FEC

THE CHAMBER OF BUSINESS OF THE DRC
CHAMBER OF MINES

MINING INDUSTRY ANNUAL REPORT 2014

CONTENT

A Word from the Presidency of the Chamber of Mines

The mining industry increased overall during 2014 and there are still plenty of projects under development. These facts underline the determination exhibited by the country's miners in spite of the difficulties encountered on a daily basis.
In particular, a partial return to security in the eastern provinces enabled the start of production of new projects in the region.

Gold	coltan	cassiterite	zinc	cobalt	copper	wolframite
+218,2%	+90,0%	+42,1%	+13,9%	+13,8%	+12,6%	-78,3%

As in previous years, the DRC's mining companies were more than willing to respond to the questions presented by EITI - yet another sure sign that international recognition is highly prized.

Commodity prices are showing few signs of recovering from the falls of late 2014 and it remains important that the mining industry can get though these lean times. If companies are unable to withstand short-term distress, the two-year outlook for producers, especially those of copper and gold, will necessarily be pessimistic, and State receipts will be much reduced.

In any event, continued growth in 2015 will require significant progress in the following areas:

- The finalising of the mining code review process without increasing taxes and while maintaining the 10-year stability clause
- Reducing the energy-supply gap by supporting the arrival of new investors in this area for the establishment of new production units, and a better structure for the distribution of energy through a new, neutral network operator
- The maintaining of the physical security of persons and property
- Improving the business climate in general and in particular, some form of constructive regulation over the system of "informers"
- The training of officials in the just and proper application of legal and administrative law
- Amplifying support for the efforts of both the country's government and the highest State authorities to improve the position of the DRC in the world rankings in terms of corruption
- The development of infrastructure: roads, rail, border posts

The Chamber of Mines aims to pursue those steps and initiatives that contribute to the creation of a more fair distribution of wealth between all stakeholders: shareholders, the people who live where its members operate, and the government itself in order to meet its own obligations.

The Chamber of Mines subscribes to all these objectives on behalf of all its members.

Simon Tuma-Waku
Vice-President of FEC, in charge of mining

Claude Polet
President, Chamber of Mines

---

[1] *Transparency international ranked DRC at 154th place out of 174*

EITI REPORT 2012

Participation and support from the Chamber of Mines in EITI[2]

During 2014, The Democratic Republic of Congo achieved Country status in accordance with the Extractive Industries Transparency Initiative (EITI). This landmark came about due to the combined efforts of all stakeholders in the process, including civil society, government and mining companies.

The prominent involvement of the Chamber of Mines (Chamber) in this collective effort was also a major factor. Indeed, the Chamber strongly supported the EITI Executive Committee and the Technical Secretariat with both the scoping study and the EITI report itself. The Chamber alerted, mobilized and even heckled mining companies, actively participating in the data-collection campaign and in various awareness workshops organized by the Executive Committee and the Technical Secretariat. To put it simply, the Chamber of Mines has been a strong presence during the implementation of EITI in the DRC.

The Chamber's support of EITI is explained by the fact that transparency improves relationships between businesses, the local community, civil society and government. Through EITI, quantified and verified information reaches the public, thereby countering media-populist speculation about the real contribution of mining and oil companies to the State coffers, the economy, and to socio-economic community-development projects within the mining areas.

The 2012 EITI report for the DRC was published on 31 December 2014. The report gives eloquent proof of the contribution by the mining sector to the country's economy, and vindicates the confidence shown by mining companies in the importance of EITI. Prepared according to the new requirements of the 2013 standard of international EITI reporting, the DRC figures for 2012 are highly illuminating:

- Payments to the State by the extractive sectors in 2012 totalled US$1.5-billion, of which more than $1-billion was paid by mining companies and $460 million by oil companies.
- The extractive sector (mining and hydrocarbons) contributed 64.1% of the ordinary revenue of the State, and comprised 13% of GDP;
- Exports of mining and oil products represent 88% and 11% respectively of the total export earnings of the DRC;
- Extractive-sector jobs account for 23.9% of the total formal sector of the country
- Social payments in 2012 amounted to $28.5-million, of which $12.8-million were mandatory payments and $15.7-million were voluntary payments made by mining and oil companies. These include investments in socio-economic development - health facilities, medical centres, road infrastructure, support for agriculture, small business development and so on[3].

The transparency of the revenues generated by the mining industry is fundamental

Source: Tenke Fungurume Mining

[2] Extractive Industries Transparency Initiative
[3] See the chapter on Corporate Social Responsibility (CSR) pages 26-28

This contribution by the mining sector to both the economy and in social development is significant, and somewhat contradicts some of the statements heard in the current political discourse, especially as the report of the Central Bank of Congo reinforces the point. Indeed, in his speech at the ceremonial exchange of vows at the end of 2014, the Governor of the Central Bank of Congo said that "the vitality of economic growth in 2014 mainly reflected the performance of the primary sector, whose contribution to growth was 46.2%, with 37% arising solely from mining". To clarify: "The dynamics of growth continue to depend primarily on the outlook for activity in the mining sector."

These facts about the contribution of mining should encourage stakeholders in the EITI process to focus more on the issue of accountability, which, for the Chamber, is the second prerequisite for good governance after the transparency of payments made by mining companies to the State. EITI reports adequately show that the extractive sector generates revenues for the Government. It is also necessary that these reports are sufficiently dispersed, that is to say, brought to the attention of local communities.
The Chamber of Mines believes that the allocation of these revenues by the State should be equally transparent, and is committed to continuing its support and involvement in the EITI process in the DRC.

Evolution since 2010

The graph shows the growth in the number of mining companies reporting to EITI (right scale, orange columns) and the total amount in millions of dollars contributed by companies to the State's revenue (linear function in blue on the left scale).
The graph also shows that the expansion of the tax base (more companies) contributes effectively to the increase in tax revenue for the State and also to increased social benefits.
An increase of certain tax rates would lead to a narrowing of the tax base and hence revenues for both the State and the population.

ACCEPTANCE BY THE DRC OF THE OHADA TREATY

On 13 July 2012, the Democratic Republic of Congo joined the Treaty on the Harmonization of Business Law in Africa, which was originally signed in Port Louis (Mauritius) on 17 October 1993 between 16 West African states and which came into force on 18 September 1995. As a signatory, the DRC became the 17th member country of OHADA, and acts which were adopted by the latter, through its Council of Ministers, have been automatically applicable in Congolese territory since 12 September 2012. Acts that have been adopted to date include:

- The act relating to general commercial law. It determines the status of the merchant, organizes the Register of Commerce and Property Credit (RCCM), commercial leases, business, the status of trade intermediaries, and commercial sales between traders.
- The law for companies and economic interest groups. It establishes the forms of commercial companies (Sarl, SA, etc.).
- The law on organizing securities. It defines the types of security (collateral): personal guarantees (bonds and letters of guarantee), PPSA (liens, pledges, pledges without delivery,) and mortgages.
- he Rules of Procedure of the Common Court of Justice and Arbitration, adopted on 18 April 1997;
- Law for organizing collective proceedings for the writing-off of adopted liabilities. It sets the terms for the preventive rules and procedures applicable in the event of default and bankruptcy (bankruptcy and liquidation of assets).
- Law for organizing simplified recovery and measures of execution procedures, adopted on 10 April 1999. It defines the order for payment procedures, for the issue of an injunction, order for return, securities and asset-seizures and foreclosures.
- Arbitration law, adopted on 11 March 1999. It determines arbitrational proceedings, remedies and procedures for the enforcement of arbitrated awards.
- Law for business accounting, adopted on 23 March 2000;
- Law for goods transport by road-contractors, adopted on March 22, 2003;
- The legal rights of cooperative societies, adopted on 15 December 2011.

Through their supranational force, these OHADA acts repealed the existing laws and regulations in the Congolese legal system where they were at odds. They apply to traders operating in the Democratic Republic of Congo, and to commercial companies with headquarters established there.

Regarding the exercise of commerce, deadlines for registration with the Commercial Register for Credit and Property (RCCM) were granted to traders and commercial companies. (This was a strictly legal point of complementary registration, because most existing mining companies already have a legal persona).
This was the same for legal compliance by commercial companies. All mining companies have complied with the prescribed legislation, in a manner consistent with the main acts. Another period of two years has been granted to companies that have not yet harmonized their statutes in accordance with the Uniform Act as revised in January 2014. In the same vein, the implementation of the Uniform Act relating to accounting in the DRC has been delayed until 2015 by the Board of Directors of OHADA.

Several training sessions in OHADA law were organized by the Federation of Enterprises of Congo (FEC) with the support of national and international experts for the benefit of responsible business (mining and other, to allow them to get to grips with the requirements of the new law.
The interpretation of this law is entrusted to all 17 member countries at the Common Court of Justice and Arbitration, whose office is in Abidjan.

The accession of the DRC to the OHADA treaty is a significant step in the process of improving the country's business climate.

