

Review

Aditya Birla's Alexandria Carbon Black operation: Global strategies for global markets

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Accepted 06 December, 2017

The Alexandria Carbon Black Case Study examined initial and continuing investment in petrochemical manufacturing facilities in Egypt by an Indian multinational. The case brought together the various aspects of global strategy, cultural issues, social responsibility and developing world companies' success in displacing current producers with operational strategies that include new plants, adherence to ISO standards, increased response to customer needs and attention to just in time warehousing close to customers. The case also shows how corporate, SBU and functional strategies at newly global Indian companies like Aditya Birla are having a huge impact on entrenched producers providing huge new opportunities in low growth businesses. Questions such as developing local staff, new ideas for increasing production, strategies for continuing growth and how to continue to grow the Alexandria Carbon Black business globally as the business model is recognized and duplicated by competitors in Eastern Europe and China are highlighted by the case.

Key words: Global strategies in basic industries, international finance, social responsibility, growth in basic industries, Cross cultural management.

INTRODUCTION

This is a case study of Alexandria Carbon Black, a company controlled by Aditya Birla Group of India (2005 revenues, USD 8.3B), using published reports and interviews with Alexandria Carbon Black staff and international agencies. Aditya Birla has been pursuing a strategy of consolidating basic industries globally since 1980. Aditya Birla's strategy is to use new facilities financed at lower than market rates by international development organizations, employ the latest management techniques, use local skilled labor in meeting special customer needs to gain customer loyalty and develop both economies of scale and scope using focused centralized management and global strategies to grow and dominate basic industries. That strategy was evident in the development of Alexandria Carbon Black and is described in this case study.

Aditya Birla established a Thai carbon black plant in 1980, another plant in Uttar Pradesh, India in 1988 and in 1994; Alexandria Carbon Black was brought online in Alexandria, Egypt. Azko Noble Gas of Indonesia and a Chinese plant was purchased in 2003 bringing total group carbon black production to 660, 000 mt/year with individual

company production summarized in Table 1. Production at the plants in India, China, Thailand and Indonesia make Aditya Birla the fourth largest carbon black producer in the world (Economist, 2006a). Carbon black is a hydrocarbon based industrial chemical additive and is used for tires, paints, dyes, inks and conveyor belts.

Alexandria Carbon Black (controlled by Aditya Birla but with shared ownership) is the largest private chemical company exporter in Egypt with over \$120M in exports each year (International Finance Company, 2007). Alexandria Carbon Black Company SAE (ACB) supplies carbon black (as a reinforcement agent for automobile and truck tires) and began production in 1994 with 20,000 metric tons per year (mt/yr) of capacity. Alexandria Carbon Black SAE (ACB) was originally conceived to supply carbon black to two Egyptian tire producers, Alexandria Tire Company ("ATC") and Trencos. However, slower than expected demand in the local market caused the Company to shift focus to export markets and ACB undertook a market development effort with the major tire producers in Europe. This effort, along with a continuous improvement of ACB's technical performance, enabled

Table 1. Aditya Birla group production capacity 2006.

Company	Production (metric tons per annum)	Location
Aditya BirlaNuvo Ltd.	170,000	India
Thai Carbon Black Company	200,000	Thailand
Alexandria Carbon Black, S. A. E.	212,000	Egypt
Liaoning Aditya BirlaCarbon Black Company	50,000	China
Azko Noble Gas	40,000	Indonesia

ACB to earn numerous international awards and become a fully accredited supplier to all major tire companies thus shifting to a mostly export strategy (Karadsheh, 2007). Early on, the Company understood the value of international quality and environmental requirements in orders to access export markets. Today ACB is Egypt's top exporter of chemicals as well as the largest exporter of carbon black from a single location, exporting 95% of its total production. It is also an established international player whose products have been certified by the world's major tire companies.

ACB has been recognized by the International Finance Corporation as well as by the Egyptian Government as a company that has been able to strengthen its position, both financially and socially, through its commitment to sustainable development. The Prime Minister of Egypt, together with his cabinet colleagues, have, in the past, conducted an investors' conference at the ACB Plant in order to provide an example of how success can be obtained with a commitment to sustainability. In addition, CEOs of a number of public and private sector Egyptian companies have met with ACB management in order to understand the best practices adopted by ACB, and learn ways in which such practices can be replicated (Karadsheh, 2007). Successive production efficiency improvements have increased ACB capacity from 33,000 mt/year in 1996 to 192,000 mt/year in 2006. In 1996, the Company began construction of a second production line, which was completed in July 1997. Within six weeks of completion, the new line was operating at full capacity with all of the new production being sold to export markets (primarily Mediterranean rim tire producers). In 1998, the first full year of operation with the second line, ACB's total annual carbon black sales stood at over 71,000 mt/year, 84% of which was sold to export markets. Carbon Black subsequently started the construction of a third production line in 1998 and completed it in July 1999, which increased its nameplate capacity to 110,000 Mt/yr, a 40% CAGR over 5 years.

ACB reached the 1st position in global ranking production at a single location from 9th position at the start-up of this last upgrade (Harlow, 2005; The American University in Cairo, Personal communication). Subsequent production increases, including an upgrade in 2005 to 2006, have increased capacity to approximately 192,000 Mt/yr. Currently, ACB exports 95% of its capacity to markets in Europe, Africa and the Middle East

(Karadsheh, 2007). Global tire manufacturing customers include Michelin, Bridgestone-Firestone, Pirelli, Dunlop and Yokohama (International Finance Corporation, 2007). Approximately 5% of total production is sold in Egypt, primarily to the adjacent Pirelli licensed tire plant in Alexandria. ACB is now completing an expansion project to bring the plant's nominal capacity from 192,000 mt/year to over 200,000 mt/year by the end of 2006 (Alexandria Carbon Black, 2007). Current ACB revenues (2006) exceed 700 million LE (Al-Shobaky, 2007). Initial ACB investment funding was from International Finance Corporation (IFC) which is the private sector financing arm of the World Bank. One of IFC's primary goals is to reduce poverty in developing countries by providing financing at attractive rates to stimulate sustainable development and investment in developing countries. The rates obtained in this financing were considerably below market rates for comparable risk investments and contained an evaluation of the plant's impact on the local economy, job creation and the environment to assure that the IFC social responsibility goals were met. ACB has a higher production with fewer production trains than any other carbon black manufacturer due to a unique engineering solution in their process that doubles the size of key drier equipment while maintaining the length of the production train. This enables them to claim to be the world's most efficient producer of carbon black.

