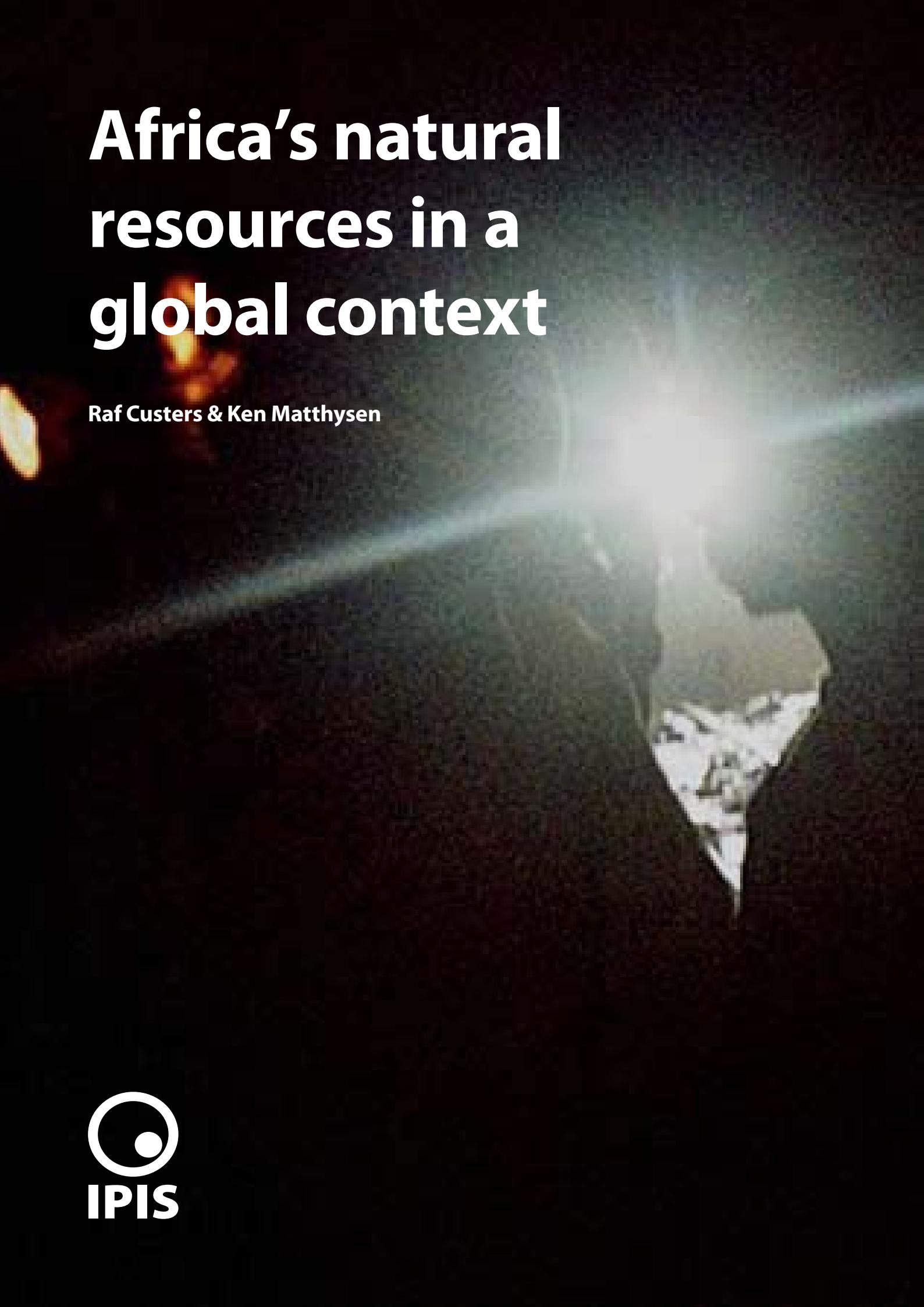


# Africa's natural resources in a global context



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**Caption photo Front Page:** : Katangese miners concentrating on their activities in a mineshift (Photo IPIS).



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# **Executive summary**

While, on the one hand, it is widely acknowledged that Africa has great natural resource potential, on the other hand, one cannot but regret that the complex interplay between political and economic factors at the national and international level appears to make it impossible to use a more substantial part of the revenues from the exploitation and trade of these resources for the promotion of the well-being of people at the grassroots level. This paper, which concentrates on non-renewable natural resources, aims to disentangle some of the processes that explain the paradox between Africa's natural wealth and its relatively limited level of economic development. It shows that the state of affairs in the resource sectors of most African countries is still to a large extent determined by external factors. Extractive industries in Africa tend to be export-oriented and contribute disappointingly little to local development.

The paper is divided into six chapters. The first chapter is dedicated to definitional issues and to the discussion of a number of applications of non-renewable natural resources. It is demonstrated that these resources are indeed of vital importance for the production of a wide variety of products, devices and instruments. The second chapter pays attention to Africa's position in the global economy. It is shown that, despite its natural wealth, the continent only plays a marginal role, not only in terms of production but also in terms of trade. An attempt is made to account for Africa's marginality and vulnerability by looking at the most significant developments in the continent's twentieth-century economic history. The third chapter zooms in on Africa's energy, metallic and non-metallic minerals. It does not only discuss Africa's production and consumption of these minerals, but it also makes a comparison with other producers and consumers across the globe. Chapter 4 contains a description of the outstanding expansion over the last years in the commodities sector and the mechanisms that explain this exceptional growth. The chapter provides a short assessment of how the financial crisis that arose in the US suddenly harmed the world economy. It also discusses how the global crisis affects the mining sector, specifically in Africa. Chapter 5 tries to answer the question whether we are witnessing a new scramble for Africa's natural resources. An attempt will be made to portray the actions of some of the main players in Africa at the moment, including the EU, the US, and China. The chapter offers an analysis of some of the special interest groups, their involvement in shaping policy and the influence that the aforementioned countries hold in the mineral sector. Finally, chapter 6 looks at how African governments can develop resource policies that have a positive impact on their national economies.

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# 1. Introduction

Africa's development depends, to a large extent, on the rest of the world. Ample evidence of this can be found in news reports about economic evolutions on the continent. First, there was euphoria over the good prospects in the mining sector, then, there was concern about the impact of the global financial and economic crisis. Outside influences determine the ups and downs of the African continent. It is also these influences that shape the initiatives of policy makers and other social actors. In today's times of crisis, the complex web of international relationships imposes itself on Africa even stronger than before, defining the opportunities and limits for development.

As a result of the increased and justified attention for issues of good governance and corruption on the African national level, there is a tendency to underplay the importance of processes on the international level. Yet, it should be emphasized that Africa is a player in a global resource game. Due to its natural resources, it occupies a central position in the global political economy. This is what this paper is about. It describes the position of Africa's natural resources in a global context.

For reasons of clarity, it is important to emphasize that we will only discuss one particular type of natural resources, namely the non-renewable ones. As we will explain in chapter 1, non-renewable natural resources are mineral substances that are won through mining and drilling, that is, through the activities of the so-called extractive industries. These minerals are of vital importance. They are used for the production of indispensable appliances as well as for the creation of new techniques.

Africa occupies a marginal position in the global economy as a whole. When one compares the volume of Africa's production and trade with that of other regions in the world - as we intend to do in chapter 2 - it becomes evident that the former is much smaller than the latter. This situation has come into existence during colonial times and has become worse ever since. The crisis of the 1970s was an important turning point in Africa's economic history. From that moment on, the prices of raw materials remained at a low level. Developing crisis policies, rich countries in the North started focusing their attention on Asia, relegating Africa to the role of raw material supplier. Things appeared to change for the better around the end of the twentieth century. Suddenly, Africa's figures of economic growth, trade and investment were showing an upward trend. However, during the last quarter of 2008, the global economic and financial crisis spread from the North to the South, forcing African governments to look for remedies and solutions, in consultation with their foreign partners.

The global public opinion is convinced of the fact that Africa is lucky to have so many natural resources. Nevertheless, we will use chapter 3 to make a number of qualifying remarks about this wealth. Although oil, gas and metals are of strategic importance, they do not even account for 5% of the world production. The importance of Africa's raw materials is also relative. While there may be substantial mineral reserves in Africa's subsoil, in most cases, the heart of the extractive industries lies outside Africa. Though Africa is at the top as far as the production of diamonds, gold, cobalt and platinum is concerned, it is essential to bear in mind that most of these minerals are exported in their raw form to the Developed Economies and to the Emerging Economies.

Africa is mainly a supplier of raw materials. African countries rich in raw materials try to generate revenues through exports. As a result of this, markets outside Africa determine the perspectives for Africa's economic growth and development. Chapter 4 will show that these perspectives are not rosy. While, on the one hand, the economic evolution in the Emerging Economies in Asia (and especially in India and China) arouses one's hopes that there will be a sustained and even an increased demand for raw materials in the near future, on the other hand, the mechanisms governing the global market in raw materials undermine the interests of countries producing them. In fact, the market in raw materials is characterized by cyclic movements and depends heavily on the law of offer and demand. In the past few years, the market witnessed a so-called 'super-cycle' with an unprecedented rise of raw material prices. However, to an increasing extent, economic power is concentrated in the hands of a limited number of mining and oil companies. The latter have used the profits of the recent resource boom to buy extractive companies on an unprecedented scale. This has given rise to the emergence of giant enterprises that impose their prices on their customers. In addition to this, raw materials have become instruments of investment. Consequently, speculators have started invading the market. Their activities have stirred up prices' volatility. Industrial countries consuming Africa's raw materials have looked at these developments with Argus' eyes.

Taking into account the abovementioned factors, one should not be surprised that the political perspectives for Africa's position as a raw material supplier are problematic. The continent is becoming the stage of an intensified competition between Developed and Emerging Economies. Chapter 5 presents an analysis of some of the main players: the European Union (with particular attention for the role of Germany and France), the United States, and, finally Japan and China. There is a lot of talk about a new scramble for Africa. Judging by the animosity in the Western media about China's Africa policy, the scramble has already started. One industrial country after the other realizes that it has to secure its access to Africa's raw materials. Remarkably, the programmes of Supply Security are often linked up with military programmes. Still, on their turn, the industrialized countries are forced to accept that Africa is developing its

own policy. This is evidenced, for instance, by the fact that both the American Africom project and the partnership proposed by the European Union have been met with opposition from the majority of African leaders.

Policy makers in Africa have gained more international manoeuvring space, because they have become *incontournable* for the mining companies and their new partners, including India, China and Brazil. As opposed to the decades after independence, they are no longer forced to rely on the former colonial powers and the United States for their external relationships. As we will point out in chapter 6, this explains why a number of countries try to gain more revenues through the mining sector, for instance through the renegotiation of contracts with Transnational Corporations. At the same time, African institutions rely on the assistance of international experts in thinking about ways to reorganize the mining sector, so that it can really turn into an engine of development. One of the questions that need to be addressed is whether it may be a good idea for Africa to rely on models from the past, such as the international resource funds. Although there are all sorts of theories about it, it seems unlikely that reflections like these will soon result in concrete plans of action.

With good reason, many development agencies are concerned about the development of the mining industry in the South. It remains necessary to realize the potential for development of mining activities. At the same time, it is also of vital importance to show solidarity with people working in the mines and sometimes facing unacceptable abuses.

Finally, it should be noted that this paper deals with the situation in the period before the middle of 2008. After that, the global financial and economic crisis erupted. This crisis develops from day to day. No one knows how long it will last and how strong will be its impact. Experts and analysts constantly need to revise their predictions. In order to be able to make a sound assessment of today's economic reality, it is necessary to look at things from a distance. This text aims at creating as many entrances as possible into a not so common issue. It is meant to enhance a proper understanding of a much-debated subject. It also hopes to stimulate the ongoing reflection and debate on Africa's natural resources and the decisions the continent is taking for its development.



The GTL/STL plant in Lubumbashi (Photo IPIS)

# 1. Definitions

This paper focuses on Africa's potential of non-renewable resources from a global perspective. What we mean by "potential" is the important place these resources take and the role they play in the world's economy and politics. We will not include renewable resources such as hydropower or products issued from agriculture, forestry or fishery, except for a few occasional examples. When we discuss non-renewable resources, we essentially mean economic minerals that can be exploited by extractive industries and marketed for productive purposes.<sup>1</sup>

## 1.1. Classification

In this paper, we will make use of the classification offered by the United Nations Conference on Trade and Development (UNCTAD) in its World Investment Report 2007. UNCTAD's classification has three main categories for minerals: energy minerals, metallic minerals and non-metallic minerals. These main categories are then further broken down into sub-categories and resources that are familiar to the global economy, such as coal, gold, brick and gems. Table-1 gives a detailed description.

Many other sources besides UNCTAD can be used for mineral classifications. In this respect, country geological services can be influential. For example, the United States Geological Survey (USGS) divides non-renewable minerals into Fuel, Metals and Industrial Minerals (diamond, cement, etc.). As explained in the 1980 USGS Circular 831 "Principles of a Resource/Reserve Classification for Minerals", the USGS believes that minerals should be categorised according to geological and physical characteristics, but also to their economic value and exploitability at a given moment.<sup>2</sup>

<sup>1</sup> Renewable resources come from agriculture, forestry, fishery, from some ecosystems and natural elements like wind, sunlight and water. The classification in renewable and non-renewable commodities is taken from the UNCTAD document: UNCTAD (2007) *World Investment Report: Transnational corporations, Extractive industries and Development* (Online: <http://www.unctad.org/Templates/WebFlyer.asp?intItemID=4361&lang=1>, last accessed on 3/12/2008).

<sup>2</sup> USGS (2008), *Mineral Commodity Summaries 2008*: p. 195-196 (Online: <http://minerals.usgs.gov/minerals/pubs/mcs/> or <http://minerals.usgs.gov/minerals/pubs/mcs/2008/mcs2008.pdf>, last accessed on 3/12/2008).

**Table-1: Mineral Classification\***

Minerals	Energy Minerals	Ferrous Metals	Coal
			Gas
			Oil
			Uranium
			Iron
	Metallic Minerals	Precious Metals	Niobium
			Tantalum
			Titanium
			Gold
			Platinum
Non-Metallic Minerals	Base Metals	Construction Minerals	Silver
			Bauxite/aluminium
			Cobalt
			Copper
			Lead
Non-Metallic Minerals	Industrial Minerals	Precious Stones	Magnesium
			Molybdenum
			Nickel
			Zinc
			Brick
Non-Metallic Minerals	Industrial Minerals	Precious Stones	Building stone
			Cement
			Day
			Crushed rock
			Aggregate
Non-Metallic Minerals	Industrial Minerals	Precious Stones	Gypsum
			Materials
			Sand and gravel slate
			Bentonite
			Industrial carbonates
Non-Metallic Minerals	Industrial Minerals	Precious Stones	Kaolin
			Magnesia
			Potash
			Salt
			Sand
Non-Metallic Minerals	Industrial Minerals	Precious Stones	Silica
			Sulphur
			Diamonds
			Gems

(Source: *World Investment Report 2007, UNCTAD:p.84*)

\*Every mineral can be used in different ways . For a list of these applications, see Annex 1.

## 1.2 Definitions

Apart from the distinction between renewable and non-renewable resources, some other concepts need to be defined more clearly. Various terminologies are used to describe *natural resources*. Often, the difference between concepts like "ores", "raw materials" or "commodities" is not clear. This can lead to some confusion. We define commodities as a very general term, meaning useful goods. Commodities can be both raw, meaning unprocessed, materials and processed materials. Ores are raw materials from which metals can be processed.

We try to avoid concepts that already carry a qualification, for example, the French word *richesse* (in English: *riches*). Instead, it is translated into the much more neutral English word *resources*. The term "riches" implies that an asset has a potential value that has yet to be extracted. To make an unambiguous distinction we use either "Mineral Resources" or "Mineral Reserves". *Resources* are a purely geological notion, pointing at the mass of materials in the earth's crust and occurring under a solid, liquid or gaseous structure. To estimate the amount of reserves on the other hand, besides geological criteria, more parameters are taken into account, such as mining related, economical, legal, metallurgic, marketing, environmental, social and political, as well as policy related factors.<sup>3</sup>

The *reserve base* is the part of the resources that meets some physical and chemical minimum criteria, such as grade, quality, thickness and depth. It includes that part of the resources that can be expected to be exploitable beyond the current technological developments and the current economic situation (e.g. the world market price of a specific ore). The reserve base thus concerns the resources that are economically exploitable at the moment, as well as those for which this is not (yet) the case. *Reserves* are only that part of the reserve base for which extraction is possible under the current economic and technological conditions.<sup>3</sup>

A characteristic feature of minerals is that they are non-renewable. The term "non-renewable" implies depletion, which means that at one moment in time all the known reserves of a given material are gone.<sup>4</sup> Depletion of minerals causes tension between exploitation and (sustainable) development. Over-exploitation can hinder the use of resources by following generations. UNCTAD endorses this in its *World Investment Report* and says that mineral wealth can be a source of revenue, economic growth and prosperity, but that it is not evident. It continues by saying that when economic development is gained through mineral exploitation, the achievement of long-term sustainable development is the biggest challenge.<sup>5</sup>

Throughout this text, figures will be annotated in European measurements and numeric notations. Thus 10.000 means ten thousand, whereas 10,5 means ten and a half.<sup>6</sup> Also, different measurements will be used. Table-2 depicts the most common.<sup>7</sup>

**Table-2: Used Measurements**

Measure	Equivalent
1 ounce	= 28,349523125 grams
1 troy ounce	= 31,103475 grams
1 carat (metric) (diamond)	= 0,2 gram
1 karat (gold)	= 1/24th of the alloy is gold (24 karat is pure gold)
1 kilogram (kg)	= 2,2046 pounds, avoirdupois
1 metric ton	= 2.204,6 pounds, avoirdupois or 1.000 kilograms

(Source: USGS, 2008)

## 1.3 Applications

Faster, more powerful, smaller, more economical; these are the trends industry tries to achieve and technology helps in this endeavour. This section will depict the importance that minerals play in the advancement of technology not only at the level of the mineral industry, but especially in everyday products used by consumers around the world. There is no doubt that the automobile and cell phone that we use today, will advance technologically once again, but not without the usage of minerals.

The mineral industry is constantly looking for advanced technologies that allow them to reach their mineral demands. The mineral industry seeks to gain from minerals as well as the country where the minerals are found. Minerals are

<sup>3</sup> VAUGHAN, W.S. and FELDERHOF, S. (2002) *International Mineral Resource and Mineral Reserve Classification and Reporting Systems.*, Rocky Mountain Mineral Law Institute: Nevada (Online: <http://www.jorc.org/pdf/vaughan.pdf>, last accessed on 3/12/2008) and USGS (2008), o.c.: p.195-196.

<sup>4</sup> The New Scientist has produced some interesting graphs about depletion of essential minerals, which can be found via the magazine's website. *Earth's natural wealth: an audit*, New Scientist, May 23 2007: [http://www.science.org.au/nova/newsscientist/027ns\\_005.htm](http://www.science.org.au/nova/newsscientist/027ns_005.htm), last accessed on 3/12/2008.

<sup>5</sup> UNCTAD (2007) o.c.: p. 93.

<sup>6</sup> In the Anglo-Saxon world commas and dots are used the other way round.

<sup>7</sup> USGS (2008), o.c.: p.194.

of vital importance and strategic interest for a number of reasons, for example, the production of industrial and consumption goods, fertilization, military equipment, transport, communication, and construction. A country's constant need for development is so drastic that an economy without minerals comes to a halt. Many countries are currently using more minerals than could ever be produced within their own borders. For example, the imports of raw materials in Germany in 2005 amounted to a total value of €77 billion and 12,3% of total imports in the country that year.<sup>8</sup> Estimates suggest that under the current life style in the United States (US), the country uses annually more than 11.300 kilograms of minerals per person, fuel not included.<sup>9</sup>

With the advancements in technology, regulation etc. the world uses drastically different materials today and in much bigger volumes. The first automobile for example was made of only a few materials; steel, wood, textile, glass and rubber. These days, more than 40 minerals are used in an average automobile: nearly a ton of iron and steel (strong and durable); more than 100 kg of aluminium (light); copper (for the electric wiring); silicon (glass); lead (in batteries); zinc; manganese; nickel; magnesium; molybdenum and vanadium (in all kinds of alloys); platinum (in catalysts); sulphur (in tires), etc. In the automobile's of today, there is also a larger amount of copper; in 1948 an automobile used 45 meters of copper wire, while today a car uses about 1,6 kilometres (1500 wires).

Personal electronic devices underwent a similar evolution: from 12 minerals (and their components) in one PC in the 1980s, to some 60 in the latest PCs and cell phones. They possess chemical components with unique electric, optical and conducting characteristics, as for example indium (in flat screens), hafnium (in silicon films on computer chips) or high-grade conductors from precious metals.

In the popular products of today, cell phones, televisions and MP3 players, consumers are investing in dozens of natural resources, perhaps without even knowing it. An example of just a few of the materials are: Copper (also in air conditioning); beryllium (in cell phones, is proof against high temperatures); cobalt (in batteries of laptops, MP3 players, digital cameras); gallium (in cell phones); palladium (in cell phones or as a substitute for gold, lead or platinum); platinum (in flat screens and LCD-screens); ruthenium (in new computers hard drives); earth metals (17 sort of elements, in consumer electronics); tantalum (in cardiac machinery); and tin (often used as a substitute for the harmful lead in switch-boards). The list could go on and on.

Furthermore, there are dozens of other sophisticated applications, as in military developments, or air and space travel that consume a large amount of minerals, such as titanium.<sup>10</sup> Titanium is the ninth most used mineral. It is used heavily in the construction of airplanes because it is extremely corrosive-proof and very strong compared to its weight. The new 787 jets from Boeing contain 15% titanium. With the increase in air travel, it becomes clear that titanium has become a hot commodity on the world market. Titanium is nonetheless still difficult to manufacture. The mineral needs to be deducted from sand and stones, which is a very complicated process. The Pentagon, the American Ministry of Defence, is considering cooperation with the titanium industry in order to find a new production process. Because of the relative shortage, the price per kilogram has doubled, from around \$6 in 2003 to \$13,5 at the end of 2006.

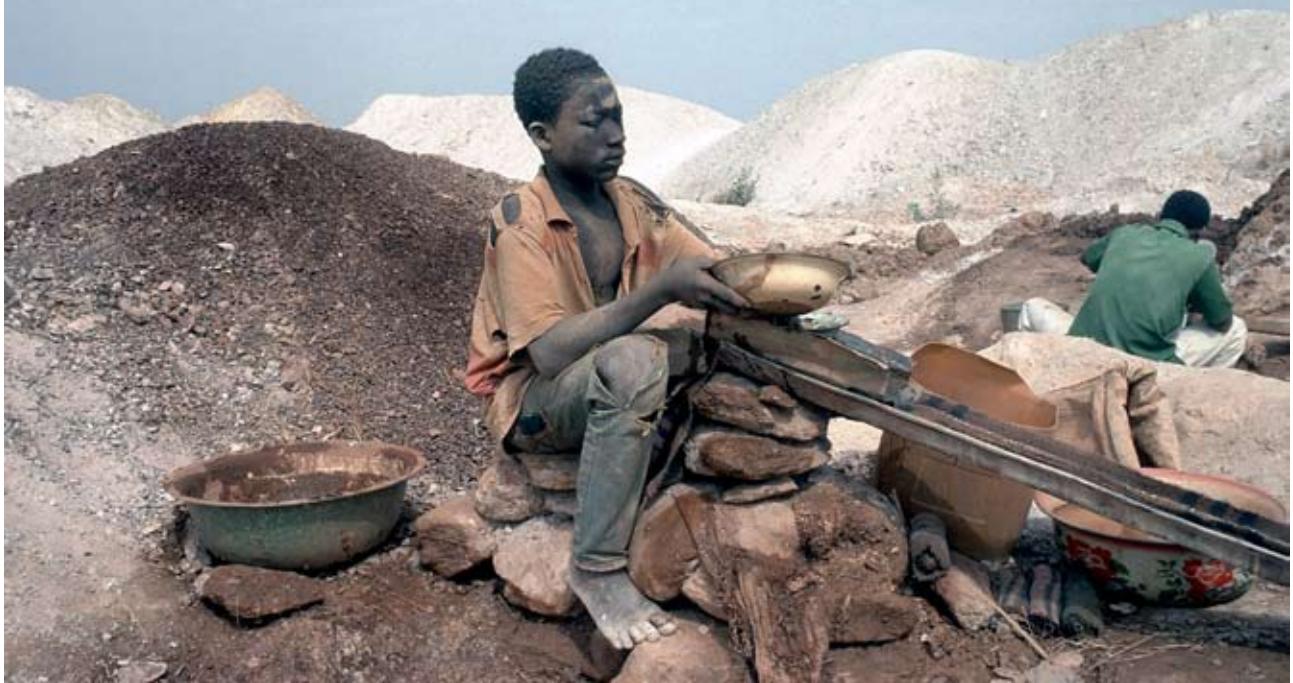
These examples just graze the surface in illustrating the usage and needs of minerals for advancements in technology, which feed not only the industry but also society. Annex 1 contains a list of applications per mineral. Future advancements in technology will call for an even greater need of minerals.

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<sup>8</sup> Rohstoffsicherheit. Anforderungen an Industrie un Politik. Bundesverband der Deutschen Industrie.Berlin, March 16 2007, p.6.

<sup>9</sup> Information in this section originates from: Anon. (2008) Minerals, Critical Minerals and the US Economy, National Research Council: Washington and from reports of the Make It Fair-campaign, online: <http://makeitfair.org/the-facts/reports>, last accessed on 3/12/2008.

<sup>10</sup> GLADER, Paul, *Titanium becomes a hot commodity*, Wall Street Journal, September 10, 2007, p.4.



*Photo: artisanal miner in Burkina Faso (1991) (Photo: R. Custer)*

## 2. Africa in the world economy

There are many assumptions made regarding Africa and its countries. One hears, for example that "Africa remains the most vulnerable to economic disruption" or a slogan like "Dig a hole in Africa's soil and you'll bump into diamonds or gold" or "The Congo's natural resources potential is enormous".

The famous "resource curse" is another assumption that has taken almost mythical proportions. It assesses the contradiction that Africa is wealthy in natural resources but that its population is not "experiencing significant economic gain" from these resources. In this chapter, we measure Africa against the global economy. We also point to systemic factors in recent history that have lead to Africa's economic fragility. We close with an assessment on the potential effect that the current economic crisis will have on the continent.

### 2.1 Africa and global production

Africa plays a marginal role in the global economy. A glance at the shares per country of World Gross Domestic Product (WGDP) makes this clear. While in 2006 WGDP totalled US\$ 58,6.trillion, Sub-Saharan Africa accounted for only 2% of the total.<sup>11</sup> This is less than the Gross Domestic Product (GDP) of Mexico and only slightly over that of Australia, respectively the fourteenth and fifteenth economies of the world.

**Table-3: World Gross Domestic Product by country for the year 2007.\***

	Ranking	(mln US\$)	Share of world total (%)
USA	1	13.811.200	25,41
Japan	2	4.376.705	8,05
Germany	3	3.297.233	6,06
China	4	3.280.053	6,03
United Kingdom	5	2.727.806	5,02
France	6	2.562.288	4,71
Italy	7	2.107.481	3,88
Spain	8	1.429.226	2,63
Canada	9	1.326.376	2,44
Brazil	10	1.314.170	2,42
Russian Federation	11	1.291.011	2,38
India	12	1.170.968	2,15
Republic of Korea	13	969.795	1,78
Mexico	14	893.364	1,64

<sup>11</sup> 2008 *World Development Indicators*, World Bank, April 2008.

**Table-3: World Gross Domestic Product by country for the year 2007.\***

	Ranking	(mln US\$)	Share of world total (%)
Australia	15	821.716	1,51
Netherlands	16	754.203	1,39
Turkey	17	657.091	1,21
Belgium	18	448.560	0,83
South Africa	28	277.581	0,51
Nigeria	41	165.690	0,30
Algeria	49	135.285	0,25
Egypt	52	128.095	0,24
<b>World</b>		<b>54.347.038</b>	

(Source: *World Development Indicator database, World Bank, July 2008.*)

\*The total of US\$58,6 trillion for 2006 mentioned above is expressed in Purchasing Power Parities (which convert local currencies to a common currency, such as the US\$)

There are 47 countries on the African continent, of which only two (South-Africa and Nigeria) can be called "regional superpowers" on the basis of their GDP. South Africa is ranked 28 and Nigeria is 41 on the list. Algeria and Egypt, from the North-African zone, are ranked 49 and 52. An objective handicap for the development of many of the African countries is that 40% of the African population lives in landlocked countries (against 23% in East and Central Asia).

As depicted in table-4, the biggest economies are particularly those from the North while at the bottom of the table are those from the South. When compared to other areas, and considering the size of sub-Saharan Africa, it produces a remarkably low percentage of all worldwide produced goods and services.

**Table-4: Grouped World Gross Domestic Product for the year 2007**

	(mln US\$)	Share of world total (%)
High-income total	40.197.253	73,96
Euro zone	12.179.250	22,41
East Asia & Pacific	4.438.135	8,16
Latin America & Caribbean	3.444.374	6,33
Sub-Saharan Africa	842.914	1,55

(Source: *World Development Indicator Database, World Bank, revised September 2008.*)

## 2.2 The Seventies: North against South

In the previous section, it was stated that, "Africa plays a marginal role in the world economy". Actually, behind this simple statement lies a particularly complex set of factors. To understand this set of factors, it is necessary to look at history.

Africa's economy performed well before and since the beginning of the 1960s, when most of the African states became independent. During the colonial era, some of the resource rich countries made exceptional economic performances. The Belgian Congo and British Northern Rhodesia were among them.

### BOX A: Draining of a Continent: The case of Congo

During colonial times, Africa had to endure what Eduardo Galeano called, referencing Latin America, "the draining of a continent": the massive looting of raw materials by colonial powers.<sup>12</sup> The Belgian colony of Congo serves as an example where large amounts of resources were exported from Congo. The impressive figures were put on display at the 2005 exposition "The Memory of Congo. The Colonial Era" at the Royal Museum for Central Africa in Tervuren.

#### Export of Coffee (tonnes)

Year	Export volume
1900	35
1940	23.242
1950	33.227
1960	60.568

(Source: *Expo The memory of Congo - Statistics Ten-Year Plan Belgian Government 1949*)

<sup>12</sup> GALEANO Eduardo (1971), *Las venas abiertas de America Latina*, Montevideo.

#### Export of Rubber (tonnes)

Year	Export volume
1890	123
1900	5.316
1910	3.416,7
1920	1.112
1940	697
1945	7.989
1950	8.271
1955	20.583
1960	35.557

(Source: *Expo The memory of Congo - Statistics Ten-Year Plan Belgian Government 1949*)

#### Export of Copper (tonnes)

Year	Belgian Congo Export volume	North-Rhodesia Export volume	World production
1920	19.000	2.800	
1938	254.900	123.900	
1946	185.200	143.900	
1955	314.000	162.000	
1966	623.400	316.900	5.350.000

(Source: *Expo The memory of Congo - C.J. Schmitz (1979), World Non-Ferrous Metal Production*)

#### Export of Uranium (tonnes)

Year	Export volume
1920	0,215
1935	253,51
1946	6.887

(Source: *Expo The memory of Congo - J. Vanderlinden, ARSOM, 1991*)

#### Export of Electricity (mln kWh)

Year	Export Volume
1939	217
1949	453
1958	2.519
1969	3.037
1979	4.265

(Source: *Expo The memory of Congo - UN-Year statistics*)

#### Export Palm oil 1952-53

(tonnes)

Angola	11.000
Belgian Congo	150.000
Nigeria	171.000

#### Export Palm kernel oil

Angola	6.000
Belgian Congo	55.000
Nigeria	171.000

(Source: *Expo The memory of Congo - UN*)

These figures show that, in comparison with other African countries, the colonial economy in Belgian Congo easily met the size of other major producers such as Northern Rhodesia (later to become Zambia) for copper or Nigeria for palm oil. Investments in Congo were extremely profitable, especially after World War I. According to the economist Frans Buelens of the University of Antwerp, total real return on investment in Congo was 7 % in the period from 1920 to 1955, in comparison with only 2,9 % for investments in the "mother country". After World War II these figures increased to reach a return of close to 14 % between 1940 and 1955 and 23 % between 1951 and 1955. Investments in the mines in Congo yielded returns of 7,5 % between 1920 and 1959 and 9,4% between 1940 and 1959 (which almost equalled the US mining yields).<sup>13</sup> These remarkable results were partially because Belgium imposed a war economy regime in Congo where the population was submitted to even harsher working conditions than before the war.

<sup>13</sup>That these were exceptional yields is shown by the fact that in Belgium shares on the stock market in the 1920-1959 period only gave an average return of 2,4% and that from 1940-1959 the return rate for mining shares was higher with 9,7%. See: BUELENS (2007), *Congo 1985-1960, Een financieel-economische geschiedenis*, Berchem, p. 598-599.

The Congolese economy indeed was a gold mine for investors. These were mainly but not only Belgian investors.<sup>14</sup> Between 1950 and 1960 they received a total in dividends of 40 billion Belgian francs. No less than 40% of all profits of all Belgian companies were derived from Congo.<sup>15</sup> In the early 1950s a quarter of all dividends paid by all Belgian and colonial companies together originated from the Congo. Amazingly, there were only 300 Congolese companies, this means Belgian companies established to work in Congo.<sup>16</sup> After it became independent in 1960, the Congo's mineral exports remained considerable and totalled some US\$ 26 billion between 1965 and 1990.<sup>17</sup>

After independence Africa had some economies that were dubbed success stories afterwards because they showed years of sustained growth, like Côte d'Ivoire, Egypt, Kenya and South Africa. But the 1970s were a turning point. During the economic crisis of the 1970s decade the African economy was severely struck.

This crisis was caused by the shifting balance of power between the developed economies in the North. Since World War II and until the crisis of the 1970s hit, the United States (US) had been the engine of the world economy. With its Marshall Plan and bilateral aid for Japan, South Korea and Taiwan during the Korean War, the US was also financially supporting the economies of its closest allies in Western Europe (especially Germany) and East Asia to recover after the war.

The US's economic troubles had a number of factors involved as well. Ironically, after the successful financial support from US programs, Germany and Japan became prime competitors to the US in the 1960s. This made the rate of return on investment for US businesses decrease by 43.5% in the US between 1965 and 1973.<sup>18</sup> In addition to the US's drop in the rate of return, the European central banks were able to amass large reserves of "euro-dollars" and began to convert these into gold. Furthermore, the US had to finance a costly war in Vietnam and other Cold War efforts. As a result, the US ran into economic trouble.

In an attempt to counter the financial ills, in 1971 President Richard Nixon decoupled the dollar-gold convertibility. In 1973, the US also put an end to the system of fixed exchange rates of foreign currencies to the dollar, which was an international framework established in 1944 by the Bretton Woods Agreement. The effect of these monetary measures resulted in shifting the US's economic woes onto the rest of the world.<sup>19</sup>

When the US lost the Vietnam War, this led to a considerable loss of prestige for the world's leading superpower. This certainly fostered the influence of the Third World. An indication is that a new agency was established at the United Nations, the United Nations Conference on Trade and Development (UNCTAD) in order to counter the growing disparities between the North and the South. Some resource rich countries decided to found commodity cartels. The aim of these organizations ranged from ensuring supply to stabilizing prices or increasing them. A few of the cartels, like the tin agreement, incorporated producers as well as consumers, while others, like the one form the oil-producing and exporting countries, only involved exporting countries. Examples of such cartels are the Intergovernmental Council of Copper Exporting Countries, the International Bauxite Association, the Association of Iron Ore Exporting Countries and the International Tin Agreement. Later, similar cartels were established for agricultural commodities like coffee, sugar and cocoa.<sup>20</sup>

Perhaps the most known and militant of the commodity cartels is the Organization of the Petroleum Exporting Countries (OPEC).<sup>21</sup> In a short amount of time, OPEC began to not only increase its membership but also its influence. In 1964, its member states had already demanded royalties on oil exploitation from the biggest oil companies, known as the "Seven Sisters". When the economic recession in the North caused the demand for commodities from the South and revenues for the exporting to decrease, the OPEC members moved to fix the price of oil, which had always been a privilege held by the Seven Sisters. In 1973 OPEC multiplied the price of oil exports, an action that came to be known as "the first oil shock". During this first oil crisis, the price of oil tripled from US\$ 16,29 to US\$ 51,65 for a barrel of crude oil in real prices<sup>22</sup>.

<sup>14</sup> Frans Buelens mentions an American plan for "huge complex in Bas-Congo" to produce cement and steel. BUELENS (2007), *Congo 1985-1960, Een financieel-economische geschiedenis*, Berchem, p. 309.

<sup>15</sup> BUELENS (2007), o.c. p. 592-600.

<sup>16</sup> BRION R. and MOREAU J.L. (1998), *De Generale Maatschappij van België (1822-1997)*, Antwerp, p.394.

<sup>17</sup> *Exportations de produits minéraux 1965-1998*, in: MATON J. And SOLIGNAC-LECOMTE H.-B. (2001), *Les espoirs déçus du <<Brésil africain>>*, CD-OECD, Document de travail 178, OECD.

<sup>18</sup> BRENNER Robert (2002), *The boom and the bubble, The USA in the World Economy*, London, p.17.

<sup>19</sup> BRENNER, o.c. p. 54-55.

<sup>20</sup> See for example: GREEN D. (2005) *Conspiracy of silence: old and new directions on commodities*, Oxfam. In chapter 6 we will examine these commodity organisations in greater detail.

<sup>21</sup> The OPEC was founded in 1960 by Saudi Arabia, Iran, Kuwait, Iraq and Venezuela to counter the Seven Sisters, who had controlled the crude oil prices for years. In 1964, OPEC forced the Seven Sisters (Exxon, Standard Oil, Texaco, Mobil, Gulf, Royal Dutch Shell and British Petroleum) to include royalties in production costs. Other countries joined the Organization: Qatar (1961), Indonesia and Libya (1962), the United Arab Emirates (1967), Algeria (1969), Nigeria (1971), Ecuador (1973), Gabon (1973-1995) and Angola (2007) See: OPEC website, <http://www.opec.org/aboutus/>.

<sup>22</sup> For price movements from 1961 to 2008, consult: *Crude Oil Prices 1961 – 2008*, Forbes website: [http://www.forbes.com/2008/05/13/oil-prices-1861-today-real-vs-nominal\\_flash2.html](http://www.forbes.com/2008/05/13/oil-prices-1861-today-real-vs-nominal_flash2.html), last accessed on 4/12/2008.

The jump in oil prices gave OPEC countries and other producers a newfound wealth. The “petrodollars” became available as loan capital for developing countries and were used to finance the next phase of their industrialization. The projects took place quickly and were very expensive. Thus, the 1970s saw the emergence of so-called “White Elephants”; huge and costly projects with little or no output. For example, in Congo-Zaire, the Inga Dams on the Congo River, which have the potential of producing electricity for large parts of Africa, were only meant to deliver electricity for the mining industry in Katanga and a few plants such as the steel factory of Maluku. The steel factory never even reached the production stage. This spending euphoria made many developing countries plunge into enormous debts<sup>23</sup>.

Another manifestation of the self-consciousness in the Third World was the fact that a number of governments executed full or partial nationalisations in the mining sector. According to UNCTAD’s World Investment Report, “the number of expropriations of foreign mining enterprises [in the world, author’s note] increased from 32 between 1960 and 1969 to 48 between 1970 en 1976”.<sup>24</sup> Later, analysts would conclude that the state owned companies did not anticipate the decelerated growth, but continued on the contrary to invest and build a huge surplus production capacity, which again pushed down prices.<sup>25</sup>

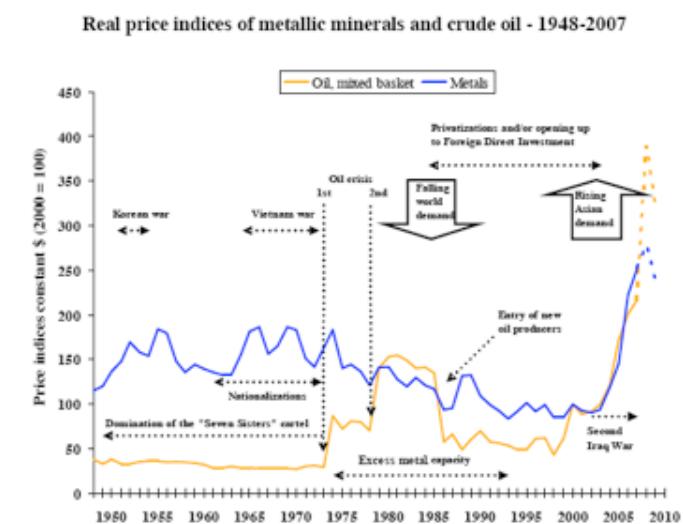
## 2.3 The Eighties and Nineties: Downturn

Against the backdrop of the world crisis, the terms of trade deteriorated for most commodity producing countries.<sup>26</sup> On the one hand, their imports became more expensive, especially for oil products; on the other hand, the revenues of commodity exports began to shrink, because of decreasing demand and increasing production capacity.<sup>27</sup>

Another factor said to have a negative impact for the terms of trade was the pressure from transnational corporations. In 1976 a commodities task force of the Organisation of African Unity in Addis Ababa declared, ‘The developed capitalist countries suffer from an endemic economic crisis, which they unload on Third World producers of raw materials. They do this through constantly deteriorating terms of trade and price manipulation by 300 transnational conglomerates controlling 75 percent of the South’s exports.’<sup>28</sup> This statement evoked the confrontational stance towards the North taken by part of the African elite in the 1970s.

In April 1980 the Organisation of African Unity convened a number of African heads of state in Lagos. In their *Lagos Plan of Action* they recorded an average annual economic growth in the African countries of 4,8% from 1960 to 1980 (“a figure which hides divergent realities ranging from 7% growth rate for the oil countries down to 2,9% for the least developed countries”). They judged this growth to be insufficient. However, they were conscious that the “Golden Age” now lay behind them and that the future appeared gloomy.<sup>29</sup>

Chart 1



(Source: RADETZKI (2007) *Handbook of Primary Commodities in Global Economy*)\*

\*Cited in EUCom Sec(2008)2741, EUCommission Staf Working Paper.

<sup>23</sup> For Inga in Zaire, see: WILLAME, J.-C. (1986), *Zaire, l'épopée d'Inga. Chronique d'une prédateur industrielle*. Paris.

<sup>24</sup> UNCTAD (2007), o.c.: p.108.

<sup>25</sup> Ibidem.

<sup>26</sup> Terms of trade express the value of exports against the value of imports. The rate worsens when the costs of imports are gaining substance over the benefits of exports.