For more information: http://www.ohada.com/doctrine/categorie/9/cour-commune-de-justice-et-d-arbitrage-ccja.html

BUSINESS ENVIRONMENT

What is the position regarding physical security for mining activities in the DRC?

Source: Tenke Fungurume Mining

Operational sites and headquarters of the DRC's mining companies have remained largely untouched by the **armed violence** that continues to affect the country, especially in the eastern provinces, and increasingly in north-east Katanga. No information in our possession suggests a strategy by any of the armed groups to target mining facilities through the interruption of their supply chains and exports, or to attack mine personnel. This cannot be said for many other countries in Africa and indeed elsewhere.

The activities of **illegal miners** (as opposed to legal and structured artisanal miners) on mining concessions continue to pose the most immediate security risk for mining operations. This activity gives rise to periodic violent confrontations at the heart of operations. This illicit digging activity could not exist if there were no networks to buy the ore; it is also accompanied by significant trafficking of other resources and supplies by the same networks. An objective approach is required to dismantle these illegal networks because they are the actual control mechanisms.

Outside the operational sites, the security of goods in **transit** remains a concern. Unlike in many neighbouring countries, ambushes are rare on the main lines of commercial traffic within the DRC. But companies remain dependent on barely a handful of more or less maintained roads, and still do not have viable options for alternative routes for their trucks.

This dependency creates bottlenecks where the slightest incident can have a disproportionate effect (egg the protests by drivers in January, the fire at the Kasumbalesa border post in November, and periodical diggers' revolts around Kawama). These choke-points serve as pressure-points by some State services through, for example, the imposition of "new" operating conditions, coercion of company employees, threats to the freedom of choice of contractors and temporary imports in the name of support for local subcontractors.

Security of tenure for mining investors

The DRC has completed another year **without any expropriation incidents** in the mining industry, either directly or indirectly by the imposition of new legal conditions which would make ongoing operations impossible.

The **structural legal environment continues to be threatened** by project revisions. FEC has amply demonstrated the damage caused by uncertainty for mining investment and thus for the Congolese economy which depends on it. The Mining Code revision project,

if it had been applied at the time it was first presented, has already discouraged many investments and shelved many projects currently in the exploration phase. If this project were to be adopted in 2015, just as the mining industry is preparing for one or two years of declining prices, the result on the profitability of projects and investment prospects would be disastrous. If the industry cannot rely on stable prices and fluid markets, it must at least be able to rely on stable and predictable charges. The stability of legislation is an investment in sustainable growth.

Along with its call for the stability of the Code, mining continues to call for compliance in everyday transactions. Too often, the guarantees of the Mining Code, particularly with regard to the customs and tax rules are wilfully ignored by State services. To take one example, the Mining Code states that fees for export services [by services legally entitled to carry out operations in conjunction with the export of mining products] should be centralized and capped at 1% of the value of the export. In practice, each service continues to require the payment of its fees directly to the one in question in addition to the fees paid at the correct point. There is no centralized system or cap, despite the stipulations of the Mining Code, tax law and administrative law applicable to export procedures.

The example of export fees illustrates another aspect of legal risk in the DRC, related to the state of the written law and its enforcement by State services. There are still cases of legislation covering internal inconsistencies, discrepancies that cause confusion in respect of application (for example, many services are competing for the authority to regulate and control radioactivity, and are putting mining companies at the centre of their wrangling without access to an arbitration which would allow them the assurance of being an unambiguous legal corpus). In another case, where the law is clear, State services may still continue to apply repealed legislation, apparently by inertia or self-interest (the status of administrative costs is an example encountered daily by operators). In addition to charging fees in terms of repealed fiscal, administrative or mining law, some services also continue to create yet more costs out of the procedure. The still-unresolved status of fees for work-permits for foreigners is an example of the legal uncertainty in which miners have to operate.

The DRC has supported huge modernization of its business law by joining OHADA. This is a very big step for the attractiveness of the DRC as investment field. But this will only be the case if the new law is assimilated and applied uniformly and not forgotten, or even worse, selectively applied.

What are the growth prospects, and what are foreseeable obstacles in 2015?

The growth in demand for energy is a positive sign of economic development. The supply deficit is unfortunately a fundamental obstacle for growth prospects, and the opaque management of the supply deficit is a real handicap, especially for those who faithfully pay for their consumption. Network maintenance and strengthening of its capabilities require the supplier to have a long-term vision, better control of spending and a more amicable relationship with the few regular sources of revenue, such as the big mining companies. The mining sector will continue to promote any initiative to ensure the supply necessary for its operations.

The mining sector is expected to remain the growth engine of the Congo in 2015, and thus a major source of government revenue. In view of the continued pressure to maximize revenues and minimize expenses, companies can still expect to be subject to repeated checks from all the State's services, each hoping to collect maximum revenue for the least effort. If the control work is a prerogative of the State respected by all members of FEC, mining hopes that this review will be conducted in a reasonable manner, that is to say, by the authorized services, operating in concert, making reasonable assumptions and in good faith. This permanent tax-inspection is now entrenched in terms of operating costs, yet detrimental to competitiveness and attractiveness of the sector. These are all amounts that are not budgeted for in respect of investment, development and shareholder dividends.

Finally, 2015 was announced as a year for local elections and for pre-election of candidates at the national level. Companies will adopt a neutral stance, as befitting of economic operators, pending the results. FEC anticipates that the local elections will permit salutary clarification in the statutes, responsibility and authority of the various decentralized administrative entities (EADs) and their representatives. These developments can only improve the transparency of local government, and clarify the obligations of companies in respect of EADs, which is sure to improve the business climate.

---

[4] *See page 5*

SUMMARY OF 2014

Source: Tenke Fungurume Mining

Production

Gold	Cassiterite	Coltan	Zinc	Copper	Cobalt	Wolframite
+218,2%	+42,1%	+90,0%	+13,9%	+12,6%	+4,5%	-78,3%

	Units	2014-3	Oct	Nov	Dec	Total 2014	2013 a	2014 / 2013
Copper	tonne	767 434	91 016	84 649	86 701	1 029 800	914 631	12,6%
Cobalt	tonne	47 333	6 280	6 897	6 405	66 915	58 792	13,8%
Gold	kg	13 413	1 904	1 589	2 662	19 568	6 149	218,2%
Diamonds	1 000 cts	12 528	1 356	1 386	n/a	n/a	17 799	nd
Zinc	tonne	11 217	1 219	1 021	1 127	14 584	12 806	13,9%
Cassiterite	tonne	8 591	680	730	755	10 756	7 567	42,1%
Coltan	tonne	1 116	83	125	0	1 324	697	90,0%
Wolframite	tonne	19	2	2	2	25	115	-78,3%

The last column shows the annual trend compared to 2013
na: not available
a: actual
e: estimated

Exports

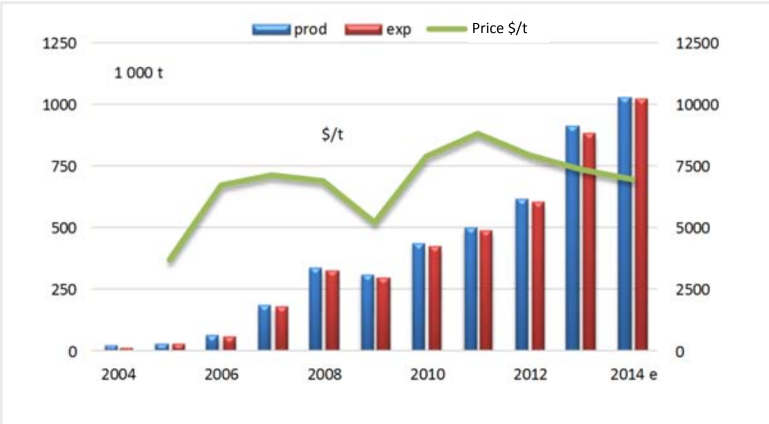
Gold	Copper	Zinc	Cobalt	Diamonds
+213,1%	+16,3%	+10,2%	+15,7%	- 15,4%

	Units	2014-3	Oct	Nov	Dec	2014 e	2013 a	2014 / 2013
Copper	tonne	768 473	94 929	80 838	83 488	1 027 728	888 657	16,3%
Cobalt	tonne	48 549	6 837	6 536	6 147	68 069	58 843	15,7%
Gold	kg	13 097	1 904	1 589	2 662	19 252	6 149	213,1%
Diamond	1 000 cts	9 116	1 364	1 735	999	13 214	15 614	-15,4%
Zinc	tonne	10 018	1 159	1 323	519	13 019	11 819	10,2%
Cassiterite	tonne	n/a	n/a	n/a		0	-	-
Coltan	tonne	n/a	n/a	n/a		0	-	-
Wolframite	tonne	n/a	n/a	n/a		0	-	-

The last column shows the annual trend compared to 2013
na: not available
a: actual
e: estimated

