [Building facilities] [Challenges Africa] [Corruption] [Language and culture] [Local skill availability]  
Quotation(s): 22

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### **P 2: Interview summary by list.docx - 2:9 [Logistics/Shipping regulations..] (6:6) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Logistics challenge - Family: Challenges]  
No memos

Logistics/Shipping regulations/Restrictions in certain ports/Escorts. They are different from one country to another. The costs are not homogeneous and some are unclear.

### **P 2: Interview summary by list.docx - 2:10 [Relationship between AEL and a..] (7:7) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment]  
No memos

Relationship between AEL and authorities. AEL needs to understand local way of doing business. AEL would need to have a local representative in each area. These issues affects AEL's bottom line.

### **P 2: Interview summary by list.docx - 2:11 [Language and cultural barriers..] (8:8) (Super)**

Codes: [Language and culture - Family: Local environment]  
No memos

Language and cultural barriers. AEL would have to train its expatriates in the local languages.

### **P 2: Interview summary by list.docx - 2:15 [AEL's strategy should as well ..] (15:16) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Strategy improvement - Family: Other parameters]  
No memos

AEL's strategy should as well on building relationships with mining houses, enhance its capacity to deploy faster in new markets, formulation of a clear plan that takes into account the challenges anticipate change and not react to it.

AEL should have a plan for to anticipate these issues upfront as they impact on the activities in new markets.

### **P 2: Interview summary by list.docx - 2:19 [AEL's strategy has been a succ..] (20:20) (Super)**

Codes: [Building facilities - Family: Local environment] [Competition - Family: Market] [Criteria to establish a hub - Family: Triple A] [Hub model - Family: Triple A] [Strategy efficiency - Family: Profitability]  
No memos

AEL's strategy has been a success as despite BME's intend to follow the African growth and Orica and Sasol slow starts AEL still has a substantial advantage in terms of sales into Africa. Revenue has grown as well as market share. However due to 1st mover advantage initial market share was 100% however AEL still holds a dominant position. Based on African success AEL will replicate the same strategy in South America. Opposition has attempted to copy AEL by establishing plants in different countries; BME has established plants and companies in different countries such as Mauritania and

Mali. However those countries are independent and the model does not seem to be as efficient as AEL. Sasol rather exports directly through representatives.

**P 2: Interview summary by list.docx - 2:21 [Complexity to establish local ..] (22:22) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Challenges Africa - Families (2): Challenges, Local environment]

No memos

Complexity to establish local business example in Nigeria AEL had to partner with a local manufacturer, in Zimbabwe there is a constraint of partnering with a local partner as well. The challenges faced when sending explosives to the different regions.

**P 2: Interview summary by list.docx - 2:22 [There is local corruption Ango..] (23:23) (Super)**

Codes: [Corruption - Family: Local environment]

No memos

There is local corruption Angola, DR Congo and to an extent Mauritania.

**P 2: Interview summary by list.docx - 2:23 [There is local skill availabil..] (24:24) (Super)**

Codes: [Local skill availability - Family: Local environment]

No memos

There is local skill availability in East Africa unlike neither Ghana nor Zambia thus the need to send expatriates. The establishment of factories increase the overheads costs. Management of the tax regimes, Difficulties in obtaining work permits.

**P 2: Interview summary by list.docx - 2:26 [The current strategy has been ..] (32:33) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Corruption - Family: Local environment] [Market research]

No memos

The current strategy has been efficient however has proved its limits in Angola, Mauritania because of ethics and corporate governance issues.

AEL needs to anticipate challenges beforehand in order to have a plan in place prior to implementation.

**P 2: Interview summary by list.docx - 2:31 [People challenge, need to deve..] (39:39) (Super)**

Codes: [Language and culture - Family: Local environment] [Local skill availability - Family: Local environment] [Strategy improvement - Family: Other parameters]

No memos

People challenge, need to develop local engineers, need to retain competent engineers, development of local skills, develop people in a pipeline, development of language skills, development of local management

**P 2: Interview summary by list.docx - 2:33 [Yes the challenges have a fina..] (40:40) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Financial impact of challenges - Family: Profitability]

No memos

Yes the challenges have a financial impact. Mozambique delays of 8 months and Tanzania fined for customs classifications.

**P 2: Interview summary by list.docx - 2:39 [Differences in legislations fr..] (54:55) (Super)**

Codes: [Administrative constraints - Family: Local environment]

No memos

Differences in legislations from one country to another e.g. requirements for import permits differ from one country to another.

Yes they do have financial implications.

**P 2: Interview summary by list.docx - 2:44 [AEL is facing the following ch..] (68:73) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Challenges Africa - Families (2): Challenges, Local environment] [Financial impact of challenges - Family: Profitability] [Logistics challenge - Family: Challenges]  
No memos

AEL is facing the following challenges

- 1) Quality issues could cause loss of business and money.
- 2) Logistics.
- 3) Distance to customers
- 4) Differences in banking systems.

The above mentioned challenges have a financial impact if not managed properly; Example Loss of business due to late delivery.

**P 2: Interview summary by list.docx - 2:47 [AEL faces the challenges of lo..] (82:83) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Competition - Family: Market] [Financial impact of challenges - Family: Profitability] [Innovation - Family: Generic Strategies]  
No memos

AEL faces the challenges of local regulations; loss of skills in West Africa to competition, AEL needs to develop as well language skills to adapt to markets. AEL's offering unable to meet drilling needs as the focus seems only to be on blasting.

These measures challenges if not managed will result in financial losses and business losses as well.

**P 2: Interview summary by list.docx - 2:52 [Explosives are perceived as a ..] (95:95) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Cost - Family: Generic Strategies] [Logistics challenge - Family: Challenges]  
No memos

Explosives are perceived as a threat. Supply is an issue as result of poor infrastructure as cost of explosives are high due to supply chain.

**P 2: Interview summary by list.docx - 2:55 [The change in strategy to key ..] (100:100) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Mining Groups - Family: Other parameters]  
No memos

The change in strategy to key accounts (Mining companies) is in conflict with territory management.

**P 2: Interview summary by list.docx - 2:58 [Deeper understanding of the li..] (107:107) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Language and culture - Family: Local environment]  
No memos

Deeper understanding of the license to operate. Educate local authorities to new products. Need to understand legislation before hand (e.g. tax). Improve language skill

**P 3: Notes Annual reports.docx - 3:10 [“The global technical skills s..] (101:104) (Super)**

Codes: [Competition - Family: Market] [Differentiation - Family: Generic Strategies] [Innovation - Family: Generic Strategies]  
[Local skill availability - Family: Local environment] [Value added services - Family: Generic Strategies]  
No memos

“The global technical skills shortage, while presenting its own internal challenges, holds significant opportunity for the Mining division as customers increasingly look for added value in the form of technical advice, support and sophisticated products such as BlastMap® blast planning and management software, as well as ‘mine to mill’ solutions. The division will continue to enhance its value proposition to customers by broadening its range of value-added offerings.” PP 14

- Technical people shortage
- Differentiation by value added projects

**P 3: Notes Annual reports.docx - 3:17 [Develop and train our people t..] (162:162) (Super)**

Codes: [Competition - Family: Market] [Local skill availability - Family: Local environment]  
No memos

Develop and train our people to enable and empower them with the expertise to provide and develop specialised products and services to our customers

**P 3: Notes Annual reports.docx - 3:20 [BME’s focus on developing our ..] (168:170) (Super)**

Codes: [Competition - Family: Market] [Local skill availability - Family: Local environment]  
No memos

BME’s focus on developing our people is evident by improved training statistics throughout its operations. This is supported by the establishing of the BME Surface Training Centre, which was accredited by the MQA (Mine Qualifications Authority) to support safety and technical training.

**P 3: Notes Annual reports.docx - 3:26 [Current strategy - BME will co..] (215:224) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Competition - Family: Market] [Innovation - Family: Generic Strategies]  
[Local skill availability - Family: Local environment] [Product range - Family: Generic Strategies] [Value added services - Family: Generic Strategies]  
No memos

**Current strategy**

- BME will continue to focus on opportunities in the mining sector in South Africa, the rest of southern Africa and West Africa
- Safety remains a top priority as a moral obligation to our people and their families. It is the only sustainable way to conduct our business
- be a dedicated customer-focused organisation that creates value for customers through advanced technical
- Support and quality, reliable and accurate products, software and process innovation
- Develop and train our people to enable and empower them with the expertise to provide and develop specialised products and services to our customers.

**P 3: Notes Annual reports.docx - 3:38 [Challenges to achieving this s..] (292:296) (Super)**

Codes: [Competition - Family: Market] [Innovation - Family: Generic Strategies] [Local skill availability - Family: Local environment] [Value added services - Family: Generic Strategies]  
No memos

### Challenges to achieving this strategy

Significant new product and process developments, supported by strong in-field technical and operational resources, have catalysed new industry thinking.

Further provision of skills and on-site reagent dosing technology will have to be developed in line with the trend of smaller reagent plant footprints, in-line dosing systems and reduced water consumption.

## 2. Code Family: Investment

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Quotation(s): 6

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### **P 3: Notes Annual reports.docx - 3:1 [2007 (Year end 2008) - Growth ..] (39:45) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Capital - Family: Investment] [Gold - Family: Other parameters] [Innovation - Family: Generic Strategies] [Sales evolution - Family: Market]  
No memos

#### 2007 (Year end 2008)

- Growth in export market pp. 38 due to East and West Africa operations.
  - o Signing of new contracts in DRC and Zambia and investment of 42 million Rands in production facilities. Pp . 40
  - o Growth in West Africa and investment in a second bulk plant in Tarkwa.
  - o First sales in Burkina Faso. Pp.40
- Growth in sales of electronic detonators pp. 38
- Investment in shock tube capability. Pp.38 and pp.41.

