

1/600th the volume of the gas. This is done with a series of units, known as a "train", which remove impurities such as dirt, water, carbon dioxide and some trace minerals, and then cool the gas in steps. One tonne of LNG is made from 48,700 cubic feet of natural gas.

Anadarko and ENI propose to construct the second largest gas liquefaction plant in the world (after Qatar), at an estimated cost of \$50 billion. Anadarko estimates that the Rovuma basin will produce 50 million tonnes of LNG.

No oil in the Rovuma basin?

In April 2009 reports circulated in the national and international press that Anadarko had found oil in the Rovuma basin. It was noted that the Rovuma basin had similar geology to the Gulf of Mexico, which suggested a potential of 3 billion barrels of oil.

But a year later the government news agency AIM (16 Aug 2010) reported that oil had been found, but that it would take more exploration to see if it was there in commercial quantities. So far, no one has found commercial quantities there.

Main hydrocarbon operators

| Company | Country | Location & stage of project | Shareholder of project |
|--------------|--------------|---|---|
| Sasol | South Africa | Pande & Temane (on shore, producing since 2004); Blocks 16 e 19, off shore (Prospecting under way; large discoveries announced) | Sasol Petroleum Sofala 50%; Petronas Carigali Moçambique 35%, ENH 15% e IFC (World Bank) 5% |
| Anadarko | USA | Rovuma basin area 1, on and off shore (Prospecting under way; large discoveries announced) | On shore: Anadarko Moçambique 35.7% Artumas Moçambique Petroleum 49.3%, ENH 15% Off shore: Anadarko Petroleum Corporation, (operator, with 43%) • BPRL Ventures Mozambique BV (11.75%) • Cove Energy Mozambique Rovuma Offshore Ltd (10%) • Mitsui E&P Mozambique Área 1 Limited (23.50 %) • Videocon Mozambique Rovuma 1 Limited (11.75 %) |
| Statoil | Norway | Rovuma basin off shore, areas 2 & 5 (Discoveries announced) | Norwegian government 67.3%; Norsk Hydro 32.7% |
| ENI | Italy | Rovuma basin, off shore area 4 (Prospecting under way; large discoveries announced) | ENI 70%, ENH 10%, Galp Energia 10%, Kogas 10% |
| Petronas | Malaysia | | Petronas 42.5%; PetroSA 25.5%, Petrobras 17%, ENH 15% |
| Terralliance | USA | Zambeze delta, on & off shore | Terralliance 60%, Bang 40% |
| DNO | Norway | Inhaminga, Sofala, on shore | 100% DNO |

ENH is Empresa Nacional de Hidrocarbonetos, the Mozambican state oil and gas company.

Source: Compiled by the author with data from the Instituto Nacional de Petróleos (INP), the companies, and the World Bank.

Coal: is huge optimism justified?

Various projections indicate that Mozambique could be producing 100 million tonnes of coal a year after 2015, when the mines in Tete become completely operational. Nevertheless, Mozambique will be producing much less than South Africa, which produces 255 mn t/y.

But there are serious problems: the market for the coal is not assured, and there is limited rail capacity to get the coal to port. Delays until 2017 or later seem likely.

The main interest in coal is in Tete province, where coal occurs in Moatize-Minjova and Mucanha –Vuzi. There is also coal in Niassa (Maniamba/Metangula), in Cabo Delgado (Lugenda) and Manica

(Mepotepote). The map on page 5 shows some of the coal basins and potentially productive areas.

The table on the next page gives an outline of coal exploration and production.

Coal seams normally have two types of coal. Coking or metallurgical coal is more valuable; coke is produced by putting the coking coal at high

temperatures (1100°C) in an oxygen deficient atmosphere. The less valuable part is steam or thermal coal, normally used for electricity generation. Current prices are \$150/tonne for coking

coal and \$90/t for thermal coal.