COPPER

Data



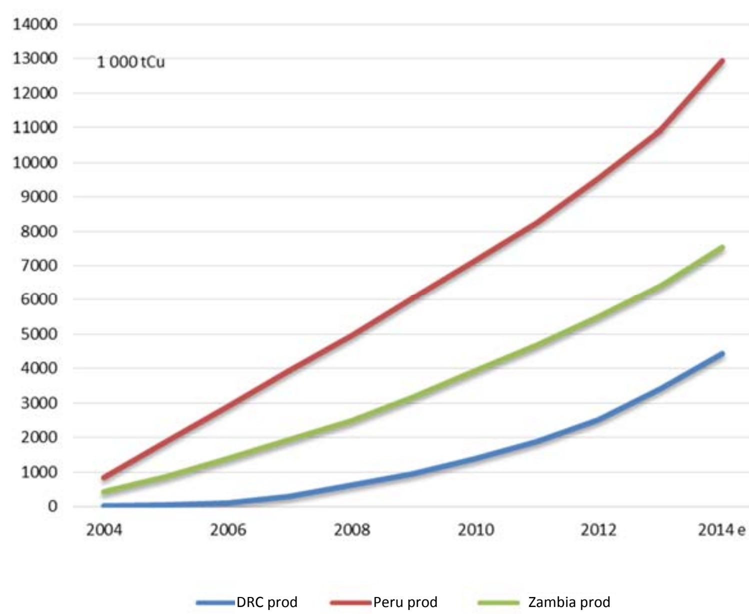
- The blue columns show production in tonnes, red columns are exports in tonnes. Units are thousands of tonnes (on the left vertical axis).
- The right axis gives metal stock prices in $/t (linear function). The price used is the average of the six-month and three-month cash prices
- The scales of the two vertical axes are similar for easy reading of values.

- Copper production in the DRC for 2014 was 1,029,800 tonnes.
- Therefore, the annualized rate of growth compared to 2013 is 12.6%.
- However, if production is to exceed a million tonnes a year consistently, it is essential that the deficit in electricity supply is overcome

International comparisons (DRC, Zambia and Peru)

These studies and publications may be obtained on request from John Nkono, Secretary General of the Chamber of Mines. (John Nkono - j.nkono@ fec.cd)

They aim to demonstrate the causal links between tax incentives and production growth and results.



"Comparison of the cumulative copper production from 2004 to 2013 in Peru, Zambia and the DRC."

Copper cathodes

	Cu cathodes	Cu total	
2013	684,653	914,631	74.9%
2014	866,595	1,029,800	84.2%

The electricity deficit precludes any envisaging of a substantial increase in the production of copper cathode.

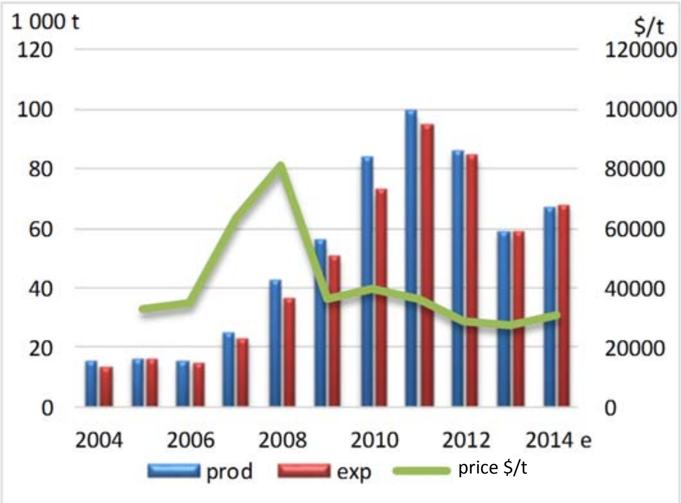
Prospects

The performance of the mining sector in 2014 was supported by the import of electrical energy and by strong demand for copper despite a drop in prices. Year-on-year production of copper was 12.6% higher.
The DRC holds the potential to produce much more in the coming years, provided, however, that there is better control over all the parameters which can influence production and investment, including the supply of electrical energy, taxation and the legal framework of the Mining Code.


Source: Tiger Resources

COBALT

Data



- The blue columns show production in tonnes, red columns are exports in tonnes. Units are thousands of tonnes (on the left vertical axis).
- The right axis gives metal stock prices in $/t (linear function). The price used is the average of the six-month and three-month cash prices
- The scales of the two vertical axes are similar for easy reading of values.

- 2014 cobalt production was 66,915 tonnes, giving an annualized growth rate of 13.8% on 2013.
- Companies continue to adjust their production strategy to market realities

Electrolytic Cobalt

	Co electro	Co total	
2013	2,828	58,357	4.8%
2014	2,935	66,915	4.4%

Prospects

- The average price at the end of 2014 remained above $ 30,000/t.
- The DRC remains the world's largest cobalt producer, far ahead of Zambia and Canada.

Source: www.katangamining.com

GOLD

Production

Source: Randgold Resources (projet Kibali)

- Blue columns represent production in tonnes; red columns are exports in tonnes. Values on the left vertical axis are in thousands of kilograms.
- The right vertical axis shows metal stock prices in $/oz (linear function). The price used is the average of the six-month and three-month cash prices
- The scales of the two vertical axes are similar to facilitate the reading of values.

The dominant gold-miners are estimated to have produced 650,000oz of gold (around 18,663kg) in 2014. The two largest companies are both undergoing expansion projects; production for 2015 can be expected to be in the order of 850,000oz.

The grades of ore being mined at operations in the two major zones are around 3g/t. Development of local infrastructure – notably hydroelectric power plants – has been remarkable. Road networks have been extended, model resettlements have been established, and many local businesses have been formed. Agricultural development for sustainable food production has also been a major focus. Companies continue to invest in exploration for further gold deposits in areas of known resources.

The Government needs to reduce the export fees charged to legal artisanal gold-miners in order to cut out the amount of fraud and to promote compliance. Estimates are that as much as 400kg of gold leaves South Kivu illegally every month because the costs of exporting legally are too high.

DIAMONDS

Both production and export of diamonds weakened during 2014[5], by 6% and 15% respectively compared to the same period in 2013. Deoxidation laboratories have had a braking effect on the official export of precious stones, and it is highly probable that some producers resorted to exporting illegally.

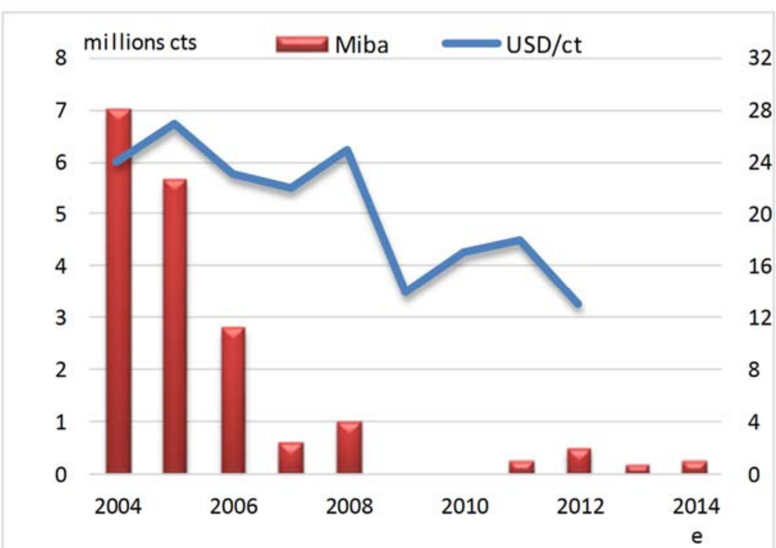
The Small Miners' Association SAESSCAM initiated several steps to curb illegal exports. This is in accordance with the requirements of the Kimberley Process, which demands such reforms.
SAESSCAM also succeeded in opening up certain areas to artisanal mining in Kasai-Oriental where artisanal diggers have gathered themselves into cooperatives. It also managed to take an inventory of those small-scale mining companies holding dredging machines.

MIBA, which remains the only industrial company in the diamond sector, achieved total exports of 289,600 carats in 2014 compared to 174,000 carats in 2013. Although in a recovery phase, MIBA still faces many problems, including the illegal plundering of its concession, a shortage of money with which to execute its growth plans, as well as periodic disruptions to its power supply.