Aditya Birla Group of India is the largest ACB shareholder. Aditya Birla's holdings are held by its two operating companies-Grasm and Indo Bharat Rayon hold a total of 56% (Chemical Week, 2000). The remaining shareholders are: Apicorp (12%), a regional investment Company; IFC(10%), Seic (8%) a joint venture Company of Egypt and Saudi Arabia, Concarb (4%) ACB's technical partner and Censor and El Nasr Coke Company (4%), the local supplier of anthracene oil feedstock to ACB and ATL(2%), a producer of tires trucks 83% owned by Pirelli of Italy. Figure 1 depicts the stockholdings in percentage of total. The parent company, Aditya Birla Group of India, is the third largest Indian business group (Sinha, 2005) and controls companies which manufacture carbon black, aluminum, cement, VSF and copper. Aditya Birla Group's holding company controls three operating companies, Indian Rayon and Industries Limited and Grassy Industries Limited and Hindalco Industries Limited. Two of these companies operate in basic chemicals with Grassy manufacturing products such as cement

Alexandria Carbon Black Executive Team

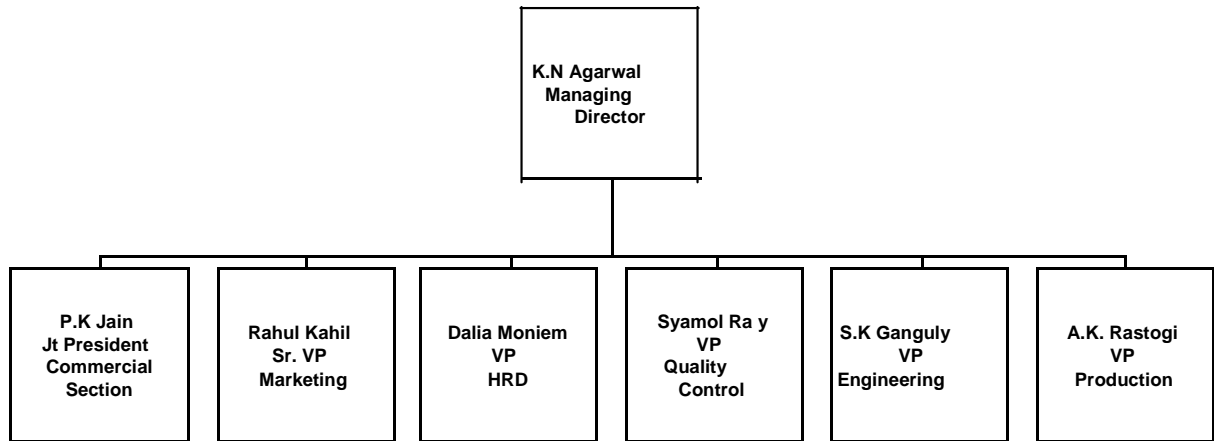


Figure 1. ACB Executive team.

such as cement and Viscose Stable Fiber (VSF) and Indian Rayon manufacturing carbon black and other chemicals. Hindalco has taken its business toward opportunities across the value chain from metals to marketing and selling finished products. Hindalco experienced very strong revenue growth and is the most profitable of the three operating groups (582 crore profits after taxes). Global market penetration for carbon black (4th largest producer), cement (25% of the largest producer's production), copper (17.5% of the largest producer's production) and alumina (less than 10% of Alcoa's production) (Sinha, 2005) make Aditya Birla Group a solid but not truly a global player in key markets it serves.

Growth in the Aditya Birla Group from 1995 to 2004 was almost fourfold under the leadership of its CEO, Kumar M. Aditya Birla (Sinha, 2005). Mr. Birla inherited control of the Aditya Birla Group after the death of his father in 1995 but had very little top management experience at the time of his succession. Nonetheless, Mr. Aditya Birla has become one of the "new Indian business Maharajahs" in the words of the Indian press (Piramel, 2005). A recent article (Economist, 2007b) quotes Mr. Birla as saying, "There's a new India emerging...there is a new found respect that India commands in the global arena". Among his innovations at Aditya Birla Group are reducing the retirement age of top managers to 58 (bringing average age down to 40), investments in sunrise businesses such as branded apparel, telecom, insurance, software development, asset based financing and consulting and allowing managers a greater degree of autonomy. The group has recently begun specific advertising on BBC World satellite broadcasts for its SunLife Insurance business targeting the underserved Indian market. Global business strategy for Carbon Black is developed in strategy sessions held in India twice per year (Harlow, 2005; The

American University in Cairo, Personal communication) Under K.M. Birla, consolidation and M&A activities are the main strategic thrust for the Aditya Birla Group's businesses. This is in sharp contrast to the management of Aditya Birla prior to 1995 when greenfield expansion and diversification were the main strategies.

As summarized previously, growth in Aditya Birla's carbon black manufacturing capacities continued with Birla's purchase of Liaoning Carbon (China) and Azko Noble Gas (Indonesia) in 2003 (This added production targeted growing markets in Southeast Asia and India and doubled the Aditya Birla Group's market share to over 6% of the global total (Sinha, 2005). The ACB plant at Alexandria was used as a knowledge resource to install management systems and upgrade plant efficiencies at these two new operations thus enabling fast upgrade for these facilities to ACB standards. Both the operations are certified ISO 9002 for quality management systems; QS 9000 for advanced quality management, ISO 14001 for environment management and OHSAH 18001 for occupational health and safety. In addition, at Gummidipoondi the coveted Deming Award for Quality (2002) was conferred on the carbon black unit by the Deming Prize Committee (JOSE), Japan. Top management at ACB is Indian with the exception of the Human Resources and Development vice president, Ms. Dalia Moniem, who is Egyptian. The ACB managing director is K.N. Agarwal and he reports to the Indian Rayon and Industries Limited operating company of Aditya Birla Group and ultimately to Kumar M. Birla. Six vice presidents report to Mr. Agarwal in functional areas (engineering, human resources, quality control, marketing, commercial and production). Mr. P.K Jain is joint president of the commercial section with Mr. Rahul Kohli the marketing Senior Vice President. ACB middle management ranks are primarily Indian staff with 10 of the 15 management positions Indian ex-patriots.

ALEXANDRIA CARBON BLACK: CAPITAL STRUCTURE AND INVESTMENT DECISION MATRIX

ACB financed Carbon Black project with 62.5% debt from IFC and 37.5% equity from its stockholders in the first stage of financing in 1993. Subsequently, the project incurred additional financing needs for plant and capacity expansion, which was primarily met with additional debt. ACB received a tax reprieve from the Egyptian government for the first 5 years of operations. Egyptian law also allows; "specific incentives of 10 years are granted to projects in new industrial zones, certain urban communities, remote areas and Social Fund for Development projects. The subsequent tax rate would be 34%". The total initial financial value of the project was \$41 million. The value of the debt at inception was \$25 million and the value of the equity was \$15 million, bringing the total enterprise value to \$40 million. This value was calculated using the IFC projections at project inception.

This value includes the net present value (NPV) of the cash flows and the present value of the interest tax shield. At the time of the investment, the IFC considered the investment to be a positive NPV project based on no additional expansion activities that would require additional equity or debt facilities. Thus, it met the financial criterion for the IFC to consider an equity investment or loan. The decision to expand the project in order to generate additional cash flows represents growth option value that was not incorporated in the value since the nature of the expansion was not clear in 1992.