<sup>27</sup> An example is the evolution of Zaire's terms of trade as illustrated in this table:

Year	1980	1981	1982	1983	1984
Terms of trade (export/import)	100	84,2	72,7	69,0	78,7

Table taken from: *Nécessité d'un ajustement structurel, Rapport d'Activité à l'intention du Groupe Consultatif pour le Zaire* (Paris, 21-22 avril 1986), World Bank, Attachment II Zaire External Trade.

<sup>28</sup> Cited in: *Commodities*, in: Third World Guide 93-94, Instituto del Tercer Mundo, Montevideo, 1992, p.90.

<sup>29</sup> “In the 20 years from 1960 to 1980 the average annual rate of growth continent-wide has been no more than 4,8 per cent, a figure which hides divergent realities ranging from 7 per cent growth rate for the oil exporting countries down to 2,9 per cent for the least developed countries. Yet, if the world economic forecast for the next decade is to be believed, the over-all poor performance of the African economy over the past 20 years may even be a golden age compared with future growth rate”. in: *Lagos Plan of Action for the economic development of Africa 1980-2000*, Lagos, April 1980.

Their assessment on a gloomy future was correct. According to a chart by UNCTAD, the commodity markets did not recover between 1980 and 2000.<sup>30</sup> This was not only the case for the developed economies but also for Africa. The American Energy Agency stated that, "Downward pressure on many primary commodity prices during the 1980s and much of the 1990s has hurt many African countries as well"<sup>31</sup>.

Commodity prices were not the only factor that negatively influenced the Third World economies. The North and the South were also involved in a showdown over resources and their prices. This was shown by the example of OPEC, a producers only organisation which had been thwarted by actions from consumers in the North. During the first oil crisis of 1973-74, US Secretary of State Henry Kissinger launched the proposal to establish an Energy Action Group which included the US, Europe and Japan. The objective was to defend the interests of mainly the Western oil importers.<sup>32</sup> As a result in November 1974 the International Energy Agency was founded under the wings of the Organization for Economic Co-operation and Development (OECD). Additionally, new oil producing countries like Norway and the United Kingdom (UK), both who were outside OPEC, entered the stage. In 1979 a second oil shock followed and OPEC drove the oil price to US\$ 91 per barrel (in real prices). But the following years, when commodity prices dropped, the oil cartel could not maintain its dominant position.

Another action that influenced the Third World economies took place in 1979 when Paul Volcker, Chairman of the US Federal Reserve, decided to increase the interest rates from 11% to 22%. One effect was that indebted Third World countries had to service higher interests and their total debt burden deteriorated. Another was that it became more profitable for investors to place their money in the financial markets in the US. The country therefore succeeded in attracting fresh money for investments and credit from abroad. It was at this moment in time, that the foundation for the financial crisis of 2007-2008 was laid.

The effect of this policy was that it exacerbated unequal development of different regions in the Third World. The unequal development evolved because investments in the US went primarily to high tech production and high added value core activities, whereas less profitable activities in the supply chain were outsourced and moved to low wage countries such as Mexico and the 'Asian Tigers' (Malaysia, Taiwan, Singapore) with whom the US maintained a preferential relationship in the Cold War framework. South America, but especially Africa, were not able to compete and missed the opportunities opened by the American monetary and industrial policy.<sup>33</sup> The Italian academic Giovanni Arrighi recently put forward a series of reasons for this uneven development. He thinks that Africa, unlike East Asia, did not have a workforce surplus or a strong culture of enterprise and that Africa inherited these deficiencies partially from slavery and colonialism. Moreover, writes Arrighi, the historical record of nation building and national economical integration differed strongly in Africa from the one in East Asia.<sup>34</sup>

The reversal of the flow of money, now directed towards the US, represented a first important change for the "world order". A second global reversal originated from the World Bank and the International Monetary Fund (IMF), where Western nations, including of course the US, were dominant. In the 1980s and 1990s, both organisations imposed structural adjustment programs (SAPs) on governments, including those of African states. These programmes aimed to push governments to service their foreign debts by scaling back the state owned enterprises and the public sector as such. This meant that the economic initiative would no longer be with the state but with the private sector. From this liberalisation wave a strong anti-state discourse evolved together with a growing negative appreciation, sometimes tending to colonial racism, of the managerial capacities of African leadership.<sup>35</sup>

After two decades of SAPs, the far-reaching reforms turned out to be dysfunctional. In 2002, the American economist William Easterly, who is known to be sceptical of many aspects of foreign aid, in a World Bank paper described the 1980s and 1990s as "lost decades". He questioned why developing countries between 1980 and 1998 achieved zero growth, while between 1960 and 1979 these states had experienced an average growth per capita of 2,5% a year. Easterly stated, "The stagnation seems to represent a disappointing outcome to the movement towards the 'Washington Consensus' by developing countries."<sup>36</sup> 'The Washington Consensus' refers to the standard recipe with which neo-liberal circles from the 1980s onwards said they could heal "sick economies".

<sup>30</sup> This chart is taken from the *World Investment Report 2007*. UNCTAD (2007) o.c.: p.88.

<sup>31</sup> *Africa Trade Facts*, Energy Information Administration, US Government, s.d. See: <http://www.eia.doe.gov/emeu/cabs/tbl6d.html>, last accessed on: 4/12/2008.

<sup>32</sup> US Secretary of State Henry Kissinger made his proposal during his address to the Pilgrims Society in London on December 12, 1973 where he said that the energy crisis could become "the economic equivalent of the Sputnik challenge of 1957". Cited in: SCOTT Richard (1994) *International Energy Agency, Origins and Structure, The first 20 years*, OECD/IEA, Paris, p.43-44.

<sup>33</sup> ARRIGHI, Giovanni, (2002) *African crisis. World systemic and regional aspects.* in: New Left Review n°15, May-June 2002.

<sup>34</sup> At the end of the eighteenth century, thus before the Industrial Revolution, China made up the world's first economy. See: ARRIGHI, Giovanni, (2002) o.c..

<sup>35</sup> In their book *Africa Works: Disorder as Political Instrument* (1999), Patrick Chabal and Jean-Pascal Daloz stated that structural adjustment policies in Africa failed partly because African leaders, fearing for their positions, clung to traditional patrimonial behaviour and sometimes refused to implement certain SAP measures. For an example of the thesis that African leaders are not apt for management see: "Does Africa have some inherent character flaw that keeps it backward and incapable of development?", The Economist, May 13–19, 2000. Cited in ARRIGHI Giovanni (2002) o.c.

<sup>36</sup> EASTERLY William (2001), *The Lost Decades: Developing Countries' Stagnation in Spite of Policy Reform 1980–1998*, Journal of Economic Growth, vol. 6, 2001.

In Easterly's opinion, the stagnation did not so much derive from "bad policies" (as a bad policy in one particular place, can be good policy in another place in another situation) but from structural factors. In 2001 Easterly evoked the analysis of the Lagos Plan of Action (of 1980) when he explained why the Third World was lagging behind. Easterly numbered these root causes by stating, "the increase in world interest rates, the increased debt burden of developing countries, the growth slowdown in the industrial world and skill-biased technical change".

## 2.4 Recent evolution

The previous section detailed the history of the African continent's economic woes. This section will focus on the current policies and detail three factors in Africa's future evolution into the global economy: economic growth, trade and foreign investment. All three are important indicators to Africa's progress in achieving the Millennium Development Goals and decreasing the potential effects from the global economic crisis.

### Economic Growth

Towards the turn of the Millennium, Africa's growth figure increased once again and continued throughout the last decade. As seen in table-5, early 2008 forecasts estimated that the years 2008 and 2009 would bring forth a sustained growth of 5,9%.<sup>37</sup> The average growth between 1999 and 2009 was expected to amount to about 4,9%.<sup>38</sup> However, because of the economic crisis, these projections have to be adjusted. In January 2009 the International Monetary Fund estimated Africa's economic growth in 2009 to be around 3,3%<sup>39</sup>.

**Table-5: African annual economic growth rate**

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	3,3	3,8	4,2	3,5	4,9	5,6	5,7	5,9	5,7	5,9	5,9

(Source: OECD (2008), *Perspectives Economiques en Afrique*)

In the United Nations Economic Commission for Africa (UNECA) statistics, East Africa appears to have realised the strongest growth (6,6%), followed by West Africa (6,4%), Southern Africa (6,3%), North-Africa (6,1%) and Central-Africa (5,4%). The petroleum net-exporters, with an expected growth of 6,8% for 2008, tower above the others, who are predicted to realise a growth of 4,9%. The top performers of the petroleum exporting countries are Angola with a growth of 21% during 2007, Sudan (11%) and Equatorial Guinea (10%). The worst performing economies are those of Somalia (-3,5% in 2007), Zimbabwe (-2,5%) and Chad (-0,5%). The Economic Commission for Africa notes an increasing division between oil importers and exporters. According to the Commission, oil importers will have to cope with larger deficits on their current account and worsening terms of trade.<sup>40</sup> The Commission states: 'The African economic performance in 2007 is a continuation of the growth cycle driven by the commodity boom particularly due to high oil prices'.<sup>41</sup> In other words a performance that was one-legged and too little structurally anchored to make it a sound basis for sustained growth.

### Trade

Trade is another striking indicator of Africa's evolution within the global economy. Africa's share in world trade has decreased for decades, from around 5,5% in 1970 to 2,5% in 2002.<sup>42</sup> In 2004, African export values amounted up to US\$149 billion. The vast majority of that export consisted of raw materials, 42% oil and natural gas (of which 19% to the US and 11,7% to Asia) and 20% other minerals and metals (around 7% to the European Union (EU) and Asia). According to the World Bank, the decrease of Africa's share in the world economy between 1970 and 1999 has cost the continent US\$70 billion annually in export revenues<sup>43</sup>.

The growing export of oil and some other minerals from Africa has nonetheless produced a positive twist in the curve. In 2006, Africa's exports rose 21% and the continent's share of the world total export nearly reached 3%.<sup>44</sup> In 2007 Africa's export of commodities and services increased 15,2%.<sup>45</sup> Still, these numbers remain considerably lower than the export levels of the 1960s and 1970s. Moreover, the realised growth is mainly due to raw materials, which makes it vulnerable for sudden evolutions and volatility on the world's markets, especially because Africa has a high dependency on resource revenues. Africa accounts for one third of all resource dependent countries; the "contribution of the 13 oil economies to the GDP rose from 55,5% in 2006 to 61,5% in 2007".<sup>46</sup> The UNECA therefore draws this conclusion: "The

<sup>37</sup> The Economic Commission for Africa of the United Nations reports a growth of 5,8% in 2007 and expects a growth of 6,2% in 2008. See: UNECA (2008), *Economic Report Africa 2008*, p.68. (Online: <http://www.uneca.org/era2008/>, last accessed on 4/12/2008).

<sup>38</sup> OECD, *Perspectives Economiques en Afrique*, May 2008.

<sup>39</sup> IMF, *World Economic Outlook*. Update. January 28v. 2009.

<sup>40</sup> UNECA (2008), o.c.: p.49.

<sup>41</sup> UNECA (2008), o.c.: p.40.

<sup>42</sup> Figures from the World Bank, cited in *The Marginalization of African Trade, Research Brief no.7*, International Food Policy Research Institute, 2007.

<sup>43</sup> World Bank (2007), o.c.

<sup>44</sup> UNECA (2008), o.c.: p.81.

<sup>45</sup> UNECA (2008), o.c.: p.37.

<sup>46</sup> UNECA (2008), o.c.: p.41

current growth momentum rests on a very fragile foundation. The continent continues to rely on primary commodities whose prices have been major sources of trade shocks".<sup>47</sup>

The positive turnaround is mainly a consequence of the trade with Asia. African exports to Asia since 2003 have increased 30% a year. The imports from Asia in Africa have increased from 2000 to 2005 with an annual average of 18%.<sup>48</sup> In this trading relationship with Asia, China is the main driver. In September 2008, Chinese customs said that in the first half of 2008 the bilateral Sino-African trade grew 66% year-on-year to US\$53,14 billion with around US\$23 billion exports to Africa (+40%) and US\$30 billion imports from Africa (+92%). It was expected that bilateral trade would exceed US\$100 billion in 2008.<sup>49</sup>

Despite the jump in trade with China, the EU still remains Africa's first trading partner. In 2006, 40% of African exports were destined for the EU-25. Furthermore, in 2006, the North American Free Trade Agreement (US, Canada, Mexico) was the second export destination (24%) while Developing Asia accounted for 16%.<sup>50</sup>

The EU's exports to Africa in 2007 valued €103,8 billion (8,4% of EU-exports) and its imports from the continent valued €128,5 billion (9% of EU imports). Around one fifth of the EU's Africa exports go to South Africa and almost one sixth of its imports from Africa originate from South Africa.<sup>51</sup> However, the EU is losing terrain, partly because of the Euro's continued appreciation, which makes imports from the EU more expensive.

### Foreign investment

Foreign investments are no exception to the overall trend and remain quite limited. In 2005, Africa's share amounted to 3,1% of global foreign investments, in 2006 this was only 2,7%.<sup>52</sup> Sub-Saharan Africa received 1,8% of global Foreign Direct Investments (FDI).<sup>53</sup>

In absolute figures, the influx of foreign capital in Africa rose 20% to US\$36 billion in 2006, which is a doubling compared to 2004. In 2007, the FDI in Africa rose to US\$53 billion.<sup>54</sup> In resource rich countries, FDI is mostly addressed to the extractive industries. Worldwide, investments in mining, quarrying and oil, occupied the third place in 2006, after investments in finance and in business activities (for example holdings). In 2006, the total amount of M&A's in the mining sector was US\$55 billion. A trend of vertical integration is visible. This means producers of goods and commodities try to achieve ownership of the suppliers of the raw materials. This has led to investments in iron ore exploitation (by Arcelor Mittal in West Africa) or, in the aluminium sector, to the construction of smelters in Mozambique, where cheap electricity is available.<sup>55</sup>

In 2006, an estimated 442 greenfield investments were initiated in Africa. Greenfield investments are projects in areas where no previous extractive industry projects existed. Of these projects, 258 were undertaken by transnational corporations (TNCs, also called multinational companies) from the North (161 from Europe) and 175 were from developing economies (of which 134 were from Asia), while the others were from Eastern Europe and former soviet states.<sup>56</sup> Of all foreign investments in Nigeria, 74,8% went to extractive industries, in Botswana it was 68,3% and in Tanzania and South Africa around 35%.<sup>57</sup>

## 2.5 Reaction to the economic crisis

Compared to the North, Africa is not an important player in the world economy. At the current growth rate, Africa will not be able to realize the Millennium Development Goals, and achieve the objective to halve poverty. In 2005 the Economic Commission for Africa wrote, "Although North Africa as a whole and a small number of SSA economies have the potential to reach the sub-goal of reducing extreme poverty by half by 2015, the slow pace of progress in the majority of countries indicates that as a continent, Africa is unlikely to reach this goal, given the current trends".<sup>58</sup> This remains ECA's conclusion today.<sup>59</sup> In addition, the economic crisis in the US will spill over to other parts of the world and affect Africa. In 2007, the rising energy and food prices hit Africa hard. Oddly enough, because of the continents minor incorporation in the world economy, it seems that the current economic crisis is not affecting the African financial market as hard as it could. According to Louis Kasekende of the African Development Bank, Africa only represents

<sup>47</sup> UNECA (2007) *Economic Report on Africa 2007*: p.9. (Online: <http://www.uneca.org/era2007/>, last accessed 4/12/2008).

<sup>48</sup> BROADMAN, H.G. (2007) *Africa's Silk Road: China and India's new economic frontier*, The World Bank, 391p.: p.70.

<sup>49</sup> *Sino-African trade to exceed \$100 billion in 2008, China predicts*, Xinhua, Beijing Sept.4, 2008.

<sup>50</sup> UNCTAD (2008) *Economic Development in Africa*.

<sup>51</sup> *External and intra-European Union trade. Monthly Statistics*. Issue n° 10/2008. Eurostat, Luxemburg, October 3 2008.

<sup>52</sup> UNCTAD (2007), o.c.: p. xvii.

<sup>53</sup> BROADMAN (2007), o.c.: p.68. The notion FDI applies to productive investment but also to transborder Mergers and Acquisitions (M&A).

<sup>54</sup> UNCTAD (2008) *World Investment Report 2008: Transnational Corporations, and the Infrastructure Challenge*, Geneva: p. 8.

<sup>55</sup> UNCTAD (2008), o.c., p.111.

<sup>56</sup> UNCTAD (2007), o.c.: p.35.

<sup>57</sup> UNCTAD (2007), o.c.: p.104.

<sup>58</sup> *The Millennium Development Goals in Africa. Progress and challenges*, ECA, 2005, p.5.

<sup>59</sup> <http://www.uneca.org/mdgs/goal1.asp>

1,3% of the world's stock market and 0,8% of the world's bank assets. However, Mr. Kasekende also added that Africa's real economy would most likely feel the next crisis shock.<sup>60</sup>

Where Africa is indeed affected by the crisis, is on the commodity markets. At this point in time, the financial crisis harms specific economic sectors in the North (such as real estate, housing and car construction, electronics, ...), which in turn, reduces the demand for raw materials. The prices of raw materials have shown a decreasing trend since April-May 2008, even though mining giants like BHP Billiton and Rio Tinto assure that in the end prices will keep on rising because of Chinese growth. Despite this, the successive shocks on the financial markets confused investors, which caused volatility on the commodity stock markets. The volatility could be attributed to investors' decision to rapidly shift important investment volumes between the dollar and commodities (like oil or precious metals) and anticipation among Wall Street investors while Washington continued its work on the Paulson Plan<sup>61</sup>.

Against this backdrop, it is impossible for commodity exporters to predict their revenues and thus their budget. The mining companies were already suffering since the US mortgage crisis of August 2007. Ever since October 2007 the shares of small and medium mining companies have obviously decreased, in some cases 60% to 70% in one year. The credit crunch is preventing mining enterprises from finding capital to finance their projects. Consequently many mining projects are frozen and companies decide to sell their inventories first. The Financial Times stated, "If you are in a hole, the best advice is to stop digging."<sup>62</sup>

What has been Africa's official reaction to the global crisis? The major African institutions (African Union, Economic Commission for Africa and African Development Bank) gathered on November 12 2008 in Tunis. This was a few days before the G20 Summit was to address the international banking and monetary crisis. Since this meeting in Tunis, the leading African bodies have been closely following events. Both ECA and AfDB presented analyses of the crisis at the assembly of the African Union in February 2009 in Addis Abeba. Donald Kaberuka of the African Development Bank mentioned "dependence on raw commodities" as one "preexisting vulnerability" which makes Africa more fragile for external shocks.<sup>63</sup> Abdoulie Janneh of ECA said that "the grave and unprecedented global economic and financial crisis, which is not of the making of African countries (...) will have a serious impact on African economies". Janneh especially stressed the crucial role of commodities in the crisis for Africa and said: "Trade and financial flows will also be greatly affected as is already evident from falling commodity prices and massive capital outflows reflected in sharply deteriorating exchange rates".<sup>64</sup>

It remains to be seen how African leaders will position themselves in this global crisis. It seems that they do not undergo events as passive bystanders. "African Leaders want More Say in the Management of Current Global Financial Crisis" was the lead of a press release of the ECA.<sup>65</sup> Janneh on his part pointed out that "Africa's recent good economic performance [had been underpinned by] better macroeconomic management, strong commodity prices and reduced debt". He feared however that "the crisis will erode much of the gains that Africa has made in the recent past in both economic and social sectors".

<sup>60</sup> *Bank crisis impact limited in Africa - AfDB economist*, in: Reuters, September 25, 2008.

<sup>61</sup> US Secretary of the Treasury, Henry Paulson's plan proposed a clean-up of the financial regulations and more control at the federal level.

<sup>62</sup> *Miners look in vain for help out of a share price hole*, in: The Financial Times, September 13, 2008.

<sup>63</sup> *Economic impact of financial crisis. Statement at African Union Assembly*, Donald Kaberuka, Addis Abeba February 3, 2009.

<sup>64</sup> *Statement on the Global Economic and Financial Crisis to the 12 th Ordinary Session of the Assembly of Heads of State and Government of The African Union by Mr. Abdoulie Janneh, UN Under-Secretary-General and Executive Secretary of ECA*, Addis Ababa, February 3, 2009

<sup>65</sup> ECA Press Release No. 04/2009 February 3, 2009.

### 3. Africa's minerals

Minerals constitute the essential component to produce a broad range of consumer goods, military equipment, infrastructure and agricultural materials as well as applications to be used in transport, communication and energy. Therefore, minerals are of strategic importance, yet, their economic importance in the world's production and trade is relatively modest. In 2005, they represented 3% of world GDP and 13% of world trade.<sup>66</sup> Moreover, there are differences among the three mineral categories (as referenced in Table-1 –from Chapter1). For example, energy minerals constitute a very different level of economic importance from metallic minerals. On the totality of mineral production, oil and gas are worth ten times the value of metallic minerals as can be seen in the following table.

**Table-6: World Production of Oil, Natural Gas and Metallic Minerals, 2005**

	Volume	Value
Oil & natural gas	47 billion barrels	US\$2.300 billion
Metallic minerals		US\$265 billion

(Source: *World Investment Report 2007, UNCTAD, p.85*)

In this chapter, we will discuss Africa's percentage of the world's mineral market.<sup>67</sup> First, we will focus on energy minerals because of their importance and because it is the category that attracts the bulk of foreign investment and attention. Then we turn to metallic minerals for some of which Africa has the world's largest deposits. We will discuss Africa's production and consumption of the minerals and compare the percentages to other producers and consumers around the globe.

It is not our aim to be overly in-depth. For example, with ferrous metals, we intend to show the main figures (production, reserves) and to create a list of the most important mining companies. This exercise will lead us to better understand Africa's role within the global mineral economy. For diamonds for example, to which a large amount of political importance has been attached, it appears that they represent only a modest part of the world's economy.

When looking at table-7 it is clear that Africa ranks among the world's top producers for some minerals. In cobalt and diamonds, Africa has well over a 50% share of the world production while it also has a large percentage in manganese, phosphate and gold.

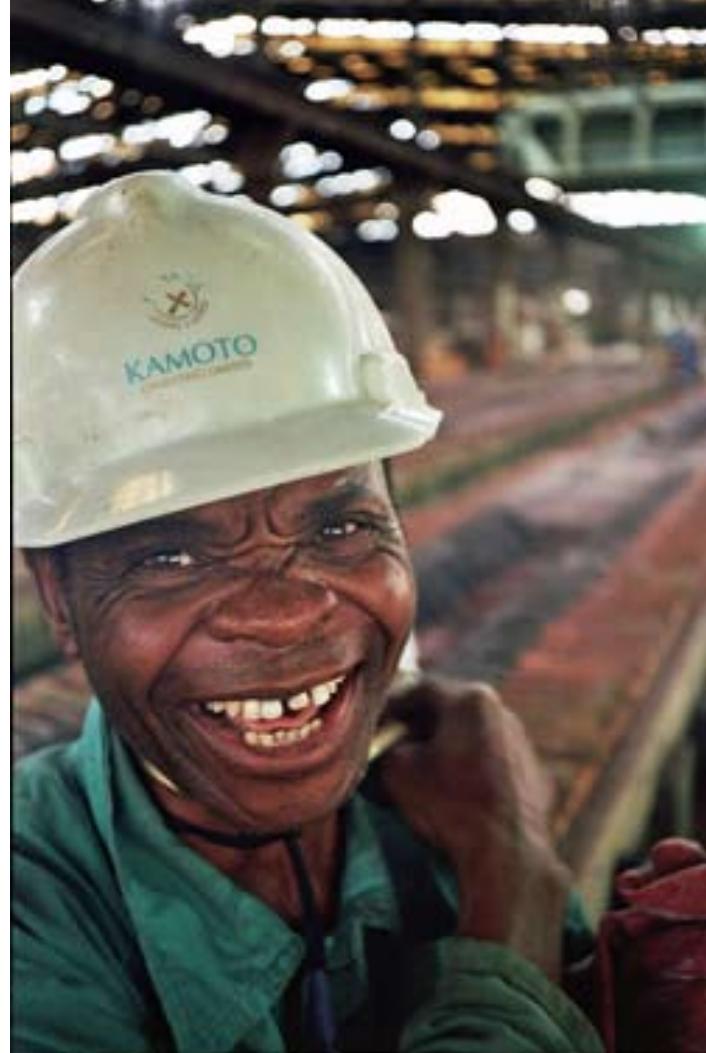
**Table-7: Africa's Share of the World Total Production of Selected Minerals, 2005**

Mineral	Share of world (%)	Major African producers
Cobalt	57	DRC, Zambia, Morocco
Diamond	53	Botswana, DRC, South Africa, Angola, Namibia
Manganese	39	South Africa, Gabon, Ghana
Phosphate	31	Morocco, Tunisia, Egypt, South Africa, Senegal
Gold	21	South Africa, Ghana, Mali, Tanzania
Bauxite	9	Guinea, Sierra Leone, Ghana
Nickel	7,5	South Africa, Botswana, Zimbabwe
Copper	5	Zambia, DRC, South Africa

(Source: Calculations from British and US Geological Services data)\*

\*YAGER R., BERMUDEZ-LUGO O., MOBBS P.M., NEWMAN H.R. and WILBURN D.R. (2005), *The Mineral Industries of Africa*, USGS: p. 1.14-1.15 (Online: <http://minerals.usgs.gov/minerals/pubs/country/2005/myb3-sum-2005-africa.pdf>, last accessed 4/12/2008).

The share of world production of bauxite is rather small at 9%. But when one knows that the US imports 29% of its bauxite from Africa, Africa's role as a bauxite exporter is not negligible. The share of copper production in Africa is also small, but rapidly growing due to known high-grade reserves and investments during recent years.



Employee of the Katangese company Kamoto Operating Limited (Photo: IPIS)

<sup>66</sup> UNCTAD (2007), o.c.: footnote p.83, can be found at p.97.

<sup>67</sup> More statistics, beside those given in this chapter, can be found in Annex 2.

### 3.1 Energy minerals

Energy has become a daily topic in the news as well as a concern for the global population. Tony Hayward, Group Chief Executive of British Petroleum (BP) writes, "The defining feature of global energy markets remains high and volatile prices, reflecting a tight balance of supply and demand. This has put issues such as energy security, energy trade and alternative energies at the forefront of the political agenda worldwide".<sup>68</sup> It is likely that energy will remain on the global political agenda for years to come, hence making it an important topic to understand further.

What is interesting with energy minerals is that, when outlined on a world map; reserves, production and consumption do not overlap at all. Developed countries (mainly in the North) are big consumers but small producers. They consume half of all oil and gas, while they only produce 25% and own barely 6% of oil reserves and 8% of gas reserves. This group of developed countries, however, wishes to be less dependent on external oil and gas providers for both political and economic reasons. That is why 70% of all exploration activities for new oil and gas fields occur in developed countries.

Clearly, there is a North-South imbalance in the world distribution of mineral production and consumption. The imbalance exists for oil, gas, coal as well as uranium. The major consumers are from the developed countries, largely the group of OECD-countries<sup>69</sup>, and they depend heavily on imports. The major producers are mainly from developing countries or transition economies and are net exporters.<sup>70</sup> As the developed countries depend on imports and dispose of only 6% of the world's reserves of oil and 8% of the natural gas reserves, they are in the process of diversifying their sources of supply, researching for substitutes and exploring for new fields.

Oil and gas reserves are now concentrated in Western Asia with 62% of "proven and probable" oil reserves and 40% of gas reserves.<sup>71</sup> Africa holds 10% of the world oil reserves and 8% of the world reserves of natural gas. Table-8 provides a glance at world production and shows that the Middle East still leads with 30,8% of global oil production, with Europe-Eurasia (including Russia) leading natural gas production with 36,5%. African oil production increased another 3,6% in 2007 to reach 12,5% of the world's production or 488,5 million tonnes. This volume largely exceeds Africa's oil consumption, shown in Table-10, that stood at 138,2 million tonnes of oil in 2007. Africa's natural gas production in 2007 amounted to 6,5% of global production.<sup>72</sup>

Refining capacity is another remarkable feature, as it reveals how not North America (with 23,9% of the world's refining capacity) but Europe-Eurasia (leading with 28,5%) dominates the oil business. As shown in table-12, Africa has only 3,7% of the world refining capacity, which compared with its production share of 12,5% means that Africa is exporting oil without transforming it (and thus adding substantial value) locally. The Middle East, with its long history of oil production, does hardly any better with only 8,6% of the world's refinery capacity. But as the Middle East and Africa show a similar growth in consumption (+4,4% for the Middle East and 4,6% for Africa), the Middle East achieves the biggest increase of refining capacity in the world, with +3,5% in 2007 compared to 2006.

**Table-8: Oil production (Million tonnes)**

	1996	2006	2007	% of 2007 World Total	% Change 2006-2007
North America	660,1	646,1	643,4	16,5	-0,5
South & Central America	312,9	345,8	332,7	8,5	-3,6
Europe & Eurasia	680	846,7	860,8	22	1,5
Middle East	1.001	1.221,9	1.201,9	30,8	-1,8
Africa	355,9	473,7	488,5	12,5	3,2
Asia Pacific	366,6	379,8	378,7	9,7	0,3
<b>World Total</b>	<b>3.376,5</b>	<b>3.914,1</b>	<b>3.905,9</b>		<b>-0,2</b>

(Source: BP Statistical Review of World Energy 2007 & 2008)

**Table-9: Gas production (billion cubic metres)**

	1996	2006	2007	% of 2007 World Total	% Change 2006-2007
North America	725,5	754,4	775,8	26,6	2,9
South & Central America	81,4	147,2	150,8	5,1	2,5
Europe & Eurasia	945,4	1.076,3	1.075,7	36,5	-0,1
Middle East	158	339	358,8	12,1	4,9

<sup>68</sup> HAYWARD Tony, Group Chief Executive, BP June 2008, in: BP Statistical Review of World Energy 2008.

<sup>69</sup> The Organisation of Economic Cooperation and Development (OECD) counts 30 member states in Western Europe, North America, Asia and the Pacific. They are: Austria, Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Iceland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New-Zealand, Norway, Poland, Portugal, Slovakia, South Korea, Spain, Sweden, Switzerland, Czech Republic, Turkey, the United Kingdom and the United States of America.

<sup>70</sup> UNCTAD (2007), o.c., p.86.

<sup>71</sup> UNCTAD (2007), o.c., p.86.

<sup>72</sup> BP Statistical Review of World Energy (2008)

**Table-9: Gas production (billion cubic metres)**

	1996	2006	2007	% of 2007 World Total	% Change 2006-2007
Africa	88,9	181,6	190,4	6,5	4,8
Asia Pacific	228,6	373,7	391,5	13,3	4,8
<b>World Total</b>	<b>2.227,9</b>	<b>2.872,2</b>	<b>2.940</b>		

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

**Table-10: Oil consumption (Million tonnes)**

	1996	2006	2007	% of 2007 World Total	% Change 2006-2007
North America	994,3	1.124,6	1.134,7	28,7	0,4
South & Central America	208,9	236,5	252	6,4	5
Europe & Eurasia	932,1	970,1	949,4	24	-2
Middle East	210,4	280,1	293,5	7,4	4,4
Africa	106,1	130,5	138,2	3,5	4,6
Asia Pacific	895,2	1148	1.185,1	30	2,3
<b>World Total</b>	<b>3.347</b>	<b>3.889,8</b>	<b>3.952,8</b>		

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

**Table-11: Gas consumption (billion cubic metres)**

	2006	2007	% of 2007 World Total	% Change 2006/2007
North America	761,4	801	27,6	5,2
South & Central America	131,3	134,5	4,6	2,5
Europe & Eurasia	1.151,5	1.155,7	39,4	0,4
Middle East	291,4	299,4	10,2	2,7
Africa	77,9	83,5	2,8	7,2
Asia Pacific	420,9	447,8	15,3	6,4
<b>World Total</b>	<b>2.834,4</b>	<b>2.921,9</b>		

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

**Table-12: Oil refinery capacity (1000 barrels daily)**

	1996	2006	2007	% of 2007 World Total	% Change 2006/2007
North America	18.703	20.821	20.970	23,9	0,7
South & Central America	6.026	6.468	6.513	7,4	0,7
Europe & Eurasia	25.454	25.021	25.024	28,5	0
Middle East	5.820	7.271	7.525	8,6	3,5
Africa	2.987	3.274	3.280	3,7	0,2
Asia Pacific	18.039	23.824	24.601	28	3,3
<b>World Total</b>	<b>77.029</b>	<b>86.678</b>	<b>87.913</b>		

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

The following sections will go into detail of consumption and production numbers on the four large energy minerals: oil, natural gas, coal and uranium.

### 3.1.1 Oil in Africa

There are many oil producing countries in Africa. As shown in table-13, almost half of the countries have doubled their oil production from 1996 to 2006. Nigeria has been Africa's leading oil producer for many years, but on a global scale, it represents a small percentage of total production at only 2,9%. The other major oil-producing countries (apart from Angola) are all situated in North Africa. Sudan (with only 0,6% of world production) is growing rapidly, with an increase of production of 38,1% in 2007. Angola showed a 20,7% production increase in 2007. "Because of soft fiscal terms and high oil prices" the deepwater areas of the Gulf of Guinea have become a "global exploration hot spot"<sup>73</sup> In a number of countries like Chad, Namibia, South Africa and Madagascar, more intense exploration for new oil fields is taking place while Mozambique and Tanzania are potential gas producers.<sup>74</sup>

<sup>73</sup> MAHTANI Dino, Trickier times ahead for big fish, in: Financial Times, January 28, 2008.

<sup>74</sup> Africa: Oil and Gas, Mbendi Information Services (online: <http://www.mbendi.co.za/indy/oilg/af/p0005.htm>, last accessed on 20/11/2008).

**Table-13: Africa oil production (Million Tonnes)**

	1996	2006	2007	% of 2007 World Total	% Change 2006/2007
Algeria	59,3	86,2	86,1	2,2	-0,1
Angola	35,4	69,7	84,1	2,2	20,7
Cameroon	5,6	4,4	4,2	0,1	-5,7
Chad	-	8,0	7,5	0,2	-6,3
Rep. of Congo	10,4	13,5	11,5	0,3	-15,3
Egypt	45,1	33,7	34,1	0,9	1,4
Equat. Guinea	0,8	17,7	18	0,5	1,6
Gabon	18,3	11,7	11,5	0,3	-2,1
Libya	68,6	85,6	86	2,2	0,5
Nigeria	105	120,0	114,2	2,9	-4,8
Sudan	0,2	16,3	22,5	0,6	38,1
Tunisia	4,2	3,3	4,6	0,1	40,2
Other	3	3,4	4,2	0,1	24,7
<b>Total</b>	<b>355,9</b>	<b>473,4</b>	<b>488,5</b>	<b>12,5</b>	

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

Interesting developments can be drawn from a 2006 overview of oil movements shown in Table-14.<sup>75</sup> It shows first of all that the US and Europe are evenly big clients, they import almost equal volumes of oil from Africa. In 2006, Africa exported 32,54% of its oil to the US, 33,6% to Europe and 11,3% to China. US oil imports from Africa represent around 5% of the world's total oil imports, Europe's Africa oil imports represent around 5,2%.

Compared with the two big clients, China is still a smaller one with around one third of the import volumes of the US and of Europe. China's Africa oil imports account for 1,7% of the world's total oil imports.

The oil movements table also shows that Europe and the US seek their African oil in specific regions. Europe imports mainly from North Africa and the US mainly from West Africa. Oil-producing countries for example that are members of the Economic Community of Western African States (ECOWAS)<sup>76</sup> export 56% of their oil to the US and 20% to Europe while the oil-producing countries in North Africa export 78% of their oil to Europe and 22% to the US. Intraregional exports to African countries accounted for only 2% of African oil exports in 2005.<sup>77</sup> Unlike China, Japan and other Asian and Pacific countries, the US and Europe hardly import any oil from East and South Africa.

**Table-14: Oil from Africa to the US, Europe and China for 2006 (1000 barrels daily)**

	US	% of US total imports	Europe	% of Europe total imports	China	% of China total imports
North Africa	742	5,45	1.947	14,46	75	1,9
West Africa	1.917	14,08	798	5,9	742	19,08
East & South Africa			1		106	2,7
Africa	2.659	19,53	2.745	20,39	923	23,74
<b>Total</b>	<b>13.612</b>		<b>13.461</b>		<b>3.887</b>	

**Table-15: Percentage of oil imports from Africa / World's total oil imports**

US imports	5,05%
Europe imports	5,22%
China imports	1,75%

**Table-16: Oil imports from Africa**

USA	32,54%
Europe	33,6%
China	11,3%
<b>Total</b>	<b>8.169.000 barrels/day</b>

(Source: Financial Times)\*

\*Oil: Key players and movements, Financial Times, o.c.

Of the dozen or so oil producing countries in Africa, only four are full members of the Organisation of Petroleum Exporting Countries (OPEC), which – in its own words - counts “13 oil-exporting developing nations”. These four are Algeria, Angola (since 2007), Libya and Nigeria. Not coincidentally, these four countries are the leading oil producers

<sup>75</sup> Oil: Key players and movements, Financial Times website. See: <http://media.ft.com/cms/8f4066aa-9934-11dc-bb45-0000779fd2ac.swf>, last accessed on 20/11/2008.

<sup>76</sup> ECOWAS is a regional organisation comprised of 15 West African countries. It was founded in 1975 with the mission to promote economic integration.

<sup>77</sup> African Development Bank (2007), *African Development Report 2007: Natural Resources for Sustainable Development in Africa*, Oxford University Press: p.60. (Online: [http://www.afdb.org/portal/page?\\_pageid=473,30695219&\\_dad=portal&\\_schema=PORTAL](http://www.afdb.org/portal/page?_pageid=473,30695219&_dad=portal&_schema=PORTAL), last accessed on 5/12/2008).

in Africa. A topic that remains open for analysis in this context is the countries' oil policies and the question whether policies differ notably between the OPEC members and the non-OPEC members.

### 3.1.2 Natural Gas in Africa

Natural gas is clearly a sector that will grow in Africa. Not only have proven reserves doubled in ten years time but the same goes for production, and almost to the same extent, for consumption. With 8,2% of the world's known reserves, Africa finds itself on the same level as the Asian Pacific region, but has double the importance of North America and South/Central America. As shown in table-17, it remains modest for example in comparison with Russia (25% of the world's proven reserves), Iran and Qatar, but it has the potential to attract investment for exploration and, even more importantly, for exploitation.

Indeed, it seems that Africa is producing natural gas at a lower rate (6,5% of world production) than what it owns in reserves (8,2%). Still, production too has considerably grown between 1996 and 2007 and remarkable efforts to increase production have been made, especially by Nigeria (+15,4% in 2007 compared with 2006) and some newcomers (+23% in 2007 compared with 2006). Already in 2005 production was boosted by the initialization of new production fields in Ghana, Tanzania and Mozambique. New production increases are expected from Algeria, Libya and Nigeria<sup>78</sup>, whereas Egypt's production is likely to start declining by 2009.<sup>79</sup>

Natural gas exports from Africa totalled around 107 billion cubic metres in 2007. Table-20 shows that the bulk of exports (61,62 billion m<sup>3</sup> or 57,5%) was transported as Liquefied Natural Gas (LNG) and the remaining 45,58 billion m<sup>3</sup> (42,5%) through pipelines. Spain was the biggest natural gas importer from Africa with France and the US following in second and third.

**Table-17: Natural Gas Proven Reserves (trillion cubic metres)**

	1996	2007	Share of World (%)
Algeria	3,26	4,52	2,5
Egypt	0,29	2,06	1,2
Libya	0,73	1,50	0,8
Nigeria	2,40	5,30	3,0
Other	0,72	1,21	0,7
<b>Total Africa</b>	<b>7,40</b>	<b>14,58</b>	<b>8,2</b>
Russia			25,2
Iran			15,7
Qatar			14,4

(Source: BP Statistical Review of World Energy 2007 & 2008)

**Table-18: Africa Natural Gas Production (billion cubic metres)**

	1996	2007	Share of world total (%)	Change 2006-07 (%)
Algeria	62,3	83	2,8	-1,7
Egypt	11,5	46,5	1,6	4,2
Libya	5,8	15,2	0,5	2,7
Nigeria	5,4	35,0	1,2	23,0
Other	3,8	10,7	0,4	15,4
<b>Total Africa</b>	<b>88,9</b>	<b>190,4</b>	<b>6,5</b>	<b>4,8</b>

(Source: BP Statistical Review of World Energy 2007 & 2008)

**Table-19: Africa Natural Gas Consumption (billion cubic metres)**

	1996	2007	Share of world total (%)
Algeria	21,6	24,4	0,8
Egypt	11,3	32,0	1,1
Other	14,3	27,1	0,9
<b>Total Africa</b>	<b>47,2</b>	<b>83,5</b>	<b>2,8</b>

(Source: BP Statistical Review of World Energy 2007 & 2008)

<sup>78</sup> In December 2008, the West African Gas Pipeline came online. It delivers Nigerian gas, which was then sent to the neighbouring countries Benin, Togo and Ghana.

<sup>79</sup> African Development Bank (2007), o.c.: p.63.

**Table-20: Exports of Natural Gas (billion cubic metres)**

	Algeria	Egypt	Equatorial Guinea	Libya	Nigeria	Total
LNG						61,62
US	2,11	3,24	0,5		2,69	8,54
France	7,85	1,21			3,78	12,84
Spain	4,32	4,04		0,76	8,33	17,45
Natural gas	34,03	2,35		9,20		45,58

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

### 3.1.3 Coal

Coal is the fastest growing fossil fuel. As shown in table-21, compared to the other regions, Africa has one of the lowest percentages of proven coal reserves. Africa owns 6% of the world's proven coal reserves, achieves 5% of the world's production and represents more than 3% of global consumption. An interesting fact is that practically all exploitable reserves in Africa are located in South Africa, where reserves were estimated in 2005 at 34 billion tonnes.

South Africa is also by far the biggest producer, consumer and exporter of coal in Africa. On a global scale, South Africa is the fifth coal producer after China, the United States, India and Australia. The South African exports amounted to 66,4 million tonnes in 2006. This volume was just below the 67,7 million tonnes in 2002, but it almost doubled in value, from US\$1,7 billion in 2002 to more than US\$3 billion in 2006.<sup>80</sup> Mozambique is the second largest coal producer in Africa.

