McFadden Research

ROYALTY ANALYSIS

2021

TIMOK COPPER-GOLD PROJECT IN SERBIA

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Key Facts:

Ticker Exchange	NYSE American:EMX: $2.91 TSX-V:EMX: $3.73
Date of Report	March 12, 2021
Analyst	Jim McFadden, CFA, MBA

Company Statistics (USD):

52 Week Range	US$1.22 - 3.79
Market Capitalization	US$234.58M
Outstanding Shares	84.98M
Total Cash (mrq)	US$41.18M
Total Debt (mrq)	N/A
CEO	David M. Cole

Major Shareholders (%):

% of Shares Held by All Insider	19.70%
% of Shares Held by Institutions	27.47%
% of Float Held by Institutions	34.21%
Number of Institutions Holding Shares	32

Price Chart: 1 year NYSE American: EMX

Source: Investing.com, March 31, 2021

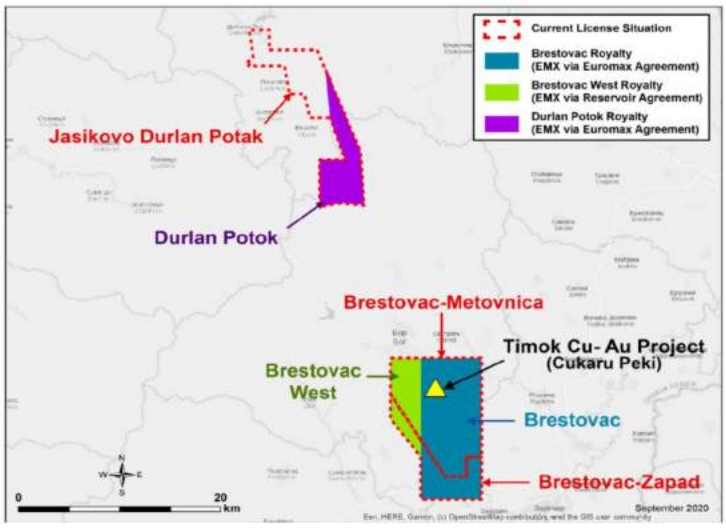
Prepared by McFadden Research. Please see our full disclosure statement on the last page of this publication.

Description

The giant Timok Copper-Gold Project in eastern Serbia, one of the largest copper gold projects in all of Europe, is 100%-owned by the Zijin Mining Group Co., Ltd. (Shanghai Stock Exchange: SA shares, code 601899), a giant multi-national mining group headquartered in China. Zijin attained 100% control of the Timok project through the acquisition of the project's previous owner, Nevsun Resources Ltd., and through the purchase of a minority interest in the Lower Zone of the Čukaru Peki deposit (see just below) from Freeport-McMoRan Inc.

The Timok mining complex is located 5 kilometers (km) from the Zijin's Bor mining complex and 250 km southeast of Belgrade. It consists of four regions: Brestovac, Brestovac West, Durlan Potok, and Jasikovo Durlan Potak. The main discovery at Timok is the Čukaru Peki deposit in the northwest section of the Brestovac region. See Figure 1.