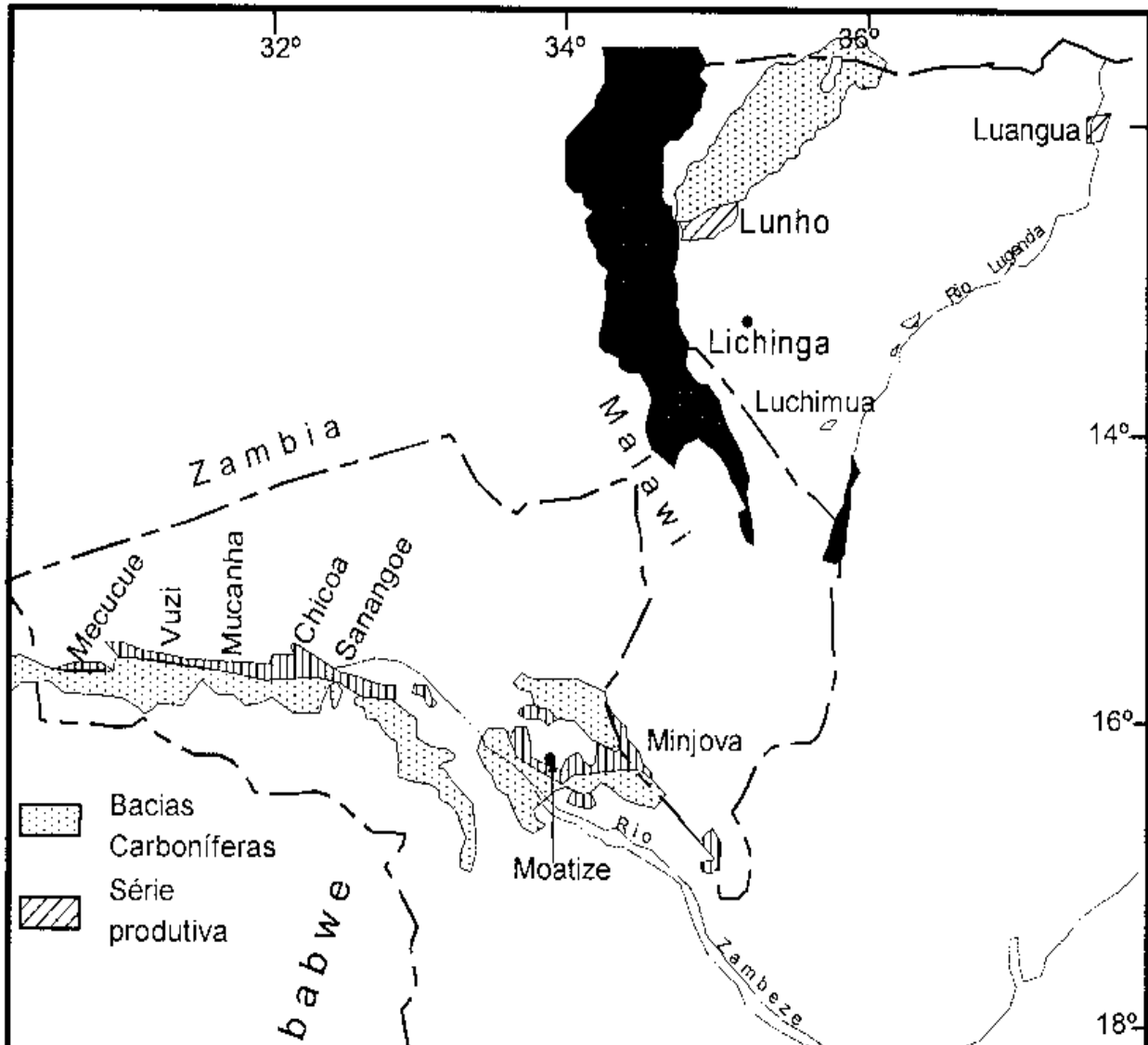
The difference in price and the proportions of the two types of coal determine the viability of a mine. Moatize and Ncondezi have less coking coal.