### **P 3: Notes Annual reports.docx - 3:2 [2008 (Year end 2009) - African..] (46:51) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Capital - Family: Investment] [Copper - Family: Other parameters] [Logistics challenge - Family: Challenges] [Sales evolution - Family: Market]  
No memos

#### 2008 (Year end 2009)

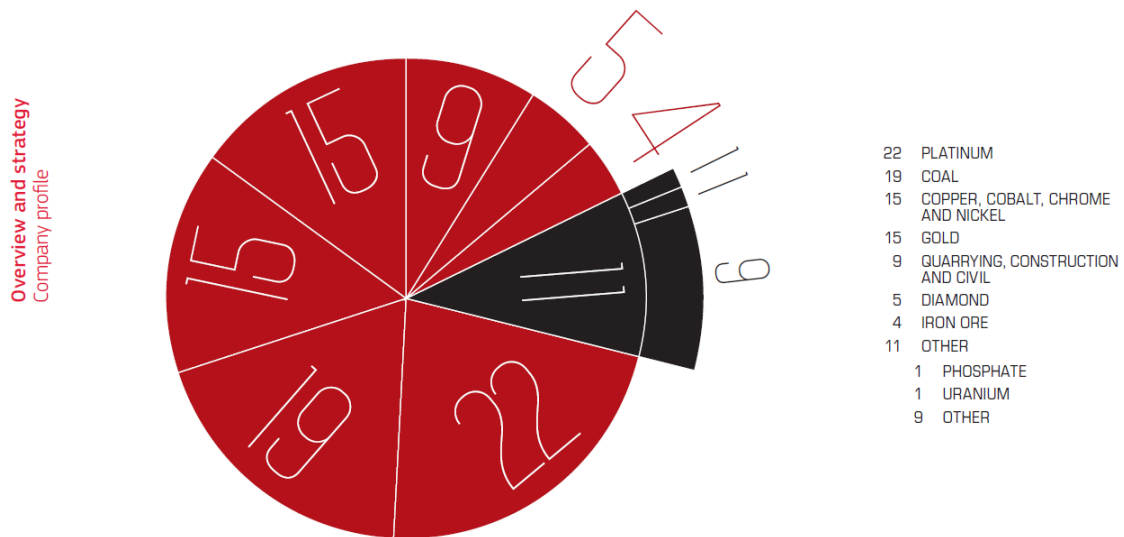
- African strategy: grow the business through the increase in productivity of existing assets. Pp. 48
- Growth of African business pp. 49
- Delivery of growth in copper and cobalt sector in Central Africa (Lumwana project) as anticipated in 2007 pp. 53.
- Production in the DRC from investments made in 2007. Pp. 53
- Focus on logistics and new channels to improve and maintain efficiencies in existing markets. Pp. 53

### **P 3: Notes Annual reports.docx - 3:6 [2012 (Year end 2013) - New pla..] (65:76) (Super)**

Codes: [Capital - Family: Investment] [Contracts - Family: Market] [Innovation - Family: Generic Strategies] [Logistics challenge - Family: Challenges] [Margins - Family: Market] [Strategy efficiency - Family: Profitability]  
 No memos

2012 (Year end 2013)

2012 GROUP MINING REVENUE BY MINERAL MINED (%)



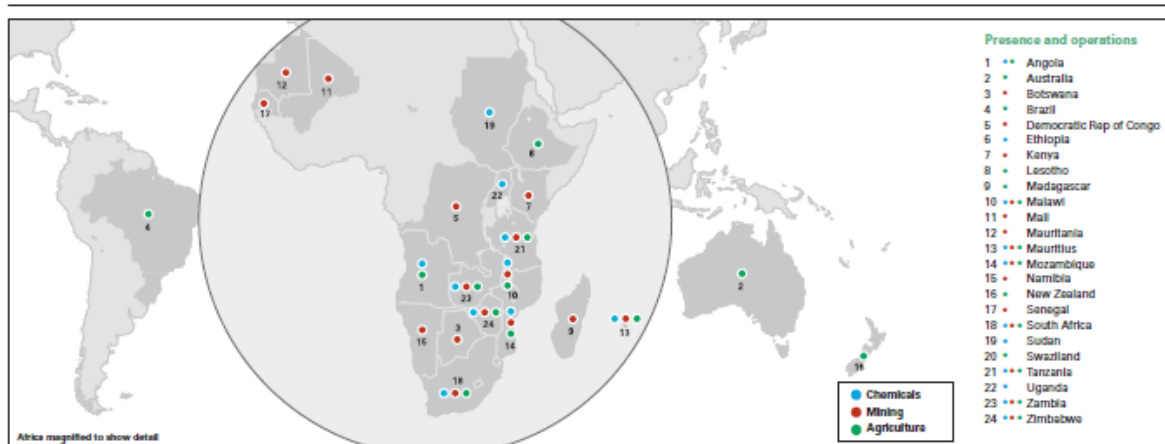
- New plants built in Burkina Faso, Egypt and DRC
- Plants are expected to be operational in 2013.
- Growth in 2012 was achieved by growth in Africa and Indonesia.
- However margins dropped to 6.8% from 9.3% in 2011. The main cause was the supply chain disruptions and strikes in South Africa.
- AEL well positioned to capture growth in 2013. Pp. 45
- Further investments were done on customer sites.
- New supply contracts pp. 58
- Completion of ISAP Project pp. 58

**P 3: Notes Annual reports.docx - 3:12 [2008 (year end 2009) Annual re..] (110:122) (Super)**

Codes: [Adaptation model - Family: Triple A] [Capital - Family: Investment] [Competition - Family: Market] [Growth - Family: Market] [Prices]  
 No memos

2008 (year end 2009) Annual report

## GROUP AT A GLANCE



BME's presence in 13 countries.

"The Africa opportunity pp.7" (Opportunity for 2009)

- Albeit at slower rates, Africa continues to show solid growth in the face of the global economic crisis, offering attractive opportunities for long-term investment.
- The investment climate and prospects for growth in many African economies continue to improve as economic reform gains momentum across the continent.
- In combination, these factors offer good opportunities for businesses seeking new avenues for expansion.

### P 3: Notes Annual reports.docx - 3:23 [2012 (Year end 2013) Company n..] (186:195) (Super)

Codes: [BME Strategy - Family: Actual strategies] [Capital - Family: Investment] [Competition - Family: Market] [Growth - Family: Market] [Product range - Family: Generic Strategies]  
No memos

2012 (Year end 2013)

Company new strategy PP. 26

The Group is committed to delivering and possibly exceeding its target for this fiveyear planning cycle of a compound 8% real growth rate in profit. Some of the actions taken in this regard are:

- Commissioning of the new nitric acid complex in March 2012
- Expansion of the Mining division's activities in Africa (Explosives contribution to group strategy)
- Expanding BME's product range (Explosives contribution to group strategy)
- Investment in expanding delivery capability in the potable water market

### P 3: Notes Annual reports.docx - 3:30 [BME has increased its in-house..] (246:246) (Super)

Codes: [Capital - Family: Investment] [Competition - Family: Market]  
No memos

BME has increased its in-house capacity to build emulsion and heavy ANFO delivery vehicles that are used in BME's operations throughout Africa to deliver down-the-hole product to the mine sites.

### 3. Code Family: Challenges

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Created: 2015-01-08 20:05:28 (Super)  
Codes (2): [Challenges Africa] [Logistics challenge]  
Quotation(s): 12

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**P 2: Interview summary by list.docx - 2:9 [Logistics/Shipping regulations..] (6:6) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Logistics challenge - Family: Challenges]  
No memos

Logistics/Shipping regulations/Restrictions in certain ports/Escorts. They are different from one country to another. The costs are not homogeneous and some are unclear.

**P 2: Interview summary by list.docx - 2:10 [Relationship between AEL and a..] (7:7) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment]  
No memos

Relationship between AEL and authorities. AEL needs to understand local way of doing business. AEL would need to have a local representative in each area. These issues affects AEL's bottom line.

**P 2: Interview summary by list.docx - 2:21 [Complexity to establish local ..] (22:22) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Challenges Africa - Families (2): Challenges, Local environment]  
No memos

Complexity to establish local business example in Nigeria AEL had to partner with a local manufacturer, in Zimbabwe there is a constraint of partnering with a local partner as well. The challenges faced when sending explosives to the different regions.

**P 2: Interview summary by list.docx - 2:38 [Consolidation of shipments and..] (49:52) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Logistics challenge - Family: Challenges]  
No memos

Consolidation of shipments and determine the shipping schedules accordingly. East Africa sea freight, West Africa sea freight and Central Africa road transport. AEL has a different strategy according to the classification of products. E.g. 1.4s packaging is shipped by airfreight whilst other class one products are shipped by sea or road.

Best rates due to consolidation, meeting the customer requirements by the development of a shipping schedule. Target on sea freight is 80% OTIF.

AEL strategy is working as regular shipments are sent outside South Africa.

AEL is doing well as shipments out of South Africa have increased.

**P 2: Interview summary by list.docx - 2:44 [AEL is facing the following ch..] (68:73) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Challenges Africa - Families (2): Challenges, Local environment] [Financial impact of challenges - Family: Profitability] [Logistics challenge - Family: Challenges]  
No memos

AEL is facing the following challenges

- 1) Quality issues could cause loss of business and money.
- 2) Logistics.
- 3) Distance to customers
- 4) Differences in banking systems.

The above mentioned challenges have a financial impact if not managed properly; Example Loss of business due to late delivery.

**P 2: Interview summary by list.docx - 2:47 [AEL faces the challenges of lo..] (82:83) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Competition - Family: Market] [Financial impact of challenges - Family: Profitability] [Innovation - Family: Generic Strategies]  
No memos

AEL faces the challenges of local regulations; loss of skills in West Africa to competition, AEL needs to develop as well language skills to adapt to markets. AEL's offering unable to meet drilling needs as the focus seems only to be on blasting.

These measures challenges if not managed will result in financial losses and business losses as well.

**P 2: Interview summary by list.docx - 2:52 [Explosives are perceived as a ..] (95:95) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Cost - Family: Generic Strategies] [Logistics challenge - Family: Challenges]  
No memos

Explosives are perceived as a threat. Supply is an issue as result of poor infrastructure as cost of explosives are high due to supply chain.

**P 2: Interview summary by list.docx - 2:55 [The change in strategy to key ..] (100:100) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Mining Groups - Family: Other parameters]  
No memos

The change in strategy to key accounts (Mining companies) is in conflict with territory management.