Figure 1: Timok Property Map



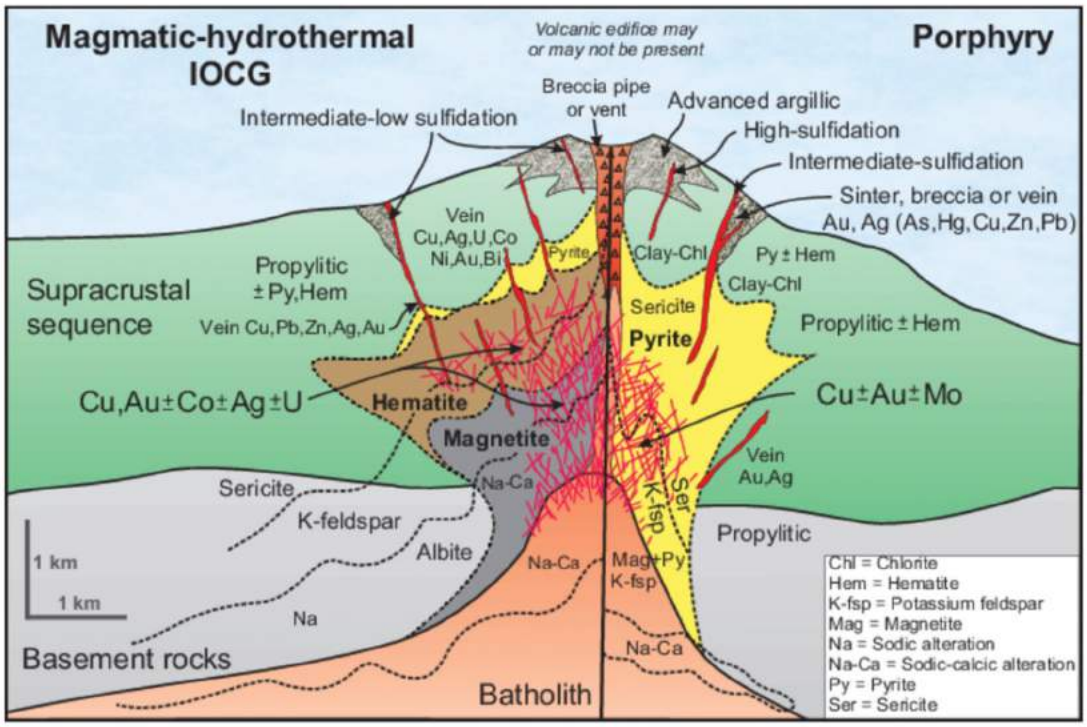
Source: EMX Royalty

Čukaru Peki Deposit

The Upper Zone is the first mining priority at Čukaru Peki. It is a high-grade, high-sulfidation epithermal deposit, which is situated in a single area at depths between 400 and 800 meters. Epithermal deposits are typically high-grade, fairly concentrated deposits that

are within 1,500 meters of the surface, thereby minimizing mining costs. A further positive: higher sulfide epithermal systems are frequently linked to porphyry copper deposits. Porphyry copper deposits can be large mineralized systems, sometimes several thousand feet in diameter. See Figure 2. Gold is primarily associated with copper sulfides in the Upper Zone and is mostly hosted in pyrite.

Figure 2: Porphyry Copper Deposit Illustration



Source: ResearchGate

The Lower Zone of Čukaru Peki, located 200 meters below the Upper Zone, is characterized by a low-grade porphyry copper-gold mineralization in close proximity with quartz-sulfide veins. According to its website, Zijin is preparing a feasibility study on the Lower Zone. Presumably, development in the Lower Zone will commence sometime after that study is finalized.

A conventional milling facility will process 3.3 million tonnes of ore per year, or about 8,900 tonnes per day. The output is expected to be a bulk copper concentrate that could be immediately sold, and a pyrite concentrate that will need further treatment to recover the contained gold.

Mineral Resources at Čukaru Peki's Upper Zone

Zijin reports on its website that the Upper Zone contains 1.05 million tonnes of copper at an average grade of 3.7 grams of copper per tonne of resources (g/t), and 68 tonnes of gold (about 2.2 million troy ounces) at a median gold grade of 2.4 g/t.

Initial production is expected to begin in June 2021 at an annualized pace of 79,600 tonnes of copper and 2 million tonnes (64,300 troy ounces) of gold. Furthermore, Zijin estimates the Upper Zone has a mine life of 13 years, roughly consistent with 1.05 million tonnes of copper resources and an approximate 80,000-tonne copper production rate.

The Upper Zone resource figures quoted by Zijin are broadly in line with a NI 43-101-compliant mineral estimate for Čukaru Peki published in March 2018. See Table 1.

Table 1: Mineral Reserve Statement -- Čukaru Peki Deposit, March 2018

Description	Quantity (kt)	Grade			Contained Metal		
		(% Cu)	(g/t Au)	(% As)	(klbs Cu)	(kOz Au)	(kt As)
Proven	0	0.00	0.00	0.00	0	0	0
Probable	27,121	3.25	2.06	0.17	1,944,074	1,792	47
Total	**27,121**	**3.25**	**2.06**	**0.17**	**1,944,074**	**1,792**	**47**

Notes:

1. The Mineral Reserves and Resources in this news release were estimated using the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM"), CIM Standards on Mineral Resources and Reserves, Definitions and Guidelines prepared by the CIM Standing Committee on Reserve Definitions and adopted by CIM Council.
2. Metal prices used include $3.00/lb Cu and $1,300/oz Au.
3. A Reserve NSR cut-off of $35/tonne was used to optimize the SLC Ring layout.
4. Contained metal figures and totals may differ due to rounding of figures.

Upper Zone – Lower Zone Cash Flow Model

Nevsun, the previous owner of the Timok project, published a NI 43-101-compliant cash flow model for Timok in mid-2018. The key inputs to the model were a Pre-Feasibility study for the Upper Zone of Čukaru Peki and a Resource Estimate for the Lower Zone. We plan to utilize the revenues and cost line items from the mid-2018 cash flow model to predict the mine's financial results -- and the required Net Smelter Return (NSR) royalty payments -- for a mine with various annualized copper and gold production run rates.