Main companies involved in coal production and exploration in Tete province

| Company | Country | Location and stage of project | Shareholders | Projected production (million tonnes) | |
|---|-------------------|---|--|--|--------------------------------------|
| | | | | Coking coal | Thermal coal |
| Vale Moçambique | Brazil | Moatize 1 (producing) Moatize 2 (hope to start production in 2015) | Vale do Rio Doce 85%; Mozambican state 5%; reserved for national investors 10% | 17.16 (with 8.58 each in Moatize 1 & 2) | 5.2 (with 2.6 each in Moatize 1 & 2) |
| Rio Tinto | Australia/ UK | Benga (producing since 2012) & Zambeze (projected start of production 2014) | 100% Rio Tinto (bought Riversdale Mining for \$3.8 billion) | Benga, 6 Zambeze, 13.5 | Benga, 4 Zambeze, 9 |
| Jindal | India | Changara (projected start of production 2013) | | 3 | 2 |
| Eurasian Natural Resources Corporation (ENRC) | UK/ Kazakhstan | Cahora-Bassa (projected start of production 2013) | Kazakhmys 26% Alex Mashkevitch 14.6% Alijan Ibragimov 14.6% Patokh Chodiev 14.6% Kazakhstan state and privatization committee of the Ministry of Finance 11.6% | 6 | 4 |
| Beacon Hill Resources | UK | Minas de Moatize, (Producing since 2011) | | 0.72 | 1.64 |
| Ncondezi Coal Mining | UK | Ncondezi (projected start of production 2014) | Strata Limited 44.8 % Henderson Global Investors 8.6 % Investic Asset Management 7.2% Spearpoint 6% Ncondezi Trust No. 1 Ogier Employee Benefit Trustee Ltd 5.5% Evergreen Resources Holding (HK) Limited 4.9% Goldman Sachs Nominees 3.8% | 0 | 10.5 |
| Anglo-American | UK/EUA | Revuboe (projected start of production 2015) | Anglo-American 58.9% Nippon Steel Corporation 33.3% POSCO 7.8% | 5.1 | 3.4 |

Source: Data from Ministério de Recursos Minerais (MIREM), companies and Rosenfeld (2012).

Coal basins and potentially productive areas



Thermal coal for local power stations depends on Eskom

The mining companies plan to use much of the thermal coal, at least the lower grades, in power stations near the mines. Initially Vale proposed a 2600 megawatt (MW) power station, Rio Tinto a 2000 MW station, and Ncondezi a 300 MW station that could be expanded to 1800 MW.

Ncondezi hopes to sell its electricity to the Mozambican market, and it will need to find finance.

Recently Vale and Rio Tinto have begun talks on a single joint power station. Both hope to sell to the South African electricity company Eskom, which so far has shown no interest in buying more electricity

from Mozambique.

Construction will not start without an agreed customer, and it takes three years to build a power station. So electricity from coal cannot start before 2017.

But how will the coal be transported? Two railways to Nacala?

The lack of infrastructure, particularly railways, is the major headache for coal producers in Tete and later Niassa. How to move the coal to port? At present there is only one railway, the Sena line from Moatize to the port of Beira, but coal transport is currently suspended and the companies blame the constant derailments. In the last week of January, three trains derailed, causing substantial losses.

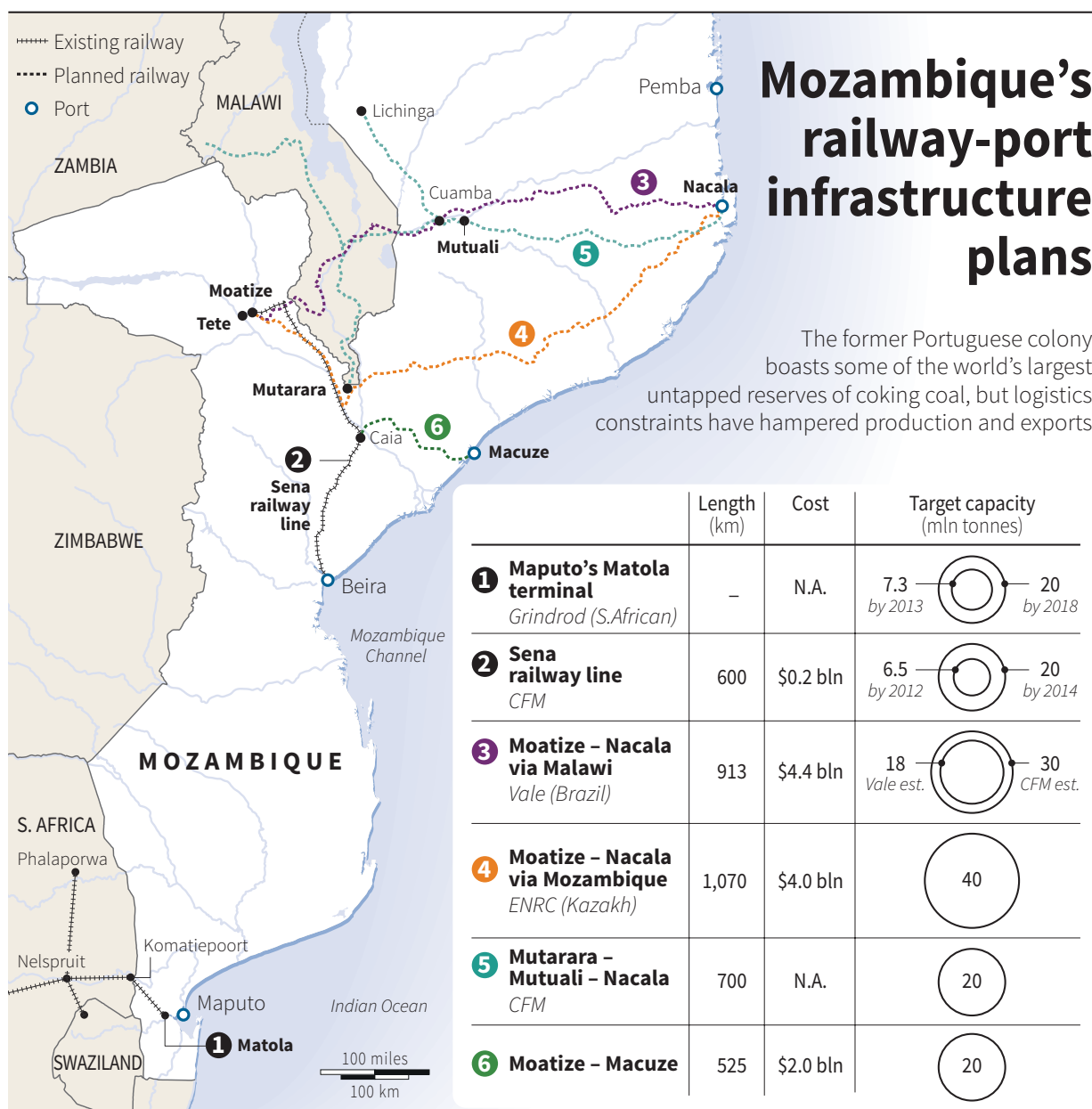
The table on page 4 shows that by the end of 2015 the major coal companies hope to be producing 51.48 million tonnes of coking coal, all exported, and 39.74 million tonnes of thermal coal, some of which will be exported. And this does not include the more than 100 other licences in Tete, plus ongoing exploration in Niassa.