**Table-21: Coal Proven Reserves (million tonnes)**

	2007	Share of World Total (%)
North America	250.150	29,6
South & Central America	16.276	1,9
Europe & Eurasia	272.246	32,1
Middle East & Africa combined	50.991	6
Asia Pacific	257.465	30,4
<b>World Total</b>	<b>847.488</b>	

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

**Table-22: Coal Production (million tonnes oil equivalent)**

	1996	2006	2007	Share of World Total (%)	% 2006
North America	617,7	635,2	629,9	20,1	-0,8
South & Central America	25,6	52,2	55,3	1,8	6
Europe & Eurasia	477,5	446,1	445,4	14,2	-0,2
Middle East	0,7	0,5	0,5		
Africa	121,5	147,1	154,2	4,9	4,8
Asia Pacific	1.052,5	1.753,4	1.850,2	59	5,5
<b>World Total</b>	<b>2.295,6</b>	<b>3.034,5</b>	<b>3.135,6</b>		<b>3,3</b>

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

**Table-23: Coal consumption (million tonnes oil equivalent)**

	1996	2006	2007	Share of World Total (%)	% 2006
North America	560,6	605,7	613,3	19,3	1,3
South & Central America	19,1	20,9	22,4	0,7	7,3
Europe & Eurasia	564,9	532,6	533,7	16,8	0,2
Middle East	6,1	8,9	6,1	0,2	-32,1
Africa	89,8	101,9	105,9	3,3	3,9
Asia Pacific	115,3	1.771,7	1.869,2	59,7	7
<b>World Total</b>	<b>2.355,8</b>	<b>3.041,7</b>	<b>3.177,5</b>		

(Source: BP Statistical Review of World Energy 2007 &amp; 2008)

<sup>80</sup> Data from the South African Department of Minerals and Energy (DME), cited in: African Development Bank (2007), o.c.: p.56.

### 3.1.4 Uranium

Africa's uranium proven reserves amounted to 5,5 million tonnes in 2007, while there were only 4,7 million tonnes in the year 2005. From an economic point of view, the uranium reserves are highly valuable because they can be exploited for less than US\$130 per kilogram.<sup>81</sup> South Africa possesses about 8% of these reserves, Namibia and Niger each 5%.<sup>82</sup>

The amount of ores worth exploiting has risen and this is mostly the result of the price evolution of uranium. Since 2001, the price has exploded from US\$10 per pound to almost US\$140 per pound in early 2007. The price evolution is in line with the growing interest for nuclear energy, as oil and gas prices worldwide are increasing very sharply. As a result there, there has been an increase in uranium exploitation, for example in Sudan and Chad, and there are uranium projects planned, for the Central African Republic and Namibia.

**Table-24: Africa's Uranium Share of World**

Recoverable Reserves	18%	Niger, Namibia, South Africa
Production	15,9%	Niger, Namibia, South Africa
Consumption	0,5%	South Africa

(Source: calculations from BP Statistical Review of World Energy 2008 & World Nuclear Association)

Globally, Canada and Australia account for 44% of uranium production. Africa has been mining uranium for over a decade. As shown in table 24, the top countries are South Africa, Namibia, Niger and Gabon. Gabon, however, lost its importance in the sector back in the 1990s. South Africa's production is declining as well. Niger, for the moment, represents 48% of Africa's uranium production, against 43,8% for Namibia and just 8,2% for South Africa. These three countries together produce 15,9% of the world's total uranium production.

Although the three countries have active production, within Africa, only South Africa consumes uranium. It represents 0,5% of the world's consumption.<sup>83</sup> According to the South African service Department of Minerals and Energy, almost all uranium mined in Africa is exported to France. The exportation of uranium to France creates an interesting setting for "economic diplomacy" regarding the energy sector. For example, when visiting South Africa in February 2008, French President Nicolas Sarkozy told the government in Pretoria: "*on va se battre pour obtenir le marché des centrales, charbon comme nucléaire*".<sup>84</sup> And in March 2009, the French energy company Areva signed a "mining partnership agreement" with the Democratic Republic of Congo.<sup>85</sup> France's active economic diplomacy will be further discussed in the Chapter 5.

## 3.2 Metallic minerals

Following the energy minerals are the metallic minerals. Six metals dominate the metal mining industry. Iron, gold and copper account for some 50% of the total value of metallic minerals produced. They are followed by nickel and zinc, which represent 8,3% of the value of metallic mineral production. Bauxite, which only becomes valuable after being refined into aluminium, is sixth on the list with 1,5% of production value. Other metallic minerals, together, represent almost 37% of the value of metallic mineral production.<sup>86</sup>

As in oil and gas, the geography of metallic minerals is unbalanced between the North and South. The developed countries consume more than they produce, whereas the other regions (Africa, Latin America and the Caribbean, Developing Asia, South-East Europe and the Commonwealth of Independent States) produce more than they consume and are often net-exporters.

Africa is the world's leading producer of precious stones (diamonds) and precious metals such as gold and platinum. Latin America dominates the world supply of copper and silver. The developed countries absorb most of the strategic metallic minerals (necessary to produce steel), although their consumption of iron, copper and zinc has started decreasing since the 1990s. This decrease in the developed countries is being compensated by the growing needs in Asia.

<sup>81</sup> *Uranium resources sufficient to meet projected nuclear energy requirements long into the future*, OECD/NEA, Paris, June 3, 2008.

<sup>82</sup> Supply of uranium, World Nuclear Association website, June 2008. See: <http://www.world-nuclear.org/info/inf75.html>, last accessed on December 5, 2008.

<sup>83</sup> The only African commercial nuclear power station can be found in Koeberg, South Africa. It was constructed by a French consortium in the beginning of the 1980s, during Apartheid. It has two reactors and is property of the South African electricity company Eskom.

<sup>84</sup> The quote can be translated as saying, "We will struggle to obtain the power plant market, both coal and nuclear". *Allocution du président de la république devant le forum des entreprises*, Capetown, French Ministry of Foreign Affairs website, February 29, 2008. See:

<https://pastel.diplomatie.gouv.fr/editorial/actual/ael2/bulletin.asp?liste=20080303.html#Chapitre1>, last accessed on 5/12/2008).

<sup>85</sup> Areva signs mining partnership agreement with DRC, Areva press release, March 26, 2009

<sup>86</sup> UNCTAD (2007), o.c.: p.85.

**Table-25: Metallic Minerals Production and Consumption Percentage of World Total, 2005**

		Africa	Latin America and Caribbean	Developing Asia <sup>1a</sup>	South-East Europe and CIS <sup>2b</sup>	Developed countries
Iron ore	Production	4	24	29	14	29
	Consumption	1	5	52	13	29
Copper	Production	9	21	6	21	43
	Consumption	1	6	42	5	46
Gold	Production	21	18	23	10	28
	Consumption	4	2	53	2	39
Nickel	Production	5	17	26	22	30
	Consumption	3	13	12	22	50
Zinc	Production	4	21	32	7	36
	Consumption	2	8	39	9	42
Bauxite	Production	10	27	19	8	36
	Consumption (aluminium)	1	20	19	12	48

(Source: *World Investment Report 2007, UNCTAD, p.87*)

<sup>a</sup>'Developing Asia' counts 44 developing member countries of the Asian Development Bank (Japan and Korea, members of OECD, are not in this group)

<sup>b</sup>Commonwealth of Independent States.

The following sections will go into detail of consumption and production numbers on the two of the three metallic minerals: precious metals and base metals.

### 3.2.1 Precious metals

Africa dominates the world's supply of precious metals and of precious stones. This is shown for gold in table-26 and for Platinum Group Metals in table-27. Gold, platinum and silver are just some of the precious metals (as defined in Table-1 in Chapter 1).

**Table-26: Gold production (kgs)**

	Rank 2006	2002	2006	% of Africa	% of world
South Africa	1	398.258	272.128	55,62	11,7
China	2	202.000	247.200		
Australia	3	266.140	247.000		
USA	4	298.000	242.000		
Peru	5	157.298	203.269		
Ghana		69.575	66.205	13,53	
Mali		56.019	50.773	10,37	
Tanzania		43.320	39.750	8,12	
<b>World total</b>		<b>2.530.000</b>	<b>2.310.000</b>		

(Source: *World Mineral Production 2002-2006, BGS*)

Total gold production in Africa reached 489.257 kgs in 2006, down from 632.185 kgs in 2002. The continent's share has been decreasing steadily from 32% of the world production in 1990 to 21% in 2006. The decline stems from the decrease of production in South Africa, which is number one in the production of gold. It is believed that the decrease in production is related to labour and the rising production costs, partly from deeper underground mining.

Although Africa is a big producer, consumption of gold in Africa is almost non-existent. South Africa imports some gold from West African countries; it also refines the majority of its production. African exports leave mainly for Switzerland, Canada and the United Kingdom (UK) (for gold in unwrought form) and Israel, the US, Belgium and Germany (for use a.o. in jewellery).

**Table-27: Platinum Group Metals Production (kgs)**

		2002	2006	% of world	2007
South-Africa	Platinum	133.796	168.125	33,35	183.000
	Palladium	64.244	86.265		93.000
Zimbabwe	Platinum	2.053	4.998		5.400
	Palladium	1.728	4.022		4.400
World		395.000	504.000		

(Source: World Mineral Production 2002-2006, BGS)

South Africa is the largest platinum<sup>87</sup> producer in Africa. In 2005, the country accounted for 97% of Africa's platinum production and 77% of the world's production. The mined platinum is used mainly in car and autocatalyst factoring as well as in jewellery. South Africa also produces over one-third of the global production of PGMs. South Africa comes second after Russia in the production of palladium, while the US and Canada follow in third and fourth. South Africa's Bushveld mine<sup>88</sup> is believed to hold enormous reserves; 5.763 million kgs of platinum and 3.291 million kgs of palladium too.<sup>89</sup> The reserves of the mining site almost equal the world's platinum production. The total exploitable reserves of PGM's in South Africa are estimated at 63 million kilos on a world total of 71 million kilos.

The majority of African platinum is being exported either in unwrought or semi-factured forms to Europe, Asia or the US.<sup>90</sup> In 2005, 34% of South African exports went to the US, 20% to Germany, 17% to Japan, 14% to the UK and 11% to Switzerland.<sup>91</sup> Total South African exports then reached a value of over US\$2 billion. The US roughly receives 44% of the platinum it consumes from South Africa and 24% of palladium.<sup>92</sup>

Platinum is currently performing well in the world market. In May 2008, its price stood at US\$2.054,5 per troy ounce, compared with US\$1.530 in 2007. The large profits from some of the platinum mining companies demonstrate how well the metal is fairing in the market. The number one producer, Anglo Platinum Corp. (a subsidiary of the fourth mining group Anglo American) declared a US\$2,697 billion profit over 2007.<sup>93</sup>

The potential for profit draws considerable amounts of investments to the sector. Some analysts are even starting to warn for an over-supply, which will result in a drop in prices and earnings. For example, a Credit Suisse Standard Securities report published in July 2008, stated that South Africa's platinum mining was expanding much too fast, with a projected production of 5,9 million ounces in 2010 and 7,6 million ounces in 2015. The report continued by stating that at the same time car manufacturing, a major consumer of platinum, was going to meet tough times and the recycling of autocatalysts, another platinum application, was increasing. As clearly analysed in the Credit Suisse report, there will be over-supply and this will cost the industry 40 to 90% in earnings by 2012.<sup>94</sup>

### 3.2.2 Base metals

In mining and economics, 'base metals' refers to industrial non-ferrous metals (and excludes precious metals). Commonly six base metals are distinguished: copper, aluminium, lead, nickel, tin and zinc. The following sections will discuss two base metals, copper and cobalt.

#### 3.2.2.1. Copper

The production of copper in the world is dominated by the Americas with Chile being the first in world production (36,5% in 2007) and state-owned Chilean company Codelco leading the list of top copper companies. Copper mining is expanding rapidly, in both volume and value. South America leaped from leading one quarter of the world's production to over a half in 2006. Chile progressed from 16% in world production in 1985 to 35% in 2006.

Africa is not the producer that the Americas are when it comes to copper. In 2006, the nine copper producing countries in Africa combined, produced only 5% of the world's copper. With some 70 million tonnes (Mt) of reserves, the Democratic Republic of Congo (DRC) comes second after Chile (88 Mt).<sup>95</sup> Then follows the US (45 Mt), Russia and Poland (each

<sup>87</sup> In order to avoid confusion, there is a need to explain the usage of the word "platinum". Platinum is just one of the Platinum Group Metals (PGMs), but by far the most important. PGMs are platinum, palladium, rhodium, ruthenium, iridium and osmium. Unfortunately, data on platinum and PGMs in this paper will be mixed, because many of our sources did not separate them in their own statistics.

<sup>88</sup> The full title of the mine is Bushveld Igneous Complex, BIC.

<sup>89</sup> Proven and probable reserves: 203,3 mln oz of platinum, 116,1 mln oz of palladium. African Development Bank (2007), o.c.: p.67.

<sup>90</sup> It must be noted here however that platinum needs little or no processing at all after it is being mined, a quality it shares with gold. According to UNCTAD, "its share of value added at the mining stage is 100". UNCTAD (2007), o.c.: p.85.

<sup>91</sup> Idem, p. 68.

<sup>92</sup> USGS (2008), o.c.: p.126.

<sup>93</sup> Anglo Platinum profit in Rand: 12,667 billion over 2007 (1,420 bln over 1998). *Anglo Platinum Annual Report 2007* (Online: [http://angloplatinum.investoreports.com/angloplatinum\\_br\\_2007/index.php](http://angloplatinum.investoreports.com/angloplatinum_br_2007/index.php), last accessed on 5/12/2008).

<sup>94</sup> Too rapid mining pushing platinum into significant oversupply, Mining Weekly, July 30 2008.

<sup>95</sup> GOOSSENS P.J. (2006) *Evaluation of DRC Mineral Resources*, in: World Bank (2007) 'Democratic Republic of Congo: Growth with Governance In the Mining Sector'. According to the US Geological Service, Chile had a copper reserve of 150 million tonnes in 2007, see: *Mineral Commodity Summaries-Copper*, January 2008.

20 Mt) and Indonesia and Peru (each 19 Mt).<sup>96</sup> However, the reserves in the Copperbelt that stretches from Katanga in the DRC through Northern Zambia to Angola holds higher copper grades and are thus of better quality than the Chilean reserves. The copper grade – this is the degree of metal in raw material - is said to reach 4% at the Nchanga basin in Zambia and even 7% at the Kolwezi basin in Congo.<sup>97</sup>

The copper price on the metal exchanges reflects global balances of copper supply and demand, "but may be significantly affected by speculative activity, currency exchange rates and market news", writes the British Geological Survey. "Copper demand and price typically reflect global economic cycles, and as a result the copper price has historically experienced major fluctuations".<sup>98</sup> Copper started on an upward trend in 2002 and has not been interrupted until the economic downturn of 2008. For example, the price of one tonne of copper has increased by 502% from 2003 to 2007. In July 2008, copper stood at US\$8.413 per tonne on the London Metal Exchange. That figure is a 614% increase compared with the average price in 2003.

**Table-28: Copper price evolution 2000 - 2007**

	2000	2001	2002	2003	2004	2005	2006	2007
US\$/tonne				1.178	2.865	3.678	6.700	7.100
(%)	15,3	-13	-1,2	14,1	143	28,4	83	5,9

(Sources: Economic Report Africa 2007, UNECA; BGS 2008; BDI 2006)

The exceptional growth in copper demand has been mainly from emerging global players. China alone, which is experiencing an intense resource growth phase, was responsible for 66% of the growth of copper demand in 2005 and took a 22% share of total world demand of copper.<sup>99</sup> For seven years in a row China's demand increased an average of 14,3% per year and India's demand increase averaged 8% per year.<sup>100</sup> In 2007, global demand increased by 3,9% with a 16% increase for China but a 5% decrease for Europe. China's import of copper concentrates is expected to grow from 574.000 tonnes in 2002 to 1.871 million tonnes in 2009.<sup>101</sup> Even during the mining boom there was a large amount of discussion on whether this upward trend is going to continue or not. One study projects that the world's consumption, with an average growth of 3,9% per year during the last decade, will remain strong but that the expansion of supply will only be around 2,3% in 2008. In other words, supply cannot follow with the demand, which means, another spike in prices.<sup>102</sup>

Whether Africa has taken advantage of the evolution on the world copper market remains to be seen. In Zambia, transnational corporations exported copper and cobalt in 2006 for a total value of US\$3,2 billion dollars, but the preceding year the Zambian government received only US\$75 million in revenues from copper mining, or some 5% of the exported value.<sup>103</sup> In 2007, the Zambian government sought to regain some of the revenues it was losing and restructured its mining tax policies. Of course, there was strong resistance from some mining companies. The new tax policies should now bring in revenues to over US\$ 400 million in 2008.<sup>104</sup>

With the presence of copper in Africa, comes the presence of large mining companies. Producing in South Africa, Botswana and Namibia is Anglo America; Freeport McMoran produces in the DRC; BHP has production sites in South Africa as well as Rio Tinto, which has additional sites in Namibia and Zimbabwe. The Swiss company, Xstrata, is producing coal (a.o. in South Africa), nickel (a.o. in Tanzania), copper and zinc and is rumoured to be pushing for control over the platinum producer Lonmin. This would be a second large takeover for Xstrata, which recently swallowed the Canadian copper company, Falconbridge, and is now sixth on the "Top 10 List" of copper companies.

### 3.2.2.2 Cobalt

Although cobalt is widely found in the Earth's crust, its low concentration usually means that it is produced as a by-product of other metals. Most of the world's cobalt deposits contain the metal in combination with copper or nickel and a bit of arsenic and silver.<sup>105</sup> Until recently, Morocco was identified as the only country where cobalt was produced as the principal product of a mining operation.<sup>106</sup> Other than Morocco, cobalt mining in Africa occurs almost solely in

<sup>96</sup> GOOSSENS o.c.

<sup>97</sup> African Development Bank (2007), o.c. Note that the deposit figures in this report (Nchanga: 450 Mt, Kolwezi: 600 Mt) differ from the reserves mentioned by the USGS (490 million tonnes in 2007). This may be a matter of definition: the USGS-reserves being the volumes that are economically exploitable.

<sup>98</sup> BGS (British Geological Survey) (2008) *World Mineral Production 2002-2006*: p.24.

<sup>99</sup> UNCTAD (2007), o.c.: p.89.

<sup>100</sup> From a Credit Suisse study mentioned by USGS (2008), o.c.: p.14.

<sup>101</sup> Brook Hunt July 2007, cited in a presentation by Cumerio (2007) *Copper market*: p.9 (Online: [www.cumerio.com/en/media/presentations/2007/show\\_Coppermarket\\_20070822.pdf](http://www.cumerio.com/en/media/presentations/2007/show_Coppermarket_20070822.pdf), last accessed on 5/12/2008).

<sup>102</sup> From a Credit Suisse study which is not publicly available but was mentioned by USGS (2008), o.c.: p.14.

<sup>103</sup> UNCTAD (2007), o.c.: p.136-137.

<sup>104</sup> Mining revenue sweetener for Zambia, Miningmx, February 27 2008. (Online: [http://www.miningmx.com/mining\\_fin/143353.htm](http://www.miningmx.com/mining_fin/143353.htm) last accessed on 29/2/2008)

<sup>105</sup> CDI (Cobalt Development Institute) (2007), *Cobalt Facts: Supply and Demand*, (Online: [http://www.thecdi.com/cdi/images/documents/facts/cobalt\\_facts-supply\\_demand\\_07\\_.pdf](http://www.thecdi.com/cdi/images/documents/facts/cobalt_facts-supply_demand_07_.pdf), last accessed on 7/11/2008).

<sup>106</sup> SHEDD K.B. (2008) *2006 Minerals Yearbook: Cobalt*, US Geological Survey: p.19.3 (Online: <http://minerals.usgs.gov/minerals/pubs/commodity/cobalt/myb1-2006-cobal.pdf>, last accessed on 5/12/2008).

Zambia and the DRC. Here cobalt is associated with copper ores, and practically no nickel, contrary to Canada where cobalt is present in nickel-copper sulphide ores.<sup>107</sup> The artisanal mining of the cobalt mineral heterogenite in the DRC, however, should be considered primary cobalt production.<sup>108</sup> South Africa mines cobalt as a by-product from PGMs and nickel, but its production quantity is very small.

Currently, a rough breakdown of worldwide cobalt production is: Nickel Industry (48%); Copper Industry (37%); Primary cobalt operations (15%).<sup>109</sup> The proportion of cobalt that is recycled is significant. In 2000, it accounted for approximately 20% of total cobalt consumption.<sup>110</sup>

When looking at the statistics represented in table-29, the Chinese and Congolese numbers for refinery are the most striking.<sup>111</sup> This is because, together, the two countries represent 45% of the world capacity in cobalt refinery. China's share is 28% and the DRC is 17%. Although both represent large percentages for capacity, both have different ways of achieving their percentages.

**Table-29: Cobalt mine production, mining reserves, refinery production, refinery capacity per country, for 2006 (metric tonnes)**

Country	Mine production (2006)	Mining Reserves	Refinery production (2006)	Refinery capacity (2006)
Australia	7.400	1.400.000	4.000	4.500
Brazil	1.200	29.000	902	1.200
Canada	7.000	120.000	5.180	5.900
China	2.300	72.000	12.700	25.000
DRC	28.000	3.400.000	550	15.000
Cuba	3.800	1.000.000		
Finland			8.582	10.000
Morocco	1.500	20.000	1.405	1.650
Norway			4.927	5.200
Russia	5.100	250.000	5.900	6.000
South Africa	400		267	750
Uganda			674	720
Zambia	8.000	270.000	4.665	8.200
<b>World Total</b>	<b>67.500</b>	<b>7.000.000</b>	<b>55.000</b>	<b>88.800</b>

(Source: USGS 2006 and 2008)

**Table-30: The origin of cobalt being refined, for the year 2005\***

New Caledonia	4,0%
Australia	10,1%
African Copperbelt	42,4%
Africa (all but the Copperbelt)	6,1%
Brazil	2,1%
Canada	8,0%
China	3,6%
Cuba	7,2%
Russia	6,9%
Others	9,5%
<b>Total</b>	<b>100% (54.900 tonnes)</b>

\*CDI (2006) Cobalt Facts: History, (Online: [http://www.thecdi.com/cdi/images/documents/facts/COBALT\\_FACTS-History.pdf](http://www.thecdi.com/cdi/images/documents/facts/COBALT_FACTS-History.pdf), last accessed on 7/11/2008).

What is unusual is that the DRC's refined cobalt production in 2006 only represented 1% of the world's production, which was 550 tonnes. This remarkable contrast is the consequence of the deterioration of the DRC's infrastructure over the past decades.

Despite the deteriorating state of the DRC's refining infrastructure, it was still able to supply the world with significant quantities of cobalt in ores, concentrates and semi-refined materials. Some of the country's cobalt mine production was from copper-cobalt ores mined by traditional methods, but a large portion was gathered by tens of thousands of artisanal miners hand-picking cobalt-rich ores which contain the mineral heterogenite. These ores were sold to intermediaries or trading houses, and exported, primarily to China and India.

<sup>107</sup> FENEAU C. (2002) *Non-ferrous metals from Ag to Zn*, Umicore: Brussels, 285p.: p.58

<sup>108</sup> SHEDD K.B. (2008), o.c.: p.19.3.

<sup>109</sup> CDI (2007), o.c.

<sup>110</sup> FENEAU C. (2002), o.c.: p.61.

<sup>111</sup> The figures shown in the table are the ones most appropriate for our arguments, a complete table can be found in Annex 2.

Unlike the DRC, China does convert its refining capacity to reach a great portion of the worldwide produced refined cobalt (23%). An interesting point regarding China is that while it represents one-fourth of the world's cobalt treatment, as you can see from table 29, its mining numbers are much lower.

China's need for raw materials is also visible in the cobalt market. China's cobalt consumption has increased by an annual average rate of 22%. The increase was driven especially by the battery industry, which represented nearly a half of Chinese cobalt consumption in 2006.<sup>112</sup>

Not only China but the world market as a whole is consuming more cobalt. The increase is driven primarily by the expanding rechargeable battery industry and the mobile phone industry, which is a major consumer of rechargeable batteries. In 2005, the mobile phone industry accounted for the consumption of 12.000 tonnes of cobalt. This represents about 22% of the world's refined cobalt production.<sup>113</sup>

China's growth requires cobalt; its production of refined cobalt was estimated to be approximately 15.200 tonnes, which made it the world's leading producer. In 2006, only about 4% of China's production originated from domestic mines. The remainder of the cobalt originated from imports (69%), stockpiled raw materials (15%), and scrap (12%). Most of the imported raw materials derived from the DRC, as its infrastructure is no longer able to refine the cobalt mined in the country.<sup>114</sup> It is estimated that between 2001 and 2005, about 75% to 90% of the cobalt China imported originated from the DRC.<sup>115</sup> In 2006, however, the government of the DRC began to enforce a ban on exports of unprocessed cobalt, in order to encourage greater development of downstream processing in the country. As a result, Congolese exports of unprocessed ores and concentrates to China decreased and exports of cobalt semi-refined materials increased. Thus, the Congolese cobalt exports to China increased in 2006.<sup>116</sup>

The restrictions the DRC government put on the export of raw ore materials and concentrates resulted in a slowing of worldwide-refined cobalt production in 2006 and 2007. This slowing of growth is an occurrence that had not happened since 1994. For now, it appears that growth is taking place again. Because of its important reserves, developments in the DRC have been, and will be in the future, an important factor in the cobalt market.<sup>117</sup>

When studying the price evolutions over the past few years, it becomes evident that two main factors were of influence: first, the political situation (war and instability) in the DRC and second, China's economic growth. Before the turn of the century, the cobalt market was guarded against sharp price increases by the US government stockpile, which sold cobalt during the 1990s.<sup>118</sup> In 2003, after some years of decline, prices recovered from a relatively low point. This decline was, among other things, the consequence of a number of producing countries increasing their amount of production and therefore, supplying more than what was demanded. In 2007, there was almost a doubling in price in the cobalt market; at the start of the year it was an average US\$24,75/lb (99,8%)/US\$22,38/lb (99,3%) in January and at the end of the year at US\$41,25/lb (99,8%)/US\$39,25/lb (99,3%).

The jump in price was in reaction to China's impressive economic growth, as it demanded ever-larger volumes of commodities to meet surging consumption, and particularly ores and concentrates from the DRC. Constraints on exports of raw materials by the DRC government caused the markets to tighten further in 2007 and the prices maintained their upward trend. A combination of weaker demand, easing supply and de-stocking tempered prices after the first quarter of 2008 to about US\$25/lb in the July holiday season. Some recovery was observed in the third quarter to above US\$35/lb.<sup>119</sup>

To some extent, cobalt prices in the near future will most likely soften. Although, some analysts think China and Asia will maintain their demand for raw materials, this will probably be at reduced rates given the financial crisis and recessionary pressures. In addition, there are a significant number of new projects in development, like the Tenke Fungurume project in Katanga, DRC, although most only in 2009/2010. Therefore, a volatile price period will occur in the medium term, resulting in a softening price trend in the long term because of the arrival of new production projects.

Most recent coverage on cobalt prices seems to support the above projected outlook. Cobalt prices in November 2008 fell to US\$18/lb. There were even some reports that large producers planned to halt production in order to keep from undermining the price. With the upcoming 2009/2010 new projects, it is estimated that prices could further decrease to US\$10/lb by 2012.<sup>120</sup>

<sup>112</sup> SHEDD K.B. (2008), o.c.: p.19.5-19.6.

<sup>113</sup> DanWatch (May 2008) *Bad connections: How your mobile phone is linked to abuse, fraud and unfair mining practices in DR Congo.*: p.15.

<sup>114</sup> SHEDD K.B. (2008), o.c.: 19.5-19.6.

<sup>115</sup> DanWatch (May 2008), o.c.: p.15.

<sup>116</sup> USGS (2008), o.c.: p.53.

<sup>117</sup> CDI (2007), o.c.

<sup>118</sup> MIKUMBIRA R., *Cobalt price running wild on predicted big supply shortfall*, Mineweb, January 3, 2008 (Online: <http://www.mineweb.com/mineweb/view/mineweb/en/page36?oid=43655&sn=Detail>, last accessed on 10/11/2008).

<sup>119</sup> CDI (2007), o.c. and CDI (2008) *Cobalt News October 2008* (Online: [http://www.thecdi.com/cdi/images/news\\_pdf/cobalt\\_news\\_oct08.pdf](http://www.thecdi.com/cdi/images/news_pdf/cobalt_news_oct08.pdf), last accessed on 10/11/2008).

<sup>120</sup> SERGEANT Barry, *Cobalt's turn to slump*, Mineweb, November 17, 2008 (Online: <http://www.mineweb.com/mineweb/view/mineweb/en/page36?oid=73195&sn=Detail>, last accessed on 25/1/2008)

### 3.3 Non-metallic/Industrial

To end this chapter we take a look at one of the non-metallic minerals in which Africa is really big, and this is diamonds. This does not mean that it is the only mineral of this category to be found in the continent. Other non-metallic and industrial minerals sometimes take preponderant stakes in African economies. For example Morocco which has the world's largest phosphate rock reserve. With major construction sites in operation, for example for the 2010 soccer World Cup in South Africa, the cement sector too has seen quite brisk developments. We choose to spend some attention to diamonds however because they have been at the heart of various conflicts but also represent a model to add value through so-called beneficiation.

#### 3.3.1 Diamonds

Africa produced around half of the world's diamonds in 2006. The sector thrived these last years, but was hit all the harder when in 2008 the economic crisis sensibly put consumption in Northern markets – with the US remaining the first consumer – under pressure. This table shows how the world's major diamond producers were performing before the crisis.

**Table-31: Diamond Production (million carats)**

	2002	2005	2006	Value (US\$ billion)
Botswana		31,8	34,3	3,207
DRCongo		33,05	28,9	0,4319
South Africa		15,5	14,9	1,361
Angola		7,07	9,1	1,132
Australia		32,9	29,9	0,5595
Russia		38	38,36	2,574
World	132,1		176,8	11,974

(Sources: *World Mineral Production 2001-2006, BGS; Kimberley Process CS cited by Canadian Minerals Yearbook 2006; USGS 2008*)

In 2006, the world produced 176,8 million carats of diamonds with a total value of almost 12 billion dollars.<sup>121</sup> Russia was the world's first diamond producing country in volume, followed by Botswana, which in 2006 jumped over Australia, and the DRC. Africa has 16 diamond producing countries. With a production of 94,2 million carats, its share in 2006 represented 53,3% of world production in volume and 61,5% in value.

The remarkable differences in value produced by each country can be explained by the type of diamonds these countries produce. The DRC is the world's fourth diamond producer in volume but it creates far less value than its neighbour Angola for example. While Angola's production of gem quality diamonds constitutes at least 70% of its total diamond production, in the DRC only 5% of the diamonds produced are of gem quality, 65% are industrial quality, and the remaining 30% are near gem.<sup>122</sup> This made the DRCongo the first producer of industrial diamonds in 2008 with a total production of 23 million carats (against 18 million for Australia).<sup>123</sup> Botswana is the number one producer of gemstones with a production value of close to \$3 billion in 2007.<sup>124</sup>

In 2006, Botswana delivered the most diamond value. This position is mainly due to a recent restructuring in the world diamond sector, of which the diamond group De Beers and the government of Botswana have been the drivers. The aim of this restructuring was to attract investment into the so-called beneficiation of rough diamonds in Botswana. The system now works as follows: De Beers (owned by Anglo American with 45%, the Oppenheimer family with 40% and the government of Botswana with 15%) has established the Diamond Trading Company Botswana (DTCB), a 50:50 joint venture with Botswana. DTCB markets the whole diamond production of Debswana (from the De Beers 'Family of Companies'), which is signing deals with 16 clients (14 contracts signed up to 2008, according to De Beers). These clients are factories, established in Botswana, that are cutting and polishing rough diamonds, before bringing them onto the world market. Botswana benefits from this system through the value it adds and the employments it creates. Namibia with the producer Namdeb and the marketing arm NDTc has been applying the same structure of beneficiation. The De Beers Group produced 48,1 million carats in 2008 (a slight drop from 51 million carats in 2007 or 28,9% of global production) of which almost 15 million carats was produced by De Beers Consolidated Mines in South Africa.<sup>125</sup>

In several African countries, that have been witnessing political instability, warring factions have used diamonds as a source of income. This was a.o. the case in Angola, DRCongo, Liberia and Sierra Leone and it created the notion of blood diamonds. As a reaction, a multi-partite (industry, governments, NGOs) system was devised to stem the flow of these 'conflict diamonds'. This control regime was launched in November 2002 and came to be known as the Kimberley Process Certification Scheme (KPCS). KPCS is – in its own words – "a joint governments, industry and civil society initiative to stem the flow of conflict diamonds – rough diamonds used by rebel movements to finance wars against legitimate governments".

<sup>121</sup> BGS (2008), o.c.; The Kimberley Process Certification Scheme gives slightly different production figures with a world production of 175,5 million carats in 2006.

<sup>122</sup> GOOSSENS P. (2006) *Evaluation of DRC Mineral Resources*. Annex 2 of World Bank (2007) *DRC Growth with Governance*.

<sup>123</sup> *Industrial diamond* (2009). USGS Mineral Commodity Summaries

<sup>124</sup> *Kimberley Process Statistical Website*.

<sup>125</sup> De Beers Operating and Financial Review 2008. February 27, 2009.



The Moroccan port of Jorf Lasfar where phosphate is being processed and exported (Photo: IPIS)

## 4. Economic perspectives

As shown in the previous chapters, mineral production has continued to grow each year. Will the sector be able to maintain the same expansion rate as the world's economy has gone into crisis? Even before the outbreak of the economic crisis in September-October 2008, there was not a unanimous answer to the question. Some projections said that the demands of developing economies would remain high for years to come and that there would be a need for raw materials. Others believed that from 2009-2010 onwards prices would decline, for example in base metals. While such a debate continues, there is no denying that large economies are being dragged into recession. Economic perspectives become more realistic (and less optimistic) every day. The demand for commodities is coming to a standstill and prices have plunged.

While the large economies debate and decide economic stimulus plans and bailouts of financial institutions or car manufacturers, the economic activity in Africa is highly dependent on the rest of the world. Africa survives mainly through the export of natural resources. The continent still has little industry processing its raw materials. This chapter describes the outstanding expansion over the last years in the commodities sector and the mechanisms that explain this exceptional growth. It was largely written before the global crisis, when confidence in the world economy was still strong. The chapter will first give a short assessment of how the financial crisis that arose in the US, suddenly harmed the world economy. It then discusses how the global crisis affects the mining sector, specifically in Africa.

### 4.1 Growth perspectives

In the beginning of 2008, the World Bank estimated that by the year 2030, global GDP will have doubled compared to the 2004 production level. Countries outside the OECD would achieve 80% of this economic growth.<sup>126</sup> This is an interesting statistic because now western countries are in crisis and their growth is falling behind, compared to the developing economies' growth. The concept "new global players" is actually more realistic as these economies together achieve 41% of global production (US\$59 trillion in 2006), compared to 36% in 2000.<sup>127</sup>

Table-32 shows the five leaders of the developing economies which could be considered "the new global players". They are the BRIC countries (Brazil, Russia, India and China) and South Africa. China is in the interesting position to be not only the largest *developing* economy in the world but to be also the second largest economy in the world, after the US.

<sup>126</sup>TAYLOR R.P., GOVINDARAJALU C., LEVIN J., MEYER A.S., WARD W.A. (2008) *Financing energy efficiency. Lessons from Brazil, China, India and beyond.* World Bank, Washington: p.24. (Online: <http://go.worldbank.org/FZLUDESSBQ>, last accessed on 5/12/2008).

<sup>127</sup> From press articles from April 11 2008, on the *World Development Indicators 2008* of the World Bank.

**Table-32: GDP 2007 (billion US\$)**

China	3.249
Brazil	1.295
Russia	1.224
India	1.090
South Africa	275

(IMF estimations, from: *Wall Street Journal*, 25 January 2008)

These countries, home to about 42% of the world population, together are becoming an engine of the world economy. For their development, they need energy and natural resources. For example, the import of metallic minerals in China in 2004 was 24 times the import of 1990. In 2005, China imported about 7 times more copper ore and 4,5 times more copper scrap than ten years earlier.<sup>128</sup> According to the World Bank, the energy consumption in the world between 2004 and 2030 would rise 53%. In non-OECD countries, this consumption would almost double. This means, that globally 5,9 billion tonnes of extra oil will have to be produced, of which 4,2 billion tonnes will be for the developing economies. For the moment, the OECD still comprises the major energy consuming countries. Lastly, the study found that OECD countries and the developing economies would be equal consumers in 2015, after which the developing countries would surpass the OECD countries.

The BRICs, nonetheless, are still developing countries and their growth potential has limits. Their economic frameworks are geared towards the world market. They have serious disabilities, which keep them from achieving their social and economic development. For example, their infrastructure is far from developed. In the beginning of 2008, both South Africa and China were seriously hindered by the inefficiencies of their electric infrastructure. South Africa had to cope with huge blackouts, which caused a 5,2% regression of the mining sector in January and February.<sup>129</sup> Massive blackouts also occurred in China, where a severe winter was to blame. Beijing heightened its power generating capacity with 18,5% between 2001 and 2007. Demand, however, surged 20,2% during the same period. The harsh winter caused a crisis: high-tension cables broke, trains transporting coal did not reach the central parts of the country and people turned up the heating. The city of Chenzhou, with 4,6 million inhabitants, had to survive twelve days without electricity.

If the World Bank is correct, in the next years, developing economies will be changing and producing at an even faster rate than developed economies. This leads us to an important question, just how is the world economy sustaining during this economic crisis? In addition, what sort of effect will it have on both economies? In August 2008, economists wondered whether the world economy would or would not go into a recession. Only a few months later, in November 2008, Japan, Germany and the entire Eurozone officially started uttering the word.

With all of the false predictions, estimates, and claims made by economists over a possible recession, can they still be relied upon? Economic specialists sometimes have their own political agenda and prefer to minimize the extent of the economic crisis. They have been doing so ever since August 2007, when the US began to feel the impact of the crisis in the real estate and mortgage sector. In the meantime, harsh consequences were felt around Europe; in the UK, Ireland and Spain, the construction sector was severely hit.

One year later, it was still possible to read doubting and overly confident analyses. For example, in the beginning of September, it was written in *The Economist*, "Only the terminally gloomy expect a downturn to match the deep recession of the early 1910s or a repeat of the grim 1970s"<sup>130</sup>. Later, in early October Jason Zweig, the Personal Finance Columnist with the *Wall Street Journal* declared, "Another Depression? Not likely".<sup>131</sup> Towards the end of November and after a series of fatal shocks in the financial system, Marc Carney, Governor of the Bank of Canada, appeared extremely confident in a BBC interview. He declared that he and his colleagues had the financial sector under full control again.<sup>132</sup>

No matter how many times you tell yourself that something is "okay", it is not possible to escape the reality. In Europe, economic activity slowed down because demand decreased. Causes of the recession were a credit crunch, a weak housing market and high fuel prices. Then in September-October 2008, the price of petroleum collapsed. US consumption fell back considerably and credit became scarce. This caused repercussions on construction, especially residential construction, and the automobile sector. In June 2008, motorists covered more than 12 billion miles less than one year earlier. American car manufacturers sold considerably less and watched as motorists swapped their gas guzzling Sport Utility Vehicles for smaller and more economical models. These factors led the Big Three (Ford, General Motors and Chrysler) into such financial troubles that they asked the US government to establish a financial emergency pro-

<sup>128</sup> Bundesverband der Deutschen Industrie (BDI) (March 2007), *Rohstoffhunger der Schwellenländer*, in: *Rohstoffsicherheit – Anforderungen an Industrie und Politik*. (Online: [www.bdi-online.de/Dokumente/BDI\\_Ergebnisber\\_Rohstofffr.pdf](http://www.bdi-online.de/Dokumente/BDI_Ergebnisber_Rohstofffr.pdf), last accessed on 5/12/2008).

<sup>129</sup> SA mining output falls after 28,2% drop in gold production, in: *Mining Weekly*, April 10, 2008.

<sup>130</sup> Home's were the hurt is. There have been far worse times for the economy but few for a chancellor, in: *The Economist*, September 6, 2008, p.39.

<sup>131</sup> ZWEIG Jason, *Another Depression? Not likely*, in: *The Wall Street Journal*, October 1, 2008.

<sup>132</sup> Governor of the Bank of Canada, Mark Carney talking to Carrie Gracie, in: *The Interview*, BBC Worldservice, November 22, 2008.

gramme.<sup>133</sup> Belgian specialists estimate that on a global scale there is an oversupply in the automobile sector of 25%, equalling 50 car factories of average size.<sup>134</sup>

During the second quarter of 2008, world trade only increased 0,6%. This was the weakest quarterly growth in seven years.<sup>135</sup> "The worst of the global financial crisis is yet to come", a former head-economist of the International Monetary Fund said in August 2008.<sup>136</sup> Some credit analysts agree.<sup>137</sup> Also in August, the IMF tempered its growth perspectives for 2009. "With a sharp US economic slowdown starting to spill out into other regions, the official said the IMF had downgraded its world growth forecast for this year to 3,9%, down from 4,1% in its World Economic Outlook last month", the press agency Reuters announced.<sup>138</sup>

The World Economic Outlook from 6 November 2008 again reduced the expectations for world output, world trade and commodity prices. Some of the Outlook's projections for the near future are reproduced in Table-33. They show that as global output shrinks the growth of exports from the emerging and developing economies, e.g. African economies, might be halved from 11% in 2006 to 5,3% in 2009 and that prices of oil and non-fuel commodities will decrease significantly.

**Table-33: Projections of global growth, trade and prices 2006-2009 (%)**

	Results			Projections
	2006	2007	2008	2009
World Output				
Africa	6,1	6,1	5,2	4,7
Sub-Saharan Africa	6,6	6,8	5,5	5,1
World Trade Volume (goods & services) – Exports				
Advanced economies	8,4	5,9	4,1	1,2
Emerging & developing	11,2	9,6	5,6	5,3
Commodity prices				
Oil	20,5	10,7	40,2	-31,8
Non-fuel	23,2	14,1	9,4	-18,7

(Source: IMF World Economic Outlook, November 6, 2008)

Everyone is now hoping that growth in China, India and other developing economies will not slow down. China has enormous needs. For example, because of the strong expansion of urbanisation in China the country will have to build between 40.000 and 50.000 skyscrapers from now to 2025. This prediction was made by Tom Albanese, Chief Executive of the mining giant Rio Tinto. Of course, the evolution in the developing economies, and especially China, is of vital importance for Africa "where growth is driven by robust global demand and high commodity prices".<sup>139</sup>

Unfortunately, China too is feeling the downturn, especially because it is an export-oriented economy. In November, China's spectacular economic growth was "slowing sharply, to 9% in the third quarter from nearly 12% last year. Some analysts worry it could easily drop below 8% next year".<sup>140</sup> Back in early November, when the Chinese government introduced the two-year stimulus package worth \$586 billion, it immediately lifted hopes that the global economy would benefit from China's economy too.

