YAOURE GOLD MINE PROJECT

FINANCIAL MODEL
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Narrative Report

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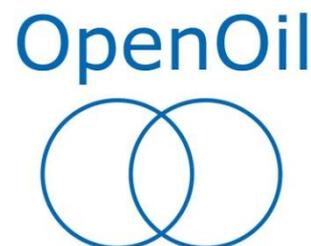
Executive Summary

This model of the Yaoure gold mine in Côte d'Ivoire is the first financial model of a major extractives project in the country known to have been developed substantially by government officials themselves.

Using the internationally recognised FAST modelling standard and financial statements published by Amara Mining PLC from April 25th, 2014, it provides the following insights onto one of the country's major natural resource projects:

- Against estimated gold reserves of 3.2 million ounces of gold and a constant future gold price scenario of $1250 per ounce, the project is strongly profitable. It shows a rate of return of 37% before tax and 29.9% for the company.

- It could earn the government about $626 million in direct revenues and taxes over its 11 years lifespan (undiscounted), assuming a constant gold price of $1250 per ounce.

- At that same gold price, the tax holiday applied to the first five years of production will cost the government about $126 million in foregone revenues.

- The mine still appears profitable to the investor without the tax break. The rate of return for the company after taxes, estimated in 29.9% does drop if the tax holiday is removed, but only to 25.1% – still well in the range of profitability where mining companies might normally be expected to go ahead with investment. To get an idea, the Bulyanhulu gold mine in Tanzania has a rate of return after taxes of 10.2%, which is considered modest; and the Oyu Tolgoi copper and gold mine in Mongolia has a rate of return after taxes of only 7%.

- The project also appears relatively robust: the company achieves a post-tax rate of return of 16.7% if gold price drops to $1000 per ounce, and of 18.8% if costs increase by 20%.

It is hoped that financial models like these will enable the government of Côte d'Ivoire map revenue flows and inform the design of Côte d'Ivoire's fiscal regime as well as support negotiations over individual projects.

Context

Côte d'Ivoire has an important geological and mining potential. Numerous minerals indicators have been identified and are yet to be developed. The country hosts 35% of the birimian rocks of West Africa, rocks rich in gold, diamonds and other minerals.

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The Yaouré Gold mine project of Amara Mining in Côte d'Ivoire is based on reserves of 3.2 million ounces. Amara Mining estimates in 2014 the life of mine is 11 years, average production during first 10 years is 279 000 ounces p.a., investments required for the construction of the mine are $357 million and future gold price is $1250 per ounce.

Our model estimates after tax IRR of 30% and project NPV of $807 million with 8% discount rate: $323 million for the Government and $484 million for Amara Mining.

The fiscal regime establishes a five-year tax holidays, which means a shortfall in taxes for the State of $129 million, i.e. 35% of the total taxes during the life time of the mine ($371 million).

However, the project remains profitable without the tax holiday: rate of return for the company is 25% after tax.

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The Government ambition is that the mining sector plays a more important role in the national economy.

According to EITI's report on Côte d'Ivoire for 2015, citing data from DGMG, there was intense research ongoing to increase and clarify the country's mining potential. The country had 3 mines under construction: 2 gold mines (Sissingué and Aféma) and 1 manganese mine (Lagnonkaha); and six projects were undergoing feasibility studies to obtain exploitation licenses: 4 gold mines (Angovia, Ity, Dahapleu-Gbétou, Debo), 1 nickel mine (Biankouma-Touba) and 1 bauxite mine (Bongouanou).

Côte d'Ivoire adopted a new mining Code in March 2014. This is in line with the international best practices to promote the mining sector and maximize revenue from these resources. Côte d'Ivoire intends to enter the circle of mining nations and to promote the development of the regions where its main mining projects are located.

The Youre gold project was operated by Compagnie Minière d'Afrique (CMA) between 1999 and 2003, and by Yaouré Mine West Africa from 2008 to 2012. Since that date, the mine has been closed due to technical and economic reasons: insufficient reserves and low gold price.

But the Yaoure gold project has significant exploration potential for resource growth. It is a brownfield site and its proximity to existing infrastructure including grid power within 5 km, an abundant water source (dam within 5 km) and a dual carriageway within 40 km make the project one of the best located gold projects in West Africa.