Yet by the end of 2015 the Sena line is likely to still be the only railway to a port. From later this

year, when rehabilitation work is completed, the Sena line will be able to carry 6 million tonnes per year. Capacity could be doubled to 12 mn t/y by 2018. But this is still a small fraction of what is needed.

Three coal mining companies are now building or proposing entirely new railways to export their coal:

- Vale is building a new line from Tete to the port of Nacala via Malawi;



Sources: CFM, Reuters

K.Pong, 13/12/2012

REUTERS

- ENRC proposes a Tete-Nacala line completely within Mozambique; and
- Rio Tinto proposes a Tete-Quelimane line with an entirely new off shore deep water port at Macuze, just north of Quelimane.

Vale's line should be the first to open. Being built at a cost of \$1.6 billion, it is planned to carry 30 mn t/y – more than Vale itself expects to export. A new line will run from Tete across Malawi to Cuamba in Mozambique, and the existing Cuamba-Nacala line will be substantially upgraded. This has been named Projecto Nacala XXI.

ENRC announced in late 2011 plans for a 60 mn t/y line from Tete to Nacala with work starting in 2014. Paul Craven, director general of ENRC told the Dow Jones Newsletter in February 2012 that their line would be entirely in Mozambique, and avoid Malawi, a country which has sometimes had difficult relations with Mozambique. Craven said it would be shorter and cheaper than the Vale line.

Rio Tinto (and Riverdale before it) wanted to ship coal by barge down the Zambeze River and create a floating off-shore deep water terminal. The Mozambican government tried to discourage the project and finally rejected it on environmental grounds. In January Rio Tinto announced that it was

writing down the value of Riversdale from the \$3.9 bn purchase price to less than \$1 bn, partly because it had no way to export the coal. Rio Tinto's head, Tom Alabanese, and its strategy chief Doug Titchie, who were behind the Riversdale purchase, were both sacked. Rio Tinto has made clear that it is open to proposals for various collaborations or sale of the entire operation.

Rio Tinto's new transport proposal, still with an offshore terminal, would involve a railway to a point just north of Quelimane. The cost would be at least \$8 billion, and sources in the ports and railways (Portos e Caminhos de Ferro de Moçambique, CFM) say it could not be done before 2018.

What remains unclear is if railways built by one of the mining companies will carry coal from other mines, and on what basis.