**P 3: Notes Annual reports.docx - 3:2 [2008 (Year end 2009) - African..] (46:51) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Capital - Family: Investment] [Copper - Family: Other parameters] [Logistics challenge - Family: Challenges] [Sales evolution - Family: Market]  
No memos

2008 (Year end 2009)

- African strategy: grow the business through the increase in productivity of existing assets.  
Pp. 48
- Growth of African business pp. 49

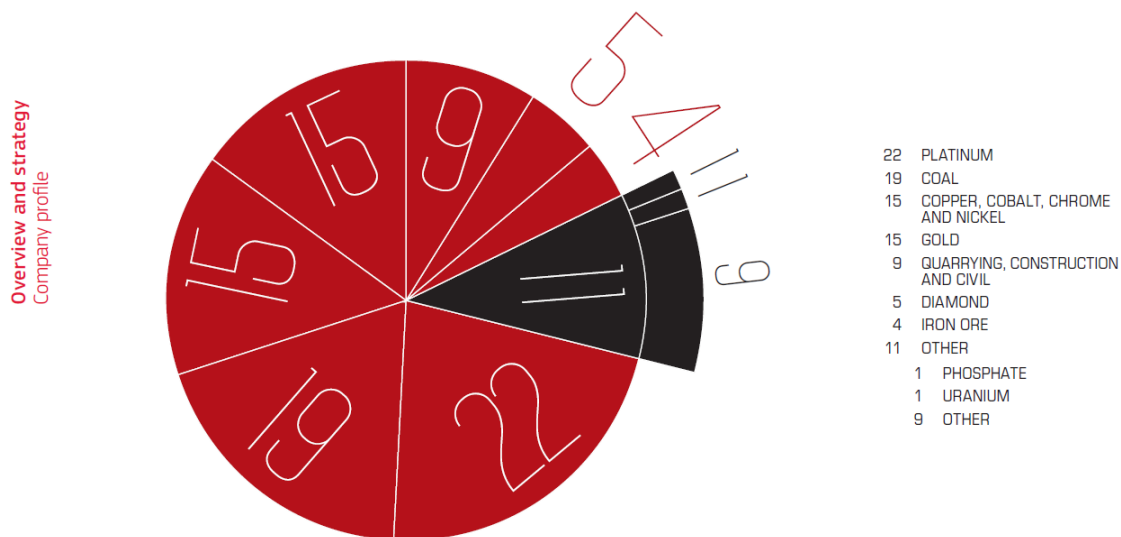
- Delivery of growth in copper and cobalt sector in Central Africa (Lumwana project) as anticipated in 2007 pp. 53.
- Production in the DRC from investments made in 2007. Pp. 53
- Focus on logistics and new channels to improve and maintain efficiencies in existing markets. Pp. 53

**P 3: Notes Annual reports.docx - 3:6 [2012 (Year end 2013) - New pla..] (65:76) (Super)**

Codes: [Capital - Family: Investment] [Contracts - Family: Market] [Innovation - Family: Generic Strategies] [Logistics challenge - Family: Challenges] [Margins - Family: Market] [Strategy efficiency - Family: Profitability]  
No memos

2012 (Year end 2013)

2012 GROUP MINING REVENUE BY MINERAL MINED (%)



- New plants built in Burkina Faso, Egypt and DRC
- Plants are expected to be operational in 2013.
- Growth in 2012 was achieved by growth in Africa and Indonesia.
- However margins dropped to 6.8% from 9.3% in 2011. The main cause was the supply chain disruptions and strikes in South Africa.
- AEL well positioned to capture growth in 2013. Pp. 45
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- Completion of ISAP Project pp. 58

**P 3: Notes Annual reports.docx - 3:9 ["In the case of explosives con..] (95:99) (Super)**

Codes: [Competition - Family: Market] [Contracts - Family: Market] [Logistics challenge - Family: Challenges] [Margins - Family: Market] [Prices] [Profit - Family: Profitability] [Raw material costs - Family: Market]  
No memos

"In the case of explosives contracts, following the disappointing margins posted last year, contracts were re-negotiated in the early part of the year under review. However, steep increases in raw material prices necessitated yet another series of negotiations in terms of which prices are now

adjusted on a monthly, rather than quarterly, basis. These re-negotiated price increases were only completed in the last quarter. This will return margins to acceptable levels in the explosives segment of the business. Re-negotiated transport contracts will also” help to alleviate pressure on the bottom line. “

- High cost of transport
- Raw material costs

**P 3: Notes Annual reports.docx - 3:34 [Future strategy pp. 79 Growth ..] (263:271) (Super)**

Codes: [Competition - Family: Market] [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Growth - Family: Market] [Logistics challenge - Family: Challenges]

No memos

Future strategy pp. 79

Growth experienced in Africa mining is expected to continue, but at lower rates than the past two years. Mining activity will also intensify through increased stripping ratios as mines become deeper. Growing competitor activity is expected to put pressure on volume growth and operating margins.

Key macro and performance drivers affecting the Outlook Global demand for commodities

Infrastructure development in Africa improving the accessibility of mines to railway and ports

South African mining and labour environment

#### 4. Code Family: Market

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Created: 2015-01-10 21:45:43 (Super)  
Codes (7): [Competition] [Contracts] [Growth] [Margins] [Market share] [Raw material costs] [Sales evolution]  
Quotation(s): 48

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High market share as AEL is the first mover; however with other players moving in AEL has lost some market share.

**P 2: Interview summary by list.docx - 2:8 [Sales are going down due to co..] (5:5) (Super)**

Codes: [Competition - Family: Market] [Sales evolution - Family: Market]  
No memos

Sales are going down due to competition Ghana, Burkina Faso, Zambia. More explosives companies interested in Africa. AEL's strategy is appropriate to respond to competition as it is a low capital strategy as it expands from existing operations.

**P 2: Interview summary by list.docx - 2:19 [AEL's strategy has been a succ..] (20:20) (Super)**

Codes: [Building facilities - Family: Local environment] [Competition - Family: Market] [Criteria to establish a hub - Family: Triple A] [Hub model - Family: Triple A] [Strategy efficiency - Family: Profitability]  
No memos

AEL's strategy has been a success as despite BME's intend to follow the African growth and Orica and Sasol slow starts AEL still has a substantial advantage in terms of sales into Africa. Revenue has grown as well as market share. However due to 1st mover advantage initial market share was 100% however AEL still holds a dominant position. Based on African success AEL will replicate the same strategy in South America. Opposition has attempted to copy AEL by establishing plants in different countries; BME has established plants and companies in different countries such as Mauritania and Mali. However those countries are independent and the model does not seem to be as efficient as AEL. Sasol rather exports directly through representatives.

**P 2: Interview summary by list.docx - 2:20 [Market shares are maintained a..] (21:21) (Super)**

Codes: [Market share - Family: Market] [Sales evolution - Family: Market]  
No memos

Market shares are maintained and revenues are growing with a high percentage of sales coming from Africa.

**P 2: Interview summary by list.docx - 2:27 [Retain existing customers by m..] (35:36) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Mining Groups - Family: Other parameters] [Sales evolution - Family: Market]  
No memos

Retain existing customers by meeting their needs. Hub model however less focus since. Seems to be the predominantly the main strategy.

AEL's current strategy is to retain existing business and expand into new territories. The company is currently holding its positions in DR Congo and Zambia as the mining activity is linked to the copper

price, expanding in Mozambique and in West Africa there is a need to maintain current customer base and move to countries as per mining companies. AEL sees Africa as a springboard to expand into Africa as a result of the stagnant market in South Africa. Establish relationship in South Africa with companies that have operations in Africa (Exxaro, etc...)

**P 2: Interview summary by list.docx - 2:30 [AEL has not grown mainly due t..] (38:38) (Super)**

Codes: [Gold - Family: Other parameters] [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

AEL has not grown mainly due to the drop in gold price by September 2013. Most of the mines have dropped there off take. AEL has not grown according to forecast in 2013 and 2014 as a result. However countries like Burkina Faso has managed to retain Business in Burkina Faso.

**P 2: Interview summary by list.docx - 2:43 [AEL is currently performing we..] (66:67) (Super)**

Codes: [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

AEL is currently performing well in Africa.

Sales seem to be growing.

**P 2: Interview summary by list.docx - 2:46 [AEL 'strategy is to provide qu..] (78:80) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Profit - Family: Profitability] [Sales evolution - Family: Market] [Strategy improvement - Family: Other parameters]

No memos

AEL 'strategy is to provide quality products and services, tight controls of costs and use AEL's values to make the difference Courage confidence and care. AEL needs to identification of areas of focus.

The objective of AEL is a double digit trading profit to sales by and Africa is part of the global company achievement.

AEL is halfway and should keep the leading role in Africa as for instance in Mali despite the fact that AEL was the first on the market Maxam and BME have managed to establish operations in country. This is the same story in Mauritania and Guinea. AEL is vulnerable as competition is prepared to put assets on the ground before the signing of agreements.

**P 2: Interview summary by list.docx - 2:47 [AEL faces the challenges of lo..] (82:83) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Competition - Family: Market] [Financial impact of challenges - Family: Profitability] [Innovation - Family: Generic Strategies]

No memos

AEL faces the challenges of local regulations; loss of skills in West Africa to competition, AEL needs to develop as well language skills to adapt to markets. AEL's offering unable to meet drilling needs as the focus seems only to be on blasting.

These measures challenges if not managed will result in financial losses and business losses as well.

**P 2: Interview summary by list.docx - 2:49 [Financial measures the strateg..] (87:89) (Super)**

Codes: [Competition - Family: Market] [Criteria to establish a hub - Family: Triple A] [Market research] [Strategy improvement - Family: Other parameters]

No memos

Financial measures

The strategy should include a provision to service underground mines. AEL should develop a clear assessment for each country of the level of risk, regulation and prospective partners. AEL needs to have a deep understanding of its competitors and the work should be done prior to the establishment of hubs.

Yes AEL should assess these aspects prior to the establishment of operations.

**P 2: Interview summary by list.docx - 2:51 [AEL is performing poorly in SA..] (93:94) (Super)**

Codes: [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

AEL is performing poorly in SA however is growing in Africa from a volume perspective.

Volumes seem to be growing in Africa unlike South Africa.

**P 2: Interview summary by list.docx - 2:57 [Margins seem to be increasing ..] (105:106) (Super)**

Codes: [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

Margins seem to be increasing in Africa.

Volumes seem to be doing well.

**P 3: Notes Annual reports.docx - 3:1 [2007 (Year end 2008) - Growth ..] (39:45) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Capital - Family: Investment] [Gold - Family: Other parameters] [Innovation - Family: Generic Strategies] [Sales evolution - Family: Market]

No memos

2007 (Year end 2008)

- Growth in export market pp. 38 due to East and West Africa operations.
  - o Signing of new contracts in DRC and Zambia and investment of 42 million Rands in production facilities. Pp. 40
  - o Growth in West Africa and investment in a second bulk plant in Tarkwa.
  - o First sales in Burkina Faso. Pp.40
- Growth in sales of electronic detonators pp. 38
- Investment in shock tube capability. Pp.38 and pp.41.