Financial risk and Islamic finance

Currency fluctuations and revaluation of the Egyptian pound were factors in this investment but subsequent devaluation of the Egyptian pound made the investment more attractive than planned since Carbon Black's customer paid in Euros or dollars and the operational costs of labor were in pounds. Raw materials from the USA were purchased with dollars and the appreciation of the Euro relative to the dollar makes this expense less costly. The rules governing Islamic finance were thought to add additional constraints to the project since Egypt's population consists of approximately 90% Muslims and 10% Christians. ACB project managers and the IFC discovered that Islamic Finance was not prominent in Egypt at the time of the financing and did not apply to the project.

Market risk

Alexandria Carbon Black's products require stringent and prolonged processes for approval of grades before commercial delivery to the customers. In order to mitigate the market risk, ACB proactively procured raw material

that it would use. ACB had the final product manufactured from the technology supplier, and then ACB had the product approved from the customers long before the start-up of the plant. Preproduction marketing resulted in the project's achieving 125% capacity utilization in the first year. ACB might have reduced market risk further by arranging pre-production sale agreements of Carbon Black to customers. Price risk of Carbon Black fluctuates as a typical commodity and is tied to regional and global demand for tires and automobile manufacture. ACB sells Carbon Black to over 30 countries, creating a diversified customer base and preventing risks associated with few buyers. However, major tire customers in Europe command the majority of production and this risk could be mitigated by diversification into other markets and to sales to other customers. Most of the customers are in Europe, the Middle East and USA and a portion of Carbon Black output is supplied locally to meet the entire local demand.

Political risks

The key risks that IFC faced as a capital provider were incorporated into sovereign risk. The risk of expropriation of assets by the Egyptian government was important given the limited history with IFC project finance in Egypt and the track record of the country during the early 1950's. This was a concern at the time due diligence was conducted in 1992. Subsequently, expropriation risk was reduced with the passage of an Egyptian expropriation prevention law. Egyptian law further (section AI, Law 8 of 1997) provides guarantees against nationalization or confiscation of investment projects under the law's domain. The law guarantees against seizure, requisition, blocking, and placing under custody or sequestration. It also offers guarantees against full or partial expropriation of real estate and investment project property. The U.S.-Egypt Bilateral Investment Treaty also provides protection against development project expropriation (Hussain, and Polad, 2003).

Initial project completion risk

Completion risk is always a concern with capital-intensive projects in both emerging and developed markets. The close integration of capital provisions with contractors' demands and unscheduled delays is a key variable that capital providers need to consider as part of the risk faced by ACB. Based on the data gathered, ACB faced completion risk as a genuine risk to the project sponsors and debt providers, but no completion delays prevented the plants from running as scheduled. The plant was completed early, and it thus, contributed to the cash flows generated to pay down the debt.

Table 2. Global carbon black market growth- Actual and forecast (1996-2006) (Harvard Business School, 2003).

Market demand (Thousand metric tons)/year)	1996	2001	2006	Growth % (1996 to 2001)	Growth % (2002 to 2006)
World Carbon Black Demand	6450	7270	8620	2.4	3.5
Tire & Tire Components	4333	4940	5670	2.7	2.8
Non-Tire Components	1698	1850	2380	1.7	5.2
Special Blacks	1996	2001	2006	2.8	3.5

Force majeure

Force Majeure, or Acts of God, includes risks which cannot be diversified or hedged. These risks require insurance to mitigate their effects from unexpected weather problems, geo-political tensions and regional wars, global market recessions, etc. ACB placed insurance contracts on the project to mitigate these risks but further information on insurance contracts that mitigate the effects of force majeure is unknown.

THE MARKET

Carbon black is used as a reinforcement of rubber, primarily in the production of tires. The consumption for tires alone accounts for more than two thirds of all Carbon Black production. Other uses are for non-tire rubber products, pigments and related industries. The Carbon Black industry is highly concentrated and largely dominated by a few global producers and consumers in Europe, North America and Asia. The global Carbon Black Market is forecast to rise 3.5% per year through 2006 to 8.6 million metric tons (Table 2). However, carbon black demand from the tire sector is projected to increase a below-average 2.8% per year through 2006. On the other hand, the smaller non-tire Carbon Black Market will expand at a much stronger 5.2% per year through 2006, a significant recovery from the poor performance of the past decade. Special blacks will also offer strong gains, although increasing from a relatively low base. While special blacks are a minor segment of the overall Carbon Black market as measured in tonnage, they command considerably higher per-kilogram prices than commodity furnace blacks, and thus will continue to be the focus of research and development activity. In addition to higher margins, a strong position in special blacks offers suppliers greater protection from cyclicity in the rubber and motor vehicle industries.

The North American Carbon Black market is dominated by US firms and has expanded at a pace approaching the global average of 3.5%. Slow growth in other developed parts of the world such as Western Europe and Japan will be more than offset by robust expansions in the Carbon Black markets of developing regions including new plants planned in new EU counties of Eastern Europe. The large markets of China and India will post particularly

impressive gains due to ongoing development of their respective motor vehicle and tire industries. Eastern Europe and Latin America will also post above average gains with ongoing industrial development. Japan will maintain one of the world's largest markets for Carbon Black, although demand will grow at a pace below the global average due to weakness in the country's motor vehicle and rubber industries. Western Europe will hold by far the slowest growth prospects among all major regions, primarily as a result of a stagnant motor vehicle industry. Competition in the market is concentrated in six producers with Cabot Corporation the major producer (25%), Degussa at 13% and Richardson at 12%. Most of the companies are owned by multinational chemical companies with very large parent firms. Cabot Corporation is similar to Aditya Birlain its diversification but relies more on basic chemical products. Cabot Corporation operates as a specialty chemicals and performance materials company. It operates in four segments: the Carbon Black Business, the Metal Oxides Business, the Supermetals Business, and the Specialty Fluids Business. Its business is headquartered in Boston, Massachusetts and has operated since 1895.