Beacon Hill has shipped some coal from Moatize to Beira by lorry, but this is not a viable alternative. Beacon Hill estimates the cost at triple that of rail. And the social and environmental impact and road damage are all unacceptable. Beacon Hill recently announced an agreement CFM to use the Sena line (Rádio Moçambique, 12 Jan 2013) – despite the on-going operational problems with that line.

Heavy Sands

Ilmenite, rutile and zircon are minerals which are extracted from "heavy sands" in various locations along the coast. Ilmenite and rutile are used to produce titanium dioxide which is a white pigment used in plastics and paint. Zircon is used in the ceramics industry.

One heavy sands mega-project, at Moma, Nampula, has been operating since 2007. Tenders for a similar mine in Chibuto, Gaza, have been cancelled twice, most recently in January 2013, after winning bidders failed to move forward.

Main heavy sands operations and explorations

| Company | Country | Location and status of project |
|---|--------------|--|
| Kenmare Moma Mining (Mauritius) Limited | Ireland | Moma, Motinhas & Angoche – Nampula Producing since 2007 |
| Africa Great Wall | China | Sangage, Angoche, Nampula. Prospecting. |
| Pathfinder Minerals Plc | UK | Moebase & Naburi, Zambézia. Ready to produce. |
| Rio Tinto | Australia/UK | Mutamba, Inhambane & Chilubane, Gaza. Prospecting. |
| Delta Zambezi Consortium | Canada | Chibuto, Gaza. Cancelled. |

Source: Author, based on data from Ministério de Recursos Minerais, companies, and international agencies.

Flourishing market in mining licenses

The increasing role of mining multinational companies has been accompanied from the start by a trade in mining and exploration licences, nearly always outside Mozambique and with little or no control by the Mozambican state.

The sale of the Benga coal mine by Riverdale to Rio Tinto in early 2011 for \$3.8 billion would have netted Mozambique \$450 million if capital gains taxes had been paid. Economist Carlos Nuno

Castel-Branco estimated that this lost money was equivalent to an entire year's budget support aid, or the equivalent to building 100 secondary schools.

This was the largest example, but in 2009 the

Canadian company Artumas sold its shares in the Rovuma gas field to Maurel & Prom and Cove Energy. Cove was later sold to PTT Exploration and Production, Thailand's biggest gas and oil company. Thus Cove's involvement in Block 1 was purely as a short term investor, with no links to exploration or production. Similarly, Riversdale was taken over before it produced any coal.

This is common in the global extractive industry. Often a smaller company which has a licence for prospecting and has found a mineral does not have the technology and large amounts of money needed to exploit the find, so the company or the licence is sold to a bigger company. But there are also many so-called mining and petroleum companies which only obtain licences and then hope to sell at a large profit.

Selling licences at a profit is common and not necessarily bad. The problem is that the state loses any control over the asset, as well as the very large losses in potential tax revenue.

Selling mining assets to be taxed at 32%

Mozambique learned a hard lesson from the sale of Riversdale. A new tax law passed at the end of last year that any mining of petroleum assets in Mozambique which are sold by foreign companies will be subject to a 32% capital gains tax. The tax rate is the same no matter how long the asset has been held.

Even before that, the tax authorities (Autoridade Tributária de Moçambique, ATM) last year moved to impose a negotiated ad hoc tax on asset sales.

Cove Energy very publicly put itself up for auction, and its main assets were 8.5% of Rovuma Block 1 and 10% of an onshore block. The Thai company PTT won the auction and paid \$1.9 billion; it also agreed to pay Mozambique \$175 million in tax.

Mozambican state incapable of dealing with the boom

Lack of money and know-how to operate the extractive industry is not simply a problem for Mozambican companies. Various recent studies point to the shortage of qualified people in the state apparatus, particularly at provincial and district level, who can deal with powerful mining and petroleum multinationals.

The lack of qualified people in the ministries that deal directly with the extractive industry for licences, exploration, production, sales and export was highlighted in the first report for EITI, the Extractive Industries Transparency Initiative, which was produced in 2011 by the Ghana consultancy Boas & Associates.

As a result, the report noted, Mozambique lacks a reliable system to regulate mineral concessions. It has no independent way to verify the quantities and quality of what is mined and exported, depending on

It's not just foreigners selling licences

Although sale of assets and licences is dominated by foreign companies, because they have the biggest and most valuable concessions, there are a growing number of Mozambican companies who are also selling mining licences.

Some are selling part of the licence in order to bring in partners with the money and technology to carry out the project. Others just collect licences in the hope that a foreign company will offer to buy.