## 4.2 Price boom because demand-supply relationship is under pressure

This decade, the world experienced an impressive *commodity-boom*, where the most visible outcome was the evolution of prices. From 2003-2004 onwards, prices have gone through an exceptional change. Not only have fuel prices increased, but also basic food, land and forest products as shown in table-34, over the past seven years, some doubling in the short time period.

**Table-34: Export prices (US\$)**

	2001	2007	Rise (%)
Maize (\$/ton)	89,6	163,66	82,7
Fishmeal (\$/ton)	486,7	1.177,25	141,9
Palm oil (\$/ton)	285,7	780,25	173,1
Round timber (\$/m <sup>3</sup> )	266,10	1.352,08	408,1

<sup>133</sup> Detroit three press for loans relief, in: Financial Times, August 22, 2008.

<sup>134</sup> Een zweer die openbarst. Crisis in de autosector, in: De Standaard, November 22, 2008.

<sup>135</sup> World trade growth slows to seven-year low in Q2, in: Financial Times, August 22, 2008.

<sup>136</sup> Large US bank collapse ahead says ex IMF economist Kenneth Rogoff, Reuters, August 19, 2008.

<sup>137</sup> Jim Reid, a credit strategist at Deutsche Bank: "I think it is fair to say the crisis is deepening because people are very worried about the health of some financial institutions". Bond fundraising costs soar, in: Financial Times, August 24, 2008.

<sup>138</sup> IMF cuts world, euro zone growth outlook, Reuters, in: Engineering Weekly, August 25, 2008.

<sup>139</sup> UNECA (2008), o.c.: p.37.

<sup>140</sup> Economic slump leaves mining companies in deep holes, in: Wall Street Journal, November 17, 2008, p.31.

**Table-34: Export prices (US\$)**

	2001	2007	Rise (%)
Cotton (\$cents/kg)	105,8	139,52	31,9
Coffee Robusta (\$cents/kg)	60,70	190,92	214,5
Cocoa (\$cents/kg)	106,9	195,23	82,6

(Source: Perspectives économiques Afrique 2008, Annexes Statistiques. OCDE)

For minerals, often the price increases were even stronger. The reason behind this is that demand had grown sharply, while supply was not able to follow. Demand rose so sharply, mainly due to the growth of the world economy, with the BRIC emerging economies at the forefront. In addition, speculators are to some extent responsible for the higher demand, as they were attracted in large numbers to the appealing commodity markets. They purchased the commodities and sold them for profit without needing them for real production. Furthermore, technological progress pushed up the demand for mineral commodities, as they are needed in the applications of new products (such as mobile phones, rechargeable batteries, more solid materials, etc.).

#### 4.2.1 Raw material prices

For several decades, prices of basic minerals were low. Since 2002-2003, however, prices of practically all basic minerals have been on the rise. As shown in table-35, some mineral prices multiplied by four or five times.

**Table-35: Minerals price evolution (2003-2007)**

		2003	2004	2005	2006	2007	2003-2007
Aluminium	US\$/Tonne	1.431,3	1.715,5	1.898,1	2.813,14	2.381	66%
Chrome	US\$/kg	0,95	1,57	1,56	1,47	2,67	181%
Gold	US\$/Troy oz*	4.07,59	441,76	509,76	629,79	803,2	97%
Iron	USCents/Tonne	31,03	36,35	62,51	71,4	81,46	162,5%
Cobalt	US\$/kg	23,9	53,2	34,6	57,52	86,81	263%
Copper	US\$/Tonne	1.178,7	2.865	3.678	6.673,18	6.586,51	459%
Lead	US\$/Tonne	514,6	885,9	975,9	1.724,38	2.595,28	404%
Manganese	US\$/Tonne	1,99	1,99	3,29	2,6	5,16	159%
Molybdenum	US\$/kg	13	41	79,6	61,03	75,28	369,5%
Nickel	US\$/Tonne	9.629,5	13.823,20	14.737,90	34.559,08	25.979,03	170%
Palladium	US\$/Troy oz*	290,3	230,2	201,6	326,06	351,29	21%
Petroleum	US\$/barrel	29	38	54,5	65	92	217%
Platinum	US\$/Troy oz*	692,3	845,7	895,6	1.121,26	1.487,37	115%
Tantalium	US\$/kg	55	56,6	79,3	77,16	77,16	40%
Tin	US\$/Tonne	4.891,7	8.503,9	7.376,2	11.149,34	16.252,08	232%
Titanium	US\$/kg	4,6	10,2	21,7	15,3	7,28	58%
Vanadium	US\$/kgTi	4,9	13,3	36,5	14,77	16,36	234%
Tungsten**	US\$/kgW	6,4	10	27,8	33,6	32,8	412,5%
Zinc	US\$/Tonne	827,3	1.047,3	1.381,3	4.404,51	2.352,29	184%

\* 1 Troy Ounce = 31 gram

\*\*Wolfram

(Calculations based on business reports, BDI-Germany, BP, London Metal Exchange)

Harry Broadman, economic adviser for the Africa Region at the World Bank, paid special attention to the increase in prices. He wrote, "Since 1999, Africa has seen price increases for most of its primary export commodities. With the exception of raw materials, which prices have been relatively stagnant, other commodities have experienced noticeable increases in their price levels. This is the case for energy prices. Metals and non-oil-minerals prices also have grown substantially".<sup>141</sup>

The higher prices opened the perspective of exceptional profits in the extractive industries and have led to a worldwide increase of investments in this sector. From 2002 onwards, the biggest companies in this sector (included in the Fortune Global 500) saw their profitability (the ratio of profits to revenues) rise at a much faster pace than the average profitability of the pharmaceutical, telecom and liquor sector. In 2006, oil company Exxon Mobil, achieved the biggest profit ever for an American enterprise.<sup>142</sup> The profits of the forty biggest metal mining companies (representing 80% of market capitalisation) rose from US\$4,4 billion in 2002 to US\$67 billion in 2006, and during 2006 their total value increased with 22% to US\$962 billion.<sup>143</sup> Over the last years, these companies accumulated a gigantic amount of fresh money, which led to a succession of mergers and acquisitions (M&As). Later in the text we will examine the M&A trend in greater detail.

<sup>141</sup> BROADMAN H.G. (2007) *Africa's Silk Road*, World Bank: p.65. Mr. Broadman does not define the notion of raw materials in this context.<sup>142</sup> UNCTAD (2007), o.c.: p.89.<sup>143</sup> PricewaterhouseCoopers (2007), *Mine: Riding the Wave. Review of Global Trends in the Mining Industry*, Johannesburg (Online: <http://www.pwc.com/extweb/pwcpublications.nsf/docid/AD4DEFB47A20ED0A852572F9007200C7>, last accessed on 5/12/2008).

In theory, commodity-exporting countries should be affected in a positive way. The boom should lead towards an increase of investments and jobs, technology transfers and bigger export volumes. Furthermore, state revenues should increase, through the taxes on mining companies, royalties, dividends in mixed enterprises, customs levies and so on. Unfortunately, this is not the case and much depends on the transnational corporation that is operating in the country, their relationship with the government and what type of government is in power. The percentage of revenues that the TNC pays to the host country depends on the relative strength of the state in that country and of government policy. In Chile, for example, the world's leading copper producer Codelco (state owned) pays a larger amount of taxes in comparison to the private copper companies. In Mali, some companies exploiting gold mines were exempted from paying taxes during the first years of operations.

A key feature of mineral prices is their volatility. Fluctuations appear because of external shocks, like political events, but also because supply needs time to adjust to new levels of demand. For instance, on average, it takes six years for a new mining site to produce its first kilos of copper. In addition, nature plays its role. When hurricane Katrina raged through the Gulf of Mexico in 2005 and destroyed several drilling platforms, production was partly cut, which resulted in shortfalls. Major producers protect themselves against the unpredictability of commodity prices. They call upon commodity traders that invest in "strategic reserves".

Commodity prices fluctuate in cycles on a long- or a short-term pattern. Take a current example: rising metallic mineral prices attract investments to the mining sector to exploit minerals that are more lucrative. This results in more minerals becoming produced and marketed but once the supply grows, the prices will be pushed down once again.

The long-term patterns of oil and metallic minerals have been inconsistent since World War II. In a first period, oil prices were determined by seven major oil companies (the "Seven Sisters"). They remained stable from the end of the war until the first oil shock in 1973, which expressed the ambitions of a group of oil producing countries. Thereafter prices increased until 1985 and then declined again. Metallic minerals underwent an erratic but in general rising price evolution until the first oil crisis, after which they had to endure a long-term, downward trend. This gradual negative price evolution only recently stopped. Since 1999, oil prices have been climbing once again, metallic minerals only since 2004.<sup>144</sup> According to the transnational corporation BHP Billiton real commodity prices have never reached a level as low as in 2001-2002. "Today", the group wrote in 2005, "we find ourselves at a period of time which is, or rather close to it anyway, 2001/2002 when real commodity prices were the lowest they've been in the last 200 years which essentially puts them at the lowest price they've been in known history".<sup>145</sup>

Prices can also experience strong volatility within a short period due to huge amounts of one or more commodities being bought and sold, with or without speculative intentions. This volatility was enormous during the American bank crisis of September-October 2008. Investors anxiously looked for the best investments and withdrew their money from government bonds to invest it alternately in oil and precious metals. Gold and other precious metals like platinum once again appeared to be the "traditional hedge against uncertainty"<sup>146</sup> which made prices increase, at least temporarily. Nevertheless, amidst the generalising crisis this upsurge did not last long.

The effect of volatility is even greater as natural resource producing countries depend more on the export of one or a few commodities for their revenues. "As many as 38 developing countries are dependent on a single commodity for more than 50% of their income; while 48 depend on only two", a UN report states.<sup>147</sup> This situation occurs in the agricultural sector. Coffee export, for example, represents 95% of the revenues of Uganda, and 65% of the revenues of Burundi, Ethiopia and Rwanda.<sup>148</sup>

**Chart 2**



(Source: US bureau of the Census, cited by BHP Billiton)

<sup>144</sup> UNCTAD (2007), o.c.: p.88.

<sup>145</sup> Preliminary results, Analyst briefing, BHP Billiton, August 25, 2005: p.8. (Online: [www.bhpbilliton.com/bbContentRepository/Presentations/Transcript240805.pdf](http://www.bhpbilliton.com/bbContentRepository/Presentations/Transcript240805.pdf), last accessed on 5/12/2008).

<sup>146</sup> Defending the dollar, in: Wall Street Journal, September 24, 2008.

<sup>147</sup> Report of the UN Secretary General to the 58<sup>th</sup> session of the UN General Assembly, August 5 2003, cited in: ASFAHA Samuel (2008), Commodity Dependence and Development: Suggestions to tackle the commodities problems, ActionAid and South Centre, Johannesburg-Geneva: p.6 (Online: [http://www.southcentre.org/index.php?option=com\\_docman&task=doc\\_details&gid=697&Itemid=69](http://www.southcentre.org/index.php?option=com_docman&task=doc_details&gid=697&Itemid=69), last accessed 5/12/2008).

<sup>148</sup> Africa Trade Facts, Energy Information Administration, US Government, s.d. See: <http://www.eia.doe.gov/emeu/cabs/tbl6d.html>, last accessed on: 4/12/2008.

There seems to be a paradoxical correlation between dependency and poverty in relation to agricultural commodities. According to a recent report, "countries that depend heavily on primary agricultural commodities are low on the human development index."<sup>149</sup> As shown in table-36, the commodity dependence is also strong for countries with mineral reserves.

**Table-36: Africa's dependency on mineral exports**

Country (italic: non african)	% of exports	The concerning resources
Algeria	97,8	Oil and gas
Nigeria	97,8	Oil
Libya	96,9	Oil
Angola	92,2	Oil
Guinea	89,8	Bauxite, alumina, gold, diamonds
Botswana	87,2	Diamonds, copper, nickel
Azerbaijan	86,6	Oil
Iran	86,3	Oil and gas
Venezuela	83,4	Oil
Gabon	79,5	Oil
Sudan	74,2	Oil
Zambia	61,5	Copper, cobalt
Trinidad and Tobago	61,3	Oil and gas
Kazakhstan	56,1	Oil and gas
Niger	46,1	Uranium, gold
Mozambique	42,3	Aluminium
Papa New Guinea	38,6	Gold, copper
Republic of Congo	34	Various metals
Ghana	33,3	Gold
Cuba	33,2	Nickel
Rwanda	32,2	Various metals
Uzbekistan	30,3	Gold
South Africa	21,7	Platinum, gold

(Source: World Investment Report 2007, UNCTAD)

Volatile markets also make producers politically vulnerable. "The volatility of mineral prices adds to the complexity of decision taking", indicates the UNCTAD World Investment Report 2007.<sup>150</sup> Every significant price variation represents an external shock. It is thus difficult for governments to calculate future revenues. Then there is also the bargaining position of governments that change in accordance to the prices on the world market. At higher prices, they can assert tougher conditions and demands to (foreign) investors, at low prices they cannot.

Because of the price evolution over the last six years and higher costs, commodity buyers are searching for alternatives such as substitution, recycling and recuperation. In the German steel industry the share of "secondary commodities" is at 44,9%. The German zinc production uses 42% scrap, copper production 53% and lead production 58%. With the jump in demand, the price of scrap (in Germany) has doubled from 2003 to 2006.<sup>151</sup> This trend was visible in 2008 all the way in the African countryside. Previously it was common to see old and unused iron left carelessly everywhere, but now, it was collected and transported to Europe and Asia, to markets willing to pay high prices.

#### 4.2.2. Supply falls behind

It has been discussed that the mineral market has been highly volatile over the past years. This section will go into detail on how supply can fall behind the demand. First, it will look at the growth of demand in the developing BRIC countries and their influence on the mineral market. Next, it will examine why supply can fall behind and how the current credit crisis has affected mining in Africa. We will conclude with a look at the role of speculators and how they are able to influence not only the mineral market but also affect Africa's economic development.

##### 4.2.2.1 Growth of Demand

The new global players, and especially China and India, are pulling the world economy these days. Their economic growth drives up the demand for raw materials, thus, having an important influence on commodity prices. "This worldwide rise of commodity prices has been engendered in large part by the rapid growth of Asian developing countries, especially China and India. They contributed close to 40% of global import for precious stones, 30% for crude oil and

<sup>149</sup> ASFAHA Samuel (2008), o.c.: p.6.

<sup>150</sup> UNCTAD (2007), o.c.: p.183.

<sup>151</sup> BDI (March 2007), o.c.: p.5.

30% for metallic ores. Their demand for these commodities is likely to grow, or at least not change from current levels, in the foreseeable future"<sup>152</sup>, writes Harry G. Broadman in a World Bank study.

Over the past few years, the Chinese economy has grown on average 10% a year. Even now, as the world economy slackens, China's growth appears to remain constant. Growth figures from the largest economies in the world (the US, Germany, Japan, the UK and France) pale in comparison to the projected outcomes of the BRICs and other Asian countries.

**Table-37: Real GDP Growth (in %)**

Countries	2008	2009
China	9,9	9,2
India	7,5	7,7
Russia	7,0	6,3
Indonesia	5,9	5,7
Brazil	5,1	4,5
South Korea	4,4	4,4
Taiwan	4,5	4,7
Saudi Arabia	6,8	4,2
Germany	2,0	1,1
France	1,5	1,3
UK	1,4	0,9
US	1,6	1,4
Japan	1,3	1,2

(Rio Tinto, Outlook for metals and minerals, August 16, 2008)

Specifically China and India, have growth which is resource intensive. On average, they consume more commodities than developed economies. To make a comparison: in 2005 China consumed an average 2,1 tonnes of copper and 180 tonnes of petroleum to generate US\$1 million of its GDP. For Japan, figures were 0,3 tonnes of copper and 50 tonnes of petroleum; while in the US the numbers were 0,2 tonnes of copper and 80 tonnes of petroleum.<sup>153</sup>

In addition, an important factor is that China underwent a radical switch in the world market in regard to its imports and exports. A German study found that the import of metal minerals in China multiplied by twenty-four between 1990 and 2004 while the export of these commodities only multiplied by ten during the same period. "War China Lange Zeit Rohstoffexporteur und versorgte den Weltmarkt mit günstigen Rohstoffen, ist das Land inzwischen zum grössten Rohstoffimporteur der Welt geworden", the German employers federation BDI wrote.<sup>154</sup> China has become a commodities importer instead of a commodities exporter and it is predicted that India will evolve into the same. With Russia and Brazil included, German researchers estimate that with the increase in population and the economic development of the BRICs, the demand for commodities might double within the next 30 years.

Not only the economic growth of the BRICs is increasing the demand for minerals, but also technological developments and meeting environmental needs have had an influence. For example, the global demand of tin increased in 2002 because of environmental legislation in the EU and Japan. The legislation obliged manufacturers of circuit boards to replace lead with tin.<sup>155</sup> Moreover, under pressure from the Kyoto Climate Protocol, the car industry has developed a partnership with the electronic industry, especially in Japan, to produce vehicle batteries to power electric engines. "At least five battery factories", the Wall Street Journal writes, "are under construction in Japan, including a US\$115 million facility announced in May by Nissan Motor Co. and electronics giant NEC Corp".<sup>156</sup> A metal like cobalt is essential for the production of rechargeable lithium-ion batteries. More and more, "minor metals" are finding their way to new applications and therefore their demand increases, which explains the growing list of products being traded on commodity markets such as the London Metal Exchange.

Since May-June 2008, however, the consequences of the crisis in the US have been experienced outside the financial markets. Because of declining demand, the price of a barrel of oil has fallen from historical heights of US\$147 in July 2008 to below US\$50 a barrel in November. The price in November represents "its lowest point since May 2005 amid fears over the outlook for demand in the face of global recession".<sup>157</sup>

<sup>152</sup> BROADMAN H. G. (2007), o.c.: p.66.

<sup>153</sup> Information originated from Commodities Research Unit & IMF 2006, cited in: UNCTAD (2007), o.c.: footnote 17, p.97.

<sup>154</sup> "For a long time, China was an exporter of raw materials and delivered resources to the world market, but now the country has become the biggest importer of raw materials in the world". BDI (2007), o.c.: p.7.

<sup>155</sup> DanWatch (May 2008) o.c.: p.10.

<sup>156</sup> US Auto firms target Japans' battery edge, in: Wall Street Journal, September 15, 2008.

<sup>157</sup> Demand jitters push crude below \$50, in: Financial Times, November 20, 2008.

#### 4.2.2.2 Supply constraints

The increase in demand discussed above, faces bottlenecks or constraints in supply. These constraints usually have specific economic causes. First, the industry invested too little in human resources, or second, it invested too little in exploration and in producing and refining capacity, or third, it simply did not judge such an investment as profitable during the extended period of low mineral prices.<sup>158</sup>

The supply-demand discrepancy is especially pertinent to the non-fuel minerals, mainly because of a lack of elasticity. This means that when demand rises, the supply side of the market needs a longer time to adjust. In general, it takes about 8 to 10 years for a mining project to start production. For newly discovered gold sediments it takes on average, 6,3 years before the first ounces of gold are produced.<sup>159</sup>

In the extractive industries, only a few new projects are starting up production. New projects are expensive and the industry reports of growing start-up costs. A very striking example is Tenke Fungurume, one of the richest copper and cobalt deposits in the world, located in the Katanga province in the DRC. Several decades ago, the exceptionally rich soil was prospected and surveyed. In the 1970s, an American entrepreneur, Maurice Tempelsman, established a consortium, which would have started production. However, in the 70s the prices crashed and the mining project was closed down. It was relaunched in 1996 by another small company, the Lundin group. But only since 2006, preparation has been underway for the mine exploitation phase of Tenke Fungurume, now under control by the American company Freeport McMoran. The cost-price of the project, planned to start in 2009, has increased from US\$600 million to US\$1,9 billion, with the extra costs including such needs as electricity supply.<sup>160</sup>

The costs for new oil and gas projects are generally even higher. The BTC pipe-line in the Caucasus, from Baku in Azerbaijan through Tbilisi in Georgia to Ceyhan in Turkey, has cost US\$3,9 billion.<sup>161</sup>

Because extractive projects require large capital assets, investors are balancing the benefits and the costs very carefully. Low prices mean low profits, which is not a stimulus for large investments. "When prices are high, companies have a higher propensity for risk (...) In periods of low prices, the profitability of resource extraction projects tends to decline", UNCTAD states.<sup>162</sup> This has influenced the number of explorations. From the 1980s onwards, when commodity prices decreased, exploration investments reduced gradually. In 2002, the exploration expenses reached a historical depth of an estimated worldwide US\$2 billion. At that time, however the commodity-boom took off and things started to change. In 2005, exploration investments amounted to an estimated US\$5 billion and in 2006 about US\$7,5 billion. These explorations, however, did not seem to pay off, as since 1998 only four new world class deposits of non-ferrous minerals have been discovered.<sup>163</sup>

For more than thirty years, there was too little investment and even some capacity liquidated because exploiters judged there was not enough profit to be made. In the US and the North Sea, drilling platforms have been shut down. In 1997, the State of Arizona declared, concerning the American mining group Phelps Dodge's copper mine project, "The project is mothballed pending improved copper prices" and in 1999 BHP wanted to sell its North American copper activities because of high running cost prices.<sup>164</sup> The Pinto Valley mine is one such example. In 2007, BHP decided to make the mine operational, as it was "desperate to cash in on near-record copper prices".<sup>165</sup> In Western Europe, coal mines were shut down, a decision which has been questioned in recent years when the supply security of energy became a prominent topic.

When minerals demand took off, it was difficult to fill the gap between demand and supply because the industry had first exploited the accessible and nearby deposits: it had picked the low hanging fruit first. For example, the metal ore mines in the US or the oil and gas fields just off the British and Norwegian coasts, where transport costs were low and the political environment friendly and stable. But the times for easy exploitation have passed. The oil and gas fields in Europe are becoming depleted and other deposits are no longer available. "Maturing basins in the OECD, limited access elsewhere, constrained capacity, higher costs and rising resource nationalism challenge consumers and producers alike", BP's senior executive Tony Hayward concludes.<sup>166</sup> In other words, new projects are further away, situated deeper under the ground and are more difficult and dangerous to access. Consequently, they are more expensive. Moreover, the quality of the new sources and their ore grades are decreasing.

<sup>158</sup> UNCTAD (2007), o.c.: p.89.

<sup>159</sup> Figure based on the study of 214 grassroots gold deposits discovered worldwide from 1970 to 2003, cited in UNCTAD (2007), o.c.: Footnote 33, p.98.

<sup>160</sup> *Tenke Fungurume Copper/Cobalt deposit: DRC*, Lundin Mining website, see: <http://www.lundinmining.com/s/TenkeFungurume.asp>, last accessed on 6/12/2008.

<sup>161</sup> For a good map of the energy investments in Central Asia see: *Mapping the World – Energy in the 21th century: risks, challenges, perspectives* (website) <http://www.cartografareilpresente.org/IMG/pdf/ener-geopo-asiecent.pdf> or through <http://www.cartografareilpresente.org/spip.php?page=cartes&lang=en>, last accessed on 6/12/2008.

<sup>162</sup> UNCTAD (2007), o.c.: p.92.

<sup>163</sup> UNCTAD (2007), o.c.: p.90.

<sup>164</sup> *Arizona mining update 1999*. State of Arizona, Department of Mines and Mineral Resources website, July 2000, see: [http://www.admmr.state.az.us/Info/mining\\_update1999.html](http://www.admmr.state.az.us/Info/mining_update1999.html), last accessed on 6/12/2008.

<sup>165</sup> *Rio Tinto shares drop as BHP bid rumours unfounded*, Reuters, May 10, 2007.

<sup>166</sup> Tony Hayward, Group Chief Executive-BP, in: BP (June 2008), *BP Statistical Review of World Energy 2008*: p.1 (Online: <http://www.bp.com/product-landing.do?categoryId=6929&contentId=7044622>, last accessed on 6/12/2008).

New oil and gas fields are situated offshore and in deep water, fields from which the oil cannot be easily extracted. Still, many countries make the effort to achieve their resource potential. On the Namibian coast there are projects planned, concerning offshore exploitation of diamonds. And off the coast of Brazil, in the Tupi-field for example, is a deposit of between 5 and 8 billion barrels of light, sweet crude oil, but it is covered under a salt sheet and it lies between 5,3 and 7 kilometres below sea-level. The Brazilian state owned company Petrobras already pumps oil and gas from 2 kilometres deep.<sup>167</sup>

The climate change opens a new frontier on the bottom of the ocean under the North Pole, appearing to be rich of mineral commodities. Because the Northwest Passage will be ice-free during the summer, Arctic exploitation apparently is no longer an illusion and transport of the minerals mined from the ocean will be increasingly possible. This area, however, is becoming the stake of a geo-strategic conflict between the states situated around the North Pole. Mainly Russia and Canada have been engaging in some aggressive policies. For example, in August 2007, Russia planted a flag on the bottom of the ocean under the Arctic ice cap. While Canada has been adding force to its claims with military expansion and financial support for the mapping of the mineral wealth in the territory.<sup>168</sup>

Another factor affecting the supply is that mining and oil companies have to work increasingly often in unstable environments, like the Niger Delta in Nigeria where militant communities are conducting a struggle to acquire a share of the oil profits. Technicians have been abducted and installations occupied. Enterprises active in the region are using private security companies to try to create a secure environment. In Niger and Mali, there are tensions with Touareg groups on the revenues from the mining sector.<sup>169</sup>

Governments are also demanding a fairer share of the revenues from the extractive industries, a phenomenon dubbed "Resource Nationalism" by some commentators.<sup>170</sup> The reasoning behind resource nationalism is that mineral commodities are property of the states where they are situated and the management over these resources is thus the responsibility of these states, especially as natural resources can be of strategic importance. The governments that control them closely study the revenues these resources could generate for the state, but also the conditions of the exploitation. Mining projects are subjected to environmental and social requirements. The industry, however, complains of being hampered by resource nationalism. Rio Tinto, for example, is in a serious conflict with the Guinean state on the Simandou project. The company complains that, "permitting and stakeholder issues play an increasingly important role in determining project timing, costs and risks".<sup>171</sup>

Theoretically, supply could be considerably expanded by tapping the proved reserves. Technically there are far more possibilities than some decades ago. The recycling of mountains of scrap waste shows this. From the scrap of metal that was thrown away years ago, now metallic minerals are re-exploited. Even under such circumstances, the industry first asks, what are the potential profits? The World Nuclear Association states that, "An ore body is by definition an occurrence of mineralization from which the metal is economically recoverable". This means that an ore deposit that cannot yet be economically exploited today, might be tomorrow, in case prices rise. To illustrate this, uranium is a perfect example. This nuclear energy mineral is also present in seawater, but is not yet extracted from it. However, the nuclear sector says, "at ten times the current price, seawater might become a potential source of vast amounts of uranium".<sup>172</sup> As such the sector speculates on a growing demand of nuclear energy and technical evolution, as an alternative for fossil fuel.

Besides the re-exploitation of scrap waste, the exploitation of oil sands is also considered. When oil prices peaked, the exploitation of oil sands became profitable. Therefore, in the beginning of 2008, new projects were launched in the Republic of Congo-Brazzaville, by the Italian group ENI, and in Madagascar.<sup>173</sup> Unfortunately, the procedure is very polluting and the negative environmental side effects of this exploitation were ignored. To produce profitable oil out of oil sands, first the sand needs to be separated from the tar. For this procedure, large quantities of energy and water are necessary. Then the tar can be refined. The Financial Times reported, that according to environmentalists extracting a barrel of crude from oil sands results in five times the amount of greenhouse gas emissions than extracting conventional crude.<sup>174</sup>

Another factor that is also driving up the prices is the shortage of technical equipment. The demand for drilling platforms, excavators, etc. has risen sharply, yet the producers of such products are not able to follow the demand. Mining and oil companies must wait a long amount of time before an order is delivered. Waiting times have doubled for grinding mills (up to 44 months in 2007), draglines (36 months), locomotives (26 months) and current generators and

<sup>167</sup> A funny kind of reward, in: The Economist, August 30, 2008, p.47.

<sup>168</sup> KNOPP Dominique, *Début de guerre froide sur la banquise*, in: Le Monde Diplomatique, September 2007.

<sup>169</sup> See: *Niger, An old uranium frontier made new again*, Pambazuka February 20, 2009 (Online: <http://www.pambazuka.org/en/category/development/54287> last accessed June 19 2009)

<sup>170</sup> See: MAGNOWSKI Daniel, *Resource nationalism on way to Africa*, Business Report, June 20, 2007 (Online: <http://www.busrep.co.za/index.php?actionId=&fArticleId=3892276>)

last accessed September 18, 2008)

<sup>171</sup> Rio Tinto, *Outlook for metals and minerals*, August 26, 2008.

<sup>172</sup> Supply of uranium, World Nuclear Association website, June 2008. See: <http://www.world-nuclear.org/info/inf75.html>, last accessed on 5/12/2008.

<sup>173</sup> Sables bitumineux: nouvelles frontières, in: Africa Energy Intelligence, n° 582 June 4, 2008.

<sup>174</sup> Canada warns US over oil sands, in: Financial Times, March 9, 2008.

wagons (24 months). The wait time for tires and haul trucks has even quadrupled.<sup>175</sup> The industry also complains of failing to find enough experts.

Despite the numerous increases in demand, once the economic crisis entered into all the branches of the extractive industry, the evolution and demand seen from recent years was brutally reversed. Giant producers reduced their production. For example, the Brazilian company, Vale, declared in a press release at the end of October, "that it is taking steps to change its production plans in accordance to the new global economic outlook that emerged from the recent intensification of financial market stress and the adverse feedback loops between the financial system and the real economy". The group reduced its iron production with 30 million tonnes a year, cut of 600.000 metric tonnes of manganese and 90.000 tonnes of ferroalloy, shut down an aluminium smelter, and laid a ferroalloy plant in Dunkerque idle for half a year.<sup>176</sup> In November, Rio Tinto as well made cuts in its production. "Rio Tinto has warned that a sharp slowdown in demand from Chinese steel customers will lead to a 10% drop in its forecast iron ore shipments from Western Australia's Pilbara region". In early 2008, Rio Tinto considered shipping 190m-195m tonnes of Pilbara iron ore but later lowered this estimate to 170m-175m tonnes.<sup>177</sup>

Not only were the larger companies making cuts, but many of the smaller mining companies also cut production because of decreasing demand and problems to finance their projects. In July, the Australian "Junior" AIM decided to "temporarily close" its zinc mine at Perkoa in Burkina Faso for financial reasons.<sup>178</sup> In November, two companies working in the DRC followed; first Camec suspended its copper and cobalt production<sup>179</sup>, and then Katanga Mining decided to halt production at the Tilwezembe open pit and ore processing at the Kolwezi concentrator.<sup>180</sup> At the end of that month, DRC government officials indicated that up to 45 of some 75 mining operations, mostly small ones, had halted work in the Katanga Province, due to plunging copper and cobalt prices.<sup>181</sup> In Kenya, a \$25 million titanium project was put on hold.<sup>182</sup> Another illustration of how mining companies are cutting their coats according to their cloths.

#### 4.2.2.3 The Role of Speculators

In the 1980s and 1990s when prices of oil and metals were low, these commodities were ordinary commercial goods. They were sold and bought to use them in production processes. Consumers (such as the metal industry or the airlines) concluded contracts on the commodity exchanges with traders or producers for a delivery of commodities at a given time in future. These future contracts protected the consumers against strong price variations in the period between buying and delivery. But with the development of the financial sector, commodities too became investment opportunities and started to be traded not only for physical use but also for speculative reasons.

Base metals are traded at exchanges, such as the London Metal Exchange (LME) or the New York Mercantile Exchange (NYMEX). The NYMEX has existed since 1872 but received its proper name in 1882. The LME was created in 1877 at the height of the industrial revolution in Britain. At the start of this era, Britain was self-sufficient in industrial ingredients such as coal and steel. The industrial revolution forced entrepreneurs to search for supplies from as far as Latin America or South East Asia. Over time the merchants acting as intermediaries and selling agents became too numerous and standardization was imposed through the LME.<sup>183</sup>

At the metal exchanges, prices are set through mechanisms of traditional oral and advanced electronic buying and bidding. This price setting has the advantage that industrial consumers can manage the risks of price changes and keep their production cost planning close to market realities. Clearing houses oversee the trade transactions and guarantee future payments.

Commodities are not physically presented at the exchanges, they are kept in warehouses and presented as future or option contracts. Commodity futures contracts are agreed upon between sellers and buyers, who specify a future date for the delivery of the underlying physical commodity at an agreed price. This base mechanism is simple and transparent; however numerous opaque and high-tech financial products surround it where speculation practices have developed.

Tin was one of the first metals traded at the London exchange. Nowadays the LME is the leading market for so-called futures and options contracts for six non-ferrous metals (aluminium, copper, zinc, nickel, tin and lead) and for two aluminium alloys. In the UK, the precious metals gold and silver trade on the London Bullion Market. London has a Platinum and Palladium Market as well. In 2008, the LME added a steel trading activity. Surprisingly, iron or iron ore,

<sup>175</sup> UNCTAD (2007), o.c.: p.89.

<sup>176</sup> Vale adjusts to the new global economic scenario. Vale Communiqué, October 31 2008. (Online: [http://www.vale.com/vale\\_us/cgi/cgilua.exe/sys/start.htm?infoid=2434&sid=554](http://www.vale.com/vale_us/cgi/cgilua.exe/sys/start.htm?infoid=2434&sid=554), last accessed on 6/12/2008).

<sup>177</sup> Rio to cut iron ore shipments, in: Financial Times, November 10, 2008.

<sup>178</sup> Africa Mining Intelligence, n°184, July 23, 2008.

<sup>179</sup> Reuters, November 19, 2008.

<sup>180</sup> Katanga Mining press release, November 21, 2008.

<sup>181</sup> Copper/cobalt miner Metorex enrages retail investors, Mineweb, November 28, 2008 (Online: <http://www.mineweb.net/mineweb/view/mineweb/en/page36?oid=74070&sn=Detail>, last accessed on 30/11/2008).

<sup>182</sup> Economic slump leaves mining companies in deep holes, in: Wall Street Journal, November 17, 2008.

<sup>183</sup> For a history of the LME see: [http://www.lme.co.uk/who\\_ourhistory.asp](http://www.lme.co.uk/who_ourhistory.asp)

which are raw materials for the steel manufacturing, are not traded on exchanges but often sold bilaterally from suppliers to consumers. In the second half of 2009, another expansion will take place on the LME when the minor metals, cobalt and molybdenum will be traded separately. Cobalt and molybdenum are by-products of copper and nickel respectively. Until now, no minor metals have been traded on the LME, partly because of a lack of market liquidity. In 2007, over all, 93 million commodity lots were traded at the LME equivalent to a \$9.500 billion trading value. In 2008, the NYMEX totalled an overall volume of 365 million futures and options contracts.

The NYMEX is organized differently than the LME. In New York some metals are traded but it is more common to find so-called soft commodities (cocoa for example) and environmental commodities. The NYMEX is the main reference for a long list of energy commodities. The US has other important commodity exchanges such as the Chicago Board of Trade (CBOT), which was established in 1848, and began as a trading exchange of agricultural commodities.

The trading of commodities did not remain a monopoly of the leading centres of business and finance New York and London. Third World countries have set up trading exchanges too and long before globalization became a buzzword. The KLCE Commodity Exchange in the Malaysian capital Kuala Lumpur was established in 1980. In the early 1990s, China created three futures exchanges. For example, the Shanghai Futures Exchange trades futures contracts for copper, aluminium, zinc, gold, fuel oil and natural rubber. According to UNCTAD, "With the liberalization of agricultural trade and the withdrawal of government support to agricultural producers outside the OECD there is a need in many countries for commodity exchanges and hence these have been created rapidly".<sup>184</sup> According to this overview, the Johannesburg Stock Exchange, which has an agricultural derivatives market, traded some 38 million futures and options contracts in 2004.

These last years commodities of all kinds, following the rising metals prices and revenues, have become targets for investors as part of investment portfolio strategies. Investors (and speculators) can easily track price evolutions from commodity indices such as the Dow Jones, AIG Commodity Index or the Standard and Poor's Goldman Sachs Commodity Index. The indices measure price changes in a cross section of agricultural and industrial commodities.

As previously discussed, because of these sharp price increases, speculators have started to buy raw materials, not to produce goods, but to stock them and to speculate on higher prices before selling them again. This is the case on the gold market. In February 2008, the Wall Street Journal declared, "The new gold rush is on. As inflation has picked up and the stock market has tumbled, investors seeking a haven have piled into gold, driving the metal to all-time highs. (...) Investors from Wall Street to Main Street are betting on what had long been a losing investment".<sup>185</sup>

The financial press sometimes tends to minimise the role that speculation plays in the market. When for example the UK's financial market regulator clamped down on commodity brokers suspected of sharing information about trades, the Financial Times wrote that, "the concerns are likely to be based on little more than hearsay". Nevertheless, the newspaper had to admit that politicians and US officials expressed, "stinging criticism" and were concerned that, "less rigorous oversight in London might have allowed price-boosting speculation in oil markets".<sup>186</sup>

The speculators, including pension funds and banks, recently entered the metal and other commodity exchanges, looking for new profitable sectors. A German study in 2007 wrote, "Der Boom der Rohstoffpreise hat zahlreiche institutionelle Investoren und Spekulanten angelockt".<sup>187</sup> The increase of players in the commodity exchanges caused a snowball effect. Increased investor participation in commodities tends to push up the prices, because these investors/speculators buy large volumes on the future markets. For example, the price of copper rose, from US\$1,41 in January 2006 to US\$3,60 in May 2008.<sup>188</sup> This increase drew in new speculators, "*solange die Rohstoffpreize tendenziell steigen, ziehen zie weitere Spekulanten an*".<sup>189</sup>

As expected, when the prices decrease, speculators withdraw their money to invest it elsewhere. For example, this happened in July 2008. "For almost a year", the Financial Times wrote, "the sure-fire trade for speculators had been to buy oils and sell banks". Then, as the price of oil suddenly plunged to the level of April of the same year, "a crowded exit" occurred. Speculators brought huge amounts of oil on the market and invested *en masse* somewhere else.<sup>190</sup> The massive buying and selling increases price volatility.

In recent years, a number of financial instruments have been invented to invest money in African funds through shares in mining companies or in metals. In 2004, the first Exchange Traded Fund (ETF) came on the market for gold. The ETF made it possible to buy virtually any amount of gold. In 2007, a Silver ETF followed, just as did ETF's for platinum and palladium. Similar to the trend with speculators investing in oil, investors entered and left the ETF *en masse* as well.

<sup>184</sup> UNCTAD, *Overview of the World's Commodity Exchanges*, 2006

<sup>185</sup> Worried investors are flocking to gold, in The Wall Street Journal, February 1, 2008.

<sup>186</sup> Watchdog alert to commodity brokers, in: Financial Times, September 17, 2008.

<sup>187</sup> "The boom of raw materials prices has attracted numerous institutional investors and speculators" Rohstoffsicherheit – Anforderungen an Industrie und Politik. BDI, March 16, 2007, p.8.

<sup>188</sup> Cited on May 13 2008 by Richard Adkerson, Freeport McMoran CEO at a Merrill Lynch 'Mining and Steel' conference in Key Biscane.

<sup>189</sup> "As long as the prices of raw materials show a tendency to rise, this will attract new speculators". BDI (2007), o.c.: p.8.

<sup>190</sup> Oil price fall might signal a deeper malaise for corporates, in: Financial Times, August 3, 2008.

When, in July 2008, the platinum price fell substantially, investors sold within the Platinum ETFs about 200.000 ounces, accounting for 41% of their total platinum stock. In the real economy, this counts as a very harsh external shock.

In spring 2008, at the time when the world was concerned about the food crisis, some economists advocated that a new bubble was developing, however, this time on the commodity markets.<sup>191</sup> In the US Congress, one politician said, "There is an orgy of speculation in the futures markets".<sup>192</sup> Nevertheless, as it did so many times before with approaching calamity, the financial world dismissed the extent of the problem. An expert from the Citigroup stated, "I do not expect the bubble to burst".<sup>193</sup>

There were plenty of signals that showed a serious event was about to happen. In October 2007, the Belgian mineral trader Traxys announced it would also begin to trade in uranium. "Traxys is well poised to act as a counter-party for the speculative community", the company wrote in a communiqué. This "speculative community" holds a stock of 7000 tonnes of uranium, according to Traxys. This stock is a very powerful lever, as it equals more than 10% of the annually traded volume of uranium (60.000 tonnes).<sup>194</sup>

The influence of the speculators was illuminated during a May 2008 hearing in the US Senate. Michael W. Masters, portfolio manager of the Masters Capital hedge fund, presented some impressive figures at the hearing and gave an interesting perspective into the world of speculators. According to Mr. Masters, the total speculative investments in a basket of 25 commodities (the Goldman Sachs Commodity Index, GSCI<sup>195</sup>) had risen from US\$13 billion in 2003 to US\$260 billion in March 2008. Mr. Masters distinguished speculative investments from physical contracts. He noticed that the hedging effect of the speculative purchases was even bigger, because the commodities market was much smaller than the total stock market. According to his figures, in 2005 all futures contracts for 25 commodities were worth US\$180 billion in the average-index, while the stock market was worth US\$44 trillion or 240 times worth all futures contracts.<sup>196</sup>

In 2004 however, as Mr. Masters states, speculative investment in the commodities sector represented US\$25 billion or 14% of total investments, which meant that they could strongly influence the whole of the sector. Mr. Masters also stated that between 2002 and 2007 "index-speculators" demand for petroleum futures had increased 848 million barrels, being almost as much as the increase of China's demand during the same period, which increased with 920 million barrels (from an annual demand of 1,8 billion barrels in 2002 to 2,8 billion barrels in 2007) <sup>197</sup>. Mr. Masters says this explains why oil prices keep on rising, while there is no shortage of oil on the market. Mr. Masters explained, "Institutional investors are buying up essential items that exist in limited quantities for the sole purpose of reaping speculative profits. They consume liquidity and provide zero profits to the futures markets".<sup>198</sup>

The true size of some very questionable business practices and instruments is immeasurable. This conclusion has been drawn at several hearings by the US authorities and in official reports on the financial markets in 2008. Thus a September 2008 report on swap dealers says that the number of commodity futures contracts has grown five fold from 630 million contracts in 1998 to 3,2 billion contracts in 2007. The report continues by saying that "this preliminary survey (on the size of the swap dealing business) is not able to accurately answer and quantify the amount of speculative trading occurring in the futures market".<sup>199</sup> Thus, at a hearing on hedge funds, a US House of Representative, Henry Waxman, said, "Hedge funds are virtually unregulated. They are not required to report information on their holdings, their leverage or their strategies. Regulators aren't even certain how many hedge funds exist and how much money they control". Rep. Waxman estimated the hedge funds holdings to be worth some \$2 trillion.<sup>200</sup>

In their own way, mining companies, small or big, also speculate. They incorporate mine concessions and exploitation rights in their portfolio, not with the intention to bring these quickly into production, but to drive up their own market value, and the accompanying value of their shares. They also have the intention to control prices. For example, the race for concessions and mining titles that has been taking place in Peru for a few years. There, the proportion of Peru's rainforest earmarked for oil and gas exploration has expanded from 15% in 2005 to 72% in 2008.<sup>201</sup>

<sup>191</sup> For example Paul De Grauw in 'Open Kaart' on TV channel 'KanaalZ' on April 12, 2008.