**P 3: Notes Annual reports.docx - 3:2 [2008 (Year end 2009) - African..] (46:51) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Capital - Family: Investment] [Copper - Family: Other parameters] [Logistics challenge - Family: Challenges] [Sales evolution - Family: Market]

No memos

2008 (Year end 2009)

- African strategy: grow the business through the increase in productivity of existing assets. Pp. 48
- Growth of African business pp. 49

- Delivery of growth in copper and cobalt sector in Central Africa (Lumwana project) as anticipated in 2007 pp. 53.
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- Focus on logistics and new channels to improve and maintain efficiencies in existing markets. Pp. 53

**P 3: Notes Annual reports.docx - 3:4 [2010 (Year end 2011) Explosive..] (55:57) (Super)**

Codes: [Currency fluctuation - Family: Other parameters] [Growth - Family: Market] [Sales evolution - Family: Market]

No memos

2010 (Year end 2011)

Explosives volumes +13% due to foreign expansion and African growth

- Foreign sales +23,5% in rand terms 6.0 % (39% in US\$) largely due to improved explosives volumes outside of SA. (Financial presentation 2011 pp. 12)

**P 3: Notes Annual reports.docx - 3:5 [2011 (Year end 2012) The Compa..] (59:63) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Business development - Family: Actual strategies] [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Growth - Family: Market] [Market research]

No memos

2011 (Year end 2012)

The Company's vision is underpinned by four strategic pillars pertaining to a globally competitive cost base, world-class technology, value-adding customer-centric service, and excellence and professionalism in all areas of activity. Growth is achieved organically and via acquisitions. Pp.15

In Africa, market development initiatives continued with new prospects identified and pursued in North and West Africa and in Mozambique. Pp. 55

Pleasing growth was achieved in Africa, primarily in West Africa's gold mining sector. The business in Central Africa grew steadily as a result of good demand for copper. The performance in East Africa, where some market share was lost, was less buoyant. (Pp. 5 Financial Results presentation)

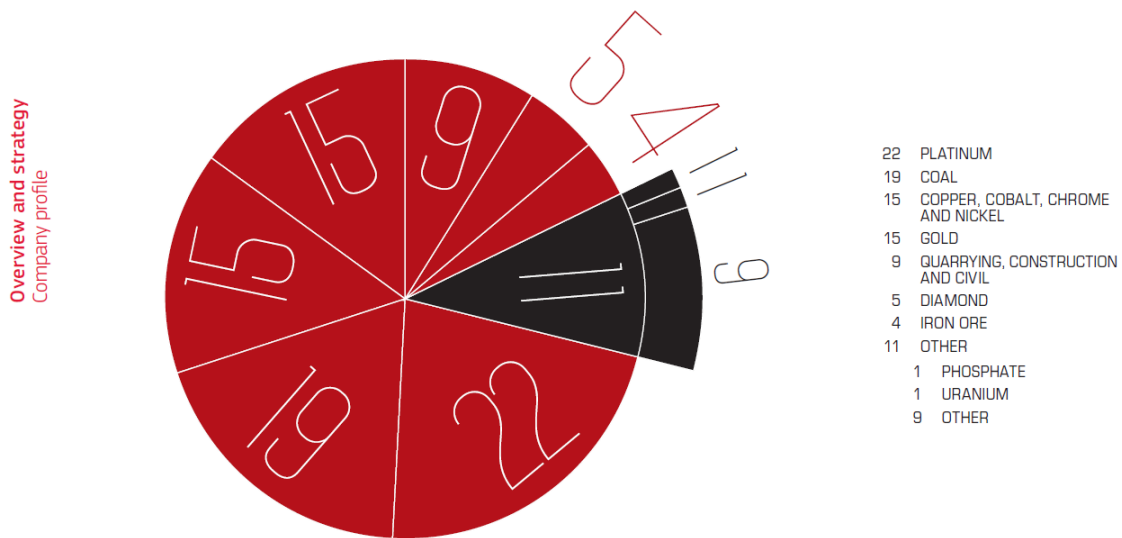
**P 3: Notes Annual reports.docx - 3:6 [2012 (Year end 2013) - New pla..] (65:76) (Super)**

Codes: [Capital - Family: Investment] [Contracts - Family: Market] [Innovation - Family: Generic Strategies] [Logistics challenge - Family: Challenges] [Margins - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

2012 (Year end 2013)

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- AEL well positioned to capture growth in 2013. Pp. 45
- Further investments were done on customer sites.
- New supply contracts pp. 58
- Completion of ISAP Project pp. 58

**P 3: Notes Annual reports.docx - 3:7 [2013 (Year end 2014) - AEL ben..] (79:82) (Super)**

Codes: [Contracts - Family: Market] [Currency fluctuation - Family: Other parameters] [Growth - Family: Market]

No memos

2013 (Year end 2014)

- AEL benefited from a weakening Rand and growth of South African volumes. As 50% of the revenues are generated outside of South Africa. Pp. 42.
- Explosives growth in Africa was 5.4% with the signing of existing contracts and the commissioning of new plants.

**P 3: Notes Annual reports.docx - 3:8 [2007 (yearend 2008) Reasons fo..] (86:94) (Super)**

Codes: [Competition - Family: Market] [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Sales evolution - Family: Market]

No memos

2007 (yearend 2008) Reasons for increase in sales:

“In the six months to mid-March 2008, gold climbed 9,5% to over \$1 000/oz., platinum surged 47% in the same period and copper hit a record high of \$4/lb.” pp. 4

In 2007, copper prices on the London Metal Exchange shot to record highs of about \$8 000 per ton from an average of \$1 200 six years ago in what is considered the biggest base-metal bull market in 50 years, fuelled by strong demand from China and India.”

(Annual report 2008 BME) pp. 9

- Impact on West Africa sales
- Mauritania (Kinross sales Mauritania)
- Copper prices impact on Zambia sales.

**P 3: Notes Annual reports.docx - 3:9 [“In the case of explosives con..] (95:99) (Super)**

Codes: [Competition - Family: Market] [Contracts - Family: Market] [Logistics challenge - Family: Challenges] [Margins - Family: Market] [Prices] [Profit - Family: Profitability] [Raw material costs - Family: Market]

No memos

“In the case of explosives contracts, following the disappointing margins posted last year, contracts were re-negotiated in the early part of the year under review. However, steep increases in raw material prices necessitated yet another series of negotiations in terms of which prices are now adjusted on a monthly, rather than quarterly, basis. These re-negotiated price increases were only completed in the last quarter. This will return margins to acceptable levels in the explosives segment of the business. Re-negotiated transport contracts will also” help to alleviate pressure on the bottom line. “

- High cost of transport
- Raw material costs

**P 3: Notes Annual reports.docx - 3:10 [“The global technical skills s..] (101:104) (Super)**

Codes: [Competition - Family: Market] [Differentiation - Family: Generic Strategies] [Innovation - Family: Generic Strategies] [Local skill availability - Family: Local environment] [Value added services - Family: Generic Strategies]

No memos

“The global technical skills shortage, while presenting its own internal challenges, holds significant opportunity for the Mining division as customers increasingly look for added value in the form of technical advice, support and sophisticated products such as BlastMap® blast planning and management software, as well as ‘mine to mill’ solutions. The division will continue to enhance its value proposition to customers by broadening its range of value-added offerings.” PP 14

- Technical people shortage
- Differentiation by value added projects

**P 3: Notes Annual reports.docx - 3:11 [“We had some major successes w..] (106:108) (Super)**

Codes: [Competition - Family: Market] [Innovation - Family: Generic Strategies]

No memos

“We had some major successes with EDDs, including a world record blast using in excess of 3 000 EDDs – significant in world terms (detailed on page 22). The benefits of using EDDs lie in their accuracy and their computerised blast design, which enables better control of vibrations, fly rock, air blast and noise, as well as promoting pit wall stability, significantly containing rock movement and enhancing fragment control, leading to less ore dilution. EDDs have significant safety advantages over conventional electric and pyrotechnic detonators.”

- Focus on new technology with EDD

**P 3: Notes Annual reports.docx - 3:12 [2008 (year end 2009) Annual re..] (110:122) (Super)**

Codes: [Adaptation model - Family: Triple A] [Capital - Family: Investment] [Competition - Family: Market] [Growth - Family: Market] [Prices]

No memos

2008 (year end 2009) Annual report

PP. 2

**GROUP AT A GLANCE**



BME's presence in 13 countries.

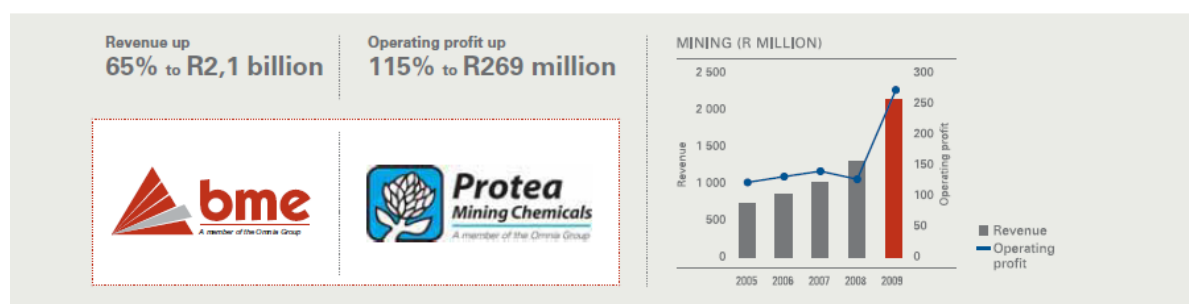
"The Africa opportunity pp.7" (Opportunity for 2009)

- Albeit at slower rates, Africa continues to show solid growth in the face of the global economic crisis, offering attractive opportunities for long-term investment.
- The investment climate and prospects for growth in many African economies continue to improve as economic reform gains momentum across the continent.
- In combination, these factors offer good opportunities for businesses seeking new avenues for expansion.