Production at Miba

- Red columns are exports in millions of carats. Values on the left vertical axis are per thousand carats
- The right vertical axis gives diamond prices in $/ct (linear function)
- The scales of the two vertical axes are similar to facilitate reading values

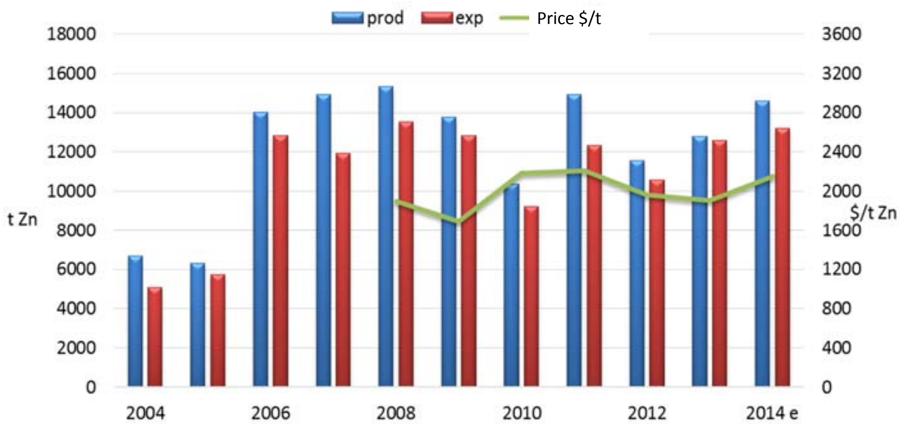
Production and Exports - total DRC



- Blue columns are production in millions of carats; the red columns represent exports in millions of carats. Values can be read on the left vertical axis.
- The right vertical axis shows selling prices in $/ct (linear function).
- The scales of the two vertical axes are similar to facilitate reading values .

[5] *Provisional figures consolidate*

ZINC



- The blue columns show production in tonnes, red columns are exports in tonnes. Units are thousands of tonnes (on the left vertical axis).
- The right axis gives zinc prices in $/t (linear function). The price used is the average of the six-month and three-month cash prices
- The scales of the two vertical axes are similar for easy reading of values.

The dewatering of a large underground zinc mine is under way, the intention being to re-establish underground operations when various studies have been completed.

Tin - Tungsten - Tantalum

Growth prospects for the 3 T sectors in the DRC

1. To bring about an increase in production, the main priority is for the government to speed up the extension and validation of mining sites in North Kivu, South Kivu, Maniema and Orientale Province. Miners can only establish operations in greenfields sites when they have achieved security of tenure. The cost of delay is material.
2. Payment of a mining royalty of 2% by the processing plants which are not holders of mining rights, based on ministerial orders 149 and 116 (Mining and Finance), subjects them to two regimes: that of the Mining Code and the other of common law, requiring them to pay a mining royalty of 2% for each transaction based on the valuation by specialized State services, while the bulk of production comes from artisanal mining.
3. The weekly determination of the base value by State-appointed agents does not correspond to daily market fluctuations. Secondly, for coltan, where the price is falling, there is a tiresome tendency of these agents to inflate the value, even though prices are known and can be checked. Export costs are exorbitant; for example, a 25-ton container of more than 30% coltan is worth up to $1-million when purchased in the DRC. Therefore, if the base value is distorted, exporters run at a loss.

4. The energy deficit poses a big problem. It puts miners at odds with the Government's desire that the DRC exports value-added products which require large amounts of electricity to produce. Miners are obliged to run their operations using generators (this applies to all provinces in the east), at a materially higher cost which renders further mineral-processing uneconomical.

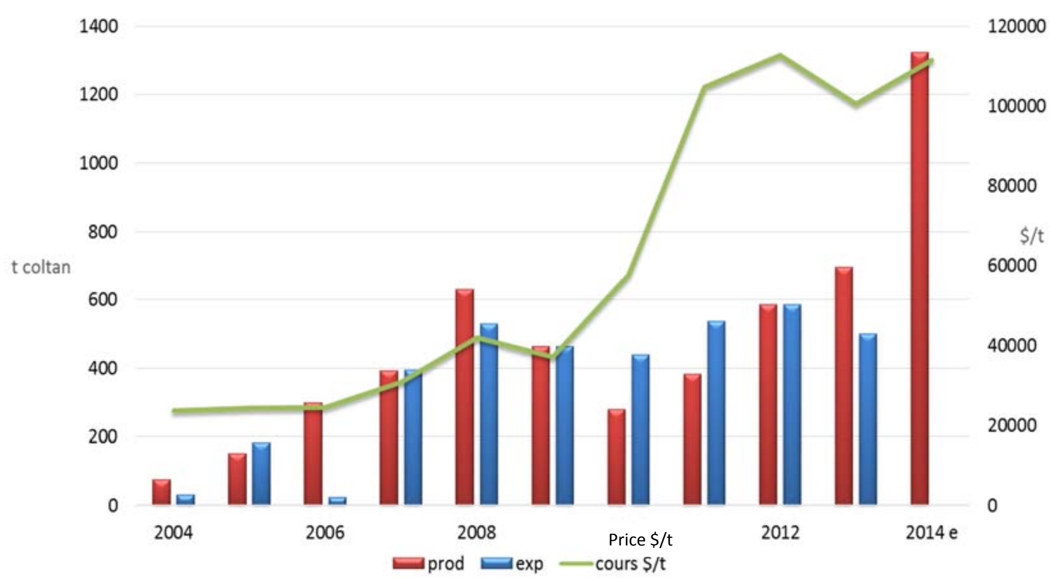
5. The problem of "informers"; secondly, the tendency of the DGRAD to seek redress at the offices of the companies, and most serious is the government's ordering of commercial banks to block the bank accounts of mining companies without notice if a dispute arises (les Avis de Tierce Détention) are three examples of official hindrance to the functioning of companies

6. Most of the DRC is landlocked, which does not help the country's miners in terms of competitiveness. However, the export of mining products through Maniema is a veritable obstacle course. The locomotives can take more than a month to cover the distance between Kindu and Kalemie, with interruptions along the entire route because of the shortage of locomotives. SNCC promised to provide locomotives, but has not yet succeeded in doing so. These delays often result in late delivery of tin concentrates against 3-month LME contracts, and unnecessary penalties often have to be paid.

7. Hassles and confusion caused by the DRC's own embassy in Dar es Salaam about the certificates of origin of export products from Kigoma, leading to blocked shipments. The embassy staff require training, particularly in respect of unauthorised demands for payment. Kigoma urgently needs a CEEC station because the CEEC has sole authority to interpret certificates of origin.

CASSITERITE

COLTAN



Prospects for the next five years

Mineral resources in the DRC

Source: Tenke Fungurume Mining

The DRC has significant mineral resources, but how do they stand in relation to global resources and number of years of operation?

The following figures provide an initial perspective :

Metal/Minerai	Resources	Units
Copper	105,319,158	tonnes
Cobalt	372,100	tonnes
Gold	45,340,444	Once (oz)
Tin	140,000	tonnes
Coal	88,000,000	tonnes
Diamonds	18,635,000	carats
Uranium	N/A	
Lithium	1,145,000	tonnes
Phosphate	58,500,00	tonnes
Zinc	4,947,000	tonnes

Source : SNL Metal and Mining, 2014

Copper resources of 105 million tonnes of metal have been identified, while the current production rate is around a million tonnes a year. However:

- Mineral resources are economically recoverable only if they are clearly identified and defined, and then converted (partly) to mineral reserves, as part of a mining development plan (usually with the abandonment of part of these resources considered economically unviable). Undefined resources are purely speculative and have no economic value.
- Mineral resources and mineral reserves only become an asset if they are actually mined.
- A dormant asset today might not be valuable tomorrow. The price of the metal in question may collapse (even temporarily) due to turmoil in the global economy, or the metal could lose its market, due either to the emergence of substitutes or technological evolution which render it obsolete.

As a result, the development of a mine is both a temporary and a limited opportunity, and should be seized when one presents itself by attracting mining investment.

It should also be understood how important these resources compared to those existing elsewhere, although the comparison must be considered with caution. Global copper resources identified by the specialist company SNL Metal & Mining, are estimated at more than 2.7-billion tonnes (1). The DRC therefore represents only 4% of global resources. For example, two mines in Chile (Andina and Escondida) are estimated each to hold 100 million tonnes of copper and associated metals (1) - each equivalent to the DRC's current copper resources.

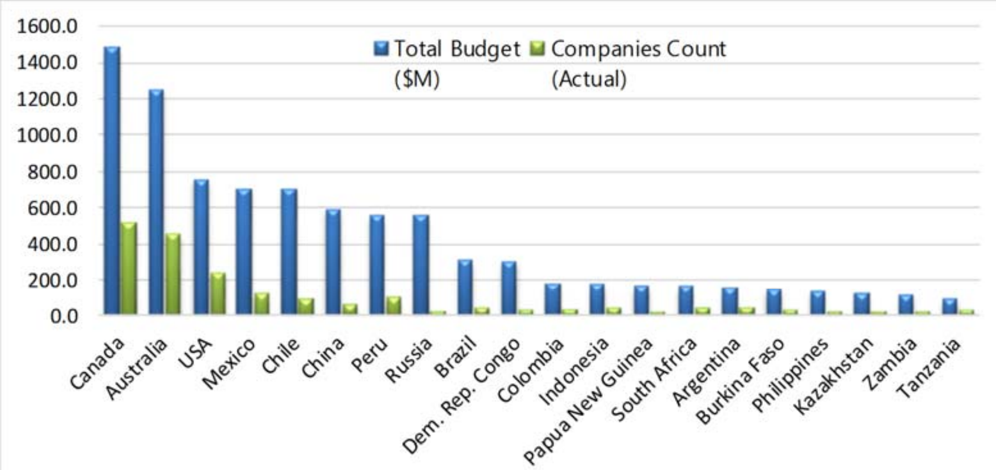
It should be noted, however, that some of the DRC's deposits are among the best in the world in terms of copper content.