<sup>192</sup> Strong week for oil with petrol at record US high, in: Financial Times, April 5, 2008.

<sup>193</sup> Banks and metals lift European bourses, in: Financial Times, April 7, 2008.

<sup>194</sup> Metals merchant Traxys expands into uranium, Press release. October 10, 2007.

<sup>195</sup> This Commodity Index contains 9 basic agrarian products, 3 sorts of livestock, 6 energy products, 5 base metals and 2 precious metals.

<sup>196</sup> Michael W. Masters. *Testimony before the Committee on Homeland Security and Governmental Affairs of the United States Senate*. May 20, 2008.

<sup>197</sup> Michael Masters takes his figures from the US Department of Energy.

<sup>198</sup> Michael W. Masters. o.c.

<sup>199</sup> Commodity Futures Trading Commission (September 2008), *Staff Report on Commodity Swap Dealers and Index Traders with Commission Recommendations*: p.2 (Online: <http://www.cftc.gov/stellent/groups/public/@newsroom/documents/file/cftcstaffreportonswapdealers09.pdf>, last accessed on 6/12/2008).

<sup>200</sup> WAXMAN H. A. opening statement (2008) *Hedge Funds and the Financial Market*. US House of Representatives' Committee on Oversight and Government Reform, Washington, November 13 2008.: p.2 (Online: <http://oversight.house.gov/story.asp?ID=2271>, last accessed 6/12/2008).

<sup>201</sup> Tread softly, in: The Economist, August 30, 2008.

#### Box B – Speculative investments in the DRC

Congo has dozens of speculative investments. The copper and cobalt reserves of Tenke and Fungurume in the Katanga province, celebrated to be the biggest and the richest in the world, have been left untouched for ten years after the concession had been assigned to Tenke Fungurume Mining (TFM) in 1996. At the time, this joint venture was 55% owned by the Congolese state and for 45% owned by the Swedish junior miner Lundin. Lundin declared *force majeure* in 1999 and the mining project laid idle for the next seven years. In the mean time Lundin only sought a large industrial partner. First BHP took an option to step into TFM, but in the end, the American mining group Phelps-Dodge became the third partner. It was only in 2006 that the preparations of the site began, and production would finally start in 2009. By participating in TFM, Phelps-Dodge made a good financial deal. When copper and gold giant Freeport McMoran acquired Phelps-Dodge, at the end of 2006, the company's value rose 33%. It was predicted that together, Freeport and Phelps-Dodge, would become bigger than BHP Billiton, the largest diversified miner in the world.<sup>202</sup> However, the prediction did not come true. BHP Billiton also had a firm interest in the DRC. On the map of Katanga, it appears that the group has been granted a long list of the mining concessions. Whether BHP will ever exploit new mines there remains to be seen. In the words of BHP, they limit their activities to exploration. The fact that it has been granted these concessions, and thus potentially huge mineral reserves, strengthens its position again within the group of the worldwide extractive enterprises. Even if these concessions remain unexploited, the assets give BHP more power compared to its rivals. This may have been a factor in the acquisition struggle BHP conducted with its competitor Rio Tinto in 2008.

Similarly, the DRC, and Guinea, have been parcelled out at an enormous pace to dozens of mining enterprises, all ranging in terms of size and intentions. According to local activists, more than 60% of the Guinean territory is assigned in the form of concessions. The territory of the DRC, which is as big as Western Europe, has been allocated to mining companies for 33%. In March 2008, the Congolese Minister of Mines said that over the past years 4.542 exploitation titles were assigned to 642 enterprises.<sup>203</sup> In the Katanga province alone, 1.644 mining titles were allocated. The Congolese government judges it a very problematic situation because on only a few of the concessions there have been mining activities, while the rest do not render any revenues. This would imply that the contribution of mining to the Congolese growth would have fallen from 30% in 2003 to 6% in 2007.<sup>204</sup>

#### 4.2.3 State and non-state actors

As we have shown in the previous sections, there are a number of factors which can influence growth in the extractive industries. The growth perspectives depend on the fundamentals of demand and supply, on distorting factors such as speculation and on technological innovation. They also depend on prices, revenues and on the relative power of the actors involved. This is an important element to consider because some actors may wish to increase gains at the expense of competitors or the state. This section will delve into the importance of state and non-state actors and their influence in the market.

State owned enterprises are at the forefront of the oil and gas industry; however, as shown in table-38, the share of foreign companies in Africa has considerably grown. In metal mining however, the companies which were nationalised in the 1960s and early 1970s are no longer around. Nowadays, privately owned transnational corporations are the dominant and most powerful producers.

**Table-38: Share of total oil and gas production by foreign companies (%)**

	1995	2005
World average	-	22.4
North Africa	12	26.4
Sub Sahara Africa	35.4	57.2
Equatorial Guinea	-	91.5
Angola	62.4	73
Sudan	-	64.2
Nigeria	19.3	57.2

(Source: World Investment Report 2007, UNCTAD, p.106)

In recent years, mining ranked among the fastest growing economic sectors. Moreover, according to Fortune, in 2006 mining and crude oil production was the most profitable economic sector, with profits reaching on average 26,6% of revenues against 19,6% in pharmaceuticals and 16,2% in commercial banking.<sup>205</sup> Table-39 shows the results of the biggest mining companies. Almost all recorded more profits than the previous year.

<sup>202</sup> For details on this mining project, see: CUSTERS Raf and NORDBRAND Sara, *Risky Business. The Lundin Group's involvement in the Tenke Fungurume Mining project in the DRC*, IPIS-SwedWatch-Diakonia, February 2008.

<sup>203</sup> Etats généraux des mines., Agence France Presse, March 12, 2008.

<sup>204</sup> Faible performance du secteur minier en RDC, in: La Tribune, March 14, 2008.

<sup>205</sup> Fortune 500, CNN website, see: [http://money.cnn.com/magazines/fortune/fortune500/2007/full\\_list/index.html](http://money.cnn.com/magazines/fortune/fortune500/2007/full_list/index.html), last accessed on 6/12/2008.

**Table-39: Ten biggest mining companies, net profits. (US\$ million)\***

	2005	2006	2007
BHP Billiton	6.628	10.534	13.469
Rio Tinto	5.215	7.438	7.312
Shenhua		Not able to find the information on the Shenhua website.	
CVRD ('Vale')	4.841	6.528	11.825
Anglo American	3.933	6.922	8.172
XStrata	2.232	4.885	5.543
Norilsk**	2.352	5.965 (2.367)	3.808
Chalco**	1.033	1.766 (998)	1.020
Freeport McMoran	995	1.457	2.997
Anglo Platinum		1.760	1.749

\*For company information and results see:

- [bhpbilliton.com](http://bhpbilliton.com)
- [riotinto.com](http://riotinto.com)
- [shenhuagroup.com.cn/english](http://shenhuagroup.com.cn/english)
- [vale.com](http://vale.com)
- [angloamerican.co.uk](http://angloamerican.co.uk)
- [xstrata.com](http://xstrata.com)
- [nornik.ru/en](http://nornik.ru/en)
- [chalco.com.cn/zl/web/chalco\\_en.jsp](http://chalco.com.cn/zl/web/chalco_en.jsp)
- [fcx.com](http://fcx.com)
- [angloplatinum.com](http://angloplatinum.com)

\*\*The 2007 figures of these companies are for the two first quarters only. The same figures are given for 2006 between brackets.

(Sources: Annual reviews and Financial statements of the companies)

It is sometimes said that the business climate in Africa is tough and complicated by deeply rooted predatory patrimonialism.<sup>206</sup> The extent of the fortunes that drain out of the public system and into the deep pockets of individuals or elite groups is unknown. However, as a Transparency International slogan says, it takes two to bribe.<sup>207</sup> High risks make the prospects for high premiums. Moreover, in the severe competition for market shares, no markets can be neglected. Yet, in their endeavour to gain a share of a desirable market, some of the biggest transnational corporations have disregarded all acceptable business standards. Below we highlight three of the most recent cases.

- Siemens: In 2007, a Munich court fined the German electronics giant

Siemens €201 million for bribes paid by its telecommunications-equipment unit in Nigeria, Russia and Libya. In 2008, investigations in a global bribery scheme showed that Siemens had paid a total of €1,3 billion in suspicious transactions. Media following the case had been pointing to the fact that prior to 1999, bribes paid abroad were deductible from corporate taxes.<sup>208</sup>

- KBR (Halliburton): The American company KBR, a former Halliburton

subsidiary, was targeted by US anti-bribery investigators over its work on a key Royal Dutch Shell project in Nigeria. According to the Financial Times, the investigation into Halliburton's Nigerian operations covered a period when it was headed by Dick Cheney, US vice-president.<sup>209</sup> It was reported that in another case, "KBR and its partners in a consortium known as TSKJ agreed to pay more than US\$170m of bribes to win billions of dollars of construction work on a giant Nigerian gas liquefaction plant also operated by Shell".<sup>210</sup>

- Alstom: Swiss prosecutors are pursuing the French power turbines and

trains manufacturer Alstom for spending "at least tens of millions of dollars more than previously suspected on illicit payments to win contracts abroad. (...) Swiss prosecutors suspect links between bribery investigations as far apart as Brazil, Zambia and Mexico".<sup>211</sup>

Another factor which can seriously influence the market occurs when companies merge together or when one company acquires another. For a decade or so, mergers and acquisitions (M&As) have been taking place on a scale that has never been seen before. In July 2007, the Financial Times wrote, with the commodity prices boom stretching into its fifth year, "mining company executives are more bullish than ever".<sup>212</sup> Many companies were rapidly accumulating a fortune in cash, which gave them the possibility to buy competitors and expand without restraint. Even Anne Lau-

<sup>206</sup> See for example: WILLAME, J.-Cl, *Patrimonialism and political change in Congo*, Lubumbashi 1971; *Global corruption report* (2005), Transparency International.

<sup>207</sup> See: <http://www.transparency.org>, last accessed on 6/12/2008.

<sup>208</sup> *Siemens trial could lead to new revelations*, in: Wall Street Journal, September 23, 2008; *Drakonische Strafen, für Siemens kann es teuer werden*, in: Der Spiegel, April 21, 2008.

<sup>209</sup> *KBR Ex Halliburton unit in bribery probe*, in: Financial Times, May 9, 2008.

<sup>210</sup> Ibidem.

<sup>211</sup> *Alstom payments face wider Swiss probe*, in: Wall Street Journal, September 15, 2008.

<sup>212</sup> *Mining groups are emboldened by notions of a 'super-cycle'*, in: Financial Times: July 20, 2007.

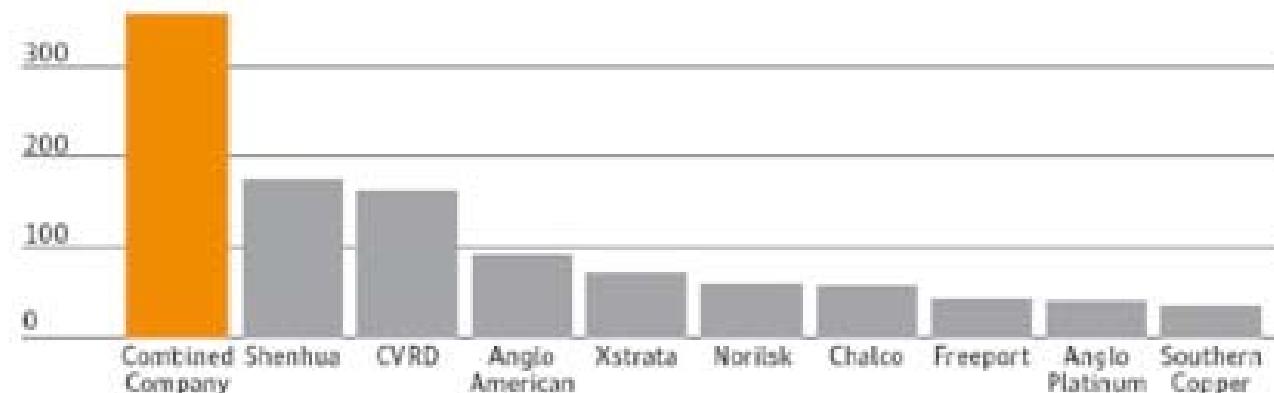
vergeon, president of the French nuclear giant Areva, at one point showed her concern about the speed with which a wave of M&As was racing through the mining industry.<sup>213</sup> Ms. Lauvergeon specifically cited the fact that mining giant Rio Tinto was purchasing Alcan for a record amount of \$42 billion.

The total value of M&As in 2007 reached US\$158,9 billion and 1.732 separate mining deals, of which 94 took place in Africa.<sup>214</sup> The biggest deal ever was announced in November 2007 when the largest mining company in the world, BHP Billiton of Australia, said that it wanted to buy the second largest mining company in the world, Rio Tinto, for almost US\$140 billion. This was a hostile takeover bid and Rio Tinto resisted fiercely, by saying it was worth far more than BHP's offer. Rio Tinto explicitly used the value of its assets, as a weapon against BHP, for example the Simandou project in Guinea. BHP also faced strong hostility from Asian and European steelmakers who feared that the BHP-Rio combination would create a single supplier with far too much market power. However, in 2008 BHP obtained a green light from anti-trust regulators in Australia and South Africa. The shaping of a true giant of unseen proportions was imminent. The chart below shows just how big the merger would be and how powerful BHP would become.

**Chart 3**

### Top 10 metals and mining companies

Market capitalisation as at November 9 2007, \$bn



(Source: *The Guardian*, November 9 2007)

Later the economic crisis intervened and on November 25, 2008, BHP Billiton dropped its takeover bid for Rio Tinto. By that date "the value of the planned bid had fallen to just \$62bn as the value of both group's shares fell".<sup>215</sup>

If BHP would have succeeded to acquire Rio Tinto, an enormous giant would have been established with interests in the entire mining industry (aluminium, iron, diamonds,...) and in oil exploitation. According to early estimations, the merged company would have had a market capitalization of about US\$360 billion, which is more than double of the second and third mining enterprises, Chinese Shenhua Energy and Brazilian Vale. It would have controlled one-third of the world's iron ores and a quarter of all uranium. According to the Australian anti-trust-regulator, the merger would have led to considerably higher prices for steel factories.<sup>216</sup>

It is not surprising that competitors as well as governments of major economic powers were worried about this acquisition struggle. In February 2008, the Chinese aluminium enterprise Chinalco took action. It bought into Rio Tinto and became the biggest shareholder with 9% of the capital.<sup>217</sup> This move of Chinalco was totally unexpected and interpreted as an effort to obstruct BHP's acquisition attempt.<sup>218</sup>

<sup>213</sup> "Nous (devrons) faire face à une extraordinaire consolidation des grands groupes miniers mondiaux et à des capacités financières incroyables, puisque nous assistons à l'absorption des transformateurs par les groupes miniers. Le mouvement Rio Tinto – Alcan est ainsi remarquable". Anne Lauvergeon, president of Areva, during a hearing on October 18, 2007. *Livre Blanc sur la Défense et la Sécurité*, Tome 2\_Débats, p.292. Translate this quote in English

<sup>214</sup> PriceWaterhouseCoopers (March 2008), *Mining Deals. Mergers and acquisitions activity in the mining industry. Annual Review 2007*.: p.2 (Online: [http://www.pwc.com/Extweb/pwcpublications.nsf/docid/0BEFE75E2B45FCF98525740F0053C0AA/\\$file/MiningDeals2007.pdf](http://www.pwc.com/Extweb/pwcpublications.nsf/docid/0BEFE75E2B45FCF98525740F0053C0AA/$file/MiningDeals2007.pdf), last accessed on 6/12/2008)

<sup>215</sup> BHP walks away from \$62bn Rio bid, in: Financial Times, November 25, 2008.

<sup>216</sup> Rio wants more partnerships with Chinese firms, in: March 22, 2008.

<sup>217</sup> Vale to seek higher iron-prices in Asia, in: Wall Street Journal, September 8, 2008.

<sup>218</sup> The strategic 'game' between BHP, Rio Tinto and Chinalco resumed in the Spring of 2009 when BHP and Rio announced their intention to establish an iron-ore Joint Venture and Rio Tinto scrapped a proposed tie-up with Chinalco. See: *China says Rio-BHP ore JV smacks of monopoly*. Reuters, June 17, 2009.

As can be seen in the two following tables, the Merger and Acquisition movements in the extractive industries sector have mobilised enormous amounts of money.

**Table-40: Big Spenders 2000-2008**

Company	Value (\$ billion)	Number of deals
BHP	182,34	29
Xstrata	50,50	45
Freeport	27,19	4
Cia Vale	25,91	26
Teck Cominco	18,95	9
Barrick	19,93	25
Existing shareholders	17,33	51
Basic Element	14,82	10
Goldcorp	14,80	16
Alcoa	14,32	2

**Table-41: Top deals**

Companies	Value (\$ bln)	Date
BHP – Rio Tinto	147,80	25 Nov 2008 cancelled
Rio Tinto – Alcan	42,96	11 July 2007
Freeport – Phelps Dodge	25,80	20 Nov 2006
Xstrata - Falconbridge	20,17	17 May 2006
CVRD/Vale - Inco	18,68	11 Aug 2006
BHP – Billiton	14,49	18 March 2001
Alum Corp China & Alcoa – 12% in Rio	14,32	1 Feb 2008
Teck Cominco – 80% in Fording	14,07	29 July 2008
Russian Aluminium – 25% Norilsk Nickel	13,83	23 Nov 2007
Existing shareholders – Polyus Gold	12,87	18 Apr 2005
Barrick – Placer Dome	11,68	31 Oct 2005
Xstrata – Lonmin	10,61	6 Aug 2008 pending
De Beers Investment – 60.2% De Beers Consolidated Mines	10,59	1 Feb 2001
Interros – 16.6% in Norilsk Nickel	10,00	5 Aug 2008 pending
Cleveland Cliffs – Alpha Natural Resources	9,38	16 July 2008 pending
Goldcorp – Glamis Gold	8,64	31 Aug 2006
BHP Billiton – WMC Resources	8,59	8 March 2005
Norilsk – LionOre Mining Int	5,45	3 May 2007
Anglo American – IronX Mineração	4,94	31 March 2008 pending
Southern Peru Copper – 99.15% in Minera Mexico	4,09	22 Oct 2004

(Source: Financial Times Sept 3, 2008: <http://www.ft.com/cms/s/0/67e618d6-79ab-11dd-bb93-000077b07658.html>)

In the commodities sector, like in other industries, a corporate concentration is starting to occur at a fast tempo. Through M&As of companies, control over specific commodities and certain links in the value-chain are going into the hands of an increasingly small group of enterprises. These corporations are becoming real oligopolies that have the power to artificially create shortages or cut the supply chain for individual clients. They have so much economic power that they can impose conditions, for example, low buying prices and high sale prices, on commodity suppliers, producing countries and clients. A notable example is from June 2008, when Rio Tinto doubled the price of iron ore for China. Rio Tinto agreed with Boasteel, one of the biggest steel companies in China, that it would increase its iron prices between 79,88% and 96,5% for the ores Rio Tinto would supply for the rest of 2008. Boasteel negotiated, representing the entire Chinese steel industry. Even a major economy, like China's, had to accept Rio Tinto's conditions.<sup>219</sup>

In September, it became public that the Brazilian Vale company also wanted to raise the price of its iron.<sup>220</sup> But this time, the global economic crisis halted the plans of the mining giant. At the beginning of November 2008, Vale had to reverse the price increase it wanted to impose on China. As a result, observers predicted that Vale, Rio Tinto and BHP Billiton would have to take into account a price reduction of 15% in 2009, the first time in seven years.<sup>221</sup>

Because of these corporate concentrations, entire commodity industries are falling in the hands of just a few players. A similar trend is seen in the agrarian commodities. For example, only three companies control the trade of unprocessed coffee. In 1998 there were six. Nestlé and Altria Group (including among others Philip Morris) control 60% of the coffee roasting industry. Nestlé rules 57% of the market of instant coffee. The tea market is controlled by three enterprises, comprising 85% of the market while two banana companies owning 50% of the market control the banana market.<sup>222</sup>

<sup>219</sup> Chinese agree 96% jump in ore prices, in: Financial Times, June 23, 2008.

<sup>220</sup> Vale to seek higher iron-prices in Asia, in: Wall Street Journal, September 8, 2008.

<sup>221</sup> ASFAHA Samuel (2008), o.c.

<sup>222</sup> ASFAHA Samuel (2008), o.c.

A similar concentration can be seen on the mineral commodity markets. For example, seven transnational corporations control 85% of all uranium.<sup>223</sup> Table-42 shows the seven metallic minerals and the market share of the three largest producers of the world production in 2005. Some of the producers own a huge percentage of the market, such as Sons of Gwalia with 64% of the tantalum market.<sup>224</sup>

**Table-42: Share (%) in world production of the three largest producers, for given minerals.**

Mineral	Share (%)	Three largest producers		
Palladium	78,1	Norilsk Nickel (50,1%)	Anglo American (17,9%)	Impala Platinum 1(0,1%)
Platinum	69,0	Anglo American (34,3%)	Impala (20,7%)	Norilsk (14%)
Tantalum	68,4	Sons of Gwalia (64,3%)	Cabot Corp. (4,1%)	
Titanium	56,3	Rio Tinto (23,8%)	Iluka Resources (20,4%)	Anglo American (12,1%)
Chrome	52,9	Eurasian Natural Resources Corp. (19,3%)	Kermas Group (18,1%)	Xstrata (15,5%)
Molybdenum	48,5	Corporacion Nacional del Cobre de Chile (21,5%)	Phelps Dodge (16,8%)	Grupo Mexico (10,2%)
Nickel	43,0	Norilsk (17,7%)	Inco (14,1%)	BHP Billiton (11,2%)

(Source: Raw Materials Group, cited in BDI Rohstoffsicherheit 2007)

Other companies have already acquired some of the enterprises mentioned above.<sup>225</sup> Freeport McMoran purchased Phelps-Dodge for US\$25,8 billion; the Brazilian CVRD group (Vale) acquired Inco in 2006 for US\$19,4 billion. Xstrata tried to take over the third largest platinum producer, Lonmin, in September 2008. And Rio Tinto had to fight off the hostile takeover bid of BHP Billiton.

### Box C – Glencore becomes a cobalt monopolist

An interesting case to illustrate the corporate concentration trend in the international commodity market, is the story of Glencore International. Glencore started as a small company and in 1994, the company's founder, Marc Rich, was bought out. The company was later turned into a group with international operations by Willy Strothotte and Ivan Glasenberg, who became CEO in 2002.

In an era when international institutions put ever more stress on transparency, Glencore holds on to a strong tradition of secrecy and a reputation for being averse to transparency.

The Swiss group owns or controls close to 800 subsidiary or daughter companies, most of them through the Swiss mining company Xstrata in which Glencore has a 35% stake.<sup>226</sup>

Yet, the Glencore conglomerate saw its investment rating lowered to a poor BBB- rating by the rating agency Standard & Poor's in 2007, one major reason being the company's vagueness and secrecy.<sup>227</sup>

Glencore is able to maintain its secrecy because it is not listed on any stock exchange. This position also enabled the enterprise to make quick decisions concerning M&As. Glencore has a very aggressive style of business when it concerns M&As and it has inspired this aggressiveness into Xstrata.

Because of its assets Glencore has a good overview on supply and demand on the commodity markets. This information is another strategic advantage in decision-making.<sup>228</sup> Over the years, Glencore has constructed a network of traders and agents in 54 countries, where its commodities are produced and consumed. The group is in all kinds of minerals, even in world oil of which 3% is sold by its traders.<sup>229</sup> Present in the entire chain from the mineshaft until the factory, the company feels the market unlike few other and notices the tiniest changes in supply and demand.

Holding stakes in mines and production facilities is thus a central feature of the Glencore strategy. Glencore seldom swaps its stakes in any of its branches for cash. Its main objective in any transaction is to heighten its control of the commodity market.<sup>230</sup> For example, when Brazil's Vale wanted to take over Xstrata, Glencore

<sup>223</sup> World Uranium Mining, World Nuclear Association website, July 2008. Also includes a full list. See: <http://www.world-nuclear.org/info/inf23.html>, last accessed on 6/12/2008.

<sup>224</sup> Sons of Gwalia is now part of the Australian Talison group, owned by a consortium of private equity firms.

<sup>225</sup> PricewaterhouseCoopers (2007), o.c.; PriceWaterhouseCoopers (March 2008), o.c.

<sup>226</sup> On the Glencore ownership tree drawn from the Raw Materials Database 796 "daughters" including Xstrata are listed.

<sup>227</sup> Glencore Parries Attacks on Secrecy as Debt Rises, in: Bloomberg.com, July 30, 2007

<sup>228</sup> Ibidem.

<sup>229</sup> Ibidem.

<sup>230</sup> Glencore: the power behind the Xstrata home, in: Mineweb, February 15, 2008.

appeared to be a very hard and inflexible negotiator. Glencore stated it would only agree to a deal if it got an equity stake in the newly merged company and the marketing rights to a significant part of the combined groups' commodity production.<sup>231</sup> Another example is the loan Glencore offered to Katanga Mining. This company created out of a merger by George Forrest, Arthur Ditto and Dan Gertler, wanted to bring the Kamoto mine back in production. For this purpose Glencore granted US\$150 million in exchange for a representation of 11,6% in the company and the marketing rights for its total copper and cobalt production for the next ten years. It is estimated that Glencore will control about 40% of the world cobalt supply by 2011.<sup>232</sup> A last case: when Glencore erased some \$22 million of debts owed by First Quantum, Glencore got a 27,8% stake of the Mopani Copper Mines in exchange. Since 1995 Glencore has spent US\$10 billion on M&As.

How strong (or weak) are commodity producing countries against these mining companies? Countries are confronted with an ever-increasing smaller group of foreign enterprises that are becoming more powerful. Worldwide there are about 4.100 metal mining firms. Of these, according to the Raw Materials Group, only 149 are majors, 957 are medium sized enterprises and 3.067 are so-called juniors.<sup>233</sup> The majors supply the greater part of the produced output. In 2007, they delivered 83% of the world production of metallic minerals.

The German industry has publicly expressed its concern on the formation of oligopolies because of the risk of "Marktverzerrungen" (distortion of the market). To protect itself against this phenomenon, small German enterprises are encouraged to step into joint ventures.<sup>234</sup>

Finally, we want to point at the geographic concentration of mineral production. For some metallic minerals, there is only a small number of countries holding the greater part of the world production. The situation of 2005 is depicted in the table below. One of the interesting elements that emerges from this table is that BRIC countries control some of the very strategic mineral reserves in the world.

**Table-43: Geographic concentration of some minerals' production, 2005**

Minerals	% of world production	3 major producing countries		
Niobium	98,8	Brazil (88,2%)	Canada (10%)	Australia (0,6%)
Wolfram	95,1	China (87,1%)	Russia (5,9%)	Austria (2,1%)
Platinum	94,5	South Africa (77,7%)	Russia (13,8%)	Canada (2,9%)
Palladium	88,7	Russia (43,8%)	South Africa (38,2%)	Canada (6,7%)
Chrome	74,4	South Africa (38,9%)	Kazakhstan (18,6%)	India (16,9%)
Cobalt	60,7	DRC (40,5%)	Canada (10,1%)	Zambia (10%)

(Source: BDI, Rohstoffsicherheit, 2007)

<sup>231</sup> Vale and Xstrata at impasse in talks, in: Financial Times, February 14, 2008.

<sup>232</sup> Glencore s'assure le cuivre et le cobalt de Katanga Mining, in: Les Echos, October 9, 2007.

<sup>233</sup> The pyramid of metal mining companies 2006, from the Raw Materials Group, in: UNCTAD (2007)o.c.: p.109. Fig. IV.6.

<sup>234</sup> For example in: Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Fraunhofer-Institut für System- und Innovationsforschung, Bundesanstalt für Geowissenschaften und Rohstoffe (2007) Trends der Angebots- und Nachfragesituation bei mineralischen Rohstoffen; BDI (March 2007), o.c.



Photo of a smelter (IPIS)

## 5. Political perspectives: The Race is On!

For a number of years, the world's major economies have been conducting an active policy that ensures oil- and gas supply for their inhabitants and businesses and avoids a possible standstill. Mineral non-fuel commodities have not been as closely monitored. Not until 2005 did these leading economies become active in assuring their supply of non-fuel minerals for their industries. Many countries, such as the EU member states and the US, have since concluded that Africa is of vital importance to secure their supply for resources. The EU and the US are not alone, and countries like China and the emerging economies of the South are increasingly supplying themselves with African raw materials. This race for resources has made some commentators to describe the current situation as "a new Scramble for Africa".

The continued disagreement between Russia and Canada over the North Pole illustrates perfectly the strategic importance of territories "blessed" with natural wealth. Under the North Pole, the bottom of the ocean contains presumably unique reserves of natural resources. Because of the melting of the Northern polar ice pack, the Arctic territory is becoming more accessible. Within the near future, ships will be able to pass regularly through the Northwest Passage and shipping routes from Europe and the American East Coast to Asia will become considerably shorter.

As the desire and enthusiasm for the territory grows, tensions rise. As mentioned in the previous Chapter, in August 2007, a Russian expedition planted a Russian flag at the bottom of the ocean under the Arctic ice pack. Moscow formally claimed the territory, including its resources. The Russian stunt however provoked some harsh resistance from other economic powers surrounding the North Pole. Canada decided to spend \$3 billion on icebreakers to enable its Navy to patrol the area. Canada, furthermore, is planning to build a military base in Resolute Bay and a deep-sea port in Nanisivik.<sup>235</sup> In May 2008 Russia, Canada, Norway, Denmark and the US settled their dispute over the control of the North Pole, at least for the time being.

In 2008, Global Business Network constructed several scenarios that outlined how the quarrel for the Arctic might evolve. The American think tank came to the following conclusion, "High demand and stable governance lead to a healthy rate of development that includes concern for the preservation of Arctic ecosystems and cultures. High demand and unstable governance set the stage for a 'no holds barred' rush for Arctic wealth and resources".<sup>236</sup> Now that the world economy is enduring a crisis and as instability spreads, the rivalry for regions endowed with natural resource wealth might increase exponentially. The access to and the control over natural resources provoke more and more aggressive statements by the leading world powers.

Are we really witnessing a new Scramble for Africa? This Chapter will portray the actions of some of the biggest players in Africa at the moment: the EU, the US, China, and Japan. For each of these actors, we will look at some of the special interest groups a.o. from the mineral industry, their involvement in shaping policy and the influence that particular countries hold in the mineral sector.

<sup>235</sup> Wetlauf zu den letzten Grenzen, in: Der Spiegel, June 2, 2008; KOPP Dominique, *Début de guerre froide sur la banquise*, in: Le Monde Diplomatique, September 2007.

<sup>236</sup> Global Business Network (2008) *The Future of Arctic Marine Navigation in Mid-Century*: p.6 (Online: <http://www.gbn.com/ArticleDisplayServlet.srv?aid=49477>, last accessed on 7/12/2008).

## 5.1 Western Europe

Natural resources are finite; the number of deposits is limited, consumers are numerous and consumption is rising. In addition, the leading economies of the EU are confronted with the problem of how to ensure supply security. Contrary to climate change, where the parties search collectively for a solution, conflict-thinking is the dominant method when it concerns access to natural resources.

### 5.1.1 The European Union

In a 2003 report on its Security Strategy, the EU alerted that, "Competition for natural resources - notably water - which will be aggravated by global warming over the next decades, is likely to create further turbulence and migratory movements in various regions. Energy dependence is a special concern for Europe. Europe is the world's largest importer of oil and gas. Imports account for about 50% of energy consumption today. This will rise to 70% in 2030. Most energy imports come from the Gulf, Russia and North Africa."<sup>237</sup> The next five years, until 2008 this assessment was translated into more precise declarations and actions.

At the European Commission the elaboration of the EU's policy was conducted above all by the Directorate-General Enterprise and Industry through consultations with the industry sectors and lobby groups. In 2006 and 2007, consultations were held with the European metal industry and the European mining and quarrying sectors. A 2006 Commission Working Paper states, "For over 20 years the European Union has been the biggest consumer and one of the major producers of ferrous and non-ferrous metals in the world. The use of most metals is still higher in the EU than in China, USA or Japan". In 2003, the working paper said, the European steel industry achieved a turnover of about €227 billion and employed 1,06 million people. However, the extraction of these metals within the borders of the EU is plunging and the industry is consequently becoming more and more dependent on imports. For example, the price of ores continues to rise, especially with the increasing demand of China and India. According to the Working Paper, the key challenge for the EU is to remain competitive.<sup>238</sup>

The opinions of special interest groups were included in the policy formulation. Comments from the Non-Energy Extractive Industries Panel (NEEIP)<sup>239</sup> and the Union of Industrial and Employers' Confederations of Europe (UNICE) can be found in the working document of the European Commission from June 2007.<sup>240</sup> The European industry fears it will lose a secure supply of various minerals as some developing countries start to consume their own resources; through exploitation rights or by entering Joint Ventures. This is currently the case in Africa.

In the EU's opinion, in order to stay competitive and secure its supply, it will have to take Canada, Australia and six emerging resource-rich countries into account. To provide an example, below are some key passages from the 2007 Working Paper:

Globally, demand for minerals has been increasing steadily for many decades, but the rate of increase has accelerated significantly in recent years, mainly because of the rapid industrialisation of highly populated countries such as China and India. This has resulted in large increases in the cost of some raw materials and bottlenecks in supply. This has raised questions about whether Europe's manufacturing industries will be able to obtain reliable and steady supplies of raw materials at competitive prices. A longer-term concern expressed by some stakeholders is that, without a strategic resource policy for the EU, some minerals could become unavailable to European industry as developing countries make increasing use of their indigenous resources and/or secure access to resources in third countries, for example in Africa, by purchasing mineral rights or by entering into joint ventures. One potential effect is an avoidable loss of some sectors of manufacturing to countries outside the EU. Concerns have also been voiced that in some parts of the EU the sector's ability to optimise domestic production is being unnecessarily constrained by factors such as over-regulation and inefficient, costly and inconsistent decision-making. (page 7)

The growing importance of China, Australia, Canada and a number of developing countries (the six resource-rich countries are Chile, Peru, Brazil, the Congo, Zambia and South Africa) contrasts with the relative decline in production in Europe, Russia and the USA. (page 45)

Over time, the EU Foreign and Security Policy gradually picked up the sentiments of the industry. In March 2008, EU High Representative Javier Solana warned the member states to be prepared for conflicts over natural resources. He

<sup>237</sup> European Council (12/12/2003) *A secure Europe in a better world, European Security Strategy*, Brussels: p.3 (Online: [http://www.consilium.europa.eu/cms3\\_fo/showPage.ASP?id=266&lang=EN&mode=g](http://www.consilium.europa.eu/cms3_fo/showPage.ASP?id=266&lang=EN&mode=g), last accessed on 10/11/2008).

<sup>238</sup> Commission of the European Communities (2006) *Commission Staff Working Document, SEC(2006) 1069, Analysis of economic indicators of the EU metals industry: the impact of raw materials and energy supply on competitiveness.*, Brussels, August 2, 2006 and *Public consultation on 'The Competitiveness of the European Metals Industry: the Impact of Raw Materials and Energy Supply'*. (Both online: [http://ec.europa.eu/enterprise/non\\_ferrous\\_metals/consultation.htm](http://ec.europa.eu/enterprise/non_ferrous_metals/consultation.htm), last accessed on 7/12/2008).

<sup>239</sup> NEEIP groups these sector associations: Euromines (mining), Euroroc (natural stone), EuLA (lime), IMA-Europe (industrial minerals), CEPMC (construction minerals), Cerame-Unie (ceramics), Cembureau (cement) and UEPG (aggregates).

<sup>240</sup> Commission of the European Communities (2007) *Commission Staff Working Paper, SEC(2007) 771, Analysis of the competitiveness of the non-energy extractive industry in the EU*, Brussels, June 4, 2007.

states in a text for the European Council in Brussels that, "The overall effect is that climate change will fuel existing conflicts over depleting resources, especially where access to those resources is politicised."<sup>241</sup>

Africa has a prominent position in the EU's external relations, as reflected in 2005, when the EU launched a Strategic Partnership with Africa. In the partnership document, the European Commission states that, "Europe is Africa's long-standing partner and closest neighbour ..."<sup>242</sup> Africa indeed has long-standing ties with Europe, especially in relation to the colonial past with, for example, Great Britain, France, Portugal and Belgium. Signs of the colonial past are still seen today in policy practices from a number of countries. For example, France maintains a prominent relation with the *Zone Franc*, which includes fourteen West-African countries, all with a common currency, linked to the French Franc/Euro.

The historical ties, however, also create suspicion. When negotiating the Economic Partnership Agreements with African countries, in the framework of the EU-ACP (Africa, the Caribbean and the Pacific) relationship, the EU meets a large amount of difficulties and mistrust. During the December 2007 EU-Africa Summit in Lisbon, Africa, as a bloc, opposed the EU free-market policy. The vote also reflected Africa's disagreement with the exclusion of some of its leaders (the UK's resistance concerning the presence of President Mugabe) and against the paternalism and the colonial past.<sup>243</sup>

#### Box D - The EU's Raw Materials Initiative

According to a European Commission report, the EU is highly dependent on imports of strategic raw materials, which are increasingly affected by market distortions.<sup>244</sup> They are especially dependent on high-tech metals such as cobalt, platinum, rare earths and titanium; all materials that are essential to the development of sophisticated products. The EU also relies on secondary raw materials such as scrap

The report states that many emerging economies are pursuing industrial strategies aimed at protecting their resource base to generate advantages for their downstream industries. Over 450 export restrictions on more than 400 different raw materials (e.g. metals, wood, chemicals, hides and skins) were identified and the main culprits were China, Russia, Ukraine, Argentina, South Africa and India.

The EU's Policy Response is that the EU should agree on an integrated raw materials strategy. The first set of measures proposed by the Commission is to actively pursue raw materials diplomacy with Africa. With emerging resource-rich countries such as China and Russia, they would like "to remove distorting measures" and with other resource-dependent countries such as the US and Japan to "devise joint actions and common positions in international forums".

However, there might be a contradiction in the Commission's stance: are trade restrictions condemned only when applied by competitors, not when done by the European industry? This contradiction is made apparent at a EU sponsored conference on Raw Materials in Brussels on September 29, 2008. Mr. Rémi Charpigny, representing the French copper firm KME Brass, presented the case of the EU "brass mill" industry and stated that 50% of the industry's output was based on recycled metal. According to Mr. Charpigny, between 1999 and 2007, some 900.000 tonnes of "copper scrap" disappeared to buyers outside the EU who were keen to pay a high price, "sometimes even more than the price of new metal".<sup>245</sup> With this statement, Charpigny implicitly pleads for EU-restrictions on recyclable copper.

The former EU-Commissioner for Trade, Peter Mandelson<sup>246</sup>, in his concluding remarks, sneered at India (where iron ore exports are taxed at 50 rupees a tonne), and China (which imposed a 120% export tax on yellow phosphorous) which are thus impeding exports of raw materials. Mr. Mandelson admits that such measures "can be an attempt to shield domestic consumers from high international commodity prices and price inflation" but in a globalized economy, he did not believe that governments should take refuge with resource nationalism. He said, "the strengthening of infant industry or ensuring a stream of government revenue from commodity exports can be better addressed through more focussed measures". Instead, Mr. Mandelson repeated his firm belief in "an open global market completely free of all distortions on trade in energy and raw materials".<sup>247</sup>

<sup>241</sup> European Commission (2008), *Climate change and international security, Paper from the High Representative and the European Commission to the European Council*. S113/08, Brussels, March 14, 2008: p. 3 and 5 (Online: [http://www.consilium.europa.eu/ueDocs/cms\\_Data/docs/pressData/en/reports/99387.pdf](http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/reports/99387.pdf), last accessed on 7/12/2008).

<sup>242</sup> Commission of the European Communities (2005), *Communication from the Commission to the Council, COM(2005) 489 final, the European Parliament and the European Economic and Social Committee. EU Strategy for Africa: Towards a Euro-African pact to accelerate Africa's development.*, Brussels, October 12, 2005: p.9 (Online: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0489:FIN:EN:PDF>, last accessed on 7/12/2008).

<sup>243</sup> *Face à l'UE, l'Afrique arrive désormais à se faire entendre*, AFP, December 10, 2007.

<sup>244</sup> Commission of the European Commission (2008) *Communication from the Commission to the European Parliament and the Council, COM(2008)699, The Raw Materials Initiative. Meeting our critical needs for growth and jobs in Europe*, Annexes in *Commission Staff Working Document. SEC(2008)2741*. Brussels, November 4, 2008. (Online: [http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=display&doc\\_id=895&userservice\\_id=1](http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=display&doc_id=895&userservice_id=1), last accessed on 7/12/2008).

<sup>245</sup> CHARPIGNY Rémi (2008), *Distortion of competition on secondary raw materials markets leads to economic and environmental irrationalities: the case of copper*, presented at Raw Materials Conference, European Commission, Brussels September 29, 2008. Also: Summary of intervention in conference brochure: p.13. (PowerPoint of the presentation online: [http://trade.ec.europa.eu/doclib/docs/2008/october/tradoc\\_140827.pdf](http://trade.ec.europa.eu/doclib/docs/2008/october/tradoc_140827.pdf), last accessed 7/12/2008).

<sup>246</sup> Shortly after this conference, in October 2008, Mr. Mandelson left the Commission to become Secretary of State in the British government.

<sup>247</sup> MANDELSON Peter (2008), *The challenge of raw materials. Speech by Peter Mandelson at the Trade and Raw Materials Conference*, Brussels, September 29, 2008.

## 5.1.2 Germany

Germany is a major economy; therefore, it takes a prominent position in the EU as well as in the EU's external commodities policy. Berlin took the lead in 2005 regarding supply security. *Bundesverband der Deutschen Industrie* (BDI), the large employer's federation, organised its first conference on natural resources. At the conference, a Task Force was established, under the command of the metal industry federation (*WirtschaftsVereinigung Metalle*, WVM) and in close collaboration with the German government, to study how to ensure a steady, international supply of resources for the German industry.

In the Task Force a number of important enterprises and research institutes did the bulk of the work. Karl-Heinz Dörner of *Norddeutsche Allianz* (NA), self-declared as "the biggest copper group of Europe", together with some other NA directors, were important contributors to the Task Force. Furthermore, the *Bundesanstalt für Geowissenschaften und Rohstoffe* (BGR) and dr. Rudolf Adam (Director of the *Bundeskademie für Sicherheitspolitik*, BAKS, between 2004 and 2008) offered scientific support. This working group in the meantime publishes several reports.