In 2014, Amara Mining published a financial model within a Preliminary Economic Assessment (PEA) of Yaoure [*Technical Report & PEA; Amara Mining Plc, 25 April 2014*]. This model contained forecasts of production, operating and capital costs disaggregated over the entire life time of the project. At that point, Amara Mining Plc, had plans to re-open the gold mine of Angovia (Yaouré Gold Mine Project). Amara's model estimated and after tax rate of return of 33.1% and after tax project NPV of 612.7 million USD, with 8% discount rate.

In 2016, Amara Mining published an optimised pre-feasibility study (PFS) of Yaoure [*Amara Mining PLC, Optimised Pre-Feasibility Study for Yaoure Gold Project, 26 February 2016*] which estimated relatively big gold reserves (3.244 million ounces of proven and probable reserves), increased the estimated life time of the mine to 15 years, and modified previous forecasts on price, production and costs. This study does not include a detailed financial model for the project, but reports an estimated after tax rate of return of 38%, and after tax NPV for the company of $555 million, with 8% discount rate.

Less than two months after the publication of such PFS, in April 8th, 2016, Amara Mining PLC was merged to Perseus Mining Limited.

Perseus is undergoing a Definitive Feasibility Study, due for completion in late 2017, to confirm the proven and probable reserves estimated in Amara's PFS, and expects a development decision of mining operation in the December 2017 quarter.

The Yaoure gold project appears as the biggest mine project in Côte d'Ivoire and one of the biggest in West Africa.

The re-opening of this mine is expected to boost the local economy, through employment and local supply, and help the Government realize its main objective: Côte d'Ivoire, an emerging country by 2020.

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Financial modelling

Exploration works and metallurgical tests led to a deep knowledge of the Yaoure gold project. Amara's technical report from 2014 and Optimised Pre-Feasibility Study from 2016, provide information on reserves, estimated average annual production, the investments required for the construction of the mine (CAPEX), average operating costs (OPEX), gold price, etc.

These figures can be used to build a financial model of the project (an Excel-based model complying to the FAST standard) to estimate net revenues, cash flows, internal rate of return (IRR) and project net present value (NPV).

As mining legislation in Côte d'Ivoire is also public, it can be used to introduce fiscal assumptions to the model and estimate revenues for government and company.

In the following paragraphs, we will compare the figures in our model with those in the financial model published by Amara Mining in 2014 [*Technical Report & PEA; Amara Mining Plc, 25 April 2014*][1].

A financial model allows us to follow the financial analysis through every stage of the life of a project, and to analyse the effects of changes in production, price, costs or fiscal regime. It also allows us to perform a gap analysis, where we point out the missing information that could improve the results of the model. So, modelling can ultimately be used as a tool for transparency.

Findings before fiscal regime

Amara Mining's technical report for Yaoure from 2014 [*Technical Report & PEA; Amara Mining Plc, 25 April 2014*], introduces four different project scenarios, or cases, depending on the annual processing capacity. Their base case assumes annual processing capacity of 6.5 Mt/year and has the highest performance from all cases.

The base case estimates the life of the mine in 11 years and an average annual production of 279 k Oz (8.9 tonnes p.a) over 10 years. It estimates a gold price of $1250 per ounce during the entire life time of the project. The estimated investments required for the construction of the mine (CAPEX) are $357 million, and the average operating costs (OPEX) are $537 per produced ounce. Total unit costs of the project are $743 per ounce.

For the base case, Amara Mining estimates an after-tax rate of return for the company of 33.1% and after tax NPV for the company of $612.7 million, at 8% discount rate.

We used Amara's figures of production, gold price and costs –except for figures in the last year of decommissioning– for the base case, to build a model of the cash flows of the project.

We assume in addition a 2% inflation rate (based on the US Federal Reserve target rate). However, to compare with the figures published by Amara, we bring nominal values back to reals using 2017 as base year (first year of the model).

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[1] As Amara's PFS from 2016 does not contain a detailed financial model for the Yaoure project, we have not incorporated the updates in production, LOM, price and costs to our model.