In 2002, the global carbon black industry saw a number of crucial developments. Among the most significant is an ongoing investigation of alleged price fixing that began in Western Europe and has since spread to the US. The rubber chemicals industry has also undergone such investigations, and there are strong indications that other rubber-related sectors could be next. In 2002, the European Union also began an investigation into the alleged dumping of Carbon Black into the European market by Alexandria Carbon Black (Egypt) and a number of Russian producers. However, the investigation, which was initiated by the European Commission based on the complaint of European carbon black manufacturers, was not supported by most of the European member states, and thus, the investigation was terminated without imposition of any anti-dumping duty. As of 2005, the charges against Alexandria Carbon Black have resurfaced with a number of European Carbon Black manufacturers complaining that Carbon Black's cost of production and delivery of products was above its price to key European customers and constituted dumping under EU law. This dispute is still unresolved as of October 2006. World carbon black demand is forecast to increase tracking gains in rubber consumption. Aided by

capacity expansions and supply tightness, production of carbon black will expand at a slightly faster rate to match demand in 2002. The carbon black industry experienced a tight supply and demand situation in the mid 1990's. Demand in 1996 was 6.7 million metric tons, with world production lagging demand by 118,000 metric tons as suppliers sold down stockpiles. This shortage was due to a number of factors. First, the global tire industry-tracking global vehicle production-has been in a strong upswing the last several years, and this has caused stronger-than-expected carbon black demand. Also, there were a number of capacity reductions in Western Europe and Japan over the first half of the 1990's due to sluggish demand. Producers have since responded by initiating new expansions and significant new capacity came on stream in 1997, primarily through production efficiency increases coupled with plant expansion (Karadsheh, 2003).

ACB's current production of over 200,000 Mt/year is approximately 2% of the over 9 Million mt/year of current global production (Aditya Birla, 2006). Alexandria Carbon Black (ACB) uses a unique strategy that targets its unsold production to customers in Europe by providing customers depots of carbon black materials at sites close to major customers to enable fast response to customers' production needs. ACB's product strategy includes developing specialty high-grade products that are superior to those of the US and other companies' products offering superior performance qualities that enable their customers to offer higher performance products. Each tire company produces a different mix of carbon black and rubber to meet the needs of its customer's for durability and performance which result from the engineered mix of these two ingredients. Sales of Carbon Black are on a per sale contract basis with renewals based on customer needs, not a firm binding contract. This means that ACB has opportunistically sought out to fill in the needs of tire makers when major European companies could not supply their needs. The European depots enable ACB to respond quickly to customer needs. In addition, ACB uses their low cost chemists' costs in Egypt to develop advanced and special compounds to meet a more diverse set of customer needs than other carbon black companies. With distribution facilities near major producers in Europe, Carbon Black holds sufficient inventory to meet fluctuating demand. This has led to major inroads at tire manufacturers as Carbon Black's competitors have continued to lose ground to Carbon Black.

Research and development and operations

ACB invests heavily in Research and Development (R&D) (over 5% of revenues) to improve its products while also offering customers highest quality TQM and TPM processes for uniformity of production and ultimately

higher quality products. Some of ACB's competitors have ceded certain parts of the market because of unwillingness by diverse parent companies to invest in carbon black research and production improvements. This competitor indifference to the market and low level of competitor investment contributes to ACB's success with their customers by allowing ACB to grab market share using up-to-date facilities and research and development capability as well as a willingness to provide special carbon black mixes.

ACB's chemists in Alexandria develop superior customer specified grade products at lower prices (mainly due to lower wage and operations costs in Egypt) that fulfill special customer needs. ACB's willingness to customize their product mix for their customers has resulted in higher production and demand and even lower costs of manufacture as scale has increased. Operations include the receipt and chemical processing of raw material feedstock from Exxon Mobile tankers that provide the basic bulk chemicals from plants in the Eastern United States. To ensure a continuous operation, ACB inventory levels are kept at sufficient levels to cover two times the crossing times of the tankers. The tankers are constantly monitored for exact location and estimated time of arrival. Shipments of finished stock are on ships to major ports in Europe that are convenient to the plants of ACB customers or to the ACB storage facilities in the United Kingdom and The Netherlands. The plant operates using several internationally recognized quality systems with examples such as ISO9002, ISO14001 and TQS and TPS. This enables ACB to claim superior control over their processes while developing methods to increase productivity and enhance employee safety.

EXTERNAL ENVIRONMENT

Egypt is a developing country with the largest population (77 million) in the Arab world (CIA Factbook, 2007) . It has a moderate income level of purchasing power parity (PPP) of USD 4200/person/year coupled with a 2005 growth rate of 5.9% (US Dept. of Commerce, 2006). Most recently Egypt's growth rate for the third quarter of 2006 reached 7.1% (Economist 2007c). Both consumer prices inflation-12.6%-and unemployment, officially 9.9%, remain high making the overall climate less than optimal (Economist, 2007c). Egypt has a climate for business that is welcoming and most global companies have operations in Egypt. The Economy of Egypt report, as reported by the Central Intelligence Agency (2007), gives a detailed description of the Egyptian economy with facts about production, population, income distribution and other pertinent economic indices. Egypt implemented several measures to boost foreign direct investment in September 2004 including custom reforms, income and corporate tax reforms, reduced energy subsidies, and

privatized several enterprises. The budget deficit rose to an estimated 8% of GDP in 2004 compared to 6.1% of GDP the previous year, in part as a result of these reforms. Monetary pressures on an overvalued Egyptian pound led the government to float the currency in January 2003, leading to a sharp drop in its value and consequent inflationary pressure. In 2004, the Central Bank implemented measures to improve currency liquidity (Central Intelligence Agency, 2007).

Egypt reached record tourism levels, despite the Taba and Nuweiba bombings in September 2004 (Central Intelligence Agency, 2006). The development of an export market for natural gas and oil is a bright spot for future growth prospects due to recent world price explosions, but improvement in the capital-intensive hydrocarbons sector does little to reduce Egypt's persistent unemployment since this sector provides few jobs in either production or exploration and foreign experts provide a large portion of the hydrocarbon labor force. In addition, the gas producers are also hindered by excessive numbers of employees in the non-producing segments of the industry such as GUPCO, the Egyptian national natural gas company. Current account balance is over \$2 billion for the most recent year to date (United States Department of Commerce, 2006) and the currency appears to be undervalued relative to current conditions. A currency valuation closer to 4.4LE/USD has been suggested as possible in the absence of government intervention in the market. Business ownership by foreign companies was recently liberalized with privately owned companies no longer requiring an Egyptian majority or managing director.

Recent elections in Egypt resulted in significant support for conservative Islamists with a more restrained business engagement likely if these parties come to power. This may affect foreign investment if this conservative shift is seen by investors as anti-business or as a destabilizing political influence. The overall influence of Islam on this nominally secular country may be increasing and foreign direct investment businesses may have to adopt more cautious outlooks if this continues. Elections of March, 2007 were designed to implement constitutional reform but the low turnout of 27% indicated that the electorate was not interested in what they increasingly see as an authoritarian regime (Economist, 2007a).