The work of the BDI Task Force is important because it raised the awareness that Germany is very dependent on imports for oil and all metals. This awareness existed to a certain degree for the supply with energy, but not for other raw materials. Politicians were more preoccupied with promoting German exports than with the security of imports, wrote Security-expert Rudolf Adam.<sup>248</sup> The BDI concluded however that for metal commodities "the understanding of the problem is clearly underdeveloped".<sup>249</sup>

In 2007, the Task Force found that the problem of supply with metals was related to the sharp increase in demand for natural resources, particularly because of the "resource hunger" from the emerging economies, especially China. The BRIC countries, are transforming themselves from commodity exporters to importers. On the other side, the market is confronted with a tight supply, partly because of the low amount of investments. From 1997 onwards, exploration investments for raw materials diminished and reached their lowest point in 2002. The divergence between supply and demand made the prices grow. This trend is further reinforced by some speculation on the commodity exchanges.

According to the Task Force, the increased concentration in the oil and mining sector further strengthened the supply-demand divergence. A decreasing number of enterprises control a growing share of the supply. For example, three companies (Anglo American, Norilsk Nickel<sup>250</sup> and Impala Platinum Holdings<sup>251</sup>) control over 78,1% of the palladium supply and 69% of the platinum supply. The Task Force states that the formation of oligopolies in the mining industry carries a number of potential threats with it.<sup>252</sup>

In addition to the formation of oligopolies, another threat to the industry is that there is an increase in the geographic concentration of the minerals. The exploitation of the most essential ores is concentrated in a small number of countries. The centre of the oil extraction lies in the "strategic ellipse", stretching from the Middle East over the Caspian Basin to Northwest Siberia. If the supply from these regions is ever disrupted, the international resource market feels it immediately.

In spring 2006, Germany's resource dependency acquired an explicit military dimension. The German government was confronted with some harsh resistance in Parliament because it wanted to send German troops to the DRC, in the framework of EUFOR. In addition to Parliament, the German peace movement was against the proposal. On March 17, 2006, Minister of Defence Franz Josef Jung defended the deployment of German troops to the DRC by saying, "It concerns a vital security interest for our country. If we do not render a contribution to pacify the Congo, it might bring about a huge refugee stream, even more dramatic than the one caused by the Bosnian war. (...) Economic interests are not of uttermost importance. Stability in this resource-rich region, however, is for the good of the German economy".<sup>253</sup> The German economy cannot function without mineral riches, "from A like in Aluminium to I like in Iron and Z like in Zirkonium".<sup>254</sup> With a bit of drama, the president of the German Metals Industry Federation Mr. Dörner stated, "Ohne den Import vieler metallischer Rohstoffe, stehen in unserer Land die Räder still".<sup>255</sup>

In the Task Force's recommendations, it suggests the traditional remedy of diminishing the risks of dependency by diversifying supply. In practice however, the situation is more complicated, as half of the mining is located in "political(ly) unstable or extreme(ly) unstable countries". For example, when mining iron, this is the case for more than 60% of the exploitation. The Task Force focused particularly on Central Africa and Central Asia.<sup>256</sup> According to dr. Rudolf Adam

<sup>248</sup> ADAM Dr. Rudolf, quoted in *Öl und Bodenschätze. Krieg um die Rohstoffe*, in: *Wirtschaftswoche*, March 4, 2005.

<sup>249</sup> BDI (March 2007), o.c.: p.4

<sup>250</sup> The Russian Norilsk group, which is the largest nickel producer in the world, became subject of a confrontation for the control over the enterprise in May 2008 between three other Russian groups, including Rusal.

<sup>251</sup> Impala Platinum acquired in February 2007 African Platinum for GBP£297 million.

<sup>252</sup> This aspect is further elaborated in Chapter 4 Economic Perspectives of this text.

<sup>253</sup> Für Demokratie und Stabilität. Interview with minister Jung in: *Bild-Zeitung*, March 17, 2006.

<sup>254</sup> Press communiqué, *Rohstoffpolitik strategisch ausrichten*, BDI, March 30, 2006.

<sup>255</sup> "Without the imports of many metallic raw materials, wheels stop turning in our country". Press communiqué, *Rohstoffpolitik strategisch ausrichten*, BDI, March 30, 2006.

<sup>256</sup> BDI (March 2007), o.c.: p.21.

"nine out of ten important oil suppliers are politically unstable".<sup>257</sup> Mr. Dörner described Kazakhstan ("the second world supplier of chromium") and the DRC ("the world's leading supplier of raw cobalt") as "unpredictable regimes".<sup>258</sup>

In consecutive documents, the BDI Task Force makes recommendations for German policy on minerals. With the intention of influencing German policy, they also wish to have an influence on EU policy. Spring 2007 presented the perfect opportunity to do just that. During this time, Germany held the presidency of the EU and organised a summit of the G8 in Heiligendam. The German metal industry wanted to use the opportunity for its lobby strategy. This is shown below in a graph, presented by Hans-Gerhard Hoffman from the NA during a conference in 2007 in Mainz.<sup>259</sup>

**Chart 4**



Source: Umgang mit Preisrisiken, Hoffmann, May 2007

Over the past three years, German activities have shown that 'Konsens 2' ("State and Industry work together to formulate a strategic raw materials policy") was always relevant. The mineral industries have cooperated intensively with the state, for example with the defence department, to create this policy.

### 5.1.3 France

In August 2007, President Nicolas Sarkozy and Prime Minister François Fillon established the *Commission pour la Libération de la Croissance Française*, under the command of Jacques Attali. The commission, as it was clearly mentioned in its title, had to find ways to improve growth of France's economy. After a few short months, in January 2008, the Attali Commission presented the final report and conclusions formulated as *300 Décisions*. *Décision 87* related to supply security. The Commission determined that Western Europe was aware of the precariousness surrounding energy minerals, but was not aware of the tensions around the supply of industrial metals that were of vital interest for the Western industries. "The Anglo-Saxon countries, Russia, China and Brazil are conducting an actual scramble for the control over natural resources and the securing of their supply chain". The Commission therefore concluded that a "European champion" should rise or be established in the industrial metals sector to guarantee the supply of minerals necessary for France's major industry sectors. According to the Attali Commission this was a condition for growth in the future.<sup>260</sup>

<sup>257</sup> ADAM Rudolf (2006), *Geostrategische Risiken der Rohstoffsicherheit*, Vortrag auf der Fachtagung „Verfügbarkeit von Rohstoffen“ der BDI-Präsidialgruppe „Internationale Rohstofffragen“, Berlin, March 30, 2006.

<sup>258</sup> Krieg um Rohstoffe, in: German Foreign Policy, April 25, 2006.

<sup>259</sup> HOFFMANN H.-G.(2007), *Umgang mit Preisrisiken*. Kongres Länderrisiken 2007. Coface. Mainz, May 15, 2007.

<sup>260</sup> Rapport de la Commission pour la Libéralisation de la Croissance Française. January 23, 2008. (Online: <http://www.liberationdelacroissance.fr/files/rapports/rapportCLCF.pdf>, last accessed on 7/12/2008).

One of the Commission's suggestions is that more French SMEs should be established to serve as juniors active in mining. In addition, these new companies should strive to be listed on the Paris Alternext market. Alternext now counts only a hundred enterprises, with a market value of \$5 billion, while the Commission estimates there are about 1.600 companies listed on London Alternative Investment Market (AIM), with a market value of €75 billion. These figures show that while the international mining shares are flourishing on the financial markets, France is absent from this sector.

Some of the ideas from the Attali Commission were picked up in a working group of the extractive industries, the *Mouvement des Entreprises de France* (MEDEF)<sup>261</sup>. In April 2008, the MEDEF Working Group finished a report and according to African Mining Intelligence, “*Le groupe recommande (...) la création d'une compagnie européenne - publique ou parapublique- de courtage en matières premières, ainsi que d'un fonds souverain (français ou européen) prenant le contrôle d'actifs stratégiques; l'émergence de juniors minières et énergétiques sur le territoire français par le biais d'un cadre juridique et fiscal incitatif jusqu'à leur introduction en Bourse sur le marché parisien Alternext... Ce dernier pourrait se poser en rival de l'AIM à Londres ou du Toronto Venture Exchange*”<sup>262</sup>.

Members of MEDEF are a.o. large transnational corporations and in the working group of extractive industries some of them are represented, for example, Total, the Société Générale and BNP Paribas. The group is chaired by Zéphirin Diabré, a close collaborator of Anne Lauvergeon, who chairs the French energy group Areva.<sup>263</sup> Areva, a key player in the world energy sector, is leading the debate in France concerning the mineral commodities supply. This is not surprising, knowing that 87% of Areva is in the hands of the state (mainly through the *Commissariat à l'Energie Atomique*)<sup>264</sup>.

President Sarkozy has conducted a remarkable economic diplomacy for the benefit of Areva. When the French president visited South Africa in February 2008, he said, “Je le dis au gouvernement sud-africain, on va se battre pour obtenir le marché des centrales, charbon comme nucléaire, parce que nous, on est comme cela. On a compris que tout prendre c'est plus facile que prendre à moitié.”<sup>265</sup> Other examples of Sarkozy's diplomacy for Areva took place in Niger and the DRCongo. In Niger, France intervened in July 2007 when Niger accused Areva of helping the Tuareg rebellion with financial support. The French president tried to find a solution and explained in a press conference, “Niger is an important country for France as it is one of the main producers of military-grade uranium, which explains the presence of Areva”.<sup>266</sup> In the DRCongo, president Sarkozy obtained an uranium mining contract for Areva in March 2009.<sup>267</sup>

The French mining sector is small and accounts of no more than a few actors. Next to Areva, there is Eramet (of which Areva is a joint owner) and the geological service *Bureau de Recherche Géologique et Minière* (BRGM). Compared to the others, Areva is an international giant. The company has acquired the Canadian uranium group UraMin for an amount of US\$2,36 billion as part of its international expansion policy aimed particularly at Canada, Niger and Namibia. Areva furthermore calls itself, “the only fully integrated player” in the global nuclear business, as the group builds atomic power plants, exploits uranium mines and produces and recycles nuclear fuel.<sup>268</sup>

In the field of Defence too, France has been considering its strategic interests and how to defend them. Based on comprehensive hearings in the fall of 2007, a *Livre Blanc* was published in June 2008, called *Defense et Sécurité Nationale*, which discussed French (and European) defence and security policy. During the hearings it was Anne Lauvergeon, again, who supplied the overriding analysis concerning energy supply. Ms. Lauvergeon was worried because Europe was behind in comparison to the rest of the world in the field of natural resources. She stated, “Look at the activism the Brazilian, American and Canadian groups develop in Africa”. According to her, Europe was not fully aware of what was happening in the world around the strategic resources. When she discusses strategic resources, she refers to “tout ce que vous mettez dans l'acier, du charbon, du fer, du manganèse, du nickel, du chrome, du cuivre. Tout ce qui était considéré il y a huit ans comme des commodités ? sans intérêt”.<sup>269</sup> Although France is one of the top uranium produc-

<sup>261</sup> The MEDEF is the French employer's federation and was founded in September 2007.

<sup>262</sup> « The group recommends : the establishment of a European company – state-owned or mixed – trading in raw materials, and also of a sovereign wealth fund (French or European) which takes control of strategic assets ; the emergence of junior mining and energy companies in France via legal and fiscal incentives and their introduction on the Alternext stock market in Paris... Alternext could become a competitor for AIM in London or the Toronto Venture Exchange ». *Où en est la réflexion "mines" du Medef?*, in: African Mining Intelligence, n°177, April 9, 2008.

<sup>263</sup> *Enfin une réflexion "mines" au Medef!* in : Africa Mining Intelligence, n° 164, October 3, 2007.

<sup>264</sup> Areva (2008), *Areva.Business and Strategy Overview*, September 2008.

<sup>265</sup> “I am saying this to the government of South Africa : We will struggle to obtain the power plant market, both coal and nuclear, because that is what we are like. We have understood that to take it all is easier than to take only half of it ». *Visite d'état en République d'Afrique du Sud, allocution du Président de la République, M. Nicolas Sarkozy, devant le Forum des entreprises*, French Diplomacy website, February 29, 2008 (Online: <https://pastel.diplomatique.gouv.fr/editorial/ael2/bulletin.asp?liste=20080303.html>, last accessed on 23/11/2008).

<sup>266</sup> France's Sarkozy aims to defuse Niger/Areva row., Reuters, July 27, 2007 (Online: <http://www.reuters.com/article/latestCrisis/idUSL27416632>, last accessed on 28/11/2008).

<sup>267</sup> Visite de Sarkozy en RDC: accords dans les mines et la francophonie. AFP, March 27, 2009.

<sup>268</sup> Areva. *Business and Strategy Overview*. Company Pdf. September 2008.

<sup>269</sup> “Everything you put into steel : coal, iron, manganese, nickel, chrome, copper. Everything which was considered a commodity eight years ago, which had no value ». *Audition de madame Anne Lauvergeon. Jeudi Octobre 15, 2007.* in: *Livre Blanc sur la Défense et la Sécurité Nationale*: p.287. (Download: [http://www.premier-ministre.gouv.fr/information/les\\_dossiers\\_actualites\\_19/livre blanc\\_sur\\_defense\\_875/livre blanc\\_1337/livre blanc\\_1340/telecharger\\_livre blanc\\_60306.html](http://www.premier-ministre.gouv.fr/information/les_dossiers_actualites_19/livre blanc_sur_defense_875/livre blanc_1337/livre blanc_1340/telecharger_livre blanc_60306.html), last accessed on 7/12/2008).

ers in the world, Ms. Lauvergeon suggests this may change because, "aujourd'hui nous assistons à un Kriegsspiel mondial d'accès aux réserves".<sup>270</sup>

In addition to the race for reserves, exploitation licenses and concessions, there is an intensive consolidation taking place by the major mining groups that has far-reaching consequences. Regarding this topic, Ms. Lauvergeon commented that, "I fear that when we wake up, we'll have to face an extraordinary consolidation of big global mining groups and incredible financial capacities, because we see how the transforming companies are being absorbed by the mining groups. (...) We are at the heart of an extremely important evolution which is not at all analysed in Europe. I fear that we will wake up with dramatic consequences for the industrial sector and its costs".<sup>271</sup>

The *Livre Blanc* expresses quite a gloomy sentiment. In the future, most experts indicate that France will need to take into account various threats and be able to respond with military force. "We live in a world full of threats", ex-Minister Hubert Védrine stated. He observed two conflicting evolutions, "Americans and Europeans are losing the monopoly of history", while at the same time, about fifteen emerging countries are increasing their involvement. Mr. Védrine provocingly said, "We must give a Nato and occidental answer to the threats".<sup>272</sup>

In the opinion of General Bentegeat, the Frenchman who is head of the EU Military Committee, there is no doubt that, Europe will be drawn into very intense regional conflicts in the future. General Bentegeat believes the conflicts will arise due to the convergence of three factors: tensions around the supply of energy, water and raw materials, primarily because of the rise of China and India; secondly, the multiplication of centres of terrorism; and thirdly, the distribution of weapons of mass destruction and ballistic missiles. General Benteget believes that the potential crises can be avoided by forging partnerships with the African Union and that maintaining a close collaboration between NATO and EU is indispensable.<sup>273</sup>

Collaboration may be the buzzword, but the primacy of national interests will always remain. Thus, as MEDEF acknowledges, a consensus may be reached over climate change and how to tackle it but that consensus on supply security of national resources is a completely different matter.<sup>274</sup>

## 5.2 United States of America

In the US, the friction among European countries and natural resources does not go unnoticed. For example, regarding Russia and its natural gas policies towards the EU, before President Bush visited Europe in May 2008, a US government report observed, "European nations are not of one mind in addressing energy security".<sup>275</sup> Although there are divisions running throughout American society, when it comes to the matter of decision-making, the US does not suffer from the handicap of competition among member states, as the EU does.

In 2001-2002, the US decided to shift its energy supply towards new technologies and, geographically, to new suppliers such as West Africa, with the intention of reducing its dependence on oil from the Middle East by 75%. This choice was made to ensure sustained support for the economic growth of the world's leading economic power. "Africa holds 7% of world oil reserves and comprises 11% of world oil production. Along with Latin America, West Africa is expected to be one of the fastest-growing sources of oil and gas for the American market", as was described in the US National Energy Policy of May 2001. The general conclusion was that a concentration of world oil production in any one region of the world was a potential contributor to market instability. The Policy stated, "Growing levels of conventional and heavy oil production and exports from the Western Hemisphere, the Caspian and Africa are important factors that can lessen the impact of a supply disruption on the US and world markets".<sup>276</sup>

The National Energy Policy remains a key document for US policy in general and some of its conclusions were used in the National Security Strategy of September 2002. Taking into consideration the need to diversify the US's resource sources, the document reads, "We will strengthen our own energy security and the shared prosperity of the global

<sup>270</sup> "Today we are witnessing a War Game for the access of reserves", *Livre Blanc* o.c.

<sup>271</sup> « Je crains que nous devions faire face lorsque nous nous réveillerons, à une consolidation extraordinaire des grands groupes miniers mondiaux, et à des capacités financières incroyables puisque nous assistons à l'absorption des transformateurs par des groupes miniers (...) Nous sommes au cœur d'une évolution extrêmement importante et qui n'est pas du tout analysé en Europe. Je crains que nous nous réveillions avec des conséquences fortes sur le tissu industriel et sur les coûts », *Livre Blanc* o.c.

<sup>272</sup> « Nous évoluons dans un monde de menaces. (...) Les Américains et les Européens perdent le monopole de l'histoire. (...) Il faudrait donner aux menaces une réponse otanienne, occidentaliste», *Hubert Védrine during the hearing of October 4 2007*, in: *Livre Blanc: Tome 2\_débats*, p.263-266.

<sup>273</sup> *General Henri Bentegeat during the hearing on October 2007*, in: *Livre Blanc: Tome 2\_débats*, p.270-279.

<sup>274</sup> "On n'arrive à trouver un consensus que par rapport à la lutte contre le changement climatique mais nous n'avons aucun consensus sur la sécurité d'approvisionnement ni sur les conditions internes ni sur les conditions externes." *Plus de pétrole... mais des idées*. Conference organised by Confrontations Europe and MEDEF. Paris, October 16, 2007.

<sup>275</sup> "While some European countries wish to move forward with long-term bilateral supply contracts with Russia, other European countries believe their more urgent priority is to strengthen their negotiating position with Russia by developing diversified supplies of natural gas. Their concerns stem from Russia's manipulation of gas and oil flows to the European market in recent years, according to a recent report by the U.S. Congressional Research Service (CRS)", in: SCHAFER Jonathan, art. *US, Europe Need Collective Energy Security Strategy*, May 30 2008. (Online: <http://www.america.gov/st/econ-english/2008/May/20080530170946liameruoy.0.919903.html>, last accessed on 7/12/2008).

<sup>276</sup> *National Energy Policy*. May 2001, Chapter 8: p.6-11. (Online: <http://www.whitehouse.gov/energy/National-Energy-Policy.pdf>, last accessed on 7/12/2008).

economy by working with our allies, trading partners and energy producers to expand the sources of global energy supplied, especially in the Western Hemisphere, Africa, Central Asia and the Caspian Region".<sup>277</sup>

Other organisations have acknowledged the need for the US to seek out other geographic areas as well. The Center for Strategic and International Studies (CSIS), an influential bi-partisan Think-Tank, pointed at the Gulf of Guinea as a "nexus of vital U.S. foreign policy priorities".<sup>278</sup> As President Bush famously stated in his State of the Union address in 2006, "America is addicted to oil"; and he once more emphasized the importance of technological and geographical diversification.

The US's statements have been put into practice. The US has increased its political, economic and military/security presence in a number of natural resource producing locations, for example in the Gulf of Guinea. In this region, Nigeria and Angola are the main oil suppliers.<sup>279</sup> But, as CSIS has observed, "Competition for influence in the Gulf is fierce".<sup>280</sup>

Just as shown in the analysis of the EU, the US anxiously observes the supply of other minerals, which are of strategic importance for American industries and the military. A report produced by the National Materials Advisory Board (NMAB), the top advisory body for policy, industry and universities, pointed out some interesting inconsistencies regarding the supply of minerals.<sup>281</sup> On the one hand, the earth's minerals are geographically distributed very unequally. On the other hand, mineral deposits in the US and Europe are largely depleted. According to the report, industry has exploited the "world class deposits", these are the biggest and richest ore deposits with the highest ore contents. Some examples are cobalt in the DRC; chromium, platinum metals and manganese in South Africa; wolfram, rare-earth metals and antimony in China; bauxite in Jamaica manganese in Ukraine; platinum metals in Russia; nickel in Canada and molybdenum in the US.

In the US, mining and the processing of minerals have lessened. Consequently, the exploration for and exploitation of new supply sources will have to move to farther removed regions of the world. This, however, will be more expensive and greater political risks will be involved, as the report says. Besides, the US will have to face the BRIC countries in the global market that have become the "dominant materials consumers". According to the NMAB Report, by 2040, the BRIC countries will together be economically stronger than France, Germany, Italy, the UK, Japan and the US combined.

The report found yet another inconsistency: it stated that the US National Defense Stockpile (NDS) was wholly ineffective. NDS is a structure with raw materials stockpiles for the defence sector, established just before WWII. It has stored dozens of raw materials that can be used in case of a crisis. However, the report argues, "neither the federal government nor industry leaders have enough accurate information to know how secure the supplies of these minerals are. This lack of information also extends to the area of national defence. (...) National Defence Stockpile (NDS), a cache of material in place to deal with national emergencies, is wholly ineffective for responding to modern needs or national security threats".<sup>282</sup> In fact, in 1992 the US Congress directed the Defense National Stockpile Center (DNSC) to sell the bulk of its assets and restructure its activities. The number of physical stock deposits started to decrease. According to a budget draft for Fiscal Year 2009, 2 of these sites would remain in 2013 as compared to 18 in 2008. In 2007, DNSC's inventories stood at US\$882,7 million against US\$7,1 billion in 1992.<sup>283</sup> Since 1992, total sales from the NDS have accounted for approximately US\$6,6 billion.<sup>284</sup>

In the US's point of view, defence and matters of supply security are closely tied together. These sentiments were projected by the Project for a New American Century (PNAC) and inspired some of the policies of the Bush Administration in 2001. In the PNAC's Statement of Principles, the authors said that they were going to make the case for American global leadership by re-promoting "essential elements of the Reagan Administration's success: a military that is strong and ready to meet both present and future challenges; a foreign policy that boldly and purposefully promotes American principles abroad; and national leadership that accepts the United States' global responsibilities".<sup>285</sup> Listed among the authors were Dick Cheney (Vice-President under George W. Bush), Donald Rumsfeld (State Secretary of Defence), Paul Wolfowitz (State Secretary of Finance, later World Bank President), the political activist writers Francis Fukuyama and Donald Kagan, and Governor Jeb Bush (brother of former President George Bush and Governor of Florida). As

<sup>277</sup> National Security Strategy. September 2002: p.19. (Online: <http://www.whitehouse.gov/nsc/nss/2002/index.html>, last accessed on 7/12/2008).

<sup>278</sup> GOLDWYN David L. and MORRISON J. Stephen (2005), *A Strategic U.S. Approach to Governance and Security in the Gulf of Guinea*. CSIS: p.1 (Online: [http://www.csis.org/index.php?option=com\\_csis\\_pubs&task=view&id=1891](http://www.csis.org/index.php?option=com_csis_pubs&task=view&id=1891), last accessed on 7/12/2008).

<sup>279</sup> In December 2007 the US imported 398 million barrels of oil in total, of which – in the Gulf of Guinea - 39,4 million barrels from Nigeria (9,8%) and 13,6 million barrels from Angola (3,4%). The third supplier in Africa is Algeria (not from the Gulf of Guinea however) with 18,6 million barrels (4,6%). Source: *US imports by country*, US Energy Information Administration website. See: [http://tonto.eia.doe.gov/dnav/pet/pet\\_move\\_impcus\\_a2\\_nus\\_ep00\\_im0\\_mbbl\\_m.htm](http://tonto.eia.doe.gov/dnav/pet/pet_move_impcus_a2_nus_ep00_im0_mbbl_m.htm), last accessed on 28/11/2008.

<sup>280</sup> GOLDWYN David L. and MORRISON J. Stephen (2005), o.c.: p.3.

<sup>281</sup> National Research Council (2008) *Managing Materials for a Twenty-first Century Military*, Committee on Assessing the Need for a Defense Stockpile. National Materials Advisory Board, Washington. (Online: [http://www.nap.edu/catalog.php?record\\_id=12028](http://www.nap.edu/catalog.php?record_id=12028), last accessed on 7/12/2008).

<sup>282</sup> Press communiqué, *US Lacks Data on Supply of Minerals Critical to Economy National Security*. National Academies, October 5, 2007.

<sup>283</sup> Department of Defense (February 2008) *Revolving Funds. Fiscal Year 2009. The President's Budget*, (Online: [http://www.defenselink.mil/comptroller/defbudget/fy2009/budget\\_justification/pdfs/06\\_Defense\\_Working\\_Capital\\_Fund/DoD\\_Revolving\\_Funds.pdf](http://www.defenselink.mil/comptroller/defbudget/fy2009/budget_justification/pdfs/06_Defense_Working_Capital_Fund/DoD_Revolving_Funds.pdf), last accessed on 7/12/2008).

<sup>284</sup> National Research Council (2008), o.c.

<sup>285</sup> *Statement of Principles*, Project for the New American Century website, June 3 1997, see <http://www.newamericancentury.org/statementofprinciples.htm>, last accessed on 7/12/2008.

evident from the ties the organisation had to the Bush Administration, it is not a surprise that the PNAC's policy suggestions were well received by the White House.

In order to pursue its national interests, the US started to intensify its relationship with Africa on various levels: diplomatic, economic and militarily. In 2000, the US introduced a trade scheme with Africa, called the African Growth and Opportunity Act, which aimed at lowering commercial trade barriers between the US and Africa. In 2002, the US government transformed the African Crisis Response Initiative (ACRI, launched in 1997-98) into the African Contingency Operations Training and Assistance (ACOTA). From 2005 to 2007 the bulk of African military personnel trained under ACOTA came from Ghana (3.213 troops), Nigeria (1.555), but mainly from Rwanda (7.453).<sup>286</sup>

The aim of ACOTA is to prepare African army units for "Africa owned" crisis interventions and to tighten communication lines between American and African command structures. For example, the Rwanda Defence Force engaged in the Darfur peace operation UNAMID, which is partly funded by the US through the African Union. The US deployed its Pan Sahel Initiative in Northern Africa and occupied a military base in Djibouti. They also actively deployed their naval forces and Coast Guard in the Gulf of Guinea, clearly to secure the maritime transportation routes from the oil fields in the region to the main markets in the North.<sup>287</sup>

Recently, some US analysts have become more realistic and the conquering rhetoric that was portrayed by groups such as the PNAC seems to be waning. In February 2006, US Lieutenant Colonel Gregory C. Kane wrote an article titled "The Strategic Competition for the Continent of Africa". He said that, "the US is unarguably the pre-eminent nation in the world" but then admitted that at the same time the US is the "largest debtor nation" and that its "worldwide security commitments stretch our military to the breaking point".<sup>288</sup> In November 2008, the 2025 projections of the National Intelligence Council foresaw the US to be only "one of a number of important actors on the world stage, albeit still the most powerful one".<sup>289</sup>

China's appearance on the African stage has been met in the US with more diplomacy than elsewhere in the West. However, there are still different opinions on how the US should respond towards China. In his paper, Lieutenant Colonel Gregory Kane observes, "China has been aggressively pursuing economic goals on the continent and parlaying those economic ties into diplomatic clout". He later concludes that the US and China should work together by stating, "The US needs to continue to build a partnership with China in Africa to promote stable oil markets, defeat terrorism and counter-proliferation, and ensure safe shipping lanes".<sup>290</sup> While the paper was being published, an Africa-China-US Trilateral Dialogue was taking shape with a first conference held in August 2006.<sup>291</sup> In 2007, however, Peter Pham, Senior Fellow of the Foundation for Defence of Democracies, maintained a more hawkish opinion. During a US House hearing he declared that, "this natural wealth makes Africa an inviting target for the attentions of the People's Republic of China whose dynamic economy has an almost insatiable thirst for oil and other natural resources to sustain it". He added, "many analysts expect that Africa will increasingly become a theatre for strategic competition between the United States and its only real near-peer competitor on the global stage, China, as both countries seek to expand their influence and secure access to resources".<sup>292</sup>

There is an important military component linked to the economic and political ambitions of the US in Africa. In 2007, the US officially announced that it was interested in opening an Africa Command (AFRICOM) somewhere on the continent. Since the end of the 1990s, the US has developed several programs of military training and assistance with African countries, for example to establish African rapid reaction forces that were partially equipped by the US. Until 2007, the command for US military operations in Africa was divided over three existing command structures.<sup>293</sup> In 2006-2007, the US authorities decided to create one single military command structure for Africa, AFRICOM. This structure became operational on October 1, 2008 but for the time being its headquarters remains outside of Africa. Indeed,

<sup>286</sup> HOLT Victoria K. and BOUCHER Alix J.(2007), *Future of Peace Operations Program*. The Henry L. Stimson Center. Issue Brief July 2007. (Online: <http://www.stimson.org/newpubs.cfm?PT=6&SB=A&P=6>, last accessed on 7/12/2008).

<sup>287</sup> It is worth mentioning that in 2004 the United States considered building a deep-water sea port and new airport on the Sao Tome archipelago off West Africa, "an energy-rich region important to Washington as it seeks to reduce dependence on Middle East oil. U.S. Ambassador to Sao Tome and Principe Kenneth Moorefield signed an agreement with ministers pledging US\$800,000 for feasibility studies into the potential projects, the U.S. Trade and Development Agency said in a statement". *U.S. mulls Sao Tome port in African oil region*, in: Reuters, February 19, 2004.

<sup>288</sup> KANE Gregory C. (2006), *The Strategic Competition for the Continent of Africa*. US Army War College Strategy Research Project.: p.1 (Online: <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA449648&Location=U2&doc=GetTRDoc.pdf>, last accessed 7/12/2008).

<sup>289</sup> National Intelligence Council (2008), *Global Trends 2025, A Transformed World*: p.xi (Online: <http://www.acus.org/publication/global-trends-2025-transformed-world>, last accessed 28/11/2008).

<sup>290</sup> KANE Gregory C. (2006), o.c.: p.18.

<sup>291</sup> *Africa-China-US Trilateral Dialogue. Summary Report*. December 2007. This report has been published by the Brenthurst Foundation of Johannesburg, the Chinese Academy of Social Sciences, the Council on Foreign Relations and the Leon H. Sullivan Foundation. (Online: [http://www.cfr.org/publication/14998/africachinaus\\_trilateral\\_dialogue.html](http://www.cfr.org/publication/14998/africachinaus_trilateral_dialogue.html), last accessed 7/12/2008).

<sup>292</sup> PHAM Dr. Peter (2007) *Africa Command A Historic Opportunity for Enhanced Engagement —If Done Right*. Testimony by dr. Peter Pham before the United States House of Representatives Committee on Foreign Affairs Subcommittee on Africa and Global Health. August 2 2007. (Online: <http://foreignaffairs.house.gov/110/pha080207.htm>, last accessed on 5/12/2008).

<sup>293</sup> The three divided command structures were: US European Command (USEUCOM) in Stuttgart, Germany which had the bulk of Africa in its "area of responsibility" (AOR) and carried out operations in North and Sub-Saharan Africa; the AOR of US Central Command (USCENTCOM) with its headquarter in Tampa, Florida) reaches from Kazakhstan throughout Afghanistan and the Middle East to the Horn of Africa; and the AOR of Pacific Command (USPACOM) headquartered in Hawaii, spanned from the US West Coast to Madagascar.

in 2007, AFRICOM faced disapproval by all African countries, except for Liberia, and the Pentagon did not succeed in moving the Africa Command to a new headquarter on African soil. "For the foreseeable future", as the command's website says, "AFRICOM is headquartered in Stuttgart, Germany".<sup>294</sup>

Despite the setback, the US has not abandoned its strategic concept for Africa. The National Intelligence Council, which represents the different US intelligence agencies, suggested the following, "If AFRICOM, the new US military command, does not present an overly militarized face to citizens in African countries, and humanitarian and economic developmental aid continues, the survey suggests African opinion about the United States will remain favourable".<sup>295</sup>

It appears that the US has followed this advice. The AFRICOM project has been repackaged to present it as a common endeavour of several American public services in Africa who share humanitarian and aid objectives as well as diplomatic and military goals. It is still too early to tell if this new version of AFRICOM will be accepted on the continent.

## 5.3 East Asia

The following section will focus on two of the largest and most influential countries in East Asia-Africa relations: China and Japan. Similar to the previous sections on the EU and US, we will discuss the policies and the companies that are the most influential in natural resources and their relations with Africa.

### 5.3.1 China

Over the last few years, a new independent spirit has been blowing through Africa. To a significant extent, this is due to the fact that Africa has managed to find new partners, including China. The Senegalese President, Abdoulaye Wade, described the new state of affairs aptly at the EU-Africa Summit in Lisbon in December 2007, "Europe has nearly lost the battle of competition in Africa. With the price of one European car you can buy two Chinese cars".<sup>296</sup>

China's relationship with Africa dates back to the post-World War II era when Beijing was supportive of the anti-colonial and independence struggle of African countries.<sup>297</sup> The Bandung Conference held in 1955 where the Non-Aligned Movement was created, represented one of the highlights of this period.<sup>298</sup> Chinese Prime Minister Zhou En Lai, one of the key figures of this movement, made his first Africa trip at the end of 1963. His diplomacy lead to China assisting Africa's post-colonial development, with early investments made essentially in the infrastructure sector.<sup>299</sup> For example, in the beginning of the 1970s, China built the Tanzania-Zambia Railway.<sup>300</sup>

Since the 1990s, Chinese trade and investment flows with Africa have dramatically increased, especially to the astonishment of Africa's traditional, and often ex-colonial, partners. The evolution of the relationship can only be appreciated when looking at the numbers: Total trade between China and Africa grew from US\$10 billion in 2000 to US\$18 billion in 2003 but reached US\$50 billion by the end of 2006.<sup>301</sup> In the first three quarters of 2008, two-way Sino-Africa trade reached US\$74 billion, up 62% from 2007. Beijing then warned that trade between the two partners might be affected by the global financial crisis, nullifying the good results of the first eight months.<sup>302</sup>

Exports from Africa to Asia have been accelerating. Between 1990 and 1995, exports grew annually, on average, by 15% and between 2000 and 2005 by 20%. In addition, exports to China grew even faster, by 48% annually between 1999 and 2004. Currently about 10% of Sub-Saharan exports are destined for China, while this was not even 3% in 2000.<sup>303</sup> However, it should be noted that China is not Africa's main trading partner. When two-way trade between China and Africa was US\$50,5 billion in 2006, the trade between the US and Africa amounted to US\$71,1 billion. Another factor to consider is that Asia is important for Africa, but Africa has less importance for Asia. Africa represents only 1,6% of the exports shipped to Asia from all over the world whereas this share is 32% towards the US and 20% towards the EU.<sup>304</sup>

China's interest in Africa stems from the growth of the Chinese economy, which began after major reforms were decided in 1978. As Chris Alden of the London School of Economics explains, "In 1978 the new leader Deng Xiaoping set China on a gradualist road of capitalist-oriented development that produced three decades of nearly double-digit

<sup>294</sup> See: <http://www.africom.mil/AboutAFRICOM.asp>.

<sup>295</sup> National Intelligence Council (2008), o.c.: p.95.

<sup>296</sup> EU/Africa Summit Soundbites. In: Financial Times, December 10, 2007.

<sup>297</sup> AFRODAD (2008) *Mapping Chinese development assistance in Africa: a synthesis analysis of Angola, Mozambique, Zambia and Zimbabwe*, 39p.: p.7-8 (Online: [www.afrodad.org/downloads/publications/China%20in%20Africa%20Draft.pdf](http://www.afrodad.org/downloads/publications/China%20in%20Africa%20Draft.pdf), last accessed on 21/11/2008).

<sup>298</sup> VAN DE LOOY, J. (2006) *Africa and China: A strategic Partnership?*, African Studies Centre: Leiden, 29p.: p.2-3 (Online: [www.ascleiden.nl/pdf/wp67.pdf](http://www.ascleiden.nl/pdf/wp67.pdf), last accessed on 18/11/2008).

<sup>299</sup> BROADMAN H.G. (2007) o.c.: p.1.

<sup>300</sup> COHEN J.A. (1973), *The Dynamics of China's Foreign Relations*, Harvard East Asian Monographs, p.81-82.

<sup>301</sup> ALDEN C. (2007), *China in Africa*, Zed Books: London, 157p.: p.8 and 14.

<sup>302</sup> *Beijing says global crisis risks China-Africa trade*, in: Reuters, October 9, 2008 (Online: Engineering News website: [http://www.engineeringnews.co.za/article.php?a\\_id=144871](http://www.engineeringnews.co.za/article.php?a_id=144871), last accessed on 24/11/2008).

<sup>303</sup> BROADMAN H.G. (2007), o.c.: p10-11.

<sup>304</sup> BROADMAN H.G. (2007), o.c.: p.2-3 and 11.

growth and a rising in living standards that has brought a nine-fold increase in per capita income to US\$ 1.700 in 2005”<sup>305</sup>

Another set of reforms was initiated in 1991 when China created the Go Out (and Join Global Competition) Strategy. After a few years, around 120 State Owned Enterprises were selected to spearhead the overseas expansion. From 1998 onwards, Chinese SMEs joined the Chinese TNCs in this endeavour.<sup>306</sup> China’s economic growth lead to a dramatic reversal in trade fluxes and from a net exporter of raw materials, China became the first importer of raw materials in the world. This major development is completely changing the existing global economy.

China’s current political strategy is to strengthen ties with Africa. In 2000, the first Forum on China-Africa Cooperation (FOCAC) was held and two others were to follow in 2003 and 2006. At FOCAC-3, the Chinese government “committed itself to an ambitious programme centred on provisions for US\$5 billion in loans and credits, the doubling of its development assistance by 2009 and, in a bid that would make China Africa’s largest trading partner, increasing two-way trade to over US\$100 billion by 2010”<sup>307</sup> There are a few factors that are important to understand China’s Africa policy. First, China conducts most of its relations through bilateral agreements with individual countries, and second, all government levels in China, from national to local, are involved in the programs abroad. All levels of government must respect the principles that officially guide relations with foreign countries. These principles have been developed over the years and were outlined in a White Paper titled “China’s Africa Policy”<sup>308</sup>. According to the Belgian scholar Jonathan Holslag (then an associate researcher at the European Strategic Intelligence and Security Center - ESISC) it is striking, how Beijing adheres to a well-conceived official discourse that is carried out consistently at every occasion.<sup>309</sup>

Jiang Zemin, then President, laid the foundation of this discourse in 1996, when he summed up five cornerstones of China’s Africa policy: sincere friendship, equality, unity and cooperation, common development, and looking into the future. In 2003, this approach was modified slightly by his successor [Hu Jintao, IPIS note] who formulated six pillars that can be summarized as: non-interference, African ownership in dealing with problems, mutual trust and cooperation, the increase of economic assistance without political conditions, to appeal the international community to pay more attention to Africa, and to promote a more friendly international environment for Africa’s development.<sup>310</sup>

Through its domestic development and global trade, China collected the managerial and financial resources to sustain expansion. In 2005, the export surplus with the US amounted to US\$202 billion, but, in July 2007, it was estimated that the surplus would reach US\$300 billion. The trade surpluses with the EU for 2006 and 2007 were estimated to be around EUR€128 and 170 billion. Thus, the estimate of the international reserves with the Chinese Central Bank totalled more than US\$1 trillion in 2007.<sup>311</sup>

China’s historical experience of lifting hundreds of millions of people out of poverty and its stance on international relations appealed greatly to African leaders. As Harry Broadman, then the Economic Adviser for the Africa Region at the World Bank, wrote in 2007, “these two prodigious countries’ newfound interest [China and India, IPIS note] in substantial international commerce with Africa—home to 300 million of the globe’s poorest people and the world’s most formidable development challenge—presents a significant, and in modern times, rare, opportunity for growth, job creation, and the reduction of poverty on the Sub-Saharan continent”<sup>312</sup> The “East Asian Miracle”, with China in particular seeking an original solution to poverty, has become a role model to many in the South. Moreover, Beijing has a comparative advantage because it shares a common (anti-) colonial past with many Third World countries. Although it is the third economic power today it still remains a developing country itself. China’s adherence to non-interference and un-conditionality also enhances the establishment of trade links with Africa. As Senegalese President Abdoulaye Wade wrote, “I have found that a contract that would take five years to discuss, negotiate and sign with the World Bank, takes three months when we have dealt with Chinese authorities”.<sup>313</sup>

Government policies and economic urgency made China look overseas and especially towards Africa for solutions. In this context, we refer to the preceding chapters to stress once again that Africa’s wealth in natural resources is relative. The most visible and questioned part of China’s presence in Africa relates to China’s need to secure its supply with raw materials. According to Jonathan Holslag, “Beijing opts for a control-over-the-well-strategy because it does not have confidence in the liberal approach of the commodity market”<sup>314</sup> Therefore, a number of companies are created, from wholly owned Chinese companies to Joint Ventures or jointly operated companies.

<sup>305</sup> ALDEN C (2007), p.10.

<sup>306</sup> He Wenping, Director of the African Studies Section of the Chinese Academy of Social Sciences, during a conference at the IFRI, Paris December 8 2008.

<sup>307</sup> ALDEN C. (2007), p.2.

<sup>308</sup> “China’s Africa Policy” January 12, 2006 <http://www.fmprc.gov.cn/eng/zxxx/t230615.htm>.

<sup>309</sup> HOLSLAG, Jonathan, *China’s new mercantilism in Africa*, June 15, 2007 (first published in Dutch by the Belgian think tank Metena in May 2007).

<sup>310</sup> HOLSLAG, Jonathan, o.c.

<sup>311</sup> BAECK, L. (2007) *De wereldwijde schok van China’s reuzensprong*, KU Leuven, 54p.: p.40 (Online: <http://perswww.kuleuven.be/~u0004464/teksten/DewereldwijdeschokvanChina.doc>, last accessed on 21/11/2008).

<sup>312</sup> BROADMAN H.G. Africa’s silk road, World Bank 2007, p. 43

<sup>313</sup> WADE, Abdoulaye, *Time for the West to practise what it preaches*, in: New African, March 2008, p.20.

<sup>314</sup> HOLSLAG J. (2007), o.c.