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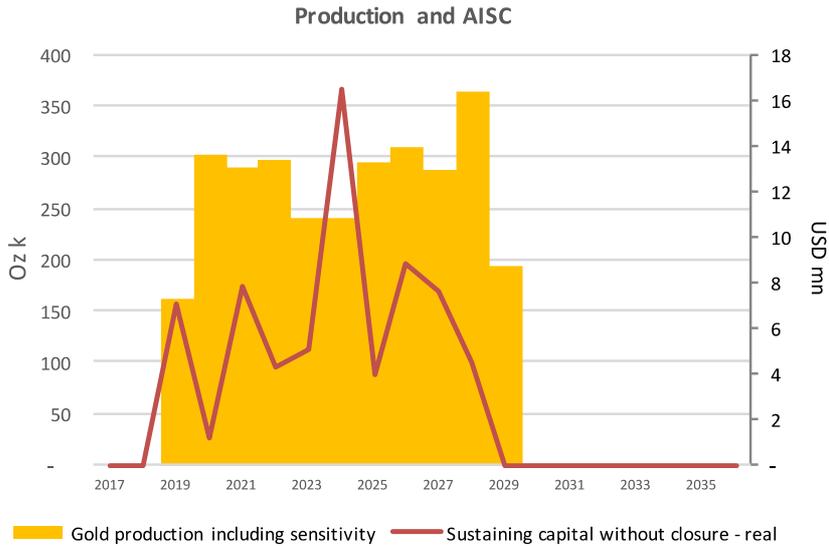## Narrative Report

Fig 1. Production and AISC considered for the model of the Yaoure project.

We also model a 10% withholding tax (based on the EY Corporate tax guide: 2016 Worldwide Corporate Tax Guide). In terms of costs, we include 62 million USD of sunk costs, estimate end of life decommissioning costs equal to 7% of development costs, and refining and transportation costs equal to 1% of gold revenue including inflation (assumptions based in empirical information about the industry).
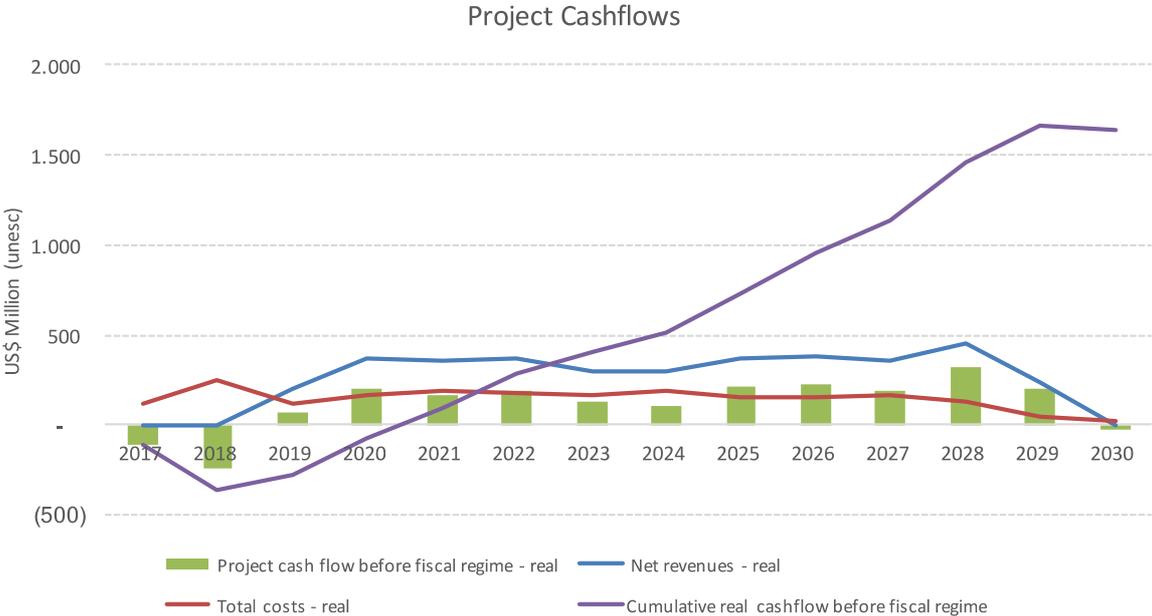

Fig 2. Project cash flows, costs and net revenue estimated for the Yaoure project.

Our model estimates net revenues of $3690 million for the project and cash flows of $1639 million, with a pre-tax rate of return for the project of 37%.

Fiscal terms

Four assumptions based on the fiscal regime of the recent mining legislation are applied in Amara Mining's technical report of 2014: 1) a variable royalty rate based on the gold price; 2) a community fund rate of 0.5% of the net revenue of refining and

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transportation costs; 3) a corporate income tax of 25% with 5 years of tax holiday from the start of production; and 4) depreciation of development costs over 10 years from the start of production.

We also consider a 10% withholding tax (based on the EY Corporate tax guide: 2016 Worldwide Corporate Tax Guide).