Frelimo veteran Raimundo Pachinuapa is an example of someone who sold in order to gain money and know how. He sold 75% of the Mwiriti ruby concession in Cabo Delgado to the British company Gemfields for \$6 million, in two parts in 2011 and 2012.

Gemfields is a world leader in emeralds, but some analysts suggest Pachinuapa made a bad deal, not knowing how much the mine is worth. The concession covers 34,000 hectares.

It is not known if the sale was taxed.

Of the 200 prospecting licences issued last year to Mozambicans and foreigners, it is estimated that half were sold. This suggests that licences were obtained purely for speculation and later sale, and were obtained by people with no capacity or experience to carry out the exploration.

There were at least two others sales of parts of the Rovuma field last year. Prices are not known, nor is it known if taxes were paid. The Norwegian Statoil sold 25% of Blocks 2 and 5 to the Irish Tullow Oil in August 2012. And on 24 September 2012 the Malaysian Petronas sold 40% of its 90% of Blocks 3 and 6 to the French company Total.

company data. Furthermore, the report says that the state has no independent way to check on world market prices and cannot verify the claimed investment costs. It is well established that companies try to inflate their local costs and depress the prices for which they sell, in order to reduce their taxable profit.

Better organised governments make serious efforts to attract highly qualified staff who can keep close tabs on the companies.

The Minerals Ministry (Ministério dos Recursos Minerais, MIREM) reports that it is training 4000 technicians at various levels, inside and outside the country. The problem is that the training is dependent on scholarships from the mining and petroleum companies. Indeed, many of the trainees are sent to home countries of these mining companies. This does not seem that safest way to build state capacity which is truly independent of the mining companies.

Another problem is the lack of coordination

between various ministries. A minister recently told the *Bulletin*: "With the frenzy in the extractive industries, various ministries began to compete and act alone in an attempt to gain a lead. Each ministry seeks to offer more service than others. The result is the current lack of coordination."

The way that exploration licences have been given to speculators with no capacity or experience also points to state weaknesses. At the moment licences are attributed on a first-come, first-served basis, with no need to prove capacity.

Tax rates for the extractive industry

Tax rates for the extractive industry are currently based on two 2007 laws, 11/2007 for mining and 12/2007 for petroleum. Mining is taxed on production and on the surface area of the concession; petroleum is taxed just on production.

The 2007 legislation raised the royalty on gas from 5% to 8% and for oil from 6% to 10%. Previous legislation gave tax concessions for deep water

production, but this was withdrawn in 2007, so all gas is taxed equally. The current tax regime is set out in the table below.

Fiscal regime for mining and hydrocarbons.

| Taxes | Mining | Petroleum |
|--|---|---|
| Royalty on production | Between 3% & 10% Coal & other mineral products: 3% Basic minerals: 5% Semi-precious stones: 6% Gold, silver, platinum, diamonds & precious stones: 10% | Oil: 10% Gas: 6% No distinction between on-shore and off-shore. |
| Surface area | Varies between 10Mt/km ² & 3000 Mt/km ² | Not applicable |
| Corporation tax (Imposto sobre o Rendimento de Pessoas Colectivas, IRPC) | Concession companies (with licence): 32% Subcontractors: 20% | |
| Special exemptions | Reduced taxes on imported machinery | |

Source: Author based on the mining laws and the Código de Benefícios Fiscais

The royalty is officially based on an average price for a month, and is based on the sale prices as declared by the company. Stocks held at the end of the month are valued at the price of the last sale, as declared by the company. Only when there are no sales during the month is market price used. The volumes exported are verified by the customs services.

But the first Boas & Associates report on EITI in 2010 noted that even though the royalty is paid based on production rather than sales, in practice many companies negotiate with the government to make the payment after the sales, often paying every three months instead of monthly. This underlines the negotiating power of large international companies.

These concessions on the margin of the law were highlighted when Ernst & Young was doing its report for EITI for 2011 and some companies refused to divulge details of the financial systems they were using. This may be changing. CIP Newsletter 17 just

issued reported that more financial information will now be published.

But pressure will continue to try to force the publication of mega-project contracts on the internet, as some countries already do, despite resistance by both government and companies.

The table shows the relatively small land rent paid by the three biggest mining companies in 2009.