Yet the resources of the DRC are still largely unknown, and could easily be much higher. This is why the Chamber of Mines supports the government's proposal to create a National Institute of Geology to promote and facilitate increased exploration programs.

Exploration

Exploration budget by country in 2014

- Exploration companies had budgeted to spend about $11.4-billion around the world in 2014. However, in the face of depressed commodity prices, the year's expenditure was actually 25% below that of 2013.



Exploration budget by country in 2014

The table above is an estimate of exploration budgets in the world in 2014.

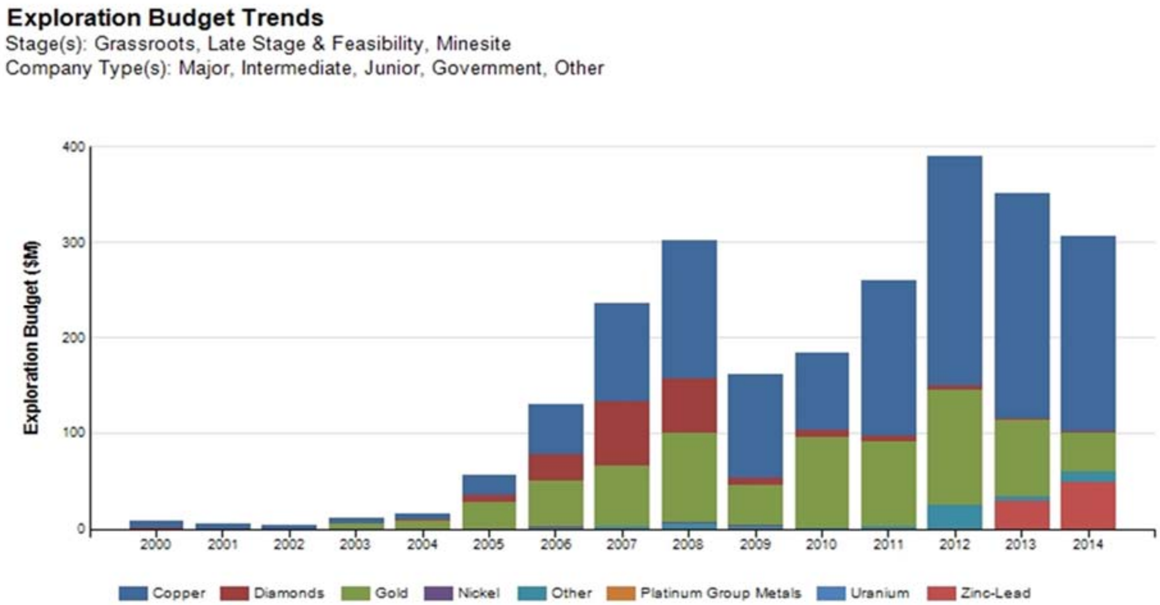
- Internationally, higher operating costs, lower grades and uncertain demand for raw materials have resulted in a renewed focus on healthy margins by the multinationals after several years of growth-oriented investment.

- To this end, multinational companies have sought to divest non-core assets by reducing project and exploration expenditures, which led to the surprising drop in the exploration spend in 2014. The juniors continue to struggle to draw investor interest, forcing them to control their expenditure to conserve funds. The exploration budget among juniors fell by 29% in 2014 on top of a 39% reduction in 2013, and their share of the total overall exploration budget shrank to only 32% from a high of 55% in 2007.

In this ranking, the DRC is rather well placed:

- The budget for DRC exploration in 2014 was $306-million,
- the 10th largest in the world and the biggest in Africa – well ahead of South Africa, Burkina Faso, Zambia and Tanzania.
- Nevertheless, it is still far behind Canada (US$1.4-billion), Australia ($1.2-billion) and the main producers of copper - Chile (US$707-million), China ($594-million), and Peru ($559-million).
- In terms of the number of companies involved in exploration, 33 companies were active in the DRC as against 49 in South Africa, 26 in Zambia, 93 in Chile and 103 in Peru.

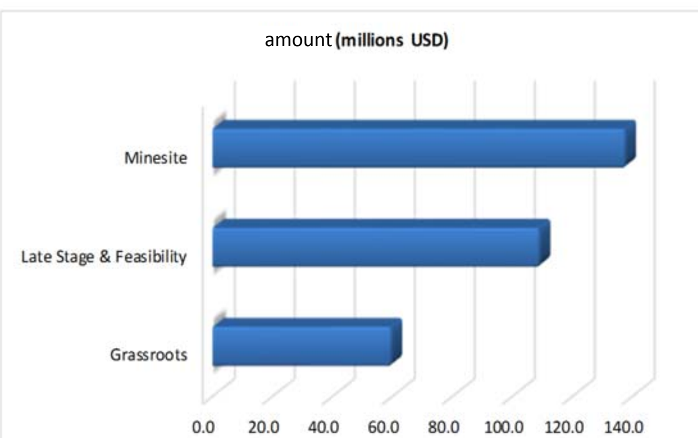
Exploration Budgets for the DRC in 2014



Source : SNL Metals and Mining

The increase in exploration expenditures in Congo appears to coincide with the implementation of the Mining Code and new mining regulations in 2002-2003. However, generally speaking, the exploration budget in the DRC follows the evolution of commodity prices and conditions at international level (the global economic crisis in 2009 and declining commodity prices since 2013).
Copper accounted for 66% of exploration expenditure in 2014, gold 14% and zinc 16%.

Details of the exploration budget in the DRC in 2014



Source : SNL Metals and Mining

The breakdown of the exploration budget for the DRC in 2014 is as follows:

- 45% of expenditure was incurred on operating mines (minesite)
- 36% was on mining projects already in an advanced stage (late-stage and feasibility)
- 19% was spent on "virgin" projects (grassroots)

Some 66% of total exploration expenditure in the DRC was made by only five companies, and five projects accounted for some 80% of the $49.4-million spent on grassroots projects.

These figures underline the relative weakness of the mining sector in the DRC where, given the potential of the country, there are too few active players prospecting for tomorrow’s mines.

What next for the DRC?

The current growth of mining in the DRC requires special attention on the part of all stakeholders in the following respects.

Revision of the Mining Code

Source: Tenke Fungurume Mining

The Mining Code came into force on 1 January 2003, therefore has been in effect for 12 years. Everyone agrees as to its intended transparency and tax incentives, specifically, a tax system which corresponds to the cycle of a mine's development, and its guarantee of stability of that tax system.

The qualities of the Mining Code became apparent in 2006: commodity prices began to rebound, many mining projects became feasible and production either commenced or resumed.

The development of mining production has created 100 000 direct and indirect jobs in the Congolese economy, infrastructural development (roads, electricity, hospitals, schools, border crossings) has been substantial, the State's control has been reinforced in certain areas, and security for the populations where formal mining operations take place has been improved.

In addition, in the great majority of cases, the well-being of communities has been much improved through social development projects, a direct result of which has been a large influx of national migrants into these prospering areas.

After 10 years, it is reasonable to review legislation in the light of experience gained. It is also legitimate for the State to want to maximize its revenue from both ordinary and special taxes. However, if these are to be done in conjunction, it must be with due consideration and circumspection.

The life cycle of a mining project and the financial risk of volatility in commodity prices require investors to take at least a ten-year view, particularly in respect of fiscal and other payments to the State.
The revised Mining Code needs to be a win-win deal for all parties: it must be transparent, and it needs to incentivise new investors. This will lead to an expansion in the tax base and to an increase in tax-take by the State. New investment means more new direct jobs and, thanks partly to outsourcing, many indirect jobs.

At the request of the government, numerous meetings have been held. They have taken place in an atmosphere of frank and constructive exchanges, resulting in agreement on the following points:

- The decision to create a National Institute of Geology
- The desire to end harassment in respect of remuneration due to CAMI (Cadastre Minière, the DRC's registrar and point of entry for mining investors)
- The right to the free marketing of mineral products
- The obligation to process minerals in the country
- Increasing the rate of surface taxes (on mining titles)
- Consideration of the decentralization process enshrined in the 2006 Constitution
- The development of cooperatives in artisanal mining areas, the better to regulate artisanal miners
- The use of local companies for subcontracting
- Improvements in environmental protection - strengthening controls
- The development or revision of certain articles poorly defined in the 2002 Code
- Transparency and traceability (application of the principles of the EITI, ITRI, the ICGLR)
- The development of the principle of consultation with local populations regarding the construction of infrastructure by the holder of the mining right.