**P 3: Notes Annual reports.docx - 3:13 [[Picture-Object]] (129:129) (Super)**

Codes: [Growth - Family: Market]

No memos



**P 3: Notes Annual reports.docx - 3:15 [2009 (yearend 2010) PP. 34 · V..] (131:141) (Super)**

Codes: [Competition - Family: Market] [Copper - Family: Other parameters] [Currency fluctuation - Family: Other parameters] [Gold - Family: Other parameters] [Growth - Family: Market] [Prices]  
No memos

2009 (yearend 2010)

Metal commodity price history



PP. 34

- Volumes dropped by 16%
- Prices were reduced
- Strong rand
- Global recession thus less demand for commodities thus affecting mine production.

**P 3: Notes Annual reports.docx - 3:16 [BME will continue to focus on ..] (154:160) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Competition - Family: Market] [Value added services - Family: Generic Strategies]  
No memos

BME will continue to focus on opportunities in the mining sector in South Africa, the rest of southern Africa and West Africa

Protea Mining Chemicals will continue to focus on its Protea Process offering and is looking to expand its offerings beyond southern Africa to the rest of Africa

Safety remains a top priority due to the moral obligation to our people and their families and it being the only sustainable way to conduct our business

Be a dedicated customer-focused organisation that creates value for customers through advanced technical support and quality, reliable and accurate products and software

**P 3: Notes Annual reports.docx - 3:17 [Develop and train our people t..] (162:162) (Super)**

Codes: [Competition - Family: Market] [Local skill availability - Family: Local environment]  
No memos

Develop and train our people to enable and empower them with the expertise to provide and develop specialised products and services to our customers

**P 3: Notes Annual reports.docx - 3:18 [BME continued to grow in South..] (164:164) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Contracts - Family: Market]  
No memos

BME continued to grow in South Africa and the rest of Africa through retaining its existing customers and renewing contracts, while also being awarded numerous new contracts.

**P 3: Notes Annual reports.docx - 3:19 [ME continues to provide strong..] (166:166) (Super)**

Codes: [Competition - Family: Market] [Value added services - Family: Generic Strategies]  
No memos

ME continues to provide strong on-site technical support to customers, who benefit from class-leading blast results from the accuracy of AXXIS™ electronic delay detonators combined with AxxiSoft™ blasting software.

**P 3: Notes Annual reports.docx - 3:20 [BME's focus on developing our ..] (168:170) (Super)**

Codes: [Competition - Family: Market] [Local skill availability - Family: Local environment]  
No memos

BME's focus on developing our people is evident by improved training statistics throughout its operations. This is supported by the establishing of the BME Surface Training Centre, which was accredited by the MQA (Mine Qualifications Authority) to support safety and technical training.

**P 3: Notes Annual reports.docx - 3:21 [BME experienced an exceptional..] (174:176) (Super)**

Codes: [Competition - Family: Market] [Contracts - Family: Market] [Gold - Family: Other parameters]  
No memos

BME experienced an exceptional year with good volume growth following the continued global recovery in most mining commodity sectors.

The surface mining sector in southern and West Africa was exceptionally rewarding in the second half of the year, with several major customers substantially increasing their production.

**P 3: Notes Annual reports.docx - 3:22 [Opportunities for 2012 pp. 79 ..] (178:184) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Competition - Family: Market] [Growth - Family: Market] [Innovation - Family: Generic Strategies] [Value added services - Family: Generic Strategies]  
No memos

Opportunities for 2012 pp. 79

The key opportunities for growth are:

Increase business with existing and potential customers engaged in unlocking Africa's vast mineral resources

Increased demand from customers to enhance safety and productivity through the application of technical expertise in advanced blasting, with the support of AXXIS™ electronic delay detonators and advanced blasting software such as BlastMap™ and AxxiSoft™.

**P 3: Notes Annual reports.docx - 3:23 [2012 (Year end 2013) Company n..] (186:195) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Capital - Family: Investment] [Competition - Family: Market] [Growth - Family: Market] [Product range - Family: Generic Strategies]  
No memos

2012 (Year end 2013)

Company new strategy PP. 26

The Group is committed to delivering and possibly exceeding its target for this five year planning cycle of a compound 8% real growth rate in profit. Some of the actions taken in this regard are:

- Commissioning of the new nitric acid complex in March 2012
- Expansion of the Mining division's activities in Africa (Explosives contribution to group strategy)
- Expanding BME's product range (Explosives contribution to group strategy)
- Investment in expanding delivery capability in the potable water market

**P 3: Notes Annual reports.docx - 3:24 [Market conditions pp. 75 - Str..] (197:204) (Super)**

Codes: [Competition - Family: Market] [Contracts - Family: Market] [Copper - Family: Other parameters] [Currency fluctuation - Family: Other parameters] [Gold - Family: Other parameters] [Raw material costs - Family: Market] [South African market]  
No memos

Market conditions pp. 75

- Strong demand in mining commodity and mineral markets throughout Africa.
- Increased mining activity in Africa outside of South Africa, mainly in brownfield expansion rather than new Greenfield operations.
- Weaker South African rand supported the export business and foreign earnings
- High ammonia price increased sales prices
- softening of uranium prices causing closure or deferral of some mines and projects
- South African underground mining market shrunk mainly due to increased strike activity, putting marginal mines under severe pressure.

**P 3: Notes Annual reports.docx - 3:25 [Operational highlights • A sig..] (206:213) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Competition - Family: Market] [Growth - Family: Market] [Raw material costs - Family: Market] [Sales evolution - Family: Market]  
No memos

**Operational highlights**

- A significant improvement in safety as a result of increased focus on training and management controls
- Volumes up 24% – strong volume growth in mining explosives sales in South Africa's surface market and the rest of Africa and in mining chemicals, especially in exports to Central Africa
- Good AXXIS™ electronic delay detonator sales
- Reduction in volumes sold to South African underground mining sector due to impact of labour unrest
- Roll out of BME's own emulsifier range throughout the rest of Africa's manufacturing facilities.

**P 3: Notes Annual reports.docx - 3:26 [Current strategy - BME will co..] (215:224) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Competition - Family: Market] [Innovation - Family: Generic Strategies] [Local skill availability - Family: Local environment] [Product range - Family: Generic Strategies] [Value added services - Family: Generic Strategies]  
No memos

## Current strategy

- BME will continue to focus on opportunities in the mining sector in South Africa, the rest of southern Africa and West Africa
- Safety remains a top priority as a moral obligation to our people and their families. It is the only sustainable way to conduct our business
- Be a dedicated customer-focused organisation that creates value for customers through advanced technical
- Support and quality, reliable and accurate products, software and process innovation
- Develop and train our people to enable and empower them with the expertise to provide and develop specialised products and services to our customers.

### **P 3: Notes Annual reports.docx - 3:27 [Strategy BME continued to grow..] (228:232) (Super)**

Codes: [BME Strategy - Family: Actual strategies] [Competition - Family: Market] [Differentiation - Family: Generic Strategies] [Innovation - Family: Generic Strategies] [Value added services - Family: Generic Strategies]  
No memos

## Strategy

BME continued to grow in South Africa and the rest of Africa through retaining its existing customers and renewing contracts, while also being awarded numerous new contracts.

BME continues to provide strong on-site technical support to customers, who benefit from class-leading blast results from the accuracy of AXXIS™ electronic delay detonators combined with AxxiSoft™ blasting software. We established the BME Surface Training Centre, accredited by the MQA (Mine Qualifications Authority) to provide safety and technical training. Our focus on developing our people is evidenced by improved training statistics throughout our operations.

### **P 3: Notes Annual reports.docx - 3:28 [BME pp. 77 BME experienced an ..] (234:238) (Super)**

Codes: [Competition - Family: Market] [Growth - Family: Market] [Sales evolution - Family: Market]  
No memos

## BME pp. 77

BME experienced an exceptional year with good volume growth following the continued global recovery in most mining commodity sectors. The surface mining sector in southern and West Africa was exceptionally rewarding.

in the second half of the year, with several large customers substantially increasing their production.

### **P 3: Notes Annual reports.docx - 3:29 [Volumes of BME's own-developed..] (239:244) (Super)**

Codes: [Competition - Family: Market] [Innovation - Family: Generic Strategies] [Product range - Family: Generic Strategies] [Raw material costs - Family: Market] [Value added services - Family: Generic Strategies]  
No memos

Volumes of BME's own-developed AXXIS™ electronic delay detonators were good, as the product is rolled out to markets outside of South Africa.

BME widened the distribution of its own Viper™ and Hornet™ booster range to surface and underground mines across Africa.

BME's own developed emulsifier range was rolled out to all our emulsion manufacturing plants in Africa. Substantial progress was made with further developing emulsion explosives technology for various surfaces

and underground applications. BME continued with its well established practice of adding used oil into the manufacturing of emulsion, which generates significant environmental and economic benefits.

**P 3: Notes Annual reports.docx - 3:30 [BME has increased its in-house..] (246:246) (Super)**

Codes: [Capital - Family: Investment] [Competition - Family: Market]

No memos

BME has increased its in-house capacity to build emulsion and heavy ANFO delivery vehicles that are used in BME's operations throughout Africa to deliver down-the-hole product to the mine sites.

**P 3: Notes Annual reports.docx - 3:31 [BME pp 78 The strong growth ex..] (250:251) (Super)**

Codes: [Competition - Family: Market] [Growth - Family: Market] [Mining Groups - Family: Other parameters] [Sales evolution - Family: Market]

No memos

**BME pp 78**

The strong growth experienced in Africa mining is expected to continue, with greater mining activity as well as increased stripping ratios as mines become deeper. Several newly acquired contracts are also expected to reach their full production capacity next year, with a positive effect on sales volumes.

**P 3: Notes Annual reports.docx - 3:32 [Increased demand from customer..] (255:255) (Super)**

Codes: [Competition - Family: Market] [Innovation - Family: Generic Strategies] [Product range - Family: Generic Strategies] [Value added services - Family: Generic Strategies]

No memos

Increased demand from customers to enhance safety and productivity through the application of technical expertise in advanced blasting, with the support of AXXIS™ electronic delay detonators and advanced blasting software such as BlastMap™ and AxxiSoft™.

**P 3: Notes Annual reports.docx - 3:33 [2013 (Year end 2014) pp.78 BME..] (257:259) (Super)**

Codes: [Competition - Family: Market] [Gold - Family: Other parameters] [Growth - Family: Market]

No memos

2013 (Year end 2014) pp.78

BME experienced a good year with good volume growth despite a cautious mining industry and reduced mining activity in a number of sectors, especially gold. The surface mining sector in southern Africa remained strong, but a reduction in demand was experienced at some operations in West Africa.