A series of tools are used to foster a relationship between two countries. Apart from diplomacy, such as the FOCAC meetings, foreign assistance is essential. A crucial component of expanding China's presence in Africa has been the use of foreign assistance to tighten and build new relationships with different regimes. Africa is the single most recipient of China's development assistance; this assistance amounts to US\$1,8 billion or 44% of China's total development assistance.

Another tool used is the lending of money. Chinese authorities have put financial institutions at the disposal of Chinese foreign investment such as the China Development Bank and especially the China Export-Import Bank (EXIM Bank), created in 1994. The state owned EXIM Bank supports Chinese enterprises by providing credit and loans. The EXIM Bank has a considerably larger budget than the Western counterparts. In 2005, it had US\$15 billion invested in several projects. The EXIM Bank endured much criticism because it ignored environmental and social standards in some of its projects. To counter that such actions happen again, in May 2007 the EXIM Bank and the World Bank signed an agreement to improve practices.<sup>315</sup>

Besides the EXIM Bank, the creation of funds can allow investments to be made. An initiative created during FOCAC-3 in 2006 was the China-Africa Development Fund (CAD Fund). It became operational in June 2007 as an equity investment fund with a US\$1 billion capital injection from the China Development Bank.

Through these instruments, China has become a key actor in the development of Africa's infrastructure. In a 2008 report, the World Bank wrote, "China's financial commitments to African infrastructure projects rose from less than US\$ 1 billion per year in 2001-2003 to around US\$ 1,5 billion in 2004-2005, reached at least US\$ 7 billion in 2006 and then trailed back to US\$ 4,5 billion in 2007 (...) Infrastructure resources by emerging financiers were around US\$ 8 billion in 2006, broadly comparable in magnitude to the Official Development Aid of OECD donors amounting to US\$ 5,3 billion in 2006".<sup>316</sup> The bulk of the infrastructure projects were given to Nigeria, Angola, Sudan and Ethiopia. Commenting on the projects, Reuters reported that such projects were welcome because, "in a region where only one in four Africans have electricity, and travel along major export routes takes two to three times longer than in Asia".<sup>317</sup> Obiageli Ezekwesili, World Bank Vice President for Africa said, "China's investments are helping fill \$22 billion a year in financing needs for roads, railways and power across Africa".<sup>318</sup>

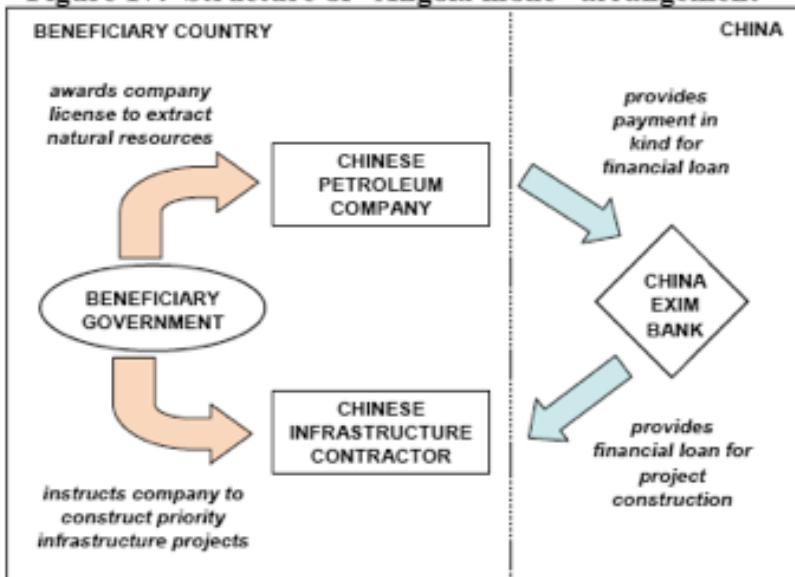
China's investment scheme in Africa is not unique and is known as the "Angola model". This term describes the financing scheme where the repayment of a loan is done through the exporting of natural resources. In this case, China allocates loans for infrastructure projects and is granted the exploitation of mineral resources in return. The EXIM Bank uses the scheme when confronted with countries that cannot provide adequate collateral to their loan commitments. Instead, a framework agreement is signed.

The EXIM Bank provides finances to a Chinese construction company that works for the beneficiary government. In exchange, the government renders some oil or mineral concessions to Chinese extractive companies that service the debts to the EXIM Bank.

The 'Angola model' was used in Angola, which received US\$5 billion in Chinese loans since 2004 in order to extract Angolan oil for delivery to China. Since 2002, Angola has been China's leading supplier of oil in Africa and 15% of China's oil imports come from Angola. Angola is now China's largest trading partner in Africa.<sup>319</sup> The model was also used in a US\$9 billion contract with the DRC to extract copper and cobalt in return for the construction of roads, hospitals, schools and the rehabilitation of two major mineral deposits.

**Chart 5**

**Figure 17: Structure of "Angola mode" arrangement**



(Source: Foster et al., *Building Bridges*, 2008, World Bank)

<sup>315</sup> ALDEN C. (2007), o.c.: p.134.

<sup>316</sup> FOSTER V., BUTTERFIELD W., CHEN C., PUSHAK N. (2008) *Building Bridges. China's growing role as infrastructure financier for Sub Saharan Africa*. World Bank, Washington July 2008.

<sup>317</sup> *China leads new financiers in Africa says World Bank*, in: Reuters July 10, 2008.

<sup>318</sup> Ibidem.

<sup>319</sup> VINES A. and CAMPOS I. (2008) *Angola and China: A pragmatic partnership*, Center for Strategic & International Studies, 26p.: p.12 (Online: [http://www.csis.org/component?option.com\\_csis\\_pubs/task.view/id.4374/](http://www.csis.org/component?option.com_csis_pubs/task.view/id.4374/), last accessed on 7/12/2008).

Oil is currently the number one export commodity to China accounting for 62% of African exports. China's suppliers are concentrated in five countries, which produce 85% of all African oil exports to China: Angola supplies 47%, Sudan 25%, Congo 13%, Equatorial Guinea 9% and Nigeria 3%.<sup>320</sup> China signed its first oil-producing contract with Sudan in 1996. Since then, over US\$15 billion has been invested by China in Sudan, primarily in the oil industry and related infrastructure projects. A network of refineries, roads, railways, hydroelectric dams and telecommunication services has been established in the country. Bilateral trade between the two partners totalled US\$3,9 billion in 2005, from US\$890 million in 2000.

China's growing presence in Africa does not take place unnoticed. China's policy of un-conditionality in relations with other countries has been the focus of much criticism. With such policies, many say that Beijing is actively supporting pariah regimes. Some consider Sudan to be an example of a pariah regime. Apparently, Beijing is sensitive to such criticism. In 2006, and on the day of the FOCAC-3 opening ceremony, President Hu Jintao urged Khartoum, to cooperate with UN diplomacy over Darfur. China was even prepared to authorize UN peacekeepers to reinforce the African Union (AU) mission. However, as China's economic interests in Sudan remain important, Beijing does not want to fundamentally change its relationship with Sudan.<sup>321</sup> One reason is that China needs the support of the African countries for its diplomatic actions against Taiwan, which Beijing considers a province of mainland China. Moreover, in some way, African countries need China to serve as a new strategic partner or at least an alternative option to the traditional counterparts of Europe and the US.

Another criticism of China relates to the conduct of Chinese entrepreneurs, mostly of SMEs who tend to avoid punishments both from Chinese and African authorities and ignore labour and environmental legislation.<sup>322</sup> How to address this topic seems to be one of the Chinese government's biggest concerns. In the DRC for example, 300 Chinese illegal immigrants were expelled in February 2008 by the governor of the copper province of Katanga with the approval of China's Ambassador to Congo Wu Zexian. Those expelled were working for small metallurgical companies that were paying very low wages. The Chinese Embassy stressed that Chinese employees recruited within the scope of the contract between DRC and the consortium of China Railways Engineering Corp. -SinoHydro-Eximbank were treated much better.<sup>323</sup>

#### **Box E - China, "The Hungry Monster"**

"Hunger", "thirst", "appetite": These descriptions have been made in numerous articles and analyses on the "dragon" or the "giant" China. By doing so, their authors have shaped an ever recurring spectre of a monster creeping into Africa, an image that strongly appeals to (and probably emanates from) Western fears of being pushed out of its traditional markets in a continent with which strong ties exist, often tracing back to a colonial past.

Not always do these articles give evidence of professionalism. An example is "The New Colonialists", published by the Financial Times (FT) on November 17, 2007 and written by FT's Bureau Chief in Johannesburg, Alec Russell. The article describes Russell's experiences with the Chinese in Angola. "This much is clear", he writes, "with the largest oil-revenues in sub-Saharan Africa aside from Nigeria - worth \$10,6bn last year - Angola has proved an alluring destination for resource-hungry China". Therefore, literally innumerable lots of Chinese slip into Angola. Russell asks how many expatriates are working in Angola; however, he is in not able to give an answer to this "Chinese puzzle". He heard that "a Chinese diplomat told a western counterpart that they had issued work permits for only 5.000 Chinese in Angola". He noted the "suggestion from one senior Western diplomat that there could be more than 100.000". He took down the estimate of between 20.000 and 30.000 Chinese nationals, given by a scholar from the Centre for Chinese Studies at the University of Stellenbosch. It seems that Russell has interviewed many counterparts for the answer, but missed one important category of sources: Angolan institutions and observers. "They have limited capacity to track the number of Chinese nationals", the scholar cautioned. "In such a climate wild rumours abound", Mr. Russell wrote. Being a staff reporter from a highly reputable British newspaper, one would expect him to deconstruct rumours. Alec Russell does the opposite. "A popular stereotype", he goes on, "of the typical Chinese expatriate has taken hold in the West: they arrive in secrecy to work for giant state Chinese companies as foot-soldiers in Beijing's new African strategy; they deprive locals of jobs and they have little or no interaction with their host countries". What is true then of the stereotype? There is no way of knowing because, unfortunately, "the most memorable aspect of the trip was not what I could see of the Chinese but what I couldn't".

Five months later, The Economist in its March 13, 2008, wrote an article called, "A ravenous dragon". The opening sentence reads, "China's hunger for natural resources has set off a global commodity boom", which is not

<sup>320</sup> Harry Broadman makes a mistake when he cites the Democratic Republic of Congo as China's third supplier in Africa. He confuses it with the Republic of Congo (Brazzaville). BROADMAN H.G. (2007), o.c.: p.10-12 and 81.

<sup>321</sup> ALDEN C. (2007), o.c.: p.59 - 66 and 122.

<sup>322</sup> ALDEN C. (2007), o.c.: p.56-58.

<sup>323</sup> 300 Chinese expelled, in Africa Mining Intelligence n°175, March 12, 2008.

exactly new news. What is surprising is the following sentence, "this report will argue that concerns about dire consequences of China's quest for natural resources are overblown".

African media often take a different stance. For example, in the March 2008 edition of the New African: "What compounds the West's worries is the fact that everyone can clearly see through its inconsistencies, such as the colonial legacy which contradicts claims of democratisation in Africa, its notable Cold War protection and support of corrupt dictators and, even worse, its stark failure to come up with any real economic success story in Africa, despite decades of policies devised by its technocrats".

### 5.3.2 Japan

In 2007, Japan was the world's second largest economy. In the 1970s and 1980s, Japan had its mind set only on engagement in South East Asia. Its relationship with Africa is a very recent one. A good illustration is the fact that in January 2001, Prime Minister Mori Yoshiro was the first Japanese leader ever to pay a visit to Africa. Today however Africa, which accounts for 20% of the world's land mass and for 10% of the world's population and is rich in natural resources, is indispensable for any major world player.<sup>324</sup> Consequently, Japan's ties with Africa have been growing steadily since the end of the Cold War and most prominently through its development assistance. In 1993, Japan co-hosted the first Tokyo International Conference on African Development (TICAD) where it presented itself as a partner in development assistance. Since then, four TICAD Summits have taken place.<sup>325</sup>

Development assistance is the primary focus of the TICAD process. When Japan created TICAD, it was the world's leading aid donor. At that time, Tokyo held a progressive discourse by emphasizing "African ownership" and "relations based on equality" in development assistance. Despite the progressive sounding policies, some observers have pointed out that the TICAD declarations have always endorsed a neo-liberal view on development.<sup>326</sup>

Japan's aid policies have indeed been inspired by the country's position within the group of leading Western economies and its alignment with US international policy. It is also widely agreed that political and economic drivers are just as important to Japan when strengthening its ties with Africa. For example, Tokyo has tried, so far without success, to promote its accession to the UN Security Council with support from African countries. Its last attempt in 2005 failed because of insufficient support, especially from Africa, which represents only 25% of the 192 UN-members.

From an economic perspective, Japan engages through TICAD in order to secure a sustainable supply of Africa's natural resources, as well as for the potential represented by the African market. There is also the rivalry with China in this field; however, Japan is obviously losing.<sup>327</sup> According to government data of both countries, Japan's trade with Africa in 2007 amounted to US\$27,7 billion, only half of China's trade with Africa. Japanese aid to Africa has also fallen 40% from its peak in 1995 to US\$6,7 billion in 2007.<sup>328</sup> Criticism from African officials on TICAD has grown louder and higher visibility from China's initiatives is overshadowing Japan's once pioneer initiative. This trend is reflected in the fact that only US\$415 million or 0,4% of Japan's total FDI went to Sub-Saharan Africa between 2002 and 2004.<sup>329</sup> This means that the attention given to Africa in Japan's foreign policy was not echoed in its foreign economic activity.

At the fourth TICAD meeting in May 2008, Tokyo adjusted its policies to include clear pledges and fast actions. The need to take care of its own interests became more apparent, now that the US could no longer fully secure them. In his opening speech, Prime Minister Fukuda emphasized the crucial link between infrastructure works and private investment. Therefore, he proposed the establishment of a US\$ 2,5 billion fund, called Facility for African Investment for the period of 2008 up to 2012, within the Japan Bank for International Cooperation (JBIC). The initiative was set up to help Japanese companies in Africa. The fund will offer direct financing for Japanese investments in Africa and guarantee loans provided by Japanese banks.<sup>330</sup> This initiative also targets Africa's natural resources because, as the JBIC writes, it must support "projects in such areas as manufacturing, energy and natural resource development, and infrastructure development in Africa's power and port sectors".<sup>331</sup> In the end, Japanese private investment in Africa is expected to double.

<sup>324</sup> HIDEO, O. (2002) *Japan-Africa Relations in the Twenty-first Century*, in Gaiko Forum (Online: [www.gaikoforum.com/5\\_p42-46\\_Oda.pdf](http://www.gaikoforum.com/5_p42-46_Oda.pdf), last accessed on 25/11/2008).

<sup>325</sup> *African Development: TICAD Process*, Ministry of Foreign Affairs of Japan website, see: <http://www.mofa.go.jp/region/africa/ticad/index.html>, last accessed on 25/11/2008.

<sup>326</sup> AMPIAH, K. (2008) *Japan in Africa: a distant partnership*, OpenDemocracy, June 6 2008 (Online: <http://www.opendemocracy.net/article/japan-in-africa-paths-to-partnership>, last accessed on 20/11/2008).

<sup>327</sup> WATANABE M. (2008) *Japan's Foreign Aid Policy in Transition: An Interpretation of TICAD IV*, in: Japan aktuell, March 2008, (Online: [http://duei.de/dl/download.php?d=/content/publikationen/archiv/ja\\_aktuell/jaa\\_0803\\_fokus\\_watanabe.pdf](http://duei.de/dl/download.php?d=/content/publikationen/archiv/ja_aktuell/jaa_0803_fokus_watanabe.pdf), last accessed on 25/11/2008).

<sup>328</sup> SAKAMAKI S. and SEKIGUCHI T., *Japan, Seeking Greater Africa Influence, Pledges Aid*, in: Bloomberg.com, May 28, 2008, (Online: <http://www.bloomberg.com/apps/news?pid=20601101&sid=aJUhHj4fDx4&refer=japan>, last accessed on 25/11/2008).

<sup>329</sup> AMPIAH, K. (2008), o.c.

<sup>330</sup> Speech by Japanese Prime Minister Fukuda, at the Opening Session of the TICAD IV, May 28, 2008 (Online: <http://www.mofa.go.jp/region/africa/ticad/ticad4/pm/address.html>, last accessed on 25/11/2008).

<sup>331</sup> *JBIC Supporting African Development: Promoting Japanese Trade and Investment Activities to Accelerate African Growth*, Japan Bank for International Cooperation website, see: <http://www.jbic.go.jp/en/about/topics/2008/0610-01/index.html#1>, last accessed on 27/11/2008.

At the last TICAD meeting Japan also promised to put US\$4 billion in soft loans at Africa's disposal for infrastructure improvement and Prime Minister Fukuda announced that Japan will double its Official Development Aid to US\$1,8 billion<sup>332</sup> by the next conference<sup>333</sup>.

Japan is now sending Joint Missions for promoting trade and investment to Africa. The Joint Missions are composed of business, government representatives and politicians.<sup>334</sup> The first Africa mission went to Botswana in September 2008. According to Japan's Vice Minister of Economy, Trade and Industry, Takamori Yoshikawa, the main areas of interest were minerals and energy. Mr. Yoshikawa said, "I believe that with the advanced technology that will be transferred to Botswana and the SADC countries, and the chance that it avails for rare metals to be detected for new mineral investment projects by Japanese companies, we will be in a position to meet the ever increasing demand for rare metals in Japan."<sup>335</sup> In May 2008, Japan had already signed a Memorandum of Understanding (MOU) with Namibia to secure a mineral supply to the Japanese industry. "Since Namibia is endowed with abundant natural resources such as diamonds, uranium and natural gas", so the memo said, "Japanese firms take great interest in resource-related businesses, and are actually participating in resource development projects in this country."<sup>336</sup>

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<sup>332</sup> Tokyo shows mettle in the race for Africa's ore, in: Financial Times, May 21, 2008 (Online: [http://us.ft.com/ftgateway/superpage.ft?news\\_id=fto052120081442230895](http://us.ft.com/ftgateway/superpage.ft?news_id=fto052120081442230895), last accessed on 27/11/2008).

<sup>333</sup> Speech by Japanese Prime Minister Fukuda, May 28 2008, o.c.

<sup>334</sup> Joint Missions for promoting trade and investment to Africa, Ministry of Foreign Affairs of Japan website, August 27, 2008, see: [http://www.mofa.go.jp/announce/event/2008/8/1182959\\_940.html](http://www.mofa.go.jp/announce/event/2008/8/1182959_940.html), last accessed on 27/11/2008.

<sup>335</sup> Japan joins race for Botswana mineral resources, in: Mmegi online, September 3, 2008 (Online: <http://www.mmegi.bw/index.php?sid=4&aid=12&dir=2008/September/Wednesday3>, last accessed on 28/11/2008).

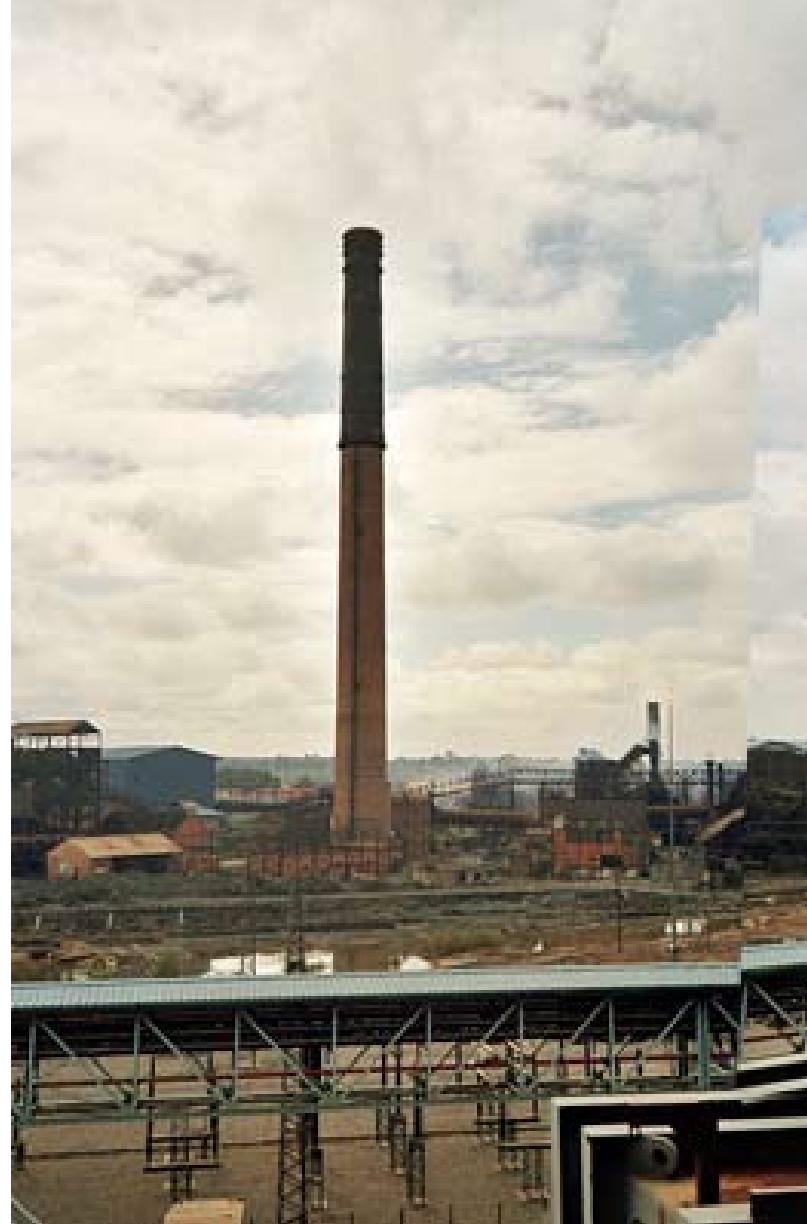
<sup>336</sup> JBIC Signs MOU with Development Bank of Namibia, Strengthening Bilateral Ties to Increase Business Opportunities for Japanese Firms, JBIC, May 29, 2008, (Online: <http://www.jbic.go.jp/en/about/topics/2008/0610-01/03.pdf>, last accessed on 28/11/2008).

# 6. Natural Resources and Development

The economic crisis, which has been manifesting since September and October 2008, poses serious threats to the development of Africa, and in particular to the development of resource rich countries. This is a troubling fact for Africa, the most marginal player in the world's economy. The extreme volatility of commodity prices during and after the summer of 2008 shows the vulnerability of raw-material-exporting countries for sudden price shocks. This raises the question whether commodity agreements might constitute a buffer against such shocks.

Another problem is the long term planning of mining companies. Many mining companies or other players in the extractive industries are reconsidering their investment projects. Many have slowed down their activities or "mothballed" specific mining projects; be it for lack of credit or for bad profit perspectives. While the project is put on hold, the host country with the resources is left without incoming revenue, which it would have received in exchange for the resources. Now, they too have to turn back budgets and future planning. It will be difficult to maintain any sustainable development planning in this context.

In this chapter, we will touch on questions of this kind without developing them thoroughly or giving solid answers. Our answers should be the result of thorough exchanges and consultations to be developed between actors in the North and the societies concerned in Africa.



The GTL/STL plant in Lubumbashi (Photo: IPIS)

## 6.1 International Commodity Agreements

Commodity dependency combined with volatile and low prices of raw materials are frequently stated as major causes of structural underdevelopment of many African countries. Such circumstances raise the question if International Commodity Agreements (ICAs) are a valuable way of devising solutions. Such agreements aim at keeping the volatility of prices and downward trends under control.

When in the second half of the 20<sup>th</sup> century, the resource rich countries were confronted with worsening terms of trade and instability in commodity prices and revenues, this problem came on top of the agenda of UNCTAD's first conference, in Geneva.<sup>337</sup> Later on, international support for an Integrated Programme for Commodities (IPC) gained vigour and it was approved at UNCTAD's fourth conference in 1976 in Nairobi.<sup>338</sup>

The idea was to negotiate commodity agreements that would, through their own resources as well as resources borrowed from a common financing facility, be able to finance buffer stocks in order to reduce price fluctuations, and to obtain stable and acceptable prices for producers. Negotiations led to the establishment of the Common Fund for Commodities (CFC), an instrument to fund buffer stocks of core commodities that were to form part of the IPC.

The results of ensuing efforts were disappointing. Although intense negotiations took place during the next years, only one new commodity agreement was negotiated within the context of the IPC, the International Rubber Agreement. Moreover, some existing commodity agreements even disappeared with the approaching global recession of the 1980s, resulting in depressed prices. When the agreement establishing the CFC (adopted in 1981) entered into force in 1989, its objective to finance buffer stocks was suspended, and the bulk of the commodity agreements were

<sup>337</sup> UNCTAD (2003), *Economic Development in Africa: Trade Performance and Commodity Dependence*, 78p.: p.32 (Online: [www.unctad.org/en/docs/gdsafrika20031\\_en.pdf](http://www.unctad.org/en/docs/gdsafrika20031_en.pdf), last accessed on 29/10/2008).

<sup>338</sup> GREEN D. (2005) *Conspiracy of silence: old and new directions on commodities*, Oxfam (Online: [http://publications.oxfam.org.uk/oxfam/display.asp?K=002P0231&aub=Duncan%20Green&sort=sort\\_date/d&m=14&dc=18](http://publications.oxfam.org.uk/oxfam/display.asp?K=002P0231&aub=Duncan%20Green&sort=sort_date/d&m=14&dc=18), last accessed on 6/12/2008).

shut down. It seemed that market intervention through commodity agreements was no longer acceptable in the world economy of the 1980s, where (price) liberalization and deregulation promoted by programmes such as the International Financial Institutions' Structural Adjustment, got the upperhand.<sup>339</sup>

Still, it is good to know that ICAs have existed for several commodities. These agreements were launched for sugar, rubber, coffee but also for some metallic minerals. For example, the International Tin Agreement, Intergovernmental Council of Copper Exporting Countries, the International Bauxite Association, and the Association of Iron Ore Exporting Countries.

The establishment of the ICAs tried to provide stability in different ways, but the two most common factors were used: buffer stocks and export quotas. The International Tin Agreement (ITA), for example, in which producing countries and consumers were represented, consisted of both elements. The buffer stock was the main instrument. It bought tin when the price would reach a level equal or below a floor price. When the tin price rose up to a ceiling price, the buffer stock had to sell tin to make the prices decrease.<sup>340</sup> When the buffer stock alone failed to support the price range, then export quotas were used.

None of the commodity agreements survived. One theory is that it is hard to manage output when productivity increases make the supply expand. The World Bank thinks that supply control attracts new entrants on the market, as occurred on the coffee market. It is also clear that it is difficult to agree on price ranges for the long term satisfying producers as well as consumers. Another difficulty is the lack of enforcement mechanisms.<sup>341</sup> Other analysts state that to overcome these problems and to make the agreements work is a matter of political will be backed by adequate financial resources.<sup>342</sup>

It would be too simple to state that since these experiences did not work in the past, it is likely they cannot work in the future. One has to look at the context from the particular point in time in order to analyse the failures. UNCTAD's IPC and CFC became operational in the era of neo-liberal reforms, hostile to any suggestion of market intervention. Free riding and counter-policies played an important role in thwarting the commodity agreements. For example, the ITA was upset by the US's stockpile and Russia's huge tin sales in the 1950s.

For ICAs to succeed, some conditions are favourable such as the domination of the market by a small number of producers, strong political alliances between them and a certain dependency with the consumers where, for example, stocks or home production are relatively small.<sup>343</sup> The experiences of the oil producing cartel OPEC and the creation of the consumers counter-cartel, the International Energy Agency, raises the question whether producers and consumers should stick to their own camps or work for partnerships that involve both sides. If the main objective of commodity agreements is to diminish short-term price fluctuations and to reach a long-term balance between increased supply and demand, is such a partnership not to the advantage of both producers and consumers? Since the 1980s, neither the commodity dependency nor the vulnerability for price volatility has disappeared. On the contrary, the 2008 crisis shows that state intervention is not only accepted (at least for a short while), but also is actively solicited by financial institutions and manufacturers (such as the car manufacturers in the US). Could this mean that new opportunities for state controlled and South-South agreements will arise?

## 6.2 Mining Reviews

The emergence of new global players thoroughly changes the international playing field. New South-South partnerships are developing. Demand for natural resources from Africa has increased. Against this setting, African public opinion and leaders have been showing a self-awareness that has not been seen for a long time.

Now, several evolutions are taking place at the same time. Around the Millennium, half a dozen of African leaders launched a new program for the continent and created the New Partnership for African Development (NEPAD). Almost a decade later, NEPAD is not so much of an achievement, it rather seems to be a philosophy or a set of guiding principles of how to organise an appropriate environment for business in Africa. While its philosophy may be liberal and may come down to a repackaging of models for free market economies, it nevertheless also expresses a shared voluntarism to enhance national or regional economies on the continent that have the capacity to integrate into and exist (or survive) within the globalized economy.

Partnerships offered from abroad are mostly seen as opportunities, as long as the counter-parts respect African sovereignty and the programs are Africa-owned. Occasionally however, this trend runs into open conflict with the North, as we have shown above. The US is therefore switching tracks to save its AFRICOM project. The EU for its part learned a

<sup>339</sup> UNCTAD (2003), o.c.: p.32-33.

<sup>340</sup> RAFFAELLI M. (2005) *Rise and Demise of Commodity Agreements. An investigation into the breakdown of international commodity agreements.* Woodhead Publishing Limited: Cambridge, 240p: p.188.

<sup>341</sup> GREEN, 2005.

<sup>342</sup> UNCTAD, 2003: p.34.

<sup>343</sup> RAFFAELLI M. (2005), o.c.: p.18-19.

hard lesson at the Lisbon summit in December 2007 where Africa collectively refused the EU's free trade approach of the Economic Partnership Agreements.

At the same time, because of the boom in global demand, resource rich countries have gained bargaining power and have been designing policies to raise more revenue from their extractive industries. The start of the process in Zambia was criticized in 2007 by Professor John Lungu. Zambia is a major exporter of copper and cobalt. Prof. Lungu recalls that the Zambian government at the time sold the state owned mines "when the price of copper was low and the company incurring year-on-year losses. This made it a buyer's market, and the assets were given away cheaply with few strings attached. The World Bank also pushed the government to sell the assets quickly".<sup>344</sup> The principal aim of privatization according to Prof. Lungu was to "establish an attractive investment environment to bring in new money. This was prioritised above ensuring that new investors accepted responsibilities to share in the wealth that would flow from their operations".

Now, asks Prof. Lungu, was this situation as good in development terms as it was economically for the private companies and had the Zambian government been able to collect enough revenue from the copper price explosion to enable it improve social provision and infrastructure? "We found", his answer is, "that the Zambian government has incurred losses in tax revenues through the subsidies given to the private mining companies".

In 2007, Prof. Lungu wrote, "Today the economic conditions worldwide have changed. The price of copper has gone up dramatically compelling civil society and the opposition political parties in Zambia to mount pressure on the government to renegotiate" the so-called development agreements. During the run up to the 2006 elections in Zambia, one of the contesting parties had campaigned with the claim of increasing mineral taxes and reducing personal taxes for the mine workers. This campaign promise became reality, due to the changing global economy when the Zambian government raised taxes for mining companies from 25 to 30 % and introduced a "windfall-tax" for exceptional profits. In 2008, this new fiscal system was to raise US\$ 415 million of supplementary revenue for the Zambian Treasury.

Elsewhere in Africa, a similar trend to renegotiate or review existing contracts between the state and (foreign) investors took root.<sup>345</sup> In Guinea, the top producer of bauxite, the review of the mining contracts was launched in early 2007, when a general strike against the regime of President Lansana Conté paralysed the country. In the DRC, reviews were launched for the first time since independence in 1960. They took place in April 2007 shortly after the Parliament had been elected and a government formed out of the Parliament's majority. Here an inter-governmental committee concluded that of the 61 reviewed conventions, not one was valid. As a result, 22 had to be cancelled and 39 had to be renegotiated.<sup>346</sup> Overall, a dozen African countries have undertaken a mining tax reform or a mining contract renegotiation, without, that is, turning back the privatizations. International financial institutions have supported these efforts but only to some extent. The African Development Bank for example has been working on a mining review framework for West Africa.

The effects of the economic crisis will certainly put this mining review process under pressure. In the view of the Multilateral Investment Guarantee Agency (MIGA, a World Bank affiliate), they believe mining reform must be slowed down "to stem a growing tide of investment uncertainty". Thus, MIGA's acting head Mamadou Barry negatively labelled mining reform as relating to Resource Nationalism and said, "So we are seeing African governments revisiting old contracts and this presents a new environment in which to manage new risk factors which can help turnaround emerging international perceptions that Africa is posing greater mining risk".<sup>347</sup> A similar opinion was voiced in a World Bank statement on Congo.<sup>348</sup>

The process encounters strong opposition from private and sometimes heavyweight mining companies and lobbies. In South Africa, Zambia and Tanzania the mining industry's representatives campaigned against higher taxes. In Congo and Guinea, powerful US and Canadian lobbies tried to influence the contract reviews to the benefit of US transnational corporations. In Tanzania in June 2008, staff from Canada's High Commissioner intervened to convince members of parliament and sway them to reject the conclusions of the Presidential Mining Sector Review Committee. For example, the review committee proposed the establishment of a Mining Authority and the introduction of taxation and royalties to be paid by the mining companies. Of course, Canada felt the urge to get involved because it is the second investor in Africa's mining industry.<sup>349</sup> Yet, only a few days earlier a consortium of African mining activists at the African Initiative on Mining, Environment and Society meeting in Accra made the recommendation that "all pressures

<sup>344</sup> LUNGU John (2007), *Development Agreements and Copper mining in Zambia: Renegotiation or law reform?* Paper presented at conference on The State, Mining and Development in Africa, University of Leeds 13-14 September 2007.

<sup>345</sup> CUSTERS Raf, *Révision des contrats miniers en Afrique*, in: Le Monde Diplomatique, July 2008. (Online : IPIS website : <http://www.ipisresearch.be/natural-resources.php>, last accessed on 8/12/2008).

<sup>346</sup> CUSTERS Raf, *Congo wants to raise the profits of its mining sector*. IPIS Briefing Paper, March 25, 2008. (Online : IPIS website : <http://www.ipisearch.be/natural-resources.php>, last accessed on 8/12/2008).

<sup>347</sup> MIGA says resource nationalism emerging in African mineral investment, International Mining, September 4, 2008.

<sup>348</sup> World Bank (1992), *Strategy Note for the Mining Sector*, World Bank Technical Paper (Online: [http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/1999/10/21/000178830\\_98101904142281/Rendered/PDF/multi\\_page.pdf](http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/1999/10/21/000178830_98101904142281/Rendered/PDF/multi_page.pdf), last accessed on 8/12/2008).

<sup>349</sup> TOUGAS Denis, *Le Canada en Afrique : « la super puissance minière! »*, Pambazuka November 21, 2008. (Online: <http://www.pambazuka.org/fr/category/features/52131>, last accessed on 8/12/2008).

and policy prescriptions for Africa and African governments must cease forthwith so as to allow African governments and people to enjoy the right to policy choices, review their laws and mining contracts without any limitation".<sup>350</sup>

How and by whom can, or must, newly generated mining revenues be spent? This is the subject of yet another international debate. In Angola, a discussion took place in the course of 2008 on the revenues of the production of some 2 million barrels of oil per day. According to the specialized newsletter Africa Energy Intelligence, a Swiss law firm advised the Angolan Central Bank to create a sovereign wealth fund, a plan that is said to have irritated the state oil company Sonangol. Finally, it is Sonangol who will now manage this fund and use it to invest abroad.<sup>351</sup> This example illustrates the presence of competing forces within a given political setting. It also raises the fundamental question of whether revenues from extractive industries should be reinvested simply to make money or should lead to the expansion of the national economy. The UNECA has advanced some principles on this subject. A general principle is that in attracting foreign direct investment, countries should be cautious and selective and "encourage FDI in sectors that have linkages to the rest of the economy and ensure that it leads to the transfer of knowledge and local capacity building. They should also give preference to sectors that have high-added value and significant potential for employment creation". For oil exporting countries specifically, UNECA says that they "need to manage oil revenues to ensure diversification of the sources of growth and of the export base".<sup>352</sup>

In general, this issue raises concerns about good governance and corruption. Governments will have to draw the mining sector out of a vicious circle. They will have to ensure that mining operations generate revenue needed to fund a properly functioning institutional apparatus and, vice versa, that the institutional apparatus imposes itself so as to get revenue out of the mining operations to serve public interest and, in the long run, the needs of development.<sup>353</sup> Good governance has become a condition in North-South partnership frameworks; it remains to be seen and how South-South partnerships will contribute to solve this endemic disease.

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<sup>350</sup> End mineral resource plunders in Africa! Tenth annual strategy meeting of the African Initiative on Mining, Environment and Society (AIMES), June 24-26, ACCRA. Published on July 20 2008 on Mines and Communities, see: <http://www.minesandcommunities.org/article.php?a=8715>, last accessed 8/12/2008

<sup>351</sup> Sonangol, premier fond souverain africain?, Africa Energy Intelligence, n°593, November 26, 2008.

<sup>352</sup> UNECA (2008), Economic Report Africa 2008.: p.16 and 129 (Online: <http://www.uneca.org/era2008/>, last accessed on 4/12/2008).

<sup>353</sup> An illustration of this vicious circle mechanism can be found in the following IPIS report: VERBRUGGEN Didier and HUND Kirsten (2006), *The State vs. the People? Governance, Mining and the Transitional Regime in the Democratic Republic of Congo: the case of Katanga.*, IPIS. Also interesting is the full "The State vs. the People" report. (Both online: <http://www.ipisresearch.be/natural-resources.php>, last accessed on 1/1/2008).