INTERNATIONAL FINANCE CORPORATION SOCIAL RESPONSIBILITY DECISION MATRIX

IFC seeks to invest in private enterprises that offer rewards beyond purely financial goals. Financial criteria are certainly a hurdle, and the ACB investment met this criterion. However, IFC looks for projects that can stimulate the local economy, generate greater benefits for

the host country or demonstrate to other private investors the feasibility of investing in the country. IFC staffer Frank Lysey (1999) addresses the need to measure these additional benefits and to incorporate them into the evaluation of a project. Lysey's paper "Assessing Development Impacts" categorizes the stakeholders that might be affected by an investment according to this model. Each of the constituents in Lysey's model has some direct or indirect benefits and costs from the project. The financiers for example will benefit from the cash flow that accrues to them. The performance is often measured as Internal Rate of Return (IRR), although in the IFC paper this is referred to as Financial Rate of Return (FRR). The aggregate benefits accruing to all the constituents yields another rate, the Economic Rate of Return (ERR). As implied by the name, the ERR accounts for externalities that are not represented in pure financial projections. The IFC stakeholder methodology was used to estimate the social impact of the ACB project. The ERR will be calculated in the next section: Some highlights of the major areas in which ACB contributes to the Egyptian society are:

Benefits to employees

In 1992, the average blue-collar worker in Egypt earned approximately LE 2,600 per annum (equivalent to US\$760) (International Finance Corporation, 2007). This placed Egypt just slightly above the average for the lower-income countries monitored by the UNDP. In addition, the first half of the 1990's saw very high rates of inflation which devastated the real spending power of Egypt's working class. The average consumer-price inflation rate over the decade had fallen from around 14.7% in 1991 to a low of 2.4% in 2000. The unemployment rate in 1995 was officially 11% but most observers thought this underrepresented the true number of both unemployed and underemployed (Hussain and Polad, 2003).

It was against this backdrop that ACB was setting up operations in Egypt in the early 1995. Merely promising stable employment would have been welcomed by the local population. However, ACB went beyond this and treated its 300 employees as part of 'family'.

ACB's human capital management activities can be divided into three categories: compensation, training/process improvement and welfare services. Each of these offered tangible and intangible benefit to the employees. From the outset, ACB has paid its employees above the prevalent shadow wage; the graph below shows the trend in employment and wage levels at ACB over the decade.

ACB also devoted significant resources to training its workers effectively to ensure high product quality and safety. This begins with an induction and evaluation with

Table 3. Wage trends-yearly le salary/blue collar employee (Harvard Business Review, 2003).

Year	1999	2000	2001	2002	2003	2004	2005*
Wage	5315	6523	7744	9379	10228	12493	14774

*Estimated.

tools like Radar Charts, but included regular updates on new skills and procedures. There was also a novel scheme to continuously refresh knowledge through short specific lessons regularly. ISO 90002, OHSAS 18001, TPM, SA8000, TS16949 and QS9000 training and use by employees at ACB created a world class environment for employees motivated to continuously learn and apply the latest systems for quality and management. A summary of some of these activities as well as others is included in a recent interview with IFC's Rana Karadsheh (2007) as follows:

"ACB engages in staff empowerment activities – compensation, incentives, continuous training/ process improvement and welfare services. A strong feedback system is in place such as skill mapping and 360 degree review to establish an ongoing empowerment and recognition of staff as well as channels for productivity improvement. In addition, ACB has been the subject of a number of on-site visits from both local and international universities, for the learning of best practices."

ACB offers its employees a number of welfare benefits that would otherwise not be available to blue collar workers in Egypt. These include medical insurance for the employee and their family, daily attendance of company's doctor for regular check-up, transportation to and from work, assistance in purchasing car or obtaining credit, bonuses and reduced working hours during Muslim holy month of Ramadan and free meals. Table 3 below summarizes the yearly increasing wage trends of ACB blue collar workers. While some of these are tangible benefits with a financial value, many simply act to build a sense of pride amongst the workers and maintain their health and safety. This culture then becomes a model for other Egyptian companies. Thus, ACB has created demonstration effects, which may be difficult to value but are nevertheless real.

In the evaluation of these benefits, we use the actual expenditure on benefits as a proxy for the value. Clearly training may well have a lifetime value to employees or safety measures may never need to be used, but they serve as good starting point in the evaluation as they are concrete minimums (if the training and benefits are well conceived). The IFC's methodology also acknowledges this approach for quantifying benefit of welfare as being reasonable.

Benefits to the community

ACB is an integral part of the local Alexandria community. Through active participation of employees, financial sponsorship and sharing of capabilities, ACB has been able to assist in the local community development. Sample initiatives include regular donations to local charitable/non-profit institutions such as Alexandria Children's Village, participation in community development initiatives such as working with universities or providing summer internships and finally providing medical assistance such as regular blood donation camps or provision of medical equipment to local hospitals.

There are also negative externalities to neighbors arising from ACB operations. In particular, Carbon Black manufacturing is a dirty business emitting SPM, SO₂ and NO_x, which are controlled by the Egyptian Environmental Agency. Research (Southeast Asia Environment Unit of the World Bank, 2002) shows that ACB has been successful in limiting its emissions to below legal requirements. In addition, ACB has worked to reduce absolute emission levels. The current level that is emitted is considered relatively insignificant in terms of measurable impact of human life. For example, it is estimated that an extra µg/m³ in the atmosphere of SO₂ increases the probability of chest discomfort by 0.01%. The negative financial value of this is US\$5018. Given ACB's low emission of SO₂ this results in a small value and so has been ignored from the quantitative valuations.

Environmental category and issues

This is a category B project according to IFC's environmental procedure. Environmental and occupational health and safety issues associated with the Project include air emissions, solid waste management and liquid effluent treatment and discharge. Occupational health and safety issues include exposure to dust, fire safety and explosion prevention, and general employee health and safety. Due to ACB's superior environmental management IFC selected ACB as one of the 5 best environment-friendly companies in its worldwide financing portfolio. This is further exemplified by a visit to the bagging facility in Alexandria. Carbon black is a messy material whose final product is a granular material with high levels of dust. At ACB's facility, the bagging area is uniformly clean and absent dust and other particles due to ACB's use of advanced bagging equipment and recycling

air systems (Karadsheh, 2007).

ACB also took several steps to protect natural resources, including introducing the use of recyclable plastic pallets instead of wooden pallets, a practice that has subsequently been followed by other carbon black manufacturers. ACB constructed a settling pond for collection of effluent water to be recycled for horticulture irrigation (AP). Additionally, ACB is generating steam and electricity, using waste gases for cogeneration. ACB is currently actively assisting the PRTR (Pollution Release and Transfer Register) process simulation, in collaboration with UNEP (United Nations Program for Environmental Protection) and UNIDO (United Nations Industrial Development Organization), by providing data and relevant information on the Company's operations to help PRTR (Karadsheh, 2007) Appendixes A to E attached to this paper gives a summary of the various pollutants which are within allowable Egyptian EPA standards.

Benefits to customers

ACB exports more than 95% of its output to customers around the world, including Michelin, Goodyear-Dunlop Bridgestone-Firestone, Pirelli and Continental General Tire (International Finance Corporation, 2007). ACB is currently the largest exporter of Carbon Black from a single location in the world. This difficult milestone has been possible due to integration of various developmental systems and innovative schemes aimed at total satisfaction of the stakeholders. On the customer satisfaction front, ACB has taken innovative steps (such as implementation of QS9000 for stringent quality control, special incentive scheme for no customer complaint, etc), which has resulted in high product, service quality and customers' confidence in ACB's products. The lower cost and higher quality of its products have a material impact on these customers.