On the contrary, although discussions about the tax system, customs and foreign exchange have led to significant advances with the introduction of the concept of mandatory provision (0.3% of revenues) for the "Community Development Fund ", unacceptable differences still remain in the following aspects:

- rate of mining royalties
- introducing tax on so-called "superprofits"
- the amortization method
- the rate of interest acceptable for foreign loans
- the tendency to reject the principle of stability of the regime

It is manifestly obvious that the Technical Commission, in applying the revised provisions, results in a significant decline in the profitability of existing projects (by making them less robust), the slowdown of planned investments and the loss of opportunity for new direct foreign investments.

In general, the Chamber of Mines notes that the proposed changes are essentially for tax purposes. The Chamber denounces any short-term vision; looking for immediate gains rather than promoting efforts for the development of mining and of the geological potential of the DRC.
Scientific studies have been commissioned by the Chamber of Mines with internationally recognized firms, and conclusions were provided to the DRC government via the Ministry of Mines. They are available on the Chamber of Mines website:
www.chambredesmines-rdc.com

These findings are indisputable, even if the models are tested with such parameters as have arisen in recent months.
The Chamber of Mines strongly hopes that the Government will communicate all of these results to other parties, as well as to national and international consultants, for reading and validation before submitting the revised Mining Code proposals to the legislator.
As noted in the chapter on DRC resources, the potential of the DRC is huge, and it would be a pity to blight the future.

Taxation and special levies

1 The situation regarding the refunding of VAT credits has deteriorated since the beginning of 2014. Apart from the amounts in loans not yet cleared, these longer repayment periods are noteworthy. This is mainly due to the fact that the tax administration services are not confined to purely formal checks but pursue detailed inspections.

2 Tax disputes accumulate, particularly at the DGE. These disputes are not dealt with, and extend well beyond the statutory processing time, generating a situation of legal uncertainty for taxpayers. Hence, the business climate suffers.

The involvement of the highest authorities of the State and the tax administration could frequently result in direct contacts and rapid dispute settlement.

Electricity

Present situation

The situation is serious:

1) The deficit in available power, and the frequent interruptions in supply which have occurred since 2012, cause adverse consequences for the development of economic activity in general and in particular for the growth of the mining industry.
2) All segments of the population have to endure random and often lengthy power cuts. Explanations given by SNEL are either inaccurate or non-existent.
3) The management of the power shortage is non-transparent; some parties appear to be perennial beneficiaries of SNEL's supply while others are always are left in the dark.

This situation has resulted in a direct loss of production ± 30,000 tonnes of copper, the loss of about US $210-million in revenue, and an additional cost of production of about $100-million for copper alone - simply because producers are obliged to use diesel-powered generators (100,000 x $ 1,000 TCu / TCu additional cost).

Gross operating profit was more than $150-million lower than it could have been, representing a lost opportunity for at least $65-million in taxes.

Solutions

Increasing the electricity supply

To recall, the last of the eight generating sets at central Inga II was commissioned in 1982. It is therefore more than 32 years since a single new unit of electricity production was fed to the grid. The power supply has to catch up with demand.

The Inga mega-project, whose estimated cost is US$12,500-million, should be continued, albeit in the knowledge that its production will not be available for at least ten years.

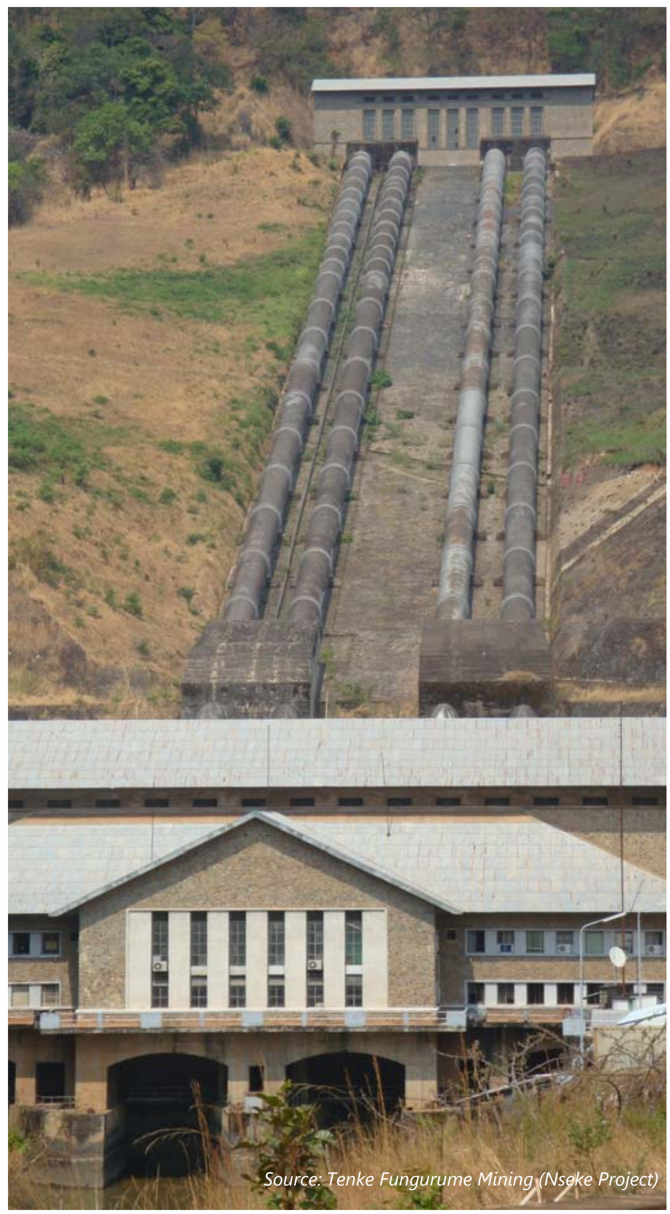
To get a better "return" in the short to medium term, faster and cheaper projects – somewhere between $500 million and $1-billion – need to be developed.

In no particular order, the following projects could bridge the supply gap in the medium term if development were to commence immediately:

- Luena
- Nzilo II
- Busanga
- Mpiana Mwanga
- Luapula

It should also be added that, unlike other provinces, Katanga already has a power network which is fed, in addition to power produced at local stations, by the injection of electricity generated at Inga, via the DC interconnector.

This large contribution comes with a major drawback: in case of failure of the converters or any faults on the DC line, when there is a sudden and complete loss of 215 MW. This destabilizes the entire Katanga grid through the loss of the connection with Zambia, which often results in the grid's collapse when the safety system - which is meant to rapidly isolate the problems – does not kick in in time.


Source: Tenke Fungurume Mining (Nseke Project)

A short-term action that the Chamber of Mines recommends, in addition to controlling the Katanga transmission network properly, is to make the Inga-Kolwezi line viable. According to statistics from SNEL, 80% of clicks from the DC line are caused by defects on the line itself - often from vegetation growing on or beneath the pylons and below the power-lines. An inspection of these lines with well-equipped aircraft is urgently needed.

The other short-term action which would slightly reduce the SNEL deficit is to import energy from southern Africa. Unfortunately, such supply is seldom available, and costs roughly twice the price charged by SNEL before any tax.

Many companies have been forced to use their own generators; unfortunately the cost is very high (8 to 10 times the cost per kWh of SNEL).

Depending on the efficiency of each copper project, as expressed in TCu/MW, by increasing the supply of electricity to 500 MW it would be possible to consider an increase in production of about 750,000 tonnes of copper in the DRC and to lift annual production above 1,500,000 tonnes sustainably.

Promoting the use of energy-efficient appliances

SNEL is currently a monopoly, both for the production and for the distribution of electricity. This explains the excesses that are currently observed.

To reassure investors who wish to invest in new power-plant projects, a completely independent third party must take over management of distribution of the high-tension voltage from SNEL.