Table 2 shows potential cash flow results (columns) for **three scenarios**:

1) The projected results published in the mid-2018 cash flow model, which shows 1.69 million tonnes of resource mined and 60,400 tonnes of copper produced;

2) A derivation of the first scenario adjusted for the annual production of 79,600 tonnes of copper;

3) A scenario where 3.3 million tonnes of resources are mined in keeping with Zijin's projection on its website that that quantity of ore could be produced annually when all underground development in the Upper Zone is completed. Under this scenario, the annual output is approximately double that of Scenario 1, cutting the potential mine life approximately in half as well.

The main assumptions utilized in Table 2 are the following:

The base commodity price assumptions we utilize in Table 1 are a copper price of US$3.50 per pound, a discount to the current spot price of around US$4.00; and a gold price of US$1,700 per ounce, in line with the current spot price and down about 17% from the all-time peak of more than US$2,000 in August 2020.

To compute our cash flow estimates for more bullish Scenarios 2 and 3, we utilize unit operating costs per tonne of resource mined or processed that are consistent with the stated 2022E per-unit assumptions in the published cash flow model.

We also factor in a 5% NSR royalty which the Serbian government collects on the sale of all metallic raw materials.

Important to note: the mine cash flow and resultant royalty estimates derived from Table 2 and outlined on page 5 only factor in production from the Upper Zone of Čukaru Peki. **No Lower Zone copper or gold sales are reflected**, even though the resources in the Lower Zone are potentially larger than the Upper Zone (see just below). Any production in the Lower Zone would be additive to our royalty estimates.

Furthermore, no Timok production from any region outside of Čukaru Peki in which EMX also holds a royalty interest is reflected in our cash flow and royalty projections. Similarly, the commencement of any copper or gold sales from these regions would be incremental to our baseline figures.

This qualification is important because, according to a mid-2018 resource estimate, the Lower Zone alone has 1.7 billion tonnes of inferred mineral resources grading at 0.86% copper and 0.18 g/t of gold. The contained copper and gold in the Lower Zone could therefore total 14.3 million tonnes and 9.6 million ounces, respectively.

Table 2: Annual Cash Flow Model for Upper and Lower Zones of Čukaru Peki Deposit

Assumptions are in bolded red.	**2022E**		
	SCENARIO 1	**SCENARIO 2**	**SCENARIO 3**
Copper Price - US$ per Pound	**4**	**4**	**4**
Copper Price - US$ per Tonne	7,716	7,716	7,716
Gold Price - UDS$ per Troy Ounce	**1,700**	**$1,700**	**1,700**
Tonnes Mined	1,690,000	2,209,081	**3,300,000**
Tonnes Processed	770,000	1,006,505	1,503,550
Concentrate Produced from Tonnes Mined, in tonnes	337,000	440,509	658,047
Copper Concentrate Grade	18%	18%	18%
Copper Payable, in Tonnes	$60,896.00	**$79,600.00**	$118,909.00
Gold Concentrate Grade, in Grams of Gold per tonne of resource (g/t)	7.2	7.2	$7.20
Gold Payable, in Troy Ounces	78,011	101,972	$152,329.00
Gross Revenue, in US$ millions	$602.50	$787.60	$1,176.50
Transport Costs, in US$ millions	$39.00	$51.00	$76.20
Transport Expense per Tonne of Concentrate	$115.73	**$115.73**	**$115.73**
Serbian Government Royalties (US$ millions) - 5% NSR	$22.20	**$30.50**	**$48.00**

Table 2: Annual Cash Flow Model for Upper and Lower Zones of Čukaru Peki Deposit, continued:

Assumptions are in bolded red.	**2022E**		
	SCENARIO 1	**SCENARIO 2**	**SCENARIO 3**
Operating Expenses:			
Mine Expenses, US$ Millions	$32.30	$42.20	$63.10
Mine Operating Expense per Tonne Mined, US$/tonne	$19.11	**$19.11**	**$19.11**
Processing Expenses, US$ millions	$8.90	$11.60	$17.40
Processing Expense per Tonne Processed, US$/tonne	$11.56	**$11.56**	**$11.56**
Treatment Charge/Refining Charge and Arsenic Penalties, US$ millions	$42.00	$54.90	$82.00
Charge per Tonne of Concentrate, US$/tonne	$124.63	**$124.63**	**$124.63**
Water, US$ $ millions	$1.10	$1.40	$2.10
Water Cost per Tonne Mined, US$/tonne	$0.65	**$0.65**	**$0.65**
General & Administrative Costs, US$ millions	$2.70	**$5.50**	**$5.50**
Total Expenses, US$ millions	$148.20	$197.20	$294.30
EBITDA, US$ millions	**$454.30**	**$590.40**	**$882.20**
0.5% NSR Royalty, US$ millions	**$2.27**	**$2.95**	**$4.41**
Implied Mine Life	$16.00	$13.00	$8.00
	Years	Years	Years
Present Value of 0.5% NSR Royalty for Implied Mine Life, at Various Discount Rates, in US$ millions:			
10%	$17.80	$21.00	$23.50
15%	$11.80	$14.00	$15.70
20%	$8.90	$10.50	$11.80
Sensitivities:			
Each US$0.25 per pound change in copper prices impacts the 0.5% NSR royalty by approx, in US$ millions:	**$0.11**	**$0.22**	**$0.35**
Each US$0.25 per pound change in copper price impacts the NPV of the 0.5% NSR royalty, at various discount rates, in US$ millions:			
10%	**$1.40**	**$1.60**	**$1.80**
15%	**$0.90**	**$1.00**	**$1.20**
20%	**$0.70**	**$0.70**	**$0.90**
Each US$100 per ounce change in gold price impacts the 0.5% NSR royalty by approx, in US$ millions	**$0.05**	**$0.05**	**$0.13**
Each US$100 per ounce change in gold price impacts the NPV of the 0.5% NSR royalty, at various discount rates, in US$ millions:			
10%	**$0.40**	**$0.40**	**$0.50**
15%	**$0.20**	**$0.30**	**$0.30**
20%	**$0.20**	**$0.20**	**$0.20**

Key calculations from Table 2 include the following:

- Based on the commodity price assumptions noted on page 3, the sale of approximately 60,900 tonnes of copper and 78,000 ounces of gold in the Upper Zone of Čukaru Peki (as specified in the full year 2022E of the cash flow model) would generate annual EBITDA of US$454 million. **In turn, EMX Royalty's 0.5% NSR royalty would generate about US$2.3 million per annum.**

  If that level of annual production were held constant, the Upper Zone alone would have a life of around 16 years (Zijin's estimate of about 1.05 million tonnes of copper in the Upper Zone divided by annual copper production of 60,900 tonnes). **The net present value (NPV) of that 0.5% NSR royalty is US$17.8 million, US$11.8 million, and US$8.9 million based on annual discount rates of 10%, 15% and 20%, respectively.**

  EMX Royalty's 0.5% NSR royalty and the NPV of that royalty cash flow are fairly insensitive to changes in commodity prices. Each US$0.25 per pound change in the assumed price of copper affects EMX's royalty and the NPV of that royalty cash flow by only about US$0.11 million and US$0.7-1.4 million, respectively. Gold price sensitivities are even smaller.

- Under a more bullish scenario (Scenario 2), where annual copper sales reach 79,600 tonnes per year and physical gold sales rise proportionate to the growth in copper tonnes, mining in the Upper Zone should generate US$590 million of EBITDA over a 13-year mine life. EMX Royalty's 0.5% NSR royalty would equal US$2.95 million over that period. The NPV of that 0.5% NSR royalty cash flow ranges from US$10.5-US$21.0 million utilizing the same discount rates as above.

- Finally, under the most bullish scenario displayed (Scenario 3), we assume that 3.3 million tonnes of resources are mined each year at the Upper Zone, in line with Zijin's projections on mining capabilities when all underground mining is complete. In Scenario 3, US$880 million of annual cash flow is produced at the project level over an eight-year period. In turn, EMX Royalty would receive royalty payments of US$4.4 million per annum. These eight royalty payments have an estimated NPV of US$11.8-US$23.5 million.

EMX Royalties in Serbia – Acquisition Details

In 2006, EMX Royalty sold properties in Serbia, including Brestovac West. In exchange, EMX Royalty received uncapped NSR royalties of 2% for gold and silver, and 1% for all other metals.

In 2013, EMX Royalty purchased an uncapped 0.5% NSR covering the Brestovac and Durlan Potok properties from Euromax Resources Ltd. for C$200,000. This 0.5% NSR covers the Upper and Lower Zones of the Čukaru Peki deposit and is the driver for all the royalty calculations shown in the preceding pages.

Conclusion

EMX Royalty should begin realizing multimillion dollar royalty cash flows beginning in 2021 under almost any reasonable production schedule at the Čukaru Peki deposit's Upper Zone. Furthermore, those payments should continue for many years. Using very realistic copper and gold price assumptions and conservative assumptions regarding the mine life and the zones that will be mined at Čukaru Peki (e.g., no production at the Lower Zone is reflected in our estimates), the minimum NPV of EMX Royalty's expected Serbian royalties is in the range of US$10-20 million.

Jim McFadden, CFA, MBA

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