Land taxes paid by the 3 biggest miners in 2009

| Company | Land Tax | |
|--------------|------------------|----------------|
| | Meticais | US dollars |
| Vale | 1,845,730 | 68,360 |
| Rio Tinto | 953,050 | 32,298 |
| Kenmare | 1,276,018 | 47,260 |
| TOTAL | 4,074,790 | 150,918 |

Source: data from the second Relatório da ITIE by Ernst & Young 2011

The surface area tax is a form of land rent, and is based on four factors:

1. size of the licence in square kilometres,
2. type of mineral,
3. just prospecting or already producing, and
4. time period of the concession.

Finally, as well as taxes, the government receives dividends from the projects where it has shares. In 2009, the state received 11,200,325 Mt (\$414,827), according to the EITI report.

Special benefits for the first 3

Before 2007, three extractive mega-project were approved: Sasol gas, Vale coal, and Kenmare heavy

sands. Each contract was negotiated separately and taken to the Council of Ministers for approval.

The benefits for the three were:

KENMARE: Corporation tax (IPRC) cut to 15% for the mine during the first 10 years, plus exemption for most other taxes during that period, including industrial tax, VAT, customs duty, stamp duties and real estate transfer tax (SISA). Expatriates paid no income tax (IPRS) during construction and the first 5 years of operation.

SASOL: Most taxes reduced by half during the first 6 years of operations.

VALE: Corporation tax (IPRC) cut to 15% for the mine and the industrial transformation tax to 5% during the first 10 years. Most other taxes halved during that period. Expatriates paid no income tax (IPRS) during construction and the first 5 years of operation.

Institutional change: much more is needed

Substantial institutional changes are needed to deal with the rapidly changing extractive sector. The Petroleum Law (3/2001) made the National Hydrocarbons Company (Empresa Nacional de Hidrocarbonetos, ENH) the commercial representative of the state in all hydrocarbons projects, with shares in the projects. The National Petroleum Institute (Instituto Nacional do Petróleo, INP) was created in 2004 (Decreto N.º 25/2004) as the regulator of the petroleum sector.

Setting up INP seemed a good idea, but it has proved problematic in practice. INP is under MIREM and has been given the task of reducing conflicts between the various companies and between companies and government agencies, many also under MIREM, such as ENH, the Mozambican Hydrocarbons Company (Companhia Moçambicana de Hidrocarbonetos, CMH), the Mozambican gas pipeline company (Companhia Moçambicana do Gasoduto, CMG), which between them have shared in most gas projects.

It would make more sense to have a regulator which is independent of government.

Obscure social and capacity building funds

Companies operating in the hydrocarbons area are obliged to make two special annual payments to the government:

SOCIAL PROJECTS FUND: to develop socio-economic projects in the areas around exploration and projection of hydrocarbons.

CAPACITY BUILDING FUND: for training government personnel and for infrastructure.

But application of these funds has not been transparent, and even the companies have complained that they don't know how their money is being used.

Communities to finally receive mining money

The petroleum law (12/2007) and the mining law (11/2007) establish that a percentage of minerals and hydrocarbon revenue is spent on development of the communities near the projects.

But it was only on 11 December 2012 that government, as part of its budget proposal to parliament, announced that the first money would go to communities in Moma and Moatize in 2013. Government announced that the communities would receive 2.75% of revenues, but did not explain where this percentage had come from – and no MP asked.

Government estimates revenue of 1,018 million Mt in 2013, which would mean 28 mn Mt (just under \$1 mn) going to the communities. It is not clear how this money will be channelled to the communities. Will it go through elected community committees as is done with similar money from the forestry sector?

COMMENT: It is important that there are very clear and transparent mechanisms for distribution of the money, and that there are clear rules as to how the money can, and cannot, be used. It is important to avoid the problems created by the "7 million" district development fund, in which there have been reports from the districts that people not linked to Frelimo are complaining they cannot access the money. TS

The amounts to be paid are set out in the contracts, which remain secret. Only the total payments are reported for EITI. In 2009 they were 91,328,899 Mt (\$3,044,297) for "institutional capacity building" and 67,576,155 Mt (\$2,252,505) for social projects. Individual payments are not reported, and the total includes payments from Anadarko, Statoil, ENI, CMH, ENH, Petronas, DNO, Sasol Petroleum Sofala, Sasol Petroleum Temane and Sasol Petroleum Moçambique.

The lack of clarity is shown by some of the spending by companies in earlier years. For example, Statoil spent \$80,000 to buy a refrigerator for fish in Quissanga, and Anadarko spend \$200,000 to extend the Radio Moçambique signal to Macomia and Palma in Cabo Delgado. Apparently the decisions were made by the companies in consultation with INP, but not with the communities.