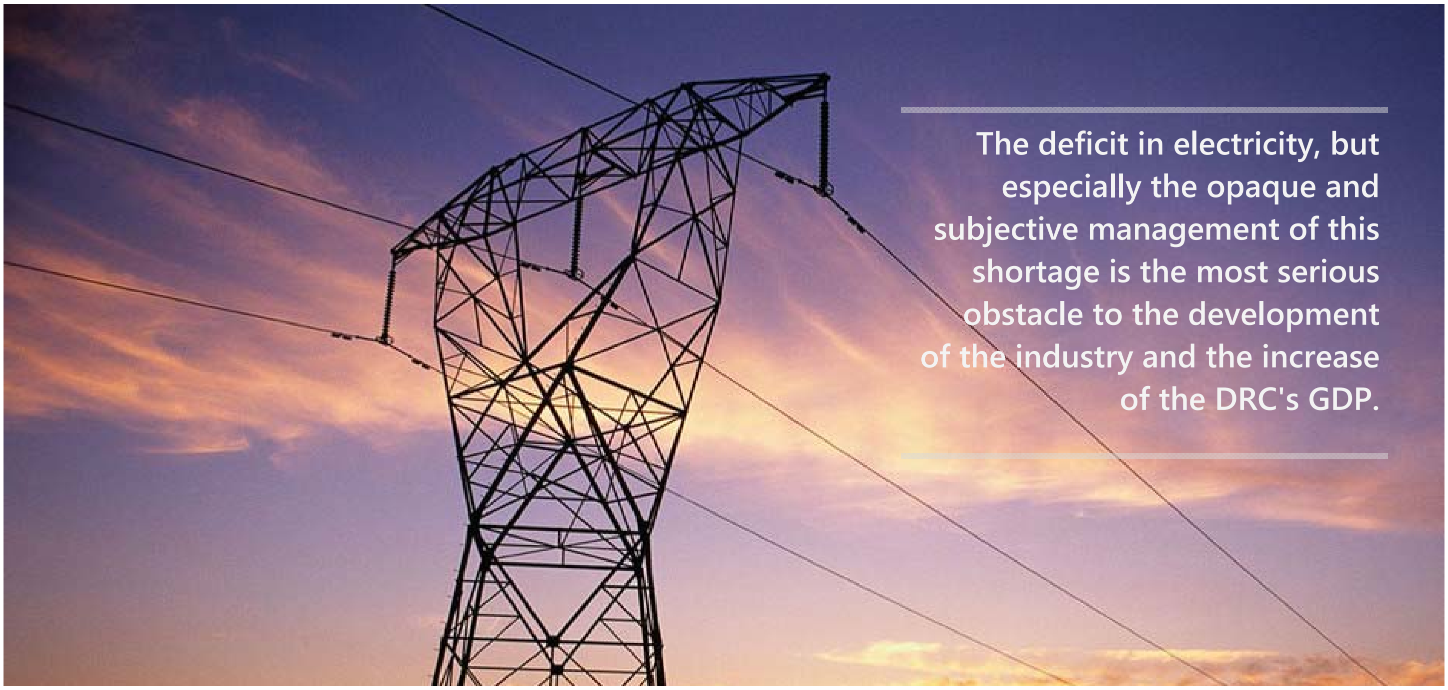
Proposed structure for better efficiency

Pilot tests in which incandescent light-bulbs have been replaced with low power-consumption lamps have shown a significant reduction in demand. Preliminary estimates indicate that the widespread use of energy-efficient lamps for the cities of Lubumbashi, Likasi and Kolwezi could contribute to a 50MW reduction in demand. Spread this to Kinshasa and other cities in Western countries, and the savings could lead to a 160MW decline in demand on the national grid.

The presence of a neutral third-party distributor would ensure that future electricity-producers could conclude sales contracts with creditworthy clients by becoming the driving force in guaranteeing the stability of such contracts.

They could then be used as collateral for financing power-generating projects.
It would also be appropriate to require new investors to allocate a percentage (10% to 20%) of the electricity generated to the needs of the population.
This social quota would be sold to SNEL, which would retain the right to distribute low and medium voltage.
If SNEL could not honour its financial commitments vis-à-vis the private power producer, the low-voltage contract would be terminated immediately, and if a Regulatory Authority were to be established, the operator of the low- and medium-voltage network could even lose its licence. The problem of financing these relay projects would then become much easier to solve.

The problem of financing these relay projects would then become much easier to solve.



Other measures to maintain the competitiveness of the mining industry include tax exemption and removing excessive charges on imported electricity.

To maintain production at acceptable levels, mining companies have had to resort to importing electricity, not by choice, but because of the inability of SNEL to meet their demand in terms of contractual agreements.

In order to maintain the competitiveness of Katanga's mining companies, it is imperative that excessive fees placed on imported electricity are removed. Solutions to make them competitive companies include:

Removing the profit margin of SNEL, which is 27.5%

Indeed, SNEL charges a margin of 20% to which is added:

- 3.5% for transmission rights;
- 1.0% depreciation; and
- 3.0% operating and maintenance costs.

Only the right of transmission, which is supposed to cover all network usage, should be applied. The other charges are nothing more than an undeserved bonus for SNEL for its own non-performance.

Exemption of import duty on electricity

If it is accepted that the electricity production deficit plaguing the country's economy in general and the mining industry in particular is a temporary situation (which will take time to improve), there is no excuse not to lift all taxes from imported electricity.

Given the size of the mining industry as an electricity consumer, it would be appropriate to examine the possibility of introducing a neutral operator for the high-tension network, so as to deliver a quality service to the mining sector. It goes without saying that the opening up of the electricity transmission network to third-party producers (TPA - Third Party Access), and independent power producers IPP, under the terms of the Electricity Law, would give even more assurance to potential investors in the sector.
Under this model, SNEL would be free to concentrate on the commercial and residential segment.

Conclusion and Action Plan

In order to achieve the production target of 1.5 million tonnes of copper per year assigned by the Minister of Mines, the Chamber of Mines of the Federation of Enterprises of Congo will:

a) Continue capacity-building projects of existing infrastructure through partnerships between its members and SNEL
b) Identify other infrastructure for partnership projects and funding;
c) Help to find financing for reconnaissance by a properly equipped aircraft to determine the status of the Inga-Kolwezi DC line
d) Continue to try to attract potential investors in the independent power generation sector in Katanga
e) Make available to the Government the necessary expertise for the development of new power plants
f) Invest in the development of renewable energy
g) Challenge why all draft memoranda of understanding have not advanced, and to give them to other, more serious investors, through tendering procedures.

Logistics – The Kolwezi-Lobito railway

Source: lepotentielonline.com

The World Bank, SNCC and the Government agreed to a complete renovation of the Kolwezi - Lobito section.

The Government has clearly favoured a concession of this section. It will give preference to mining, and in the event of a lack of initiative by the mining sector, will proceed by tender.

However, mining companies will require a legal guarantee of financial independence from the SNCC of the structure that will finance and manage the concession.

Local content

According to the principles of the International Council on Mining and Minerals, the highest standards should be applied in dealing with local matters and in providing adequate answers to the expectations of local people and their chiefs. The Chamber of Mines (CoM) has set up a committee in charge of Local Content to help establish realistic policies through proper interaction with the community and institutional partners. The views of some of FEC's members are reflected below.

The Chamber of Mines was instituted by the Federation of Congolese Enterprises (FEC).

FEC has an interest by promoting and encouraging Congolese companies. Its duty is to represent them, and they are encouraged to become members. FEC is the natural partner for any public or private initiative for such development. It is also best placed to develop an approach that allows all companies, without discrimination, to benefit from the record growth that the country is experiencing.

The reflections below should help to frame the debate, and make relevant concrete proposals. The basic terms of the debate need to be set correctly. The debate is built around the term "local subcontracting."

Before becoming sub-contractors, companies are just that: businesses. The problem is not one of inadequate opportunities for subcontracting, suggesting a lack of demand, but one of insufficient entrepreneurship. Let us put aside the term "subcontractor" to talk about the issue in its entirety, using the term "undertakings".

What allows a company to claim to be "local" in a globalized economy? Local registration? A majority of local employees, including in management positions? Predominantly local capital? More or less unofficial sponsorship of community leaders? And where does the "local" extend? In the city? To the leadership? To the province? The whole country?

We see that this "local" criterion leads directly to political considerations that have no place in the decision-making of a business enterprise. This is why companies choose their trading partners on other criteria: experience, capacity, and cost. Criteria include good management; criteria which pass the test of an audit at international standard.

Unlike some accusations heard in the debate, procurement procedures do not include any "discriminatory" measures. On the contrary, according to the law and/or agreements with the State, companies choose local business with equal skills. It is in their interest to do so when the option is available: the local firm would a priori be more


Source: www.katangamining.com

flexible on time, cheaper in cost, and would lead to a strong, closer relationship. Some members make an effort to identify new local contractors, and even to help them form themselves into entities capable of meeting acceptable business practice standards. If the industry indeed contains black sheep with respect to the allocation of contracts, it does not deserve to be wholly tainted as not contributing to local entrepreneurship. FEC will continue to support initiatives to identify and penalize companies that do not respect the law.

The ultimate goal in developing local entrepreneurship is to ensure the growth of a domestic middle class. The members of FEC support this goal. We believe that the middle class is growing prominently in the


Source: Tenke Fungurume Mining

so-called "foreign" companies; those that expect the highest international standards from their employees, give the best training, and pay regular and competitive salaries.
Moreover, the development of a business climate requires that people want to take the risk of being independent, rather than being an employee, and to take the risk of employing the skills and character shown by others. To start a new business, to create a society that will compete with others looking for clients, to have to invest in equipment when the rewards are still uncertain and may not be immediate, all this requires real determination, a taste for risk, and a lot of will.

There are undoubtedly people who have these qualities. Have we even dreamt of training good technicians in plumbing, electrical, masonry, furnishings? Are we happy with the quality of the education provided in our schools, colleges and high schools, our universities? These courses take time.
Citizens engaged in the formal sector generally have incomes allowing them to enrol their children in an educational system that will enable them 15 years to 20 years later to create their own businesses.