**P 3: Notes Annual reports.docx - 3:34 [Future strategy pp. 79 Growth ..] (263:271) (Super)**

Codes: [Competition - Family: Market] [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Growth - Family: Market] [Logistics challenge - Family: Challenges]

No memos

Future strategy pp. 79

Growth experienced in Africa mining is expected to continue, but at lower rates than the past two years. Mining activity will also intensify through increased stripping ratios as mines become deeper. Growing competitor activity is expected to put pressure on volume growth and operating margins.

Key macro and performance drivers affecting the Outlook Global demand for commodities

Infrastructure development in Africa improving the accessibility of mines to railway and ports

South African mining and labour environment

**P 3: Notes Annual reports.docx - 3:35 [Ammonia price Rand exchange ra..] (275:277) (Super)**

Codes: [Competition - Family: Market] [Currency fluctuation - Family: Other parameters] [Raw material costs - Family: Market]  
No memos

Ammonia price

Rand exchange rate.

**P 3: Notes Annual reports.docx - 3:36 [Strategy to be followed the cu..] (279:283) (Super)**

Codes: [Competition - Family: Market] [Growth - Family: Market] [Mining Groups - Family: Other parameters]  
No memos

Strategy to be followed the current strategy will be continued and the key opportunities for growth are:

Increased business with existing and potential customers engaged in unlocking Africa's vast mineral resources

Growing optimism that global demand on sustainable and base load energy will start to recover over the next year.

**P 3: Notes Annual reports.docx - 3:38 [Challenges to achieving this s..] (292:296) (Super)**

Codes: [Competition - Family: Market] [Innovation - Family: Generic Strategies] [Local skill availability - Family: Local environment] [Value added services - Family: Generic Strategies]  
No memos

Challenges to achieving this strategy

Significant new product and process developments, supported by strong in-field technical and operational resources, have catalysed new industry thinking.

Further provision of skills and on-site reagent dosing technology will have to be developed in line with the trend of smaller reagent plant footprints, in-line dosing systems and reduced water consumption.

## 5. Code Family: Profitability

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Created: 2015-01-10 21:46:29 (Super)  
Codes (3): [Financial impact of challenges] [Profit] [Strategy efficiency]  
Quotation(s): 18

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### **P 2: Interview summary by list.docx - 2:5 [The first mover advantage coul..] (4:4) (Super)**

Codes: [Strategy efficiency - Family: Profitability]  
No memos

The first mover advantage could result in negative consequences for the retention of the contract as AEL is perceived as having taken advantage of high prices in the initial period.

### **P 2: Interview summary by list.docx - 2:6 [The strategy does not seem to ..] (4:4) (Super)**

Codes: [Strategy efficiency - Family: Profitability]  
No memos

The strategy does not seem to be formulated and the key questions seem to be when to establish the hub and when to expand from the hub. The strategy seems to be efficient as expanding from South Africa base to Burkina Faso or DR Congo would have increased the risk profile of the region and the decision could have not been made on time. Moves are made more difficult example Cameroon when the establishment of a presence is driven by AEL South Africa.

### **P 2: Interview summary by list.docx - 2:19 [AEL's strategy has been a succ..] (20:20) (Super)**

Codes: [Building facilities - Family: Local environment] [Competition - Family: Market] [Criteria to establish a hub - Family: Triple A] [Hub model - Family: Triple A] [Strategy efficiency - Family: Profitability]  
No memos

AEL's strategy has been a success as despite BME's intend to follow the African growth and Orica and Sasol slow starts AEL still has a substantial advantage in terms of sales into Africa. Revenue has grown as well as market share. However due to 1st mover advantage initial market share was 100% however AEL still holds a dominant position. Based on African success AEL will replicate the same strategy in South America. Opposition has attempted to copy AEL by establishing plants in different countries; BME has established plants and companies in different countries such as Mauritania and Mali. However those countries are independent and the model does not seem to be as efficient as AEL. Sasol rather exports directly through representatives.

### **P 2: Interview summary by list.docx - 2:24 [Yes all these issues have a fi..] (25:25) (Super)**

Codes: [Financial impact of challenges - Family: Profitability]  
No memos

Yes all these issues have a financial implication.

### **P 2: Interview summary by list.docx - 2:30 [AEL has not grown mainly due t..] (38:38) (Super)**

Codes: [Gold - Family: Other parameters] [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]  
No memos

AEL has not grown mainly due to the drop in gold price by September 2013. Most of the mines have

dropped there off take. AEL has not grown according to forecast in 2013 and 2014 as a result. However countries like Burkina Faso has managed to retain Business in Burkina Faso.

**P 2: Interview summary by list.docx - 2:33 [Yes the challenges have a fina..] (40:40) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Financial impact of challenges - Family: Profitability]  
No memos

Yes the challenges have a financial impact. Mozambique delays of 8 months and Tanzania fined for customs classifications.

**P 2: Interview summary by list.docx - 2:35 [The Model seems to be more a f..] (45:45) (Super)**

Codes: [Strategy efficiency - Family: Profitability] [Strategy improvement - Family: Other parameters]  
No memos

The Model seems to be more a financial model without long term benefits. Framework is set around financial targets. Decisions made based on the basis of returns and project viability.

**P 2: Interview summary by list.docx - 2:41 [The strategy addresses the con..] (58:58) (Super)**

Codes: [Strategy efficiency - Family: Profitability] [Strategy improvement - Family: Other parameters]  
No memos

The strategy addresses the concerns. But is currently been improved as AEL is currently lobbying to lift restriction on class 1 products. However this already been put in place. Main customer been AEL subs there is clear understanding of the import procedures and process and grouping is been processed.

**P 2: Interview summary by list.docx - 2:43 [AEL is currently performing we..] (66:67) (Super)**

Codes: [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]  
No memos

AEL is currently performing well in Africa.

Sales seem to be growing.

**P 2: Interview summary by list.docx - 2:44 [AEL is facing the following ch..] (68:73) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Challenges Africa - Families (2): Challenges, Local environment] [Financial impact of challenges - Family: Profitability] [Logistics challenge - Family: Challenges]  
No memos

AEL is facing the following challenges

- 1) Quality issues could cause loss of business and money.
- 2) Logistics.
- 3) Distance to customers
- 4) Differences in banking systems.

The above mentioned challenges have a financial impact if not managed properly; Example Loss of business due to late delivery.

**P 2: Interview summary by list.docx - 2:46 [AEL 'strategy is to provide qu..] (78:80) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Profit - Family: Profitability] [Sales evolution - Family: Market] [Strategy improvement - Family: Other parameters]  
No memos

AEL 'strategy is to provide quality products and services, tight controls of costs and use AEL's values to make the difference Courage confidence and care. AEL needs to identification of areas of focus.

The objective of AEL is a double digit trading profit to sales by and Africa is part of the global company achievement.

AEL is halfway and should keep the leading role in Africa as for instance in Mali despite the fact that AEL was the first on the market Maxam and BME have managed to establish operations in country. This is the same story in Mauritania and Guinea. AEL is vulnerable as competition is prepared to put assets on the ground before the signing of agreements.

**P 2: Interview summary by list.docx - 2:47 [AEL faces the challenges of lo..] (82:83) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Competition - Family: Market] [Financial impact of challenges - Family: Profitability] [Innovation - Family: Generic Strategies]

No memos

AEL faces the challenges of local regulations; loss of skills in West Africa to competition, AEL needs to develop as well language skills to adapt to markets. AEL's offering unable to meet drilling needs as the focus seems only to be on blasting.

These measures challenges if not managed will result in financial losses and business losses as well.

**P 2: Interview summary by list.docx - 2:51 [AEL is performing poorly in SA..] (93:94) (Super)**

Codes: [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

AEL is performing poorly in SA however is growing in Africa from a volume perspective.

Volumes seem to be growing in Africa unlike South Africa.

**P 2: Interview summary by list.docx - 2:57 [Margins seem to be increasing ..] (105:106) (Super)**

Codes: [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

Margins seem to be increasing in Africa.

Volumes seem to be doing well.

**P 2: Interview summary by list.docx - 2:59 [Impact of tax issues are high ..] (108:108) (Super)**

Codes: [Financial impact of challenges - Family: Profitability]

No memos

Impact of tax issues are high as well as understanding local legislation.

**P 2: Interview summary by list.docx - 2:60 [AEL's strategy is globally eff..] (115:116) (Super)**

Codes: [Strategy efficiency - Family: Profitability]

No memos

AEL's strategy is globally efficient it depends on the people implementing it.

These concerns should be anticipated.

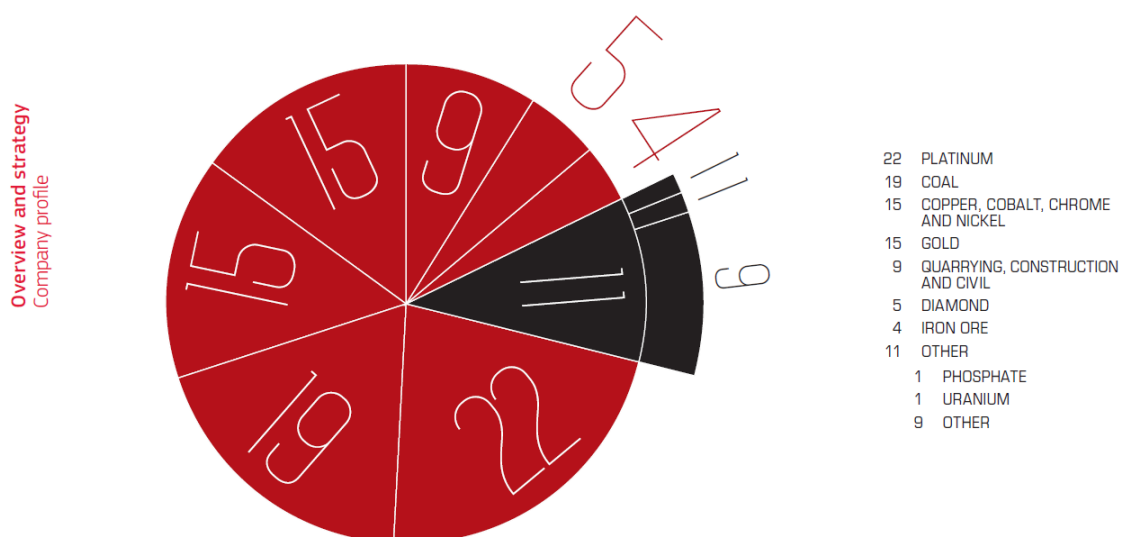
**P 3: Notes Annual reports.docx - 3:6 [2012 (Year end 2013) - New pla..] (65:76) (Super)**