Artisanal mining: gold garimpeiros

As well as the maga-projects of coal and heavy sands, there is also industrial mining for marble and graphite in Ancube, Cabo Delgado. But gold, rubies and semi precious stones have become important and are mined by individuals or small groups working at very small scale, and known as "garimpeiros." Artisanal mining is carried out with a minimum of environmental and safety considerations, and is harmful to health and the environment.

The national directorate of mines estimates that there are 100,000 small scale gold miners, most of whom are illegal but are at least earning enough to survive. They use the most rudimentary tools. Excavating and processing is done with hoes, picks, shovels, basins, screens and running water from surrounding rivers.

Excavation is generally done by adult men, although some women and children do related activities including crushing rocks and making food.

The structure of artisanal gold – from discovery to sales

In some areas gold was discovered by local peasants who found a stone with an attractive sheen and began digging, and discovered more. In these cases, the garimpeiros themselves become the owners of the mines, and only later linked up

with potential buyers, and with suppliers of mercury.

In other cases, mine "owners" arrive with geological maps, and indicate to the garimpeiros the zones where they should work. In this case, the actual miners are just working for someone else.

Reports from Sussundenga, Manica and Mavuco, Nampula, show illegal garimpeiros working for identified people who at the end of each day collect the production and pay the miners. These mines are never disturbed by the police, who sometimes even guard the mines to ensure that the garimpeiros do not leave with some of the gold.

A recent report showed that in most mines the garimpeiro receives half the production and the other half goes to the mine owner. Where the discoverer of the mine is not the mine owner, it is one-third to the land owner, one third to the mine owner, and one third to the miner.

Mining promotion fund is a weak link

The state is also having enormous difficulties with artisanal mining. To try to solve this problem, the Mining Promotion Fund (Fundo de Fomento Mineiro, FFM) was set up under MIREM in 2005 (Decreto 17/05 de 24 de Junho).

It has two tasks: 1) support and financial assistance to small scale mining, and 2) promoting associations of small scale miners. But it has only 27 staff and is represented in Nampula, Niassa, Tete and Manica, according to its website (<http://www.ffm.gov.mz/>).

In addition, the government is using FFM to buy gold from garimpeiros. Unfortunately it only pay 517 Mt/gramme, compared to the 1000 Mt/g paid by the informal traders, so FFM does not buy much gold.

Mercury: the executioner of miners and the environment

Small scale gold miners face two hazards, collapse of the excavations which are usually done without adequate equipment, and poisoning from mercury, which has long been used to separate gold from the surrounding sand.

Mercury vapour can be inhaled and causes a wide range of problems, including stomach aches, diarrhoea, tremors, irritability and nervousness, insomnia, memory loss, and more serious mental problems.

Mercury is also an environmental hazard, and fish in the lake behind the Chacamba dam have been found contaminated by mercury being used by garimpeiros upstream in the Revue and Messica rivers.

But Leovigildo Jate, the provincial delegate of FIPAG, the water investment fund, denied there was mercury contamination. (*Notícias* 25 July 2012)

Comment

What will Mozambique have when the mines are finished?

Mineral resources are finite and not replaceable, and the biggest problem in relation to the mineral resource boom is the lack of a vision of Mozambique after the mines.

The world is full of bad examples where an abundance of minerals and oil has resulted in wars, increasing poverty and inequality, and authoritarian regimes. But there are also good examples from which Mozambique can learn. To draw on those examples, there must be more openness in the discussion of models of resource exploitation.

Transparency of negotiations and contracts with the extractive companies is crucial – to avoid suspicion and contribute to a climate of more public confidence in both companies and government.

Capacity building of government personnel (and not in programmes dependent on the good will of mining companies), technology, and a better institutional architecture must be seen as essential.

Some have advocated a sovereign wealth fund

such as the Norwegian petroleum fund – and which has been done by other countries including Angola, East Timor, the USA, Brazil, Qatar and Russia. But having a sovereign wealth fund does not, by itself, create good management of natural resources.

Such a fund might help to reduce the so-called problem of Dutch disease, where the exchange rate increases due to influx of foreign currency from the sale of minerals.

But if there is no transparency and no limits on conflict of interest, such a fund will not improve the management of our resources. The danger is that the fund becomes a labyrinth in which public money is lost, and at the end of the day no one but the managers know where the money has gone. TS