Creating a middle class is a long process that requires real determination from public authorities, and which requires citizens to take charge and refuse to be assisted. This is not something that can be decreed.
We also submit the observation that the presence of 'foreign' trade partners in the economic fabric of the DRC is a good thing in itself. This is a sign of the rehabilitation of the DRC in international trade circuits, a sign of normalization that should be good news for a country ostracized by war and corruption for so long. We note that the contracting companies, all legally Congolese, will, if allowed, ultimately export their skills abroad, when they too will perhaps encounter the same protectionism.

We offer several concrete courses of action, as discussed at the last workshop on the development of the Congolese entrepreneurship.

For the attention of the Government:

* Developing industrial policy and a strategy to promote SME/SMI
* Promoting the development of technical and vocational training institutions in partnership with the private sector
* Upgrading the REIT so it can better meet financing needs

For the attention of mining companies, FEC and the Chamber of Mines:

* Improving communication between the Chamber of Mines and FEC's SMEs
* Strengthening cooperation between FEC and agencies of technical and financial support to SMEs/SMIs, such as REITs, OPEC and ANAPI
* Strengthening Katanga's SME/SMI capacity to enable small businesses to reach the levels required by contractors, including international standards applied by the sector
* Publishing information about outsourcing procurement by order of donor mining companies
* Developing a support service for young entrepreneurs to facilitate the emergence of new SMEs/SMIs
* Pressing FEC to expand its strategic and organizational vision for strengthening its institutional capacity to diversify and improve member services
* Helping to create an environment that can support a market of outsourcing with the mining sector, for example the creation of an investment fund with FEC members for example the creation of an investment fund with FEC members for the benefit of SMEs

Corporate Social Responsibility

Current situation

Dialogue on CSR was launched in Lubumbashi, Katanga Province, on 11 February 2011, via the Idak platform (Idak – Sustainable Development in Katanga).
It aims to create, enliven and maintain dialogue on issues related to the social contributions and social responsibilities of companies, and to reduce the negative impacts of mining on the environment and local communities.

Dialogue continues in tripartite consultations between mining companies, the Katanga Provincial Government and organisations of civil society.
The standard of CSR is based on seven pillars: the environment, human rights, consumer issues, communities and local development, relationships and working conditions, fair practices and governance of the company.
The Chamber is committed to mobilizing mining companies to promote their CSR and to structure and coordinate efforts to significantly improve the lives of people affected by their operations.

Promoting CSR aims to bring mining in DR Congo to meet the challenge of sustainable development through improved mining practices, protection of the environment, contributions to economic development, improvements in basic social services, implementation of local subcontracting, respect for human rights, and through good governance. It contributed to the revision work on the Mining Code by proposing to include in the new mining law provisions on CSR to encourage miners to take into account the local communities in which they operate.

By taking clear ownership of the CSR work done by the Chamber of Mines 'commission, FEC has taken hold of an asset that will allow the expansion of CSR activities to all affiliated companies, even those mining companies that are not members of the Chamber of Mines. It is in this context that GIZ supported the CSR Committee of the Chamber of Mines in the organization of training on CSR in July and December 2014.

Prospects

The Commission of the Chamber's CSR has made available to the mining industry a CSR guide based on the ISO 26000 reference standard, to which the DRC is a signatory.
A workshop to develop this tool (norms, standards and guidelines) was held in Lubumbashi on 9 and 10 December 2014, and was attended by all stakeholders in the mining sector. This guide will serve as a simplified model of the reference standard ISO 26000.

Tangible achievements

Mining companies have managed to significantly improve the conditions of people affected by their operations by undertaking social work in the fields of health, education, agriculture, improvements of basic infrastructure, the creation of SMEs and the creation of sustainable jobs.

Environmental protection practices have improved, and there has been great progress in the commitment to transparency and good governance through the EITI.

The table gives a preliminary estimate of the achievements of companies. Confirmation of the data will be presented in the first quarter report of 2015.

PROJECT	
Constructed and rehabilitated schools	**85**
Children attending these schools	**35 134**
Scholarships for primary, tertiary and vocational courses	**9068**
Medical facilities constructed or rehabilitated	**30**
Drilled wells for drinking water	**249**
Treated mosquito-nets distributed	**50**
SMEs created - agricultural cooperatives	**121**
Market-places built	**10**
Km of rural roads maintained	**653,6**
Km of roads tarred	**38,2**
Bridges built and rehabilitated	**32**
Resettlement houses built	**648**
Farmers assisted	**5465**
Quantities of inputs to farmers (tonnes)	**741,1**
Agricultural area planted in 2014 (ha)	**8057,5**

Source: Tenke Fungurume Mining

Workshops

In partnership with the German Cooperative GIZ in its Good Governance program in the Mining Sector, the CSR commission brought together mining companies, civil society and government in a constructive dialogue to discuss several topics on the Idak platform.

The plenary works are decided by consensus on identified priority themes, the recommendations are adopted by consensus and all stakeholders are committed to implementing them.

All these workshops were conducted in Lubumbashi except the June 2014 workshop on waste management and mining waste, which was held in Kolwezi in Katanga Province, the pilot province for CSR.

DATE	THEME OF THE WORKSHOP
Février 2011	Workshop – Establishment of Idak
Juin 2012	Mining and Environmental
Juillet 2012	Business Cooperation with local communities
Septembre 2012	Invasion of mining sites by illegal artisanal miners
Novembre 2012	Subcontracting and the local supply chain,
	applicability of sustainable development plans
Février 2013	Revision of the mining code in respect of CSR and sustainable development
Mai 2013	Relocation of populations
Juin 2013	Increasing the added value of mining products
Septembre 2013	Management of the expectations of politicians and administrators
Novembre 2013	Health on mine-sites
Mars 2014	Harmonizing sustainable development of mining companies' plans with the Five-Year Plan of the Province of Katanga
Juin 2014	Management of waste and mining waste
Octobre 2014	Governance of the labour market in the mining sector
Décembre 2014	The "Local Content" or integration of the mining sector in the local economy, governance of the labour market in the mining sector

Sources of data, validation and transparency

Sources

Data was gathered by the Chamber of Mines from the following sources:

- National and provincial departments of the Ministry of Mines
- Gécamines regarding producer partnerships
- Consultation of different data on web sites
- Other information disseminated through press releases or media
- Direct contact with companies to validate their production data

A cross-check of the data was performed against the publications of the Central Bank of Congo for the years for which reports are available, and against other publications. Information was treated with great scrutiny.

Calculation of metal content

- For precious metals in general there is no problem because no refining takes place outside the country.
- For saleable products: the tonnage of metal contained in the commercial product was calculated taking into account the content of the metal and the moisture content as appropriate. Commercial products include: concentrates, red and white alloys, black copper, matte, Cu / Co carbonates, cobalt hydroxides, cathodes and ingots.

Accuracy of the figures

The classic error calculation was not performed. However, it is reasonable, based on the principle of compensation of differences, to assume that the overall figures show a relative error of ± 3%.
This level of accuracy could be worse when relating to areas where mining activity is more limited.

Annex 1: Calculation of metal content

COPPER (Cu)	
	Concentrate Cu: 10 to 30%, average 20% Cu, moisture content: 13-20%
	Copper-cobalt-focused (CuCo): Cu: 16-20%, mean 18%; Co: 6-12%, average: 9% moisture: 10-20
	Black copper: 80 - 98%, average 90% Cu
	Cu cathode: 99.80 to 99.99% Cu
	White Alloy: 30 - 35% Cu, 33% average, 30-35% Co, 33% average
	Red alloy: 80 - 98% Cu, 90% average
	Matte Cu: 90-98% Cu
	Cu powder: 93-95% Cu
	Cu botton: 94 - 97% Cu
	Cu carbonate: 20 - 30% Cu, moisture: 12-20%
	Cu nodule: 95 - 97% Cu
	Wire bars : 96 - 99 % Cu
	Copper Scraps : 25 - 35 % Cu
COBALT	
	Co concentrate: 4-15%, mean 10% Co, moisture: 10-20%
	Co hydroxide: 29 - 40% Co, humidity: 60-70% (with dryer, moisture: 7%)
	Co carbonate: 20 - 30% Co, humidity: 12-20%
	Electrolytic cobalt: 96 - 99% Co
	Co magnetic separator: 50 - 60%
	Co granule: 96 - 98% Co
ZINC	
	Zinc powder: 65 - 70% Zn, 68% Zn average
TIN	
	Tin concentrate 55 - 65%, average 60% Sn (artisanal mining)
COLTAN	
	Coltan Concentrate: average grade tantalum 205: 27% average grade niobium 205: 25% (artisanal)
GOLD	
	Gold concentrate: 92 - 98 %, average 95 % Au
WOLFRAMITE	
	Wolframite concentrate: 55 - 65 %, average 60 % tungsten (artisanal)
DIAMONDS	