ACB has two major local customers: Trencó and Alexandria Tire Company with whom ACB has extensively shared its expertise including developing the use of TPM and TQM processes and integration of supply chain, wherever possible. These benefits accrue to the customer community and offer low cost upgrade of customer's operations. One example of ACB's collaboration is working with customers to reduce their inventory needs. ACB worked with Trencó and ATC to more closely manage order submission and fulfillment, resulting in a reduced inventory period for the customer. The average inventory days were reduced from 90 to 7 days resulting in savings of over L.E. 500,000 per annum. These savings also accrue to ACB in the form of faster receipts for shipped orders and higher customer satisfaction. For its largest customers in Europe, ACB has devoted several storage facilities to fill in for emergency customer

needs and non-emergency shortages from other suppliers.

ACB has also worked with local customers to provide additional credit facilities, again providing direct benefit to the customer. Through these interactions ACB has been able to directly benefit the Egyptian economy.

Suppliers

ACB benefits suppliers in the domestic economy by providing them incremental revenues. ACB's presence in the area has also benefited several suppliers, namely raw materials providers, contractors, and truckers. ACB has long-term agreements with its technology suppliers in the sharing of technological development. The technology suppliers aided ACB during its expansions while in return its consultants learned many in-house developments at ACB. ACB helps the suppliers in the developmental process by working with them to develop product per their needs. Agreements like these have resulted in improved productivity for the suppliers. ACB has several long-term contracts with vendors for supplies of raw materials and packaging materials, which helps in assured availability of materials and are good substitutes to expensive imports. The quantitative benefits of these efforts are far less than the qualitative benefits ACB accrues to its suppliers.

Benefits to rest of society

There are a number of ways that in which the Egyptian society as a whole can benefit from the presence of ACB. These include tangible ways such as higher taxation or intangibles such as demonstration effects. For example, given ACB's success the Egyptian government has actively promoted ACB as a model investment. Highlighted are the tax holiday provided ACB, co-investment, noteworthy operations in terms of efficiency and good people. This promotion brings in new investors to the country. Another factor is the large foreign exchange earnings by the Egyptian government as 95% of ACB's output is exported and earnings remitted as US dollars. This of course has helped in easing the pressure on hard-currency requirement of the country. Taxation comes from three main sources: personal taxation of ACB and supplier employees, corporate taxation of suppliers, import tariffs and sales taxes. We have been able to obtain this data from ACB directly as the levels of taxation vary according to the base and so can be difficult to calculate.

Finally, ACB produces electricity to sell using its own on-site power generation equipment and is a lower cost producer of electricity than the National Grid, which is government-owned. ACB sells excess power to the

National Grid at a favorable price, providing another direct benefit. In addition, ACB sells excess power to its neighbor companies in Alexandria.

Other benefits

A full analysis of the social impact would include the benefits and costs to competitors, producers of complementary products and new entrants. However, ACB was the first domestic player in this market and competitive issues and benefits for manufacturers of complementary products are thought to be minimal and as yet, no new entrants have emerged.

Calculating an economic rate of return

The values to society can be calculated and those values in the case of ACB by IFC were positive. This indicated that based on IFC criteria, this investment was one which met the social requirements for the investment. In addition, the income statements show a solid positive cash flow with each new injection of capital and increase in revenues from increased production. A recent quote by Rana Karadsheh of the IFC (2007) indicates that,

"the ACB investment met all of the social responsible goals established and that continuing funding by IFC is based on the same criteria. Continued support and funding for expansion of ACB is still a priority and is currently being handled by the Cairo IFC office."

CONCLUSION AND CURRENT ISSUES

ACB has developed an uncommon approach to their business that incorporates customer service, higher quality products and low price to expand in a slow growth global market. The use of low cost IFC investment capital for project inception, operational expansion and improvement coupled with the low cost of operations in Egypt (from both labor and environmental standpoint) has enabled ACB to grow from 20,000 Mt/year to 200,000 Mt/year in 2006. ACB's strategy of using world-class quality and high customer value with strong customer services into a slow-growth market has yielded higher than average total returns to both Alexandria Carbon Black and society as a whole. Aditya Birla Group through its holdings in carbon black and other chemical industries has used a comprehensive strategic approach to their businesses that includes a clearly identifiable firm -level strategy of consolidation and M&A coupled with ACB SBU level strategies such as low cost and high quality. Finally, each functional department has employed

strategies that support the low cost and high quality of the ACB SBU by developing systems for manufacturing that yield low costs and high quality, engineering and developing customized products for each of its customers, supporting customers with strong distribution and product marketing support, continuously training its employees and empowering their employees while also injecting new ideas into the organization.

In 2005, ACB was recognized as one of the top two companies operating in Egypt based on the National Award for Excellence (NAFE). This award, modeled on the prestigious Malcolm Baldrige Quality Award in the United States, recognizes companies that have the highest standards of quality in their operations. It is a measure of how companies treat their employees, their suppliers, customers and other stakeholders while maintaining the highest level of quality in their operations. Mercedes in Egypt was the NAFE award winner which gives a strong indication of how well ACB is being managed.

ACB management has recently spent several weeks developing a strategic plan for ACB that covers the next five years. The plant in Alexandria is physically limited because of property constraints and his operating process engineers have made his plant the top world producer based on the number of production lines installed but are struggling to get more production. Recent announcements in trade magazines indicate that ACB will use more automation and technology to up production. Jobs may not increase in proportion to production and this new production will target export markets in the European Union.

Environmental concerns have been raised by the Egyptian government concerning ACB emissions increases and ACB local employee costs have continued to rise at about 10% per year. Low cost Eastern European producers are beginning to copy the ACB business model for service using depots close to customers and low cost, highly differentiated products and are closer and more convenient to tire customers in Western Europe. The Russians have embarked on major plant renovations and increased capacity and his firm is still fighting dumping charges from the EU. The big makers of carbon black world-wide have seen Aditya Birla consolidate carbon black production through acquisitions and increase capacity profitably and are looking at their businesses with an eye toward the same. Indian expatriates are being lured back to India to work with large pay increases and the benefit of working in their own culture. Most of the Indian managers have been residing in Egypt for over five years and this has created problems for families of workers and Indians who might be living in the local communities. Although, training of Egyptian staff for technical positions at lower levels has gone well, ACB has had a difficult time attracting high quality Egyptian managers to work in this company in Egypt because of

the perception that this is an "Indian" company with few opportunities for locals. Management must make a number of decisions concerning expansion and direction of the firm based on the changing employment climate, environmental concerns, EU charges and competition from low cost new entrants in Eastern Europe and Russia.