Codes: [Capital - Family: Investment] [Contracts - Family: Market] [Innovation - Family: Generic Strategies] [Logistics challenge - Family: Challenges] [Margins - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

2012 (Year end 2013)

2012 GROUP MINING REVENUE BY MINERAL MINED (%)



- New plants built in Burkina Faso, Egypt and DRC
- Plants are expected to be operational in 2013.
- Growth in 2012 was achieved by growth in Africa and Indonesia.
- However margins dropped to 6.8% from 9.3% in 2011. The main cause was the supply chain disruptions and strikes in South Africa.
- AEL well positioned to capture growth in 2013. Pp. 45
- Further investments were done on customer sites.
- New supply contracts pp. 58
- Completion of ISAP Project pp. 58

**P 3: Notes Annual reports.docx - 3:9 ["In the case of explosives con..] (95:99) (Super)**

Codes: [Competition - Family: Market] [Contracts - Family: Market] [Logistics challenge - Family: Challenges] [Margins - Family: Market] [Prices] [Profit - Family: Profitability] [Raw material costs - Family: Market]  
No memos

"In the case of explosives contracts, following the disappointing margins posted last year, contracts were re-negotiated in the early part of the year under review. However, steep increases in raw material prices necessitated yet another series of negotiations in terms of which prices are now adjusted on a monthly, rather than quarterly, basis. These re-negotiated price increases were only completed in the last quarter. This will return margins to acceptable levels in the explosives segment of the business. Re-negotiated transport contracts will also" help to alleviate pressure on the bottom line. "

- High cost of transport
- Raw material costs

## 6. Code Family: Other parameters

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Codes (6): [Copper] [Currency fluctuation] [Gold] [Iron ore] [Mining Groups] [Strategy improvement]  
Quotation(s): 37

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### **P 2: Interview summary by list.docx - 2:1 [AEL tends to follow existing m..] (2:2) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Mining Groups - Family: Other parameters]  
No memos

AEL tends to follow existing mining companies into Africa seeking for opportunities.

### **P 2: Interview summary by list.docx - 2:13 [The hub strategy addresses par..] (10:10) (Super)**

Codes: [Hub model - Family: Triple A] [Market research] [Strategy improvement - Family: Other parameters]  
No memos

The hub strategy addresses partially these concerns although some pre work needs to be done in order to discover local competences, service maintenance availability. From a logistics point a view there is a need to find in country logistics routes. Such skills need to be included in the structure in order to be able to understand the issues.

### **P 2: Interview summary by list.docx - 2:15 [AEL's strategy should as well ..] (15:16) (Super)**

Codes: [Administrative constraints - Family: Local environment] [Strategy improvement - Family: Other parameters]  
No memos

AEL's strategy should as well on building relationships with mining houses, enhance its capacity to deploy faster in new markets, formulation of a clear plan that takes into account the challenges anticipate change and not react to it.

AEL should have a plan for to anticipate these issues upfront as they impact on the activities in new markets.

### **P 2: Interview summary by list.docx - 2:27 [Retain existing customers by m..] (35:36) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Mining Groups - Family: Other parameters] [Sales evolution - Family: Market]  
No memos

Retain existing customers by meeting their needs. Hub model however less focus since. Seems to be the predominantly the main strategy.

AEL's current strategy is to retain existing business and expand into new territories. The company is currently holding its positions in DR Congo and Zambia as the mining activity is linked to the copper price, expanding in Mozambique and in West Africa there is a need to maintain current customer base and move to countries as per mining companies. AEL sees Africa as a springboard to expand into Africa as a result of the stagnant market in South Africa. Establish relationship in South Africa with companies that have operations in Africa (Exxaro, etc...)

**P 2: Interview summary by list.docx - 2:28 [AEL has performed well but not..] (37:37) (Super)**

Codes: [Innovation - Family: Generic Strategies] [Iron ore - Family: Other parameters] [Strategy improvement - Family: Other parameters]

No memos

AEL has performed well but not in sectors like copper and not won a contract in the iron ore sector. AEL will need to develop a value proposition to supply to iron ore mines. Perhaps enforce more a market segmentation by minerals.

**P 2: Interview summary by list.docx - 2:29 [AEL's current strategy is to r..] (36:36) (Super)**

Codes: [Copper - Family: Other parameters]

No memos

AEL's current strategy is to retain existing business and expand into new territories. The company is currently holding its positions in DR Congo and Zambia as the mining activity is linked to the copper price, expanding in Mozambique and in West Africa there is a need to maintain current customer base and move to countries as per mining companies. AEL sees Africa as a springboard to expand into Africa as a result of the stagnant market in South Africa. Establish relationship in South Africa with companies that have operations in Africa (Exxaro, etc...)

**P 2: Interview summary by list.docx - 2:30 [AEL has not grown mainly due t..] (38:38) (Super)**

Codes: [Gold - Family: Other parameters] [Sales evolution - Family: Market] [Strategy efficiency - Family: Profitability]

No memos

AEL has not grown mainly due to the drop in gold price by September 2013. Most of the mines have dropped there off take. AEL has not grown according to forecast in 2013 and 2014 as a result. However countries like Burkina Faso has managed to retain Business in Burkina Faso.

**P 2: Interview summary by list.docx - 2:31 [People challenge, need to deve..] (39:39) (Super)**

Codes: [Language and culture - Family: Local environment] [Local skill availability - Family: Local environment] [Strategy improvement - Family: Other parameters]

No memos

People challenge, need to develop local engineers, need to retain competent engineers, development of local skills, develop people in a pipeline, development of language skills, development of local management

**P 2: Interview summary by list.docx - 2:32 [Capital availability, the cape..] (39:39) (Super)**

Codes: [Strategy improvement - Family: Other parameters]

No memos

Capital availability, the capex approval system is long. AEL's model is to wait for a signed contract for Capex approval as BME works differently. 3) Local management to understand local conditions. 4) Shipping and logistics. 4) Understanding of local legislation.

**P 2: Interview summary by list.docx - 2:35 [The Model seems to be more a f..] (45:45) (Super)**

Codes: [Strategy efficiency - Family: Profitability] [Strategy improvement - Family: Other parameters]

No memos

The Model seems to be more a financial model without long term benefits. Framework is set around financial targets. Decisions made based on the basis of returns and project viability.

**P 2: Interview summary by list.docx - 2:36 [The hub system should be more ..] (46:46) (Super)**

Codes: [Criteria to establish a hub - Family: Triple A] [Hub model - Family: Triple A] [Strategy improvement - Family: Other parameters]

No memos

The hub system should be more dynamic as the decision for a spoke to become a hub could take time and could result in a loss of an opportunity for AEL. Example the setup of plant construction only happened in 2013. AEL should transform spokes in hubs diligently. The strategy addresses the challenges faced by the market, as the hubs are responsible for the implementation of the strategy. Business development should be able to identify issues before. The strategy could be improved if it was developed in subs and not from a South African perspective. There should be a framework to develop beforehand issues to be addressed before hand.

**P 2: Interview summary by list.docx - 2:37 [These issues should be identif..] (47:47) (Super)**

Codes: [Strategy improvement - Family: Other parameters]

No memos

These issues should be identified beforehand.

**P 2: Interview summary by list.docx - 2:41 [The strategy addresses the con..] (58:58) (Super)**

Codes: [Strategy efficiency - Family: Profitability] [Strategy improvement - Family: Other parameters]

No memos

The strategy addresses the concerns. But is currently been improved as AEL is currently lobbying to lift restriction on class 1 products. However this already been put in place. Main customer been AEL subs there is clear understanding of the import procedures and process and grouping is been processed.

**P 2: Interview summary by list.docx - 2:42 [Pursue mining operations in Af..] (64:65) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Innovation - Family: Generic Strategies] [Mining Groups - Family: Other parameters] [Value added services - Family: Generic Strategies]

No memos

Pursue mining operations in Africa and seize growth opportunities in Africa and transfer knowledge into Africa. The idea is to transfer knowledge acquired in Africa to the hubs outside of South Africa to seize the African potential.

Understand market, needs, grow with the customers and establish collaboration with mines, develop value added projects, understand local legislations further understand the competitive environment through alliance with other customers and benchmark to competition sourcing and logistics. AEL intends as well to differentiate through service differentiation. AEL is gives centralized technical services from AEL South Africa as well as sales of electronic detonators

**P 2: Interview summary by list.docx - 2:45 [The strategy is not shared and..] (74:77) (Super)**

Codes: [Strategy communication] [Strategy improvement - Family: Other parameters]

No memos

The strategy is not shared and has not been communicated clearly to everybody.

The strategy seems to be applied however it lacks leadership as performances are not measured against it.

Difficult to measure as it is not formulated no measures are in place to measure progress. The strategy is not efficient as there is a fire fighting attitude.

AEL does not address these issues but rather reacts to them.

**P 2: Interview summary by list.docx - 2:46 [AEL 'strategy is to provide qu..] (78:80) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Profit - Family: Profitability] [Sales evolution - Family: Market] [Strategy improvement - Family: Other parameters]

No memos

AEL 'strategy is to provide quality products and services, tight controls of costs and use AEL's values to make the difference Courage confidence and care. AEL needs to identification of areas of focus.

The objective of AEL is a double digit trading profit to sales by and Africa is part of the global company achievement.

AEL is halfway and should keep the leading role in Africa as for instance in Mali despite the fact that AEL was the first on the market Maxam and BME have managed to establish operations in country. This is the same story in Mauritania and Guinea. AEL is vulnerable as competition is prepared to put assets on the ground before the signing of agreements.

**P 2: Interview summary by list.docx - 2:48 [The strategy is not applied as..] (86:86) (Super)**

Codes: [Strategy improvement - Family: Other parameters]

No memos

The strategy is not applied as there is no anticipation.