Applying inflation to the price scenario of $1250 per ounce, results in a royalty rate of 4% of the net revenues (gold revenue minus refining and transportation costs) until 2030, when it increases to 5%.

Incorporating these fiscal assumptions to our model distributes the estimated net revenues of the project ($3690 million) as follows: 17% for the State, 27% for the company and 56% accounting for supply of mining goods and services. Capturing a significant amount of this 56% share represents a huge challenge for local content policy.

From the estimated cash flows ($1639 million), 38% go to the government and 62% to the company.

The estimated after tax IRR is 29.9%. And the project NPV is $807 million, with 8% discount rate, from which $484 million (60%) goes to the company and $323 million (40%) goes to the government.

The tax holiday applied to the first five years of production costs the government $129 million, 35% of the $371 million total taxes during the life of the project.

Sharing of 3690,3 unesc USD mn real net revenues

Sharing of 1638,9 unesc USD mn full-cycle undiscounted real net cashflows


Our estimated project NPV is 21% smaller than the one reported by the mining company. The difference in after tax IRR is of 3.2%.

The differences between Amara Mining's estimates and ours might be due to our different disaggregation of costs, additional fiscal considerations and introduction of inflation.
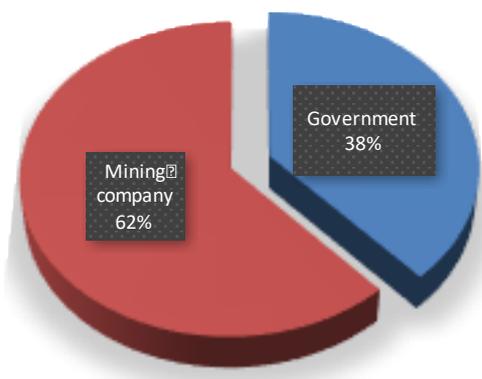
Modifying the fiscal terms: removing the tax holiday

The most interesting finding comes from analysing the removal of the five-year tax exemption period from the start of production valid for all projects with an exploitation permit.
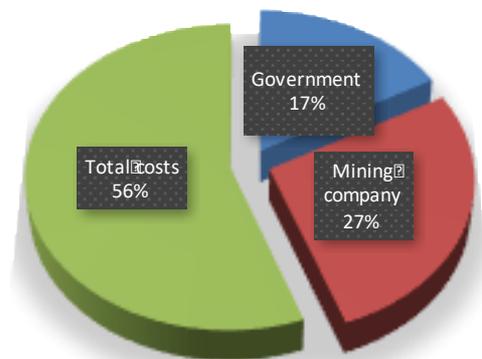
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This allows us to evaluate whether the fiscal deal done by the government for the project makes sense or not and allows us to imagine the costs to government if this is extrapolated across the entire sector.

But our financial model shows that the project remains profitable even without the 5 years of tax holiday.

In real terms, after tax IRR is 25.2% for the company; NPV is $807 million for the project, from which $390 million are for the company and $417 million for the government, with 8% discount rate.
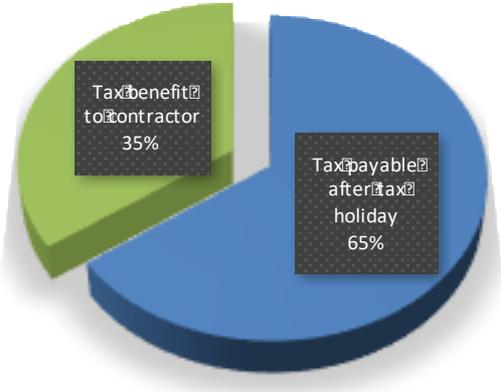
The revenues of the project are also distributed differently: $417 million (52%) for the Government and $390 (48%) million for Amara Mining, at 8% discount rate.

The undiscounted net cash flows for the life time of the project ($1639 million) are then distributed 46% for the State and 54% for the company, instead of 38% and 62%, respectively.

Thus, the tax holiday is arguably not necessary to make Yaoure viable for the investor, and the government may forego $140 million in potential revenue unnecessarily.

If this finding was repeated across the entire sector the costs to Government could be very substantial indeed. This policy should be revisited, after careful evaluation using the type of modelling that we have done for Yaoure.

Tax holiday (371,3 unesc USD mn payable before holiday)

Tax benefit to contractor 35%

Tax payable after tax holiday 65%

Sharing of 1638,9 unesc USD mn full-cycle undiscounted real net cashflows

Mining company 54%

Government 46%