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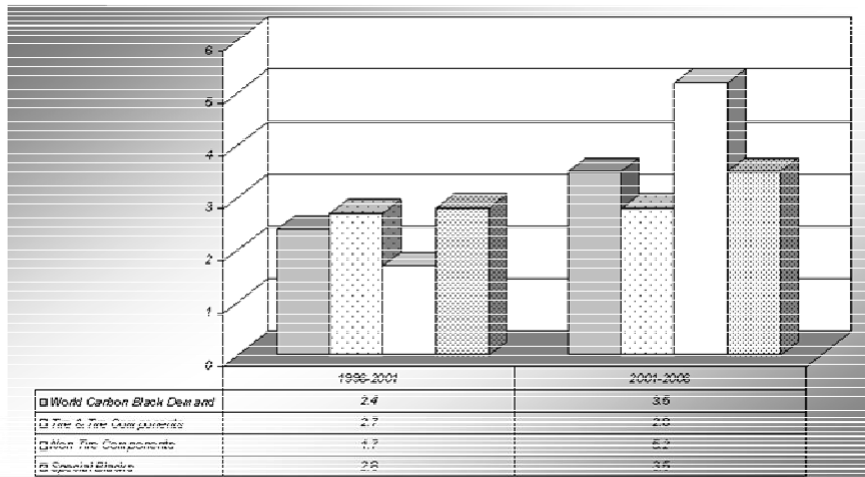
Appendix A. Income Statements/Cash Flow ACB 1004-2002 (Harvard Business School, 2003).

Statement of Income and Cash Flow ACB 1994-2002									
Item	1994	1995	1996	1997	1998	1999	2000	2001	2002
Net Sales	\$8,421,669	\$60,484,262	\$71,287,331	\$108,246,493	\$137,692,234	\$156,038,926	\$195,692,655	\$233,053,664	\$293,994,269
COGS	\$4,777,172	\$36,540,415	\$38,755,390	\$64,932,142	\$75,106,917	\$80,584,551	\$115,248,419	\$142,202,525	\$173,163,888
Marketing & Sales	\$148,834	\$1,118,254	\$1,147,877	\$1,500,324	\$1,874,960	\$2,035,930	\$1,879,403	\$2,686,124	\$3,553,842
Export Exp.	\$516,765	\$3,956,876	\$4,657,754	\$8,854,327	\$12,042,321	\$13,549,802	\$17,512,914	\$24,206,297	\$25,137,777
Gross Profit	\$2,978,898	\$18,868,717	\$26,726,310	\$32,959,700	\$48,668,036	\$59,868,643	\$61,051,919	\$63,958,718	\$92,138,762
G&A	\$1,579,908	\$4,620,791	\$4,437,841	\$5,921,343	\$7,412,409	\$8,954,336	\$9,529,658	\$10,314,265	\$14,520,547
Exp. of Finance	\$1,473,305	\$8,673,143	\$10,495,809	\$12,592,000	\$14,736,354	\$19,372,052	\$25,445,258	\$20,515,854	\$14,242,024
Provisions	\$765,000	\$711,175	\$500,000	\$116,639	\$822,500	\$0	\$0	\$0	\$2,398,129
B of D	\$11,865	\$376,013	\$387,171	\$474,999	\$493,530	\$568,645	\$400,350	\$444,510	\$560,138
Depreciation	\$1,912,979	\$5,434,315	\$6,022,375	\$6,762,453	\$12,270,524	\$13,741,376	\$18,533,511	\$19,081,320	\$19,838,718
Amortization	\$359,720	\$1,942,857	\$1,942,857	\$1,942,857	\$1,942,857	\$1,942,857	\$1,836,868	\$1,898,629	\$1,898,629
Misc Income	\$950	\$19,122	\$46,981	\$67,208	(\$128,017)	\$14,561	\$166,542	(\$212,028)	\$2,021,510
Interest Income		\$57,251							
Operations Inc.	(\$3,124,829)	(\$2,908,699)	\$2,893,276	\$5,082,201	\$11,117,879	\$15,274,816	\$5,139,732	\$11,916,168	\$36,659,067
Currency	(\$178,191)	(\$33,373)	(\$5,616)	(\$10,654)	\$293,146	(\$554,409)	(\$1,189,948)	(\$5,591,060)	\$0
Adjust Prior Year		\$66,773	\$36,011	\$8,166	\$0	\$0	\$0	\$0	\$0
Net Profit Operations	(\$3,303,020)	(\$2,875,299)	\$2,923,671	\$5,079,713	\$10,824,733	\$14,720,407	\$3,949,784	\$6,325,108	\$36,659,067
Cash Flows									
EBT	(\$3,303,020)	(\$2,875,299)	\$2,923,671	\$5,079,713	\$10,824,733	\$14,720,407	\$3,949,784	\$6,325,108	\$36,659,067
EAT	(\$3,303,020)	(\$2,875,299)	\$2,923,671	\$5,079,713	\$10,824,733	\$14,720,407	\$3,949,784	\$6,325,108	\$36,659,067
Interest	\$1,473,305	\$8,673,143	\$10,495,809	\$12,591,800	\$14,736,354	\$19,372,052	\$25,445,258	\$20,515,854	\$14,242,024
EAT	(\$1,829,715)	\$5,797,844	\$13,419,480	\$17,671,513	\$25,561,087	\$34,092,459	\$29,395,042	\$26,840,962	\$50,901,091
Dep	\$1,912,979	\$5,434,315	\$6,022,375	\$6,762,453	\$12,270,524	\$13,741,376	\$18,533,511	\$19,081,320	\$19,838,718
Net Worth Incr.	(\$1,030,216)	(\$602,233)	\$14,390,338	(\$11,190,551)	(\$750,598)	\$10,811,723	\$4,303,535	(\$1,988,830)	\$9,180,328
Capital	\$62,778,605	\$7,122,070	\$10,572,597	\$106,840,034	\$16,391,293	\$106,964,526	\$1,984,837	\$2,350,565	\$3,342,403
Cash Flow	(\$65,491,083)	\$4,712,322	\$23,259,596	(\$71,215,517)	\$22,190,916	(\$97,425,166)	\$4,573,159	\$45,560,547	\$76,577,734

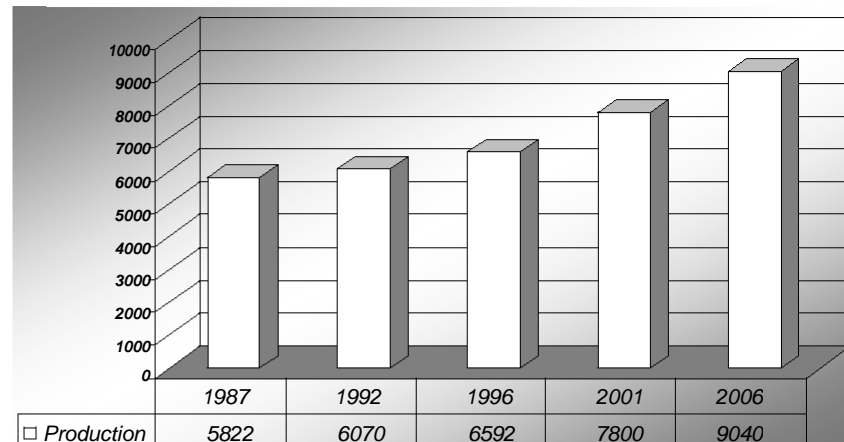
Appendix B. Average emissions in 2001 (Harlow, 2005).