**P 2: Interview summary by list.docx - 2:49 [Financial measures the strategy..] (87:89) (Super)**

Codes: [Competition - Family: Market] [Criteria to establish a hub - Family: Triple A] [Market research] [Strategy improvement - Family: Other parameters]

No memos

Financial measures

The strategy should include a provision to service underground mines. AEL should develop a clear assessment for each country of the level of risk, regulation and prospective partners. AEL needs to have a deep understanding of its competitors and the work should be done prior to the establishment of hubs.

Yes AEL should assess these aspects prior to the establishment of operations.

**P 2: Interview summary by list.docx - 2:54 [Differentiation through electr..] (99:99) (Super)**

Codes: [Differentiation - Family: Generic Strategies] [Innovation - Family: Generic Strategies] [Mining Groups - Family: Other parameters]

No memos

Differentiation through electronic detonators and value added services. The new strategy is moving from a territorial segmentation to minerals segmentation.

**P 2: Interview summary by list.docx - 2:55 [The change in strategy to key ..] (100:100) (Super)**

Codes: [Challenges Africa - Families (2): Challenges, Local environment] [Mining Groups - Family: Other parameters]

No memos

The change in strategy to key accounts (Mining companies) is in conflict with territory management.

**P 3: Notes Annual reports.docx - 3:1 [2007 (Year end 2008) - Growth ..] (39:45) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Capital - Family: Investment] [Gold - Family: Other parameters] [Innovation - Family: Generic Strategies] [Sales evolution - Family: Market]

No memos

2007 (Year end 2008)

- Growth in export market pp. 38 due to East and West Africa operations.

- Signing of new contracts in DRC and Zambia and investment of 42 million Rands in production facilities. Pp. 40
- Growth in West Africa and investment in a second bulk plant in Tarkwa.
- First sales in Burkina Faso. Pp.40
- Growth in sales of electronic detonators pp. 38
- Investment in shock tube capability. Pp.38 and pp.41.

**P 3: Notes Annual reports.docx - 3:2 [2008 (Year end 2009) - African..] (46:51) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Capital - Family: Investment] [Copper - Family: Other parameters] [Logistics challenge - Family: Challenges] [Sales evolution - Family: Market]

No memos

2008 (Year end 2009)

- African strategy: grow the business through the increase in productivity of existing assets. Pp. 48
- Growth of African business pp. 49
- Delivery of growth in copper and cobalt sector in Central Africa (Lumwana project) as anticipated in 2007 pp. 53.
- Production in the DRC from investments made in 2007. Pp. 53
- Focus on logistics and new channels to improve and maintain efficiencies in existing markets. Pp. 53

**P 3: Notes Annual reports.docx - 3:3 [2009 (Year end 2010) - Lower pr..] (52:54) (Super)**

Codes: [Copper - Family: Other parameters] [Currency fluctuation - Family: Other parameters]

No memos

2009 (Year end 2010)

- Lower prices of copper pp. 48
- Strong rand pp. 48

**P 3: Notes Annual reports.docx - 3:4 [2010 (Year end 2011) Explosive..] (55:57) (Super)**

Codes: [Currency fluctuation - Family: Other parameters] [Growth - Family: Market] [Sales evolution - Family: Market]

No memos

2010 (Year end 2011)

Explosives volumes +13% due to foreign expansion and African growth

- Foreign sales +23,5% in rand terms 6.0 % (39% in US\$) largely due to improved explosives volumes outside of SA. (Financial presentation 2011 pp. 12)

**P 3: Notes Annual reports.docx - 3:5 [2011 (Year end 2012) The Compa..] (59:63) (Super)**

Codes: [AEL strategy - Family: Actual strategies] [Business development - Family: Actual strategies] [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Growth - Family: Market] [Market research]

No memos

2011 (Year end 2012)

The Company's vision is underpinned by four strategic pillars pertaining to a globally competitive cost base, world-class technology, value-adding customer-centric service, and excellence and professionalism in all areas of activity. Growth is achieved organically and via acquisitions. Pp.15

In Africa, market development initiatives continued with new prospects identified and pursued in North and West Africa and in Mozambique. Pp. 55

Plausible growth was achieved in Africa, primarily in West Africa's gold mining sector. The business in Central Africa grew steadily as a result of good demand for copper. The performance in East Africa, where some market share was lost, was less buoyant. (Pp. 5 Financial Results presentation)

**P 3: Notes Annual reports.docx - 3:7 [2013 (Year end 2014) - AEL ben..] (79:82) (Super)**

Codes: [Contracts - Family: Market] [Currency fluctuation - Family: Other parameters] [Growth - Family: Market]

No memos

2013 (Year end 2014)

- AEL benefited from a weakening Rand and growth of South African volumes. As 50% of the revenues are generated outside of South Africa. Pp. 42.
- Explosives growth in Africa was 5.4% with the signing of existing contracts and the commissioning of new plants.

**P 3: Notes Annual reports.docx - 3:8 [2007 (yearend 2008) Reasons fo..] (86:94) (Super)**

Codes: [Competition - Family: Market] [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Sales evolution - Family: Market]

No memos

2007 (yearend 2008) Reasons for increase in sales:

"In the six months to mid-March 2008, gold climbed 9,5% to over \$1 000/oz., platinum surged 47% in the same period and copper hit a record high of \$4/lb." pp. 4

In 2007, copper prices on the London Metal Exchange shot to record highs of about \$8 000 per ton from an average of \$1 200 six years ago in what is considered the biggest base-metal bull market in 50 years, fuelled by strong demand from China and India."

(Annual report 2008 BME) pp. 9

- Impact on West Africa sales
- Mauritania (Kinross sales Mauritania)
- Copper prices impact on Zambia sales.

**P 3: Notes Annual reports.docx - 3:14 [[Picture-Object]] (133:133) (Super)**

Codes: [Copper - Family: Other parameters] [Gold - Family: Other parameters]

No memos

Metal commodity price history



**P 3: Notes Annual reports.docx - 3:15 [2009 (yearend 2010) PP. 34 · V..] (131:141) (Super)**

Codes: [Competition - Family: Market] [Copper - Family: Other parameters] [Currency fluctuation - Family: Other parameters] [Gold - Family: Other parameters] [Growth - Family: Market] [Prices]

No memos

**2009 (yearend 2010)**

Metal commodity price history



**PP. 34**

- Volumes dropped by 16%
- Prices were reduced
- Strong rand
- Global recession thus less demand for commodities thus affecting mine production.

**P 3: Notes Annual reports.docx - 3:21 [BME experienced an exceptional..] (174:176) (Super)**

Codes: [Competition - Family: Market] [Contracts - Family: Market] [Gold - Family: Other parameters]

No memos

BME experienced an exceptional year with good volume growth following the continued global recovery in most mining commodity sectors.

The surface mining sector in southern and West Africa was exceptionally rewarding in the second half of the year, with several major customers substantially increasing their production.

**P 3: Notes Annual reports.docx - 3:24 [Market conditions pp. 75 - Str..] (197:204) (Super)**

Codes: [Competition - Family: Market] [Contracts - Family: Market] [Copper - Family: Other parameters] [Currency fluctuation - Family: Other parameters] [Gold - Family: Other parameters] [Raw material costs - Family: Market] [South African market]  
No memos

Market conditions pp. 75

- Strong demand in mining commodity and mineral markets throughout Africa.
- Increased mining activity in Africa outside of South Africa, mainly in brownfield expansion rather than new Greenfield operations.
- Weaker South African rand supported the export business and foreign earnings
- High ammonia price increased sales prices
- softening of uranium prices causing closure or deferral of some mines and projects
- South African underground mining market shrunk mainly due to increased strike activity, putting marginal mines under severe pressure.

**P 3: Notes Annual reports.docx - 3:31 [BME pp. 78 The strong growth ex..] (250:251) (Super)**

Codes: [Competition - Family: Market] [Growth - Family: Market] [Mining Groups - Family: Other parameters] [Sales evolution - Family: Market]  
No memos

**BME pp 78**

The strong growth experienced in Africa mining is expected to continue, with greater mining activity as well as increased stripping ratios as mines become deeper. Several newly acquired contracts are also expected to reach their full production capacity next year, with a positive effect on sales volumes.

**P 3: Notes Annual reports.docx - 3:33 [2013 (Year end 2014) pp.78 BME..] (257:259) (Super)**

Codes: [Competition - Family: Market] [Gold - Family: Other parameters] [Growth - Family: Market]  
No memos

2013 (Year end 2014) pp.78

BME experienced a good year with good volume growth despite a cautious mining industry and reduced mining activity in a number of sectors, especially gold. The surface mining sector in southern Africa remained strong, but a reduction in demand was experienced at some operations in West Africa.

**P 3: Notes Annual reports.docx - 3:34 [Future strategy pp. 79 Growth ..] (263:271) (Super)**

Codes: [Competition - Family: Market] [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Growth - Family: Market] [Logistics challenge - Family: Challenges]  
No memos

Future strategy pp. 79

Growth experienced in Africa mining is expected to continue, but at lower rates than the past two years. Mining activity will also intensify through increased stripping ratios as mines become deeper. Growing competitor activity is expected to put pressure on volume growth and operating margins.

Key macro and performance drivers affecting the Outlook Global demand for commodities

Infrastructure development in Africa improving the accessibility of mines to railway and ports

South African mining and labour environment

**P 3: Notes Annual reports.docx - 3:35 [Ammonia price Rand exchange ra..] (275:277) (Super)**

Codes: [Competition - Family: Market] [Currency fluctuation - Family: Other parameters] [Raw material costs - Family: Market]  
No memos

Ammonia price

Rand exchange rate.

**P 3: Notes Annual reports.docx - 3:36 [Strategy to be followed the cu..] (279:283) (Super)**

Codes: [Competition - Family: Market] [Growth - Family: Market] [Mining Groups - Family: Other parameters]  
No memos

Strategy to be followed the current strategy will be continued and the key opportunities for growth are:

Increased business with existing and potential customers engaged in unlocking Africa's vast mineral resources

Growing optimism that global demand on sustainable and base load energy will start to recover over the next year.

**P 3: Notes Annual reports.docx - 3:37 [The development of new gold mi..] (290:290) (Super)**

Codes: [Copper - Family: Other parameters] [Gold - Family: Other parameters] [Mining Groups - Family: Other parameters]  
No memos

The development of new gold mines in West and east Africa, and the resurgence in demand for copper from the central African copper belt will provide further growth avenues.