# Annexes

## Annex 1 - Applications

Mineral	Uses and production	Share of global reserves
Antimony	Alloyed with lead to increase hardness and strength, used in semi-conductors and flame retardants. China accounted for 86% of mine production (2002), although antimony can be produced as a by-product of lead refining. Imported into the EU as ore, metal or oxide	China (43%), Russia (17%), Bolivia (15%), South Africa (12%), Kyrgyzstan (6%)
Beryllium	A lightweight, high-strength metal with high thermal conductivity. Used in electronic components, electrical equipment and aerospace and defence applications. Portugal is thought to possess approximately 0.2% of global reserves.	Brazil (32%), India (15%), China (11%), Russia (11%), Argentina (6%), USA (4%)
Bismuth	Used in pharmaceuticals and as a metal in fusible (low-melting) alloys. Mexico and China accounted for 59% of world production in 2002. Can be produced as a by-product of lead and zinc refining. Bulgaria and Romania both mine bismuth.	China (18%), Australia (16%), Peru (10%), Bolivia (9%), Mexico (9%), USA (8%), Japan (8%)
Boron (Boric oxide)	Glass manufacture (particularly fibreglass) and ceramics. Turkey is the world's largest producer.	Russia (24%), USA (24%), Turkey (18%), China (16%), Kazakhstan (8%), Chile (5%)
Cobalt	Used in steel alloys, super alloys, magnet alloys, batteries, catalysts and as the cement for carbides in tools. Also used in pigments and paint-dryers. Mine production is dominated by just five countries (Zambia, Democratic Republic of Congo, Canada, Russia and Brazil).  Belgium and Finland produce significant quantities of cobalt metal from imported ores, while the UK, Finland and France produce significant quantities of cobalt compounds. Often mined as a by-product of other metals (copper, nickel, platinum, silver or zinc). Finland has 0.5% of global reserves.	Congo (44%), Cuba (22%), Australia (15%), Zambia (8%), New Caledonia (5%)
Molybdenum	Used in high-tensile steel to impart hardness, tolerance to high temperatures and resistance to corrosion. It is usually produced as a by-product of copper mining. Production in 2002 was confined to 13 countries, of which the USA, Chile and China accounted for 75% of global production.	USA (49%), Chile (20%), China (9%), Canada (8%), Russia (4%)
Niobium	A soft ductile metal used mainly in special steels and super alloys. Brazil produces approximately 85% of the global total.	Brazil (77%), Russia and other CIS countries (16%)
Platinum group	Used as catalysts (e.g. catalytic converters in cars), in electronics and jewellery. The largest producers in 2002 were South Africa (61%, mainly platinum) and Russia (27%, mainly palladium). Finland is thought to possess approximately 0.1% of global reserves.	South Africa (89%), Russia (9%)

Rare earth elements	A group of 15 metallic elements, of which cerium, lanthanum and neodymium are the most commonly used. Used in automobile catalysts, as metallurgical additives and in glass and ceramics. China produces more than 90% of the global total. Finland and Sweden combined are thought to have relatively small amounts (<0.01% of global reserves).	China (42%), Russia and the former Soviet Union (18%), USA (17%), Australia (5%)
Rhenium	The main uses are in high-temperature super alloys and petroleum refining.	Chile (52%), USA (15%), Russia (12%), Kazakhstan (8%)
Tantalum	A heavy, very hard, ductile metallic element with a very high melting point (2 996°C) and strong resistance to chemical attack. Used in electronic applications, especially miniature capacitors. Global production dominated by Australia (60%).	Australia (41%), Nigeria (18%), Canada (17%), Congo (11%), Brazil (5%)
Tellurium	Mainly recovered from the anode slimes obtained from the electrolytic refining of copper. Used in iron and steel products, non-ferrous metal alloys, electronics and photoreceptors, catalysts and chemicals, including rubber.	Chile (28%), USA (15%), Zambia (10%), Zaire (9%)
Titanium (ilmenite)	A low-density, strong and corrosion-resistant metal used in the aerospace industry. Most (94%) is used as titanium dioxide as a pigment in paint, plaster, rubber and paper. Finland is thought to possess approximately 0.3% of global reserves.	Australia (25%), South Africa (19%), Norway (12%), Canada (9%), China (9%), Brazil (5%), USA (4%)
(Rutile)		Australia (39%), South Africa (19%), India (15%), Sri Lanka (11%), Sierra Leone (7%), Ukraine (6%)
Vanadium	A soft ductile metallic element that is highly corrosion-resistant. Mainly used as an additive in steel alloys to which it imparts strength and corrosion resistance. Also used in titanium alloys and as a catalyst.	Russia (50%), South Africa (30%), China (20%)

(Source: Commission Staff Working Document - Analysis of the competitiveness of the non-energy extractive industry in the EU, SEC(2007)771, Commission of the European Communities, June 4 2007)

## Annex 2 – Mineral Statistics

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### Aluminium (Thousand metric tons)

	Smelter production			Yearend capacity	
	2002 <sup>b</sup>	2006	2007	2006	2007
U.S.	2.707	2.284	2.600	3.700	3.700
Australia	1.836	1.930	1.900	1.950	1.950
Bahrain	519	872	870	830	830
Brazil	1.318	1.498	1.700	1.650	1.700
Canada	2.709	3.050	3.100	3.060	3.100
China	4.300	9.350	12.000	10.500	14.000
Germany	653	537	520	670	600
Iceland	285	320	400	400	790
India	671	1.100	1.400	1.200	1.500
Norway	1.096	1.330	1.100	1.350	1.190
Russia	3.347	3.720	4.200	3.800	4.400
Tajikistan	308	414	500	515	515
U.A.E., Dubai	536	730	900	860	920
Venezuela	605	610	630	675	675
Mozambique	268	564	560	570	570

	Smelter production			Yearend capacity	
	2007	2006	2005	2006	2005
South Africa	707	895	900	900	900
Other countries		4.510	4.500	5.240	5.360
Cameroon <sup>a</sup>	67	87			
Egypt <sup>a</sup>	195	252			
Ghana <sup>a</sup>	117	13			
<b>World total (rounded)</b>	<b>26.100</b>	<b>33.700</b>	<b>38.000</b>	<b>37.900</b>	<b>42.700</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/aluminum/mcs-2008-alumi.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Argentina, Azerbaijan, Bosnia and Herzegovina, Cameroon, Egypt, France, Ghana, Greece, Hungary, Indonesia, Iran, Italy, Japan, Mexico, Netherlands, New Zealand, Poland, Romania, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/aluminum/myb1-2006-alumi.pdf>)

### Bauxite (Thousand metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
United States	NA	NA	NA	20.000	40.000
Australia	54.135	62.300	64.000	5.800.000	7.900.000
Brazil	13.260	21.000	24.000	1.900.000	2.500.000
China	12.000	21.000	32.000	700.000	2.300.000
Greece	2.492	2.450	2.400	600.000	650.000
Guyana	1.690	1.400	2.000	700.000	900.000
India	9.647	12.700	13.000	770.000	1.400.000
Jamaica	13.120	14.900	14.000	2.000.000	2.500.000
Kazakhstan	4.377	4.800	4.900	360.000	450.000
Russia	4.500	6.600	6.000	200.000	250.000
Suriname	4.002	4.920	5.000	580.000	600.000
Venezuela	5.191	5.500	5.500	320.000	350.000
Guinea	15.300	14.500	14.000	7.400.000	8.600.000
Other countries		5.460	6.800	3.400.000	4.000.000
Ghana <sup>a</sup>	684	886			
Mozambique <sup>a</sup>	9	12			
<b>World total (rounded)</b>	<b>144.000</b>	<b>178.000</b>	<b>190.000</b>	<b>25.000.000</b>	<b>32.000.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/bauxite/mcs-2008-bauxi.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Bosnia and Herzegovina, Ghana, Hungary, Indonesia, Iran, Malaysia, Mozambique, Pakistan, Serbia and Montenegro, Turkey.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/bauxite/myb1-2006-bauxi.pdf>)

### Cement (Thousand metric tons)

	Cement Production			Yearend clinker capacity	
	2002 <sup>b</sup>	2006	2007	2006	2007
U.S. (includes Puerto Rico)	99.700	96.400	101.000	102.000	
Brazil	39.500	40.000	45.000	45.000	
China	1.200.000	1.300.000	1.000.000	1.100.000	
France	21.000	21.000	22.000	22.000	
Germany	33.400	34.000	31.000	31.000	
India	155.000	160.000	150.000	160.000	
Indonesia	34.000	35.000	42.000	42.000	
Iran	33.000	34.000	35.000	35.000	
Italy		43.200	44.000	46.000	46.000

	Cement Production			Yearend clinker capacity	
	2002 <sup>b</sup>	2006	2007	2006	2007
Japan	69.900	70.000	70.000	70.000	70.000
Republic of Korea	55.000	55.000	62.000	62.000	62.000
Mexico	40.600	41.000	40.000	40.000	40.000
Russia	54.700	59.000	65.000	65.000	65.000
Saudi Arabia	27.100	28.000	29.000	29.000	29.000
Spain	54.000	50.000	42.000	42.000	42.000
Thailand	39.400	40.000	50.000	50.000	50.000
Turkey	47.500	48.000	41.000	41.000	43.000
Vietnam	32.000	32.000	20.000	20.000	20.000
Egypt	29.000	29.000	35.000	35.000	35.000
Other countries (rounded)	442.000	390.000	470.000	470.000	470.000
<b>World total (rounded)</b>	<b>2.550.000</b>	<b>2.600.000</b>	<b>2.400.000</b>	<b>2.500.000</b>	

<sup>b</sup> These figures can be consulted in the next table.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/cement/mcs-2008-cemen.pdf>)

Country	Production (Thousand metric tons)				
	2001	2002	2003	2004	2005
Algeria	8.300	9.000	9.000	9.000	9.000
Angola	550	597	700	754	760
Benin	250	250	250	250	250
Burkina Faso	50	30	30	30	30
Cameroon	980	937	949	1.032	1.000
Congo (Kinshasa)	201	265	331	403	410
Côte d'Ivoire	650	650	650	650	650
Egypt	25.700	28.155	26.639	28.763	29.000
Eritrea	45	45	45	45	45
Ethiopia	900	900	1.130	1.316	1.568
Gabon	240	257	260	260	260
Ghana	1.900	1.900	1.900	1.900	1.900
Guinea	315	360	360	360	360
Kenya	1.319	1.463	1.658	1.789	2.123
Liberia	63	54	25	40	40
Libya	3.000	3.300	3.500	3.600	3.600
Madagascar	52	35	80	130	180
Malawi	181	174	24	120	120
Mauritania	200	200	200	300	300
Morocco	10.000	10.200	10.400	11.000	11.000
Mozambique	265	285	362	370	400
Niger	47	54	55	55	55
Nigeria	2.400	2.100	2.300	2.300	2.400
Rwanda	91	101	105	104	105
Senegal	1.539	1.653	1.694	1.700	1.700
Sierra Leone	113	144	169	180	180
South Africa,	8.036	8.525	8.883	12.348	13.000
Sudan	190	205	272	307	310
Tanzania	900	1.026	1.186	1.281	1.375
Togo	800	800	800	800	800
Tunisia	5.721	6.022	6.038	6.358	6.500
Uganda	431	506	507	559	650
Zambia	215	230	350	480	435
Zimbabwe	800	600	400	400	400
<b>World total</b>	<b>1.740.000</b>	<b>1.850.000</b>	<b>2.030.000</b>	<b>2.190.000</b>	<b>2.310.000</b>

(USGS, 2005: <http://minerals.usgs.gov/minerals/pubs/commodity/cement/cemenmyb05.pdf>)

## Chromium (Thousand metric tons, gross weight)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.		W	W	110	120
India	2.699	3.600	3.600	25.000	57.000
Kazakhstan	2.369	3.600	3.600	290.000	470.000
South Africa	6.435	7.418	7.500	160.000	270.000
Other countries		4.970	5.000	NA	NA
Madagascar <sup>a</sup>	11	132			
Sudan <sup>a</sup>	14	22			
Zimbabwe <sup>a</sup>	749	600			
<b>World total (rounded)</b>	<b>14.600</b>	<b>19.600</b>	<b>20.000</b>	<b>NA</b>	<b>NA</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/chromium/mcs-2008-chrom.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Afghanistan, Albania, Australia, Brazil, Burma, China, Cuba, Finland, Iran, Madagascar, Oman, Pakistan, Philippines, Russia, Sudan, Turkey, United Arab Emirates, Vietnam, Zimbabwe.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/chromium/myb1-2006-chrom.pdf>)

## Cobalt (Metric tons, cobalt content)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.		—	—	33.000	860.000
Australia	6.800	7.400	7.500	1.400.000	1.700.000
Brazil	1.099	1.200	1.200	29.000	40.000
Canada	5.148	7.000	8.000	120.000	350.000
China	1.000	2.300	2.300	72.000	470.000
Cuba	3.442	3.800	4.000	1.000.000	1.800.000
New Caledonia	2.780	1.900	2.000	230.000	860.000
Russia	4.600	5.100	5.000	250.000	350.000
DRC	14.600	28.000	22.500	3.400.000	4.700.000
Morocco	1.453	1.500	1.500	20.000	NA
Zambia	10.000	8.000	7.000	270.000	680.000
Other countries		1.300	1.300	130.000	1.100.000
Botswana <sup>a</sup>	269	303			
South Africa <sup>a</sup>	520	400			
Zimbabwe <sup>a</sup>	99	290			
<b>World total (rounded)</b>	<b>52.200</b>	<b>67.500</b>	<b>62.300</b>	<b>7.000.000</b>	<b>13.000.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/cobalt/mcs-2008-cobal.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Botswana, Kazakhstan, Norway, South Africa, Zimbabwe.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/cobalt/myb1-2006-cobal.pdf>)

## World annual cobalt refinery capacity, December 31, 2006 (Metric tons, cobalt content)

Country	Capacity
Australia <sup>e</sup>	4.500
Belgium	1.500
Brazil <sup>e</sup>	1.200
Canada	5.900
China <sup>e</sup>	25.000
DRC <sup>e,1</sup>	15.000
Finland	10.000

**World annual cobalt refinery capacity, December 31, 2006 (Metric tons, cobalt content)**

Country	Capacity
France	600
India	1,560
Japan <sup>e</sup>	1,000
Morocco <sup>e</sup>	1,650
Norway	5,200
Russia <sup>e</sup>	6,000
South Africa <sup>e</sup>	750
Uganda	720
Zambia	8,200
<b>Total</b>	<b>88,800</b>

<sup>e</sup> Estimated.

<sup>1</sup> Refurbishment necessary to achieve stated capacity.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/cobalt/myb1-2006-cobal.pdf>)

**Cobalt: World refinery production, by country**

Country	2002	2003	2004	2005	2006
Australia	3,700	3,840	3,880	3,150	4,000 <sup>e</sup>
Belgium	1,135	1,704	2,947	3,298	2,840
Brazil	960	1,097	1,155	1,136	902
Canada	4,625	4,233	5,144	5,090	5,180
China	1,840	4,580	8,000	12,700	12,700 <sup>e</sup>
DRC	2,149	1,200 <sup>e</sup>	735	600	550
Finland	8,240	7,989	7,893	8,171	8,582
France	176	181	199	280	256
India	270	255	545	1,220	1,184
Japan	354	379	429	471	920
Morocco	1,354	1,431	1,594	1,613	1,405
Norway	3,994	4,556	4,670	5,021	4,927
Russia	5,100	5,500	5,400	5,800	5,900 <sup>e</sup>
South Africa	352	271	309	268	267
Uganda	450 <sup>e</sup>	0	436	638	674
Zambia	6,144	6,620	5,791	5,422	4,665
<b>Total</b>	<b>40,800</b>	<b>43,800</b>	<b>49,100</b>	<b>54,900</b>	<b>55,000</b>

<sup>e</sup> Estimated.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/cobalt/myb1-2006-cobal.pdf>)

**Copper (Thousand Metric tons)**

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.	1,140	1,200	1,190	35,000	70,000
Australia	867	859	860	24,000	43,000
Canada	603	607	585	9,000	20,000
Chile	4,581	5,360	5,700	150,000	360,000
China	593	890	920	26,000	63,000
Indonesia	1,171	816	780	35,000	38,000
Kazakhstan	490	457	460	14,000	20,000
Mexico	330	338	400	30,000	40,000
Peru	845	1,049	1,200	30,000	60,000
Poland	503	512	470	30,000	48,000
Russia	695	725	730	20,000	30,000
Zambia	330	476	530	19,000	35,000
Other countries		1,835	1,800	65,000	110,000
Botswana <sup>a</sup>	22	24			
DRC <sup>a</sup>	34	132			
Morocco <sup>a</sup>	5	4			
Namibia <sup>a</sup>	18	6			
South Africa <sup>a</sup>	130	97			

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
Tanzania <sup>a</sup>	4	4			
Zimbabwe <sup>a</sup>	3	3			
<b>World total (rounded)</b>	<b>13.600</b>	<b>15.100</b>	<b>15.600</b>	<b>490.000</b>	<b>940.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/copper/mcs-2008-coppe.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Argentina, Armenia, Bolivia, Botswana, Brazil, Bulgaria, Burma, Colombia, DRC, Cuba, Cyprus, Ecuador, Finland, Georgia, India, Iran, North Korea, Laos, Macedonia, Mongolia, Morocco, Namibia, Pakistan, Papua New Guinea, Philippines, Portugal, Romania, Saudi Arabia, Serbia and Montenegro, South Africa, Spain, Sweden, Tanzania, Turkey, Uzbekistan, Zimbabwe.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/copper/myb1-2006-coppe.pdf>)

### Diamond (Million carats)

	Industrial Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
Australia	19	22	16	90	230
China	1	1	1	10	20
Russia	12	15	15	40	65
Botswana	7	8	8	130	230
DRC	17	22	23	150	350
South Africa	7	9	9	70	150
Other countries		3	3	85	210
Angola <sup>a</sup>	0,5	0,8			
CAR <sup>a</sup>	0,1	0,1			
Côte d'Ivoire <sup>a</sup>	0,1	0,099			
Ghana <sup>a</sup>	0,193	0,19			
Guinea <sup>a</sup>	0,123	0,118			
Liberia <sup>a</sup>	0,028	0,004			
Sierra Leone <sup>a</sup>	0,190	0,252			
Tanzania <sup>a</sup>	0,036	0,035			
<b>World total (rounded)</b>	<b>64</b>	<b>80</b>	<b>75</b>	<b>580</b>	<b>1.300</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/diamond/mcs-2008-diamo.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Angola, Brazil, Central African Republic, Côte d'Ivoire, Ghana, Guinea, Liberia, Sierra Leone, Tanzania, Venezuela.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/diamond/myb1-2006-diamo.pdf>)

	Gemstone mine production				
Country	2002	2003	2004	2005	2006
Angola	4,520	5,130	5,490	6,300	7,000
Australia	15,136	13,981	6,058	8,577	7,305
Botswana	21,297	22,800	23,300	23,900	24,000
Brazil	0,500	0,400	0,300	0,300	0,300
Canada	4,937	10,756	12,618	12,300	12,350
Central African Republic	0,312	0,250	0,263	0,285	0,315
China	0,100	0,100	0,100	0,100	0,100
DRC	4,223	5,381	6,180	6,100	5,600
Côte d'Ivoire	0,205	0,154	0,201	0,201	0,200
Ghana	0,770	0,724	0,725	0,850	0,780
Guinea	0,368	0,500	0,555	0,413	0,355
Guyana	0,248	0,413	0,445	0,340	0,300
Liberia	0,052	0,026	0,007	0,007	0,007
Namibia	1,562	1,481	2,004	1,902	2,200

Gemstone mine production					
Country	2002	2003	2004	2005	2006
Russia	17,400	20,000	21,400	23,000	23,400
Sierra Leone	0,162	0,233	0,318	0,395	0,360
South Africa	4,351	5,144	5,800	6,400	6,240
Tanzania	0,204	0,201	0,258	0,185	0,195
Venezuela	0,046	0,011	0,040	0,046	0,045
Other	0,042	0,131	0,186	0,241	0,236
<b>Total</b>	<b>76,400</b>	<b>87,800</b>	<b>86,200</b>	<b>91,800</b>	<b>91,300</b>

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/diamond/myb1-2006-diamo.pdf>)

### Fluorspar (Thousand metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.	—	—	—	NA	6.000
China	2.450	2.750	2.750	21.000	110.000
France	105	40	—	10.000	14.000
Mexico	622	938	900	32.000	40.000
Mongolia	185	388	400	12.000	16.000
Russia	169	210	210	Moderate	18.000
Spain	141	132	140	6.000	8.000
Kenya	85	83	90	2.000	3.000
Morocco	95	95	95	NA	NA
Namibia	81	130	130	3.000	5.000
South Africa	227	270	295	41.000	80.000
Other countries	294	300	110.000	180.000	
Egypt <sup>a</sup>	0,5	0,5			
<b>World total (rounded)</b>	<b>4.450</b>	<b>5.330</b>	<b>5.310</b>	<b>240.000</b>	<b>480.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/fluorspar/mcs-2008-fluor.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Argentina, Brazil, Egypt, Germany, India, Iran, Italy, Kazakhstan, North Korea, Kyrgyzstan, Pakistan, Romania, Tajikistan, Thailand, Turkey, United Kingdom.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/fluorspar/myb1-2006-fluor.pdf>)

### Gold (tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.	298	252	240	2.700	3.700
Australia	266	244	280	5.000	6.000
Canada	152	104	100	1.300	3.500
China	192	245	250	1.200	4.100
Indonesia	142	164	120	1.800	2.800
Peru	158	203	170	3.500	4.100
Russia	168	159	160	3.000	3.500
South Africa	399	272	270	6.000	36.000
Other countries	818	920	17.000	26.000	
Algeria	0,369	0,377			
Benin	0,02	0,02			
Botswana <sup>a</sup>	0,008	3			
Burkina Faso <sup>a</sup>	0,209	2			
Burundi <sup>a</sup>	0,483	4			
Cameroon <sup>a</sup>	0,700	2			

	Mine production		Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007	
CAR <sup>a</sup>	0,016	0,007		
Chad <sup>a</sup>	0,150	0,1		
ROC <sup>a</sup>	0,01	0,01		
DRC <sup>a</sup>	8	4		
Cote d'Ivoire <sup>a</sup>	4	2		
Equatorial Guinea <sup>a</sup>	0,1	0,15		
Eritrea <sup>a</sup>	-	0,03		
Ethiopia <sup>a</sup>	4	4		
Gabon <sup>a</sup>	0,07	0,3		
Ghana <sup>a</sup>	69	66		
Guinea <sup>a</sup>	17	15		
Kenya <sup>a</sup>	1	0,62		
Liberia <sup>a</sup>	0,042	0,02		
Madagascar <sup>a</sup>	-	0,005		
Mali <sup>a</sup>	56	55		
Morocco <sup>a</sup>	3	1		
Mozambique <sup>a</sup>	0,017	0,068		
Namibia <sup>a</sup>	3	3		
Niger <sup>a</sup>	0,028	1		
Nigeria <sup>a</sup>	0,04	0,04		
Senegal <sup>a</sup>	0,6	0,6		
Sudan <sup>a</sup>	5	3		
Tanzania <sup>a</sup>	43	46		
Uganda <sup>a</sup>	0,003	2		
Zimbabwe <sup>a</sup>	15	11		
<b>World total (rounded)</b>	<b>2.530</b>	<b>2.460</b>	<b>2.500</b>	<b>42.000</b>
				<b>90.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/gold/mcs-2008-gold.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Algeria, Argentina, Armenia, Australia, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burma, Burundi, Cameroon, Central African Republic, Chad, Chile, Colombia, Republic of Congo, Democratic Republic of Congo, Costa Rica, Cote d'Ivoire, Cuba, Ecuador, Equatorial Guinea, Eritrea, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Georgia, Ghana, Guatemala, Guinea, Guyana, Honduras, India, Iran, Italy, Jamaica, Japan, Kazakhstan, Kenya, North Korea, Republic of Korea, Kyrgyzstan, Laos, Liberia, Madagascar, Malaysia, Mali, Mexico, Mongolia, Morocco, Mozambique, Namibia, New Zealand, Nicaragua, Niger, Nigeria, Oman, Panama, Papua New Guinea, Philippines, Poland, Romania, Rwanda, Saudi Arabia, Senegal, Serbia and Montenegro, Slovakia, Solomon Islands, Spain, Sudan, Suriname, Sweden, Tajikistan, Tanzania, Thailand, Turkey, Uganda, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Zimbabwe.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/gold/myb1-2006-gold.pdf>)

### Gold Mine Production in African countries

	Mine production (Kilogram)				
	2002	2003	2004	2005	2006
Algeria	369	365	597	697	377
Benin	20	20	20	20	20
Botswana	8	9	162	2.770	2.800
Burkina Faso	209	770	1.125	1.397	1.571
Burundi	483	2.855	3.229	3.905	3.900
Cameroon	700	700	1.500	1.500	1.500
Central African Republic	16	7	7	7	7
Chad	150	150	150	100	100
Republic of Congo	10	75	60	20	10
Democratic Republic of Congo	7.600	4.100	5.700	4.200	4.200
Cote d'Ivoire	3.570	1.313	1.219	1.638	1.600
Equatorial Guinea	100	100	150	200	150
Eritrea	--	9	33	30	30
Ethiopia	3.670	3.875	3.443	4.376	4.028
Gabon	70	70	300	300	300
Ghana	69.271	70.749	63.139	66.852	66.205

### Gold Mine Production in African countries

	Mine production (Kilogram)				
	2002	2003	2004	2005	2006
Guinea	16.815	16.622	11.100	15.300	15.230
Kenya	1.477	1.543	567	616	620
Liberia	42	20	110	16	20
Madagascar	--	10	5	5	5
Mali	56.043	50.535	42.911	49.230	55.484
Morocco	2.747	1.863	1.200	1.200	1.200
Mozambique	17	63	56	63	68
Namibia	2.815	2.508	2.205	2.703	2.900
Niger	28	30	684	3.005	1.480
Nigeria	40	50	30	40	40
Rwanda	10	2	--	--	--
Senegal	600	600	600	600	600
South Africa	398.523	373.300	337.223	294.671	272.128
Sudan	5.239	5.106	5.000	3.625	3.158
Tanzania	43.320	48.018	48.178	52.236	46.000
Uganda	3	40	1.447	1.700	1.600
Zimbabwe	15.469	12.564	21.330	14.023	11.354
African Total	629.434	598.041	553.480	527.045	498.685
<b>World Total</b>	<b>2.530.000</b>	<b>2.560.000</b>	<b>2.440.000</b>	<b>2.470.000</b>	<b>2.460.000</b>

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/gold/myb1-2006-gold.pdf>)

### Iron (Million metric tons)

	Mine production			Crude ore		Iron content	
	2002**	2006	2007	Reserves	Reserve base	Reserves	Reserve base
U.S.	52	53	52	6.900	15.000	2.100	4.600
Australia	187	275	320	16.000	45.000	10.000	28.000
Brazil	215	318	360	16.000	27.000	8.900	14.000
Canada	31	34	33	1.700	3.900	1.100	2.500
China	231	588	600	21.000	46.000	7.000	15.000
India	86	140	160	6.600	9.800	4.200	6.200
Iran	17	20	20	1.800	2.500	1.000	1.500
Kazakhstan	15	19	23	8.300	19.000	3.300	7.400
Mexico	10	11	12	700	1.500	400	900
Russia	84	102	110	25.000	56.000	14.000	31.000
Sweden	20	23	24	3.500	7.800	2.200	5.000
Ukraine	59	74	76	30.000	68.000	9.000	20.000
Venezuela	17	23	20	4.000	6.000	2.400	3.600
Mauritania	10	11	11	700	1.500	400	1.000
South Africa	36	41	40	1.000	2.300	650	1.500
Other countries		67	70	11.000	30.000	6.200	17.000
Algeria *	1	2					
Egypt *	3	3					
Morocco *	0,009	0,01					
Nigeria *	0,025	0,1					
Tunisia *	0,198	0,2					
Zimbabwe *	0,272	0,2					
<b>World total (rounded)</b>	<b>1.100</b>	<b>1.800</b>	<b>1.900</b>	<b>150.000</b>	<b>340.000</b>	<b>73.000</b>	<b>160.000</b>

\*This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

\*\* Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: [http://minerals.usgs.gov/minerals/pubs/commodity/iron\\_ore/mcs-2008-feore.pdf](http://minerals.usgs.gov/minerals/pubs/commodity/iron_ore/mcs-2008-feore.pdf))

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Algeria, Austria, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Colombia, Egypt, Germany, Greece, Guatemala, Indonesia, Kenya, North Korea, Republic of Korea, Macedonia, Malaysia, New Zealand, Norway, Pakistan, Peru, Portugal, Romania, Slovakia, Thailand, Turkey, United Kingdom, Vietnam.

(USGS, 2006: [http://minerals.usgs.gov/minerals/pubs/commodity/iron\\_ore/myb1-2006-feore.pdf](http://minerals.usgs.gov/minerals/pubs/commodity/iron_ore/myb1-2006-feore.pdf))

### Lead (Thousand metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.	451	429	430	7.700	19.000
Australia	694	686	640	24.000	59.000
Canada	97	82	75	400	5.000
China	641	1.200	1.320	11.000	36.000
India	34	67	75	NA	NA
Ireland	32	62	55	NA	NA
Kazakhstan	40	48	50	5.000	7.000
Mexico	139	120	110	1.500	2.000
Peru	306	313	330	3.500	4.000
Poland	57	51	50	NA	5.400
Sweden	44	77	75	500	1.000
Morocco	62	45	45	500	1.000
South Africa	49	48	45	400	700
Other countries		240	250	24.000	30.000
Algeria <sup>a</sup>	1	-			
Namibia <sup>a</sup>	14	14			
Tunisia <sup>a</sup>	5	-			
<b>World total (rounded)</b>	<b>2.870</b>	<b>3.470</b>	<b>3.550</b>	<b>79.000</b>	<b>170.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/lead/mcs-2008-lead.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Algeria, Argentina, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Burma, Chile, Colombia, Ecuador, Georgia, Greece, Honduras, Iran, Italy, Japan, North Korea, Republic of Korea, Macedonia, Namibia, Romania, Russia, Saudi Arabia, Serbia and Montenegro, Spain, Tajikistan Thailand, Tunisia, Turkey, United Kingdom, Vietnam.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/lead/myb1-2006-lead.pdf>)

### Manganese (Thousand metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
Australia	983	2.190	2.200	62.000	160.000
Brazil	1.095	1.370	1.000	35.000	57.000
China	900	1.600	1.600	40.000	100.000
India	601	811	650	56.000	150.000
Mexico	88	133	130	4.000	9.000
Ukraine	840	820	820	140.000	520.000
Gabon	810	1.350	1.550	20.000	160.000
South Africa	1.504	2.300	2.300	100.000	4.000.000
Other countries		1.360	1.360	Small	Small
Ghana <sup>a</sup>	363	600			
<b>World total (rounded)</b>	<b>7.770</b>	<b>11.900</b>	<b>11.600</b>	<b>460.000</b>	<b>5.200.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/manganese/mcs-2008-manga.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Ghana, Kazakhstan.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/manganese/myb1-2006-manga.pdf>)

## Molybdenum

	Mine production (metric tons)			Reserves	Reserve base
	2002 <sup>a</sup>	2006	2007	(thousand metric tons)	
U.S.	32.300	59.800	59.400	2.700	5.400
Armenia	2.884	3.000	3.000	200	400
Canada	8.043	7.270	8.000	450	910
Chile	29.466	43.278	41.100	1.100	2.500
China	29.300	43.900	46.000	3.300	8.300
Iran	2.300	2.000	2.500	50	140
Kazakhstan	230	250	400	130	200
Kyrgyzstan	250	250	250	100	180
Mexico	3.428	2.500	4.000	135	230
Mongolia	1.590	1.200	1.500	30	50
Peru	8.613	17.209	17.500	140	230
Russia	2.900	3.100	3.100	240	360
Uzbekistan	500	600	500	60	150
<b>World total (rounded)</b>	<b>122.000</b>	<b>184.000</b>	<b>187.000</b>	<b>8.600</b>	<b>19.000</b>

<sup>a</sup> Figures for 2002 originate from USGS Minerals Yearbook 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/molybdenum/myb1-2006-molyb.pdf>.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/molybdenum/mcs-2008-molyb.pdf>)

## Nickel (Metric tons of nickel content)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.	—	—	—	—	150.000
Australia	188.000	185.000	180.000	24.000.000	27.000.000
Brazil	45.456	82.500	75.300	4.500.000	8.300.000
Canada	189.297	233.000	258.000	4.900.000	15.000.000
China	53.700	82.100	80.000	1.100.000	7.600.000
Colombia	58.196	94.100	99.500	830.000	1.100.000
Cuba	71.342	75.000	77.000	5.600.000	23.000.000
Dominican Republic	38.859	46.500	47.000	720.000	1.000.000
Greece	22.670	21.700	20.100	490.000	900.000
Indonesia	143.000	140.000	145.000	3.200.000	13.000.000
New Caledonia	99.841	103.000	119.000	7.100.000	15.000.000
Philippines	24.148	58.900	88.400	940.000	5.200.000
Russia	310.000	320.000	322.000	6.600.000	9.200.000
Venezuela	18.600	20.000	20.000	560.000	630.000
Botswana	28.600	38.000	35.000	490.000	920.000
South Africa	38.546	41.600	42.000	3.700.000	12.000.000
Zimbabwe	8.092	8.820	9.000	15.000	260.000
Other countries		34.300	41.000	2.100.000	5.900.000
Morocco <sup>a</sup>	109	80			
<b>World total (rounded)</b>	<b>1.350.000</b>	<b>1.580.000</b>	<b>1.660.000</b>	<b>67.000.000</b>	<b>150.000.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/nickel/mcs-2008-nicke.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Burma, Finland, Kazakhstan, Macedonia, Morocco, Norway, Spain, Turkey, Ukraine.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/nickel/myb1-2006-nicke.pdf>)

## Niobium (Metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
Australia	290	200	200	21.000	320.000
Brazil	28.873	40.000	40.000	2.600.000	2.600.000
Canada	3.335	4.167	4.200	62.000	92.000
Ethiopia	6	11	10	NA	NA
Mozambique	6	29	30	NA	NA
Nigeria	65	35	40	NA	NA
Rwanda	30	80	80	NA	NA
Other countries		18	20	NA	NA
Burundi <sup>a</sup>	NA	9			
DRC <sup>a</sup>	695	10			
Namibia <sup>a</sup>	-	-			
Uganda <sup>a</sup>	3	-			
Zimbabwe <sup>a</sup>	NA	NA			
<b>World total (rounded)</b>	<b>33.300</b>	<b>44.500</b>	<b>45.000</b>	<b>2.700.000</b>	<b>3.000.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/niobium/mcs-2008-niobi.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Burundi, DRC, Namibia, Uganda, Zimbabwe.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/niobium/myb1-2006-niobi.pdf>)

## Phosphate Rock (Thousand metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.	36.100	30.100	29.700	1.200.000	3.400.000
Australia	2.025	2.300	2.200	77.000	1.200.000
Brazil	5.084	5.800	6.000	260.000	370.000
Canada	1.000	550	500	25.000	200.000
China	23.000	30.700	35.000	6.600.000	13.000.000
Israel	4.091	2.950	3.000	180.000	800.000
Jordan	7.179	5.870	5.700	900.000	1.700.000
Russia	10.700	11.000	11.000	200.000	1.000.000
Syria	2.483	3.850	3.800	100.000	800.000
Egypt	1.550	2.200	2.300	100.000	760.000
Morocco and Western Sahara	23.028	27.000	28.000	5.700.000	21.000.000
Senegal	1.551	600	800	50.000	160.000
South Africa	2.803	2.600	2.700	1.500.000	2.500.000
Togo	1.271	1.000	1.000	30.000	60.000
Tunisia	7.461	8.000	7.700	100.000	600.000
Other countries		7.740	8.000	890.000	2.200.000
Algeria <sup>a</sup>	740	1.500			
Burkina Faso <sup>a</sup>	2	2			
Tanzania <sup>a</sup>	1	7			
Zimbabwe <sup>a</sup>	108	50			
<b>World total (rounded)</b>	<b>136.000</b>	<b>142.000</b>	<b>147.000</b>	<b>18.000.000</b>	<b>50.000.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: [http://minerals.usgs.gov/minerals/pubs/commodity/phosphate\\_rock/mcs-2008-phosp.pdf](http://minerals.usgs.gov/minerals/pubs/commodity/phosphate_rock/mcs-2008-phosp.pdf))

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Albania, Algeria, Burkina Faso, Chile, Colombia, Finland, India, Indonesia, Iran, Iraq, Kazakhstan, North Korea, Mexico, Pakistan, Peru, Philippines, Sri Lanka, Tanzania, Thailand, Uzbekistan, Venezuela, Vietnam, Zimbabwe.

(USGS, 2006: [http://minerals.usgs.gov/minerals/pubs/commodity/phosphate\\_rock/myb1-2006-phosp.pdf](http://minerals.usgs.gov/minerals/pubs/commodity/phosphate_rock/myb1-2006-phosp.pdf))

## Platinum Group Metals (Kilograms)

	Mine production						PGMs	
	Platinum		Palladium			Reserves	Reserve base	
	2002 <sup>b</sup>	2006	2007	2002 <sup>b</sup>	2006	2007		
U.S.	4.390	4.290	3.400	14.800	14.400	13.500	900.000	2.000.000
Canada	9.202	9.000	8.500	12.210	14.000	18.000	310.000	390.000
Colombia	661	1.100	1.100		NA	NA		
Russia	27.000	29.000	27.000	96.000	98.400	95.000	6.200.000	6.600.000
South Africa	132.897	170.000	183.000	63.758	85.000	93.000	63.000.000	70.000.000
Zimbabwe	2.306	5.100	5.400	1.943	4.000	4.400		
Other countries		2.190	1.500		8.210	8.100	800.000	850.000
Botswana <sup>a</sup>	300	300		1.300	2.000			
Ethiopia <sup>a</sup>	NA	5						
<b>World total (rounded)</b>	<b>178.000</b>	<b>221.000</b>	<b>230.000</b>	<b>196.000</b>	<b>224.000</b>	<b>232.000</b>	<b>71.000.000</b>	<b>80.000.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/platinum/mcs-2008-plati.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006:

- For Platinum: Australia, Botswana, Ethiopia, Finland, Japan, Poland, Serbia and Montenegro.
- For Palladium: Australia, Botswana, Japan, Poland, Serbia and Montenegro.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/platinum/myb1-2006-plati.pdf>)

## Tantalum (Metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
Australia	807	850	850	40.000	84.000
Brazil	190	250	250	88.000	90.000
Canada	71	68	70	3.000	>3.000
Ethiopia	33	70	70	NA	NA
Mozambique	13	70	70	NA	NA
Rwanda	20	62	60	NA	NA
Other countries		32	30	NA	NA
Burundi <sup>a</sup>	15	9			
DRC <sup>a</sup>	30	10			
Namibia <sup>a</sup>	5	-			
Nigeria <sup>a</sup>	8	10			
Uganda <sup>a</sup>	2	-			
Zimbabwe <sup>a</sup>	144	-			
<b>World total (rounded)</b>	<b>1.340</b>	<b>1.400</b>	<b>1.400</b>	<b>130.000</b>	<b>180.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/niobium/mcs-2008-tanta.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Burundi, DRC, Namibia, Nigeria, Uganda, Zimbabwe.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/niobium/myb1-2006-niobi.pdf>)

## Tin (Metric tons)

	Mine production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
United States		—	—	—	40.000
Australia	7.017	2.000	2.200	150.000	300.000
Bolivia	15.242	18.000	18.000	450.000	900.000
Brazil	12.063	12.000	12.000	540.000	2.500.000
China	62.000	125.000	130.000	1.700.000	3.500.000
Indonesia	88.142	90.000	85.000	800.000	900.000
Malaysia	4.215	3.000	3.000	1.000.000	1.200.000
Peru	38.815	38.000	38.000	710.000	1.000.000
Portugal	574	200	200	70.000	80.000
Russia	1.300	3.000	4.000	300.000	350.000
Thailand	1.130	200	200	170.000	200.000
Vietnam	1.700	3.500	3.500	NA	NA
Other countries		4.000	4.000	180.000	200.000
Congo (Kinshasa)	300	2.800	3.000	NA	NA
Burundi <sup>a</sup>	-	4			
Namibia <sup>a</sup>	-	-			
Niger <sup>a</sup>	11	3.100			
Nigeria <sup>a</sup>	790	1.500			
Rwanda <sup>a</sup>	197	300			
Uganda <sup>a</sup>	-	2			
<b>World total (rounded)</b>	<b>235.000</b>	<b>302.000</b>	<b>300.000</b>	<b>6.100.000</b>	<b>11.000.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006.

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/tin/mcs-2008-tin.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Burundi, Namibia, Niger, Nigeria, Rwanda and Uganda

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/tin/myb1-2006-tin.pdf>)

## Titanium (Thousand metric tons)

	Mine production		Reserves	Reserve base
	2006	2007		
<b>Ilmenite</b>				
U.S.	300	300	6.000	59.000
Australia	1.330	1.340	130.000	160.000
Brazil	130	130	43.000	84.000
Canada	791	816	31.000	36.000
China	500	500	200.000	350.000
India	313	340	85.000	210.000
Norway	380	380	37.000	60.000
Ukraine	273	280	5.900	13.000
Vietnam	230	200	1.600	14.000
Mozambique	—	100	16.000	21.000
South Africa	1.050	1.060	63.000	220.000
Other countries	108	109	66.000	150.000
<b>World total (ilmenite, rounded)</b>	<b>5.400</b>	<b>5.600</b>	<b>680.000</b>	<b>1.400.000</b>
<b>Rutile</b>				
U.S.			400	1.800
Australia	207	209	19.000	31.000
Brazil	3	3	1.200	2.500
India	18	18	7.400	20.000
Ukraine	57	57	2.500	2.500
Mozambique	—	3	480	570

	Mine production		Reserves	Reserve base
	2006	2007		
Sierra Leone	13	80	2.500	3.600
South Africa	117	121	8.300	24.000
Other countries	—	—	400	1.000
<b>World total (rutile, rounded)</b>	<b>415</b>	<b>491</b>	<b>42.000</b>	<b>87.000</b>
<b>World total (ilmenite and rutile, rounded)</b>	<b>5.800</b>	<b>6.100</b>	<b>730.000</b>	<b>1.500.000</b>

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/titanium/mcs-2008-timin.pdf>)

Although production figures from before 2006 are included for the other minerals in this annex, they are not here for titanium. The figures for 2006 of the USGS Mineral Yearbook 2006, which also contains figures for 2002, do not match the 2006 figures of USGS summary 2008. It would thus not make a good reliable comparison. The production figures in the USGS Mineral Yearbook 2006, can be consulted through the following link: <http://minerals.usgs.gov/minerals/pubs/commodity/titanium/myb1-2006-titan.pdf>

### Zinc (Thousand Metric tons, zinc content of concentrate and direct shipping ore)

	Mine Production			Reserves	Reserve base
	2002 <sup>b</sup>	2006	2007		
U.S.	784	727	740	14.000	90.000
Australia	1.469	1.380	1.400	42.000	100.000
Canada	916	710	680	5.000	30.000
China	1.550	2.600	2.800	33.000	92.000
Kazakhstan	390	400	400	14.000	35.000
Mexico	446	480	480	7.000	25.000
Peru	1.232	1.200	1.500	18.000	23.000
Other countries		2.500	2.500	49.000	87.000
Algeria <sup>a</sup>	9	5			
DRC <sup>a</sup>	0,828	15			
Morocco <sup>a</sup>	90	73			
Namibia <sup>a</sup>	43	68			
South Africa <sup>a</sup>	65	34			
<b>World total (rounded)</b>	<b>8.880</b>	<b>10.000</b>	<b>10.500</b>	<b>180.000</b>	<b>480.000</b>

<sup>a</sup>This one is included in afore mentioned "Other countries". Its production figure originates from USGS Minerals Yearbook 2006.

<sup>b</sup>Figures for 2002 originate from USGS Minerals Yearbook 2006

(USGS, 2008: <http://minerals.usgs.gov/minerals/pubs/commodity/zinc/mcs-2008-zinc.pdf>)

Other Countries, not defined in USGS summary 2008, but in USGS Minerals Yearbook 2006: Argentina, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Burma, Chile, Ecuador, Finland, Georgia, Greece, Honduras, India, Iran, Ireland, Japan, North Korea, Republic of Korea, Macedonia, Mongolia, Poland, Portugal, Romania, Russia, Saudi Arabia, Serbia and Montenegro, Spain, Sweden, Thailand, Turkey, Vietnam.

(USGS, 2006: <http://minerals.usgs.gov/minerals/pubs/commodity/zinc/myb1-2006-zinc.pdf>)

## List of abbreviations

ACOTA	African Contingency Operations Training and Assistance
ACP	Africa, the Caribbean and the Pacific
ACRI	African Crisis Response Initiative
AFRICOM	(United States) Africa Command
AIM	Alternative Investment Market
AOR	area of responsibility
AU	African Union
BAKS	Bundeskademie für Sicherheitspolitik
BDI	Bundesverband der Deutschen Industrie
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe
BGS	British Geological Survey
BIC	Bushveld Igneous Complex
BP	British Petroleum
BRGM	Bureau de Recherches Géologiques et Minières
BRIC	Brazil, Russia, India, China
BTC pipeline	Baku-Tbilisi-Ceyhan pipeline
CAD Fund	China-Africa Development Fund
CBOT	Chicago Board of Trade
CDI	Copper Development Institute
CENTCOM	(United States) Central Command
CFC	Common Fund for Commodities
CSIS	Center for Strategic and International Studies
DRC	Democratic Republic of the Congo
DME	Department of Minerals and Energy
DNSC	Defense National Stockpile Center
ECOWAS	Economic Community of Western African States
EIA	Energy Information Administration
EITI	Extractive Industries Transparency Initiative
EPA	Economic Partnership Agreement
ESISC	European Strategic Intelligence and Security Center
ETF	Exchange Traded Fund
EU	European Union
EUCOM	(United States) European Command
Exim Bank	(China) Export-Import Bank
FDI	Foreign Direct Investments
FOCAC	Forum on China-Africa Cooperation
GDP	Gross Domestic Product
GSCI	Goldman Sachs Commodity Index
ICA	International Commodity Agreement
IMF	International Monetary Fund

IPC	Integrated Programme for Commodities
ITA	International Tin Agreement
JBIC	Japan Bank for International Cooperation
KPCS	Kimberley Process Certification Scheme
LME	London Metal Exchange
LNG	Liquefied Natural Gas
M&A	Mergers and Acquisitions
MEDEF	Mouvement des Entreprises de France
MIGA	Multilateral Investment Guarantee Agency
MOU	Memorandum Of Understanding
Mt	Million tonnes
NA	Norddeutsche Allianz
NATO	North Atlantic Treaty Organization
NDS	National Defense Stockpile
NEA	Nuclear Energy Agency
NEEIP	Non-Energy Extractive Industries Panel
NEPAD	New Partnership for African Development
NMAB	National Materials Advisory Board
NYMEX	New York Mercantile Exchange
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PACOM	(United States) Pacific Command
PGMs	Platinum Group Metals
PNAC	Project for a New American Century
SAPs	Structural adjustment programs
SMEs	Small and Medium Enterprises
TFM	Tenke Fungurume Mining
TICAD	Tokyo International Conference on African Development
TNC	Transnational Corporation
UN	United Nations
UNAMID	United Nations – African Union Mission in Darfur
UNECA	United Nations Economic Commission for Africa
UNCTAD	United Nations Conference on Trade and Development
UNICE	Union of Industrial and Employers' Confederations of Europe
USA	United States of America
USGS	United States Geological Survey
WGDP	World Gross Domestic Product
WVM	WirtschaftsVereinigung Metalle