Monitoring mode	Location	Unit	SPM	SO₂	NOX
Stack	Max	mg/m ³	50	2500	300
	Boiler 1	mg/m ³	29.72	1418.12	151.08
	Boiler 2	mg/m ³	29.72	1402.5	145.67
	EBF 1	mg/m ³	32.04	955.04	143.08
	EBF 2	mg/m ³	31.8	989.44	143.36
	EBF 3	mg/m ³	30.83	917.64	142.2
	Max. 24 h	ug/m ³	230	150	400
Ambient air	Max Average	ug/m ³	90	60	150
	East	ug/m ³	87.03	35.43	28.62
	West	ug/m ³	86.51	34.1	27.43
	North	ug/m ³	86.74	35.71	29.38
	South	ug/m ³	86.36	35.98	28.56

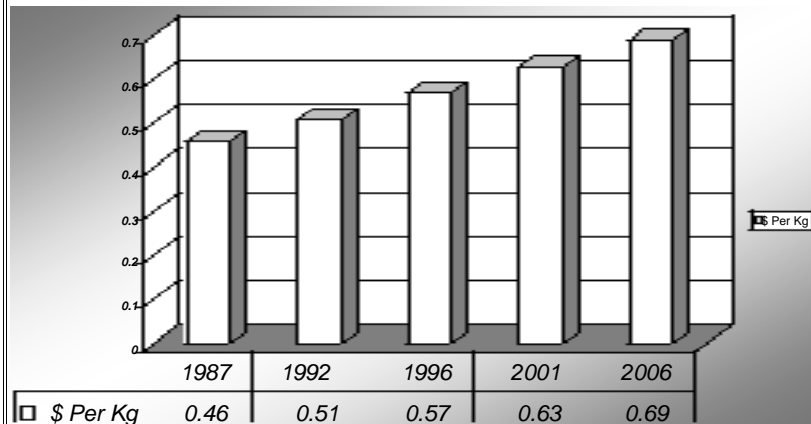
World Carbon Black Demand-By Segments (Millions MT)



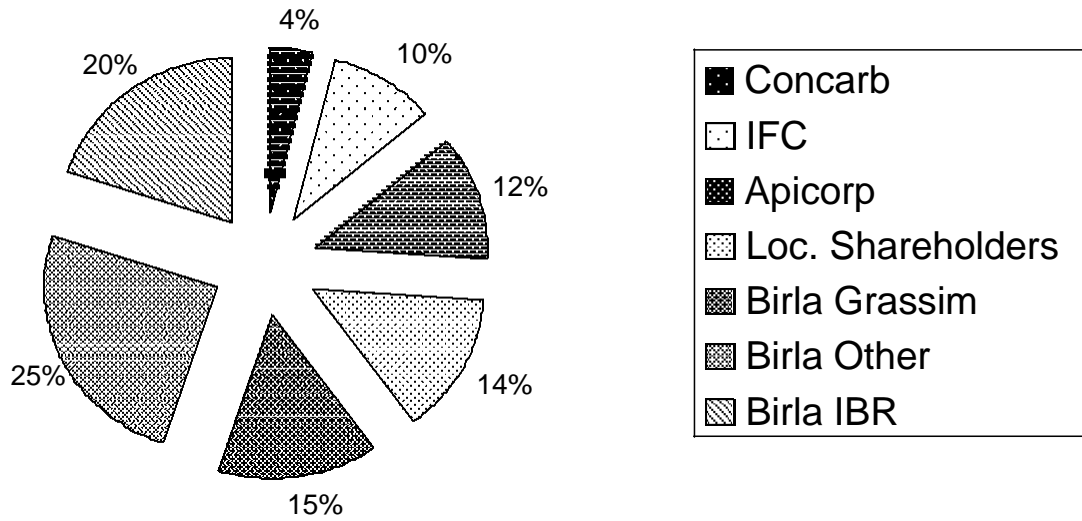
Carbon Black Global Production Capacity (MMT)



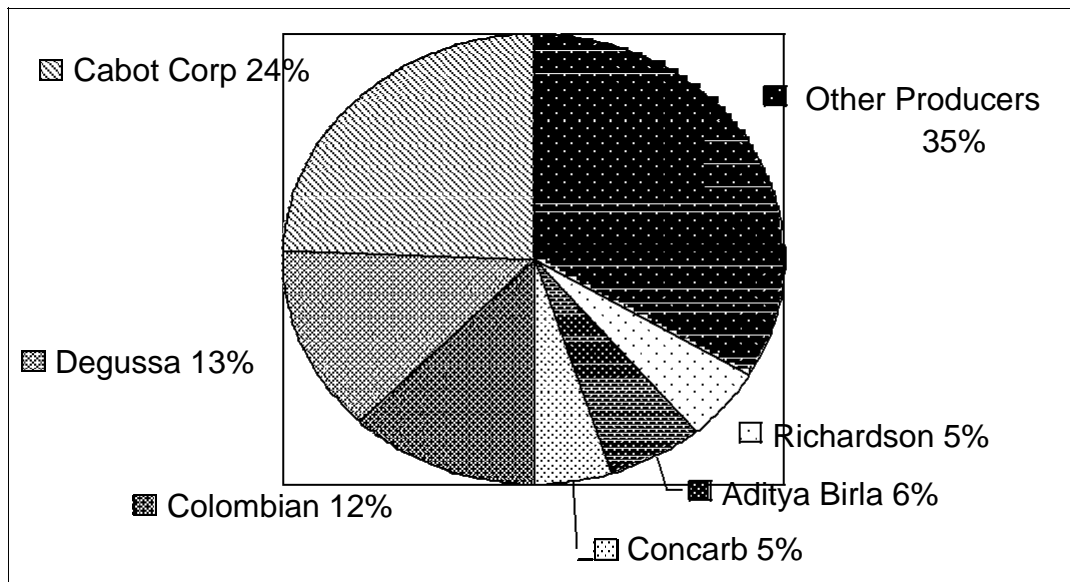
Global Price (\$) per Kg.



Appendix C. Other teaching aids.



Appendix D. ACB's Shareholding Structure.



Appendix E. Global carbon black production % (Source: Aditya Birla, 2007).